WHITE PINE DISTRICT
State and Federal Annual Rep

Stretch, 1867, p. 100
(SM for 1866)

B44
Item
83

5290 083

"PRODUCT OF THE MINES IN LANDER COUNTY.

NAME.	Tons.	Pounds.	Aver. per Ton.
Diana	143	1,909	$ 91 18
Amsterdam	1	250	168 75
Buel North Star	4	1,920	336 57
Camargo	12	973	116 57
Chase	4	1,438	405 10
Enterprise (White Pine District)	1	.....	111 53
East Oregon	4	779	187 65
Empire State	7	619	99 22
Ensign	1	667	66 25
Fortune Teller	4	416	177 28
Florida	13	1,900	255 60
Fenian Star	7	1,359	54 24
Fortuna	1	1,520	30 33
Farrel	3	1,453	71 12
Great Eastern	287	.....	217 94
Idora	22	1,695	220 42
J. R. Murphy	1	100	251 18
Joseph Cole	1	1,350	27 85
Jacob Bradley	1	.....	116 80
Keystone	2	350	194 66
Kihock	1	.....	197 27
Zaidee	1	728	100 61
Lodi	7	1,019	32 54
Livermore	3	500	157 79
Mount Tenabo Company (Cortez)	.....	.....	.....
Morgan & Muncey	4	626	25 69
Magnolia	6	1,671	338 23
Metacom	26	.....	100 99
Manhattan Company	69	288	83 90
May & Davis	2	430	136 80
North River	13	1,924	56 03
Owen & Perkins	3	1,700	46 16
Providential	64	844	54 91
Pinney, Rev	6	600	51 73
Patten	2	824	200 43
Remington	6	1,500	49 68
Savage Consolidated	451	.....	103 25
Silver Queen	14	1,913	38 28
Surprise	1	.....	171 66
Semanthe	2	150	332 52
Timoke	79	1,138	148 41
Taylor & Passmore (Cortez)	5	982	160 43
Tunnehill (Eureka)	3	1,338	106 35
Victoria	4	1,176	91 20
Washington	12	67	479 52
Whitlatch Union	18	546	105 97
Zimmerman	5	1,278	71 75

= $1912

WHITE PINE DISTRICT.—The District of White Pine was organized in the autumn of 1865, and received its name from the species of wood growing upon the mountain. That portion of the range bearing the name of White Pine is about two degrees in length, is lofty, and generally covered with pine. It has not been much explored for mines, except in the district now mentioned. Here a number of veins have been located which are represented to be valuable. The district is about 90 miles east of Austin, and is in Lander county. A company called the Monte Christo commenced in July last the development of a property, but the progress made, or the results obtained, have not been ascertained.

Browne, 1868, p. 411 for 1867

WHITE PINE MOUNTAINS.

To the north this mountain extends nearly to the Humboldt River in broken sections, at places rising to a considerable altitude. Within twenty-five or thirty miles of the mines the range consists of a series of short, smooth hills, lying diagonally across it in a southeast and northwest direction, and nearly destitute of timber. The supply of water is not abundant. Just east of Pancake Mountain these hills are more isolated, change their course by degrees to due north, are more regular in form, rise to a much greater altitude, and are thickly covered with juniper, nut-pine, mountain mahogany, and an inferior growth of white pine.

South of this for ten or twelve miles the mountain is very broken and somewhat depressed. All the loftier sections are covered with timber and with a profusion of bunch grass, and are quite well supplied with water. This is the general character of the range as far as it has been explored.

WHITE PINE DISTRICT.

In the spring of 1865, a company from Austin went eastward for the purpose of exploring the country, a little south of where Newark is situated. From some points on the Diamond range, their attention was directed to a very high and regularly formed mountain, east of the Pancake range. They approached it through what is now known as Mohawk Canon, near the head of which they discovered the first evidences of the existence of silver mines. A district was organized on the 15th of July and called White Pine District, from the fact that white pine timber grew in the cañon. This mountain, or hill, has an elevation of perhaps 8,000, or 8,500 feet—others estimate it much higher. Its course is due

north and south, and its length about twelve miles. Its contour is a finely drawn curve, quite regular, terminating a little abruptly at the north end. The summit is thin and blade-like in shape. The base is not broad. The spurs and cañons run at right angles with the summit, are short and sharp, but not usually precipitous. Perhaps, on the eastern slope, they tend southward somewhat, before reaching a smooth open canon, running south and southwest, connecting with the plain in that direction. Towards the north this canon is divided by what is known as Middle Hill, two or three miles in length, having a course north of northwest, and an altitude of about 1,200 feet less than that of White Pine Hill. To the east of this is Treasure Hill. Its course is northeast and southwest. On the west the spurs are quite abrupt, near the cañon, but rise more gradually afterwards. Where they connect, the ascent for two or three hundred yards is quite gentle, then it increases rapidly to the summit, which is about a mile in length, and precipitous for two or three hundred feet on the east side, and at either end. To the north it terminates at the highest point in a kind of elongated peak, which has an altitude of about 7,000 or 7,500 feet. South of this, a few hundred feet, there is a depression for a short distance of from one hundred and fifty to two hundred feet, and then there is a second rise of fifty or a hundred feet for several hundred yards, to the termination of the summit. The hill south of this is a series of spurs, divided by sharp cañons. These spurs slope towards the southeast, south, and southwest, from two to three miles. Below the precipitous part of the hill, east of the summit, the descent is at an angle of about 35° for two or three hundred yards, where it again becomes almost precipitous for several hundred feet, to a very broad canon, or narrow valley. This cañon sweeps around the spurs of the hill, south and southwest, and unites with the cañon from Middle Hill. It also circles around all three of the hills on the north, connects with the canons on either side of Middle Hill, and finally opens out into Newark Valley. The flow of the water in these cañons is determined by slight elevations or saddles, connecting Middle Hill with the other hills at the north, and Treasure Hill with Fossil Hill, a little east of Hamilton. These elevations are so slight that they cause no obstructions to the roads which are made along these natural passes, and a carriage may be driven around either one or all of these hills. In these cañons there are a number of springs of good water, a little hard. The supply is sufficient for quite a number of mills, and may be greatly increased by short tunnels. Several springs are near the heads of the canons on White Pine Hill, but there is no water found either on Middle Hill or Treasure Hill.

The geological formations are essentially the same in every part of the district. Belts of argilacious slates, extensive croppings of quartzite, heavily covered with oxidized iron and heavy croppings of limestone, constitute the prevailing rocks. On the western slope of White Pine Hill it is said that granite appears. The mines originally discovered are north of this, where the limestone prevails. Quartzite crops out on the summit in many places.

Middle Hill is a mass of limestone, underlaid apparently with slate. Sections of this rock lie against every side of Treasure Hill; often triangular in shape, and hundreds of feet in length, height and thickness. They overlap the spurs or rest against them without regularity or connection. They are found transversely on the southern portion of the summit. Their disjointed edges and tilted strata make all the precipices. A belt of slate two or three hundred feet wide, appears northwest of the north end of the summit down towards the cañon, and is wound like a sheet up the side of the hill, south and east nearly half way around the highest point. This point is an extensive outcrop of very hard quartzite. It projects fifty or sixty feet, and great masses have fallen and lie in loose boulders below. Fossils are found in great abundance in the limestone. Encimites, corals, terebratulas and spirifers occur.

Fossil Hill, next north of Treasure Hill, is covered wtih a great variety of fossils.

The discoveries made in 1865, were not followed with a rapid development of the mineral resources of the district. The ore was of too low a grade to pay largely. It was reduced under great disadvantages at Austin. It contained copper, iron, lead and antimony, and yielded from seventy to one hundred and fifty dollars per ton in silver.

A few miners, however, remained in the district. They affirm that in the early part of the following winter they experienced a severe earthquake. There were several shocks—three much harder than the others.

In the spring of 1866, mines were discovered on the eastern slope of White Pine Hill. It is thought that there are several ledges extending along the mountain from near the summit, far down the foot-hills. The ore contains large quantities of base metals, and without being tested, was condemned as refractory.

Late in the fall of 1867, an Indian found a fine specimen of chloride ore on Treasure Hill, near what is now called the Hidden Treasure Mine. He conducted the miners to the place, and other discoveries followed in rapid succession. In two or three days, however, a deep snow fell, which continued until late in the following spring, and prevented a thorough exploration. It is somewhat singular that experienced prospectors had previously passed over this hill in search of mines, without being successful. The fact is explained when it is known that the float-rock has a very unusual appearance. It is generally dark, with a slight reddish or rusty tinge, sometimes yellow, or even black, and looks much like a specimen of limestone colored with the oxide of iron. It is heavy and compact, and when broken, has a dull, unpromising lustre, very different from that shown by rich quartz generally. As the snow melted away in the spring, hundreds of claims were located; work began in many places; immensely rich deposits of horn silver were found, and the deepest interest was awakened.

Commencing at the point of discovery on the summit, a deposit of ore is traced on the surface due south 1,200 feet, where it disappears under a capping of limestone for several thousand feet, and reappears on the brow of the southern slope of the hill. It is traced on the surface at this place nearly two thousand feet. It disappears again, but is found further south in several places. It varies little from a direct line at any point. Discoveries are also made on the eastern slope of the hill, a few hundred feet below the summit, in a line due north and south. Further to the westward, down among the foot-hills, many locations have been made which promise well. Rich mines are being opened on the western slope, and in various places on the spurs south and southwest. The richest discoveries are in an eastern and western direction, along the break of the southern end of the summit. The Eberhardt is in this neighborhood. Croppings and deposits of fine chloride ore are found, and slightly developed in different places, running north and south diagonally across Middle Hill. As a whole, this mineral belt is crescent-shaped, the northern and southern extremities bearing strongly towards the west. It is between six and seven miles in length, and about one and a half in width.

The number of truly valuable mines cannot now be ascertained. Usually the openings on different claims extend but a few feet. The deepest shafts are about one hundred and twenty-five feet below the surface, and only one or two have attained that depth. The distinguishing characteristics are their extent and productiveness, the wonderful richness of the ore, its uniform freedom from base metals, and the ease with which it is taken out and reduced. In a few places there is a trace of lead, and a glance of copper. Small quantities of iron are found everywhere, but this is all. The silver is in the form of chlorides. Very careful assays show a small per cent. of gold. Horn silver is not found alone in scales and thin

linings, but massive, in specimens weighing between fifty and a hundred pounds, nearly solid, with only quartz sufficient to give it body and consistence.

In regard to the permanency of these mines it is impossible to decide with absolute certainty. The general impression is, that there are no well defined walls; that the ore is much broken and is found in masses or beds, rather than in veins; that they have no regular dips, and sometimes it is even difficult to determine their course.

Such views are formed without consideration, and in the face of many facts to the contrary. No mine can truly be said to be opened so as to show its real characteristics, until it has been examined below the disturbed country rock, and usually below the water level. Not a mine in the district has been thus examined. Were they mere deposits—ore beds—it would seem that some of them, when hundreds are being worked, would have exhibited the fact by becoming exhausted. But thus far not one has failed; on the contrary, the Hidden Treasure, the Eberhardt, the Emersley, the Pocotillo, and the Hidden Treasure South and several others, show well defined walls, with clay selvages on one or both sides and in different places. In both the Aurora South and North, transverse excavations for fifty feet have been made at intervals for more than 1,200 feet in a direct line, to the depth of twenty-five or thirty feet; and, although no walls have been found yet the facts stated lead fairly to the inference that there must be a ledge below.

But should this inference be incorrect, and should there be no ledge, it would be a new experience in the history of mining developments. Still, the quantity of ore prospected as described, and paying, as it does, an average $185 per ton, renders this a mine of great value, and to be preferred to one of equal productiveness between walls of granite or of porphyry. But that this should be the case, that there should be a deposit of ore so uniform in richness, so regular in its course for 1,200 feet, situated only a few rods from the summit of a high, isolated mountain, is very improbable, and has not occurred before in any district in the State.

When the mines are opened below the disturbed rock, the true idea of this wonderful mineral belt, known as the Treasure Hill belt, will be known, but probably not before.

HIDDEN TREASURE.

This claim was located November 3d, 1867, and contains one thousand feet. The width varies from two to eight feet. The ledge has been opened through nearly the whole length of the claim in places, and excavations made to the depth of twenty-five feet. Dip west, slightly north, about 25°; walls in places well defined; the east wall is limestone; the west is slate dipping with the ledge. Between three and four hundred tons of the ore have been reduced, and have produced on an average one hundred and sixty dollars per ton. Assorted ore has yielded from five to eight hundred dollars per ton. The silver is in the form of chloride; much of it horn silver; a little iron is the only base metal.

HIDDEN TREASURE SOUTH.

One thousand feet are claimed. This mine is the same in all respects as the Hidden Treasure, except that there is not nearly so much work done.

The quality of the ore is unchanged.

CONTINENTAL.

Located in August, 1868. The original claim, and the extension together have 2,200 feet south, next to the Hidden Treasure South.

Vein matter shows on the surface, and quartz with the chloride of silver shows

in an excavation only a few feet in depth, and also in the bottom of a shaft ten feet deep. From the assays, this quartz will probably yield twenty-five or thirty dollars per ton; but it is not opened, only reached at the points indicated, sufficiently to show the continuation of the ledge due south from the Hidden Treasure.

BARRIS AND SPROUL, WARD BEECHER, MONTROSE AND TWILIGHT.

These claims are near each other, and contain about six hundred feet each. The Ward Beecher was located in the fall of 1867. The others in the spring of 1868. They are probably on the same ledge. The working value of the ore is about two hundred dollars per ton.

AURORA NORTH.

Located in the spring of 1868. One thousand feet claimed. The south part of the mine is opened by an excavation east and west, about ten feet in width, twelve in depth, and forty or more in length.

It exposes a large body of chloride ore, yielding from one hundred and fifty-five dollars to two hundred and two dollars per ton; 6,375 lbs, without assorting, yielded $442.86.

AURORA SOUTH.

This mine is the same as the Aurora North in every respect, except that there are a number of excavations running east and west for fifty and sixty feet, and to the depth of from twenty to thirty feet, exposing a great quantity of ore. More than one hundred and fifty tons reduced, yielded an average of one hundred and eighty-five dollars per ton; 17,157 lbs yielded $3,696.56; ninety tons yielded $14,713.50; 30,159 lbs yielded $2,842.48; eight tons at another time yielded $3,500.

KEYSTONE.

This claim is south of the Aurora, about one thousand five hundred feet. Eight hundred feet are claimed; located May 11th, 1868; course east and west. This mine was discovered from a mass of horn silver found on the surface, which yielded about $12,000 per ton. An excavation about thirty feet wide, and fifty feet in length, east and west, opens this mine to the depth of eighteen feet. A shaft from the mouth of this excavation is sunk about one hundred feet through vein matter. Quartz rich in chloride silver abounds along this shaft.

Quantities of ore have been reduced at different mills, and have yielded on an average one thousand dollars per ton. When closely selected it has yielded over one thousand five hundred dollars per ton; eight hundred and fifty tons of ore gave a return of one hundred and eighty dollars per ton. In mining, quantities of chloride silver are shaken loose from the quartz and finely pulverized. It is collected and passed through screens, and yields from one hundred and fifty to several hundred dollars per ton.

EBERHARDT SOUTH.

Located in December, 1867. Eight hundred feet are claimed; course east and west. Like the Keystone, this mine is opened with an excavation from the east side of the hill, about fifty feet in length, forty in width, and twenty in depth. Drifting has been done to various distances westward, without finding the limits of the ore. A shaft south and west of this excavation, probably one hundred feet, known as the Blue Bell Shaft, is sunk to the depth of one hundred feet along the north side of a section of limestone. This wall is quite regular and well defined. About forty feet below the surface, a drift in an irregular direction connects this shaft with the excavation before described. It passes the whole

distance (one hundred feet) through a mass of ore of marvellous richness. It is all chloride, principally horn silver. Short tunnels and excavations are made at intervals, to ascertain the extent of this ore, but no limit has as yet been reached. Above, beneath, on the sides, in every little curve and drift throughout the whole extent, the quartz is loaded with yellow, gray or green chloride, or with horn silver. But little of this ore is of low grade; and scarcely a spot of barren quartz is seen.

The following statistics are taken from the mill books, where most of the ore is reduced. This mill, the Oasis, has ten stamps, eight Varney pans, three pans for settling, engine sixty-horse power. The product of eleven days run from October 15th, was $60,919; and of sixteen days run from November 1st, was $82,500. Two hundred and twenty-five tons of ore in the ore-house, (November 16th) was being reduced and yielding, according to the books, from eight hundred to one thousand dollars per ton. One hundred and fifty tons of the first class ore carefully selected, were reduced in the Centenary Mill at Newark, before the Oasis mill was running, and yielded a little above $1,300 per ton. A chimney, or pocket in the mine, yielded $85,000. Specimens usually carried away for cabinets, are fabulously rich. Four and a quarter pounds were reduced and yielded thirty-five dollars and twelve cents. Twenty pounds were reduced in November and yielded one hundred and fifteen dollars and twenty-five cents. The average fineness of all the bullion from this mine, is .975.

BLUE BELL.

This mine joins the Eberhardt on the south, and is similar to it in every essential characteristic. An agreement is made by which the Keystone, the Eberhardt, and the Blue Bell are to be consolidated on the first day of August, 1869. There is no wall or other natural line of division separating them. Together, should they continue to yield as they now promise, they will constitute a mine of almost incredible value. A wall similar to that in the Blue Bell shaft is found on the north side of the excavation in the Keystone, and is exposed in a drift east and west for seventy feet at the bottom of the shaft.

After repeated, careful examinations of all the available facts, it is suggested that these claims may be situated on what is known as a pipe vein, radiated in an eastern and western direction. No conclusion perfectly satisfactory can be reached without further developments.

It is certain that effectual causes have produced at this point a mass of silver ore of unsurpassed richness, and of surprising extent.

SILVER GLANCE.

This claim is on a spur of the hill south of the Eberhardt about three thousand feet, and is five or six hundred feet below it. The course of the mine is northeast and southwest. The ore is found on the surface and needs but little uncovering. There are intruded fragments of limestone, but the ore is obtained without difficulty and yields about one hundred and ten dollars per ton. Very little excavating is done, and yet this mine has produced several thousand dollars.

ARGYLE

Joins the Silver Glance on the southwest. A west wall appears at the surface, and is quite regular for thirty feet—the depth of the shaft. The dip is fifty degrees southeast. It is apparent that there is a great quantity of ore in this mine. It has been reduced, and yields from seventy-five to over two hundred dollars per ton.

A number of claims showing ore, and in promising localities, are situated

south and southwest from the Argyle, at distances varying to a mile or more; but they are scarcely opened, and any report made at this time would be unsatisfactory.

NOTE.—The Herman, Mazeppa and California, in this vicinity, have within a few days developed large quantities of very rich ore.

POCOTILLO.

Located in the spring of 1868; 1,000 feet in the claim; course north, slightly west; width about eight feet. An excavation east and west shows a fine body of ore. A shaft is sunk, about fifteen feet in depth, and exposes walls apparently regular. The ore recently taken from the shaft is exceedingly rich and resembles closely the ore of the Eberhardt in character and value. This mine is on the eastern slope of Treasure Hill, about opposite the Aurora North.

EMERSLEY.

This claim is situated on the eastern slope of the hill, northeast of the north end of the Hidden Treasure, and about 1,000 feet below it. Course, southwest and northeast; width varies from six to ten feet; dip, northwest fifty degrees. The east wall is smooth and has a clay selvage. The west wall is irregular, but shows distinctly. Three thousand and seventy-four pounds of ore yielded six hundred and sixty-nine dollars and eighty-one cents.

This mine was located on the fourth of June, 1868. There are several claims both north and south of the Emersley, which show good ore on the surface, but are not opened.

VIRGINIA.

Located in the spring of 1868, on the north end of Treasure Hill; six hundred feet claimed. An excavation is made to the depth of twenty-five or thirty feet, and a quantity of ore obtained which yields from one to two hundred dollars per ton. Sixteen tons averaged two hundred and twenty-six dollars per ton.

South of this mine about 1,500 feet are the Vallejo, C. T. Fay, Echo, Almira, and other mines, showing good ore near the surface.

CHLORIDE FLAT

Is west from the Aurora two or three hundred feet. The hill slopes gently for two hundred yards or more, and is not broken for some distance north by cañons. This space is known as Chloride Flat. It is covered over with claims, and is being perforated in every direction with shafts, tunnels, and drifts. The ore cropped out on the surface, but is found in sheets of every size and thickness, between successive layers of limestone.

Among the most prominent mines in this neighborhood are the Iceberg, Stone Wall, Snow Drop, Post Hole, Genessee, Delmonico, Hemlock, Indiana, Glacier, Wabash, Silver Cloud, Robert Emmet, Excelsior, etc.

On opening these mines, generally, it is found that the ore decreases in quantity and in value in a westerly direction. When followed eastward it is more abundant and of a finer quality. In places it has yielded very large results. The sheets or deposits of ore vary in thickness, and the same sheet will vary greatly in different places. The limestone often shows evidences of having been subjected to heat, being disintegrated and mingled apparently with black volcanic matter. 8,632 pounds of ore from the Glacier produced nine hundred and eighty dollars and four cents. 6,909 pounds from the Snow Drop produced $1,151.28. At another time, 7,662 pounds produced $1,296.05; 25,067 pounds from the Stonewall produced $5,074.82; 6,000 pounds from the Romulus pro-

duced $1,415.50, and 2,620 pounds from the Genessee produced one hundred and ninety-nine dollars and sixty-four cents. These statistics are from the records of the mill where the ore was reduced, and might be greatly increased were it necessary.

NORTHERN LIGHT.

This mine is situated on the eastern crest of Middle Hill. It was located in the spring of 1868, and the claim contains eight hundred feet; course, due north and south; dip, thirty degrees west. Several excavations have been made at intervals, across the ledge, and small quantities of ore have been extracted, which assay from forty to between seven and eight hundred dollars per ton.

The walls are limestone, but have not been traced sufficiently to ascertain their peculiarities, if any. A stain of copper is seen in the ore occasionally, and close assays show a small per cent. of gold.

PILOT.

Situated south of the Northern Light. Located September 1st, 1868; 1,200 feet claimed. This mine is on the same ledge with the Northern Light and is in all respects similar. The ore is chloride, and closely resembles the surface ore of the Pocotillo. These mines are finely situated to work.

BASE METAL BELT.

The mines comprising this belt are on the eastern slope of White Pine Hill. They have not been opened, and occupy an area about four miles in length by a mile or a mile and a quarter in width.

The ledges crop out in places and are from two to six feet in width. The ore assays from seventy-five to six hundred dollars in silver. The base metals most abundant are copper, lead, and iron. Traces of antimony have been found, but the ore cannot be called refractory when compared with ores successfully reduced in other parts of Nevada.

WESTERN BELT.

This belt includes the mines first discovered, and which led to the organization of the district. It is on the western slope of White Pine Hill, and has an extent of about six miles in length by one in width. The ledges crop out on the surface and have well defined walls. The ore produces from one to four hundred dollars per ton. It contains the same base metals as the ore in the Base Metal Belt, but not in such quantities. It is not more difficult to reduce than the ore in many of the mines at Austin. All work is suspended in this part of the district for the present.

SMELTING FURNACE.

In addition to the Oasis Mill, described in connection with the Eberhardt Mine, a cupola furnace is in operation at Silver Springs. It has capacity for reducing about twelve tons of ore in twenty-four hours.

WHITE PINE MILL.

This mill has ten stamps, eight pans, and is doing good work. It is at Hamilton.

MONTE CRISTO MILL.

This mill is situated at the base of the spurs southwest of White Pine Hill. It has five stamps, two roasting furnaces, and pans to match. It is a complete little mill and runs well.

MINERAL RESOURCES

OF THE

STATES AND TERRITORIES

WEST OF THE ROCKY MOUNTAINS.

BY

ROSSITER W. RAYMOND,
SPECIAL COMMISSIONER OF MINING STATISTICS, TREASURY DEPARTMENT.

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1869.

(for 1868)

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obtained was not more than $10 per ton, while the hauling from the mine to the mill cost about that sum. A splendid road was cut along the face of the mountain to the mine; but the ore still continued to yield less than expenses, and the company finally abandoned the mine and, I believe, removed the mill to Newark, where it has recently produced a good deal of bullion from White Pine ore. Santa Fé district contains fine timber and water. The saw-mill formerly there furnished excellent lumber. The natural advantages of the location are such that some good mining engineers do not hesitate to say the Veta Madre may yet be worked with success, the ores being reduced in Kingston cañon. Perhaps this will be the case when labor and provisions shall have grown cheaper.

Bunker Hill and Summit districts are situated on the eastern slope of the Toiyabe range, about 25 miles south of Austin, and on both sides of Big Smoky creek, which flows into Smoky valley. The geological formation is argillaceous slates, interstratified with calcareous and graphitic slates, the whole being broken and uplifted in many places by dikes of greenstone and diorite. The ledges occur in the slates, or between them and the diorite, and generally coincide with the slates in dip and strike. A few ledges run across the course of the country rock, but these are poorer in precious minerals than the others. There appears to be one mother lode in the district, with several subordinate ones parallel or only slightly divergent in course. The ores are antimonial sulphurets, chlorides, &c., combined with considerable quantities of copper and lead minerals, such as malachite, azurite, and silicate of copper, and carbonate, chloride, and sulphate of lead, with occasionally some galena. Gold occurs native in most of the ledges, and in some forms the most important constituent. Among the principal mines are the Victorine, Real del Monte, Gold Point, Phœnician, Brown, and Jackson. Much of the ore, especially in the first two, is stained with copper minerals. The porous ore from the Gold Point assays high in gold. A selected sample from this vein yielded by assay $226 12 per ton in silver, and $886 29 in gold. There is abundance of fuel in the district, and the stream flowing through the cañon on both slopes of which the mines are situated is one of the largest that enter Smoky valley.

The Sterling Silver Mining Company constructed a handsome twenty-stamp mill, run by a turbine wheel, in the mining town of Kingston, in this district. The battery is one of the best in the State, and the capacity of the reverberatories is sufficient for the stamps. This enterprise was ruined by the failure of the mines on which it was based, and the company's mill is now owned by its creditors. Half a mile below the Sterling mill is the twenty-stamp mill erected by an eastern company for the treatment of the ore from the mother-lode in the neighboring Santa Fé district. This mill also failed on account of the poverty of the ore. C. Coover, a practical mill-man, in company with others, under the name of the Bunker Hill Mining Company, afterwards erected a five-stamp mill, run by water-power, for wet crushing, without roasting. In this mill 1,000 tons of unassorted Victorine ore were worked, with an aggregate yield of $19,500. This mill has now been moved to White Pine. The ore of these districts is generally of low grade; but the large quantity in sight, and the ease with which, by means of tunnels, etc., it can be extracted, render inevitable a future recovery of the lost activity and the inauguration of a new prosperity.

Northumberland district.—This district lies in the Mootay range, which lies opposite and parallel to the Toiyabe, forming the eastern boundary of Smoky valley. The district is about 25 miles south of the overland road, and the same distance north of Belmont. The principal rocks are granite, (chloritic and syenitic,) porphyry, (generally much decomposed,) and lime. The mines occur almost exclusively in porphyry. The ores are sulphantimoniurets, (ruby silver, etc.,) with the usual products of decomposition, (chlorides, etc.,) and occasionally copper minerals, such as malachite and azurite. The principal veins are the Northumberland, Lady Cummings, and Detroit; but there are, as usual, numerous locations the value of which is unknown as yet. From the Northumberland and Lady Cummings some 20 tons of ore were sent to Austin last year, and yielded, it is said,* from $70 to $150 per ton. The Quintero Company have recently erected a ten-stamp mill, with roasting furnaces, to work ore from the Northumberland vein. The machinery was obtained by dismantling Hunt's mill at San Antonio. Considerable money was expended in miners' dwellings, etc., and the mill closed soon after starting, on account of financial embarrassments. The Northumberland is a large vein, but the ore is of low grade. Wood is abundant in this district, and water is supplied by several springs.

White Pine district was organized in 1865, but did not become the scene of successful operations until the fall and winter of 1867, when the rich mines of Treasure Hill were located. Previous to that time a company, called the Monte Cristo, was engaged, with no very flattering prospects, in the development of certain mineral veins on White Pine mountain, from which the district derives its name. It is said that an Indian, seeing the ore piled in the Monte Cristo mill, offered to make known a place where there was plenty of such material, and guided a party to Treasure Hill, sixteen miles distant, where the Hidden Treasure mine was located September 14, 1867.

The White Pine mountain, so called from the species of timber with which it is abundantly covered, is about 120 miles south of east from Austin, and 60 miles southwest from Egan cañon, a station on the overland road. It is said to be situated in latitude 39° 10′ north, and longitude 38° 30′ west. The mountain is ten or twelve miles long, and rises boldly some 2,000 feet above the level valleys, having a total altitude of perhaps 10,000 feet above the sea. On the western slope are the veins first discovered, some of which were worked by the Monte Christo Company above mentioned. They are said to have been tolerably rich, but small. Parallel with White Pine mountain, on the east, is a ridge some 1,500 feet lower, and five or six miles long, in which mineral veins occur carrying ores of silver considerably contaminated with baser metals. This is called the Base Range. Still farther east is the mountain known as Treasure Hill. It is comparatively bare of timber, about 9,000 feet above the sea, and separated by deep cañons on every side from surrounding ranges. All these mountains have a generally north and south course.

The geological formation of the district is extremely simple, resembling that of all the so-called limestone districts of Nevada. An upheaval of limestone strata by porphyry, and a subsequent metamorphosis of structure by solfataric and thermal-aqueous action, is evidently indicated. My brief examination did not extend to the minute local details of the formation, but I believe this neighborhood, when thoroughly studied, will throw much light on the geology of other districts, where the effects of these agencies are more obscure and the exposures of rock less extensive and distinct.

The limestone strata of Treasure Hill have been tilted from the east,

*See J. Ross Browne's last report, page 423.

and have a general course north and south, and a dip of about 20° west. The uppermost layers now remaining from the extensive denudation which has degraded all the mountains of Nevada form a rugged summit of limited area, which has been (strangely enough) described as "trap," but consists of highly fossiliferous limestone, containing mainly crinoids. Below this is a thin stratum of calcareous shales, colored yellow and red with iron, and beneath these again is the limestone stratum in which the rich deposits of silver ore occur. This limestone is highly siliceous, and contains little or no traces of fossils so far as I can learn at present. The eastern side of Treasure Hill is precipitous, and exposes the outcrops of successive strata; and here it may be seen that fossiliferous limestone appears again beneath the metalliferous layers. It is believed by many that a second stratum of ore-bearing rock will be found beneath the lower fossiliferous limestone, but this has not been proved. Across the cañon to the eastward the precipitous face of a parallel range shows the continuations of the limestone strata; but the range is of inferior height, and the upper metalliferous layer is consequently wanting, having probably been carried away by denudation. This range dips eastward, and the cañon between it and Treasure Hill probably occupies an anticlinal axis.

"The formation of the White Pine district," says an otherwise intelligent correspondent, "is an anomaly, and sets at defiance all known laws and rules of geology." This is the common expression of miners and tourists, readily adopted by speculators, who have learned by experience that "anomalies" sell best in the market. The truth is, there is nothing unusual in the formation of the district, except the enormous value of its ores. These occur in irregular masses and impregnations throughout a certain stratum of the limestone, and, fortunately for the miners, this stratum is the very one which the processes of disintegration and denudation have left uppermost. The ore consists of chloride of silver, with some enargite and stetefeldtite, and (in rare instances) native silver in capillary form. Of the extent of the deposits nothing can be said at present. They are probably bounded above and below by the planes of stratification, but laterally they seem scarcely to be separated from one another—what has been considered barren rock between them being mainly low-grade ore, which will hereafter be extracted like the rest. The accompanying minerals are quartz and calc-spar. The copper-stains upon most of the ore show that this metal was a constituent of the original deposits; and I conclude that the remarkable purity of the chloride ore of the Treasure Hill mines is the result of chemical changes subsequent to their original formation, in the course of which soluble chlorides, sulphates, and bicarbonates have been removed. It is possible, therefore, that the ore deposits of Treasure Hill have a common origin with those of the Base Range, and that the present differences are due to the concentrating and purifying action of thermal waters carrying chemical reagents in solution. There is no radical distinction in nature between the filling of a fissure and that of a cavity in limestone. The metalliferous fluids, whether solfataric gases, aqueous solutions, or molten masses, find their way wherever an opening is offered, and leave their deposits wherever they are checked for a sufficient time to cool or evaporate, or wherever they meet with chemical agencies which produce in them insoluble precipitates. Experience has shown that upheavals of stratified limestone do not generally produce fissures so extensive and well-defined as occur in some other kinds of rock. The solubility of the limestone itself in carbonated waters, especially under high heat and pressure, tends both to fill up the fissure with calc-spar and to open outlets from it into irregular cavities, and, finally, to cause a general alteration (silicification, often) of the country rock, and its impregnation with the metallic contents of mineral waters. Hence the miner's maxim, that lime is a "good gangue, but a poor country."

The ore deposits of Treasure Hill are richer than any that have been discovered during the present century; but, according to all the data that have yet been collected, they are not fissure veins. These data, though they all point one way, are necessarily incomplete, since no shaft on the hill is deeper than 60 feet, and no horizontal drift longer than 100 feet.

Not long before my visit, the miners of the district held a meeting, at which they were strongly urged to adopt at once the system of "square locations," and abandon the farce of staking out claims on ledges which do not exist. This proposition was defeated; and every man on Treasure Hill now claims so many feet of a vein, running, he does not specify in what direction, and dipping, he cannot tell at what angle, from a hole which he has made at random in the neighborhood of some already exposed body of ore. If he gets down to the ore, all the better; he can then work night and day, extract a large quantity of rich chloride, and send it away, before the neighbor, who has a prior location, can prove the identity of the deposit. In the utter absence of any real distinctive features of lodes, the principle has been set up by the White-Piners, that proof of such identity must consist in absolute continuity of chloride of silver from the working of the prior locator to those of the alleged trespasser. In one case, that of the Eberhardt and Blue Bell, this astounding demand was satisfied. A drift from the Eberhardt opening 30 feet to the Blue Bell shaft, passed through a mass of horn-silver, such as human eyes have rarely looked upon; and, as a consequence, the Blue Bell was united to the Eberhardt. The Keystone is, without the shadow of a doubt, on the same deposit as the Eberhardt. There is only a wall of two feet between them; but this wall is amicably let alone, and the "two veins" are therefore held by miners' law to be distinct! In another case which came to our knowledge, a claimant was endeavoring to protect himself from robbery, by tracing the ore into the works of a new-comer, close by, and had successfully arrived within a yard of his object, when the occurrence of a piece of calc-spar across his path defeated him. The intruder, protected by that bulwark, laughed his claims to scorn, and continued to extract and carry away the ore, which was, under miners' law, in a distinct vein, separated from the other by a "wall." All the "walls" thus far discovered on Treasure Hill are of this wholly indefinite and untrustworthy character—mere seams of calc-spar in limestone; and, under the present regulations, there is no such thing as security of title. Even if one had a regular fissure vein, he might be cheated out of all but a few feet of it by some accidental shoot of calc-spar across it; and when we consider that calc and limestone are chemically the same, and that a little trickling of water might deposit one of these so-called walls anywhere, we shall see what protection is offered to capital by such a rule as has been adopted in White Pine.

This is an instance of the danger of allowing the first miners in any district to make, without limitation, such laws as they please, governing the rights of property. This splendid district is now subjected to two styles of operations—grabbing on the spot, and gambling away from it. A great many worthy, honest, and industrious men are at work there; but they will acknowledge that they are merely putting off the evil day of litigation and chaos. Others are interested in claims, which they want to sell to capitalists; and they may sincerely believe their claims to be

valid and well-defined. No one is accused of intentional deception in the matter; it is only to be lamented that the inhabitants did not, by adopting at once a rational basis for mining titles, introduce order among conflicting claims. To their credit be it spoken, there has been thus far little quarrelling among them. White Pine has been notably a quiet, industrious, and good-natured mining camp. But that is because there was room for all, and profitable work for all. Unless some radical change, of which I have now no knowledge, has taken place since my visit in September, White Pine is a good place for men who live there, and can watch and defend their own interests, and for custom-mills, which will doubtless do a good business for months to come, in reducing the marvellously rich ores of the different deposits; but I must again repeat that I cannot find in the circumstances of the case any protection for permanent investment of capital. Some of the mines, as for instance the Hidden Treasure and the Virginia, standing a little apart from the great crowd, already extensively worked, and having moreover a semblance at least of definiteness in their deposits, are better off than others; but they all suffer under the absurd regulations of the miners.

It is the natural tendency, when men with nothing but their own industry to depend upon gather in a new district, that they should make such laws as will favor industry, and that only. When I was in White Pine, many a man with pick and shovel, and now and then a little gunpowder, was making good wages out of his small prospecting shaft. The retail mining business suited him well enough; but capital must work on a larger scale. Insecurity of title is no trouble to one who, if he is ejected to-day, can pack up his tools, move away a rod or two, and have a new mine in full blast to-morrow; but capital requires a certain basis for the investment of its thousands in permanent works. The only cure for this evil now possible, is that which the inhabitants may themselves supply, by uniting conflicting claims, and arranging amicably their boundaries. Perhaps it is not too late to establish square locations by general agreement, and to adjust the claims for damages that may arise from such a change by means of a commission elected by the citizens.

I adopt, with such alterations and additions as my notes of personal observation suggest, the following account of different mines, &c., from the letter of a San Francisco Alta California correspondent, who visited the district in November, two months after I left it:

The mines from which nine-tenths of the treasure now being produced in the White Pine district is being taken are located along the broken edge of the dolomite formation, in a line running southwards from the town of Hamilton up to the summit of Treasure Hill, and thence in the same direction over the declivity on the other side. The length of this lode or line of deposits is, so far as is known, between two and three miles—say about that of the Comstock; the Virginia at the northern end answering, for the purpose of illustration, for the Ophir and Gould and Curry, and the Aurora, Keystone, and Eberhardt, near the south, for the Crown Point, Kentuck, and Yellow Jacket. The principal claims thus far opened along this line of deposits are located in succession, as follows, commencing at the northern end: Virginia, Mammoth, Ellersly, north of the crest of Treasure Hill; Hidden Treasure, near the summit; South Extension of Hidden Treasure, North Aurora, South Aurora, Keystone, and Eberhardt. There are numerous other localities along this line, or nearly parallel with it on the west, but these are the principal claims opened. There is an apparent break in the line of deposits, as evinced by the croppings at the crest of the hill, south of the Hidden Treasure and north of the Aurora; but from that point south the deposits crop out so near together that they may practically be said to be continuous.

Virginia.—Located at the northern end of the Treasure Hill belt, or line of deposits, half a mile south of Hamilton, and 500 feet higher. This claim is situated on the eastern side of a ravine near the top of a ridge, running north and south. It includes 600 feet north and south, and 200 feet in width from east to west. It has been but partially opened, but the ore crops out nearly its whole length, at points from 40 to 60 feet apart, east and west, and at a depth of 20 feet, solid rock, with a large, well-defined pay streak of *bonanza*, has been exposed. On the top of the ridge, above the Virginia shaft, a claim was located, and called the Aladdin's Lamp. This claim ran directly across the Virginia, and though the prior claim exhibited no evidence of a ledge, excavations on the Aladdin's Lamp ground soon disclosed rich ore in detached masses, and the whole hill appears to be full of it. The Virginia ore, though not so exceedingly rich as that of the Eberhardt and Keystone, which is so near pure silver as to be hardly describable as ore, runs from $100 to $2,000 per ton, the average being probably not under $225. Sixteen tons recently crushed and worked yielded $226 net per ton.

Hidden Treasure.—This mine was discovered by an Indian, who guided white men to it, September 14, 1867. There was considerable secrecy maintained for a time, but the facts which were attempted to be suppressed soon leaked out, and the result led to the discovery of the great Keystone and Eberhardt deposits, lower down the hill, on the south, and the sudden development of the whole district. The present owners are T. J. Murphy and J. E. Marchand. It includes 600 feet. The line of deposits has been stripped for nearly the entire length of the claim, and in places to a depth of 20 feet. The lode, if such it may be called, pitches westward at an angle of 20 degrees, and its thickness has not yet been clearly determined. Three hundred tons of the ore—no rich specimens included—hauled to the Monte Cristo mill, on the west side of White Pine mountain, 16 miles by the road via Hamilton, yielded $160 per ton. The cost of reducing it was $65 per ton. Next year it will cost not over $20 per ton to reduce the same ore. The owners now have 100 tons of ore of superior quality out ready for crushing, and the lode is increasing in richness. The mine is entirely uncovered, and no work will be done on it after the heavy snows fall, until next spring. Picked specimens show horn-silver in abundance, worth $1,000 per ton and upwards.

Aurora.—This mine is located on the south of the crest of Treasure Hill—the Hidden Treasure being on the north—and just east of the town of Treasure Hill. This is properly the South Aurora, the North Aurora being above it, near the summit of the hill, and being but little developed. Work was commenced on it with two men, September 22, 1868; 30 men are now worked. One hundred and fifty tons of rock from this mine, worked at the Newark mill, in the Diamond range, 90 miles to the northwest of Hamilton, yielded an average of $185 per ton—the highest being $202, and the lowest $155. The cost of hauling was $20 per ton, and of working $35. There is more quartz here than lower down the hill on either side, and the indications of a regularly defined deposit are better than elsewhere. The shaft is 20 feet deep, and the drift westward 60 feet. The entrance to the mine is roofed over, and work can be carried on all winter.

Keystone.—Descending the hill southward past a number of claims, we come upon the Keystone, which is situated some distance below the edge of the dolomite croppings, on the eastern face of the hill. Here the chloride deposit crops out in almost incredible richness, and the developments are astonishing. The claim covers 800 feet, and the deposit was discovered by a party following "float" ore up the hill from the ravine

below. At the point where the shaft now is, one of the party, a mer lad, named John Turner, struck a pick into what seemed to be a mass o dried putty. This proved to be pure chloride of silver, worth $15,000 t $25,000 per ton, and under it was found more of the same sort, and masse of almost pure metallic silver. The original location was mixed up wit that of the Eberhardt, but a compromise has been effected; a neutra line, beyond which neither is to pass, has been agreed on, and on the 1s of August next the two claims are to be consolidated. At present eac company works its own ground. The amount already taken out of th Keystone is not stated by the owners, but it is very large, and all came out of an opening in the hill, not more than 50 feet long horizontally, and 20 feet deep. A shaft has been sunk 60 feet through successive layers of dolomite, at the entrance of this open cut, and ore is said to have been found at the bottom. Much of the wealth of this mine consists of dull yellowish brown colored dust, which is run through screens to free it from rock, and placed in bags. This is clear chloride of silver. One piece of this chloride, shown me while at the mine, weighed 143 pounds and was worth, as it lay on the ground, over $1,500 in coin. In one pile were 100 tons of ore which will work $300 per ton; in another, 150 tons which will yield $300 to $500 per ton; in another, 600 tons which will yield $100 and upwards; in another a large pile of chloride dust in bags, worth—one hesitates to say how much. Two lots of the ore from this mine, worked at the Newark mill and the Manhattan mill, at Austin, yielded an average of $1,000 per ton, or $100,000 in the aggregate.

Eberhardt.—Next south, and adjoining the Keystone, is the most celebrated of all—the Eberhardt. So rich is this mine that its name has become almost synonymous with that of the cave entered by Aladdin. The location was made in December, 1867, and covers 800 feet, north and south.* At a depth of 20 or 30 feet from the surface drifts have been run in several directions through solid masses of chlorides, and other ores of silver for 20 to 50 feet, and the end is not yet reached. The entrance of the tunnel has been closed, and admission to the mine can now only be gained by descending the vertical shaft in the company's building. Descending the shaft on a rope, we found ourselves among men engaged in breaking down silver by the ton. The light of our candles disclosed great black sparkling masses of silver ore on every side. The walls were silver, the roof over our heads silver, the very dust which filled our lungs and covered our boots and clothing was a gray coating of fine silver.

From a chimney in the Eberhardt ground $85,000 worth of silver was taken in a few days, and the party taking it out then compromised with the company, being allowed to hold all he had taken out and release to the Eberhardt company the ground in dispute. The silver is now piled up in a cabin at Treasure Hill. The proprietors have $50,000 worth of similar specimens piled up in another place. One of the owners of the Eberhardt, but recently a poor man, values his interest at $1,000,000, and we presume the others would refuse to sell for less money.

Down the long cañon a road leads to Silver Springs, where the Oasis mill, now owned and run by the Eberhardt company is situated. This is the old Keystone mill, which was burned at Austin last summer. Mr. Page, after settling with the underwriters, took the machinery to this place and rebuilt it. It has ten stamps, eight Varney pans, and three settlers. No roasting, chlorination, or other expensive process is employed; the wet process of crushing and direct amalgamation, known as the Washoe process, being found for the present sufficiently remunerative. Mr. Page erected the mill on a contract to work the Eberhardt and other ores; but the company soon found it for their advantage to purchase the establishment. The mill cost $30,000, and the mill and contract were sold to the company for $75,000.

Chloride Flat is a slope comprising from five to ten acres on the western side of the hill, adjoining the town of Treasure Hill. It is perforated like a sieve with shafts, sunk often within from 10 to 30 feet of each other. The holders claim 400, 600, or 1,000 feet each, and the claims, being located on the old ledge theory, run into each other, cross and interlace in every direction. At present the lucky holders of claims in which metal has been struck are too busy getting out rich horn silver and other forms of the metal to quarrel with each other, but as soon as they work out the horizontal deposits, and run into each others' claims, as they soon will, shooting and lawsuits will be the order of the day in what is now a peaceful and highly prosperous community. The great mistake of organizing the district on the perpendicular ledge theory—each claimant being allowed 200 feet on the ledge, "with all his dips, spurs, and angles," and the discoverer 200 feet in addition—was made at the outset, and it is now too late to remedy it. Had the location been made by the square yard it would have been all right, and many a lawsuit and shooting affray saved. Already difficulties are arising in the vicinity of the Eberhardt, and more must follow. From 10 to 30 feet through the limestone brings the prospector on Chloride Flat to his deposit of silver, or to the certainty that he has missed it and must seek elsewhere. The owners of the Robert Emmet mine, on Chloride Flat, who are taking out rich horn silver, reject as base rock, unworthy of being worked, all yielding less than $50 per ton. This deposit is at least seven feet thick, and not yet worked through. The Genesee, Stonewall, Delmonico and other mines in the vicinity, are among the richest on the Flat. There are 1,500 locations recorded in this district, and of this number 500 at least are within rifle shot of the above named mines.

There are three towns in the district, Hamilton, north of Treasure Hill; Silver Springs or Shermantown, south of the hill, and Treasure City in the midst of the mines upon the hill itself. Chloride City is a part, I believe, of Treasure City.

Hamilton, the town which has grown up in the cañon at the entrance of the hills on the north, contains perhaps 600 inhabitants. From thence a graded road winds up the hill to Treasure City, which stands below the crest of Treasure Hill, within the line of rich mines named on the east and Chloride Flat on the west. Here the principal mining population is congregated, the inhabitants (regular and transitory) numbering from 800 to 1,000. The distance from Hamilton to Treasure City is not over one and one-half miles in a direct line, though two and one-half by the toll road, and the difference in altitude is estimated at from 1,000 to 1,200 feet. The town of Silver Springs, sometimes called Shermantown, is located at the southern end of the Base Metal Range, two miles southwest of Treasure Hill, the road winding down a deep cañon to reach it. It is probably 1,500 feet lower than the town of Treasure City, or 7,500 feet above the level of the sea, and containing 400 or 500 people.

Hamilton has a supply of water, and is the stage and express depot, and the primary depot for supplies for the district. Treasure Hill is exposed to the full sweep of the winds on the summit of the mountain, and has no water save what is hauled up there from Hamilton or Silver Springs and sold at eight cents per gallon, but it is in the heart of the mineral deposits, and must be an important place despite its unpleasant location.

* Or, according to White Pine law, in any other direction which the locators may subsequently choose. The present assumed course is nearly east and west, I believe.—R. W. R.

Silver Springs is sheltered from the winds, and is the more desirable—rather endurable—place of residence. Hamilton was first called Cave City, from a number of caves below the town in which the people first found shelter. It consists of board and cloth shanties, tents, and brush, rock and earth cabins. Treasure Hill ditto. Silver Spring has two or three good brick buildings, and is generally better built than either of the others. There is a saw mill, quartz mill, brick yard, (not now in operation,) and large slaughter-house, at Hamilton; two banks and several assay offices at Treasure Hill; and a quartz mill, smelting furnaces, assay office, and saw mill at Silver Springs. The entire population of the district may be put down at 2,500 or 3,000 at this time, and increasing at the rate of 50 per day. A very few women have found their way into the district, but as yet there can hardly be said to be anything like female society there. The wages paid in the mines are $5 per day, coin, and those not at work for themselves get employment easily at something, if so disposed. Lots which sold at $25 in Hamilton and Treasure Hill two or three months since are now in many cases worth $600 to $1,200, and "jumping" is as lively as in San Francisco, though attended as yet by no bloodshed. Nearly every building spot along the road, from Hamilton up to and through Treasure Hill and down to Silver Springs, is already claimed by somebody, and holders always ask an advance on yesterday's prices.

The climate—Necessary outfit.—The peculiarities of the climate of White Pine are not so well known as they will be when the district shall have been inhabited for a few years, instead of less than a year. Treasure Hill is from 8,000 to 9,000 feet above the level of the sea, and exposed to the full sweep of the winter winds, which are fearfully severe at times between the Rocky mountains and Sierra Nevada. Spring is late, cold, and wet; summer short, dry, and tolerably pleasant; autumn long and pleasant, with fine days and cold, frosty, freezing nights. It is reported that snow falls to a depth of 15 feet on the White Pine range in winter, but this story is not well authenticated, and the vegetation and general appearance of the country would lead to the belief that the annual fall is not extremely large. Up to the 20th instant there were but a few inches of snow on the highest peak of the White Pine mountains, and only an inch or two, in scattered patches, on Treasure Hill and the Base Range. It was snowing on the 20th and 21st on the Toiyabe and other ranges south and southeast of Austin, and probably also at White Pine, but the storm did not appear to be of long duration. The winter, however, must be intensely cold, and those who propose to remain there until spring must be well provided with good heavy woollen underclothing, heavy pilot, beaver or blanket cloth outer-clothing, and at least two pairs of the heaviest and best San Francisco or Oregon blankets—the best are the cheapest in the end, and will always find ready sale.

It is difficult to get goods over the railroad at this time promptly, owing to the pressure of material for extending the line, which must go forward whether or no; but parties intending wintering in the mines must either take over a stock of provisions, and have them hauled from Argenta, or go provided with means to purchase them at Hamilton day by day for four or five months, probably at an advance on the prices quoted below as the present ruling rates. The climate appears to be exceedingly healthy, but owing to the great elevation of the country, and consequent rarefaction of the atmosphere, no person with weak lungs should attempt to winter there. Colds, rheumatism, and fevers will doubtless prevail to some extent before spring, as the result of exposure, neglect, and carelessness.

*Present cost of living.**—At present the necessaries of life are high-priced, but of good quality and abundant. At Hamilton and Treasure Hill are quite a number of restaurants at which a tolerably good meal may be obtained. The price per meal is $1, and board by the week is $12. There is no hotel in the district, and but one or two places where a bunk to sleep in can be rented. The price of a single bunk bed, with a mattrass and blankets, at the store of Wakefield & Wheeler, in which Wells, Fargo & Co.'s office is kept, in Hamilton, is $1 per night. This is the general resort of all new-comers, and a man who is in season to be booked for a bunk is looked upon as a favored mortal. Others, less fortunate, sleep in their blankets on the floor of the store, in saloons, restaurants, tents, hovels, or in the open air, as they can catch it. The prices of various articles of food for man and beast are as follows: Flour, $16 per hundred pounds; potatoes, (grown in Nevada and of superior quality,) 12½ cents per pound; onions, 15 cents per pound; sugar, (brown,) 3½ pounds for $1; crushed sugar, 3 pounds for $1; coffee, (ground,) 75 cents per pound—(no facilities for grinding it in the district;) bacon, (sides,) 37½ cents; hams, 37½ and 40 cents; shoulders, 35 cents per pound; beef, fresh and of good quality, 25 cents; pork, 37½@50 cents per pound; eggs, from Salt Lake, (so-soish,) $1@$1 25 per dozen; eggs, (fresh,) $2 per dozen; tea, $1 25 per pound; candles, 35 cents per pound; barley, 10@12½ cents per pound; hay, $150 per ton; drinks, 25 cents each, and no credit at the bar.

Wood of good quality is abundant, and can be had for the cost of cutting and hauling. All the wood land in the vicinity is being claimed by parties who propose to cut wood for the mills and to supply the miners. Lumber costs $150 per 1,000 feet for ordinary, $175 per 1,000 feet for choice at Hamilton, where there is a little steam saw-mill with a single circular saw constantly engaged in cutting lumber from the "bull pine," (or "nigger pine," as it would be termed in the south,) which grows on the White Pine mountain proper, in considerable quantities, and of sufficient size to afford saw logs 20 to 25 feet in length and two feet thick. At Treasure Hill $200 and upwards per 1,000 feet is charged for boards, which are hauled from Hamilton or Silver Springs, or from remote districts by heavy teams. Half a dozen men clubbing together could in a few days put up a shanty of cedar posts chinked with stones and mud, and roofed with cedar boughs and earth, which would afford comparatively comfortable quarters for the party through the winter. Those erecting buildings of sawed lumber at present line them with cotton cloth to exclude the wind, then shingle or tin the roofs. A horse will "eat his head off" in a week or two, and parties coming into the district at this time will do well to send them off to the lower valleys, 20 to 50 miles away, where they can winter on bunch grass and white sage in the open air, only requiring the attention of a herder. Clothing and blankets cost about 50 per cent. more than in San Francisco.

There are, as yet, no agricultural developments in the district itself. Some fine ranches on the road to Austin produce hay and grain, and considerable coarse hay is cut in the next valley eastward. Teams from Salt Lake via Egan cañon have found their way in great numbers to the White Pine cities, and their owners have done a flourishing business in grain, vegetables, etc.

Mills and reduction works.—The Oasis mill at Silver Springs, (10 stamps,) the White Pine mill at Hamilton, (10 stamps,) and the Monte Cristo,

* Since this chapter was written, in November, 1868, the great influx of prospectors and speculators into White Pine may have enhanced these prices still further.

(5 stamps,) are, I believe, all running. The old Butte mill, (5 stamps,) from San Francisco cañon, Reese River district, has been transported to White Pine, and will soon be in operation. There are also two smelting furnaces, which will start in the spring, for the treatment of the richest ores, and of the ores from the Base range. The product of White Pine for 1868, including the value of the ore extracted, but not yet reduced, may fairly be estimated at a million dollars, perhaps more.

At present there is but one route by which the White Pine district can be reached from San Francisco, viz: via the Central Pacific railroad, Argenta and Austin. The distance from San Francisco in round figures is about as follows: San Francisco to Sacramento, by rail or steamer, 100 miles; Sacramento to Argenta, by rail 400 miles; Argenta to Austin, by stage, 97 miles; Austin to Hamilton, by stage, 120 miles—total, 717 miles. The cost of the trip for passage alone, only 25 pounds of baggage being allowed, is as follows: To Sacramento $5, to Argenta $40, to Austin $15, to Hamilton $25—total, $85. After passing Reno, meals are $1 each along the whole route, and $15 is a moderate allowance for the expense of eating on the way, which would bring the cost of the trip to $100 in round figures, providing one has no extra baggage, does not stop to sleep on the way, and indulges in no luxuries. By purchasing a through ticket at Sacramento for Austin $10 can be saved on the above estimate, but the stage by which one engages passage from Argenta to Austin may be filled in advance, in which case it may be necessary to remain for days at the former point. If no detention occurs, and travelling is kept up night and day, the trip through from San Francisco to Hamilton may be made in five days. There are two regular stage lines, Wells, Fargo & Co.'s mail line and Miller, Wadleigh & Co.'s passenger and fast freight line, running between Argenta and Austin. Between Austin and Hamilton there are two regular stage lines, viz: Len Wine's (connecting with Wells, Fargo & Co.) and Shannon's and half a dozen guerilla lines, which make about half as good time as a man can make on foot. Fare the same all round.

In a few weeks—the weather permitting—it will be possible to reduce the staging on the trip by one-half. From Hamilton to the nearest point at which the railroad can be reached—near Fort Halleck, east of Gravelly Ford—the distance is not over 110 miles, possibly not more than 100. The new road will leave Austin far to the westward, and passing down an open valley country directly northwards, will present no heavy grades. It can be constructed cheaply, and must be opened immediately. It may run through Ruby valley, or it may leave it to the right, and pass to the westward. There are now probably 3,000 people in White Pine district and vicinity wholly without mail facilities, and dependent solely on Wells, Fargo & Co., for their letters, papers, &c. A mail route should and probably will be opened between the railroad, near Fort Halleck, and Hamilton immediately on the cars reaching the former point.

The future productiveness and importance of this district cannot now be foreseen; but much may be expected from the active explorations of next season, in a broad belt of country as yet comparatively unknown. As for the deposits of Treasure Hill, they are certain to yield large amounts of silver before they are exhausted; and the prospects of the mines would be most encouraging, but for the confusion and waste which an injudicious system of titles will be certain to generate.

Product of mines.—The only means for arriving at the product of the mines of Nevada, outside of the Comstock, is afforded by the returns of the county assessors; these are unfortunately made out with considerable irregularity, and are especially liable to error from the fact that all values are calculated in currency, according to the State law, for purposes of taxation. I applied for these returns to all the assessors in the State, but was only able to obtain in time those of Lander county for the first three quarters of 1868. The tables subjoined have been partly copied and partly calculated, by myself, from the memoranda furnished. The grand totals are correct, and the different items approximately so. The designation "chloriders" is given to parties who bring in small lots of ore, without reporting the mine from which they obtained it. In the second quarter there were 109 of these, but they are now considerably diminished in Reese River district, by the stampede to White Pine.

ASSESSOR'S RETURNS OF BULLION-PRODUCING MINES OF LANDER COUNTY.

For the quarter ending March 31, 1868.

Mine.	Location.	Ore reduced.	Average per ton.	Yield.
		Tons. *lbs.*		
Aurora	White Pine	7 1,478	$255 75	$1,979 25
Buel North Star	Reese River district.	6 327	219 85	1,355 15
Chase	Yankee Blade	14 1,510	124 94	1,849 11
Fortuna	Reese River district.	26 1,496	130 29	3,485 96
Harding and Dickman	....do	13 973	233 50	3,148 98
Isabella	....do	2 1,734	821 60	2,355 53
Magnolia	....do	98 609	243 19	23,913 69
Macey's	....do	4 468	125 55	531 58
Morse	....do	7	250 43	1,752 81
Manhattan Company	....do	761 347	154 36	117,495 26
Niagara	....do	1 372	140 71	166 28
New York and Austin, (Florida)	....do	210 1,627	361 24	76,154 08
New York Company, (Troy)	....do	28 1,358	264 44	7,583 88
Posey	....do	3 1,348	145 99	532 77
Social and Steptoe	Egan cañon	217	66 49	14,428 33
Sam. Brannan	Reese River district.	1 884	122 83	177 12
Silver Parlor	....do	2 1,144	71 75	183 53
Semanthe	....do	3 699	253 93	849 40
South American	....do	3 738	100 45	338 42
Savage Consol	....do	17 1,534	245 11	4,356 75
St. Louis	Cortez district	12 919	399 50	4,977 79
Shoshone Company, (Great Eastern)	Reese River district.	105 1,412	105 81	11,184 94
Timoke	....do	79 1,199	222 83	17,735 05
Vedder Company	Amador district	5 798	307 07	1,657 87
Wisner		2 1,072	106 25	269 45
Washington		6 297	286 07	1,759 04
Yosemite		1 1,111	120 10	186 75
46 "Chloriders"		107 1,194	171 20	18,420 83
Total		1,753	181 87	318,825 29

WEST OF THE ROCKY MOUNTAINS.

For the quarter ending June 30, 1868.

Mine.	Location.	Ore reduced.	Average per ton.	Yield.
		Tons. *lbs.*		
Aurora	Reese River district.	2 1,704	$287 11	$818 84
Buel North Star	....do	126 1,000	425 12	53,777 68
Buckeye		16 218	276 72	4,457 68
Cedar Point		2 1,628	153 19	431 02
Chase	Yankee Blade	7 90	414 09	2,917 26
Comet		2 1,104	198 54	506 77
Centenary Company	Newark	392	98 82	38,737 44
Diana	Reese River district.	71 1,134	190 46	13,630 65
Eliza Anderson		2 1,760	79 59	229 22
Eberhardt, South	White Pine	2 748	271 26	643 97
East Oregon	Reese River district.	1 536	283 20	359 09
Florida	....do	150 1,885	370 00	55,848 72
Fortuna	....do	11 1,206	270 27	3,135 94
Featherstone Company	White Pine	1 366	514 10	608 16
Girard		3 1,908	332 91	1,316 33
Great Eastern	Reese River district.	30 307	303 10	9,139 51
Hidden Treasure	White Pine	73 930	172 14	12,645 49
Hunchback		11 1,888	114 45	1,365 31
Keystone Company	Reese River district.	11 156	190 07	2,105 59
Kaleseed	....do	1 126	153 20	162 85
Keystone Company	White Pine	4 675	994 77	4,314 81
Magnolia	Reese River district.	16 906	464 91	7,649 16
North Star	....do	575 1,339	144 09	82,947 49
Navarette		5 1,846	101 74	602 60
New York	Reese River district.	1 1,700	78 12	144 52
Old Colony	....do	4 788	135 04	593 37
Silver Chamber	....do	16 36	144 26	2,310 75
Silver Belt	....do	4 1,058	346 85	1,570 88
Santa Fé	Santa Fé	2 664	88 62	209 67
St. Louis	Cortez	21 1,108	501 48	10,759 92
Semanthe	Cahaley	2 1,465	455 28	1,244 05
Do	Craycroft	9 944	240 09	2,274 13
Sam Brannan		5 538	175 53	924 87
South America	Reese River district.	3 574	202 64	683 69
Savage	....do	3 1,768	354 34	1,376 26
Timoke	....do	118 1,252	269 74	31,998 17
Troy	....do	92	363 19	33,413 48
Vineyard		3 1,704	251 77	969 82
Washington		30 736	97 68	2,966 33
Yaqui		6 952	113 94	737 87
Yellow Jacket		4 116	269 02	1,091 68
106 "Chloriders"		337 247	84 51	28,492 38
Total		2,173 1,000	188 50	410,110 48

The increase in the product of the Buel North Star is a noticeable feature of the quarter. There is also an increase in the Timoke, while the Manhattan North Star, Florida, and Magnolia show a falling off. The Timoke was doing its best in this quarter, and, having exhausted the ore-body in view, was abandoned in the following quarter. The celebrated Great Eastern mine makes its last appearance in the quarter ending with March 31. It has since been entirely abandoned, and the timbers withdrawn. It will be seen that the ores of White Pine begin to show themselves in the above table. The principal developments in White Pine occurred, however, after this quarter.

For the quarter ending September 30, 1868.

Mine.	Location.	Ore reduced. Tons.	lbs.	Yield.
Aurora	White Pine	14	1,926	$3,123 12
Aurora, (S Ext)	do.	2	1,782	750 72
Aurora, (Western Company)	do.	1	1,655	289 [illegible]
Aurora	Reese river	2	1,194	715 [illegible]
Blair	White Pine	5	400	477 [illegible]
Buel North Star	Reese river	343	866	122,113 [illegible]
Chihuahua	Newark	109	1,000	7,626 [illegible]
D. A. Cleavenger	Yankee Blade	1	1,645	369 [illegible]
Chase	Reese river	5	1,494	2,806 [illegible]
Double Eagle	White Pine	3	1,731	957 [illegible]
Diana	Reese river	7	1,650	1,267 [illegible]
Empire	White Pine	3	1,302	435 [illegible]
Eberhardt	do.	141	765	188,207 [illegible]
Eclipse	do.	1	352	663 [illegible]
Featherstone	do.	21	1,543	1,714 [illegible]
Fortuna	Reese river	4	970	1,004 [illegible]
Genessee	White Pine	79	369	13,186 [illegible]
Green Mountain		3	450	3,027 [illegible]
Grinnell	Chase, Reese river	2	850	385 [illegible]
Hidden Treasure	White Pine	211	637	24,103 [illegible]
Hidden Treasure, (S. Ext.)	do.	2	500	1,275 [illegible]
Hart and Harps	do.		1,674	282 [illegible]
Iceberg	do.	5	1,155	1,298 [illegible]
Indiana	do.	12	1,947	1,459 [illegible]
Keystone	do.	56	1,938	64,808 [illegible]
Last Chance	do.	12	1,332	2,320 [illegible]
Mississippi	do.	1	1,926	489 [illegible]
Magnolia	Reese river	43	1,502	14,875 [illegible]
Manhattan Company	North Star, Reese river	320	1,592	52,493 [illegible]
Napier	White Pine	1	663	274 [illegible]
Florida	Reese river	97	446	27,246 [illegible]
Owens & Jones	Yankee Blade	1	868	350 [illegible]
Patriot	do.	1	1,456	231 [illegible]
Plymouth	Reese river	7	1,894	2,926 [illegible]
Romulus	White Pine	10	1,977	3,420 [illegible]
Ross & Taylor	Cortez	8	648	1,963 [illegible]
S. B. Ross	do.	4	1,918	996 [illegible]
Sumott & Casey	Yankee Blade	14	1,496	5,322 [illegible]
South American	Reese river	58	198	19,503 [illegible]
Silver Chamber	do.	12	464	5,876 [illegible]
St. Louis	Cortez	28	162	21,214 [illegible]
Savannah	White Pine	1	1,824	505 [illegible]
Timoke	Reese river	11	948	2,882 [illegible]
Turner & Co	do.	17	1,558	5,442 [illegible]
John Traverse	do.	4	1,650	428 [illegible]
Vedder Company	do.	1	346	146 [illegible]
Virginia	White Pine	3	1,987	724 [illegible]
Virginia, (S. Ext.)	do.	2	265	91 [illegible]
Virginia, (Float Rock)	do.	2	551	418 [illegible]
G. B. Wilson	Cortez	2	84	1,122 [illegible]
I. H. Walker	do.	6	340	1,073 [illegible]
Willard & Osborne	White Pine	9	580	10,110 [illegible]
J. R. Williamson	do.		1,892	2,513 [illegible]
Wabash	do.	2	192	450 [illegible]
Total		1,739	1,574	627,767 [illegible]

To this must be added 202 tons 564 pounds of ore brought in by "chloriders" in small lots, and yielding $92,806 98, making the total for the quarter 1,941 tons 1,138 pounds, yielding $720,574 25—a general average of $371 13 per ton. This high average is due in part to the extraordinary richness of the ore from the new district of White Pine. The returns for the quarter ending December 31, 1868, (not yet made out,) will show still greater improvements from this source.

The product of Lander county for the year 1868 may be estimated from these data as follows:

	In currency.
First quarter	$318,825 29
Second quarter	410,110 48
Third quarter	720,574 25
Fourth quarter (estimate)	900,000 00
	2,349,510 02

The shipments of bullion through Austin for the year amount to $3,000,000, gold, as reported by Wells, Fargo & Company. This sum includes the bullion of Nye county, and possibly of some other localities.

Railroads.—The great benefits which Humboldt and the northern part of Lander county have experienced already from the construction of the Pacific railroad naturally indicate a most important means of developing and maintaining the industry of central Nevada. Nature has provided, in the series of magnificent level valleys which stretch from north to south through the State, a system of highways unequalled in the world. Reese River, Smoky, Steptoe, and other valleys, along the sides of which are located numerous mining districts, offer extraordinary facilities for the laying of railroads, and at no distant day, when the supply of fuel has become in many localities insufficient, no doubt the ores will have to be transported to the more favored localities on the Pacific railroad for reduction. Reno, on the Truckee river, is expected to become an important centre for operations of this kind, and the Central railroad is extending every facility to those who desire to ship ores for treatment. The route for a cross-railroad must be determined by more careful examinations hereafter. In some respects an oblique route, traversing the mountain ranges by the low passes which abound in most of them, would be the most beneficial. At all events, it seems advisable that such a road should terminate, if possible, in an agricultural district. I am inclined to believe that a road might easily be constructed, say through Reese River valley, and through a pass in Esmeralda county, into the Owens River valley, California. This is, at least, the opinion of intelligent men, and I have examined a part of the route and found it quite feasible.

Probably the first step towards a cross-railroad system will be the construction of short branches from the Pacific railroad to the nearest mining districts. The railroad proposed to Virginia City is an example; and if the developments at White Pine increase in importance, the connection of that district with the Pacific road at Gravelly Ford (110 miles) may be undertaken, as the road would lead through a level valley most of the way. One such road, reaching into the heart of the silver-mining districts of Nevada, would effect wonders for their future prosperity.

The same may be said of the proposed northern lines, connecting Idaho and Montana with the Pacific railroad. An interesting discussion of this subject will be found in the section on Montana.

The policy of granting land in aid of such enterprises is heartily to be recommended. The government is not only enabled to double the price of the alternate sections which it retains, but to sell them at that double price; whereas, without the railroads, such lands are of no value to anybody.

CHAPTER VIII.

NYE COUNTY.

Mammoth district, situated about 60 miles west of south from Austin, and 12 miles west of the Union district, on the Mammoth range of mountains. The district has been known for some years, and the Mount Vernon company in particular expended considerable money there; but the ore, though abundant, seemed to be of low grade, and the mines declined in the estimation of the population. The company alluded to stopped

41ST CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { Ex. Doc. No. 207.

STATISTICS

OF

MINES AND MINING

IN THE

STATES AND TERRITORIES

WEST OF THE ROCKY MOUNTAINS,

BY

ROSSITER W. RAYMOND,
UNITED STATES COMMISSIONER OF MINING STATISTICS.

WASHINGTON.
GOVERNMENT PRINTING OFFICE.
1870.

Statement of ore worked in Nye County, Nevada, during 1867 and 1868.

District.	Mine.	Production in 1867—Coin.				Production in 1868—Coin.				Total for two years.			
		Tons.	Pounds.	Value in gold.	Average per ton.	Tons.	Pounds.	Value in gold.	Average per ton.	Tons.	Pounds.	Value in coin.	Average per ton.
Philadelphia	Highbridge, dry crushing and roasting					1,272	1,835	$130,002 47	$102 13	1,272	1,835	$130,002 47	
	Highbridge, wet process					2,048	60	40,463 12	19 75	2,048	60	40,463 12	
	Transylvania, dry crushing					182	1,812	24,337 16	133 06	182	1,812	24,337 16	
	Transylvania, wet	2,802	1,081	$125,303 54	$44 71	334	232	9,301 27	27 85	3,136	1,041	134,604 81	$42 91
	El Dorado, dry	14	1,292	2,926 20	200 00	434	202	63,464 97	146 19	448	1,494	66,391 17	147 95
	El Dorado, wet					7	1,000	476 74	63 56	7	1,000	476 74	
	Other mines	9	1,198	2,403 10	250 24	56	1,639	7,526 08	132 45	66	637	9,928 18	149 48
						1,042	1,000	211,850 09	109 06	5,790		639,498 83	110 45
Twin River	Murphy	3,847	1,000	427,648 74	111 15							2,615 72	
	Other mines	12	1,154	2,615 72	207 98					706	12	72,135 70	102 09
		283		34,486 46	121 86	423	1,904	37,648 84	88 88		1,904		
San Antonio	Liberty					1	949	308 70	270 04	1	949	308 70	
	Other mines	55	1,911	4,897 98	87 53	131	1,431	13,429 15	101 95	187	1,342	18,326 13	97 65
	Storm King	88	1,130	8,132 40	91 83	237	52	18,274 23	77 09	325	1,182	26,406 63	81 10
Union	Indianapolis	33	1,815	2,847 85	83 99	13	1,463	1,357 55	98 86	47	1,278	4,205 40	89 48
	Clipper	120	806	11,284 54	93 72	141	295	12,118 35	85 83	261	1,101	23,402 89	89 68
	Other mines	111	252	11,961 51	107 64	10	905	1,104 51	56 77	130	1,157	13,066 02	100 06
Hot Creek	Old Dominion	45	165	2,561 62	56 82	73	691	7,738 38	104 79	118	856	10,300 00	86 60
	Other mines	92	282	17,432 63	189 19	23	1,208	4,295 96	181 79	115	1,490	21,727 59	187 67
		97	1,680	11,744 53	120 03	61	1,653	8,089 11	130 83	159	1,333	19,833 66	124 91
Reveille	Sundry mines						500	87 65	70 12	1	500	87 65	70 12
Morey	Sundry mines			892 79	37 49	11	368	2,296 79	205 36	35	81	3,189 58	91 02
Manhattan	Sundry mines	23	1,713	589 02	144 84	7	692	1,020 04	138 91	11	825	1,609 06	140 99
Mammoth	Sundry mines	4	133										
Other districts	Sundry mines									15,068	1,640	1,963,007 11	83 81
Totals		7,642	1,501	667,727 63	87 38	7,426	49	595,279 46	80 01				

5 districts

Eureka County? Yes →

CHAPTER XXI.

WHITE PINE COUNTY.

This county has been created out of Lander County since last year's report, and many of the mines hereinafter noted were described in that report under the head of Lander County. The boundaries of the new county are laid down as follows: The initial point of starting is on the western portion of Shannon's Station, which is located at the western base of the Diamond range of mountains, and, by the road, forty miles west of Treasure City. The exact meridian of this city is not yet established, but it is not far from thirty-seven degrees thirty minutes west from Washington, and the western boundary of the county is at about thirty-eight degrees. From Shannon's station the western line runs south to the northern line of Nye County, which is a few miles north of the thirty-ninth degree of latitude. This line is the southern boundary of the county to the eastern boundary of the State. The northern boundary line passes east and west through the northern portion of Camp Ruby, and includes the overland road. The county has an area of about eight thousand square miles. The districts at present organized in it are the Diamond, Newark, Egan or Gold Cañon, Hercules, Robinson, and White Pine. Some people think that Patterson, Cave, and Grant are in White Pine County, but surveys will certainly prove them in Nye. Mines have been found in the mountain ranges east of the Egan range, but I am not aware at the present time of any districts having been formed there. The great wealth of the districts mentioned is well known. Egan was the first organized in the eastern part of the State, and it has produced a large amount of bullion. The organization of Diamond district followed, but, although a great number of mines have been located and good results obtained, it cannot boast of having shipped many thousand dollars worth of bullion. Many tons of ore have been taken to Austin for reduction, and the value of the mines has been proved by mill tests. But all the work has been done by miners unaided by capital, and a great deal could not be accomplished in this way. Diamond district is on the western slope of Diamond Mountain, a little northwest of Hamilton, contains wood and water in abundance, and many advantages favorable for making it a first-class district. Hercules and Robinson districts are some fifty miles directly east of White Pine, have been known for several years, and, although undeveloped, are in high favor with many. They are located in the Egan range. White Pine district is situate near the southeastern corner of the county, and includes some of the loftiest peaks of the State. Its unexampled wealth is now known all over the world. Treasure City, built at an elevation of 9,000 feet above the sea, is the chief town, and probably the highest city in the United States. The present population is estimated at four thousand, and the surrounding towns of Hamilton, Shermantown, and other villages in the district add twice as many more. Twenty-five miles west of White Pine is Newark district, flanking the eastern slope of Diamond Mountain. Its mines, as far as developed, prove to be rich. The leading metal extracted in the county is silver, but as economical mining advances much wealth will be reaped from its mines of lead, gold, copper, antimony, and salt, with which the rocky hills and barren plains are stored. But mining will not represent the only resources of White Pine County. Vast areas of agricultural and grazing lands, capable of supplying its own inhabitants with provisions, are

contained in its boundaries. It is already noted for the quality of its beef and mutton and the richness of the butter and milk produced in it. The surface is made up of alternating ranges of mountains and valleys, isolated peaks with narrow chasms, broad passes, and elevated valleys. On the west is the lofty and continuous Diamond range, extending north and south across the county. At its eastern base is the broad Newark Valley, separating it from the White Pine range. In this valley are vast areas of salt, alkali, and soda lands, giving it the appearance of desolation and worthlessness, but, in reality, it is most valuable, as it furnishes substances which cannot be dispensed with in the reduction of silver ores by amalgamation. Along the bases of the mountains are large tracts of valuable farming land, which redeem the valley of its feature of barrenness. The northern portion of the range bears the name of Ruby Mountains, and incloses the famous Ruby Valley, only a portion of which is in White Pine County. No extensive valley appears to be between the White Pine and Egan Mountains, but the many small valleys and rolling hills afford superior grazing and sites for many productive farms. East of the Egan Mountains is the extensive Steptoe Valley, flanked on the east by Shell Creek range. Next follows Spring Valley and the Spring Mountains, Snake Valley and Snake Mountains, Antelope Valley and the mountains of the same name. The eastern boundary line passes through Deep Creek Valley.

Besides the mining districts above mentioned, quite a number of others have been organized, which, although perhaps not located inside the county, are closely connected with it as the starting point for all expeditions, and they will therefore be mentioned in this part of the report.

WHITE PINE DISTRICT.

The opinion in my last report, that the formation of White Pine is a simple and not anomalous one, remains unaltered by subsequent examination. The rocks of Treasure Hill are certainly all sedimentary, and so completely exposed as to dip and strike that nothing more than a careful and patient survey of the surface would be required to determine, with considerable accuracy, the geological section. This is at present, however, subordinate in practical importance to the question of the character of the White Pine ore deposits, and the latter question is to be considered mainly in its bearing upon two vitally interesting matters: the probable form and extent of the deposits already opened, and the calculations or natural indications upon which successful search may be made for new ones. No man can predict the effect which future discoveries and developments may exert upon all present theories, and what I may suggest as my opinion upon the evidence thus far produced does not even pretend to be a complete theory. It seems to me, however, that the following points are indicated with considerable force by the prospecting and mining operations, as well as by the original superficial signs upon Treasure Hill:

1. Many of the deposits are clearly connected with the stratification of the limestone. They follow it and permeate it in such a way as to hint at deposition by means of percolating thermal waters carrying in solution mineral salts, and accompanied or preceded, or both, by jets or springs of solfataric gases, chiefly sulphurous acid. Their regularities and irregularities alike resemble those displayed by ordinary springs of water, permeating the crust of the earth, avoiding some strata, saturating others, filling local cavities and fissures in others. Now, if this theory be correct, it is most likely that its application, as far as the mode of

deposition is concerned, will be found universal in this limestone hill. Differences in character among the mines must be explained by differences in the mold or form receiving the deposit. I am not prepared to say that there will be found no deep fissure veins in Treasure Hill. Their coexistence with the stratified deposits is possible, but not yet proved, nor do I at present consider it highly probable. The smooth walls running east and west on the Eberhardt mine are susceptible of a different explanation, and one which seems to me more in consonance with the apparent distribution of the ore in layers in that zone of two hundred feet width.

2. Some of the best mines in the district show deposits between a certain belt of arenaceous slate and limestone. The Hidden Treasure, Sheboygan, Mammoth, and others on the north end of the hill are examples, and one of the remote southern mines, the California, has a hanging wall of clay, which may or may not be the equivalent of the same slates. Between these two extremities there are cross-breaks or slides in the limestone, certain portions of which have been elevated more than others, so that the same topographical level or continuous line does not represent the continuity of the same stratum of rock. In many instances a highly metalliferous layer abuts suddenly upon a smooth wall, beyond which the lithological character of the limestone appears so different as to suggest that it is in reality the continuation of another stratum, brought opposite to the first by a change of relative position in the rocks.

3. It will be seen that this hypothesis after all involves the recognition of a certain sort of fissures, such, namely, as were formed after the deposits of ore and quartz had been made. If future study should enable us to determine in each case the direction and extent of movement, one might find the continuation of such deposits of value as are suddenly thus cut off; and this question would be of immense importance on deeper workings, since, if this theory be measurably true, there must be accumulations of rich ore in Treasure Hill that do not crop out at all.

4. There seems to be a difference between the ores of the eastern side and summit, and those of the western side nearer to the so-called Base Metal range. This difference may disappear in depth; it certainly might be expected to do so if the deposits were separate fissure veins, but it gives to the former mines at present a very tangible advantage in purity of ore and consequent cheapness of successful reduction.

5. The ores of some of the mines are contained in a peculiar vein matter consisting of breccia or angular fragments of silicified limestone cemented together with calc spar, which generally fills up all the interstices. As this spar never contains any silver ore, (so far as I have been able to learn,) it seems likely that it is the latest infiltration into the mass. The silver ore, generally in the form of chloride, but frequently as sulphuret, and even as native silver, is found incrusting the breccia, penetrating the crevices in threads and films, and disseminated through the whole texture as well as aggregated here and there in irregular chambers or pockets. However rich the ore may be in such bonanzas, it has never failed to show traces of the usual vein matter, thus indicating that it differs only in quality, not kind or origin, from the ordinary ores of lower grade. Doubtless it would be extravagant for any one to expect the frequent occurrence of rich bodies like that discovered in the Eberhardt, since experience has proved such occurrences to be exceptional; but this much may be said with truth, that the White Pine limestone is a peculiarly favorable matrix for such bodies of ore, and that they may not impossibly occur anywhere in these argentiferous strata, where cavities or fissures large enough to contain them have been formed by the disintegra-

tion or solution or erosion of the rock, and where the metalliferous fluids have had sufficient access. Traces of these conditions would necessarily be found in the inclosing rocks. I should, therefore, not expect to find chambers of rich ore in the hard, dense, non-metalliferous lime, while, on the other hand, I should regard (in default of any more positive indication) a layer of silicious and spathiferous breccia, showing traces of silver ore, as a most favorable locality for their occurrence. It is almost impossible to give anything like a full account of the mining operations of the district. There are now at least ten thousand mining locations made, and it would be the labor of months to obtain even a list of claims which are being worked, and which furnish ore in quantities ranging from small lots of a few hundred pounds per month to twenty, thirty, or forty tons per day. The following notes, furnished by a gentleman in Treasure City, were obtained partly by personal inspection, but mainly compiled from the mention made of the different mines from time to time in the local papers.

LOCATION OF THE MINES.

The White Pine mines are about one hundred and fifteen miles south of Elko, a town on the line of the railroad two hundred and seventeen miles west of Promontory Point, the junction of the Union and Central Pacific railroads. Several lines of stages run from Elko to Hamilton, the county seat of White Pine County; time seventeen hours; fare from $15 to $25 according to the opposition at any given time. The road is over a smooth level plain for about one hundred miles south; thence an easy grade to the mines. There are three or four well-graded roads leading to the summit of Treasure Hill, over which heavily loaded wagons pass without difficulty. Freight from Elko to Hamilton during the dry season is about two cents per pound.

POPULATION.

There are three incorporated cities, Hamilton, Treasure, and Sherman. Treasure, on the summit of the hill of the same name, is the leading business place, although there are probably more people in Hamilton. The principal mines at present are on the top of the hill in and about Treasure City, and the majority of the laboring men of the district are found there. Hamilton, at the base of Treasure Hill, has a more pleasant location, a good supply of water, and being the county seat, and having superior advantages for milling, draws quite a population. No census having ever been taken, the number of inhabitants is not known with any certainty, and is variously estimated. The Inland Empire sets it down at 15,000 for the entire district, an area twelve miles square. This estimate would require a distribution somewhat as follows: Hamilton, 5,000; Treasure, 4,000; Sherman, 2,000; other towns and scattering, 4,000. Many think this estimate is about twenty-five per cent. too high all round. Sherman has the best climate, and is the most pleasantly situated of the three.

YIELD OF THE MINES.

From such statistics as I have been able to obtain, it appears that the total production of silver of the White Pine mines from the month of May, 1868, to the 1st of January, 1869, has been $968,813, and from the two mills at Shermantown, from January 1 to April 1, 1869, $297,023:

making a total of $1,265,836. From the two mills at Hamilton I have not received any returns. The report of the month of March shows a constant increase. According to the assessment roll returned by the county assessor for the quarter ending June 30, 1869, the ore crushed from thirty-four mines, scattered over an extent of country six miles in length by three in width, amounted to 4,174 tons, which represented a value of $412,814. The average value of a ton was, therefore, $98 82. It must be remembered here that during the whole of April and the greater part of May the actual bullion-producing capacity of the district was limited to thirty stamps, while for no part of the quarter over sixty-five were in actual operation.

The following is a complete list of the mines having made returns to the assessor, the number of tons milled, and the amount of bullion produced:

Name of mine.	Tons.	Value.	Name of mine.	Tons.	Value.
Autumn	115.1049	$19,333 08	Hidden Treasure, first ex.	19.1721	$2,189 42
Alturas	60.0881	11,849 90	Highland Chief	1.1064	146 31
Ancestura	6.0915	2,926 60	Industry	175.0046	14,688 56
Aurora South	343.0382	22,589 50	Inimportancy	2.0593	217 74
Addington	7.1837	418 04	Keystone	64.0533	12,070 11
Aurora, (consolidated)	239.0973	10,678 70	Nash and Melleno	.1160	83 86
Charles and Theresa	10.0977	663 66	Pocotillo	7.0032	213 06
Copper-Silver Glance	7.1850	565 85	Post Hole	215.0000	27,907 00
Charter Oak	4.0064	233 08	Rattler	105.0785	2,690 00
Comstock	4.1659	354 81	Sage Bush	17.1270	784 12
Consolidated Chloride	931.0751	88,132 01	Steptoe	15.1910	478 65
California	23.1606	3,177 38	Summit and Nevada	495.0000	32,810 20
Bell	5.1000	165 00	Thunderbolt	3.0299	132 78
Derby	75.0280	4,720 43	Virginia	6.1814	498 10
Eclipse, (consolidated)	14.0149	4,819 31	Willard	2.0015	9,928 73
Eberhardt	744.0000	110,112 00	Zubrick	.1972	197 00
Original Hidden Treasure	428.1091	34,512 78			
Hearst	19.0585	1,796 29	Total	4,174.0064	412,814 19

Under the law $18 per ton of the gross proceeds of the mines is exempt from taxation. This amount deducted, the three and a quarter per cent. tax on the remainder will return $11,093 65, which is the amount of revenue accruing from the mining tax in this county for the quarter ending June 30.

The returns made from July 1 to 20 are given in the following:

Name of mine.	Tons.	Pounds.	Yield per ton.	Total.
Aurora South	153	.....	$92 25	$14,114 25
Amador	1	1,559	311 65	553 17
Ashes	3	1,000	106 00	371 00
Baker Metallurgical	.....	548	6,874 19	1,883 50
Consolidated Combination	1	1,000	126 00	189 00
Eberhardt	480	.....	390 00	187,200 00
Eclipse	2	616	734 83	1,693 98
Tennessee	5	.....	122 40	612 00
Hidden Treasure	8	1,000	100 00	880 00
Highland Chief	3	500	190 00	617 50
Keystone	179	.....	192 00	34,368 00
Manzanna	14	.....	307 00	4,298 00
Mississippi	2	714	296 07	697 83
Nevada	12	.....	246 67	2,960 00
New Day	12	.....	126 92	1,523 04
Pocotillo	7	1,500	340 00	2,635 00
Ramonius	.....	618	299 08	92 51
San Rita	2	.....	57 50	115 00
Stonewall	54	.....	157 60	7,510 40
Steam	5	1,300	120 93	683 24

According to the statistics gathered by Mr. C. B. Dahlgren, who has spent much time for that purpose, and whom I consider trustworthy

authority, the total number of tons worked from and in White Pine up to July 1, 1869, is 8,869.23; value of bullion produced, $2,017,831; average yield per ton, $227 75; average fineness, .963.

123 of the PRINCIPAL MINES ON TREASURE HILL. (123)

In order to describe the location of these mines understandingly, a word as to the general configuration of the ground is necessary. The White Pine Mountain range is quite broad, consisting often of two or three parallel ridges, sometimes quite close together, sometimes spread more widely apart. At the point where the White Pine mines are located there is a spread so that the summits of the two nearest ridges on the inside are five miles apart. Right in the middle of the valley thus formed rises up Treasure Hill, 10,000 feet high above the sea, about fifteen hundred above its immediate base. It is called Treasure Hill, but it is in fact a very large mountain, which is longest from north to south. A line drawn through its immediate base from north to south would be about three and a half miles long, and through the base from east to west about a mile. The summit is about a mile and a half in length from north to south, and the terminal line of the summit at each end is very plainly marked by a sudden and, at the south end, almost precipitous descent. The body of the mountain is composed of limestone strata, originally horizontal, but subsequently raised from the eastern side so that the strata slope now at an angle of about thirty degrees toward the west. The east side is very rough and precipitous, as it consists entirely of the jagged, projecting ends or sides of the strata so tilted up. It is true, these are worn off a little by the weather, the action of frost, snow, heat, and rain, which constantly loosen little particles of the rock. These, borne along by the falling rain and melting snow, and lodging in convenient places on the side of the mountain, form little banks and comparatively flat places of small area, where the seeds of the indigenous pines and mahoganies find room for a stunted growth. This portion is called the East Side, and on it are found many mines of considerable, and some of primary, importance; among the latter the Hidden Treasure, near the crest toward the northern end, the Emersley, a little below the last, and the Pocotillo, toward the southern end. From the crest to the western base the slope is more gradual, and the surface comparatively smooth, because it is really nothing but the originally flat stratum tilted up from the east at an angle of thirty degrees. Still, though it may be called smooth as compared with the eastern side, viewed by itself, it is quite uneven. There are two reasons for this: first, as the upheaving force was not perfectly equal at all points along the line, the strata were not uniformly elevated throughout the whole length of the mountain. Wherever the upheaving force was greatest the strata are lifted highest, leaving intermediate depressions along the line. Again, there are signs indicating that there was at places such an inequality of force, that the strata broke across from east to west, and either fell back below the level of an adjoining portion or remained stationary, while the adjoining portion continued in its upward course. Along the sides of these transverse cracks there are signs of the grating and grinding of the rocks upon each other, and the scratches on their surface are vertical, showing that the motion which made them was vertical. At the south end there is a spur and a sudden descent. On the small table-land thus formed, and called, with the neighborhood, the South Side or Sunny Side, is the Eberhardt, and farther down the California, Morgana, and numerous other claims. The second cause

for the unevenness of the west side is the unequal erosion of the strata. Some of the strata exposed by these cross-breaks being softer than others, wear away more rapidly and leave the surface very irregular. On the west side, beginning at the southern end, is a smooth area called Pogonip Flat. On this flat are found the Pogonip, Othello, Glacier, and numberless other mines. Next on the north is another flat, called Chloride Flat, where some of the most important mines are located. Still further north are Bromide and Bonner Flats. The northern slope of the mountain is commonly spoken of as the North End. In the following descriptions mines are variously spoken of as being on the East Side, Sunny Side, North End, Pogonip, Chloride or Bromide Flats; and reference to the foregoing description of the localities will explain their situation at once. The Base Range, beginning at the foot of the west side of Treasure Hill, runs west along the side of the adjoining mountain. Bullion Hill is a little hill about two miles northwest of Treasure Hill. Blue Hill is located close to Hamilton. Treasure City is built along the summit of the mountain, on the west side, near the crest. Main street runs parallel with the crest of the mountain, and is from two to three hundred feet from the summit. Many of the mines are on this street, and shafts are sunk in what should be the sidewalk.*

Aurora Consolidated.—At the south end and on the west side of the summit, midway between Main street and the crest; one of the leading mines; located in the fall of 1867—about the same time as the Eberhardt. June 19, 1869, it had 50 men at work, 250 tons of ore on the dump, and was extracting 20 tons daily, which were shipped to the Newark mill, thirty miles distant. The main shaft is down 55 feet. At a depth of 30 feet a breast was opened to the north, which, at the time of inspection, was 18 feet in, 12 feet high, and 25 feet wide. A shaft further north, called Last Chance shaft, was 30 feet deep, with a drift running northerly 40 feet to the Iceberg shaft, which had a depth of 26 feet. Thirteen feet east of the Iceberg is another shaft, from which there was a drift run north 70 feet. Two hundred feet north of the south line is the Protection shaft, 30 feet deep, and in ore. July 3, 1869, the drift connecting the Iceberg and Last Chance shafts completed; drift northeast from Iceberg, in 90 feet, with an air shaft tapping it at 50 feet in. The ore breast south, 30-foot level, showed no signs of depreciation. July 10, stock quoted at $18. (The company was incorporated in San Francisco, December 11, 1868; 16,000 shares; capital $1,600,000.) This company claims that its location covers the Earl mine, situated on Main street, and is now litigating title with the Earl claimants. A temporary injunction has been laid upon the Earl, stopping it from work.

Aurora South.—Immediately south of the Aurora Consolidated, and located at the same time. It is 800 feet in length. Prospect shafts have been sunk the whole length of the location, and a continuous deposit of mineral was found from the starting point at the south end of the Aurora Consolidated for a distance of 400 feet. The main works are a few feet south of the north end of the claim. At this point a large shaft has been sunk, and a drift run from the bottom of it in a southerly direction for about 250 feet. The deposit of ore is considered to vary from 30 to 100 feet in width. June 19, 1869, was working 70 men; at that time most of the ore extracted was taken from the main shaft, before referred

* Many of the facts herein recited are taken from the notes of Mr. Ginn, the "mining beat" of the White Pine News, and were made up by him from actual inspection of the mines, and published in the News in the form of a weekly summary. They were subject at the time to the criticism of thousands of persons cognizant of the facts, and were universally received as strictly correct.

to, at a depth of 30 feet, and from a chamber running east and west. This chamber is 20 feet deep, 20 wide, and 58 in length from east to west. From the west end of this chamber the long drift starts south. This drift was run to "trace out" the Autumn and Highland Chief, two separate claims, which were claimed by the Aurora. Litigation instituted by the Aurora to eject the other parties from the ground was pending. The Highland Chief men, satisfied that they could not hold the ground, effected a favorable compromise, and surrendered their claim. The result as to the Autumn is not yet decided. The main shaft, June 19, was down 57 feet, all in ore. The mine yielded 10 tons daily. At this date cuts were being run to strike the ledge further south. The 25th of June the company completed a shipment of 200 tons to the Big Smoky mill, at Hamilton. About this time the cuts spoken of tapped the ledge some 300 feet south of the main workings, and struck very rich ore, with some horn-silver. The company then suspended shipments of ore, awaiting the completion of the Stanford mill on Sunny Side, near Eberhardt City, and reduced its working force to 40 men, which number, it was believed, would be able to extract 1,500 tons by September 1, the time the mill was expected to be ready. It was not convenient to extract a larger amount, because the dump piles would be too much incumbered. The company is incorporated in San Francisco, and is principally owned by the Stanford Brothers, who paid $120,000, coin, for it to the original locators, one of whom was the discoverer of the Eberhardt. The mine is at present under the superintendence of Dr. Goodfellow, and ranks in public estimation very close after the Eberhardt.

Abercorn.—On the south side, below the line of the Eberhardt, and about 40 feet north of the California. June 19, 1869, had a shaft down 12 feet on the foot-wall in ore, and located 40 feet northeast of the main workings on the California. The claim is spoken of as being noted chiefly for marking a distinct line of upheaval in such close proximity to that remarkable mine.

Addington.—On Bromide Flat, May 29, 1869, struck a body of very fine ore in one of the shafts. The two shafts called the east and west shafts are connected at 43 feet depth by a drift. The west shaft is 45 feet deep. Considerable ore was taken from it, but some time before June 26 work was suspended in it and a new shaft was started 50 feet west, which on June 26 was down about 45 feet, without having reached ore. On the 43-foot level in the east shaft a drift was run south in ore, and as late as July 10 they continued to get ore in that drift.

Auburn is next below the Addington; was in ore June 26, some of which was very rich. A quantity of the lower-grade ore, taken from above the rich strike, was sent to the Newark mill to be tested.

Albemarle.—Incorporated at San Francisco, California, March 21, 1869; 12,000 shares; capital stock, $1,200,000.

Blair and Banner State.—At the bottom and on the west side of the cañon leading down between Eberhardt Ridge and Argyle Hill. June 17 a shaft had been sunk through spar and ore to a depth of 23 feet, and about 35 feet from the gulch a tunnel had been driven in which had just tapped the shaft. From 32 feet of this tunnel 40 tons of high-grade ore had been taken. That raised from the shaft was of an inferior quality, being mixed with spar, but nevertheless milled at the Monte Christo mill $93 per ton. Ore shows on all sides in the tunnel. The rock is extremely hard. Ore was sent to mill July 10 at the rate of 12 tons per day. At that date an easterly drift was run from the tunnel, which carried ore; the surface cut running east from the east face of the tunnel was down about 7 feet.

Black Hornet.—On south side, adjoining and parallel to the California. The ground is claimed by the latter company as being a part of its ledge. The owners extracted considerable ore, and then bonded the property for sale. The question of title was not settled up to July 10, 1869.

Bourbon.—June 19, had a shaft down 28 feet, from which an incline 31 feet long had been sunk. A fine body of ore was here met with, 20 tons of which were shipped to the Big Smoky mill.

Bromide Tunnel Company.—Incorporated at San Francisco, February 27, 1869; 30,000 shares; capital stock, $3,000,000; stock quoted July 3 at $3 80. These tunnel companies are organized for prospecting purposes. They select what is supposed to be a favorable location, and then run a tunnel into the mountain, expecting to strike some deposit of ore which does not cross or has not been located on the surface. Such deposits or veins are called blind ledges, and if any are discovered by the workings of such a company they become its property.

Burns.—On Chloride Flat. Struck ore at 19 and at 30 feet depth. July 10, commenced drifting southeast at a depth of 19 feet, at which point they had two feet of good ore in the shaft.

Consolidated Chloride Flat Company.—This company has one of the best properties in this region, and conducts its business on as large a scale as any company in Eastern Nevada. Their mines are all situated on Chloride Flat, in the southern part of Treasure City, near Main street. The Bank of California is generally supposed to be the prime mover and largest owner in the company. The first rich discoveries made on Chloride Flat were taken up by the Gennesee, Indiana, Stonewall, and several other companies. The moment the rich ore was found a thousand other locations were made in the immediate vicinity. Hundreds of shafts were sunk and almost every one of them struck rich ore. Soon the theory was started that the ore in that section was deposited in horizontal strata, extending underneath the whole flat, and consisting of successive layers, one underneath the other, separated from each other by sheets of limestone. In the midst of the general excitement the agents of the Bank, it is said, quietly began searching the records of location. They soon found that about a dozen old locations were made a year and a half before the excitement began, and that most of these locations called for four or five hundred feet each way from the notice, sufficient to cover the richest portion of the flat if they could be all consolidated into one company. They hunted up the owners of these old claims and quietly purchased them all. When these preparations were fully completed, they consolidated all the titles into one company and began work upon the old locations. Wherever they saw a promising mine in the immediate neighborhood, within the radius of any of their claims, they ran a drift into it immediately, and ran the occupants out. By reason of this peculiar system of working they have the ground completely honeycombed underneath quite an area. They have some three thousand feet of tunnels already run and still the work goes on. The ore is connected throughout all these workings. Much of the ore is exceedingly rich; portions of it sometimes yield as high as eighty-five per cent. of its weight in silver, or something like $27,000 per ton. This company employs more men and raises a larger amount of ore than any other in the district. The force employed varies from one hundred and twenty to one hundred and fifty men. The average daily yield is about forty tons of ore. Nearly all of the ore is packed to the mill on mules. The sight of the long trains filing through the streets, urged on by their swarthy *arrieros*, would make a Spanish miner feel quite at home. The

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bulk of the workings are very near the surface, the greater portion being on the 30-foot level. The ore is hoisted through a dozen or more different shafts, which also serve for ventilation. The Gennesee is the deepest shaft. It was down 145 feet July 10, and most of the way through ore; good ore is found in the bottom. The intention is to drive the shaft on steadily until a depth of 500 feet is reached. The stock sells for from $12 to $13 per share. The company was incorporated in San Francisco, California, December 23, 1869. Fifty thousand shares, capital stock $5,000,000; $12 per share would be $600,000 for the mine.

California.—This is the most noted mine on the south side below the Eberhardt. It was bought from the original locators in July, 1868, by John Moffet, and by him sold to one of the Stanford brothers, of California, in December of the same year, for $50,000 coin. At the time this price was paid for it there had not been much over $1,000 worth of work done on it. The Stanfords began stripping the dirt off the ledge, and very soon uncovered it for 400 feet in length, finding it very uniform in its course and width. The mine is situated about one mile south of the Eberhardt. It is 50 feet wide; hanging wall, red shaly rock; foot-wall, limestone. The ore is rich in chloride and bromide of silver. There is more of the latter present at this mine than in any other mine in the district. The crushed ore, up to May 13, yielded from $300 to $1,000 per ton. The course of the "vein" is east and west; the dip 48° south. Much of the ore resembles the cinders of a blacksmith's forge, mixed with ashes. The company has never employed a very large force of men in the mine, as they have been busy since its purchase erecting their mill at Eberhardt City—the Stanford mill spoken of in connection with the Aurora South. June 19 they had 400 tons of ore on the dump, besides 100 sacks of 175 pounds each of selected ore, worth $1,000 per ton. July 2 the last of 120 sacks of this rich ore was shipped to the Big Smoky mill for reduction. It was expected they would have 2,000 tons of the average-grade ore ready for the mill September 1. The mine is worked by shafts and connecting drifts. Incorporated January 29, 1869; 15,000 shares; capital stock, $1,500,000; 800 feet in the location.

Comstock.—On south side, in Mahogany Cañon, below the Evening Star and Banner. The company owns three ledges, all in slate. A tunnel has been run on the middle ledge. Some very rich chloride ore was found, several tons of which have been smelted at Shermantown.

Constitution.—On Pogonip Flat.—June 19, had a shaft down 20 and an incline 30 feet. Both are connected by a drift 30 feet in length. A fine body of ore was exposed in the breast to the west, and about 30 tons were on the dump.

Copper Glance.—On Argyle Hill.—"Vein" claimed to be 100 feet wide. The shaft, 55 feet deep, passed through three feet of good ore, at a depth of 45 feet.

Crow Wing.—On Chloride Flat.—The shaft is 28 feet deep.

Cora.—On Mazeppa Flat.—The shaft is 55 feet deep, and exposes ore the same as a drift once forced it northward.

Cerro Pasco, on Radical Hill, has followed a beautiful foot-wall, with an incline 49 feet deep, through a body of fair ore, the entire distance.

Charter Oak, belonging to the White Pine Mutual Milling and Mining Company, is situated on the east side, toward the north end; adjoins the Emersley, of which it is a continuation, and is almost due north of the Hidden Treasure, and about 500 feet below the summit. May 17 the shaft was 50 feet deep, and contained good ore all the way. A

large amount has been reduced at their mill, in Hamilton, parts of which yielded $450 per ton. Some of the ore found at 50 feet depth has a light yellowish green color when taken out, but on exposure to the sun it changes to a purplish hue. The mine is owned in Philadelphia, and was located June 10, 1868. It contains chloride and sulphide of silver. The vein is believed to be 30 feet wide. July 10, 1869, the shaft was down 70 feet. The north drift, in 12 feet from the 35-foot level, was in $60 ore.

Casteel.—Claimed to be an eastern extension of the California. Struck ore similar in character to the California on June 30.

Chester.—July 10, had out 20 tons $115 ore from a shaft 42 feet deep, located on a vertical ledge 3 feet wide.

Dell.—June 10, had eighty tons of ore on the dump; shipped 25 tons three days before; was taking out about 4 tons daily. The shaft is round and vertical, 20 feet in diameter, and 24 feet deep. A drift to the north was in 14 feet in a large body of fine ore.

Double Eagle.—Property of the White Pine Mutual Milling and Mining Company, near Virginia street, between Main and Union. Found good ore at a depth of about 20 feet. The shaft is being sunk deeper.

Doran.—Owned by Pogonip Silver Mining Company, J. R. Murphy, superintendent. Struck ore at 38 feet, which ranged from $236 to $722 per ton. Drifted on this awhile, and then continued sinking. The vein stands nearly vertical.

Dreadnaught.—On south side, near the head of Mahogany Cañon, on the eastern slope of Eberhardt Ridge. July 3, had a shaft 20 feet deep, between smooth walls 7 feet apart, and nearly vertical. Quartz and some chloride are found in the bottom.

Eberhardt.—This being the leading mine of a district which is attracting so much attention, a full description of it will be given here.

Just at the south end of the summit of Treasure Hill seems to have been an immense break running east and west across the strata. A chasm 200 feet wide was opened. The ground to the south of this chasm is several hundred feet lower than that immediately north of it, and lies for some distance comparatively level. In this chasm the Eberhardt mine is located. The deposit of ore and gangue fills the whole of the opening made by the break. The gangue is composed of limestone, quartz, and spar. The ore proper is very irregularly deposited, lying sometimes in horizontal sheets, occurring at other times in the shape of large pockets of all shapes. Large lumps of pure chloride of silver, some of them weighing over a hundred pounds, are found so pure that a nail may easily be driven into any part of them, the same as into a bar of lead. A silver coin laid upon these pieces and struck smartly with a hammer or sledge will leave its impression as distinctly as a seal on soft wax. While there is a large amount of this exceedingly rich ore, there is a hundred times the quantity of ore of ordinary richness, say worth $100 per ton, and this, like in all mines, must be, of course, the main reliance for the profitable working of the mine in the future.

The ore was found very near the surface. The first work done was altogether by open cuts and sinking directly on the surface, the same as in a stone quarry. Hundreds of thousands of dollars were taken out in this way. Then shafts were sunk and drifts run. The main shaft is down now about two hundred feet; it shows no particular variation in the manner of deposition of mineral. No bodies of ore equal to that cut by the first workings were found in the shaft. Of course, this does not at all go to prove that there are no other such bodies in the ledge, simply because there is no particular reason for their occurring at any

particular place except the fact that cavities large enough to contain them must have existed at the time the ore was deposited. The location of these cavities is accidental, and though one shaft might be sunk one thousand feet without striking one, another shaft a few feet distant might cut numbers of them. Probably the best way to find them is to follow the threads of mineral through the vein matter, which probably connect the larger bodies. On June 19 the mine was employing eighty men, twenty-one of whom were employed on dead-work. Twenty tons per day were being taken from the face of the hill and five tons from the mine; twenty of which were only sent to the mill. The Keystone shaft on the north wall was down 200 feet and was still in good ore. A drift driven a distance of 180 feet west from this shaft showed ore the entire length. The Blue Bell shaft on the south wall was down 190 feet. July 3 the mine was sending 22 tons of ore to mill per day. About the same amount was raised. Seven tons of it (very rich) were daily taken from a chamber immediately north of the Blue Bell shaft. This chamber was then 100 feet long, 30 feet wide, and 13 feet high; its base being 40 feet from the surface. The south wall is nearly perpendicular, while the north wall dips south at an angle of 82°. The drift running west along the north wall from the Keystone shaft is 80 feet below the surface and was (July 3) 180 feet in length, showing a seam of clay about two inches thick along the wall. At that time work was suspended on the drift. From the same level in this shaft a drift was being pushed south in the direction of the Blue Bell shaft with which it is intended to make another connection on that level. From the Blue Bell shaft on the south wall, at a depth of 187 feet, another drift is being run north to the Keystone shaft. There will then be three connections from the north to the south wall, a distance of 200 feet between the Keystone and Blue Bell shafts, viz: at the respective depths of 40, 80, and 187 feet. July 10 the usual amount of 22 tons per day was still being sent to the mill. At this date they had 100 tons at the mill and over 300 tons on the dumps. The capacity of the company's mill at Shermantown is 14 tons per day. In the Keystone shaft a large body of high-grade ore is met with at a depth of 165 feet, while the bottom is also on ore, less concentrated but of good quality. This shaft will not be sunk deeper at present, as the depth already attained is very trying to a common windlass and rope. The Eberhardt was the first mine in White Pine to reduce the wages from $5 to $4 per day. This was done in July, 1869. A strike and some trouble for a few days followed, but order was soon restored. The mine and mill were incorporated in San Francisco, California, March 6, 1869; 120,000 shares; capital stock, $12,000,000.

Evening Star.—South side, in Mahogany Cañon, near Blair and Banner State; incorporated; 40,000 shares; capital stock, $4,000,000. Ledge was stripped to a width (or length) of 140 feet and no boundaries found. In general appearance it resembles the California, but the ore is different and seems to be richer. It is spoken of as the largest compact ledge in the district. June 26, had a cut 30 feet long, 12 feet wide and 9 feet deep in ore, in which horn-silver was freely distributed. The company, as at present organized, is a consolidation of the Evening Star and Mahogany mines. Mr. Greenleaf, formerly of the California mine, is conducting the works. Up to July 10 the workings were most satisfactory.

Eastern Slope Tunnel Company.—East side of Treasure Hill, about 800 feet below the summit and directly opposite Treasure City. Location made December, 1868; work began March 2, 1869. May 30, in 150 feet. The first 100 feet passed mostly through slate, which, in some

places, was very hard, in others, damp and soft. June 16, the second 100 feet were completed. The tunnel here passed through a formation of limestone, mixed with spar. Here and there small cavities exist in the limestone, and extensive seams intervene between the rock and spar. The mouth of the tunnel is east of the main line of upheaval of Treasure Hill, as shown in the tunnel, where, for the first 100 feet, the rock dips east, and then changes to the west, dipping with the body of the hill. Cost of tunnel, $15 per foot for the first 150 feet, which is cheaper than common. Incorporated in San Francisco, California, February 7, 1869; 10,000 shares; capital stock $1,000,000.

Excelsior.—North end, below the Mammoth; 800 feet. Located December, 1868. Owned by Dunne, Moffett & Freeman; 8 feet wide; dips west 30°. Has all the appearance of a fissure vein. Shows a fine body of vein matter, principally composed of spathiferous breccia, mixed with angular fragments of silicified limestone. Ore assays from $50 to $5,000. Chloride of silver (horn-silver) is found in it, which will assay $20,000 to the ton. The location is exceedingly favorable for working.

Excelsior.—On the west side, toward the north end, below main street, and just below Rice's toll-road; 800 feet. Located November 12, 1867. Ledge runs east and west; stripped 250 feet. On the east end of this stripping, a drift has been run about 20 feet along the ledge. About 40 feet west from this, a drift is being pushed north into the hill, the bottom of which is in vein matter, quartz, and spar, for its entire length, 48 feet. The ledge is nearly horizontal for some distance in, appearing to dip at a greater angle toward the western end of the claim than elsewhere. There are three north drifts from the east and west cut, only one of which is being pushed at present—the most easterly. The other two are in, one about 25 and the other 20 feet, both on the ledge. Considerable low-grade ore has been taken from the mine. Incorporated; capital stock $1,600,000.

Eclipse Consolidated, (Eclipse and *Umatilla.)*—June 26, had 500 tons of ore out, 5 tons of which were sacked for shipment to San Francisco. This lot was estimated to mill over $1,000 per ton. Main shaft, 75 feet. Passing through a fine body of ore at the surface, it penetrated solid limestone for 50 feet, and again struck into ore. It is now being pushed with the intention of sinking to a depth of 200 feet. East drift in 93 feet, all the way through vein matter, mineral, and spars. South drift in 70 feet; July 10, the shaft had reached a depth of 82 feet, and struck some rich ore in the bottom.

Emersley.—East side, below Hidden Treasure, south of Charter Oak, (another location in the same vein.) A very large vein running north and south, and dipping west, 800 feet in the location. June 26, was reported to have been sold East for $80,000. It is considered to be well worth the money.

Eggleston & Brown.—Located July 22, 1868, on north end; July 3; an incline to the west had followed down on the foot-wall at an angle of 45° to a depth of 23 feet, where vertical sinking was commenced, the ledge being found to stand perpendicularly at that point.

Glacier.—On the brow of the mountain at the commencement of the southern slope, directly west of the Eberhardt, and commonly thought to be in the same transverse fissure, the ore resembles that from the Eberhardt. Location 1,600 feet, beginning at the westerly line of the first west extension of the Eberhardt. Bordering it on the north is a huge limestone cliff which forms the north wall of the great Eberhardt ledge, and which there is every reason to think constitutes also the north wall of the Glacier. The mine is owned principally in the East, being

the property of the White Pine Mutual Milling and Mining Company, and work is being vigorously prosecuted. June 19, had a 35-foot shaft in a 10 foot body of fine ore. The incline from the west was down 20 feet between two well-defined wells lined with clay; but the fissure seemed to have lost its ore near the surface, which had given place to fragments of limestone and spar. Next to the north wall in the incline, ore and more compact vein matter was appearing. June 26, the incline was down along the north wall 14 feet, still in hard limestone with seams of spar.

Gold Hill.—June 19, had penetrated a cap of limestone with a 12-foot shaft, and struck a body of good ore.

Georgia.—Mahogany Cañon, on south side.—June 19, had a cut along the ledge 140 feet, shaft 35 feet, and a few tons of good ore on the dump. June 26, struck good ore at 38 feet in the shaft.

Great Union Tunnel Company.—Three thousand feet square. Located February 22, 1869, on east side, 2,000 feet below the summit, opposite the center of Treasure City. Incorporated in San Francisco, California; 60,000 shares; capital stock, $6,000,000. Some of the heaviest capitalists of San Francisco are the locators. Tunnel was in 100 feet June 15, and work going on.

Good Omen.—East side, on Pocotillo Flat, just south of the Pocotillo mine. June 19, was idle, with a small quantity of good ore on the dump, which was taken from the west drift at the bottom of a 16-foot shaft.

Guardian.—East slope above Pocotillo Flat, a little north of the line of the Eastern Slope Tunnel Company. July 3, had a cut of 18 feet, bottom and sides in good ore; 6 tons on the dump. It is a "protection" location of the Sentinel mine; both owned by the same parties and treated as one property. July 10, was building up a large dump of pay ore. Had a shaft down 12 feet, and intended to begin work on the Sentinel shaft soon.

Grattan.—July 3, was taking ore (mixed with base metal) from a 30-foot breast.

Hidden Treasure.—This was the first mine discovered on Treasure Hill. The locality was shown to A. J. Leathers, the blacksmith of the Monte Christo Company, by an Indian. But the unusual formation of the deposit bewildered him so, that for fear of missing the ledge, he did not locate his claim until the middle of September, and not before he had drawn Mr. Marchand, the superintendent of the Monte Christo Company, into the secret.

When the Eberhardt and other mines were discovered, the excitement began, and the district was soon filled with people. The Hidden Treasure still holds its rank as one of the first mines in point of value as well as discovery. It is worked mainly by open cuts, and the deposit lies between a stratum of clay slate above and limestone below, its dip necessarily following that of the strata on the hill. It crops out on the east side of the summit very near the crest, and at that place lies quite flat. It has been stripped for 600 feet in length, and many large excavations have been made. The ore abounds in horn-silver, and as at present opened the mine can easily raise 100 tons per day. The shipments during the past summer have varied from 10 to 40 tons per day, most of which were packed on mules. It is difficult to give the thickness of the vein; one cut run across it seemed to indicate a width of 97 feet, but that inference was based upon the supposition that the dip was forty-five degrees. If the angle of the dip should be less, as is almost certainly the case, the length of the cut would give the real thickness of the deposit considerably too high. However, the vein is large enough to satisfy the most rapacious company which

ever mined for silver. A tunnel was in, on June 26, 98 feet. Surveys indicated that 52 feet more would strike the ledge at a depth of 200 feet from the surface, but this is again based upon what is probably a false supposition of the dip. The open cut has been run across to the west or hanging wall, and the whole body of the ledge thus exposed is being breasted to the south by open work. July 10, the south breast was not yielding as well as it had been, but a new deposit was found west of what had been supposed to be the west wall. A suit is pending for a large portion of this mine. The locators of the Hidden Treasure complied with the laws of the district in putting their notice on the ground, but it is claimed that they did not cause the same to be recorded for a long time after the ten days which are allowed by law from the time of posting the notice. The locators of the Rathbun mine near by, thinking they had a point on the Hidden Treasure in this, ran their claim over a portion of the Hidden Treasure ground (I think about four hundred feet) and got their claim recorded first. The Hidden Treasure being in possession, instituted an action to quiet title, thereby compelling the Rathbun men to go to their proofs and defend their claim or forever after hold their peace. The Hidden Treasure men, while they admit the patent fact that their notice was not recorded in time, claim that it was delivered to the recorder before the Rathbun notice, and that it was mere inadvertence in the recorder to enter the Rathbun notice out of its order, and that they cannot be made to suffer for this fact. The matter will probably be compromised after a strong show of fight on both sides, as it is very dangerous work to litigate at title in White Pine where so much is involved. Both parties are generally taken very much by surprise by the testimony introduced before they get through. It is astonishing how witnesses will turn up who happen to know always just what is necessary to suit the particular wants of the case. The stock of the Hidden Treasure stands pretty firm at $30 per share. There are 16,000 shares, which puts the present market price of the mine at $480,000.

Hidden Treasure Consolidated is the first extension north of the Hidden Treasure. It has been pretty well prospected and the ledge uncovered about one hundred feet. June 4, they had 50 or 60 tons of ore on the dump, which resembled that from the original. Two inclines are being sunk with satisfactory results. The ledge improves, so far, in width and appearance, and there is scarcely room for a doubt that it is the same "contact vein" opened in the original, as it rests on the same bed of limestone and has the same clay slate above. There is no indication between the two mines of any disturbance. July 10, the mine was looking well; both shafts had got into fair ore. The incline was down 60 feet, at which depth a winze had been sunk eight feet in a mixture of limestone, quartz, and spar stained with chloride. North shaft down 15 feet in ore. Incorporated; 12,000 shares; capital stock, $1,200,000. Stock holds pretty steadily at $2 50 per share.

Hidden Treasure South.—Working steadily with good returns.

Horseshoe.—South side near Mazeppa. May 9, opened a splendid breast of horn-silver. The incline is down 71 feet, pointing toward the Mazeppa; all the way down it is on a good foot-wall and through good ore. This foot-wall is said to be the finest in the district; it dips forty-seven degrees. The ledge is seven feet wide and a model for compactness and uniform grade of ore. The bottom of the incline rests against limestone, 12 feet of which separate the Horseshoe from the Mazeppa shaft. On June 26 ten tons of good ore were on the dump.

Herman.—June 26, had a shaft 40 feet, following the hanging wall.

Here a turn was made through the wall into the ledge, and 20 feet of good ore were penetrated. The east shaft in the foot-wall is claimed to show the ledge to be 80 feet wide.

Hydrogen.—South side on a ridge east of the California. Shaft 22 feet down a slightly-inclined hanging wall, smooth as sheet iron. A drift has been run ten feet northeast from the bottom of the shaft through a mixture of limestone and black spar.

Hemlock.—July 3, was sinking and drifting in ore. Fifty sacks were on the dump and a large body in sight. July 10, was running a cut east and west, south of the shaft, which showed ore of good quality within three feet of the surface for its entire length.

Hornet.—A few hundred yards west of the toll-house on the road from Hamilton to Shermantown. One thousand feet; sold in the winter of 1868–'69 for $3,000. Was working well May 20, 1869, and work going on. The ores are chloride and sulphuret of silver. The mine is said to be entirely free from conflict of title with any other claim. July 3, had an incline down 35 feet, and a large quantity of fair ore on the dump.

Industry.—On Main street, near the south end of the summit above Chloride Flat; incorporated at White Pine; 20,000 shares; capital stock, $2,000,000. It is the pioneer home incorporation at White Pine. In the week ending June 19, 1869, it shipped bullion to the amount of $5,312 38. The shaft at this date was down 35 feet, where a large chamber has been opened in a fine body of ore. The fineness of the bullion from this ledge is remarkable, one bar assaying .989 and three bars .991, or one above the government standard. At this time the mine was raising 8 tons daily, which were shipped to McCone & Dunn's mill.

July 26, it was raising 10 tons daily; $1 per share was offered for the stock in the board. The force was increased. June 30, the first dividend was declared. A threatened contest of title with the Nevada Company was, during this week, avoided by compromise, without expense to either company, and the Industry title was at that time considered unclouded, and the boundaries established and admitted. July 10, yielded 5 tons daily, and had 35 or 40 tons on the dump. Three breasts were being pushed on the 35-foot level to the north, east, and west.

Indianapolis.—July 10, had a shaft down 73 feet, from the bottom of which a drift was run 13 feet north across the ledge, through quartz, which carried some ore.

Ince Hall.—East side south of Pocotillo Flat. Shaft down 41 feet on June 26. Some good ore struck.

John Dare.—East side, on the upper or western Pocotillo Flat, or rather above the flat. A large shaft was originally sunk on this mine to a depth of 25 feet, from which a quantity of good chloride ore was taken, but the location not being favorable for working, a cut was commenced lower down the hill on a level with the bottom of the shaft. It was an open cut for a distance of 20 feet into the hill, when a drift was commenced. July 10, cut and drift were in 27 feet, leaving 17 feet to penetrate to the bottom of the shaft. The principal place of business of the company is San José, California.

Johnson Tunnel.—July 3, was running for the Relief and Cuyahoga ledges. Open cut 28 feet into the hill; from this point a tunnel was in 46 feet.

Keblah.—The most elevated mine on Treasure Hill. June 26, the shaft 26 feet deep, exposing some pay ore. It is the property of the National Milling, Mining, and Tunnel Company, and the National Tunnel starting in on the eastern side of the hill on a level with the Eastern Slope Tunnel Company's works. is driving, among others, the ledge of

this company. This mine is located 9,260 feet above the sea. July 10, ore of improved quality was mined. Shaft was 32 feet deep.

Leviathan.—Eastern slope of Argyle Hill. June 26, was taking good ore from a shaft 26 feet down.

Lincoln.—June 26, shaft was 50 feet deep. Two drifts are run from it, one at 25 feet depth, (in 15 feet,) the other from the bottom, (in 14 feet,) both following the ledge between the walls.

Lexington.—In the first sag of the Eberhardt Ridge. Shaft 40 feet deep. July 9, was sinking the shaft deeper.

Mazeppa.—On the south side, below the California, and southeasterly from it, in the cañon leading to Eberhardt City. It is considered one of the leading mines of that neighborhood. June 19, was working in rich ore. An incline from the old shaft had reached a depth of 28 feet, where a 9-foot breast was being pushed into the rich ore. June 26, the principal work was done at a depth of 23 feet; on this level a breast 15 feet wide by 8 feet in height had been pushed 15 feet to the north in a large body of good ore. To the west another breast 15 feet broad by 12 high had been driven 20 feet, descending gradually with the dip of an apparent foot-wall which is, in fact, only a stratum of limestone separating the upper deposit from one beneath, which has been cut by the shaft. The west breast was all ore, save the limestone under foot, and of a higher grade than that in the northern one. The principal work was then being done west, and the intention was to broaden the breast into a vast chamber, with sufficient pillars left to secure the roof. July 3, sinking in the shaft was continued with the intention to go down 40 feet. The west breast, 23 feet in, was being cleared preparatory to sinking an incline. Work in the north breast was stopped. The intention was to open another chamber at a depth of 35 feet beneath the layer of limestone, on top of which breasting was then carried on. The shaft which had penetrated this stratum was in good ore July 10. The west ore breast had been followed to a point where the limestone stratum beneath (penetrated by the shaft) had changed into a red conglomerate of lime spar and quartz, carrying chloride. Workings showed the ore under this stratum continuous and good. This Mazeppa is not incorporated. The incorporated Mazeppa quoted on the San Francisco stock board is an undeveloped extension.

Mahogany.—South side, 1,500 feet below Eberhardt. This company is a consolidation of the Stewart, Evening Star, and Mahogany ledges, the Stewart and Evening Star being about 500 feet above. June 19, had a 10-foot drift leading from a 30-foot cut into a rich body of horn silver.

Mecca.—June 19, shaft, 25 feet, thence a drift 8 feet through ore; 28 tons of ore on the dump.

Manhattan.—Western slope of Argyle Hill, owned principally by T. J. Murphy, former owner of the original Hidden Treasure. Two parallel inclines were first sunk 30 feet deep on the foot-wall, then connected at the bottom by a drift from which rich chloride and stelefeldtite were taken. Ledge claimed to be over 100 feet wide. June 19, had 25 tons of ore on the dump. June 26, working force was 25 men.

Mechanics.—South side between Eberhardt and California. June 26, shaft 42 feet deep.

Misolony Tunnel.—July 3, was in 51 feet, inclining downward. It showed some quartz and spar on the north side near the face.

McLane.—July 3, had a tunnel 50 feet long and a winze of 23 feet in depth; still in limestone.

Mammoth.—The leading mine on the northern slope of Treasure Hill, (the Virginia not being exactly on this slope.) This ledge was located

in July, 1868, but was afterwards sold by the original locators to a San Francisco company, and is now owned and incorporated by them. The dip and strike of the vein is similar to that of the Hidden Treasure and the principal mines of Chloride Flat. The width of the vein is as yet unknown. The company, in order to ascertain the width of the pay streak, have sunk seven shafts, one above the other, each shaft being from 8 to 20 feet in depth, and have struck good ore in each. A cross-cut has been made, running immediately on the top croppings of the vein, but as yet not across the ledge. From the number of shafts sunk and the cross-cut run, it is believed that the ledge cannot be less than 300 feet in width. There is ore enough now in sight to warrant the company in any expenditure for mills or improvements on the mine. A daily force of 15 men is at present (June 3, 1869) employed in taking out ore. Not less than 200 tons of ore are now lying on the dump. Quite a number of assays have been made, none going under $100 per ton, and some as high as $1,000—the ores showing an abundance of chloride. As work was only commenced in February, 1869, considering the inclemency of the weather, great progress has been made in the way of developing this mine. The company think the amount of ore now on the dump will warrant them in erecting a mill. James McQuaid is superintendent. The Mammoth is well and truly named, being not only of immense width, but having thousands of tons of ore in sight that will mill from $100 to $500. Incorporated; 36,000 shares; capital stock, $3,600,000; stock stands about $2 50 per share. The Sheboygan, a somewhat noted mine east of Mammoth shaft, was lately absorbed by the Mammoth Company.

Noonday.—On Chloride Flat. June 26, had a drift south 200 feet, with a cross-cut 100 feet from the mouth. The latter runs 40 feet east and 15 feet west from the line of the drift. Many other cross-cuts, shafts, drifts, and winzes have been run. July 10, extensive prospecting was carried on, with good result.

Nightingale.—June 26, had a shaft down 40 feet through black spar and some ore.

Napoleon.—June 26, a tunnel 37 feet long and a winze at the end 24 feet deep, were in vein matter.

National Tunnel.—(See Keblah Mine.)

Oakland North.—On Lower Chloride Flat. July 3, shaft was 30 feet deep, at which depth a drift was run east 12 feet through ore.

Oakland.—On south side, a few hundred feet west of Mazeppa, and about 2,000 feet south of the California; located December 20, 1868. July 3, the shaft was 47 feet deep in 4 feet of quartz and chloride.

Old Ned.—July 10, had suspended operations in the south drift, (34-foot level,) and had commenced drifting in the same direction on the 50-foot level. In the 34-foot drift the ledge was standing almost vertically.

Omega.—Northern slope on a line between the Hidden Treasure and Mammoth. June 26, the shaft was down 85 feet in 5 feet of ore, mixed with black spar and quartz.

Othello.—(See Pogonip and Othello.)

Pogonip and Othello.—On Pogonip Flat, at the south end of the summit of Treasure Hill; located November, 1867. Several locations in this vicinity have been purchased by San Francisco capitalists, and all consolidated under the name of Pogonip, (the Piute Indian word for fog.) Sometimes the claim is spoken of as Pogonip and Othello, the Othello being one of those locations. Some wonderfully rich strikes have been made by this company, and the mine is considered one of the leading ones. June 19, had 300 tons of ore out awaiting the completion

of the company's mill, which was expected to start up about the 20th of July. The entire 800 feet of the claim had been cut through, and rich ore was found in all parts of it. North incline 20 feet deep; middle and main shaft 20 feet, with a drift to the north 25 feet, leaving 35 feet yet to connect the two shafts.

The south line shaft was down 18 feet, and from this a drift ran north 50 feet, all the way through ore. All these shafts are upon a line, while the Othello shaft is 30 feet west, and was then 30 feet deep. Two drifts were being run from the Othello to strike the main drift connecting the other shafts. The ore from the Othello is exceedingly rich. June 26, the stock of the company had been listed by the board in San Francisco, and quoted at $16. A body of rich ore was struck in the north shaft, resembling that from the Othello. July 3, stock opened at $20, closed at $19.

Pocotillo.—East side, south end, on a flat of the same name. Quite a noted mine. Work was suspended for some time, on account of litigation. Resumed June 19. July 3, stock stood at $8; 14½ tons of ore worked at the Treasure mill gave a pulp assay of $225 to the ton. This was from the original working of the mine. Workings about this date disclosed the fact that the main body of ore lies south of where the mine was first opened and pitches north. The old pit (first workings) is about 15 feet square and 12 feet deep. In the south face the ore is rich, 7 feet up from the bottom, but dips towards the north at an angle which brings the rich stratum to the bottom at the north side of the pit.

Phil. Sheridan.—East side, at the foot of the slope toward the north end, at the foot of Treasure street. July 3, working in $119 ore.

Post-hole.—On south end of Chloride Flat. June 19, had 30 men engaged. Shaft 24 feet, drift east and west 78 feet. Raising 10 tons daily, which milled from $100 to $600. June 26, had added 5 feet to its east and west drift, on the 24-foot level, and raised and shipped 5 tons daily of $100 ore; 50 tons still on hand. July 3, had sent 101 tons of ore to mill during the last week, which averaged, second class $150, first class $350. This company has traced out the Alturas, and is now running that shaft also, taking out 7 tons daily from a breast 20 feet wide, extending along the connecting drift. July 10, extracting and sending to mill 10 tons per day, and drifting north and south in ore on the 25-foot level. No richer ore has ever been found in White Pine than that taken from the Post-hole. The mine stands among the very first on Treasure Hill, but there has been great uneasiness felt about the title, on account of a claim made by the Nevada Company, which is said to have an older location. On the 30th of June the following notice was published in one of the local papers as an item of news:

"COMPROMISED.—The Nevada, (Treasure Hill Mill and Mining Company,) Industry and Post-hole mines have come to an amicable adjustment of title, by which the three go ahead with work without further danger of litigation. The Post-hole and Industry each made a separate arrangement with the owners of the Nevada, and everybody is satisfied, so far as we know, except, perhaps, the lawyers."

But whether that arrangement gives the Post-hole its ground or only permission to work it six months or less, the notice does not state, but wherever the title goes it takes with it a wonderful mine.

Pasco.—June 19, shaft, 35 feet; good ore, which was sacked for shipment. July 3, sent 10 tons of ore to mill, and had as much more on the dump. Drift southeast from bottom of shaft, 12 feet, through good ore.

Paris.—July 10, struck a body of good ore on the south side of the incline.

Pennsylvania.—On summit of ridge south of original Hidden Treasure,

400 feet in the location; located July 22, 1868; at work July 3, in a cr on the north line of the claim.

Rattler.—In the southern part of the town, near Main street, in th neighborhood of the Post-hole. June 19, had 33 men at work; shaft down 35 feet, 11 feet in ore; driving a breast north 8 feet high, 20 wide all in ore, and drifting west at the same time. East drift in 6 feet, wit the whole face in ore; 120 tons ore on the dump; 9 tons hoisted daily, and about the same amount shipped.

Rarell.—East side on Pocotillo Flat next south of Little Phil. Sheridan. June 19, struck ore at 15 feet depth.

Rathbun.—At work June 19. Shaft closed to outsiders. Stock sold in local board during the week at $4.

Red Jacket.—Near the Eberhardt, said to be about 30 feet wide. June 26, shaft 8 feet in decomposed spar and red quartz. July 3, shaft 1 feet in black spar and quartz, having passed through the red rock and 3 feet of decomposed spar and apparently reached a solid formation.

Sagebrush.—On Main street. July 10, opening new levels at 35 fee depth and sinking. A drift was being run to the Post-hole for air.

Sunny Side.—June 26, still drifting east and north from the east shaft at the 36-foot level. East drift in 12 feet with some ore. The north drift struck a curious formation, a large mass of fine powder resembling ashes, and containing a large percentage of chloride; 25 tons of or on the dump.

Silver Wave.—In the northeastern portion of Treasure City, among the private residences, a little southwest of the south workings of the original Hidden Treasure. July 3, was quite active in the board opening at $13, closing at $10. Two shafts 100 feet apart, the west one down 23 feet through slate, temporarily closed, and the east shaft down 40 feet with a drift on that level running west of north, in good ore; 2 tons on the dump.

Saskatchewan Tunnel Company.—On Bromide Flat, back of Hallock & Meyer's store, and 100 yards down. June 19, in 80 feet, from which point a winze has been sunk 40 feet, (120 feet from the surface.) A large amount of ore is in sight and some on the dump.

Second of May.—Northeastern slope Pocotillo Flat, June 29, shaft 25 feet; vein, 12 feet wide; 25 tons ore on the dump.

Spring Hill and Eldorado Company.—July 3, shaft 47 feet; drift from bottom, northeast, 12 feet.

Southern Slope Tunnel. (*Chloride Tunnel Company.*)—July 3, in 70 feet, through limestone; expected to reach the ledge (which was stripped on the surface) 30 feet further in.

Silver Vault Tunnel.—East side, a little north of the Great Union Tunnel, favorably located and work progressing.

Treasure Hill Mining and Milling Company.—This company owns the Big Smoky mill at Hamilton, and two valuable mines on Treasure Hill, the Nevada and the Summit mines. The two jointly work 65 men by the day, besides doing a good deal on the contract system. Summit has two shafts, 30 feet apart; Nevada two shafts, all in good ore; 40 tons of ore raised and 35 shipped daily. This company also owns the North Iceberg, upon which they are sinking a shaft. June 26, cut on Nevada in 80 feet, leading into an ore chamber 80 feet in length and 30 feet in width, in which breasting was going on in high-grade ore. The end of the cut next to the chamber is 12 feet deep, and the whole mass is ore. Ore yield, 40 tons per day; about the same amount is sent to the mill daily. North Iceberg shaft down 24 feet, and west drift commenced. July 3, still shipping 40 tons per day, and raising about the same. July

raising 30 tons daily. Two shafts down on North Iceberg, connected the bottom with a drift.

Utile Dulce.—Shaft, 34 feet in quartz and spar.

Virginia.—One of the foremost mines, on the west side of Treasure A thousand tons of good ore in sight and on the dumps last June. l statistics of mine promised me by the superintendent, but not re- ved.

Victor.—A short distance north of the Horseshoe. June 19, about tons ore on dump. Shaft, 50 feet, the last 10 feet in good ore.

Ward Beecher.—Main street, south end, near the Auroras. June 19, aft, 56 feet. June 26, shaft, 60 feet, coming into good ore. July 3, ft, 73 feet, drifting.

Ward Beecher South.—Adjoining above. June 19, incline, 50 feet. e 76, incline, 76 feet; was expected to break into the Earl that night. e 3, drifting from 40-foot level toward Napoleon Tunnel.

West Point.—Pogonip Flat. Location 1,000 feet west of and near the gonip and Othello. Ore resembling that of those mines; found in annels and layers divided by reefs of hard limestone. June 19, had veral cuts and a main shaft 40 feet deep, from which considerable fine had been taken. June 26, drifting northwest from the 40-foot level the main shaft; large amount of fine ore in sight. July 3, norththwest, drift on 40 foot level of the main shaft was in 13 feet. July drifting east in ore 10 feet from the north end of the surface cut.

Wabash.—June 26, had some good ore sacked for shipment and a ge body in sight in the incline drift to the north.

White Eagle.—July 3, shaft 35 feet; at 30 feet a drift south-southeast tarted.

It is not pretended that the foregoing include all the mines on easure Hill which are worthy especial mention by reason of their d, amount of work done on them, or general advantages and prosts, nor that some that will be mentioned afterward, under the genral head of other White Pine mines, are not of more importance than me of those mentioned above. Those given in the foregoing list are the ones on which most work was done during the spring and summer nths of 1869, and for this reason they are grouped together.

Bullion Hill.—This is the name of a newly discovered series of ledges bout two miles west of Hamilton, and a short distance south of the old l road leading down the cañon. It was discovered as early as May, 69, but was kept quiet until about 200 locations had been made. It has since raised a great excitement, and is not considered second to anything White Pine. It has a great advantage over Chloride Flat, as far as mate, wood, and water are concerned, and is generally considered al to it in the deposit of silver ore, as far as its area goes. The prinal locations are the Bullion ledges, numbered from 1 to 10 consecuely, the Sentinel and Bullion Guard, series of equal number. John ffet, late owner of the California and West Eberhardt, (which last ned mine he sold in January, 1869, for $85,000,) is the principal owner the Bullion Hill mines. It is reported that the Chicago hundred who ited White Pine in July last, invested heavily in Bullion Hill.

Mount Ophir.—This is the name of a new and very promising mining secwhich is situated on the western slope of White Pine Mountain, a litsouth of west from Shermantown, at a distance, by a rough trail directly the mountain, of three miles and a half. It is easy of access, howby following the road around the southern point of the mountain, which increases the distance to about ten miles from Shermantown. There are 12 mines in the district, upon which the most flattering develop-

ments have been made near the surface, namely, the Little Amador, Cutter, Black Diamond, Nosano, Shiloh, Kern, Locomotive, Atchison & Davis, Margaret, Caroline, Buena Vista, and another, the name of which I failed to note. The Little Amador was the first discovery made in that vicinity, and was located May 5, by a company of Swiss miners, composed of Philip Siebenthaler, J. Forster, D. Teuscher, Joseph Wasescha, P. Reedy, and J. Ott. There are 1,200 feet in the claim, and for about 70 feet the ledge can readily be traced. The ledge at the bottom of the shaft is some 10 feet in width. A rich stratum of pure chloride follows down the entire distance from the surface, increasing from six inches to two feet in thickness. About 40 tons of excellent ore are piled on the dump, which were obtained in sinking the shaft, and without drifting. The first southern extension on the same ledge is the Cutter. This, as in the case of the original location, bears unmistakable evidence of permanence. The ledges show chlorides, but in none of the claims of the new section is base metal to be found. Being on the White Pine Mountain, this may appear strange, but it is nevertheless true. An average of 18 assays from this mine gave $1,730, while others have been obtained yielding a return as high as $3,000 per ton. Further south, on the same ledge, is the Nosano, with a shaft down 15 feet, and carrying well-defined walls and first-class ore. The Black Diamond, Shiloh, Atchison & Davis, and other claims to the southward, also show well for the amount of work performed. About 2,000 feet north of the Little Amador is situated the Buena Vista, also showing a splendid ledge of fine mineral. The mineral belt of the new district appears to be about one-fourth of a mile in width by two to three miles in length.

OTHER MINES ON TREASURE HILL AND IN OTHER PARTS OF THE DISTRICT.

Charles and Theresa.—Chloride Flat, 1,000 feet. Rich strike March 15, 1869. Shaft 20 feet deep at that time. Incline west, 40 feet. Vein at lowest working said to be three feet wide, dipping west 30°. Some rock found assaying $10,000.

St. Lawrence.—Near the cliff mine adjoining Hamilton. Located February 1, 1869. Antimonial sulphurets with ruby silver, furnishing rare and beautiful specimens.

Cliff.—Near Hamilton.

Alexandrine.—East side Treasure Hill, near the Pocotillo.

Norfolk.—Sixteen hundred feet. In Base Metal Range. Galena ore. Assays $400 to $1,000. Some smelted at Swansea, White Pine, gave $450 silver and large amount of lead. Vein, 16 feet wide. Crops 400 feet. Numerous shafts sunk on the croppings.

Golero.—A few hundred feet northeast of Eberhardt, and claimed to be the eastern extension of that famous vein. Up to March 20 not much mineral had been found.

Lookout No. 2.—Located July, 1868, about 1,800 feet north of the Pogonip ground; claimed by the Seymour Company, (Bank of California.

Silverado.—Located February 25, 1869. 1,000 feet. Is on the east side Treasure Hill, near the summit, in a sag east of Aurora South. No ore and little work.

Cheshire.—Eight hundred feet in claim. 300 feet below the California, on south side of Treasure Hill. Cut, 10 feet deep, 20 feet long. Owners, Robert Cheshire, E. Mattice, C. Dupee, and others.

Idaho.—Located June, 1868. Eight hundred feet. Owners, C. O. Rich-

ardson, and others. On Bromide Flat, about 250 feet north of Empire. March 25, shaft, 8 feet, and drifting east.

Carl and Prussian.—On the point west of Eberhardt, and near the road leading to Silver Springs. Contains copper and lead. Very heavy ore. Assaying $150 in silver.

Cassaday.—Mohawk Cañon, Base Metal range. Galena and chloride, $95 to $238 75, silver. Three feet wide. Traced 300 feet.

Angel.—West base Treasure Hill, south end, near Shermantown and Hamilton road. Twelve feet wide.

Murray.—Saw-mill Cañon. West slope White Pine Mountain. Four feet wide. Fine-looking quartz.

Liberty.—Main street, Treasure City.

Anita.—One and a half mile from Hamilton, on Shermantown road, 300 feet from west side. Base metal and chloride. Assays $200 to $2,000. Supposed to be continuation of the Phœnix. At 10 feet deep is 4 feet wide. April 14, 30 tons of ore were on the dump.

Little Monitor.—South side Treasure Hill, near California, and on that belt. Twenty feet wide.

Silver Star.—Near the Virginia. East of Hamilton. Incorporated.

Happy Jack.—East slope Treasure Hill. Two hundred feet from summit. Five feet wide. March 27, incline down 12 feet. Assays from $136 to $900.

Scholarie.—One thousand feet. Located January, 1869. 1,500 feet above Mazeppa, south side Treasure Hill. Four feet wide. March 27, shaft, 15 feet. Chloride and quartz.

Phœnix.—On Rice's toll-road, quarter of a mile from Hamilton. March 27, was taking out several tons of ore daily. Assays from $200 to $500. Claimed to be an extension of the Virginia. Shaft, 40 feet, April 25, 1869.

Katie.—Near the toll-house, between Treasure and Shermantown. Four feet wide. Some specimens assay as high as $1,300.

Featherstone.—Near the Phœnix, and close to Hamilton. Made considerable stir in the early spring. Has been quiet lately.

Black Eagle.—In Spring Mountains, seven miles north of Hamilton. Contains some gold. Pay streak 2 feet wide. Vein, 30 feet. Wood and water abundant in immediate vicinity.

Buffalo City.—One thousand feet north of American Hotel, Treasure City. April 16, shaft, 10 feet.

Standing Stone.—Eberhardt City. April 2, good ore taken out, assaying from $300 to $500.

Lady Washington No. 3.—Eberhardt City, base of southern slope Treasure Hill. April 2, good chloride found.

Biggs.—Half a mile from Hamilton; April 9, good ore found.

Willimantic.—Foot of Chloride Flat. Incorporated.

California State Tunnel.—Starts 1,000 feet south of the Eberhardt. Intended to run through West Eberhardt at a depth of 400 feet from the surface of that mine.

Snow Drop.—Chloride Flat, near the road; claimed to be one of the oldest locations and threatens to disturb many now sleeping soundly on their titles. Yielded some very rich ore in early days. Not worked now.

East Eberhardt.—Another location claiming to be on the east extension of the Eberhardt. Owned by a French house in San Francisco, Pascal, Dubedat & Co. Charles DeLong, United States minister to Japan, has another location on the same ground.

Silver Comet Mining, Milling and Tunnel Company.—Located near the Virginia mine, northwest base of Treasure Hill. Incorporated.

Salt Point Silver Mining Company.—West base Treasure Hill, 600 feet above the road to Shermantown. Incorporated.

La Monte.—Two hundred and fifty feet north of the Eberhardt. Native gold is said to have been found April 1.

Sotoyome.—Twelve hundred feet; located February 24, 1869, on the east side of White Pine Mountain, on the town site of Babylon, by Rogers and others.

Sea Shell.—Four hundred feet south of Sotoyome; located February 24, 1869, by Z. Lyford and others.

Bounding Billow.—East of Main street, Treasure City; south of Hidden Treasure, located March 25, 1869, by Z. Lyford.

Iceberg.—An old and important location on Main street, Treasure City, now included in Aurora. Consolidated.

Gorilla.—West side of Main street, nearly opposite Iceberg.

Storm Cloud.—Chloride Flat, west side of Main street near the street. Rich ore. Litigation ahead.

Oak Hill.—Chloride Flat, near Main street, 600 feet; April 4, down 30 feet.

Derby.—Chloride Flat, near Main street, 800 feet. Very rich ore. Bought by Consolidated Chloride Flat Company.

New Eldorado.—West of but near Main street, Treasure City; located July, 1868; 1,000 feet.

Hyde.—One mile west of Hamilton; 2,000 feet.

Saco.—Sixteen hundred feet southwest of Hamilton, between Phœnix and Hyde.

Bob Allen.—Two and a half miles below Hamilton stage road to Elko; 1,400 feet.

Gregory.—Pogonip Flat, on the side hill below, facing west; 1,200 feet.

Silver Circle.—Fourteen hundred feet, one-quarter mile southeast of Eberhardt.

Letitia and Poole.—Near Blair and Banner State. Incorporated.

Long-looked-for Carson.—Two and a half miles north of Hamilton; contains a remarkable cave.

Cræsus.—Near Hidden Treasure. Worked ore about April 6, at the White Pine mill, in Hamilton, which gave $257 per ton.

Stewart.—(See Mahogany in first list.)

Buckland.—Near Keystone and Eberhardt, Treasure Hill.

O'Keefe.—On Blue Hill, west of Hamilton, near Phœnix; April 4, shaft 8 feet deep, with a good pile of ore on the dump.

Oriole.—Near O'Keefe.

Foy & Haggerty.—Three-quarters of a mile northeast of Hamilton. Ledge stripped 100 feet; at one place 3 feet wide. Assay $444 52, $580, $2,250.

Saginaw.—Six hundred feet south of Hidden Treasure.

Orphan Boy.—Near Mazeppa; legal difficulties. Work stopped April 7, 1869.

Black Cloud.—Southern slope of Treasure Hill, a little south of the Eberhardt. Had good ore April 7; in several shafts from 5 to 18 feet deep. North wall stands nearly vertical; south wall not found at that date; 15 or 20 tons of ore had been taken from the principal opening, which was about 15 feet deep. Assays $200 to $1,500. Located January 19, 1869.

Monster.—South side Treasure Hill, a little above Eberhardt City, at the town of Menken.

Bromide Tunnel Company.—On Bromide Flat. Incorporated.

Mayflower Mining Company.—On the road from Hamilton to Treasure City, nearest to Hamilton.

Kohler Mining Company.—April 8, was erecting a mill at Pleasant Valley 1½ mile south of Shermantown.

Umatilla.—Lower end of Bromide Flat. Fine ore.

Ocha Vera.—In a cañon southeast of Hamilton, near the town. Located April 8, 1869; crops 600 feet, 7½ feet wide. Assays $1,300, and contains some copper.

Peninsula.—Six hundred feet east of south of Hidden Treasure on Treasure Hill; near a ridge of rocks overlooking the cañon east.

Hidden Treasure No. 2.—Located March, 1868; in the rear of Pacific Union Express office.

Shamrock No. 3.—About 200 yards below Arcade on Silver Glance, about one mile east of Eberhardt; 1,000 feet in the claim. Located by Dunn & Leonard, January 28, 1869.

Illinois No. 10.—Sixteen hundred feet. Is about 800 feet from Buffalo City mine, about 1,000 feet west of Union street, at the base of the west slope of Treasure Hill.

Leonard.—Across the cañon directly west from the Illinois in Base Metal range about 2,000 feet from Illinois. Eight hundred feet in claim.

Umatilla.—Twelve hundred feet. Lies north of Mazeppa half a mile, on south slope of Treasure Hill. Croppings light. Country rock, limestone and spar. Course nearly north and south.

Mutual.—Bromide Flat. West of Hallock and Meyers's store.

Limestone.—Considerably below the Mutual on the road.

Cuckoo.—Near Swansea on the road from Hamilton to Sherman. Shows some very good ore with galena.

Zaphna.—M. J. Henlay, Elias, and others, owners. About one-eighth of a mile below Swansea, on the left of the road, thence to Sherman in a cañon leading down to the road, about 200 yards up that cañon, on the right. Very promising ledge. Price demanded May 18, 1869, $10,000.

Belisarius.—On top of hill, half a mile northeast of Shermantown.

Bunker Hill.—Forty feet east of Belisarius. Does not show much.

Some Pumpkins.—Near Belisarius, and within sight of Shermantown. Course distinctly marked east and west. Dips north 70°. Two to five feet wide. Looked well May 18, 1869. Shows fine mineral advantageously situated for working. Held at $12,000.

Grape Vine.—A little north of last. Showing favorably.

Winning Hand.—A little south of Grape Vine. A cut run across and along the vein shows some ore.

Industry.—North of last across a cañon.

Spitzbergen.—East of Industry about 100 feet.

Juggernaut.—A few hundred feet west of Industry.

Eva Jane.—Up the cañon some distance, east of Industry and north of Clara Jones. Shows splendid mineral.

Cremorne.—Chester Company, a few hundred yards west of the toll-house, on the road from Hamilton to Shermantown; in the Base Metal range. Gangue, spar and quartz; ore, chloride and horn-silver, small amount of lead. Through the body of the vein matter, the width of which has not been ascertained, there is a streak of rich ore two feet wide, which assays $250 to $1,100. Fissure nearly vertical. Strike east and west shows several hundred feet on the surface.

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Arco Iris.—Not far from Cremorne. Ores, chlorides and sulphurets of silver. Heavy body of spar for hanging wall, stringers of which permeate the lode in every direction. Assays $500; $800 for the better class; great quantities from $100 to $200.

Diana.—North of Arco Iris, which it greatly resembles. Vein 12 feet wide. Crops 600 feet. $250 to $700.

Bright.—One thousand feet. Located October 28, 1868. Owned by A. D. McCulloch and others. Situated a quarter of a mile east of Eberhardt, below the line of Eberhardt. 15 feet wide. About $600 worth of work done in open cut.

Burns.—Chloride Flat. Ore at 30 feet depth.

Mountain Boy and Silver Queen.—On "Take-a-nip Flat." Sixteen hundred feet. Two parallel ledges. Shaft between them, 40 feet deep. Yields good ore.

Trench.—Located March 29, 1869, by Captain Layne, of the Hidden Treasure. In Base Metal range, 6 feet wide.

Latest Discovery.—Near the Trench, above noted.

Westford.—On Blue Hill, directly northeast of Hamilton. Twelve hundred feet in extent. Good ore; assays $125 to $1,000.

Bowers.—About 400 yards from the Westford on the western slope of the hill. Located April, 1869. Ten feet wide. Estimated to go $200 per ton.

Idlewild.—A few hundred feet below the Bowers. Located April, 1869. Ore resembles that of Chloride Flat. Veins easily traced 2,000 feet, with an apparent width of 30 feet.

Three Kings.—In the bend of the Sheehan toll-road, northern slope of Treasure Hill.

Alturas.—Surrendered its title to the Post-hole latter part of June.

Borealis.—Main street, above Stony Point, Treasure City.

Hamilton Tunnel and Hydraulic Mining Company.—Organized for mining and milling purposes. Has a location of a quarter section of land, about one mile east of Hamilton, with a spring on it. The intention of the company is declared to be to run a tunnel from the west base of Treasure Hill to a point directly under the summit, 3,400 feet from their starting point.

Dawson.—South of Hamiltown, near Rice's toll-road.

El Dorado.—On a hill of the same name, at the north end of Treasure City. Located May, 1869, by John A. Steele. A considerable quantity of ore has been extracted.

Cadiz.—Base Metal range, two miles west of Shermantown, 5 feet wide. Carbonate of lead and some silver; assayed $78 54 silver and 65 per cent. lead.

Michael O'Nasby.—Pocotillo Flat. Shaft, 34 feet; ledge, 3 feet wide; smooth walls; vein matter, spar and quartz.

Mohawk No 10.—Four miles northwest of Hamilton. H. C. Jackson discoverer. Selected specimens assay $700 to $3,411 37, by roasting specimens coated with silver.

Inland Empire.—Extension of Mohawk No. 10. Located by Pat. Holland. Assays, $723 60.

Elian Cave and Mining Company.—Two miles west of Hamilton.

Elms.—First extension south of Anita Cutter, six miles west of Shermantown, at the foot of White Pine range, 6 feet wide. Assays from $31 42 to $4,583 24.

Little Phil. Sheridan.—A few hundred feet south of Pocotillo. Some good ore on the dump June 16, 1869.

Orient.—South side Treasure Hill, between Eberhardt and Mazeppa. Good ore at 12 feet depth.

Boxwood Tunnel Company.—East side Treasure Hill, 1,400 feet below Pocotillo.

Richmond.—A location on the southeast corner of the Eberhardt, that is, the jury said it was on the Eberhardt, but the owners still hope to show that it is not.

Kentucky Home No. 3.—One mile south of Hamilton in Base Metal range. Assays $570. 100 tons on the dump in the spring.

Wallace.—Three quarters of a mile east of Eberhardt. Owned by a company composed exclusively of printers. They own also the Nonpareil and Turrel.

Greenwood.—At the head of old Hendrie Mill cañon, on the west side of Base Metal range. Five feet wide.

Miner's Delight.—Near Greenwood.

Enterprise.—Near Greenwood.

Whiteman and Loneman.—Just over, the peak from Aurora Consolidated, Treasure Hill. June 29, shaft, 78 feet.

Armadillo.—Incorporated. Capital stock $2,400,000. Running for blind ledges in Treasure Hill.

Todd.—Near the trail from Treasure City to Shermantown. Located March 1, 1869. Assays, $414 40.

Depot.—Another location on the Todd.

Locomotive.—Also on the Todd. It is thought the Locomotive will run into the Depot if the company keep up steam long enough.

Whellvor.—North side of Bromide Flat. Shaft, 50 feet, June 30.

Virginia Tunnel Company.—Pogonip flat. Running for blind ledges.

Nettie Lamar.—On the ridge leading southeast from the Eberhardt. Is on the brow of the cliff below the Poor Man.

List of White Pine incorporations, formed mostly in San Francisco.

Name.	Incorporated.	Shares.	Capital.
Aurora Consolidated	Dec. 11	16,000	$1,600,000
Appleton Milling, Mining and Tunnel Company	Feb. 18	40,000	4,000,000
Ascendant	Feb. 19	13,000	1,300,000
Accidental	Mar. 6	4,000	400,000
Astor	Mar. 9	10,000	1,000,000
Argyle Tunnel and Mining	Mar. 15	14,400	1,440,000
Allemarle	Mar. 21	12,000	1,200,000
Alexander	Mar. 23	20,000	1,000,000
Alhambra	Mar. 23	12,000	1,200,000
Angostura	April 18	10,000	1,000,000
Armadilla	April 23		2,400,000
Belcher	Dec. 2	10,000	1,000,000
Bismarck	Jan. 19	2,000	200,000
Brolt	Jan. 29	10,000	500,000
Banner State	Feb. 18	10,000	1,000,000
Bowden	Feb. 26	10,000	1,000,000
Bromide Tunnel	Feb. 27	30,000	3,000,000
Blue Rose	Feb. 27	16,000	800,000
Badger	Feb. 27	5,000	1,000,000
Bromide Flat	Mar. 2	50,000	5,000,000
Black Hawk	Mar. 3	5,000	500,000
Beale Street	Mar. 3	5,000	1,500,000
Benjamin Franklin	Mar. 5	12,000	1,200,000
Black Diamond	Mar. 6	4,000	400,000
Blue Eagle	Mar. 16	6,000	600,000
Bucklin	Mar. 31		1,400,000
California White Pine	Dec. 17	15,000	1,500,000
Consolidated Chloride Flat	Dec. 23	50,000	5,000,000
Chloride Flat and Aurora Tunnel	Dec. 26	10,000	1,000,000
Continental	Dec. 26	10,000	5,000,000
Carmen Chief	Jan. 27	12,000	1,200,000
California	Jan. 29	15,000	1,500,000
Chloride Mountain and Tunnel	Feb. 1	5,000	500,000
Cinderella Gold and Silver	Feb. 8	4,800	480,000
Chloride Flat Lode and Tunnel	Feb. 17	10,000	1,000,000

List of White Pine incorporations, &c.—Continued.

Name.	Incorporated.	Shares.	Capital.
Crown Lode and Tunnel		10,000	$1,000,000
Cliff Lode and Tunnel	Feb. 18	10,000	1,000,000
Cortez	Feb. 22	24,000	2,400,000
Capital	Mar. 2	6,000	600,000
Chloride Range Consolidated and Tunnel	Mar. 5	50,000	5,000,000
Chicago Mining	Mar. 8	20,000	2,000,000
Carrington	Mar. 14	12,000	1,200,000
Charles Sumner	Mar. 16	6,000	600,000
Consolidated Eberhardt	Dec. 1	10,000	10,000,000
Chloride Flat	April 26	25,000	2,500,000
Chester Company	April 29		1,800,000
Douglass	Jan. 11	3,200	32,000
Diamond Silver	Jan. 15	14,000	1,400,000
Dolomite Consolidated	Jan. 21	5,000	500,000
Dinero	Feb. 10	7,500	750,000
Dundee	Feb. 18	10,000	1,000,000
Daniel Webster	Feb. 24	12,000	1,200,000
Day Star	Mar. 4	16,000	1,600,000
Dave Williamson Tunnel and Mining	Mar. 22	8,000	800,000
Dora and Chauncey Consolidated	Mar. 9	12,000	1,200,000
Eclipse Chloride Flat	Feb. 3	50,000	5,000,000
Eastern Slope Tunnel and Mining	Feb. 7	10,000	1,000,000
Etna	Feb. 18	10,000	1,000,000
Edith	Feb. 18	10,000	1,000,000
Egleston & Brown	Mar. 5	10,000	1,000,000
Eberhardt Mill and Mining	Mar. 6	120,000	12,000,000
Estelle No. 2	Mar. 23	12,000	1,200,000
Eureka	Mar. 25	10,000	1,000,000
Empire	Mar. 14	8,000	800,000
Europe	Mar. 30	20,000	2,000,000
Eastern Enterprise	April 9	10,000	1,000,000
Evening Star	April 10	18,000	1,800,000
Enoch Arden	April 10	10,000	1,000,000
Emanuel	April 18	10,000	1,000,000
Five-Forty	Feb. 25	12,000	1,200,000
Featherstone	Jan. 26	14,000	1,400,000
Florence Mining and Tunnel	Mar. 24	10,000	1,000,000
French	Mar. 30	14,000	1,400,000
Grand Trunk Tunnel			5,000,000
George Washington	April 23		100,000
Green Mountain	April 18	14,000	1,400,000
Georgia	Mar. 3	14,400	1,440,000
Germania Consolidated	Mar. 18	20,000	1,000,000
Grant Invincible	Mar. 21	8,000	800,000
Great Republic	Mar. 25	10,000	1,000,000
Golconda	Jan. 25	8,000	800,000
Great Union Mining and Tunnel	Mar. 11	60,000	6,000,000
Hidden Treasure Consolidated	Mar. 21	12,000	1,200,000
Hornet	Mar. 26	10,000	1,000,000
Hearst Mining	Mar. 8	30,000	3,000,000
Holcombe	Jan. 25	8,000	800,000
Ida	Jan. 28	3,200	320,000
Ion	Feb. 13	14,000	1,400,000
Independence Consolidated	Mar. 18	20,000	2,000,000
Imperial	Mar. 25	10,000	1,000,000
Kewanee	Feb. 16	8,000	400,000
Knox Tunnel and Mining	Feb. 2	4,000	400,000
Letitia and Poole Consolidated	Feb. 17	14,000	1,400,000
Little River	Feb. 27	5,000	1,500,000
Louisiana	Feb. 27	20,000	2,000,000
La Belle	Mar. 24	25,000	500,000
Lucky Ledge	Mar. 18	20,000	1,000,000
Latowana	Mar. 18	19,200	1,920,000
Lexington Mill and Mining	Jan. 29	16,000	1,600,000
Larcombe		1,400	280,000
Lee	April 9	10,000	1,000,000
Ludlow	April 18	12,000	1,200,000
Marlborough		10,000	1,000,000
Madden	April 10	40,000	4,000,000
Monte Christo	Dec. 4	14,000	1,400,000
Maid of Saragossa	Dec. 31	20,000	2,000,000
Monroe	Jan. 11	10,000	1,000,000
Metropolitan Milling and Mining	Jan. 17	10,000	1,000,000
Miantonomah	Feb. 5	4,800	480,000
Magenta	Feb. 8	14,000	1,400,000
Marion	Feb. 11	10,400	1,040,000
Mammoth	Feb. 16	36,000	3,600,000
Main Street	Mar. 3	5,000	1,500,000
May Wentworth	Mar. 18	10,000	1,000,000
Mount Moriah	Mar. 21	6,000	300,000
Mazeppa	Mar. 9	8,000	800,000

List of White Pine incorporations, &c.—Continued.

Name.	Incorporated.	Shares.	Capital.
Noonday	Jan. 24	20,000	$2,000,000
New Era Gold and Silver	Mar. 8	10,000	1,000,000
North Star	Mar. 16	20,000	1,000,000
Nantucket	Mar. 17	12,000	1,200,000
North America	Mar. 14	12,000	1,200,000
Original Hidden Treasure	Feb. 2	16,000	1,600,000
Omega	Feb. 12	8,000	800,000
Obispo	Mar. 1	7,200	720,000
Original Champion Mining and Tunnel	Mar. 6	15,000	1,500,000
Oakland North	Mar. 14	6,000	600,000
Opal Silver	Mar. 14	10,000	1,000,000
Pocotillo	Dec. 21	4,000	800,000
Peck	Jan. 25	1,000	100,000
Palmer	Jan. 28	4,000	400,000
Phil. Sheridan	Feb. 4	10,000	1,000,000
Pogonip Flat Consolidated	Feb. 5	12,000	1,200,000
Pennsylvania Tunnel and Mining	Feb. 13	10,000	1,000,000
Pacific Consolidated	Feb. 20	20,000	2,000,000
Phœnix	Feb. 27	16,000	800,000
Pioche Shaft	Mar. 5	10,000	1,000,000
Pick and Shovel	Mar. 11	16,000	1,600,000
Paulico	Mar. 14	12,000	1,200,000
Philadelphia Brewery	Mar. 15	18,000	1,800,000
Pilot	Mar. 15	24,000	2,400,000
Pride of the West	Mar. 25	10,000	1,000,000
Pomeroy and Dixon	April 29		500,000
Reichart and Silver Gate	Mar. 30	4,000	400,000
Raven	Feb. 16	8,000	800,000
Red Jacket	Mar. 12	10,000	1,000,000
Rathbun	Mar. 4	16,000	1,600,000
Russia	Mar. 29	44,000	4,400,000
Scott	Jan. 15	200	18,000
South Virginia	Jan. 22	16,000	1,600,000
San Francisco and White Pine	Jan. 29	6,000	600,000
Silver Cord	Feb. 1	12,000	1,200,000
San Francisco and Treasure City	Feb. 1	20,000	1,000,000
South Aurora	Feb. 3	24,000	2,400,000
Silver Terrace	Feb. 25	10,000	1,000,000
Salt Point	Feb. 26	10,000	1,000,000
Silver Comet Milling, Mining, and Tunnel	Mar. 2	16,000	1,600,000
Stuart Street	Mar. 3	5,000	1,500,000
Silver Moon	Feb. 27	16,000	800,000
Summit	Mar. 6	8,000	800,000
Silver Eagle	Mar. 9	8,000	800,000
Silver Star Consolidated	Mar. 11	5,200	520,000
Snow Flake	Mar. 14	11,000	1,100,000
South Eberhardt Tunnel and Mining	Mar. 15	14,400	1,440,000
Silver Wave	Mar. 23	20,000	2,000,000
Silver Key Boring and Mining	Mar. 24	6,000	600,000
Somerville Silver Ledge	Mar. 24	1,400	140,000
Silver Crown	Mar. 25	10,000	1,000,000
Silver Star	Mar. 25	10,000	1,000,000
Silver Mint	Mar. 29	10,000	5,000,000
Troy Ledge	Jan. 12	12,000	1,200,000
Teese	Jan. 25	1,000	100,000
Treasure Trove Consolidated	Jan. 27	5,250	525,000
Titicaca	Feb. 16	12,000	1,200,000
Tabasaca	Feb. 18	7,500	750,000
Treasure Hill Consolidated	Feb. 24	50,000	5,000,000
Treasure Hill Tunnel	Feb. 25	20,000	2,000,000
The Brothers	Feb. 27	5,000	1,500,000
Tidal Wave	Mar. 3	12,000	1,200,000
Treasure Box	Mar. 8	20,000	2,000,000
Treasure Peak Consolidated	Mar. 22	14,000	720,000
Tevis	April 12	8,000	800,000
Thomas Tobin	April 29		1,000,000
Virginia	Dec. 1	16,000	1,600,000
Virginia No. 2	Jan. 19	8,000	800,000
Victoria	April 26	12,000	1,200,000
West California	Mar. 31		1,600,000
Wyoming	April 13	14,000	1,400,000
White Pine Smelting	Jan. 19	5,000	50,000
White Pine Mutual Milling	Jan. 19	10,000	1,000,000
Wells	Feb. 5	10,000	1,000,000
Willimantic	Feb. 24	4,000	1,000,000
White Pine Associates	Mar. 8	11	11,000
Washington	Mar. 14	5,000	2,500,000
West Eberhardt Tunnel and Mining	Mar. 15	12,000	1,200,000
Total of nominal capital			277,564,000

MILLS.

In the month of May, 1869, there were, running or building, the following mills in White Pine:

Shermantown.—Eberhardt Company, 2 mills, 10 and 8 stamps; Metropolitan Company, 15 stamps; Kohlers & Co., 8 stamps, (rotary battery;) Moyles, 5 stamps; Union Mill Company, 15 stamps.

Hamilton.—White Pine Milling and Mining Company, 10 stamps; Treasure Mining Company, 5 stamps; Old Big Smoky mill, 20 stamps; Dayton mill, 10 stamps; Henderson's mill, 2 stamps; mill one and a half mile east of Hamilton, 10 stamps; Centenary mill, Newark, twenty-eight miles distant, 20 stamps.

Total, 12 mills, with 113 stamps, or, counting the Centenary, 13 mills, with 133 stamps. These mills were all running before July, and many others have been erected since. The number in August was 13 mills, with 135 stamps. To these were added, a little later, the Stanford, (30 stamps,) at Eberhardt City, about two miles from Treasure Hill and the same distance from Shermantown, and one or two more, so that White Pine probably possesses, January, 1870, an effective force of 200 stamps.

SMELTING.

Considerable attention has been paid to this system of reduction, there being an immense amount of ore in the Base range which can be utilized by no other process. Two very large and expensive furnaces have been built, but up to July they were not in regular operation. According to the News, the smelting works owned by Mr. J. J. Bassey, near Swansea, had just made a second run, May 9, 1869, on ore from the Base Metal range. Three and a half tons were reduced, yielding 2,400 pounds of metal, or about 600 pounds to the ton—assay value, $227 40. The ledge from which this ore was obtained was said to be about 150 feet wide.

COAL-FIELDS IN WHITE PINE.

In a country where so much fuel is already used, and likely to be necessary for a long time to come, and where the growth of timber is so limited, as in White Pine, it is natural that much stress should have been laid on the discovery of coal. Bituminous shales being a prominent constituent of the formation east of Hamilton, many have expected to find coal in this neighborhood, and small seams of an inferior lignite have actually been found on the quarter section owned by W. G. Sanderson. But the beds found so far will never be of the slightest consequence, as far as practical use of the coal is concerned, not alone on account of their small extent, but also because the quality of the fuel is entirely unsatisfactory.

WATER.

The want of nothing has been felt so much by the inhabitants of Treasure City and the milling interests of the neighborhoods as that of an abundant and cheap supply of water. At last a corporation—the White Pine Water Company—took hold of the enterprise, to supply not alone Treasure City, but also Hamilton, Shermantown, Eberhardt, and the mills erected at present and those to be built in the future, with such quantities of water as may become necessary for consumption in the different ways that liquid is used in a mining region.

The company was organized in San Francisco with a capital of

$1,000,000, divided into shares of $1,000 each. The corporate duration of the organization was limited to fifty years. Colonel A. W. Von Schmidt, A. P. Stanford, W. C. Ralston, Alvinza Hayward, and other equally wealthy and substantial residents of the Bay City, were among the trustees of the company. Colonel A. W. Von Schmidt was the engineer and projector of the enterprise.

The water of Illapah (Clear Water) Creek, a stream which has its origin in a large spring about three miles from Hamilton, on the other side of the Momomoke Mountain, was selected to furnish the contemplated supply. The spring discharges about 300 miners' inches of water. It flows north for about 10 miles and disappears at that point under a mountain. The water has been caught in a reservoir a few rods below the spring. Here the first engine of 150 horse-power is located, which raises the water 438 feet up the side of the mountain into a reservoir, from which it is forced a second 438 feet up to the mouth of the tunnel, which, 60 feet below the crest of the mountains, has been driven by the company through to the Hamilton side. At the mouth of this tunnel is a large reservoir, containing 220,000 gallons of water, which is to be used for unusual contingencies. Twelve-inch water pipes are laid throughout up to this point. From here part of the water is conducted to a reservoir one-half mile distant, which has a capacity of 1,000,000 gallons and is situated 160 feet above the corner of Main and Hamilton streets, so that an ample fall is secured to supply any part of Hamilton City. Another part of the water is conducted through pipes down the mountain and up Treasure Hill into another reservoir of the same capacity as the foregoing, to a point in the neighborhood of the original Hidden Treasure, which is to supply Treasure City. The work is said to have cost $500,000, and was expected to confer an incalculable benefit on this mining region.*

BUILDING MATERIAL.

Although a great deal of timber well fitted for sawing into lumber exists on the White Pine Mountain range, and though several sawmills have tried their best to supply the demand, lumber has been sold mostly at the high rates of $300 to $350 per thousand feet. The excessive demand during the excited times of the past, and the difficulty of hauling, have been the main causes of these exorbitant prices, and it is confidently expected that lumber for building purposes will be bought in ordinary times at less than one-fourth of the above figures. For the building of more substantial structures the country furnishes an excellent limestone and an easily-worked rock, occurring near Shermantown, which hardens on exposure to the air. Clay for the manufacture of brick is also abundant in most of the valleys.

EGAN CAÑON.

See Emmons, 1870

The following interesting description of the mines of Egan Cañon, an old mining district, was prepared by Mr. L. F. Emmons, connected with King's geological expedition. The district is in the northeastern part of White Pine County, about one hundred miles distant from Treasure City:

Where the overland road crosses the Egan Mountains, they are divided into two ridges, between which lies a pretty mountain valley, surrounded by well-wooded hills, easy of access, and in the valley bottom are good grass and plentiful springs.

* The triumph of engineering skill in the construction of the works is unquestionable, but the receipts of the company have not been sufficient to insure its prosperity; and it is now reported that the works have recently (March, 1870) been sold at auction.

The water from this valley finds an outlet in a northerly and easterly direction through Egan Cañon, at the head of which is situated the town and a 5-stamp mill. The western ledge is composed of limestone, the eastern of metamorphic rock, principally of quartzite, the formation having a north and south direction (magnetic,) and dipping to the westward. At the mouth of Egan Cañon, on Steptoe Valley, granite comes up, extending on the north along the lower foot-hills, and on the south further, or rather higher up, into the range. Above the granite are quartzite cliffs, extending nearly up to the town, (the cañon is about one and a half or two miles long,) where the quartzite alternates with chlorite schist. At the mill, in the upper part of the town, is a stratum of fine roofing slate. In the lower hill, north of the town, about 300 feet above it, are the croppings of the Gilligan ledge, which runs northeast and southwest, and dips from 60 degrees to 70 degrees to the northwest. This ledge belongs to the Social and Steptoe Mining Company of New York.

This company was incorporated in September, 1861, formed by the consolidation of the Social Company, owning the Gilligan ledge and a 5-stamp mill, and the Steptoe Company, owning extensions on the Gilligan as well as several other ledges, and a 10-stamp mill, of which the frame is now standing at the lower end of the cañon, while the machinery is stored at Salt Lake City. From 1866 to March, 1868, the 5-stamp mill has been running on ore from the Gilligan ledge, with sufficient profit to pay general expenses, and the developing of the mine.

The mill has five stamps, weighing about 650 pounds each, which stamp dry, the pulverized ore being carried from the battery to the dust-chamber, which is above, by a fan-blower, thereby saving much dust; three Varney pans and two settlers, which give a capacity of about five tons per twenty-four hours. The motive power is a small 8-inch cylinder, horizontal-working steam-engine, which works the stamps, pans, settlers, and blowers, (250 revolutions.) It is also used to run a circular saw, with which the company saw all their mining and building timbers, fir and yellow pine, that they cut in the neighboring hills. Wood, as fuel, costs at the mill $3 50 per cord.

The mine is opened by three shafts or inclines; the principal is worked by a horse-whim. This shaft was originally sunk in the ledge, (which dips from 60 degrees to 75 degrees,) and consequently, with a varying inclination, 400 feet below the surface; but, water coming in at the bottom in large quantities, the lower works were abandoned; the 300-foot level is now the lowest worked. From this depth up to within some 40 feet of the surface the incline has been enlarged and straightened, new timbers put in, and a ceiling of 2-inch stuff throughout the greater part of its extent. This work has been progressing since the stoppage of the mill. Near the surface a body of ore has been stoped out to the northeast of the shaft, which yielded in the mill $18,000, averaging $200 per ton. From this point down to the 300-foot level, no ore has been taken out except in sinking, but the vein is said to have maintained the same character throughout. On the 300-foot level drifts have been run 150 feet southwest, and 120 feet northeast. In the former the vein is very regular, being a broken quartz somewhat decomposed, colored with iron oxide, and showing some sulphurets of silver. It has a width of from four and one-half to six feet, so that the entire drift is in the vein, the hanging wall being remarkably clean and distinct, having a clay gouge of decomposed slate. The foot-wall is not so distinct; the country rock seems to be impregnated with quartz and vein matter some distance from the vein. The vein has a small seam running through the middle, dividing it into two characters or classes of ore. The second or poorer class, which comes on the foot-wall, has hitherto been discarded for want of hoisting power, and used to fill up deserted works, *e. g.*, the incline below the 300-foot level is mostly filled up with this ore. Mr. O'Dougherty, the superintendent, assures me that the whole vein without assorting will run $50 per ton in the mill; that the richer ore often runs from $100 to $200, and a black clayey ore which occurs, sill richer.

To the northwest the vein maintains the same character, but within 20 feet of the present face it pinches to two or three feet, the quartz becoming whiter, more compact, and less rich, resuming its former character, however, at the face. Take it altogether, this vein shows a remarkable regularity throughout. At 50 feet from the face a stope has been run up some 15 feet from the floor of the level, nearly to the face of the drift, which has been filled in with second-class ore taken from this drift. On the surface, to the southwest of the shaft, the vein has been stripped to a distance of 500 feet, passing a change in the formation from quartzite to chlorite schist. It shows a uniform width of quartz of good appearance throughout, and is said to yield very well in gold toward the extremity. Three hundred feet to the northeast of the main shaft, another shaft has been sunk in a sort of ravine or bend in the slope of the hill, to a depth of 120 feet, said to be in good ore, and here about eight feet wide. The quartz in the dump has a whiter, more compact appearance than that taken from the other shaft. It is intended to extend the drift on the 300-foot level to connect with this shaft, which will then be used as an air shaft.

Eight hundred feet have thus been traced on the original ledge. The original location gives the company 1,600 feet, and extensions (1,600 feet, and 800 feet northwest) make their claim 4,000 feet long. About midway between the two shafts another has been sunk to the depth of 75 feet, said to yield good ore. From what I have seen, and according to Mr. Dougherty, whom I have every reason to believe, the mine seems to be one of great promise, having a very large body of ore in sight, which is easily worked, and yields a fair profit. I should judge they must have some 20,000 tons of ore in sight, estimating the vein to be nearly as uniform above as in the 300-foot level, say four feet thick and 200 feet in length. It is the intention of the company to erect a 20-stamp wet crushing mill, with which they calculate to extract seventy per cent. of the bullion, to treat the ore for $12, and have an average yield from the whole vein of $40 per ton. For this it will be necessary for them to put up a new shaft-house, and also steam-hoisting machinery. The ore for the past few months has yielded bullion 937 fine, being gold and silver in the proportion of 86 cents gold and $1 20 silver to the ounce, the ounce being worth $2 06.

Mr. O'Dougherty assures me that the mine has paid its way since the commencement through the profit on ore extracted from the shafts, drifts, and their few stopes, and reduced in their 5-stamp mill. Since the stoppage of their mill they have been incurring expenses without any corresponding income to the amount of $12,000.

Below the town two men are running a small arrastra by water-power furnished by the stream running out of the valley. They are crushing a gold-bearing quartz from a ledge higher up on the hills north of the mouth of the cañon, called the Gold Cañon ledge. It is a clear white quartz, showing occasional specks of native gold. They crush about five hundred pounds per diem, which yields them at present at the rate of $40 to $50 per ton. They have sufficient power to run stamps if they had them. As it is, they break up the ore by hand to the size of a filbert.

EUREKA DISTRICT.

The mines of Eureka were discovered and the district organized nearly five years ago, but as the ores are largely composed of base metals, their development has been neglected. The district is situated about forty miles west of White Pine, in what is known as the Diamond Range. The deposits are frequently large, but occur irregularly in limestone. They contain smelting ores, which, for cheap reduction, ought to be dressed before they reach the furnaces.

The principal deposits are the Juno, Inca, Ruby, Summit, Sunburst, Eureka, Giant, Grant, Tiger, Lily, and Gem, all of them situate on Mineral and Silver Hills. A shaft furnace has been built in the neighborhood of these mines during the last year, by Mr. C. A. Stetefeldt, mining engineer, in which he has smelted some of the ore taken from several of the above mines. The principal difficulty encountered was the large proportion of gangue delivered with the ores at the furnace, so that enormous quantities of flux had to be added to make smelting possible, and pecuniary embarrassments of the company prevented even the completion of the works.

The ores of the district assay well, an average of many, made of the smelting ores by Mr. Stetefeldt, yielding as high as $80 per ton in silver. Besides its ores the district contains an abundance of wood, water, and building-stone.

The latest discoveries in Secret Ravine contain rich ores resembling those from White Pine. The average value of the ores of this new district probably surpasses that of the ores from the base range at White Pine.

GRANT, TROY, AND SEYMOUR DISTRICTS.

These three districts lie nearly due south of Hamilton, and about eighty miles distant. From the mountain (White Pine belt) spurs arranged in a half-moon or circle run out into this region. Grant lies on the north of the arc, and Troy on the south, while the Irwin Cañon (Seymour district) makes down from the extreme summit of the moun-

WAGON ROUTES, STAGING, COST OF TRAVEL, ETC.

White Pine County is beginning to be provided with good roads to connect it with the outside world. Besides the graded roads in the immediate vicinity of the mines, a road is being built from Carlin, a station on the railroad, to Hamilton. This road will be eighteen miles shorter than that from Elko, and travelers from Sacramento will save forty miles by taking that route to White Pine. It is intended to run through Dixie Valley and form a junction with the old road through Huntington Valley. Travelers generally complain about the high rates of stage fare in the vicinity of White Pine, but in a new country like that locality everything tends toward compelling the owners of stage routes to charge high prices in order to maintain the business. The fare from Hamilton to Elko, for instance, is $40, that from Elko to Hamilton $50, for a distance of one hundred and twenty-five miles. On the road to Hamilton the stage is generally well filled, carrying, say, ten passengers, but from Hamilton only five persons go on an average at a trip. When we consider the very high cost of conducting the business, the income from passengers will evidently not maintain the line, and were it not for freight and express matter it would have to be given up. The line of Len Wines on the Elko road, for instance, employs four agents, six drivers, twenty-five station men, and one hundred and sixteen horses. The pay of the four agents is $450, of the drivers $75 each, of the station men $60, and the board of each $40, aggregating $3,800 monthly. The price of barley is twenty cents per pound at Hamilton, and at Elko eight and a half cents; hay is $400 per ton at the first-named place, and $80 at the last. The price of both articles of feed increases gradually according to the distance from the railroad. One horse consumes eighteen pounds of barley and twenty pounds of hay per day, costing $5 per horse, or $580 in the aggregate daily, or for a month of thirty-one days $17,980. The expenses for repairs, &c., are about $1,000, and for horse-shoeing $470. The federal government taxes two and a half per cent. on gross receipts, which adds another $600 to expenses. Interest on capital, loss. State and county taxes would make expenses still higher, but even without these the expenses of Len Wines are $23,850 monthly. It is evident from the above that as long as high prices last for everything else stage fares cannot become any cheaper, unless the government pays hence

forth for the carrying of the mail, which so far has been done free of charge by the stage line.

LITIGATION IN WHITE PINE.

There has been much less litigation in White Pine district, Nevada, up to the present time, than I was led to expect at the outset, from the vague absurdity of the mining laws, and the locations under them, and from the indefinite character of the deposits. In common with most observing men, I naturally looked for violence first, and suits at law afterward. In both these anticipations I have been measurably disappointed. Except a few weeks of last summer (characterized by a slight outburst of highway robbery, stabbing, and shooting) White Pine was remarkably quiet, temperate, and industrious for a new mining camp. Some malicious people say that so many "roughs" flocked into the district that there was no chance to intimidate anybody by violence, since the desperate characters intimidated one another. But this explanation is not the true one. As a matter of fact, roughs fight with one another more than with anyone else. The reasons for the peaceableness of White Pine lie in its peculiar character and history, and are curious enough to be detailed.

In the first place, the excitement concerning this district occurred at a time when the mining population of the Pacific slope had learned wisdom by many such experiences; and a large portion of the locators are old miners, resolved not to waste what they gain, as they have so often done before, in gambling, drinking, and dissipation. In the second place, the ores of White Pine were, at the beginning, rich enough to make desultory mining by individuals quite profitable. For months the slope of Chloride Flat looked almost like a placer gold-digging of the early days. Each miner worked with pick, gad, and shovel in his little pit, collecting in a canvas bag the rich ore he obtained. Questions of boundary were not raised. There was, for the time being, enough room for all. But one difference existed, fortunately for the peace of the community, between this state of things and placer mining. The miner did not go from his daily labor with his earnings in his pocket. The reward of his toil was in the form of ore, which must be accumulated and sent to mill before he could realize its value in money. In a placer camp everybody is "flush." Gold-dust forms a currency; and the temptation to spend that which is money as soon as it is obtained is often irresistible to the miner without means of rational amusement. In White Pine people have been in a chronic state of poverty as to pocket from the beginning. When they have made money, they have made it in lumps, and gone elsewhere to spend it. But there has been no such steady dropping of daily plums into individual pockets as usually fosters extravagance in mining camps. Even the men who are at work for $4 or $5 per day seem to have caught the general infection of economy and sobriety; and the complaint of liquor-dealers, merchants, and showmen is that no money can be got out of the people. This, I need not say, prevents that vast amount of violence which originates in idleness and drunkeness. Finally, White Pine came sooner into contact with civilization than other mining districts. The railroad precipitated upon it a law-abiding population before any reign of violence could be established. Courts and magistrates have been in operation from the beginning. So this community has been spared the era of revolvers and lynch law.

My anticipation of ruinous litigation has likewise been agreeably disappointed. White Pine titles are not much better than they were; but

proprietors of adjoining claims have in many cases preferred compromise to a struggle, which would ruin both. In many other cases they keep quiet until by selling out they can shift all possible future difficulty upon the shoulders of a purchaser. Only two or three important cases have got into the courts; but the points settled by these have covered the issues at stake in many others. On the whole, I think the result of all these decisions has been favorable to peace in the future.

Of course, the question whether there are any true fissure veins on Treasure Hill, or, rather, whether the deposits of silver ore on Treasure Hill are true fissure veins, has been brought up in several cases. It has not been legally decided in any of them, for a very good reason. It is not clear in fact, and therefore it cannot be made the subject of a definite judgment of court. I am inclined to believe that none of the principal mines thus far discovered are upon fissure veins; but I do not think that the title to a mine should turn on the opinion of a geologist. In cases so dubious as this of White Pine, square locations, which leave no uncertainty as to boundaries, would have been better from the beginning. Then the *savans* might have fought out their theoretical battles with much less danger to the public interest, and with much more likelihood of agreement. For there is nothing that disturbs the coolness of professional observers like the knowledge that money is dependent upon the views they take of some knotty questions. Men who, if left to themselves, would modestly compare their opinions with those of their brethren, become, as fee'd witnesses upon the stand, dictatorial, didactic, and obstinate.

In the Eberhardt and other cases, tried at Austin, I believe, before the organization of White Pine County was complete, it was decided that under the laws of the district any connected body of ore can be held by location to the extent claimed, whether it occurs in the form of a vein or not. This removed the necessity of abstruse geological evidence and argument for settling a simple question of title. A recent decision by Judge Beatty, in the Aurora *vs.* Earl case, fixes some other important points, one or two of which I shall mention here.

This decision contains an extra-judicial opinion, construing certain sections of the mining law to require, for the holding of a claim one year, not merely two days' work on the whole claim, whatever be the number of feet, but two days' work *on each two hundred feet.* This opinion, not being fairly within the grounds on which the case is decided, has not the full force of law; but there is little doubt that when the question comes up it will be so decided; and such an utterance, from a judge so widely known and respected, will have great weight. I fancy it will cause some uneasiness among the holders of locations who claim one or two thousand feet, and have no idea of the whereabouts of their property after the first hundred feet. It will now be necessary for them to trace it throughout its whole extent, and do work upon each section of it. This will be in many cases impossible.

Another point settled in this Aurora case is that "a wall does not make a vein." I have often heard of the numerous beautiful walls exposed in the mines of Treasure Hill. One of these, "a smooth, even surface, extending from the mouth of the incline to within two or three feet of the bottom, crossing the general stratification of the country, highly polished in places, exhibiting marks of striation, conforming very nearly, if not exactly, to its dip, (30° or 40° east,) and overlaid generally by a thin stratum of clay or soil" figures in this case. Could anything be more "true fissure vein" like than this? A wall, selvage, slickensides, lines of movement and all. Yet Judge Beatty's extremely clear

decision sets the matter in its true light. Says he: "When it appears that there is *as much if not more ore* below than above it, it loses the character of a foot-wall, in my estimation. It shows that the fissure *was formed subsequent to the deposit of ore.*" The whole of this opinion is exceedingly forcible. I am glad to know that such is the temper in which the exceedingly imperfect laws of White Pine are being administered. There is common sense on the bench, whatever there may have been in the miners' meeting.

But it is clear that Judge Beatty, having (rightly) knocked away the walls from a good many mines by this *dictum*, has left the owners without any boundaries, except such as compromise or fresh judicial pronunciamentos may give in each case. The best thing about this decision is, that it helps bring matters *ad absurdum.* The miners' meeting last summer virtually refused to alter the present district laws. Of course, they cannot be forced to do so under the present mining laws of the United States, but they will surely get tired of having their titles depend on "connected bodies of ore" instead of accurate measurement.

R.

THE LATEST REPORTS FROM WHITE PINE.

The following review of White Pine gives a very interesting description of the present aspect of affairs in that locality, and the changes from an almost unparalleled mining excitement to comparatively regular business. It is taken from the White Pine correspondence of the San Francisco Evening Bulletin of January 7, 1870:

In no mining district of which I have any knowledge have such changes been wrought in a single year as in this of White Pine. From the most violent excitement and extravagant hopes everything has dropped down to the extreme of dullness, though I can hardly add of despondency. Unimproved real estate, which one year ago was held at inordinate prices, can now be had in many cases for the taking, few caring to go to the expense of a deed or to expose themselves to pay taxes upon it. As a consequence many holders of this species of property, who twelve months ago were supposed to be rich, to-day find themselves poor. There is of course much wailing on the part of this class that they should have suffered their cupidity to so get the better of their judgment as to cause them to refuse selling when good prices were obtainable. Many who could have left the country rich had they disposed of their town lots last winter or spring are now too much impoverished to get away from the place. One year ago everybody here seemed crazy to get hold of town property—locating, buying, jumping, fighting, and resorting to almost every other means for getting possession of it, this act being sometimes effected by means of inclosure, that is, by punching a few feeble sticks into the ground at long intervals and connecting them by means of rawhide, ropes, and often with nothing more substantial than twine or tow strings. Yet this answered every purpose—it was in the eye of the law deemed constructive possession, and more than one of these claimants has been acquitted for killing trespassers on lands thus inclosed; for in the strife after this wretched and now generally worthless species of property, contention, riots, and even murder ensued. But the excitement, with its consequent scrimmages, its violence and bloodshed, is all over now—the owners of houses can now inhabit them in peace, and the possessor of town lots hold them without let or hindrance. Even stores and business places, unless eligibly situated, are scarcely worth contending for, rents having declined in nearly the same ratio as the prices of real estate. Stores that readily commanded monthly rents of $500 ten or twelve months ago, can now be had for $100, the price of choice lots having fallen in equal proportion. Of course serious disappointment has ensued to many who had counted on a certain income from investments in this description of property, while others who had built houses for rent upon leased lands have in many cases found it expedient to surrender the same with the improvements, to their landlords. Contracts entered into for the purchase of real estate have been generally ignored, no one pretending to observe or any longer attempting to enforce them.

And now, lest those abroad should get the impression that such a great falling off in the value of town property is indicative of a like decline in all other values, as well as of a generally distressed state of things here, I may as well say that such is not the case; that while there has been a great reduction of prices generally, this reduction has affected few other things to the same extent as real estate, and that the de-

preciation of the latter, followed by lower rents, is looked upon by our people as a most fortunate occurrence, the former prices oppressing the laborer and proving universally hurtful. In regard to losses suffered by this declension in the prices of real estate, they might as well fall upon present holders as upon any one else; since had they sold out it must have been sustained by whoever might have happened to be the purchasers. But proceeding to notice other changes, rates of wages, &c., I present the prices which obtained here for leading articles one year ago, following them with those now prevailing: A year ago hay was selling at $250 per ton; lumber, best quality, $300, second quality, $200 per thousand feet; wood, $20 per cord; barley, $20 per hundred pounds; box stoves, $75; common cooking stoves, $140; apples, 50 cents per pound; poultry, 75 cents to $1 per pound; the prices of all imported goods being in the same proportion, only those obtained from the Mormon settlements being comparatively lower. Now hay can be bought for $45 per ton; lumber, $50 to $100 per thousand; wood, $7 per cord; barley, $6 per hundred pounds, and other articles above mentioned for about one-fourth of their former cost. Miners' wages from $5 per day have fallen to $4, many being glad to work for $3. Masons, carpenters, and other mechanics, whose services commanded from $6 to $10 per day last spring, have scarcely any demand—common labor being abundant at almost any price the employer chooses to name. Millwrights, when they can get work, are still paid from $5 to $7 per day; blacksmiths being able to earn about the same wages. Good wood-choppers can make from $3 to $5 per day, with work always offering. Teamsters owning their own animals generally make good wages hauling quartz, hay, wood, lumber, &c., mostly on contract.

For hauling quartz from the mines to the mills the price is now $4 to $5 per ton, against $8 and $10 last winter. But, with good roads, cheap feed, and plenty to do, teamsters can make more money now than they could then. Now it costs $3 per ton to extract ore from the mines and $18 for having it worked at the mills—one year ago the cost was respectively $7 and $50. Other examples might be cited, were it necessary, to show the great and beneficial changes that have taken place here within a twelvemonth; for no one at all conversant with the condition of things here, or having the best interests of this district at heart, can look upon these changes as other than salutary and desirable; it being utterly impossible for any mines, however rich, to be successfully worked under such a tariff of prices as formerly obtained here. White Pine, to-day, with its diminished population and reduced scale of prices, with its empty buildings and beggared speculators, with liquor saloons closed and gambling houses deserted, is infinitely better off and more deserving the attention of capitalists and mill men than when it was crowded with idlers and infested with gamblers—some playing with dice and cards and others with mining claims. There is also more comfort and real prosperity here now than during the "flush times," when everybody made money and nobody worked. The condition of society has also greatly improved, the drones and swarms of middle-men that once infested the country having mostly departed, leaving only the industrious and such as serve a useful purpose in society behind. We have now in each of the towns here, schools, churches, and benevolent and literary societies, with a good sprinkling of women and children, men coming here and bringing their families, with the intention of settling and making permanent homes.

In regard to the weather I should have stated that this, too, seems to have changed; being, like other things, an improvement on that of last year. Twelve months ago the weather here was severely cold and blustery, the mountains being covered with snow and enveloped in "pogonip." Now it is clear and calm; the days warm and bright, with no snow and no cold mists swept by strong winds, chilling the very marrow in one's bones. The roads, instead of being incumbered with snow, or slippery with ice and heavy with slum, are now in excellent condition—hard and dry, and in places even dusty. Stock, instead of being driven to the plains for subsistence, still feed among the hills, and the Indian, rejoicing in the sunshine, continues to inhabit his "wickiup" on the mountains. It is indeed, thus far, a mild and pleasant season, and could we be certain of its holding on so to the end, one need desire no more healthful climate or agreeable winter home. With improved houses, augmented comforts, and this mitigation of the rigors of winter, the general health of our people is excellent; very few having suffered from pneumonia, erysipelas, or those other diseases which, from their prevalence here last winter, were supposed to be endemic. In fact, so far from being subject to diseases of any kind, this would seem to be an extremely healthy country; the deaths occurring here from natural causes having been very few, considering the hardships and exposure to which much of the population were at one time subject. Of the deaths in this district, a large proportion have been caused by violence; these cases being now, happily, much less frequent than aforetime, a result largely due to the lessened prices of real estate, which, from its former value and looseness of title, by exciting the cupidity of all classes was a prolific source of violence and crime.

A few facts will illustrate the extent of the present production and progress of development of the mines. The number of men now employed at mining in the district since the reduction of labor force by several of the large companies is about 600, one-half of

whom are working on their own account. There are now 17 mills in operation, carrying about 190 stamps, each crushing 1½ ton of ore daily, yielding, say, $60 per ton; giving a total product of a little over half a million dollars per month. There are now about 17,000 tons of ore on the various mill and mine dumps, which, with the large quantities capable of being raised, even with the present reduced force, affords sufficient reason for these companies to cut down their number of hands, without coupling that act with a "bearing" operation. It would certainly be poor economy to go on taking out ores in advance of the crushing capacity at command, during the short days of winter, when men cannot be worked to advantage, and with the prospect of cheapened labor in the spring. The Stanford mill, 30 stamps, is now crushing steadily nearly 50 tons of ore per day from the South Aurora mine, yielding something over $50 per ton, or about $80,000 per month, a rate of production that can be kept up for an indefinite period, judging from the present appearance of the mine. The product of the mine of the Treasure Hill Company is equally good in proportion to the capacity of their mill, carrying 20 stamps. The mine of the Aurora Consolidated Company could be made to yield just as the Aurora South, with a sufficiency of milling facilities. So, also, perhaps, could the Hidden Treasure, the Evening Star group of mines, the Manhattan, the Eberhardt, and possibly the combined claims of the Chloride Flat Combination Company. In fact, the producing capacity of these mines can almost be said to have no other limit than the milling and extracting forces employed in raising and reducing their ores. The question of their permanency may also, like that of their capacity, now be considered pretty well settled, the continuity of the ore beds being uninterrupted for a depth of at least 200 feet.

Not only are the older and more extensively developed mines proving capacious and fertile, but many of those upon which less work has been performed are affording promise of equal value. Of this class, the Manhattan—an early location—is now beginning to attract attention by the massive body of high-grade ore lately cut by the tunnel being driven into it. Forty feet of compact vein matter, composed largely of concentrated ores, has been penetrated without the tunnel having entirely traversed it. This mine seems entitled to rank with the Auroras, possessing a better-walled ore channel than is to be found in either of these, or any of the other leading mines of the district, with the exception of the Eberhardt. Deeper explorations on the California mine are disclosing a greater concentration of the ores and other more favorable conditions than exist near the surface. A whim, the first in the district, is now being erected over the main shaft of this mine, with a view to its thorough exploration. Work is also in progress on the West California mine, adjoining the original location, with results that are likely to make it the peer of its older neighbor. It is a sterling property, judiciously managed, and should the bodies of ore lately uncovered prove persistent in depth, it must soon gain a footing among the big mines of the district.

Sales of mining properties are taking place here almost daily, but generally in a quiet way, many of the purchasers being old and successful residents of the district. The prices obtained are often large, proven properties selling now better than ever before—no others can be sold at all. A ledge may be small, but it must carry good ore and evince indications of permanent wealth in order to get a purchaser at any price. Among other properties lately disposed of is the French, the Emersley, the Pogonip, and Othello, and the Saturday mine, besides a good many claims of less note on the Base Metal range. The French mine is reported to have been sold for $24,000, and the Saturday $7,000, being a small but exceedingly rich and well-defined lode. The purchaser of this last property is Thomas J. Murphy, discoverer and first recorder of the White Pine district, and who has been one of the most successful operators in it. A good deal of the bullion produced here is now being sent East by railroad; the quantity for the past two or three months having aggregated nearly a third of all turned out by our mills—a circumstance that should be taken into account in estimating the yield of the country, as estimated by the arrivals of bullion at San Francisco.

The mills in White Pine January, 1870, are reported as follows:

Name.	Stamps.	Name.	Stamps.
Stanford	30	Staples	10
Manhattan	24	Monte Christo	10
Boston	20	Drake & Applegarth	8
Big Smoky	20	Morten & Cutts	5
Metropolitan	15	Henderson	5
Nevada	10	Little Treasure	5
Swansea	10		
Chicago	10	Total	172
Union	10		

In this list the Newark mill (Centenary Company) is not included, though it formerly reduced a good deal of White Pine ore.

WHITE PINE DISTRICT

Monte Cristo

Raymond [1872], p. 204

WHITE PINE MOUNTAIN.

The mines on the west side of White Pine Mountain were the first discovered in White Pine district, but during the excitement attendant on the discovery of the rich ores of Treasure Hill they were neglected until the building of the new Monte Christo Mill in June last. Since then the prospect of having a good mill, convenient of access, and one adapted to the reduction of the refractory ores found in that locality, has induced several of the mine-owners to start work on their mines; and in nearly every instance developments have given satisfactory evidence of valuable mines.

The Trench mine has been opened by two shafts, each 50 feet deep, and by drifts from the bottom of the shafts, 50 to 100 feet in length, in all aggregating about 350 feet, and running mostly through bodies of high-grade ore. No ore has been extracted from the mine beyond that necessarily excavated in running the drifts. This, amounting to about 100 tons in all, has been worked, giving a gross yield of $32,000 or $320 per ton, one-half of which has been profit. The vein is in a thin bed of dolomite overlying shale, and is very irregular, varying in thickness from 1 foot to 8 feet. The ore is argentiferous galena.

The Bald Eagle is a well-defined vein incased in an altered shale. The granite formation is only a few yards distant from the works, and the ledge passes into it. The ledge is only 3 feet thick on top, but at the bottom of the incline, 120 feet from the surface, its thickness has increased to 10 feet, nearly all of which is fair milling ore. Ten tons of assorted ore yielded $138 per ton. There are 50 tons of first-class and 150 tons of second-class ore on the dump.

The Philadelphia is a parallel vein. The incline is 110 feet deep, and the ledge 4 feet thick Assorted ore works $124 per ton.

The Badger State is incased in granite. The vein is 16 feet thick, and opened by an incline 30 feet deep. The ore is nearly pure sulphide of antimony.

The Uncle Sam is opened by an incline 56 feet deep, which shows a ledge 5 feet thick. The ore is argentiferous galena. The average value per ton is $68, while some of the richest ore yields $320 per ton.

Mills in White Pine.

Name of mill.	No. of stamps.
Manhattan	24
Dayton	20
Big Smoky	20
Swansea	10
White Pine	10
Sheba	10
Oasis	10
Stanford	30
International, (new)	60
Staples	8
Monte Christo, (new)	20
Two other small mills, 5 stamps each	10
Number of mills, 13; number of stamps	232

The Dun and McCone Mill, 10 stamps, was destroyed by fire; the Henderson, 5 stamps, was removed to Schell Creek, and the Chicago, 10 stamps, to Pioche. The Metropolitan, 15 stamps, is now being removed to Eureka. Moore and Barker, 8 stamps, has been dismantled.

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STATISTICS

OF

MINES AND MINING

IN THE STATES AND TERRITORIES

WEST OF THE ROCKY MOUNTAINS;

BEING THE FIFTH ANNUAL REPORT OF

ROSSITER W. RAYMOND,

UNITED STATES COMMISSIONER OF MINING STATISTICS.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1873.

as is now the case. The bullion produced contained 40 ounces of silver, and the slag, assayed daily about 4½ per cent. Pb., and 37 to 50 cents Ag. per ton, rarely running above these figures. The consumption of charcoal (not pine) was 25 bushels per ton of material smelted.

WHITE PINE COUNTY.

For most of the information in regard to this county, I am indebted to Mr. A. J. Brown, of Treasure City. I visited, however, White Pine district late in August, 1872.

The unmistakable signs of dull times were upon the district. Hamilton, the chief city, was painfully quiet. No crowds congregated in its streets; the merchants were selling out at great sacrifice, preparatory to removal to Pioche or Robinson or Schell Creek, whither many of the inhabitants had gone already. The houses, even, were disappearing; for in this region of scarce building-materials, a house is frequently the companion of its occupant in his pilgrimages. It was said that seventy-five edifices, at least, had started on their travels from Hamilton during the fore part of the year; and many of those that were left stood empty, with placards vainly calling for tenants upon their locked doors.

Yet, White Pine is not utterly played out, though the reaction from the sanguine hopes and reckless swindles of an earlier time is a staggering blow, and the fresh excitements of the year have drawn off the surplus population. Between four and five hundred men were, at the time of my visit, still actively employed in the mines, and three large mills, the International, of the Eberhardt Company, the Manhattan, of the Ward Beecher Company, and the Big Smoky, of the Hidden Treasure Company, were constantly running.

The developments of the past year have tended to demonstrate that the principal mines on Treasure Hill—both Auroras, the Ward Beecher, the Silver Wave, the Hidden Treasure, the Sheboygan, and the Mammoth—are situated upon a continuous belt or channel of ore, bounded on the west by a vein or dike of calcite. The question of depth is, however, the vital one. Explorations with the diamond drill had not yet resulted in anything favorable up to end of August. The Wheeler tunnel, of the Hidden Treasure Company, was advancing toward the point where the downward continuation of the ore was expected to be found—500 feet below the surface. Indications were said to be encouraging. So far as I could learn, they consisted in the cutting of a spar-vein, supposed to be the eastern boundary of the ore-belt, and the finding of rock beyond it similar in appearance to that in which the ore occurs.

Meanwhile, the Eberhardt Company was doing much better than heretofore. The old Eberhardt mine was not being worked productively, but the Ward Beecher ground, subsequently acquired by the company, contains a large body of high-grade ore, (reported at $100,) and kept the large International mill running. The wire tram-way, which has cost so much, was working satisfactorily, except in the matter of wire-rope, which it used up at a frightful rate. The shipments of the company were, at the above time, at the rate of $90,000 per month.

Other mines on the hill had a good deal of low-grade ore. The South Aurora was idle, and a director of the company was on the spot to decide whether work was to be continued, in the way of exploration, or stopped altogether. The splendid Stanford mill of the company was likewise idle.

In the absence of new discoveries of milling-ore in depth, another

year would probably put an end to active production in White P unless the "base-metal" mines, some of which possess undoubted v should be again revived. The attempt to smelt in this district everywhere failed; but the causes of the failure are not irrepa The metallurgical difficulties, which arise from the abundance of and lack of silica, may be overcome by the use of ores from some o new districts, or the cheapening of transportation may permit the of ores direct to buyers, in the present favorable state of the ma The failure of Mr. Mattison's ambitious and extravagant enterprise a great injury to the district, in discouraging all attempts to handl base ores. His works, foolishly located high above the town, now s in the desolate glory of whitewash and gold-knobbed flag-staf solemnly silent as the old cemetery which adjoins them.

On August 30, the International Mill of the Eberhardt Company destroyed by fire. Every man in town felt it as a personal loss; fo realized that this English company was the mainstay of White P It was fortunate that the disaster occurred at a time when the min the company were looking better than at any time since their purch and that some time before the fire the mill was insured for $250,000

At the end of the year, it may be safely said that in this district surface-deposits have been gradually exhausted of their workable o and, no new ones having been discovered in depth, the prospect for future prosperity of its mining-industry is rather discouraging.

Active operations have been carried on by most of the leading c panies with a view to testing their ground in depth, but thus far w out making any very promising discoveries. That the ore-body is tinuous from the Edgar mine to the O'Neil grade, South Aurora min linear distance of 2,360 feet, has been proved beyond a doubt. places this ore-body has been worked out at the comparatively tri depth of 130 feet from the surface, while in others no bottom has b found at a depth of 180 feet from the surface. On the contrary, be ore has been found at the last-named depth in the North Aurora Edgar than nearer the surface.

There has been a marked decrease in the bullion-product of the trict for the year, as compared with that of 1871. This is partly ow to the decrease in the number of productive mines, and partly to destruction of the International Mill in August last. The whole bul product for the year will not exceed $750,000.

Only four mills have been run during the year, and those only du the summer-months. Their running-time, with the number of stam may be summed up about as follows:

International, 60 stamps, 7 months' running-time.
Big Smoky, 20 stamps, 7 months' running-time.
Manhattan, 24 stamps, 5 months' running-time.
Swansea, 10 stamps, 2 months' running-time.

The Dayton, 20 stamps, and the Monte Christo, 20 stamps, have b idle.

The Trinity was erected, during the summer, near Shermantown, the purpose of working the large lot of tailings that had accumula in that locality during the flush times of 1869 from Eberhardt c worked by the mills in the vicinity. This mill differs from others having no stamps or other ore-crushing machinery, and in its la amalgamating capacity, concentrated in one pan adapted to gri ing the pulp, and one agitator. Its capacity is estimated at 40 tons twenty-four hours. The labor necessary to run it twenty-four hours c sists of—

2 engineers, at $5 per day	$10 00
2 amalgamators, at $5 per day	10 00
2 pulp-carriers, at $4 per day	8 00
For labor per day	28 00
Other expenses consist of wood, 3 cords, at $7 per cord	21 00
Chemicals per day, (estimated)	12 00
Oil, lights, wear of machinery, &c	10 00
Superintendence	8 00
Total	79 00

Expenses per ton, in round numbers, $2.

The amalgamation differs from that of the raw ore only in the use of sulphate of copper and salt. This mill, after having made a short run, has been compelled to shut down for the winter, owing to the severe weather having frozen the tailings.

The mines in which active operations have been carried on during the year are limited to about a dozen, most of which have produced some bullion.

South Aurora.—Operations in this mine have been confined to prospecting with the diamond drill. Six holes have been sunk to perpendicular depths, varying from 400 to 800 feet from the surface. No ore has been found. The formation passed through varies but little from the ore-bearing zone near the surface. From 500 to 700 feet from the surface the drill passed through a zone of limestone rich in well-preserved fossils, (mollusks and radiates.) Below this was found a narrow zone of limestone containing some graphite.

The actual cost of prospecting with the diamond drill may be summed up as follows:

First cost of drill-machinery, &c., including 700 feet of tubular rods, 4 sets of annular bits, and other fixtures	$4,773 80
Freight on machinery	821 27
Cost of machinery delivered at mine	5,595 07

Cost of boring 2,315 feet of holes, viz:

	Feet.
Hole No. 1, depth	101
Hole No. 2, depth	576
Hole No. 3, depth	340
Hole No. 4, depth	510
Hole No. 5, depth	417
Hole No. 6, depth	371
Total	2,315

The actual expenses of boring are about as follows:

For labor	$3,694 00
For water*	2,652 53
For wood	568 25
Actual cost of boring 2,315 feet	6,914 78

Cost per foot, $2.98½.

* Water may be considered an extra expense, as it was procured under circumstances and at a cost that is not likely to occur in other localities.

This, as compared with the cost of exploring the same ground by means of shafts and drifts run by manual labor, effects a saving of about $40,000, and has in this case apparently done the work quite as effectually, as there is no large block of ground that has not been penetrated by the drill. So far as the annular diamond bit is concerned, there can be no doubt that it is admirably adapted for testing in some measure the value of mines where it is desirable to know what the ground contains in advance of the usual explorations.

But there is yet much room for improvement in the machinery used to work the rods. Mr. Brown writes in regard to this:

> It would be a great improvement, and one very much needed, if the machinery could be made to draw the rods from the hole. As at present used, almost as much time is consumed in drawing the rods as in boring. The machinery used at the South Aurora mine is altogether too weak for the strain put upon it in boring even the comparatively shallow holes so far bored in that mine. This is particularly the case with the rods and the couplings. In several instances the couplings have broken, and in one instance the rod itself has been twisted off. In all cases it has been found difficult to recover the piece left in the hole, so much so, that at the last break it was found necessary to sink a shaft 70 feet to reach the end of the broken rod. In another case they have altogether failed to recover over 100 feet of rod with the bit attached. The strain on rods working in a hole from 500 to 700 feet deep must be enormous. The rods should be made, it seems to me, as nearly solid as possible, (with the exception of the first 20 feet, which should be full size for the core.) A tube ¼ inch in diameter would be ample to admit all the water necessary. A deep square thread for the couplings would probably answer better than the present ordinary thread. Finally, the machinery costs too much by half to be generally adopted in mining, but this is a fault that will eventually right itself. The average distance sunk per twenty-four hours running-time has been about 36 feet. In many cases this would be a sufficient recommendation, as, in mining, time is often an important item.

O. H. Treasure.—Some ore was extracted from the old surface-deposits in this mine during the early summer, but it has been about exhausted, that remaining being of too low grade to admit of its being worked at a profit. The principal feature of this mine has been the Wheeler tunnel, which was started about eighteen months ago for the purpose of prospecting the mine to a depth of 500 feet from the surface. The ground has been hard and the progress necessarily slow, so that its present length is only about 425 feet. The last 100 feet has been run through what is usually termed ledge-matter in this district, viz, quartz and calcite, in this case showing traces of silver, from $5 to $10 per ton. If the main ore-channel maintains the same strike and dip here which it has in the leading mines of the hill above, the company need not expect to strike it before the tunnel is in 600 feet from the mouth.

North Aurora and Ward Beecher South.—These two mines are adjoining and on the same ore-body, and both belong to the same company, so that both can be described under one head. The entire length of this mine is 1,360 feet, and it contains throughout this extent a body of ore varying in thickness from 20 to 150 feet. In the central portion of the mine the bottom of the deposit has not been found at a depth of 180 feet from the surface, but this is accounted for by the fact, so far as observed, that the end lines of the ore mass dip toward the center from both north and south extremities of the mine. This immense ore-body has also extended through the South Aurora and Edgar mines, altogether a total distance of 2,360 feet, and has produced, as nearly as can be stated, 81,576 tons of ore, giving a gross yield of $3,257,419 up to the present time. A considerable amount of ore has probably been worked of which no account can be got at present, so that $3,500,000 would not be too high an estimate.

The Ward Beecher Company's ground consists of the mine of this name and the Edgar. The ore-body described in the last paragraph is continuous through this company's ground. About eighty men were

employed by the company during the summer, but as the ore is too poor to pay the extra cost of transportation to the mill during the stormy weather of the winter, it is considered more profitable to allow the mine to lie idle during that season. Since it has been shut down a little prospecting has been carried on and good ore has been found at a greater depth in the Edgar shaft.

Eberhardt.—Considerable prospecting has been done on this mine, but without finding anything of great value.

East Sheboygan and Copper Glance.—A small prospecting force has been employed on these mines during the year. Large bodies of ore have been opened, but of too low a grade to pay a profit in a custom-mill.

Caroline.—This mine is situated at Mount Ophir, on the west side of White Pine Mountain, in what is usually considered the "base-range." The vein lies in limestone, and is very small, rarely exceeding 8 inches in thickness, and probably averaging not over 3; yet, owing to the high grade of the ore it contains, work has been carried on profitably on a small scale. It would not be worth the notice of, nor would it pay under the loose management of an incorporated company. During the first nine months of the present year only 42 tons of ore of all classes were extracted and worked, which gave a gross yield of $7,795, or $195 per ton. The ore is quite refractory.

French.—This mine, situated in the same locality as the last named, has been in active operation during the year. The ore has been shipped for reduction, and I have been unable to get the full returns.

Imperial.—This mine is situated on one of the outlying spurs on the west slope of Treasure Hill, in the "base-range" proper. In early times it was considered one of the best mines in the district, but since the failure of the Mattison smelting-works it has been idle, with the exception of a short time in August last, when 20 tons of ore were extracted and shipped to San Francisco as an experiment. The returns gave a yield of $78 of silver per ton of ore; lead, 5 per cent.; copper, 12½ per cent. This mine may be cited as a fair representative of a large class of deposits which, considering their size and the character and value of their ores, are worthy of more attention than they have hitherto received.

On the west slope of Treasure Hill, in strata 300 feet below the geological horizon of the free-metal belt, we encounter a series of veins or deposits extending north and south through the whole length of the district, in which ores of copper, malachite, azurite, and arseniate form the predominating minerals. Most of these cupriferous veins are rich in silver. The most careful tests made of all the ores show quantities varying from 50 to 150 ounces per ton of ore, with only a small percentage of lead or antimony. The formation consists of a dark arenaceous limestone, which is much broken.

The veins or deposits found in this belt may be divided into three classes, as follows: (*a.*) Veins striking east and west generally vertical or dipping at a high angle. Their croppings are generally continuous for a long distance, sometimes several thousand feet, and, so far as explored—175 feet from the surface—they have been found persistent in depth. In thickness they vary from a thin seam to 20 feet. (*b.*) Veins striking north and south and dipping east at a low angle. The veins of this class correspond in strike and dip with the stratification of the country-rock. (*c.*) Irregular deposits, apparently impregnations, filling seams and cavities in the country-rock. In the first two classes named, the country on one side, sometimes on both sides of the veins, is impregnated with minerals characteristic of the vein, often to a distance of 10 feet from the vein itself.

In a few of the mines in this belt lead predominates on the surface, but in one instance, that of the C. T. Fay, it has been gradually replaced with ores of copper at a depth of 150 feet from the surface.

Mobile.—This mine is situated at the head of Swansea Cañon. It has been worked steadily for the past two years. The ore is cerussite. This mine has afforded some specimens of very pure white carbonate, almost as pure as could be made in the laboratory. The vein is about 2 feet thick, strikes east and west, and dips north from 75° to 80°. A tunnel follows the vein into the hill, a distance of 250 feet from the cañon. There are about 500 tons of lead-ore on the dump, that will yield from 40 to 80 ounces of silver per ton.

Chester.—This mine is situated on the west side of White Pine Mountain, in the copper-range. The vein is situated between a siliceous limestone, the hanging, and a quartzose schist, the foot-wall. It maintains the same relations to the formation for a distance of two miles. The vein, so far as developed, is about 12 feet thick. The ore is compact and of an even grade the whole thickness of the vein, and consists wholly of chalcopyrite.

Silver Plate.—This mine has been worked constantly with a small force. During the first nine months of the year 231 tons of ore have been extracted and reduced, giving a gross yield of $13,488, or nearly $58 per ton.

Noonday.—A large body of good ore has recently been struck in this mine at a depth of 96 feet from the surface.

Assessor's returns of ore worked in White Pine County for the quarter ending March 31, 1872.

Name of mine.	Quantity.		Gross yield.	Remarks.
	Tons.	*Lbs.*		
Caroline	1	733	$1,620 37	Refractory, shipped.
Eberhardt and Aurora	5,256	.....	169,346 20	
Do	1,030	.....	5,061 89	Tailings.
Edgar	14	1,000	249 84	
Empire	1	1,400	223 00	
O. H. Treasure	639	1,500	16,582 68	
Piermont Silver-Mining Company	550	.....	11,133 03	Piermont district.
Pinto Silver-Mining Company	393	.....	12,167 28	Pinto district.
Silver Plate	65	.....	3,579 60	
Smith	9	1,000	972 00	
South Aurora	17	1,380	1,881 28	
Do	3,240	.....	9,334 50	Tailings.
French	3	600	1,988 91	Refractory, shipped to Reno.
Truckee	12	1,600	253 75	
Total ore	6,964	1,213	$234,394 33	
Total tons tailings	4,270	.....		

Assessor's returns of ore worked in White Pine County for the quarter ending June 30, 1872.

Name of mine.	Quantity.		Gross yield.	Remarks.
	Tons.	*Lbs.*		
Caroline	11	500	$3,330 00	Refractory, shipped.
Eberhardt and Aurora	2,928	625	109,987 22	
Mammoth	52	.....	1,058 20	
Noonday	35	1,000	741 50	
O. H. Treasure	393	.....	7,187 50	
Oliver and Sullivan	15	.....	2,115 75	Pinto district. C & C omitted Why?
Selfrising	.....	1,120	77 46	
Silver Plate	145	.....	8,788 99	
South Aurora	8	500	168 30	W.P. dist.?
Total	3,588	1,745	133,464 92	

Assessor's returns of ore worked in White Pine County for the quarter ending September 30, 1872.

Name of mine.	Quantity.		Gross yield.	Remarks.
	Tons.	*Lbs.*		
Alcoon	6	820	$411 00	
Banner State	15	940	676 00	
Caroline	29	1,000	2,845 00	
Eberhardt and Aurora	4,317	1,300	166,472 00	
Elk	1	1,480	132 00	
Iceberg	66	1,000	5,600 00	
O. H. Treasure	837	1,100	14,045 00	
Page	4	370	574 00	
Piermont	230	.....	5,683 00	Piermont district. copied
Saint John del Rey	.....	1,430	223 00	
Silver Plate	21	470	1,120 00	
Truckee	6	1,520	511 00	
Ward Beecher	2,324	1,450	63,814 00	
Total	7,862	880	262,196 00	

Assessor's returns of bullion produced in White Pine County for the quarter ending December 31, 1872.

Name of mine.	Quantity.		Gross yield.	Remarks.
	Tons.	*Lbs.*		
Antelope	1	1,076	$119 06	? A 2
Banner	1	1,831	148 14	B 1
Columbus	6	1,137	990 62	C 2
Eberhardt and Aurora	1,156	722	46,240 00	E 4
Caroline	5	.....	1,700 00	F 1
Genesee	7	1,858	152 59	G 1
Iceberg	41	1,818	2,270 13	I 3
Iceberg, (English company)	1	1,541	81 00	M 1
Iceberg South	52	938	1,601 87	N 1
Mammoth	18	1,328	522 59	O 2
Noonday	4	481	232 87	P 3
O. H. Treasure	254	875	10,194 37	S 5
South Aurora	29	1,096	1,447 85	T 1
Silver Plate	60	344	1,335 02	W 1
French	16	.....	6,848 00	27
Chloriders	24	254	2,240 81	
Total	1,782	1,299	76,124 92	

Raymond, 1877, p. 191-195

file: Hist. Mng. White Pine

U.S. Treasury Dept.

STATISTICS

for 1875

OF

MINES AND MINING

IN THE

STATES AND TERRITORIES WEST OF THE ROCKY MOUNTAINS;

BEING THE

EIGHTH ANNUAL REPORT

OF

ROSSITER W. RAYMOND,

UNITED STATES COMMISSIONER OF MINING STATISTICS.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1877.

(for 1875)

(No reports for 1876-1881) See U.S. Bur. Mint

Cont'd by U.S. Geol. Survey, 1882-1923, Mineral Resources of the U.S.

free, and there being but little silver. The mill started last May a ran with little interruption until the middle of December, on Bad ore and custom-ore from other mines in the district. The charge working is $6 per ton. The old arrastra in which the first ores of t district were worked is still in its place, about midway between the t mills. Several other mines have been prospected and worked to so extent, and ores yielding sometimes as much as $40 per ton, mostly free gold, have been extracted.

Sierra district.—Another attempt was made during the summer a fall to work the ore of the Langsyne Mine at the "Paul's-process" m of the company that owns the mine. About $2,000 were spent to repa the mill and to extract ores. After a few days' running it was fou that not enough was extracted to meet expenses, and both mill a mine are closed. The ore assays from $20 to $28 per ton, mostly gol

The body of rich ore worked last year on the Last Chance Mine w exhausted, the ledge pinching out. After some further prospecting, t mine was abandoned.

No permanent work was done on the Tallulah Mine during the yea About five tons of ore were extracted, on a contract obtained from t company, the parties finding little encouragement to go on.

The Auburn, Samaritan, and other mines have been worked at inte vals and prospected by the discoverers. Several small lots of ore ha been thus extracted and shipped for reduction.

The Thacker and Goodrich mines have been prospected by a sma force of men. The Goodrich was discovered last spring, near t Thacker, by the owners of the latter. Very soon after the discover steps were taken to erect a 10-stamp mill, about half a mile from the mines. The mill came from Chicago and was put up in the early fa It is a steam-mill, with one pan. Gold is amalgamated in the batter The ores of these two mines carry mostly gold, and are of low grad though very rich specimens are found in both mines.

Central district.—The Golden Age Mill and the mine connected wit it were sold at sheriff's sale in January, 1875, to James Gould, of Mi City. The mill has been idle during the year.

A tunnel drive at the Dutchman Mine, to reach the ledge about 2 feet below the outcrop, was completed at the end of the year.

Small quantities of ore have been extracted, and after close assor ing, shipped for reduction from the Little Bell, Railroad, and Mariet mines. The old Fifty-six Mine (one of the oldest in the county, locate first in 1856) has been relocated this year and worked by four men sinc last October. It is a copper-ledge, bearing silver. The ore extracte has been shipped to San Francisco for sale.

Humboldt district.—In October, 1875, two or three good "strikes" ar reported to have been made in some of the old locations of the district These consist, so far as known at the present time, of small bodies o ore exremely rich in free gold. This has created some talk and excite ment in the vicinity.

Rabbit Hole district sulphur-mines.—In March, 1875, a sulphur-de posit was located by McWorthey, of Oakland, Cal., who obtained th knowledge of its locality through an Indian. The mine is situate about 40 miles northwest of the Humboldt House, on the Central Pa cific Railroad, on the foot-hills of the range of mountains east of Quin River Sink. These foot-hills consist of table-lands, which terminate ab ruptly on the valley of the sink, and are cut abruptly in places by th water-courses coming from the higher hills, leaving crumbling banks o soil and rocks. It is in one of these banks that the sulphur-bed wa discovered by the Indian, who reported the fact to many without arous ing special interest. But the rise in the price of sulphur, due to the greater consumption of it in the manufacture of sulphuric acid on the coast, finally led to the location of the mine. The article proved pure and easily extracted. It occurs in irregular masses, sometimes one to two feet thick, and of pure quality, and again thinning out and getting mixed up with a light-colored fibrous magnesia-deposit, in close proximity to a deposit of lime-sinter, such as commonly occurs in the vicinity of hot springs in this country.

Shortly after this another deposit was located, about a mile from the first, by a cattle-man living on the Humboldt River, who previously knew of its existence. This location has been sold to the Humboldt Sulphur Company of Carson City, Nev. The best of the ore is taken out, transported to the Humboldt House, and thence by rail to Carson City, where it is used in the manufacture of sulphuric acid. The place where this mine is located is called Inferno. Beautiful crystals of sulphur are found in these mines. Much of the sulphur in the second mine being mixed with foreign matters, steps have been taken to melt it on the spot.

Star district.—The Sheba Mine has been worked steadily with a small force of men, taking out small quantities of ore. The shaft sunk on the outside of the old works and on the north side of the cañon, to reach the ledge found in the inside works, at the lowest level, has reached the depth of 80 feet. Hoisting-works have been placed over it. The motive-power is taken from the creek running in the cañon. The power is imparted to the machinery by a hurdy-gurdy wheel, receiving the water through a pipe over 300 feet long with a half-inch orifice. The administration of the mine has changed, John C. Fall having sold his interest.

The De Soto Mine was worked only about six weeks during the year.

The Krom Concentrating Works were run only a short time during the summer, to concentrate the second-class ore taken out of the Sheba and De Soto mines. This amounted to 343 tons of Sheba and 52½ tons of De Soto ore. The concentrator could not be run in the winter, as no provision is made to dry the ore, which, when moist, will pack in the rollers, and also fail to be separated in the air-currents of the concentrator.

WHITE PINE COUNTY.

P. 191

The sudden death of my former agent for this county, Mr. A. J. Brown, of Treasure City, having deprived me of the source of information on which I had been accustomed to rely, I am indebted to General A. Cadwalader, of Hamilton, for the notes on which the following account is principally founded.

White Pine County contains at present about 8,000 square miles. It extends from the one hundred and fourteenth meridian, separating it from Utah Territory on the east, to Eureka County on the west, 100 miles, and from Elko County on the north to Lincoln and Nye on the south, with a width of 80 miles. Its topography is striking. Five great mountain-ranges course through it, springing from the Humboldt Basin, and, running south toward the Colorado, lose themselves in depressed volcanic hills, with the exception of the White Pine range, which, under the names of the Humboldt, White Pine, the Vegas or Charleston, and the Providence, continues its course with two interruptions, subsiding only in the basin of the Mohave. Valleys lie between these ranges of an area quite equal, if not even a little larger, than that of the mountains. The average elevation of these valleys is about 5,000 feet above

the sea, while the mountains acquire a maximum height of 11,000 to 12,000 feet. The rocks constituting these mountains are mostly of Devonian and Carboniferous age, having been elevated in the latter, and here and there retaining on their crest and sides rocks of that system. At intervals the Devonian rocks are intruded upon by traps, porphyries, and granites, but otherwise they present, in nearly all cases, a bed of magnesian limestone 600 to 800 feet in thickness; a black clay shale from 100 to 300 feet thick, and a quartzite, the bottom of which has as yet not been reached at 1,300 feet. These are all metalliferous, while the Carboniferous rocks that skirt them are barren of precious metals.

The first range at the west is the Diamond, and following in order eastward, and strictly parallel, are the White Pine, Egan, Schell Creek, and Snake. Huntington Valley interposes between the Diamond and the White Pine ranges, Steptoe between the Eagen and the Schell Creek, and Spring Valley between the Schell Creek and the Snake. The Pancake, the Mokomoke, and the Antelope are intervening ranges of less importance and apparently more recent birth. They are unproductive as yet in minerals, with the exception of the first-named, which is now exploited for coal with most favorable indications. It is a low range, some 80 miles long, between the Diamond and the White Pine, and the period to which it belongs is probably the Carboniferous. Twenty-six mining-districts are distributed irregularly over the county, occupying unconnectedly the various mountain-ranges; and though silver is the principal valuable metal in all, each has its specific claim for consideration. White Pine, in its Treasure Hill chloride-ores, has no rival. Robinson takes rank for its vast exhibition of its copper, Ruby Hill for its antimonial-silver ores, Cherry Creek for its auriferous ores in connection with silver, while Muncey Creek and Hunter promise in the future for much silver-lead. Pinto, Diamond, and Newark districts, in the Diamond range, have failed to realize the expectations of their operators, and hence are in a depressed condition. Cave, Bald Mountain, and White Pine are in the White Pine range. The two former are but little known and are uninhabited.

White Pine district, the theater of unexampled excitement in 1868–'69, has since shrunk in public estimation as much below par as the "fever" had raised it above. The failure of the rude efforts in smelting at an early period condemned a valuable portion of the district to idleness, while another kind of valuable ores (copper-silver) were not utilized, because the metallurgists of the district, apparently unfamiliar with such ores and the proper method of reducing them, dreaded to undertake the problem. Mr. Quann, the proprietor of a patent process for this purpose, has recently made an unsuccessful essay in this direction, first roasting the sulphureted ores, and then melting in a reverberatory with a blast (supplied through a tuyere to the ash-pit) and a tank for condensing fumes. The resulting bullion was an alloy containing 48 per cent. of copper and 34 per cent. of lead, and worth in silver about $150 per ton. For this product there was no sale.

The error of this proceeding is manifest. Instead of roasting, the inventor should have added sulphur in some form, (if enough was not already present in the ores,) in order to separate, in the form of argentiferous-copper matte, *all* the copper from the lead. This matte would be saleable, as would be also the lead, in which the greater part of the silver would be collected. Or, the silver might be profitably extracted by leaching from the argentiferous matte on the spot. The argentiferous-copper ores of White Pine need no new process, but an intelligent application of old and well-known ones.

The Rothschild blast-furnace (lead-smelting) has been run during the autumn with a degree of success which will probably stimulate operations in this direction.

The chloride-ores have participated in the neglect resulting from general industrial paralysis. With the exception of the Eberhardt and Aurora, few claims have been worked to any extent, most holders having contented themselves with doing the "assessment-work" and in many cases securing patents for their ground. The great Aurora vein or channel has been in *bonanza* this summer, in the Eberhardt and Aurora claim, yielding monthly some $100,000. This claim is only 1,400 feet of a belt a mile and a half long and 100 feet wide, which has been penetrated not more than 400 feet in depth. It seems not unreasonable to hope for similar developments at other points and at greater depths. A tunnel to cut this and other ore-channels at a depth of 1,200 feet is now projected, and as it will cut the other two formations, it will furnish, if it should be carried through, an interesting and valuable section of Treasure Hill, on that line.

Copied Raymond 1877 P. 194.

The Eberhardt and Aurora is the only mine steadily worked; some few of the others are only worked periodically. According to the assessor's report, the returns for the four quarters of 1875 aggregate* 15,791 $\frac{23}{2000}$ tons, yielding $874,215.06, this being an improvement on last year, but falling far short of the early production of the county.

Some 11,000 claims have been located in White Pine district alone, thousands of which have been undisturbed, save by "assessment-work," while the great White Pine Mountain, 11,000 feet high, 12 miles in length, and abounding in mineral-lodes, being outside of the chloride range, has been left almost wholly virgin ground. Its western base exhibits the granite and shales that underlie the limestone, and the presence of gold is an ordinary feature of its southern veins. The great north and south deposits concur with the strike of the mountain, and these are intersected by numberless east and west veins, which may hereafter furnish convenient ground for drift-adits to intersect the meridional zones, 4,000 feet below the summit. The rich ores of the Trench and Caroline Mines have yielded from $200 to $600 per ton, by roasting in a Stetefeldt furnace and subsequent amalgamation, and the presumption is that these are not solitary and abnormal mines.

Information received from Mr. Cadwalader at the end of the year is to the following effect:

Within the past week a discovery has been made in the Eberhardt and Aurora claim that has produced much excitement in the community. In driving some 250 feet north of the current workings, and some 80 feet deeper, ore has been struck that resembles that of the first and famous Eberhardt chamber. It is a rich, soft chloride, yielding by assay of selected samples up to $9,000, average uncertain, probably $200 or $300. Should it develop as anticipated, it will give a new impulse to the camp, particularly by encouraging deeper explorations.

Whitehill, 1877, p 124 for 1875-76

WHITE PINE DISTRICT.

The White Pine range of mountains is one of the principal ones in eastern Nevada. It has a northerly and southerly trend. The peaks are somewhat serried and uneven. Treasure Hill is in the middle ridge of this range, which at this point spreads out into three branches. It is an isolated peak, about nine thousand feet in height, three miles long, and one and a half miles in width. On the east and west, the descent is precipitous and craggy; on the east side is Applegarth Cañon, and on the west, another cañon, from which rises in low ridges the Base Metal range. On the north and south, the descent is more gradual—Hamilton being situated at the foot of the north slope, and Eberhardt to the south, at the junction of Applegarth and Mazeppa Cañons. Treasure City is near the summit of the hill, several hundred feet above the level of Hamilton. About two hundred feet below the crest of the ridge, on the west side, are Pogonip, Chloride, and Bromide Flats, which slope to the west with an easy grade, and terminate at the lower end in a cliff of considerable abruptness. The extent of these flats is about one half a mile in length by five or six hundred yards in width, and the surface consists chiefly of strata of limestone, which lie almost horizontal. The formation of the hill in general is limestone, and on these flats the rich deposits of ore were found between the strata, and on top with no covering but loose shale and debris, accumulated from the washing and decomposition of the hill above. They have extended to no considerable depth, and with scarcely an exception, have all been worked out. To the east of these rich beds there is a vein of spar which cuts the hill from north to south in its entire length. It is found near the Eberhardt mine on the extreme south, in the Hidden Treasure at the northern end of the hill, and in all the locations on the line between. In some places this spar vein crops out to the surface, but in most places it is concealed from view by the same causes that hid the beds of ore on the west. Cross courses, from east to west, have, in a few places, broken through; but in no place has it been dislocated by a horizontal fracture. It is continuous, from the surface to the lowest workings on the hill. It is found in the Wheeler tunnel at a depth of six hundred feet below the croppings, and varies in width from one to ten feet. The ore beds to the west have been found in every instance where the spar vein does not come to the surface; where the spar croppings are found there is no sign of ore in this direction; which facts make it quite evident, that the ore beds to the west are outflows from the deposits of ore east of the spar. On the east side of the spar vein, these deposits of ore are found close up to it, and with the same dip into the hill, but not with the same continuity or regularity of width. Some of the locations on this line are the South Aurora, North Aurora, Ward Beecher, and Hidden Treasure. These mines have been worked to various depths, and ore bodies of immense value have been found in them all. On the east side of the ore chambers there is no distinct line of separation between the ore and country rock, each one gradually shading out in the other. Pillars of lime are found in some of the large chambers of ore, extending from the bottom to the top. In the ore bodies are also found seams of spar and vuggs lined with spar.

?? The dimensions of some of these chambers are as follows: The Autumn Chamber, in the South Aurora, thirty feet long, twenty to twenty-five feet wide, and two hundred feet in depth; the Big Chamber, thirty

feet wide, forty feet long, and one hundred feet deep; the Open Cut, two hundred feet long, thirty to forty feet wide, and one hundred feet deep. On the North Aurora, the Risdale Chamber is forty feet wide, one hundred feet deep, and two hundred feet long; the Peerless, one hundred feet long, one hundred feet wide, and from thirty to seventy feet deep. the Wyon is also one of the largest chambers of ore found; for six hundred feet between this and the Lady's Chamber, the ground has not been thoroughly prospected. This chamber is sixty feet long, sixty feet wide, and two hundred feet deep. To the east of the Lady's Chamber, another one was found, two hundred and forty feet long, sixty feet deep, and forty feet wide. The Beecher Chamber is two hundred and fifty feet long, forty-five to fifty feet wide, and sixty feet deep. Between this chamber and the Edgar are six hundred feet of virgin ground. The Edgar is ninety feet deep, sixty feet long, and forty feet wide; and between this and the Silver Wave are twelve hundred feet of unprospected ground. The Silver Wave Chamber is forty feet long, thirty feet wide, and one hundred feet in depth. The Hidden Treasure connects with this on the north, and is the most northerly claim on this line. Here the ore has more the appearance of a regular vein than on any of the other mines. The Eberhardt is at the extreme south end of the belt, and is also on the east side of the spar vein. The ore beds to the west have all been exhausted. Here were located, on Bromide Flat, the Iceberg, North and South Noonday, and General Lee; on Chloride Flat, Genesee, Posthole, and Nevada; on Pogonip Flat, the Pogonip, Othello, and Glazier. In eighteen hundred and seventy-five, the Eberhardt and Aurora produced six hundred thousand dollars worth of bullion, while there are other claims which are not inferior in their prospects, but on them work has been suspended. Labor and capital, rightly expended, will, in the future, no doubt develop other chambers of ore which are now hidden.

WHITE PINE

1883 *White Pine district.*—I am indebted to Mr. W. Woodberry, of Hamilton, White Pine County, for the following estimates of the bullion product of the mines of the White Pine district for the year:

Burchard 1883 p559

Producing mines.	Total product.
Paymaster	$109,091 05
Star	34,335 83
Monitor	66,187 00
Stafford	10,897 60
Bay State	39,257 48
Exchequer	1,968 00
Fair Play	35,401 23
Blue Bell	2,728 00
Rescue	4,920 00
Fort Wayne and Credit Mobilier	1,708 00
Smoky mill	24,838 65
Miscellaneous	19,625 30
	350,958.14

560 PRODUCTION OF PRECIOUS METALS IN UNITED STATES.

On Treasure Hill work was carried on in several mines.

In the Eberhardt mine the tunnel was pushed further and explorations made developing ore assaying from $70 to $700 per ton.

The Konigsberg and the Smoky mines were successfully worked, and the Sweetwater and Rescue were worked during part of the year.

10,898
2,728
1,708 ?
24,838
$40,162

S. Aurora { Autumn, Big, Open Cut
N. Aurora { Rigsdale, Peerless, Wyon, Lady's, another

WHITE PINE DISTRICT
(Hamilton

MR 1905

White Pine district, which is practically all silver-lead, and which produced $17,935 silver, $91,343 lead, and $270 gold, is the largest lead-producing district in the State, having yielded 1,943,504 pounds out of 3,457,124 pounds credited to Nevada in 1905. The principal producers are the Rocco Homestake, the Nevada Mining Company, the Lead King Mining and Milling Company, the Whitepine Mining Company, the Ne Plus Ultra, the Julia, and the Young Treasure mines.

MR, 1905, p. 274

MR 1906

The principal producing mines in the White Pine district, where the ores are mainly silver-lead, were the Julia No. 2, Rocco Homestake Nevada Mining Company, Ne Plus Ultra mine of the White Pine Lead Company, and the Young Treasure mine. The only other producer in the county is the Bay State mine, in the Newark district—a silver-lead ore carrying a small percentage of copper.

MR 1907

Hamilton district.—With a production of over 1,000,000 pounds of lead from 4 mines, Hamilton took second place after Eureka in lead production in Nevada. From the Julia mine were shipped several carloads of ore to Salt Lake City, which yielded silver, copper, lead, and zinc. The Rocco-Homestake Nevada Mining Company shipped lead ore to Salt Lake City. The ore contained 63 per cent of lead and 13 ounces of silver, with some copper. The Ne Plus Ultra mine, of the Whitepine Lead Company, was one of the largest producers in the district, with lead as the leading metal. From the Young Treasure was shipped the largest tonnage of the year. The ore in this mine is lead-silver, with principal values in lead. The mine is developed by an incline shaft 300 feet deep and a tunnel 350 feet long. Another tunnel is being run to tap the works at a depth of 700 feet. The Comanche mine, down 185 feet on the incline, made no production. The Jennie and Black Rock Mining Company shipped no ore. The Protection, Protective, and Rex mines were worked, but no ore was shipped from them. These mines are down 1,600 feet on an incline 2,200 feet long.

5412

MR 1908

Hamilton district.—Hamilton or Whitepine district yielded $27,479 in 1908 from 429 tons of ore. In detail the gold yield was $182, the silver $5,412, the copper 3,660 pounds, valued at $483, and the lead, 509,572 pounds, valued at $21,402. The main values of the district are seen to be in the lead ores. Most of this ore was crude, shipped direct to smelter, but some concentrates were made by one mine in the district. The producing mines reported were the Paroni, Coyote, Dog Star, Jennie O, and McEllin, and the mines of the Black Rock Mining Company and the Rocco-Homestake Mining Company.

MR 1909

Hamilton and Silverado districts.—There was a reduced metal yield from the Hamilton section west of Ely; only 2 mines made shipments in 1909 as compared with 5 producers in 1908.

WHITE PINE

MR1912

White Pine district.—All of the ore produced in this district by 2 operators contained lead, gold, and silver, and was of shipping grade. The Dog Star, the principal producer, was operated by lessees.

MR 1913

White Pine district.—The total output of the district made by six producers was 308 tons of ore, containing $196 in gold, 16,953 ounces of silver, 26,187 pounds of copper, and 209,266 pounds of lead, valued in all at $23,703, or an average value of $76.96 per ton.

MR 1914

White Pine (Hamilton) district.—Five producers reported the output of 736 tons of ore, containing $1,520 in gold, 22,301 ounces of silver, 40,184 pounds of copper, and 572,311 pounds of lead, valued in all at $41,517, or an average value per ton of $56.41. The principal producer was the Grand Prize group, which produced sulphide lead ore. This property is opened by a tunnel 200 feet long, in which

[1] Hill, J. M., unpublished notes on some Nevada mining districts.

a winze has been sunk 120 feet deep. There was no new development in 1914. The ore is all hand sorted and produces a $50 grade for shipment to the smelter. The tailings from this sorted ore are reserved for future jig treatment. The Jennie A. claim produced some lead carbonates carrying silver and a little gold. The property is opened by an incline shaft 330 feet deep. All of the ore shipped was of smelting grade and jiggings from some dump material were mixed with the shipments. Lead sulphide ore carrying silver and a little gold and copper was shipped from the Young Treasure claim. The main tunnel on the property was extended over 100 feet and crosscuts aggregating 200 feet were run from it during 1914.

MR1915

White Pine (Hamilton) district.—Six deep-mine producers reported 561 tons of ore, containing $270 in gold, 11,981 ounces of silver, 11,508 pounds of copper, and 494,578 pounds of lead, valued in all at $31,603, or an average value per ton of $56.33. The larger part, or 441 tons, was shipped to smelter and 120 tons were treated at a concentration plant, yielding lead concentrate. The principal producers of lead ore were the Grand Prize, Jennie A., and Young Treasure properties. Milling ore yielding concentrate was produced from the Eureka property.

MR 1916

White Pine district.—Eight deep mine producers reported the output of 1,199 tons of ore, containing $1,427 in gold, 20,592 ounces of silver, 10,838 pounds of copper, and 1,009,513 pounds of lead, valued in all at $87,299, or an average value per ton of $72.81. There were 508 tons treated at concentration mills, yielding 172 tons of lead concentrate shipped directly to the smelter with 691 tons of crude ore containing lead, silver, and copper. The Nevada mine, situated on the east slope of White Pine Mountain, was the principal producer of milling ore and also yielded considerable lead ore of shipping grade. The Young Treasure and White Pine properties were also producers of lead-silver ore. There was a small output of copper and lead oxidized ores from the Grandelmeyer-Imperial property.

MR1917

White Pine district.—In 1917 there were produced 1,225 tons of ore, valued at $97,434, or an average value per ton of $79.54, reported by five producers. About half of the ore was milled, and yielded 205 tons of concentrates, containing 11.32 ounces of gold, 6,285 ounces of silver, and 257,631 pounds of lead. The ore of shipping grade (610 tons) contained 13.25 ounces of gold, 13,938 ounces of silver, 3,838 pounds of copper, and 663,458 pounds of lead. The Nevada, Young Treasure, and Jennie A. properties were the principal producers.

WHITE PINE

MR 1918

White Pine district.—The Grand Prize property yielded some oxidized copper-lead ore and a small quantity of oxidized lead ore of shipping grade containing silver and a little copper. At the Great Valley mine some lead ore was concentrated in a hand jig and the concentrate shipped to the smelter. Reports from the Nevada mine gave the shipment of a number of lots of oxidized lead ore and a little copper-lead ore, containing principally silver. The total output of the district amounted to 2,848 tons, containing $293 in gold, 16,742 ounces of silver, 20,049 pounds of copper, and 897,500 pounds of lead, valued in all at $85,710, or an average value per ton of $30.09.

MR 1919

White Pine district.—Six producers reported an output of 563 tons of ore, 445 tons of which was of shipping grade and contained 16.99 ounces of gold, 15,980 ounces of silver, 16,102 pounds of copper, and 446,085 pounds of lead. The remainder, 118 tons of lead ore containing some copper and a little silver, was concentrated. The Grand Prize group was the principal producer of smelting ore and was followed in order by the Nevada, Jennie A., Young Treasure, and Fay properties.

MR 1920

White Pine district.—Six producers in the White Pine district reported 453 tons of ore, containing $288 in gold, 10,903 ounces of silver, 19,887 pounds of copper, and 413,009 pounds of lead, valued in all at $48,872, or an average of $107.88 a ton. Included in the output was 61 tons of old tailings containing copper shipped directly to the smelter. The producers were the Great Valley, Jennie A., Black Jack, Nevada, Rocco Homestake, and Young Treasure properties.

102691°—M R 1920—PT 1——22

MR 1921 Pt. 1, p 398

White Pine district.—The 349 tons of ore produced by five operators in the White Pine district was all of shipping grade and contained $249 in gold, 7,316 ounces of silver, 11,753 pounds of copper, and 319,960 pounds of lead, valued in all at $23,479, or $67.28 a ton. The ore is hauled about 36 miles to Kimberly, a station on the Nevada Northern Railway. Most of the output came from the Great Valley, Nevada, Rocco Homestake, and Young Treasure mines.

MR 1922

White Pine district.—All the ore (334 tons) produced by seven operators in the White Pine district was of shipping grade. The output contained $157 in gold, 5,999 ounces of silver, 11,516 pounds of copper, and 285,023 pounds of lead, valued in all at $23,387, or $70.02 a ton. Copper ore was shipped from the Dover mine, copper-lead ore from the Great Valley and Leath, and lead ore from the Jennie A., Nevada, Rocco Homestake, and White Pine properties.

MR 1923

White Pine district (Hamilton).—Six producers in the White Pine district reported the output of 269 tons of ore, all of which except a small lot of rich ore shipped to Tonopah for treatment by cyanidation was of smelting grade. The total output contained $368 in gold, 8,878 ounces of silver, 6,198 pounds of copper, and 208,455 pounds of lead, valued in all at $23,151. Most of the ore was mined from the Nevada property, and smaller shipments were made from the Rocco Homestake, Great Valley, Jennie A., and Carlisle.

MR 1924

White Pine district (Hamilton).—Considerable development work was reported and as a result of that work there was shipped to smelters 303 tons of ore containing $301 in gold, 4,864 ounces of silver, 6,123 pounds of copper, and 177,492 pounds of lead, valued in all at $18,561, or $61.26 a ton. The Great Valley and McEllin mines were the principal producers of lead ore. Other producers of small lots of ore were the Dover, Midnight, and Rocco Homestake properties. The Tonopah Mining Co. did considerable crosscutting and drifting on veins in the Treasure Hill section, and though some ore was found, available reports do not indicate that important ore bodies were opened.

WHITE PINE

White Pine district (*Hamilton*).—As a result of considerable development work, 10 lode producers in the White Pine district reported the production of 798 tons of ore which with 470 tons of old tailings yielded $246 in gold, 21,536 ounces of silver, 11,140 pounds of copper, and 567,422 pounds of lead, valued in all at $66,140, or $52.16 a ton of ore and tailings. Of this output 660 tons of ore were shipping grade; 138 tons were milled, producing 46 tons of concentrate. Old tailing treated by cyanidation yielded some silver bullion containing a little gold. The McEllin property, worked by the Hamilton Leasing Association, was the largest producer of lead ore. The Belmont Development & Mining Co. was actively engaged in developing the Nevada and Roosevelt mines, which yielded some first-class lead ore and a little ore that was jigged. Other producers were the Great Valley, Letha, Red Top Extension, and Rocco Homestake mines.

White Pine district (*Hamilton*).—Nine lode mines in the White Pine district produced 6,537 tons of ore and old tailings, yielding $372 in gold, 17,892 ounces of silver, 19,069 pounds of copper, and 549,809 pounds of lead, valued in all at $58,192, or $8.90 in metals a ton. With the exception of 519 tons of first-class ore smelted and 1,440 tons of old tailings treated by cyanidation, the output was concentrating ore. Vigorous work was done at the Nevada Belmont property by the Tonopah Belmont Development Co. More than 2,500 feet of work in drifts, crosscuts, and raises disclosed silver-lead ore, which was treated in the 50-ton concentration plant. A flotation unit was added, but the recovery was not satisfactory. The property

is about 60 miles from Ely on the Nevada Northern Railway. The mill was operated from August 27 to the end of the year. Notes from the printed report of the Tonopah Belmont Development Co. for 1926 follow:

> In the Nevada No. 1 tunnel a total of 285 feet of new development work was done during the year, and of this 160 feet was in ore of good grade.
> In the Nevada No. 5 level 110 feet of new development work was done during the year, and of this 50 feet was in ore. * * *
> In February a mill was designed to treat 50 tons of ore per day, and construction was started in April. An aerial tramway 9,200 feet long was built from the Cornell portal of the mine to the mill. * * *
> The mill began operating on August 27, but it was found that the ore was much more difficult to treat than had been expected. * * * A small flotation unit was then installed, but the results obtained were still very poor, and the mill was closed December 31.

Several cars of oxidized copper-lead ore were shipped from the Great Valley mine, and lead ore was shipped from the Nevada Bell, Rocco Homestake, McEllin, and Roosevelt properties. During the summer months old tailings from the Treasure Hill dump, 5 miles south of Hamilton, were treated in a 30-ton cyanidation plant, and silver bullion was shipped to a refinery in California.

MR 1927 No review by districts in 1927

MR 1928

White Pine district (*Hamilton*).—Thirteen producers in the White Pine district reported an output of 1,961 tons of ore and old tailings in 1928, compared with 3,403 tons of ore in 1927 reported by 10 producers. The output in 1928 consisted of 261 tons of lead-silver ore, shipped directly to the smelter, and 1,700 tons of old silver tailings treated by cyanidation. The tailings were from the Treasure Hill and Smoky Hill mill dumps. Other properties producing small lots of lead ore were the Dog Star, Manilla, Nevada Bell, Roosevelt, McEllin, and Rocco Homestake.

WHITE PINE

MR1929

White Pine district (*Hamilton*).—Eight lode mines in the White Pine district produced 4,479 tons of ore and old tailings yielding $1,045 in gold, 13,263 ounces of silver, 1,068 pounds of copper, and 286,026 pounds of lead, valued in all at $26,322, or $5.88 in metals a ton. Considerable high-grade lead-silver ore was developed in the Nevada Lead property by the Tonopah Belmont Development Co., which milled the lower grade ore in a 50-ton concentration mill equipped with jigs and tables. The plant operated during three months of 1929, and operations were suspended at the end of the year due to the low price of silver and lead. Other mines and claims producing ore were the Grand Prize, Peterson, and Young Treasure. The old tailings were principally from the old Smoky mill and the Richland property.

MR1930

White Pine district (*Hamilton*).—Six lode mines in the White Pine district produced 720 tons of ore and old tailings yielding $47 in gold, 4,086 ounces of silver, 3,423 pounds of copper, and 109,901 pounds of lead, valued in all at $7,560, or $10.50 in metals a ton. The entire output, except 588 tons of old tailings treated by cyanidation, was first-class smelting ore from the Rocco Homestake, Grand Prize, Peterson, Nevada Lead, and Reck properties. The tailings were from the Treasure Hill mill dump.

MR1931

White Pine district (*Hamilton*).—Two lode mines in the White Pine district produced 1,426 tons of ore and old tailings yielding $20 in gold, 2,698 ounces of silver, 137 pounds of copper, and 28,074 pounds of lead, valued in all at $1,853, or $1.30 in metals a ton. The ore (26 tons) was first-class smelting ore from the Rocco Homestake. The old tailings (1,400 tons), all from the Treasure Hill mine dump, were treated by cyanidation.

MY for 1935

White Pine district.—Six hundred tons of old tailings were cyanided at the Smokey mill property in a 5-ton cyanide plant.

MY for 1936

White Pine district.—A number of operations in 1936 were reported in the White Pine district, including the treatment of Smokey Mill tailings in a 10-ton cyanide plant.

MY for 1937

White Pine district.—A number of operators during 1937 were reported in the White Pine district. The Stafford dump yielded 3,812 tons of silver ore, which was shipped for smelting. Shipments of silver ore were also made from the South Aurora property. Old tailings were cyanided at the Richland mine.

MY for 1938

White Pine district.—Small quantities of ore and old tailings, containing chiefly silver, were produced at mines in the White Pine district during 1938.

MY 1947

White Pine District.—E. R. Wooley shipped lead ore from the Dog Star mine, the Mary Ellen mine, and the Young Treasure dump to a smelter in 1947. J. C. Bettles worked the Oro mine during 1947, shipping zinc-lead-copper ore to a smelter.

MY1948

White Pine District.—P. C. Fraser, working the Seligman Lead-Zinc mine from June through December 1948, shipped zinc-lead and lead ores (143 tons containing 2 ounces of gold, 606 ounces of silver, 800 pounds of copper, 33,400 pounds of lead, and 5,500 pounds of zinc) to a concentrator-smelter for treatment. Nevada Sunshine Silver Mines, Inc., shipped zinc-lead, lead-copper, and copper ores to smelters from the Grand Prize mine during 1948.

MY 1949

White Pine District.—Kidder & King, lessees, and Hamilton Leasing Co., sublessees, worked the Onetha claim from March 1 to December 31, 1949; 542 tons of ore containing 4 ounces of gold, 3,703 ounces of silver, 14,660 pounds of copper, 264,262 pounds of lead, and 68,181 pounds of zinc were shipped to a smelter.

WHITE PINE

MY 1950
p. 1554

White Pine (Hamilton) District.—Andrew Siri and Alma Gubler operated the Great Valley mine throughout 1950; 190 tons of ore containing (gross) 1 ounce of gold, 1,613 ounces of silver, 12,478 pounds of copper, 82,224 pounds of lead, and 10,660 pounds of zinc were shipped to smelters. Kidder & King and lessees worked the Onetha and Ora claims from March 7 to November 17, 1950, and shipped ore with values in silver, copper, lead, and zinc to smelters.

MY 1952

White Pine (Hamilton) District.—Hal Jensen shipped lead ore from the Grand Prize mine to a smelter. Hamilton Consolidated Mines Corp. explored the Rocco-Homestake mine, and Newmont Exploration Co., Ltd., developed the Seligman mine. Lead and silver ores were shipped from these properties in prior years.

MY 1953
v. 3
p. 679

White Pine District.—Belmont Mine & Mill Co. shipped 1 car of direct-smelting lead ore, containing gold, silver, and copper, from the Belmont mine. Fred Farnsworth shipped silver ore to a smelter from the Hoppe Canyon claim in the Monte Cristo area. A. S. Hawkins & Ermly Dusharm produced and shipped a small tonnage of high-grade lead-zinc ore from the Lucky Larry claim. Newmont Exploration, Ltd., explored the Seligman mine, a producer of lead-zinc ore in past years. The property was returned to the owner late in 1953. Hamilton Consolidated Mines Corp. explored the Rocco-Homestake mine for lead ore on a DMEA loan.

MY 1954

White Pine District.—Lead ore was shipped to a Utah smelter from the Belmont mine, operated by the Belmont Mine & Mill Co. Gold and silver was contained in the ore. Minerals Engineering Co. operated the Monte Cristo open-pit mine and shipped tungsten ore to the company mill near Ely.

WHITE PINE

MY 1955 V.3, P715

The McGill smelter also received fluxing ores --- from --- the Grand Prize mine (copper ore), White Pine district ---. Leading producers --- of lead --- were --- D.A. & Blanca Jennings, Belmont mine, Ivan Lewis, Rocco Homestake mine ---,

MY 1956

The main producers of lead, which also contributed several hundred ounces of silver and some copper to the State total, from lead ore shipped to a Utah smelter were: The O. B. Mining Co., Ward mine, in the *Ward* district 12 miles south of Ely; and Andrew Dowd & Fred Harris, Belmont mine, Hamilton Land Co., Grand Prize mine, and Joe Nardi, Rocco Homestead mine, all in the *White Pine* district near Hamilton.

MY 1956

The relatively small zinc-production was derived from zinc ore shipped to a Utah smelter-fuming plant from the Kink claim in the *Robinson* district and from lead-zinc and copper-lead-zinc ores from the Crest (Lucky Larry) claims and the Great Valley mine, respectively, in the *White Pine* district. These ores also contained some recoverable gold and silver.

copied

MY 1957

Properties from which lead and lead-zinc ore shipments were made to Utah smelters were: The Great Valley, Rocco Homestake, and Grand Prize mines, *White Pine* district; and the Bay State mine, *Newark* district.

copied

MY 1958

Lead and lead-zinc ores mined at * two properties in the *White Pine* district yielded most of the county lead and zinc output as well as silver and copper, and a few ounces of gold.

* Onetha and Great Valley

MY 1959 V.3 P.647

In the Hamilton area, the Great Valley, Hamilton, and Rocco Homestake properties were worked for the same metals. Ores were mined at the Last Chance and Sunnyside mines near Ely for their silver content. Reports on the rehabilitation work at the Belmont mine near Hamilton indicated possible production by mid-1960.

MY 1960

Ore produced during exploration at the Belmont mine was stockpiled; some was shipped in 1960.

MY 1960

However, lead ores of the Belmont, Hamilton, and Rocco Homestake mines --- contained modest quantities of recoverable gold and silver together with some copper, lead, and, zinc.

WHITE PINE

WHITE PINE DISTRICT, NEVADA. (Wheeler, 1871, P. 39)

No examinations made here since 1869, subsequent to which visit there was a great lull in mining matters; latterly, however, the prospects have greatly revived; mines have been found to descend where alone pockets were expected; capital has been introduced on a large and liberal scale. I am informed that the charter has been granted and the incorporation perfected for a narrow-gauge railroad from Elko to Hamilton, and that work is soon to be commenced. A wire tramway for transporting the ore from the mine to the mill at a trifling expense is in operation, and at last accounts was working successfully. This is the first instance in which this method of transporting the ores has been tried; various experiments are going on with a view to perfect this sort of a tramway, and the results cannot fail to be a step in the right direction.

SPRING VALLEY DISTRICT, NEVADA. Wheeler, 1871, P. 39)

This district is situated immediately north of the stage-road from Austin to Eureka and about twelve miles from the latter place. The ores are chlorides and sulphides of silver in metamorphic limestone, showing croppings of a limited size. But little labor has been applied, and beyond generalizations of the widest nature, but little can be said. Most of the miners were absent and the time for observation short. The mines lay in the southeastern foot-hills, covered with nut pine. Water is scarce. The country roads are good.

Eureka county

White, 1871, p. 65 WHITE PINE DISTRICT. for 1869-70

The natural resources and facilities for mining were described in my last report.

The mines on White Pine Hill have been opened to some extent, especially those on the western slope, near the southern part of the hill.

A cut, thirty feet in depth, shows a fine body of ore in the French mine. The vein is six feet in width, and dips southwest. The ore is of a high grade, contains a trace of gold, some galena and antimony.

The Robinson mine is about one hundred feet above the French. The vein is six feet wide between limestone walls. It dips east 30°, and runs north. The ore is similar to the ore from the French mine.

The C. S. Bushnell is near the summit of the hill—is four feet wide, dips east, and runs north. The ore will probably average $75 per ton. Some of it will yield much higher.

PARKER.

Located in August, 1869. There are a thousand feet in the claim. Course, northeast; width, seven feet; dip, 35° east. There is an open cut and a shaft to the depth of fifteen feet. Thirty-five tons of ore yielded from $15 to $289 per ton. Galena and antimony are abundant on the surface, but disappear below. The vein is eighteen inches wide.

MOUNTAIN LION.

Located in 1869. Eighteen hundred feet are claimed. Width, from two to three feet. This mine is in a slate formation. At the depth of thirty feet the vein is three feet in width and quite regular. The ore shows galena and a large per cent. of iron.

The Mike Gray is very similar to the Mountain Lion.

In the mines first discovered in Mount Ophir, the Philadelphia, the Enterprise, the Badger, the Moral and Leathers, the Vanderbilt and Cariboo, are all opened to some extent, and promise soon to become productive mines. More or less ore of good quality is now on the dumps. It yields from $50 to $200 per ton, and carries galena, antimony and copper. Some recent locations have been made which promise well on development.

The Monte Cristo mill has now a Stadfeldt furnace, and has an addition of two large Fountain pans and a Wagoner's crusher. It will reduce twenty tons in twenty-four hours.

Considerable work is being done in the mines on the eastern slope of White Pine Hill in the base metal belt.

THE SADIE MINE.

Located December 12th, 1869. There are one thousand four hundred feet in the claim. Course, northeasterly; dip, northwest 45°. Country rock, limestone with spar. A shaft follows the ore twelve feet. The foot wall has a clay lining and is smooth. Width of the ore varies from eighteen inches to six feet. Forty feet west is a second incline thirty-six feet in depth. The ore is three feet wide. A drift follows it north twelve feet, where there is a shaft twenty-five feet in depth. Towards the bottom the ore breaks into three channels. One runs north and is four feet wide, and lies horizontally. A drift follows it seventy feet. Another drift runs northwest sixty feet on a horizontal sheet of ore a foot in thickness. A drift follows a horizontal sheet of ore west forty feet. It may be found that these drifts are on the same body of ore. From the point where these drifts commence a shaft passes through ore eight feet, where a drift runs northwest seventy-eight feet through vein matter showing ore. From the end of this level, an incline runs northwest one hundred and thirty-six feet through vein matter and ore with a smooth foot-wall. Fourteen feet from the mouth of this incline an opening to the west shows a body of ore for six feet. The ore contains galena and carbonate of lead; and from $30 to $40 per ton in silver, also antimony, iron, copper and bismuth.

CADIZ MINE.

Located April, 1869. Twelve hundred feet in the claim. Course, north. The bodies of ore are irregular, and are followed by a tunnel towards the west for fifty feet. Some other work is done.

BOUNTY MINE.

Located December, 1868. Fourteen hundred feet in the claim. A incline follows the ore to the depth of thirty feet northeast. A level fro the bottom of the incline runs thirty feet north and the same distance sout on the vein. It is eighteen inches wide, but varies. From this level th incline is driven twelve feet further northeast, and then turns northwe forty feet. The vein matter and country rock are greatly broken. Fro the mouth of the incline a shaft falls eight feet, then inclines twenty-fi feet north through a body of ore which yields $43 in silver, forty-six p cent. in lead, and considerable antimony, arsenic, iron, copper, cobalt an bismuth.

GRANITE STATE.

Located in February, 1868. One thousand feet are claimed. It i irregular in width, course and dip. An irregular incline follows the or to the depth of forty feet. The ore contains large quantities of bismut and copper, and assays from $17 to $300 in silver.

CAROLINE.

Located in April, 1869. Six hundred feet are claimed. Course, north A tunnel runs north one hundred and fifty feet on the ore. A drif follows it sixty feet to the northwest. The ore lies in seams and pockets and yields from $16 to $60 per ton. It carries carbonate of lead and som antimony.

MISER'S DREAM.

Located in 1866. Two thousand feet are claimed. The ore is found in deposits and irregular seams running zigzag north and south, varying in width to ten feet. The ore is a carbonate of lead, disintergraded, and averages $27 in silver, with a trace of antimony. Large masses of ore have been taken out, leaving irregular chambers of various sizes. Seams of white spar pass through the country rock in every direction.

HOOSIER STATE.

Located in 1866. One thousand six hundred feet are claimed. The ore descends, narrowing from near the surface in vertical seams. It is opened to the depth of one hundred and twelve feet by a shaft following a seam of ore—with a sheet of spar on the south side. At the depth of ninety feet a drift runs north twenty-five feet through a large body of ore.

THE MOLLIE STARK, DON JUAN, AND ALTA

Are similar to the mines above described. The ore yields as high as seventy per cent. in lead, and $27 per ton in silver, with iron and antimony. The Great Valley runs east and west. A tunnel cuts the ore in

sixty feet, and follows it forty feet. It yields $60 in silver and fifty per cent. in lead.

MIDDLE HILL.

A considerable development has been made in the Pilot, and some ore found. The Northern Light has been opened in several places, and in combination with the North America, some fine ore has been taken out. It yields from $30 to $120 per ton. A number of other mines in the vicinity are not developed.

TREASURE HILL.

This hill comprises the eastern section of White Pine District. It is isolated and lies somewhat in the form of an irregular crescent, with the convex side to the east. Its altitude is nine thousand seventy-seven feet above the sea level. Its length from north to south is not far from six miles. Its greatest width is about two miles. The course of the summit is north, a few degrees west, and is about one mile in length, terminating on the north in a triangular point of quartzose rock, highly colored with the oxide of iron. Fossil encrinites and encrinatic impressions occur, showing this rock to be metamorphosed limestone. South of this there is a depression of one hundred and fifty feet following the summit for two or three hundred yards. In this depression there is an outcrop of brown slate which forms a belt descending towards the northwest. It gradually changes its course to the north and east, and finally completely encircles the hill, and passes south for several hundred yards, two or three hundred feet below the point where it made its first appearance. The limestone south of the depression rises to nearly the same altitude of the point further north, and on the summit is bare and forms a precipice facing the east, from fifty to a hundred and fifty feet, or more, in height. It dips west at an angle of about 20°, but the dip changes constantly. There is an irregular descent from this point to the southern termination of the summit. On the north of the hill, below the point of metamorposed limestone, the descent is at an angle of about 35°, gradually diminishing to the bottom of the cañon. The slate below is three or four hundred feet in width. Large masses of displaced limestone rest against the base of the hill, frequently covering acres of ground. They are from twenty to fifty feet in thickness, and are generally, though not always, bare of soil. Along the eastern base of the hill they present the appearance of immense inverted saw-teeth. They approach near, but do not lap upon each other. The belt of slate forms a narrow bench two or three hundred feet below the summit, along the eastern slope of the hill, increasing in width towards the south, where it is known as Pocotillo Flat. The ascent west of this flat is very steep. The limestone is much broken, but the strata are very distinctly marked in the face of the precipice below the summit, and from one to ten feet in thickness. Pocotillo Flat is terminated south by a short cañon commencing at the foot of the precipice below the summit. This cañon runs almost due east. A rough spur separates it from the second cañon known as Keystone Cañon, which heads south and west of the southern point of the main summit, between the Aurora and Keystone mines. Its course is nearly southeast. It is sharp and deep, and where it passes the southern termination of the summit, the hill is precipitous, and from the cap descends about a thousand

feet to the bottom of the canon. Fossil ammonites and spirifers, corals and algæ, were found in this vicinity. From the south end of the summit of Treasure Hill, the descent towards the west is about 35° for five or six hundred feet, when it becomes more gentle and is known as Chloride Flat. Pogonip Flat lies immediately south, and is a bare limestone rock descending gently to the west; said to cover a space of from fifteen to twenty acres. The east side is bounded by Keystone Cañon. South, the flat breaks off rapidly five or six hundred feet to the Eberhardt mine, and a little to the west of this mine it descends into the head of Eberhardt Cañon, which runs slightly south of southeast. On the west, Pogonip Flat is terminated by a steep descent for several hundred feet into the heads of two short steep cañons, running respectively southwest and west, into the large cañon separating Treasure Hill from White Pine Hill. The north side of the flat is designated by a descent, nearly perpendicular, of fifteen or twenty feet, into Chloride Flat. This descent, or break, is on a direct line west of the break of the hill at the southern terminus of the summit. Chloride Flat includes a space of twenty or twenty-five acres, and generally the limestone is covered a few inches in depth with soil and debris. A great amount of ore of unusual richness has been taken from the mines opened on this flat. North of Chloride Flat, and separated from it by another break in the rock, there is a small plateau, covering several acres, known as Bromide Flat, where some very rich ore has been extracted. West of these flats, the hill descends abruptly for several hundred feet into a deep cañon, which rises southwest of the north end of the main summit, and runs south and southwest, forming the principal east branch of the main cañon, between Treasure Hill and White Pine Hill.

On the northwestern slope of the hill west of the slate belt, a spur runs south, changing to southwest, known as Fay's Hill. There are several promising mines in this hill.

A group of mines, beginning on the southeast side of the north point of the summit, passes southward crossing to the western slope in the depression, and follows the curving of the hill to the break at the south end of the summit. They pass east of Bromide and Chloride Flats, and are described as follows:

HIDDEN TREASURE.

This mine is situated on the summit, in the depression where the slate forms the walls and the country rock on the west, and the limestone the wall and the country rock on the east. It is opened by a tunnel from the face of the hill running south, and slightly west, two hundred and twenty feet, where it connects with a shaft, at the depth of seventy-five feet, which is let fall from an open cut known as No. 5. An irregular chamber is stoped out one hundred feet north of the shaft. The stoping extends upward twenty-five feet. The east wall is regular through the whole length of the tunnel. From near the shaft, a cross drift extends east eighteen feet, through vein matter, where some good ore was obtained. The dip of the vein through these openings is 40° to the west.

The Bourn shaft is south, slightly west from the open cut No. 5 one hundred feet, and is seventy-five feet in depth. It is expected to connect with the main tunnel at the depth of one hundred and twenty feet. The shaft intersected the ledge at the depth of sixty-seven feet, where it dips slightly towards the northwest, and is somewhat broken. There is spar

in the slate on the west wall. The ore varies in richness. Shaft No. 3 is sixty feet south of the Bourn shaft, and has a depth of sixty-five feet. It intersects the vein at the depth of fifty feet, where an oval-shaped chamber is made, called the Big Chamber. A large body of very fine ore was taken from this opening. From the bottom of this chamber, it is expected to connect with the main tunnel, at the depth of one hundred and thirty-five feet. A drift runs south into another body of ore, near the southern boundary of the claim. Considerable work has been done near the surface, and large quantities of very fine ore have been taken from the mine.

SILVER WAVE.

This mine is the south extension of the Hidden Treasure, and was located in October, 1867. There are one thousand feet in the claim. Course south, a few points west; width undetermined. Vein matter is traceable for a long distance. The ore occurs through it in deposits. Limestone, spar and slate are also found in intruded masses. Twenty-one shafts have been sunk at various distances along the claim, without order or regularity. No. 4 passed thirty feet from the surface through slates, earthy matter and limestone, where it cut the vein and followed it twenty-four feet. The ore yielded as high as $175 per ton. Eighty-six tons gave a return of $4,000. A trace of lead, iron and copper appears.

The Silver Wedge shaft, passed from the surface through earthy matter, slate and limestone to the depth of fifty feet, where ore was found, interspersed with spar and small masses of limestone. Some of the ore extracted was of the first class. There is no certainty in regard to the walls.

There are several mines south of the Silver Wave upon which some work has been done, but is now suspended.

JAMES EMMA.

There are a thousand feet in the claim. It is opened by a tunnel from the western face of the hill, running east two hundred and forty feet through limestone. A body of second-class ore was cut at fifty feet. A shaft follows it to the depth of thirty feet below the bottom of the tunnel, and fifty below the surface. The ore shows on the south side of the shaft, and is unchanged in character. The country rock is greatly broken, but the stratification is apparent. It dips 25° west. Further east, two hundred feet from the mouth of the tunnel, is another body of ore. It is about ten feet wide, and thirty in length. From the end of the tunnel an air shaft connects with the surface at seventy feet. The ore was found continuous in the air-shaft. Forty feet above the tunnel some drifting and stoping was done. The ore proved to be of good quality.

WARD BEECHER.

This mine was located in 1867. The claim covers six hundred feet. Course north. An open cut runs east and west near the centre of the claim, showing a large body of ore. There is a second open cut east of the first, passing eastward through ore. Across the east end of this, there is a cut running north and south seventy feet through ore. This cut is

only four or five feet deep. The Ward Beecher shaft, near the south end of the claim, shows ore four feet in thickness at the depth of thirty-five feet. The shaft passes through limestone to the depth of seventy-three feet, where a second body of ore is seen and followed by two drifts west and northwest respectively, thirty feet into a chamber in the Earle mine. From the northeast side of the Earle chamber, another chamber, forty feet square and twenty high, opens on the Ward Beecher ground into the west drift, yielding a large quantity of fine ore. One hundred and ten feet north, and slightly east of the Ward Beecher shaft, is the Eclipse shaft, descending to the depth of thirty-three feet through a body of ore. Forty feet west of the Eclipse shaft, is a third shaft forty feet deep. A drift from the bottom runs forty feet southeast through limestone. It then rises eighteen feet and connects with a drift running south, twenty-four feet from the Eclipse shaft. At the place of connection, a chamber twelve feet square, extends eastward into a large body of ore. A drift runs north from the Eclipse shaft, forty feet, connecting with an air-shaft, where there is also a chamber forty feet in length, twenty in breadth, and twelve in hight. Ore shows above, below, and on all sides, except the west. From the air-shaft, at the depth of thirty feet, a drift runs eighteen feet north through ore. The ore taken from this mine carried some galena, and yields about $40 per ton, selected.

The North Aurora, South Iceberg, Last Chance, Drake, Silas Field, Napoleon and Earle claims, together with the Eberhardt, are owned and worked by the Eberhardt and Aurora Mining Company (limited).

EARLE.

The Earle shaft has a depth of one hundred and twenty-two feet; it passes through ore. A large chamber has been stoped out one hundred feet in length, fifty feet wide and forty feet high, yielding a large quantity of good ore. Drifts run in various directions from this chamber, showing bodies of ore of different sizes, similar in character to that obtained from the Ward Beecher.

NORTH AURORA.

A large chamber, called the "South Chamber," opens this mine to the depth of forty-five feet. From the bottom of the chamber a shaft descends through ore forty-five feet further. A tunnel runs north from the chamber two hundred feet through a body of ore. A cross drift at this point runs west through spar and limestone one hundred feet, and east one hundred and fifty feet. The ore bed in this place is irregular in its width, varying from fifty to sixty-five feet. About five hundred feet north of this cross drift there is a shaft thirty feet deep, showing a body of ore. A tunnel runs north fifty feet from the shaft, fifteen feet below the surface through ore. A chamber, twenty feet square and fifteen feet in depth, is excavated in the ore at the mouth of the shaft. There is but little difference in the richness and character of the ore from that in the Ward Beecher.

SOUTH AURORA.

There are 860 feet in the claim. The mine is opened by a cut one hundred feet in length, eighty feet in width and sixty in depth. About three fifths of the matter excavated was a fair quality of ore, yielding about $40

per ton. Forty feet perpendicularly below the bottom of this cut a tunnel runs north three hundred feet through vein matter. At the end of one hundred and fifty feet a chamber, twenty feet square, is stoped out. A second chamber, about the size of the first, is stoped out fifty feet further north. The tunnel entered a body of ore two hundred and fifty feet from its mouth, and continued in it fifty feet.

The middle chamber, or Autumn Pit, as it is called, is connected with the south opening by a tunnel eighty feet in length. This chamber is seventy-five feet long, fifty feet wide and sixty feet deep. Some of the ore obtained was exceedingly rich. Eight tons, closely selected, yielded $893 per ton. From the bottom of this chamber a shaft is being sunk, to connect with the tunnel below, for ventilating purposes. It exposes a fine body of ore. The North Chamber is one hundred and ninety feet north of the Autumn chamber. It is one hundred feet in depth, fifty feet in length and twenty-five in width, very irregular. Five hundred tons of ore were taken out of this opening. Of this, about twenty tons were waste matter. A shaft is being sunk from the bottom of this opening, to connect with the tunnel below. There is no water in the mine. The ore generally blends with limestone, which is often stained with the chloride. There are no clay linings. The dip of the ore is generally 40° to the east. A seam of spar, from ten to twenty feet wide, follows the ore on the west side as far north as it has been examined. It seems to be the division line between this belt of ore and the ore beds in Chloride and Bromide Flats. The spar is not broken.

As far as it has been possible to examine the limestone, the strata east of this ore belt dips with the strata on the west of it. There are small cross seams of spar which cut the ore in passing from east to west. The limestone in places is very silicious and hard. There is about thirty per cent. of lime in the ore, some lead and a stain of copper. There are evidences of slides in the limestone, especially on the east side of the mines, where the face of the rock is frequently grooved at an angle of about 50° southwest.

West of this belt is a separate group of mines extending down to, and passing over, Chloride and Bromide Flats.

ICEBERG.

A tunnel runs from the face of the hill fifty feet east. At the distance of twenty-five feet, a body of ore was found. A chamber at the end of the tunnel, at the depth of twenty feet below the surface, runs north in ore. Another chamber is stoped out about one hundred feet further north. A shaft from the bottom of the chamber is sunk to the depth of thirty-five feet, showing a body of ore.

LAST CHANCE.

This mine is about four hundred feet west of the Aurora. It has a southeasterly course. A shaft thirty-five feet in depth shows ore, and a cut, forty feet long and fifteen feet wide, is in a large body.

NEVADA.

Located in 1868. There are eight hundred feet in the claim. Course east and west. An open cut follows the ore bed seventy feet, where there

is an ore channel running northwest, fifteen feet wide, and eight fee high, twenty feet below the surface; it is traced two hundred and fifty feet. South of this twenty feet another channel runs parallel, and i about fifteen feet below the surface. The ore channels run into Chloride Flat.

POST HOLE.

A large chamber one hundred feet in length, fifty in width, and thirty in height, produced a large quantity of ore. A shaft from the bottom o this chamber, follows a seam of white spar, fifty-three feet in depth. The chloride of silver occurs in the spar, assaying from $3 to $17 per ton.

SUMMIT.

This mine was located in 1867. It was the first mine located on the hill There are eight hundred feet in the claim. A cut to the depth of twenty feet, one hundred and fifty feet in length and forty feet in width, runs north on the ore channel, to a point where it changes its direction to the west, and is followed under ground two hundred feet further. The chloride stains the limestone, so that it often appears rich in silver, when it is not. There are no clay partings.

INDUSTRY.

This mine was located in 1869. There are eight hundred feet in the claim. A shaft at the depth of twenty feet entered the ore bed. A chamber was excavated fifty feet in length, twenty-five in width, and fifteen in height.

Ore channels have been worked out through the Rattler and Old No mines.

As a general fact, it is found that the channels in which the ore i imbedded, grow narrower and thinner as they are traced down the hill i a westerly direction. When it is possible to determine the dip, it is with the dip of the country rock. In the channels now opened from the Industry, passing through the Nevada and Post Hole, the ore in the south channel was forty per cent. richer than the ore in the north channel. They connect in the western part of the Post Hole, and for some distance the ore was of a fine character. It became poorer, however, and diminished in quantity. From the point where the channels unite, a smaller channel runs north, nearly in the direction of the North Aurora. It produced medium quality of ore. From nearly opposite, to the southwest, there is a cave, quite regular, descending at an angle of 30°. It has been explored about fifty feet, but no discoveries of ore were made. The main ore channel gradually changes its direction to the north, and becomes considerably broken. In places it approaches nearly to the surface, and then descends somewhat for a short distance. Its irregularities increase, and it finally disappears. The strata in the limestone correspond closely on either side of these channels. Seams of white spar pass through it in almost every direction. They continued through the ore, without regard to grade, with the greatest persistence. The country rock is very hard, carrying silica and iron generally.

SNOW DROP.

This mine was located in 1868. A thousand feet are claimed. The ore originally appeared on the surface, on the south end of the claim, near the Stonewall shaft. It is all stoped out for a thousand feet to the northwest, leaving an irregular shaped channel, which separates at the distance of four hundred feet from the place of beginning. One branch keeps due north about eight hundred feet to the Eclipse mine. The other curves westward three hundred and fifty feet to the Genessee. Deposits of fine ore have been found to the west of this channel, in the Bourbon, Robert Emmet and Belmont mines. A channel is opened south from the Romulus. It produced a large quantity of rich ore, which gradually disappeared in spar and limestone.

ECLIPSE.

A shaft reaches a large body of ore of medium value, at the depth of one hundred and twelve feet. There is some lead and a trace of copper. On Bromide Flat the ore lies near the surface, and is found more generally in boulders and deposits.

VIRGINIA.

This mine is on the northwestern slope of the hill, not far above Hamilton. The claim runs slightly north of east. A tunnel follows the ore from the face of a hill sixty or seventy feet. A shaft from the top of the hill connects with the tunnel. Some fine ore has been taken from this mine, yielding from $40 to $60.

On the side of the hill east from the Virginia, there are a number of mines, but no developments of interest have been made.

South from the Virginia, a mineral belt extends along the western limit of the State, and follows the windings of the low hills west and south of Pogonip Flat. The ore in this belt carries galena, iron, copper, antimony, and some arsenic.

IMPERIAL.

Located in November, 1868. The claim covers six hundred feet. Course southeasterly, across a spur of the Fay Hill. A tunnel runs from the southern face of the hill northwest two hundred and sixty feet. It gradually rises about forty feet in passing through the distance of one hundred and thirty feet, where there is an air shaft one hundred and eighty feet to the surface following the vein matter. The vein dips west 50°. This work exposes a large quantity of ore, which yields on close assorting $130 per ton in silver, thirty per cent. in copper, forty per cent. in lead, and a trace of gold. The country rock is a crystaline limestone.

FAY MINE.

The incline follows the vein one hundred feet towards the east, where there is a break across the hill. The break is followed twenty feet and the ore stoped to the surface. The vein appeared again below the break

about twenty inches. It has a width of eighteen inches. The ore is very similar in character to the ore from the Imperial.

BURNING MOSCOW.

This mine was located on the twenty-first of December, 1868. There are one thousand six hundred feet in the claim. Course northeast. The ore has been uncovered on the surface for two hundred feet. A shaft sixty-five feet in depth follows the ore, and a level from the bottom of the shaft, eighty feet northeast, shows that the vein matter has a uniform character. The dip is about vertical. A seam of white spar, from a foot to eighteen inches wide, is followed by bodies of quartz on each side. Some black spar is intermingled. The vein matter is usually about six feet wide. The ore is found in seams throughout this formation, but that which is the richest occurs in bunches. A seam from one to six inches wide was found at the depth of forty-five feet, running in a southerly course, filled with rich ore. It dipped east into limestone, in which specimens of horn and chloride silver occurred, unaccompanied with quartz. This seam was followed forty feet along the main ore channel. It then turned in a kind of semi-circle into the country rock, and disappeared at a distance of thirty-five feet. Some of the ore extracted from this mine has yielded as high as $700 per ton. The greater part of it has yielded only about $50 per ton. There are indications that the larger deposits of ore in this mine may be found further east from the present openings. There are many other mines in this neighborhood not opened sufficiently to determine their character. The Silver Age, the Alexander and the Mountain Queen show the general direction of the belt further south, and exhibit ore of the same character.

EBERHARDT.

Pogonip Flat is terminated on the south by a descent almost precipitous for five or six hundred feet, to the heads of two cañons, between which the Eberhardt mine is situated. This mine has not been developed to a great extent for the last two years. The principal open cut has not been enlarged in any direction. The Keystone shaft, twenty feet south of what is regarded as the northern wall, intersects the wall at the depth of eighty feet, where there is a drift on the wall to the west two hundred and sixty feet, and to the east forty feet. Through this distance the wall is smooth and well defined, with a dip to the south of 65°. The face of the wall is grooved quite regularly. These grooves dip west 45°. The vein matter, for six feet next the wall, is ground up very fine, and contains spots of ore. Stoping has been done twenty feet in depth and a hundred feet along the wall. Also a chamber has been excavated south, forty feet wide and ten in height, to the southern wall. Assays were made every two feet, through this chamber (two hundred and eleven in all), and showed a continuous body of ore. The assays averaged $1,500 per ton. They run from $9 43 to $1,400 per ton.

The Blue Belle shaft is sunk on the south wall, which dips slightly north, and leaves the shaft at the depth of sixty-five feet. The shaft continues to the depth of one hundred and forty feet below this point, where

vein matter again appeared. The spar and quartz are ground up considerably. The wall is not so well defined as the one on the north side of the mine.

The Richmond shaft is one hundred feet east of the Blue Belle. This shaft is not very deep, but it shows a wall to some extent. The course of the mine is east and west, generally. It dips at first slightly north, but changes to a perpendicular, or perhaps a little to the south. The walls are nearly parallel. The vein matter is considerably broken to the depth of thirty-five feet, where it becomes more compact and solid. Small seams in the ore dip with the grooves on the walls. Work will be resumed on this mine in a short time.

South of the Eberhardt, for half a mile or more, are a large number of mines, upon which some work has been done. They are on the low hills or spurs from Treasure hill.

MAZEPPA.

Located in December, 1868. Course, north; dip, 47° west. A shaft at the depth of thirty feet cuts the foot wall, which showed a smooth face, lined with clay. A body of good ore lay west of the wall, ten feet in width. Masses of intruded limestone are found in the vein matter. Some very rich ore was taken from this mine, yielding from $300 to $400 per ton.

CALIFORNIA.

This mine runs northwest and crops on the surface for some distance. It has been stripped, and shows a large amount of low grade ore.

Another mineral belt is traced on the eastern slope of Treasure Hill.

Silver Vault tunnel, intended to prospect the hill about the south boundary of the Hidden Treasure mine, runs from the eastern slope one hundred and forty feet below the surface. It is now about three hundred feet in length. At the distance of one hundred and fifty-eight feet the course changes from due west 2 to the north. Ninety feet from the mouth, a small spring of water appeared, the first found in Treasure Hill. It is very pure and soft, and runs about eight gallons in twelve hours.

The limestone, through which this tunnel passes, varies in dip from a horizontal to a perpendicular. The strata are from three to seven feet in thickness. One hundred and fifty-three feet from the mouth of the tunnel a cave appeared on the south side, six feet wide, ten feet long, and forty in height. Water-worn pebbles covered the floor. Twenty feet further in the tunnel a crevice opens from above, down which a current of air descends. The country rock is very hard and fiery in places; in other places it is soft and easily removed. Near the end of the tunnel a little quartz, showing a trace of silver, was found.

Below this tunnel is the Emmerly and other mines, and further south the Pocotillo group.

The Pocotillo and the H. F. Rice are probably on the same vein. It has been opened in three or four different places, and shows a fair quality of ore—carrying some lead, and a trace of copper. The vein dips west, under the hill. It has not been opened sufficiently to determine its character with accuracy. About two hundred feet above these mines a tunnel is run west into the hill a considerable distance. Near the surface the

slate and limestone were much broken and mingled with debris. At the distance of twenty-five or thirty feet these rocks assumed their natural position and the strata became regular, though not compact. The dip is to the west at an angle of 10°. Further in the tunnel the slate passes below it, and the limestone becomes silicious and hard.

Generally on Treasure Hill the canons follow the deepest fissures in the rock. The soil and debris are but a few feet in depth—barely sufficient to sustain a growth of the nut pine and mountain mahogany, and a few stunted white pines on the lower hills. The limestone appears on the sides of the ravine. The regularity of its stratification is generally preserved. Its dip varies with the face of the hills in which it occurs. In the body of the hill, both the slate and the limestone are more or less broken, so that they do not retain water in any great quantities.

Silica forms a large element in their composition generally. Iron is widely diffused as an oxide.

The ores obtained from the mines near the summit of Treasure Hill are remarkably free from base metal, and exceedingly rich in the chloride of silver. They are mined and reduced without difficulty.

MILLS.

The White Pine mill has ten stamps.
The Treasure Hill Silver Mining Company's mill has twenty stamps.
The Manhattan mill has twenty-four stamps.
The Dayton mill has sixteen stamps.
The Nevada mill has ten stamps.
The Treasure mill has five stamps.
The Swansea mill has ten stamps.
The Henderson mill has five stamps.
The Chicago mill has ten stamps.
The Stanford mill has thirty stamps.
The Oasis mill has ten stamps.
The Drake & Applegarth has ten stamps.
The Metropolitan has sixteen stamps.
The Little Giant has five stamps.
The Kohler has five stamps.
The Sheba has ten stamps.
The Vernon has eight stamps.
The Eberhardt & Aurora Mining Company are erecting a mill with sixty stamps.

SMELTING WORKS.

Rothchild's smelting and mining works at Hamilton have a building very conveniently arranged—two hundred and nine feet in length, thirty in width, and one story high. The engine has forty-horse power; there are three furnaces eight feet square outside, fifty inches square inside, and seventeen feet to the feed hole; the smoke stacks are forty-five feet high. The capacity is equal to twenty tons in twenty-four hours, to each furnace. It is the intention to erect refining works in a short time.

There are many furnaces, on a variety of plans, in the district. Some of them do very fine work.

White, 1871, p. 116

A CATALOGUE OF NEVADA FLORA,

BY

C. L. ANDERSON, M. D.

This catalogue of Nevada plants is not offered as a complete one. The botany of this State has not as yet been thoroughly made out. It is exceedingly varied, and when complete will form a catalogue much larger than the one here presented.

The purpose, however, of this list is mainly to serve as a nucleus and sort of guide for those who may be interested in the study of the somewhat peculiar flora of this State.

In forming this list no little care and labor have been expended. Before coming to Nevada Territory in 1862, I inquired of a resident friend something in regard to the botany. He said I might botanize somewhat in "sagebrush" and "greasewood," for these plants were about all. And such at some seasons of the year is the appearance of most of the country; but such it is not in reality, as this catalogue will amply prove. There are seasons when the mountains and foot-hills, and some portions of the plains are literally clothed with flowering herbage, and the country is as rich in vegetable novelties as it is at all times in mineral wealth.

Nutritious grasses abound at all seasons, and the number of genera and species in this catalogue will be considerably augmented when the list is complete.

Lupines, Clovers and Vetches abound. They contain much nutriment for stock. The genus Eriogonum presents some twenty-two species. It undoubtedly possesses some good qualities as a forage plant. Even the Artemisias (including the aromatic Sage-brush) and many allied species, are devoured and even relished by cattle, horses and mules, affording them sustenance in the winter season.

For assistance in preparing this catalogue, I am largely and mainly indebted to Professor Asa Gray, of Cambridge, Mass.; he has kindly determined most of the plants for me, besides describing many new species.

For determination of a large part of the grasses, I am indebted to Professor Bolander, of San Francisco, (late State Botanist of California,) who has generously aided me in this matter.

I have omitted the Sedges in this list because they have not been collected, and consequently their names for the most part are undetermined. The same may be said of all the flowerless plants, including Ferns, Mosses, Liverworts and Lichens.

The botany of California and Nevada is nearly identical in the Sierras, but east of this mountain range there are but few plants in common. The change seems to begin suddenly in the foot-hills bordering the Utah basin.

The earliest flowers begin to open about the fifteenth day of February, in sheltered spots, and by the first of April a large number of plants are in bloom. In May the mountain sides near the foot-hills are in full glow of flowering, and, during the summer months, there are many favored spots where a large variety of flowers may be seen. Even late in autumn, say in November, when ice is forming gradually down the sides of the mountains, I have often seen the Lupine, or the Golden Rod looking fresh and bright in close proximity to the snow.

RANUNCULACEÆ.

Ranunculus Cymbalaria; Pursh. Alkaline marshes. "Buttercup."
glaberimus; Hook. Foot-hills.
Andersonii; Gray. Mountains near snow, southeastern Nevada. An interesting new species of buttercup, that would be a fine acquisition to the garden. Blooming in March.
Thalictrum Fendleri; Engln. Borders of meadows. "Meadow Rue."
Aquilegia Californica; Gray. Meadows and hedges. "Columbine."
Delphinium decorum; F. & M. Meadows and hillsides. "Larkspur."
Aconitum nasutum; Fisch. Rich shady soil. "Monkshood," "Wolfsbane."
delphinifolium.
Actea spicata; L. var. arguta. Damp woods. "Baneberry."
Peonia Brownii; Dougl. Foot-hills. "Peony."
Myosurus minimus; Dill. Sandy places. "Mousetail."

PAPAVERACEÆ.

Eschscholtzia Californica; Cham. Fields. "California Poppy."
Argemone Mexicana; L. Plains. "Prickly Poppy."

CRUCIFERÆ.

Nasturtium officinale; L. About springs. True "Water Cress."
Cardamine pauciseeta; Benth. Var. argulata. "Bitter Cress."
Streptanthus Breweri; Gray. Mountain Valleys.
Erysimum asperum; D. C. Plains.
Thelypodium sagittatum; Gray. Plains.
brachycarpum; Gray. High mountain sides.
Smelowskia Californica; Gray. Near Mono Lake.
Turritis retrofacta; Hook. Meadows and mountain sides.
Capsella Bursa-pastoris; Moench. Fields. "Shepherd's Purse."
Sysymbrium incisum; Engl. Sagebrush lands.
canescens; Nutt. Var. brachycarpum.
Lepidium intermedium; Gray. Fields. "Peppergrass."
montanum; Nutt. Hillsides.
fasciocarpsum; Nutt. Sagebrush lands.
dictyotum; Gray. Sagebrush lands.

CONIFERÆ.

Ephedra antisyphylitica; Bert.
Pinus ponderosa; Dougl. "Yellow Pine."
Lambertiana; Dougl "Sugar Pine."
contorta; Dougl. "Twisted Pine." (Valley of Lake Tahoe, Southern Nevada.)
edulis; Engl. "Pinon."
Sabiniana; Dougl. "Nut Pine;" "Digger Pine."
Picea grandis; Dougl. "White Fir;" "Western Balsam Fir."
Thuja gigantea; Nutt. "Great Arbor Vitæ."
Juniperus tetragona; Schlecht, also Torr. var osteo-sperma. "Sweet Berried Cedar."
Taxus brevifolia; Nutt. "Western Yew."

LEMNACEÆ.

Lemna trisulca; L. "Ducks meat." Stagnant waters.

TYPHACEÆ.

Typha latifolia; L. Swamps. Catstail Flag.

IRADACEÆ.

Iris longipetala; Herbert.
Sisyrinchium grandiflorum; Dougl;. "Star Grass." "Blue-eyed grass."

ORCHIDACEÆ.

Platanthera dilatata; Lindl. Washoe Valley.
Spiranthes decipiens; Hook.

MELANTHACEÆ.

Anticlea Fremontii; Torr.

LILIACEÆ.

Lilium Californicum; Hook. "Lily."
Fritillaria mutica; Lindl.
Calochortus venustus; Benth.
Nuttallii; Torr and Gray.
Veratrum Californicum; Durand. "Hellebore." About Carson and Washoe.
Smilacina stellata; Desf.
Allium tribracteatum; Torr. "Wild onion."
acuminatum; Hook.
Hesperoscordium. Species uncertain.
Stropholorion Californicum; Torr. Little Valley, near Washoe City.
Leucocrinum montanum; Nutt.
Yucca. Several species, but names undetermined.

GRAMINEÆ. (GRASSES).

Alopecurus aristulatus. "Floating Foxtail."
Panicum Crus-Galli; L. Var. "Barnyard Grass."
capillare; L. "Old witchgrass."

Raymond, ~~1873~~ [1872], p 183, 205

file: ~~Hist Mng.~~ White Pine

OF

MINES AND MINING

IN THE STATES AND TERRITORIES

WEST OF THE ROCKY MOUNTAINS;

BEING THE FOURTH ANNUAL REPORT OF

ROSSITER W. RAYMOND,
UNITED STATES COMMISSIONER OF MINING STATISTICS.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1872.

(for 1871)

tain class of ores is not reported at all, as of too low grade, according to the new law, to be subject to taxation.

NYE COUNTY.

I have no returns from this county of an exact and detailed character, the reason being that the very estimable and courteous citizens who promised to furnish them have not kept that promise. I can, therefore, only say in general terms that the Belmont and Mammoth districts in this county have maintained some production, the principal (or only?) mills running being the Canfield Mill at Belmont and the Ellsworth at Mammoth. The shipments from Belmont amounted to $268,903. The principal producing mine was the El Dorado South, which has been described in former reports. It is rumored that this very valuable mine has been sold to a San Francisco company. The incline is reported to be now 375 feet deep, with levels 100 and 80 feet, respectively, both ways on the vein. The vein is from 4 to 12 feet wide, and has thus far produced about $400,000, the ores worked having yielded, it is said, an average of $150 per ton. This high average indicates that only first-class ores have been worked.

The Arizona mine, which is said to have been consolidated in one property with the El Dorado South, is opened to a depth of about 200 feet by a tunnel, and about 200 feet of drifts on the tunnel-level. It is said that a ledge of high-grade ore, 2½ to 6 feet thick, is developed throughout this distance. The ore worked has averaged, according to report, $275 per ton.

Another very promising mine at Belmont is the Monitor, which, according to the Reese River Reveille of March 4, 1872, had yielded, since June, 1871, 240 tons of rock, averaging $503, or a total of $120,732.

At Mammoth there is beginning to be a revival of activity, partly due to the starting of the Ellsworth Mill. The following account is from the Reese River Reveille of February 27, 1872:

> This mill was completed last summer by a company organized at Bridgeport, Connecticut and is running exclusively on custom ore. It has ten stamps and a Stetefeldt furnace, is under the supervision of Mr. Kustel, the well-known assayer, Mr. F. W. Smith being general agent. They have adopted the Manhattan Company's schedule of prices, and give complete satisfaction to their customers. Their sources of ore-supply are Ione, ten miles distant, Belmont, eighty miles, and San Antonio, sixty miles. No mining worth mentioning is being done at Mammoth. The cost of hauling from these various places is, from Ione from $5 to $6 per ton, and from Belmont and San Antonio $30 per ton. During the past few months some 40 tons of ore from the Liberty and Potomac mines of San Antonio have been worked at Mammoth. Mr. Roberts does not know the exact yield, but it was quite satisfactory. From Belmont the Monitor and Arizona mines have sent several lots; the last, consisting of 36½ tons of Monitor ore, yielded at the rate of $462.17 per ton.
>
> The camp of Ione, ten miles distant, is, however, the principal source from which the mill must obtain its ore. This is an old camp, and has passed through many vicissitudes. It has had many ups and downs, at one time promising to be a leading district, and anon all but deserted. Two mills have been erected there, but for causes too numerous to mention here they did not prosper. They were first closed and then dismantled, and it did look for sometime as if Ione had yielded up the ghost. There are good mines there, however, as we know of our own knowledge, having done some prospecting there ourselves in early times. They are small, averaging in the neighborhood of one foot in thickness, but sufficiently rich to pay well. Mr. Roberts tells us that the satisfactory returns given by the Ellsworth Mill have infused new life to the place, and that owners of mines are returning to work them. The principal mines upon which work has been resumed are the Indianapolis, Shoo Fly, Pleiades, and Stonewall. The first of these is down 280 feet, and works 26 men, principally on dead work. They take out about three tons of ore per day, which pays all expenses and a little over. The amount of ore now on the various dumps and at the mill ready for reduction is not less than 400 tons. This looks encouraging, and we hope that the mine-owners of Ione will show a reasonable degree of enterprise, and not allow the mill at Mammoth to want for ore, for they cannot afford many more failures. The little town is looking quite lively; it has two saloons, two billiard-tables, one store, one restaurant, one livery-stable, all doing a good business, and it only rests with themselves to make it as prosperous as it was in 1864 and 1865.

The Manhattan Mill at Austin has worked a good deal of the Nye County ores during the year. This is one reason of the high yield per ton. Only very rich ores would pay for transportation to Austin.

Lida Valley district.—This district has attracted some attention during the latter part of the year, especially in Austin, which seems to have been the source of supplies for the new camp. The Reese River Reveille of March 4, 1872, contains the following correspondence from that point:

> Lida Valley mining district was organized on the 28th of last August. It embraces an area of one hundred square miles, with Scott's Springs as the center. This is the most prominent and affords the greatest amount of water of a series of springs in the eastern part of a small basin lying between the Palmetto range of mountains on the north and west, and Mount McGruder on the south and east. The valley was christened "Alida" by Colonel D. E. Buel, some eight years ago, when on his memorable trip through the Death Valley country in search of the mystical "Breyfogle" lode, but either from a corruption of the word or by common usage the district is known as "Lida."
>
> Rich mines were known to exist here before the organization of the district, and subsequent developments have proven their value beyond a peradventure. Since about the first of last December Messrs. Hiskey and Walker have purchased from Messrs. Scott, Black & Co. their water-right and mill-sites, together with the Cinderella mine, and at once commenced active operations for the development of the ledges and the improvement of their property generally.
>
> There are now about thirty persons in the district, and thirty-two claims on record. The mineral bearing belt is about one-fourth of a mile in width, and extends from the valley between Mount McGruder and Gold Mountain on the east to and including Palmetto district on the west, a distance of fifteen miles. The country-rock or formation is diversified by slate, limestone, porphyry, and granite. The ledges run in an easterly and westerly direction, and the ore is chiefly chloride with galena as the principal base metal. As to the value of the ore, I am not yet prepared to speak advisedly in general terms. Messrs. Hiskey and Walker are shipping ore to their mill at Deep Springs, Esmeralda County, for reduction, the result of which I will give you when known. A lot of ore from the Cinderella mine, recently worked at Columbus, yielded a fraction over $500 per ton. Other mines of recent discovery "rank" that ore by 100 per cent.

The editor of the above paper, to whom several specimens from the new mines were sent, says the ores are similar to the rich green-stained decomposed surface ores of some of the mines on Lander Hill, and predicts that the Lida Valley mines will receive wider attention during the present year.

WHITE PINE COUNTY.

I am indebted to Mr. A. J. Brown of Treasure City for a report on White Pine district. His notes, together with other information received during the year, are embodied in the following pages:

Operations in the free-metal mines have, on the whole, been vigorously prosecuted. But nothing has been done during the year in the smelting line except twelve days' run of the Alsop furnace, and there are no indications that smelting will be resumed prior to the advent of the Eastern Nevada narrow-gauge railroad. The prospects for the early building of that road are not flattering. Some mining property has been sold to English companies during the year; but it is well known that but little money has really changed hands; not more than $60,000 in this district can really be traced. The vendors of property generally receive the major part of the payment in paid-up shares of the company. The properties belonging to London companies are the East Sheboygan, Ward Beecher South, Earl, North Aurora, South Aurora, Eberhardt, Idaho, and Great Western.

The prospects of the district appear to be slowly but surely improving. Most of the miners are beginning to realize that the "spar-vein" is the guide-board that points to deeper bodies of ore if any exist, and of that there can be but little doubt, for the formations to the west of Treasure Hill, including White Pine Mountain, comprising granite, silurian, and Devonian rocks, all contain mineral-bearing veins. For most of the information in regard to the "spar-vein" Mr. Brown acknowledges his indebtedness to Mr. D. H. Barker, civil engineer and surveyor, who has made several maps of the vein and accompanying ore-deposits. In the description of the mines the words "vein," "deposit," and "ore-channel" are indiscriminately used for the same thing.

The most important mining operations in White Pine district during the past year have been mainly carried on along the supposed north and south "ore-channel," extending through Treasure Hill, from the Mammoth and East Sheboygan mines at the extreme north end, to the Mazeppa at the extreme south end of the hill. Early in the year a large vein of calc spar was discovered forming the western or foot-wall of the South Aurora, Ward Beecher, and some of the other important mines on the east side of Main street, Treasure City. Later explorations have established its continuity along the whole length of the hill from the O. H. Treasure mine to the South Aurora. At the south end of the last-named mine an apparent break occurs in the vein, but it makes its appearance again near the north wall on the west side of the Eberhardt, and continues thence south along the ridge nearly to the Mazeppa mine. This spar-vein in itself may possibly be of little or no importance as a mineral-bearing one, but taken in connection with the character of the ore-bodies existing along the eastern side of its course, it is important, and worthy of a careful description. This spar has a general north and south course, and dips to the east at an angle varying from 33 degrees near the surface to 38 degrees in the deepest workings. As might be expected, it is often faulted, and generally from east to west. It does not correspond with the strike and dip of the country-rock, its dip being at an angle of 65 degrees. Its structure is banded, *i. e.*, it is made up of narrow bands or layers running parallel to the walls. In thickness, it varies from 10 to 40 feet. Although there are numerous masses and veins of spar in the district, none of them bear any resemblance to the one described. They are generally limited in extent to a few hundred feet at most, lie mostly flat, and correspond with the dip and strike of the country-rock, while the one forming the foot-wall of the "main-ore channel" is persistent in its course for a known length of nearly two miles, and does not coincide with the strata of the country-rock, which it cuts, on the contrary, all along its course. The mines along its eastern side, although partaking of the irregular deposit character common to limestone formations, form an almost continuous "ore-channel," and all, with the exception of the South Aurora, are proving persistent in depth. Those lying on the west side were merely superficial horizontal deposits, corresponding with certain limestone strata. Belonging to these superficial deposits are the mines on Chloride, Bromide, and the other flats on the west side of Main street, which have been mainly exhausted and abandoned. A number of east and west vertical fissures appear to cross the main north and south "ore-channel" at right angles, and, although themselves poor in mineral, they seem to have wonderfully enriched the main channel at the points of intersection. Of these east and west fissures, two are well known, and have often been described, viz, the Eberhardt and California. Another is found 800 feet south of the Eberhardt, crossing from

the Grant and Colfax, through the Eureka and Indianapolis mines, and developing in the last-named mine an immense body of low-grade ore. Another smaller one, 400 feet still farther south, passes through the El Dorado mine. But perhaps the most important and most productive is that crossing the Ward Beecher, and forming, with the main vein the massive bodies of rich ore developed in that mine.

Mines east of the spar-vein.—Commencing at the north end of Treasure Hill, the first of the important mines situated on or near the main ore-channel is the Mammoth. During the first two years following the discovery of the district, extensive explorations were made on this mine, and something like $60,000 were expended without discovering any bodies of ore extensive enough to reward the owners for their time and expense; but during the present summer work, was commenced on the large croppings situated 600 feet north of the old works, and an extensive body of good ore has been developed. This ore-body, as exposed in the different works, is 10 feet in thickness and 300 feet in length. The deepest shaft is in good ore at a depth of 50 feet from the surface. The vein courses east and west, and dips to the north at an angle of 50 degrees to the plane of the horizon. The hanging-wall is arenaceous shale, and appears to be smooth and well defined. The foot-wall is the ordinary lime stone of Treasure Hill, and is not defined, but gradually blends with the quartz of the vein. Two hundred and fifty tons of ore are on the dump.

The Miner's Dream is situated about 500 feet east of the new works on the Mammoth, and is probably a part of the same vein or ore-channel. It was accidentally discovered by the superintendent of the Mammoth on the 16th of October of the present year. He was on his way to Hamilton, when he noticed a bunch of quartz, a piece of which he broke off and had assayed. The result was $109 per ton in silver. The ledge, as exposed in an open cut, is eight feet thick. Some very rich rock has been mined, but the explorations are quite limited, and the unfavorable weather will be likely to prevent developments during the winter. The vein has the same casings as the last.

The East Sheboygan, situated immediately east of the Mammoth old works, was located early in 1869. Considerable work was done at the time, and some of the ore was worked with fair results. But the owners were not able to develop the property, and it has lain idle until the present summer. It is now the property of an English company, with head-quarters in London. Since the 1st of September explorations have been vigorously prosecuted, and with the most satisfactory results. Several shafts have been sunk on the course of the vein, and are connected with each other by drifts, thereby exposing a body of ore at an average depth of 50 feet from the surface, 300 feet in length, and 10 feet in thickness. Specimens of ore taken from the present depth are almost solid coin-silver; but the average mill value of all that has been extracted to the present depth does not exceed $35 per ton. The quality of the ore has so far appeared to improve with the increase of depth, and the mine bids fair to become one of the best properties in the district. The vein has a north and south course, and dips to the east at an angle of 30 degrees. Like the two last named, it is a contact-vein, with a hanging-wall of slate and a foot-wall of limestone. The vein is well defined, both walls being smooth and well marked. Fifty tons of selected ore, recently worked, gave an assay value of $78 per ton. Two hundred and fifty tons of second-class, worth from $25 to $30 per ton, are on the dump. This mine is most conveniently situated for cheap working. A mill, situated 100 yards below the present works, can

receive a full supply of water from the pipes of the White Pine Water Company at a trifling expense, and the ore can be dumped from the mine directly on the battery floor, if necessary, by means of a chute, thereby saving the expense of transportation by teams, which usually costs from $3 to $5 per ton.

O. H. Treasure.—This mine was the first discovered on Treasure Hill, and has been so often described that its locality is too well known to require any further description in these pages. During the first two years that it was mined it was generally supposed, from its location at the point of contact of the lime and shale, to be a contact-vein pitching to the west, but the explorations of the past year have disproved the theory. It is now known to dip to the east at an angle of 38 degrees, thus corresponding in dip and course with all the mines situated on the main north and south ore-channel. The greatest depth attained at the present writing is 160 feet from the surface. At that depth the vein is found to be from 10 to 30 feet in thickness. It contains low-grade milling ore, which is very much mixed with lime and spar, and requires careful sorting. A tunnel is projected and is already driven in 56 feet. It starts from the O'Neil grade on the east slope of Treasure Hill, and will eventually explore the mine to a perpendicular depth of 500 feet below the croppings. The distance to be run will be something less than 400 feet, as the east slope of the hill is very precipitous. The probability is that, on this account, much of the deeper explorations along this channel will eventually be carried on by means of tunnels. The prospects of this mine have materially improved during the past year. We find the returns for the first quarter to amount to only 64 tons, and the gross yield to $1,310.72, while those for the quarter ending September 30 are 1,162 tons, giving a gross yield of $48,540. The company have purchased the Big Smoky mill, and have thoroughly overhauled it preparatory to working the ore from the mine.

Silver Wave is the next mine south of the last named. It has been explored to a depth of 170 feet from the surface. The vein of ore is very large, but generally too poor to pay. Some small bodies of good ore have been encountered, but not enough to cover the expense of exploration. The future of the mine is not encouraging. The vein has the usual north and south course, and dips to the east at the same angle as the last, of which it is a known continuation. Two hundred and ninety-nine tons of ore have been extracted and milled during the present year, giving a gross yield of $10,831.63.

The Edgar, situated 500 feet south of the last-named mine, was prospected during 1870, by a perpendicular shaft, to a depth of 140 feet, and by a drift run in 30 feet east from the 100-foot level. Nothing was found, however, to encourage further expense, but the developments elsewhere along that line during the past year induced some parties to lease the property. They went to work some time in September, and have continued the 100 foot-level 40 feet further east. At a distance of 40 feet from the shaft they encountered a large body of excellent ore, through which they have continued the drift 30 feet without finding the end in that direction. The ore, as taken from the mine, yields $50 per ton. The present yield is 10 tons per day, which can, without doubt, be increased to 50 tons per day when the mine is properly opened. The vein appears to course north and south with the usual easterly dip. It is impossible to form any estimate of the size and importance of this newly discovered ore-body, but it is evidently one of the largest and deepest yet found on Treasure Hill.

Portage is situated 300 feet further south. A shaft was started from

the surface on the east wall of the spar-vein, with the expectation of finding the "ore-channel," which was supposed to be there from the developments made further south. A small quantity of low-grade ore was found 47 feet from the surface, but the property became involved in litigation with the Ward Beecher Consolidated, and work has been suspended since September.

The Ward Beecher Consolidated, 200 feet south of the last named, had a good body of ore during the summer, but this is now exhausted, except 20 feet, which are involved in litigation with the Ward Beecher South. An incline is, however, being sunk through a brecciated mass of black spar and quartz, with fair indications of ore. Two thousand four hundred and twenty-seven tons of ore have been extracted and worked during the year, giving a gross yield of $61,976.59.

The Ward Beecher (English company) is situated next south, and its ore-body connects with that in the last-named mine. The Ward Beecher includes within its works the Autumn No. 2, Red Rover, Montrose, and Colfax locations. No description can give any very clear idea of the underground workings of this mine. It is, perhaps, the best-managed piece of mining property in White Pine district. Every change in the appearance of the mine, as well as every fault and slip, is carefully noted and taken advantage of in the exploitation. The Earl portion of this mine was worked quite extensively and made considerable stir during the summer and autumn of 1869, but the ore-body apparently gave out, the mine was abandoned, and remained idle during the whole of 1870 and until June of the present year. About the last of that month the present owners commenced work in the old Earl chamber, and soon discovered that a slip or fault had occurred, the upper part of the vein having slid down the hill. A drift was accordingly started east from the old works, which encountered the main ore-body 30 feet from the starting-point. This part of the mine is now known as the Ladies' chamber. The body of ore in this chamber has been opened by shafts and drifts to a perpendicular depth of 122 feet from the surface; its greatest breadth, as far as known, is 150 feet from east to west. Its length from the Autumn chamber, with which it connects on the north, is something over 200 feet, and its southern limit has not been found, although a drift has been extended from the chamber 50 feet south, toward the Risdale chamber in the North Aurora mine. It is scarcely probable that so large an ore-body will be found to extend unbroken through the 600 feet of virgin ground that separates the two mines, although it is the general impression that they will finally connect.

The broken and disturbed character of the surface limestone fully warrants this conclusion; in fact, small quantities of mixed limestone and ore have been found in several shallow shafts sunk along the line. But a small portion of the immense ore-body exposed in this chamber has been extracted. The open space is 70 feet long, 40 feet wide, and [illegible] feet high. The Philpotts chamber is situated between the last described and the Ward Beecher Consolidated, with both of which it forms an ore-connection. Work was commenced on this portion of the line during the summer of 1870, and 1,331 tons, giving a gross yield of $[illegible],000, were extracted during the last quarter of that year. From the 1st of January to the 1st of October 9,706 tons were extracted, giving a gross yield of $496,223.64. The ore-body in this chamber was 35 feet in thickness from east to west and 200 feet long, the greatest depth reached being about 116 feet from the surface. The greater part of the deposit has been worked out to that depth, but the ore in the bottom of the works is as good as ever, though the body is somewhat narrower

than it was nearer the surface. The ore-body exposed in this mine, taken in connection with that in the Ward Beecher Consolidated, forms a continuous "ore-channel," about 500 feet in length from north to south, and the southern limit is not yet found. Several thousand tons of ore are broken and ready for hoisting, and the quantity exposed in the different workings is enormous; it cannot be less than 25,000 tons, even if the chimney should be found to terminate in length and depth within 10 feet from the present limits. The hoisting for this mine is done by means of a 20 horse-power engine, and the quantity delivered daily at the surface is 80 tons.

The North Aurora, situated next south, was worked extensively during 1868 and 1869, but remained idle during 1870, and was supposed to be exhausted. The explorations of the past summer have developed a large body of excellent ore only 4 feet below the east end of the tunnel belonging to the old works. This ore-body is situated about 100 feet north of the old works, and has been sunk upon to a depth of 60 feet from the surface. A drift has been driven north through good ore 100 feet, and another east 30 feet, without encountering the line-wall. The quantity of ore exposed in this chamber is estimated at 15,000 tons. Seventy tons of ore are daily shipped by tramway since the 1st of November.

The South Aurora, lying next south, has been actively worked since 1868, and has yielded a large quantity of ore, but it is now apparently exhausted. Prospecting is, however, being vigorously prosecuted, but so far without success. The greatest depth attained in this mine is 225 feet from the surface. The present indications for deeper ore-bodies are not as favorable as might be desired. At the greatest depth the material encountered was brecciated limestone and spar with some quartz. The amount of ore extracted from the South Aurora mine during the year 1871 is given by Mr. B. N. Lilienthal, the chemist of the Stanford Mill, where the ore was worked, as 5,765 $\frac{1775}{2000}$ tons, which yielded $148,804.60 in fine bullion.

The mines above named are all supposed to be on the great north and south ore-channel, and form a continuous chain of locations nearly one mile in length. From the Hidden Treasure to the South Aurora there are only two noticeable breaks in the continuity of the ore. The ore-body early found in the Hidden Treasure continues through the Silver Wave and to the Edgar, a total distance of about 1,000 feet. The most of this ore, however, is of too low grade to pay at present. From the Edgar south to the Ward Beecher Consolidated, traces of ore have been found near the surface, but the only shaft in that distance has been sunk only 60 feet, and has probably stopped at least 40 feet short of the depth of the main channel. The second great ore-body extends from the Ward Beecher Consolidated 500 feet south into the north part of the North Aurora ground. South of this lie 600 feet of unprospected ground. Several shallow shafts, however, have shown traces of ore near the surface, and the prospect is good that ore will be found extending south to the Risdale shaft, the locality of the Aurora deposit. The third and last ore-body formerly extended from the Risdale shaft in the North Aurora to the O'Neil grade, a total distance of 600 feet, but the South Aurora seems now exhausted.

The Eberhardt has been but little worked during the present year. A new prospecting-shaft has been sunk to a depth of 180 feet from the surface, without encountering a new ore-body. Only 500 tons of ore have been extracted from the old works and reduced during the year.

The Indianapolis is situated 800 feet south of the Eberhardt. It has one shaft 80 feet deep, and a drift from the bottom 15 feet east in low-

grade ore. A drift has also been run 20 feet east at a depth of 30 feet, and another north 60 feet from the same level, all in ore worth $25 per ton.

The Sharp mine was discovered in February last, while grading the foundation for station 20 on the tramway. Several tons of good ore have been mined, but the title is disputed, and the property will probably have to lie idle for some time.

The Grant and Colfax and Eureka have been worked but little during the year. Very extensive bodies of low-grade ore are exposed.

The Bourbon has been worked most of the year on lease. It was sold early in the summer to a company located at Erie, Pennsylvania.

The Genesee has been worked to a depth of nearly 200 feet from the surface. The shaft is still sinking.

The Noonday has one shaft 140 feet deep, in which the owners claim to have encountered a well-defined vein of ore, 8 feet thick.

The Iceberg, south, is yielding considerable ore at a depth of 30 feet from the surface.

The General Lee has yielded some good ore during the year.

The Pocatillo has a tunnel running west on a vertical vein. It is in about 300 feet toward the Ward Beecher.

The Virginia has been worked during most of the season, and 287 tons of ore, giving a gross yield of $14,523, have been extracted.

From the Silver Plate, situated northwest of Hamilton, 115 tons, giving a gross yield of $4,768.33, have been extracted and reduced during the year.

The Great Western, situated west of the Eberhardt, is owned by an English company, who have sunk two shafts, 80 feet deep, in limestone, with the vain hope of finding the west extension of the Eberhardt ore-body.

The Caspian has an incline 190 feet deep, a drift west from the bottom of the incline 60 feet, and one 40 feet in spar, with some quartz. The owners are still driving west toward the summit of Treasure Hill.

The Asbury, situated in the cañon east of the Eberhardt mine, has a tunnel 400 feet in length. The main tunnel is under contract to be run west 100 feet further; there are also two cross-drifts of 100 feet each in length to be run.

The Featherstone is situated west of Hamilton. It has been worked considerably during the year. Only 30½ tons of ore, giving a gross yield of $1,005.50, have, however, been extracted.

The Blair and Banner, Mahogany Cañon, has been worked on lease during most of the year. It has yielded 173½ tons of ore, worth $11,881.40.

In the Glazier a good body of fair ore has been exposed during the year. Work is suspended for the present.

The Caroline, Mount Ophir, has been worked quite extensively, and partly on lease. The vein is small, seldom exceeding one foot in thickness, but contains exceedingly rich ore, which is, however, refractory. The course of the ore-channel is north and south, and it appears to stand vertically.

A late communication of Mr. Brown informs me that there is but little that is worthy of note in mining affairs since he sent his report in November. The unusually severe weather experienced ever since the 20th of December had almost wholly suspended mining operations. A limited amount of prospecting work had, however, been carried on in localities where the conditions were favorable, and some new bodies of good ore had been brought to light.

The most important developments had been made in the Silver Plate mine, situated about one mile northwest of Hamilton, in the low foot-hills, a short distance east of the Truckee mine. The formation in this locality bears a strong resemblance to that near the Hidden Treasure, Sheboygan, and other mines at the north end of Treasure Hill. The ore is found lying between a limestone foot-wall and a slate or shale hanging-wall. Both walls are smooth and well defined, and lightly striated. The deposit has the appearance of being a sheet deposit, but probably further developments will disprove the theory, as it has in all the mines on the hill occupying a corresponding position. The ore-body exposed in the present workings is something over 100 feet in length, and from 4 to 7 feet in thickness, most of it of very fair grade, 75 tons lately milled having yielded at the rate of $80 per ton.

A new and apparently large body of excellent ore has recently been encountered in the Ward Beecher Consolidated, 30 feet east of the old works and at a slightly increased depth.

Ward Beecher South has materially improved during the last month. A new chamber has been opened 100 feet south of the Ladies' chamber. Its present dimensions are 60 feet in length by 30 feet in width and 40 feet in height. The ore-body developed in this mine, taken in connection with the Earl and Ward Beecher Consolidated, of which it forms a part, shows a continuous ore-channel over 700 in length, by an average thickness of about 60 feet, depth unknown, at 160 feet perpendicularly from the surface. This is the greatest depth yet attained. The ore yields as well as nearer to the surface, and from appearances may continue in that direction indefinitely. This deposit has yielded something over 25,000 tons of ore since it was first discovered in the Earl chamber, of an average value of something over $40 per ton, or, in round numbers, $1,000,000. The present yield is 50 tons of $50 ore daily.

The Aurora North has developed the finest body of ore at present worked in the district. The mill assay for the last month has run from $78 per ton to $128; present yield 40 tons per day; greatest depth attained in ore, 73 feet. The ore from the two last-named mines is transported to the mill by tramway at a cost of 65 cents per ton. The cost of mining per ton is estimated at $7 and milling at $8.

I have been furnished with the following detailed description of the Stanford Mill, and with an account of the mode of working, and the results obtained up to the middle of November, by Mr. B. N. Lilienthal, the chemist of the establishment.

The 30-stamp Stanford Mill, designed and built under the supervision of William H. Patton, esq., in 1869, at Eberhardt City, White Pine County, Nevada, consists of one main building, 58 by 164 feet, to which the engine and boiler building in the shape of an L, or a wing 38 by 42 feet, is attached.

The main building is subdivided as follows:

58 by 24 feet, ore-house.
58 by 16 feet, drying-room.
58 by 48 feet, battery-room.
58 by 60 feet, pan-room.
58 by 16 feet, retort and melting room.

The fall of the mill between dump-boards and tail-race is 44 feet, divided as follows:

8 feet between dump-boards and ore-house floor.
8 feet between ore-house floor and drier.
2½ feet between drier-battery and floor.
13½ feet between battery and pan-room floors.
12 feet between pan-room floor and tail-race.

44 feet, total fall.

The wing is subdivided as follows:

42 by 16 feet, engine-room;
42 by 22 feet, boiler-room;

and is built so as to bring the crank-shaft of the engine level with the cam-shaft.

The ore-house has a capacity of 350 tons when filled to the level of the dump-boards. There is a niche 8 by 10 feet in the center of its lower side for a Varney and Rix rock-breaker, the mouth of which is level with the ore-house floor. The drier, 52 by 10 feet, is divided into two equal portions, having each its own fire-place (6 by 2 feet in the clear) and chimney. Each has four flues, built of common brick, which are covered over with cast-iron plates, 36 by 30 by ¾ inches, joined at their ends by countersunk bolts and flanges. The straight dry-crushing battery of thirty stamps is divided into six batteries, each pair having one cam-shaft in common. The battery is a knee one, and has nothing peculiar in its construction. The stems are of 3-inch turned iron, placed 10 inches from centers, and weigh 750 pounds mounted, viz:

Stem	286
Boss	230
Shoe	120
Tappet	114
Total weight	750

The batteries make 98 drops of 8 inches per minute, and discharge on both sides, the stamps rising in the order 1, 4, 2, 5, 3. The screens have an inclination of 13 degrees from the perpendicular, No. 40 (1,600 meshes to the square inch) being used on the front and No. 30 wire screen on the back side. The batteries are fed by C. P. Stanford's self-feeder, which does its work satisfactorily. Double-armed cams are in use, constructed after an evolute of a circle, the distance between centers of cam-shaft and stem being $4\frac{3}{16}$ inches.

When a stamp drops 98 times per minute, the time during which one rises, drops, and is at rest, is—

$$t = \frac{60}{98} = 0.612 \text{ second.}$$

The time (t_1) of rising, by construction is $t_1 = 0.263$ second.

The time (t_2) required in falling 8 inches is—

$$t_2 = \sqrt{\frac{2h}{g}} = \sqrt{\frac{2 \times \frac{2}{3}}{32.166}} = 0.204 \text{ second,}$$

showing the time (t_3) of rest to be

$$t_3 = t - (t_1 + t_2) = 0.612 - (0.263 + 0.204) = 0.145 \text{ second.}$$

Rittinger, in his Aufbereitungskunde, gives as an empirical rule that the stamp requires 0.2 second rest. But the friction in a California battery is less than in a German one.

In addition, we find, by construction, that at the instant the stamp touches the mortar, the highest point of the ascending cam is 3¾ inches below the tappet, allowing a sufficient modulus of safety.

The theoretical horse-power required by the battery, when making 98 drops of 8 inches per minute is, calling—

$n = 98$ = number of drops per minute,
$w = 750$ = weight of a stamp in pounds,
$h = \frac{2}{3}$ = drop in feet,
$m = 30$ = number of stamps,

$$x = \frac{n \times w \times h \times m}{33000} = \frac{98 \times 750 \times \frac{2}{3} \times 30}{33000} = 44.54 \text{ horse-power.}$$

Fifty-five tons of ore per day for thirty-one successive days is the best record of the battlry; and forty-six tons of ore per day for fifty-four successive days is the worst record. (The stems had been worn so as to prevent the proper fitting of the guides.) In the first case we find that one horse-power per twenty-four hours crushes—

$$x = \frac{55}{44.54} = 1.235 \text{ tons.}$$

In the second case—

$$x^1 = \frac{46}{44.54} = 1.032 \text{ tons.}$$

A set of shoes and dies lasts about five months, and a set of cams about fifteen months. The pans are placed at right angles to the battery, in two rows of eight each, 15 inches below the level of the pan-room floor. They are the common flat-bottom pans, with steam-chamber, built by H. J. Booth & Co., 4½ feet in diameter, 32 inches deep, making 57 revolutions per minute, and holding 25 cwt. of dry pulp. Five feet lower, to each two pans, is placed one Belden settler, with wooden shoes, 7½ feet in diameter, 2½ feet deep, making 11 revolutions per minute, and discharging the amalgam through a siphon. The settlers have each four plugs placed respectively 6, 12, 17, and 22 inches from the top. The lowest plug is only removed during the clean-up. Five and a half feet lower are the agitators, one to each two settlers, 6½ feet in diameter, 2½ feet deep, making 17 revolutions per minute. They discharge into the tail-race, and can be run down by means of plugs. Two Knox pans, 4 feet in diameter, are used to clean the amalgam. There are four retorts, 14 inches in diameter and 6 feet long, each set in a furnace separate and independent from all the rest. Each of the two melting-furnaces is capable of holding a No. 50 graphite crucible. A set of pan-shoes and dies lasts about four months.

The machinery is driven by a 140 nominal horse-power horizontal engine furnished with Scott & Eckart's governor and cut-off, built by H. J. Booth & Co., San Francisco, who also constructed all of the other machinery of the mill. Steam is furnished by three tubular boilers, 52 inches in diameter, 16 feet long, and each containing 51 3-inch tubes. The boilers are in one bank, with no dividing walls.

The ore is principally chloride of silver in silicified limestone. An analysis of an average of South Aurora pulp, worked during six months, gives the following composition:

$Si\ O_3$	=	49.600
$Ca\ O\ Co_2$	=	48.808
$Fe_2\ O_3$	=	0.600
$Al_2\ O_3$	=	0.400
$Mg\ O$	=	A trace
$Ag\ Cl$	=	0.192
$H\ O$	=	0.400
		100.00

The ore is hauled to the mill by teams and unloaded on the dumping-floor, where it drops 8 feet into the ore-house. Thence it passes through the breaker, where it is reduced to egg-size, caught in an apron, and then distributed over the drier by means of wheelbarrows. Here it is turned until it is dry, then shoveled into wheelbarrows, and emptied into the hoppers of the self-feeders. The ore leaves the battery as very fine pulp, a mechanical analysis giving:

Water	0.400
Metallic iron	0.006
Silver	0.145
Remained on No. 40 sieve	0.025
Remained on No. 60 sieve	1.978
Remained on No. 100 sieve	16.150
Passed No. 100 sieve	81.296
	100.000

As the pulp is discharged from the battery it is caught in cars, which, when full, are run out, weighed, and charged into the pans in quantities of 20 to 25 cwt., according to the rapidity with which the battery furnishes it.

Method employed in working the ore.—The pans to be charged are filled partly with water; the pulp, 20 pounds of salt, and ¼ pound of commercial cyanide of potassium, (containing 55 per cent. K Cy, c. p.,) to each part, are added; the whole is thinned down to the necessary consistency with water. (When the shoes and dies are new, about 200 pounds of amalgam and quicksilver remain undischarged in the pan.)

The muller is then let down and left to grind for four and a half hours, then 250 pounds of quicksilver are added, and the grinding is continued for one hour. The muller is then raised so as to give the amalgam a chance to collect. Seven and a half hours after charging, sixty pounds of quicksilver are added, and the mass is thinned down with water. Eight hours after charging, the contents are run off into the settler, and the pan is ready for a new charge. Should, at any time during the charge, the quicksilver appear in bad condition, it is remedied by adding a small piece of cyanide of potassium.

The settler receives the contents of two pans, and all the additional water it will hold. The arms are kept revolving, the amalgam sinks to the bottom, collects at the siphon, and escapes through it into a tub. Six hours afterward the first plug is drawn, and a stream of water turned into the settler, the surplus, with the suspended sands, escaping into the agitator. Seven to seven and a half hours after the settler receives the charge, the second and third plugs, respectively, are drawn. The settlers are cleansed of the deposited sands every forty-eight hours. They are recharged in the pans with the pulp. The agitators receive the tailings from the settlers. They pass merely through these, so that the suspended sands and amalgam may have an opportunity to settle. A small stream of water runs continually into the agitator. The remainder run through the tail-race to the tailings-pile, where they are settled. The agitators are, once in twenty-four hours, relieved of the deposited sands which are recharged into the pans. These sands usually assay 50 per cent. of the ore-value.

The amalgam which passes through the siphons of the settlers is strained through No. 5 canvas strainers, and then carried to the cleaning-pans. There it is diluted with quicksilver and water, and a small piece of cyanide of potassium is added, stream is turned on, and the muller

is allowed to revolve for a few hours. If any iron shows itself, it is removed with a magnet, and then the amalgam is strained as dry as possible.

When 1,000 to 1,200 pounds of amalgam have accumulated, it is retorted and melted in the usual manner.

Sampling.—Every half hour the sampler goes around the battery, catching some of the pulp as it falls into the cars. This is placed in a box, the contents of which are thoroughly mixed every twelve hours. From this an average sample is taken, which is assayed. The tailings-sample is taken from the agitator half an hour after the second plug is drawn from the settler, dried, and assayed, and if it shows over 20 per cent. of the pulp-assay, the ore is not amalgamating well, which must be remedied.

The work of the mill during the past year can be seen from the following table:

Date.	Tons worked.	Bullion produced.	Percentage obtained.	Loss of quicksilver per ton in lbs.
January 17 to February 17	1,706 1541/2000	$56,202 47	84.84	2.20
May 1 to May 31	1,567 1200/2000	35,972 90	85.00	1.83
July 6 to August 3	1,327 1985/2000	42,797 34	85.80	1.53
August 6 to September 6	1,504 350/2000	64,733 68	88.29	1.68
September 20 to November 13	2,480 1620/2000	67,766 99	85 60	1.33

County assessor's returns of ore worked in White Pine district for the quarter ending March 31, 1870.

Name of mine.	Number of tons.	Pounds.	Gross yield.	Remarks.
Aurora South	3,292	800	$95,734 70	
Aurora Consolidated	1,669	1,570	33,032 69	
Alta	157	.....	1,570 00	Smelting ore.
Andrew Jackson	2	1,000	62 00	Do.
Butter Cup	4	461	133 98	Do.
Burning Moscow	9	500	762 58	
Binghampton	28	1,750	1,047 58	
Bounty	16	.....	192 50	Smelting.
Badger Hill	7	500	123 25	Do.
Bismuth	13	1,500	206 25	Do.
Chloride Flat Consolidated	1,750	.....	59,762 84	
Constitution	14	.....	1,032 66	
Cliff	10	914	446 80	
Chloride Flat	22	174	992 97	
Chibuahua	24	1,000	490 00	Smelting.
Cadiz	154	1,000	1,725 50	Do.
Crescent	53	1,500	337 50	Do.
Cohalco	13	.....	130 00	Do.
Cordoza	76	.....	680 00	Do.
Dell	3	370	158 90	
Don Juan	10	.....	80 00	Smelting.
Eberhardt	880	.....	34,011 36	
Earl	307	.....	614 00	
Elko	10	1,500	193 50	
Erie Company	18	1,500	337 50	Smelting.
Empress Josephine	22	1,000	450 00	Do.
Fletcher Mining Company	15	1,500	1,849 18	
Frazier Company	61	1,000	552 00	
Germania	20	.....	160 00	Smelting.
Hoosier State	6	.....	48 00	Do.
Hemlock	93	600	1,959 30	Do.
Iceberg	35	1,580	1,018 47	
Imperial	178	1,000	3,592 00	Smelting.
Jennie A	15	.....	225 00	Do.
J. C. Hill	18	896	862 11	

County assessor's returns of ore worked in White Pine district, &c.—Continued.

Name of mine.	Number of tons.	Pounds.	Gross yield.	Remarks.
Lockport	26	1,000	397 50	Smelting.
Mazeppa	8	1,660	255 64	
Nelson	1	55	126 29	
O. H. Treasure	464	1,000	27,334 08	
Owego	137	830	11,274 50	
Port Wine	4	.....	104 00	
Pinto	13	.....	130 00	Smelting.
Ralbet and Steele	22	.....	330 00	Do.
Stockholm	7	.....	210 00	Do.
Silver Wedge	81	1,000	2,005 30	
Summit and Nevada	148	1,725	6,214 18	
Sage Brush	97	1,250	2,390 76	
Silver Star Consolidated	37	.....	3,953 97	
Snow Drop	37	140	1,375 29	
Tom Paine	32	1,240	715 73	
United States	7	500	94 25	Smelting.
Wabash	178	500	6,114 83	
Montgomery	9	630	302 26	
Manhattan	16	1,930	596 87	
Mineral Point	22	1,000	270 00	Smelting.
Mollie Stark	128	.....	1,024 00	Do.
Miser's Dream	35	.....	280 00	Do.

County assessor's returns of ore worked in White Pine district during the quarter ending June 30, 1870.

Name of mine.	Number of tons.	Pounds.	Gross yield.	Remarks.
Aurora South	2,833	100	$133,982 67	
Aurora	568	275	15,220 27	
Autumn No. 2	41	1,307	2,604 17	
Alta	96	.....	576 00	Smelting.
Burning Moscow	26	205	4,234 70	
Butter Cup	5	428	201 86	
Banner State	91	222	2,872 47	
Bourbon	11	.....	352 00	
Baldy Green	11	805	300 90	
Blood & Co	19	1,900	1,300 94	
Bismuth	89	1,000	1,342 50	
Blue Cloud	12	.....	120 00	Smelting.
Big Treasure	3	1,000	87 50	
Chloride Consolidated	433	.....	10,439 63	
Chloride Flat	86	1,867	4,401 05	
Clyde	14	.....	532 00	Smelting.
Chaparell	51	1,000	1,249 00	Do.
Cadiz No. 2	71	.....	883 75	Do.
Cadiz No. 1	21	1,000	215 00	Do.
Chibuahua	9	1,000	190 00	Do.
Caroline	13	.....	130 00	Refractory.
Cream City	17	1,000	350 00	Smelting.
Derby	10	.....	1,600 00	Do.
Davis	11	240	417 24	
Delmonico	11	170	763 95	
Double Eagle	17	85	545 63	
Dickinson	11	.....	132 00	Smelting.
Eberhardt	186	1,485	3,809 53	
Empire	2	560	668 00	
Eunice	60	.....	1,326 40	
Emersly	12	922	619 14	
Elko	81	1,000	1,874 50	Smelting.
Empress Josephine	16	1,000	330 00	Do.
Fletcher	7	1,312	1,599 78	
Fay	7	1,500	310 00	Smelting.
Feney	13	500	132 50	
Frank Ruland	7	1,000	105 00	
Genesee	64	743	2,360 55	
Great Valley	74	.....	740 00	Smelting.
Hartwell	15	125	1,047 98	
Hemlock	229	205	6,128 49	
Iceberg	18	1,550	496 80	
Imperial	110	500	2,010 00	Smelting.
Jennie A	28	1,000	350 00	Do.
Kingley	15	500	122 00	
Mazeppa	1	775	714 45	
Mammoth	78	1,000	1,707 38	
Miser's Dream	69	.....	707 25	Smelting.

County assessor's returns of ore worked in White Pine district during the quarter ending June 30, 1870—Continued.

Name of mine.	Number of tons.	Pounds.	Gross yield.	Remarks.
Montezuma	37	1,000	450 00	Do.
O. H. Treasure	2,472	.....	119,425 27	
Owego	33	1,352	1,016 76	
Ohio State	6	955	213 37	
Post Hole	158	1,750	3,119 44	
Progress	9	461	508 39	
Promontory	24	.....	463 50	Smelting.
Roman Empire	19	1,000	243 75	
Summit and Nevada	758	1,500	23,629 72	
Sage Brush	24	859	792 00	
Silver Wedge	84	915	1,704 25	
Snow Drop	55	390	5,367 20	
Sierra Pasco	5	565	211 30	
Silver Star	2	1,164	373 22	
Stonewall	19	1,500	928 25	
Seymour No. 2	82	1,000	1,806 75	
Saratoga	4	1,790	235 52	
Saunders	3	566	218 61	
San Pedro	10	955	542 72	
Spanish	4	1,940	185 80	
Stamboul	4	1,441	264 77	
Smith, J. R	.....	1,550	119 05	
Silver Brick	9	1,000	133 00	Smelting.
Seto	11	1,000	105 00	Do.
Trench	104	.....	4,552 00	Refractory.
Do	12	852	447 43	Do.
Virginia	5	1,875	216 48	Do.
Wabash	292	685	5,919 93	
Wilson and Grasstree	12	.....	300 00	Smelting.
Wamebatia	10	.....	150 00	Do.
Waguleslicunian	8	.....	160 00	Do.
Virginia	2	.....	129 60	

Assessor's report of ore worked in White Pine district during the quarter ending September 30, 1870.

Name of mine.	Number of tons.	Pounds.	Gross yield.	Remarks.
Aurora South	2,889	150	$1,112,363 68	
Aurora	238	.....	5,446 19	
Aurora Consolidated	20	.....	100 00	
Autumn No. 2	52	462	1,833 63	
Burning Moscow	62	1,143	6,049 69	
Bourbon	66	99	2,120 22	
Bulliop Hill	27	804	1,439 71	
Belmont	1	1,442	140 55	
Bamboo	32	825	1,621 77	Smelting.
Bismuth	11	750	182 00	Do.
Blue Cloud	41	.....	451 00	Do.
Bowie and Brown	11	.....	130 00	
Chloride Flat	81	117	4,814 51	
Cheshire	2	906	201 70	
Copiapo	7	1,540	415 27	
Caroline	43	750	433 75	Refractory.
Colfax	13	500	202 50	
Camperdon	24	.....	192 00	Smelting.
Delevan	10	1,568	451 16	Do.
Eberhardt	116	.....	7,555 74	
Empire	9	1,264	1,126 71	
Eclipse	22	1,687	1,171 43	
Elko	23	1,000	470 00	Smelting.
Farewell	19	1,805	749 35	Do.
Failey	2	1,429	255 32	Do.
Frank, F. M	.....	108	378 00	
Frasier	48	.....	384 00	Smelting.
Fay	37	1,000	1,425 00	Do.
Great Basin	30	100	1,051 75	
Genesee	321	1,000	7,604 57	
Gilkey	3	1,492	329 43	
Gorrilla	13	116	425 77	
Garibaldi	4	818	210 60	
Gregory	8	1,250	279 90	
Hartwell	10	438	304 78	
Harrington	4	1,380	183 06	
Iceberg	27	1,400	664 75	

Assessor'e report of ore worked in White Pine district, &c.—Continued.

Name of mine.	Number of tons.	Pounds.	Gross yield.	Remarks.
Imperial	41	500	825 00	Smelting.
Indian Chief	11	1,134	765 78	
Jewett	5	292	419 57	
John Bull	10	500	143 50	Smelting.
Jennie A	22	380	266 28	Do.
Kit Carson	2	1,302	194 85	
Little Bilk	4	590	204 98	
Live Yankee	19	.....	323 00	
Miller	8	1,887	335 82	
McCormick	4	1,814	238 63	
Martin	.....	1,000	134 14	
Maria	7	824	518 09	
McBride	1	142	161 61	
Miser's Dream	20	.....	350 00	Smelting.
Mollie Stark	101	1,500	1,017 50	Do.
Maria Louisa	10	1,000	105 00	Do.
Madison	63	.....	353 50	Do.
Mapulesna	7	590	116 00	Do.
Nevada Star	16	.....	360 00	Do.
Nevada	195	1,057	7,295 70	
O. H. Treasure	1,333	.....	33,324 63	
Othello	2	1,371	261 60	
Pogonip	9	125	362 72	
Piermont	4	1,218	639 02	
Summit	28	947	848 65	
Silver Wedge	6	54	438 28	
Snow Drop	47	700	1,022 83	
Saratoga	13	652	836 60	
Spanish	15	1,690	726 84	
Scott	6	1,418	359 19	
Silver Plate	15	380	501 02	
Salazar	2	672	231 14	
Sheboygan	6	383	311 81	
Truckee	67	.....	6,495 23	
Ward Beecher	651	.....	17,520 00	
Winnebago	17	.....	246 50	Smelting.

Assessor's returns of ore worked in White Pine district during the quarter ending December 31, 1870.

Name of mine.	Number of tons.	Pounds.	Gross yield.	Remarks.
Aurora Consolidated	258	665	$9,470 46	
Aurora	49	1,928	1,160 16	
Aurora South	3,914	1,000	126,751 51	
Ballarat	5	1,935	388 60	
Bismuth	10	1,120	147 84	Smelting.
Black Diamond	3	608	370 77	Do.
Bowie and Brown	9	1,550	121 19	
Burning Moscow	33	1,900	925 14	
Cadiz	15	1,810	159 05	Smelting.
Charter Oak	13	278	851 00	
Cheshire	2	1,950	153 69	
Chihuahua	10	56	200 56	Smelting.
Copley	4	1,728	229 63	
Dubuque	19	588	192 94	Smelting.
Eberhardt	330	225	12,101 92	
Eclipse	.....	1,800	408 00	
Enterprise	17	.....	1,324 64	Smelting.
Farewell	11	.....	110 00	Do.
Fay	15	.....	450 00	Do.
Great Valley	13	.....	130 00	Do.
Hemlock	27	594	1,127 10	
Iceberg North	4	1,945	145 41	
Iceberg and Indiana	9	1,352	523 47	
Indiana	21	750	760 62	
Maryland	11	1,328	1,149 55	Pinto district.
Do	31	.....	4,250 10	Do.
Mammoth	.....	656	119 16	
McNevin	2	1,760	455 64	
Mineral Point	18	116	180 58	Smelting.
Miser's Dream	33	1,270	470 89	Do.
Mollie Stark	44	.....	440 00	Do.
Mono	7	1,947	581 58	Do.
Noel	7	.....	425 95	Do.

Assessor's repor of ore worked in White Pine district, &c.—Continued.

Name of mine.	Number of tons.	Pounds.	Gross yield.	Remarks.
Noonday	25	585	641 16	
O. H. Treasure	996	.....	20,940 90	
Pocotillo	1	244	178 65	
Sierra Pasco	10	1,125	425 97	
Seymour and Darby	14	760	571 00	
Sheboygan	5	750	192 01	
Silver Plate	62	1,321	1,661 75	
Silver Wave	15	.....	409 50	
Snow Drop	26	.....	903 50	
Snow Drop South	129	233	3,402 08	
Summit and Nevada	248	1,839	9,613 27	
Toll Road	8	1,458	78 00	Smelting.
Trench	10	.....	670 00	Refractory.
Do	5	1,660	459 23	Do.
Truckee	36	1,865	3,210 90	
Uncle Sam	8	.....	192 00	Smelting.
Ward Beecher	1,457	562	80,565 78	
Do	55	.....	6,266 15	
Waterloo	9	885	165 24	
Yosemite	29	1,192	295 96	

The smelting-ore was in all cases sold on the dump, and those mines here marked "smelting" constitute less than one-half of those from which ore was extracted for that purpose. To get at a correct estimate of the ore worked in this district it will be necessary to add about one-quarter for small lots and low-grade ore not taxable.—A. J. B.

Statement of ore worked in White Pine during the quarter ending March 31, 1871, (taken from assessor's books.)

Name of mine.	Tons.	Pounds.	Gross yield.	Cost of extraction.	Remarks.
Aurora South	1,553	200	$50,756 00	$14,754 45	
Aurora Consolidated	14	1,351	1,464 40	763 86	
Banner State	80	1,000	5,847 00	2,775 50	
Black Jacket	15	1,386	1,709 40	.....	
Belmont	325	1,800	3,391 50	651 80	
Bourbon	27	365	2,125 25	1,094 82	
Charter Oak	29	704	582 50	293 50	
Compromise	4	1,320	915 52	.....	
Dahlgren	1	800	199 35	35 00	
Dominion	2	1,005	180 26	50 00	
Empire State	3	100	365 61	.....	
Emerald Isle	3	796	262 00	524 75	
Genesee	148	1,250	5,366 00	1,411 94	
Do	21	1,500	727 00	200 00	
Do	500	500	4,875 00	.....	
Iceberg South	17	500	1,346 50	155 25	
Hemlock	11	100	828 50	121 55	
Maryland	32	.....	3,194 80	812 50	Pinto district.
Mazeppa	6	100	623 00	476 00	
Metropolitan Mill	548	.....	2,304 87	.....	Tailings.
McCormick	.....	1,739	234 44	30 00	
Mountain Chief	9	75	411 70	.....	
Nettie McCurdy	6	1,405	975 00	.....	Warm Spring district.
O. H. Treasure	64	.....	1,310 72	320 00	
Oakland	1	1,000	174 00	100 00	
Pope	2	305	235 61	.....	
Summit and Nevada	24	1,787	1,092 82	128 93	
Silver Wave	79	1,180	2,044 44	795 00	
Silver Plate	30	1,265	973 66	1,181 50	
Stonewall	331	1,900	3,497 25	.....	
Smith	1	1,250	195 66	100 00	
Sentinel	1	28	138 25	.....	
Swansea Mill	900	.....	4,506 34	.....	Tailings.
Truckee	16	200	1,308 12	483 00	
Trench	14	100	4,350 00	1,689 60	Ore refractory.
Treasure Hill Mining and Melting Co.	1,208	.....	17,274 00	.....	
Uncle Sam	6	1,279	1,716 70	.....	Argentiferous galena.
Virginia	224	1,546	11,649 98	1,123 86	Refractory.
Wabash	9	1,000	724 50	104 50	
Ward Beecher	964	649	99,485 25	7,328 86	

Statement of ore worked during the quarter ending June 30, 1871.

Name of mine.	Tons.	Pounds.	Gross.	Net.	Remarks.
All Around	1	619	$214 82	$107 41	
Bourbon	124	1,235	2,355 31	471 06	
Bowie	16	1,331	907 03	366 81	
Baffman	3	1,000	270 62	108 25	
Caroline	2	178	1,090 55	545 27	Refractory.
Chloride Flat	501	1,625	13,683 35	2,736 67	
Eberhardt and Aurora	2,972	.....	165,060 00	85,125 51	
Flynn	.....	604	347 00	173 50	
General Lee	4	1,255	137 67	.....	
Hamilton	8	854	903 79	451 89	
Iceberg North	2	1,404	106 93	42 77	
Lew Morgan	.....	1,500	273 85	136 92	
Lucky Boy	3	1,300	287 75	115 10	
Manhattan Mill	.....	.....	2,233 00	.....	Tailings.
Montgomery	6	990	263 43	105 38	
Metropolitan Mill	1,119	.....	4,460 63	.....	Tailings.
Mazeppa	1	1,411	1,101 45	550 72	
Noonday	6	115	250 00	100 00	
O. H. Treasure	107	1,185	7,223 57	2,889 43	
Do	126	1,790	507 58	.....	Sold.
Panlding	1	1,978	279 00	139 50	
Powell	1	782	308 65	154 32	
Piermont	446	.....	4,395 97	439 60	Piermont district.
Republic	3	1,546	673 60	336 80	
Sheba Mill	726	.....	6,500 00	.....	Tailings.
Silver Plate	45	550	1,684 87	673 94	
Silver Wave	215	550	8,554 69	3,421 87	
Smith	18	1,410	1,498 88	599 55	
South Aurora	1,065	1,575	22,227 65	4,475 93	
Summit and Nevada	31	1,643	1,736 68	1,096 68	
Treasure Hill Mining and Melting Co.	1,040	.....	5,616 00	.....	Tailings.
Trench	30	383	7,714 37	3,857 18	Refractory.
Truckee	43	1,411	2,856 94	1,134 77	
Uncle Sam	13	996	1,518 15	759 07	
Virginia	62	1,940	2,040 93	816 37	Refractory.
Ward Beecher Consolidated	227	.....	5,873 55	1,767 55	

Statement of ore worked during the quarter ending September 30, 1871.

Name of mine.	Tons.	Pounds.	Gross.	Net.	Remarks.
Alceon	12	1,000	$860 00	$344 00	
Black Jacket	13	1,000	411 50	164 60	
Blair and Banner	92	1,750	6,044 50	2,417 80	
Smoky Mill	498	.....	3,486 00	.....	Tailings.
Caroline	5	911	1,823 78	830 06	Refractory.
Chloride Flat Consolidated	163	1,700	8,129 50	3,250 80	
Copper-Silver Glance	9	1,500	354 25	141 70	
Crown Point	1	300	250 00	125 00	
Daisy	12	1,400	613 00	245 00	
East Sheboygan	12	.....	538 00	215 20	
Eberhardt and Aurora	5,874	.....	231,680 33	99,436 80	
Do	364	.....	.....	.....	Tailings.
Featherstone	30	1,000	1,005 50	402 20	
O. H. Treasure	1,162	300	48,540 00	19,416 00	
Metropolitan Mill	540	.....	1,869 12	.....	Tailings.
Moffit	3	500	411 60	205 80	
Piermont	538	.....	7,456 68	1,491 34	Piermont district.
Sheba Mill	362	.....	1,349 00	.....	Tailings.
Silver Plate	38	1,500	2,110 00	844 00	
Silver Wave	5	100	232 50	93 00	
South Aurora	1,171	500	28,623 00	5,724 60	
Summit and Nevada	279	650	5,865 89	1,181 87	
Truckee	26	300	1,940 00	776 00	
Trench	24	360	6,674 00	3,297 00	Refractory.
Ward Beecher Consolidated	2,258	.....	56,103 04	13,353 04	

WHITE PINE

MY 1961

Exploratory drilling for copper was in progress in the *White Pine* district by Homestake Mining Co. Only subcommercial mineralization was discovered, and the project was abandoned late in the year. In the same district lead ore that contained recoverable gold, silver, copper, lead, and zinc was shipped from the Hamilton mine.

MY 1962

The major sources of recoverable zinc were Mountain View mine (zinc ore), Eureka County; Galena mine (old lead tailings), Lander County; and Hamilton mine (lead ore), Willard mine (zinc ore), and Ward Group (silver ore), White Pine County. In contrast with 1961, about 51 percent of the zinc output was recovered from zinc ores; 20 percent from silver ores; 25 percent from lead ores, residues, and tailings; 3 percent from copper ores; and the remaining 1 percent from lead-zinc and gold ores.

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MY 1962

Lead ore mined from the Hamilton mine and copper-lead-zinc ore from the Grand Prize mine, White Pine district, were shipped to a Utah smelter for recovery of silver, copper, lead, and zinc. The Hamilton mine also yielded a few ounces of recoverable gold.

County assessor's returns of ore worked in White Pine district for the quarter ending December 31, 1871.

Name of mine.	No. of tons.	Pounds.	Gross yield.	Remarks.
Caroline	20	400	$5,101 00	
Eberhardt and Aurora	7,135	.....	145,643 00	
East Sheboygan	15	400	1,075 80	
Edgar	377	.....	6,972 25	
Iceberg	334	320	17,946 62	
Manhattan	49	1,000	1,530 00	
Noonday	6	1,800	792 50	
O. H. Treasure	660	1,800	12,790 87	
Do	47	.....	327 85	Tailings.
Oasis	176	.....	1,139 78	Do.
Piermont	236	.....	5,099 80	Piermont district.
Pocatillo	70	1,800	2,684 40	
Swansea Mill	600	.....	3,300 00	Tailings.
South Aurora	2,075	1,500	47,135 90	
Silver Plate	41	100	1,588 75	
Silver Stone	6	1,500	1,350 00	
Truckee	7	1,500	682 50	
Trench	61	1,200	10,105 91	
Ward Beecher Consolidated	150	.....	6,370 00	
Manhattan Mill	137	.....	12,577 00	Tailings.
Do	250	.....	3,625 00	Ore purchased.
	7	.....	1,000 00	Name of mine not given.