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ITEM  
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August 8th. 1898.

Dear Sir, of the.

Having recently, at your request, examined  
the mining claims known as the "Shamrock Group", sit-  
uated near Iron, Nevada, and belonging to your Nevada  
Company, I beg leave to submit the following report of  
my observations and conclusions concerning their pre-  
sent condition and prospective value.

The group comprises a number of claims, the most important of which are known as the Indianapolis-North Star, Cleveland and Wild Emigrant; to the eastward of the last named lie some less important claims called the Phonograph, Brown, Stonewall, Violet or Storm King (lying north of the Emigrant); to the westward of the Cleveland or Keystone are others, known as the Crown, Silver Moon and Clipper; and south from the Crown is the Shamrock-Berlin.

The relative positions of all these claims may best be seen on the map of the properties in your

possession. They lie mainly along the southerly slope of the hills which form the north side of Shamrock Canyon, stretching **18 Wall Street, New York.** direction from the town of **August 8th, 1898.** and central claim is the Indianapolis-North Star, from which, in both directions, east and west, the claims extend so as to cover the **J. G. Phelps Stokes, Esqre.,** of the lode-formation for a distance of **President Nevada Company.**

**Dear Sir,** The country rock appears to be generally barren, with other occurrences of minerals.

Having recently, at your request, examined the mining claims known as the "Shamrock Group", situated near Ione, Nevada, and belonging to your Nevada Company, I beg leave to submit the following report of my observations and conclusions concerning their present condition and prospective value.

The group comprises a number of claims, the most important of which are known as the Indianapolis-North Star, Cleveland and Wild Emigrant; to the eastward of the last named lie some less important claims called the Phonograph, Brown, Stonewall, Violet or Storm King (lying north of the Emigrant); to the westward of the Cleveland or Keystone are others, known as the Crown, Silver Moon and Clipper; and south from the Crown is the Shamrock-Berlin.

Under these circumstances only the richest and most carefully selected ore could be shipped at all.

The relative positions of all these claims may best be seen on the map of the properties in your

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possession. They lie mainly along the southerly slope of the hills which form the north side of Shamrock Cañon, stretching for a mile or two in an easterly direction from the town of Ione. The main and central claim is the Indianapolis-North Star, from which, in both directions, east and west, the claims extend so as to cover the probable place of the lode-formation for a distance of about 7,000 feet. The country rock appears to be generally diorite, with other occurrences of metamorphic rocks.

Constructed, many years ago, as a custom mill for the treatment of silver ores by roasting and amalgamation, and long since abandoned by its owners.

The best known mines of this high taxation of the district were discovered and opened

HISTORICAL These many years ago and are said to have yielded products of considerable value, of which, however, no precise or authentic records appear to be available at the present time. The ores of the district generally appear to have been valuable mainly if not only for silver, occurring usually in the form of rich mineral, not easily treated by ordinary milling methods. There being no suitable reduction works in the neighborhood, the ores could be disposed of only by shipment to distant places at high costs for freight and treatment. Under these circumstances only the richest and most carefully selected ores could be shipped at all, and these with very questionable profit when silver was at

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its standard value; so that these operations necessarily ceased altogether when the low price for silver made any profit whatever almost if not quite impossible. The district has therefore been practically abandoned for a long time, except by one or more parties who, during the past few years, have carried on small operations, consisting mainly in working over the old dumps, selecting the best of the ores remaining there and treating them in the Knickerbocker Mill, a large and costly establishment, constructed, many years ago, as a custom mill for the treatment of silver ores by roasting and amalgamation, and long since abandoned by its earlier owners on account of the lack of business and inevitable high taxation of the idle property.

These recent operations, although small, are said to have afforded some profit, a few thousand dollars, to the parties engaged in them on lease or royalty, mainly by working ores already mined and obtainable at only the cost of sorting or selection from the dumps on the surface.

of these mines, together with the purchase of the above mentioned Knickerbocker Mill and its reconstruction and equipment for milling the ores.

The ores of the Indianapolis and other mines under present consideration, although carrying the larger portion of their assay value in silver, have almost always contained a little gold therewith as-

**GOLD-BEARING**

**ORE**

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sociated; and it has not been unusual to sometimes find a larger proportional value in the richer minerals, occurring in the vein. Free gold has also sometimes been found in valuable bunches or pockets in the quartz; and it is said that one such pocket found some years since in, I believe, the Cleveland Mine, yielded some thousands of dollars.

This well established fact of the almost constant association of some gold with the ores of this group of mines, considered together with the more or less rare occurrence of rich gold bearing mineral in some of the quartz veins, would seem to have recently given encouragement to the belief that these mines, on deeper development, might be worked profitably for gold, without depending for success upon the value of the silver therewith contained; and it was with this expectation (based upon the representations of your advisers that the ores might yield \$15. to \$20. per ton, in gold) that your Company undertook, some time last year, the purchase and reopening of several of these mines, together with the purchase of the above mentioned Knickerbocker Mill and its reconstruction and equipment for milling the gold-bearing ores by the usual methods of amalgamating the free gold on plates and concentrating the sulphurets and other valuable mineral on Frue Vanners. The incline follows downward the northeasterly dip of the vein, at an angle of about 40 degrees. At the depth of 275 feet (on the incline)

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the present main level is open in the northwestern and southwestern directions. During the nine months or more which have passed since your report, at both ends of the main level, the Company acquired these properties, the work of development has been carried on more or less vigorously in the Indianapolis-North Star, the Cleveland and Wild Emigrant, besides some less important operations in one or two other claims. These developments, although not very extensive, have been sufficient to afford some definite and accurate knowledge of the character of the veins under consideration and the value of their ores. The Knickerbocker Mill has been put in repair at a considerable cost, furnished with all necessary appliances and kept in operation during about three months. About 1,100 tons of ore from several mines have been worked, with results which, although very unsatisfactory and discouraging, may be regarded as decisive.

It is fairly continuous

hardly to be seen in some

based on measurements

valley for the whole length

level, is 18 inches.

or less charged with a

ing plant.

The incline follows downward the northeasterly dip of the vein, at an angle of about 40 degrees. At the depth of 275 feet (on the incline)

#### INDIANAPOLIS

The central and principal claim of the group is the Indianapolis. This is opened by an inclined shaft, recently equipped at the surface with a light hoisting plant. Eight samples of the vein, Nos.

6.

the present main level is opened by drifts in both directions, northwesterly and southeasterly, together about 270 feet, at both ends of which breaks have been found, crossing the formation and dislocating the vein.

The ground between these two breaks and between this main level and the surface, has been mined and the available ore found therein is said to have been taken out.

This block of ground has been the source of nearly all the Indianapolis product in past times, including something mined there during the operations, already referred to, of the last few years.

It is said to have yielded some valuable ore; but no precise record of its output is now available.

As mentioned. At the time the vein had not been taken out.

I have carefully examined the Indianapolis vein along this

the MAIN DRIFT shaft, in which it is shown

it and the value of the vein for a distance of 270 feet

between the breaks at both ends.

It is fairly continuous although pinched very small and hardly to be seen in some places.

Its average thickness based on measurements taken across it at frequent intervals for the whole length of the drift on the main

level, is 18 inches. The vein is mainly quartz, more or less charged with a variety of metal bearing minerals, generally pyritous, with some galena, zinc blende, gray copper, etc., all having more or less silver and little gold in association. Eight samples of the vein, Nos.

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II to 18 inclusive, were taken in this drift, at intervals of about 25 feet, where any vein was visible. They show an average contents of 3.42 ounces of silver and \$1. in gold, per ton. This value is much too low for profitable mining under conditions now existing here or under any circumstances probable. the value of

VALUE OF THE

ORE

BELOW MAIN LEVEL

the ore of this mine so far ob-

tained Below this main level the

inclined shaft is known to be

extended but for an uncertain

depth. This work was done

ing at present prices long ago. The incline stands filled with water up to the level of the main drift before mentioned. At the time of my visit this water had not been taken out since your purchase, nor, apparently, for many years before. The actual depth of the inclined shaft, the character of the vein shown in it and the value of the ore found therein are all matters of various traditions. The shaft is generally believed to extend about 75 feet below the level but some statements make it much deeper. It is said by some that a vein of rich ore was cut in the bottom, together with a large volume of water which drove the miners out and the absence of sufficient pumping capacity or other facilities for raising the water, has since made further sinking impracticable. It may be impossible to know the truth; but it will be only prudent to apply to these statements the same discount which from the main inclined shaft. The North Star vein



concerning the name of the ore deposit at the time  
has been going oblique to the observations made

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has also been opened by an incline sunk from the surface long ago, it is said to a depth of 192 feet, by the earlier owners, developing the vein somewhat and showing it to be generally similar in character to the Indianapolis. It is since your purchase of the property that the North Star vein has been opened in greater depth by means of the above mentioned cross-cut from the Indianapolis main level.

From the intersection of the cross-cut, a drift has been opened on the North Star vein for a distance of about 135 feet, encountering a break in the formation at each end, cutting off and dislocating the vein; and a stope has been raised along this entire length which, at the time of my visit, was from 10 to 30 feet high. The vein shows a width of one to three feet and sometimes more. Two samples were taken in the roof of this stope, No. 55 about 10 feet above the top of the drift and 7 feet west of the cross-cut, across a width of one to two feet, yielding on assay \$2.80 in gold and 9.10 ounces of silver, per ton, and No. 56, taken 20 feet above the level, 15 feet east from the cross-cut and across a width of four feet, yielding on assay \$0.80 in gold and 10.30 ounces in silver, per ton. The product of this stope forms the principal part of the ore sent to the Knickerbocker Mill from the Indianapolis-North Star Mine, the results of which have already been referred to and are set forth in detail later on, of the North Star vein.

At 250 feet from the Indianapolis vein

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*this south cross-cut, driven prior to your purchase.* A considerable amount of exploration work has also been done on this main level of the mine, especially seeking the further extension of the Indianapolis and North Star veins beyond the breaks already mentioned, which have cut off and dislocated them. At the west end of the above described workings on this level a long cross-cut has been driven, following the course of the main break from its intersection with the above mentioned veins and extending in a south-westerly direction for a distance of 250 feet from the main drift on the Indianapolis vein. Along the course of this cross-cut two occurrences of quartz and ledge matter have been found on the west side of the break, which, from their relative distances (about 150 feet respectively) from the North Star and Indianapolis veins, have been regarded as the dislocated portions and continuing extensions of these two veins. Drifts, 50 to 60 feet in length, have been begun at each of these two points, each following a ledge for some distance (perhaps 20 feet) but ending in broken or unsettled ground, without any well defined vein in sight. A small stope has been raised on each, 30 to 40 feet high, showing a vein about one to two feet thick and generally similar in appearance to the main veins. Some ore has been taken from these stopes and milled with the recent product of the North Star vein.

At 250 feet from the Indianapolis vein some other intervening or intermediate break, possibly

this south cross-cut, driven long since and wholly prior to your purchase, had encountered a small vein, apparently nearly parallel to the general course of the Indianapolis workings, which appears to have been developed to some extent by drifts and cross-cuts, as shown on the map in your possession, several hundred feet long in the aggregate, with one or more upraises and, apparently, some stoping. The veins, wherever accessible or exposed to view, are very small and unpromising in appearance. The ground is much broken and unsettled, with little if any indication of visible or prospective value.

EXPLORATION  
AT EAST END

Some exploration has also been done at the eastern end of the mine-workings on the Indianapolis, by which a considerable area of ground has been partially prospected without, so far, any encouraging results. From a point on the main drift, about 160 feet easterly from the Incline and about where the vein is cut by the easterly break, a cross-cut has been driven in a north-easterly direction, presumably along the line of break in a general way, for a distance of 120 feet or more. If the North Star vein were continuous and in its proper place, it should so appear or be found in this cross-cut (see map); but there is no visible indication of it and the presumption is that the North Star vein is broken and dislocated by some other intervening or intermediate break, possibly

the one which is now seen in the east end of the drift on the North Star vein, as already mentioned. This cross-cut discloses nothing of practical value. At its extreme end it connects with other older exploring drifts not now accessible but said to extend for several hundred feet, one in a northerly and another in an easterly direction, the latter being under the ground of the Wild Emigrant Claim, so far as known or reported, developing nothing of value. is reached by a short cross-cut (20 feet) at the first level, about 100 feet, or more, down on the incline, at which point the first level is opened about 40 feet, and the drift is shown. In the west drift a small vein, two feet wide, is showing to the east. The Wild Emigrant is near the foot, where it is cut Indianapolis at the easterly end being WILD country rock of the last named claim. Their

EMIGRANT Below boundary endlines do not join the occurrence of each other but they are close neighbors and the ground of the Emigrant claim would seem to have been somewhat prospected by the drift just mentioned, which is shown on the map as being 300 feet within its lines.

The Emigrant claim is said to be 1,000 feet long. A ledge or vein of very well defined character is traceable along its surface and has been opened by surface workings for a long distance. They show a vein generally parallel to the course of the Indianapolis and North Star and similar in dip. It might be identical with one of these veins, as a dis-

cross-cut discloses nothing of blackish nature. It is on the north side near as already mentioned. This the one which is now seen in the east end of the drift

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located portion, lying a little further, about 150 feet, to the north.

It is opened by an Incline which is about 750 feet from the Indianapolis Incline, measured in an easterly direction along the general trend of the lode. This Incline is about 227 feet deep, measured on a dip of about 40 degrees and in a north-easterly direction. The upper portion of the Incline appears to underlie the vein, which is reached by a short cross-cut (20 feet) at the first level, about 100 feet, or more, down on the Incline, at which depth the first level is opened about 40 feet <sup>west</sup> and 30 feet east. In the west drift a small vein, two feet wide, is showing to the end; in the east drift the vein shows for about 15 feet, where it is cut off by a break, the end of the drift being in country rock.

Below the first level the Incline shows the occurrence of the vein in places. The second level is opened at the bottom of the Incline. It is about 207 feet long, opened about equally east (105 feet) and west (102 feet). The vein shows a width of one to three feet for the greater part of its distance, averaging between one and two feet.

This mine is not furnished with steam hoisting machinery. It has been operated with a horse whim. About 100 tons of ore were taken from these workings to the Knickerbocker Mill for the run of 1,100 tons, recently made there, the results of which are stated elsewhere. The ores of this mine, from Indianapolis-North Star on the west, is

It is observed that the machine is a-  
located below, about 120 feet

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samplings made from time to time by the Superintendent during the mill runs referred to, are said to have yielded on assay \$3. to \$4. in gold and 6 to 8 ounces of silver per ton. This was found to be confirmed by the record of assays in the Assay Book at the Mill, identical with the Indianapolis or one of the veins opened on that claim.

The Cleveland is opened by a tunnel driven on the vein, bearing The properties of the Company west of the mouth of extend in an easterly direction more than 1,200 feet beyond the 300 EASTERLY CLAIMS east end line of the Emigrant, a- gently, giving 90 to long the general trend of the lode formation, covered by the claims of the Phonograph (about 200 feet long), the Stonewall and Brown (parallel claims) 800 to 1,000 feet long (see map). The Violet or Storm King (1,000 by 350 feet), also a part of the Company's property, lies 500 to 1,000 feet north of the Emigrant, more or less parallel thereto, and contains a mine once well equipped and opened to a considerable depth which, long ago, was specially notable among the mines of the neighborhood as a producer of rich silver ores. It has been inactive and practically abandoned since the great decline in the price of silver.

visible vein.

Above the level of the tunnel for the Cleveland is a vein of about 100 feet. Closely neighboring to though not exactly adjoining the Indianapolis-North Star on the west, is

the Keystone Patent, 1,000 feet long by 600 feet wide, covering the mining claims known as the Keystone, Savage, Cleveland and Florence. The principal workings are on the Cleveland vein, which is generally regarded, though differing somewhat in course and dip, as identical with the Indianapolis or one of the veins opened on that claim.

The Cleveland is opened by a tunnel driven on the vein, beginning at a point about 900 feet west of the mouth of the Indianapolis Incline and following the vein in a north-westerly direction for about 300 feet, above which tunnel level the surface rises gently, giving 90 to 100 feet of ground standing over the tunnel at the Incline shaft, which is about 200 feet distant from the mouth of the tunnel. This Incline, recently equipped with light hoisting machinery, is sunk on the vein from the surface to the tunnel and also about 60 feet deeper; but no drifting or other development of the vein has been done below the tunnel level. Nearly if not all the above described work was done long ago by former owners. Since your purchase, the tunnel has been further extended, beyond the Incline, following the vein for about 50 or 60 feet, where a break in the formation cuts it off. The tunnel is driven on about 40 feet further without any visible vein.

Above the tunnel level and for the distance of about 100 feet from the tunnel mouth, the vein was stoped by the former owners quite through to the

200000. The following are the results of the analysis of the ore. The analysis shows that the ore contains 1.000 per cent of gold and 100 per cent of silver.

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surface, showing a width of three or four feet. Further in, above the tunnel and near the incline, the ground has been somewhat stoped in the course of your recent operations, about 100 feet long and 20 feet high, from which source came the larger portion, about 350 tons, of the ore which was lately taken from this mine and milled at the Knickerbocker Mill.

These developments show a vein more or less continuous for 250 feet in length and averaging between two and three feet in width. It is said that in the earlier workings of this mine, a bunch or pocket of ore was found, which yielded some thousands of dollars in gold; and this fact or tradition seems to have given occasion to the belief that the mines of this district might be worked profitably for gold.

In the recent operation of this mine, nothing has been found to realize this expectation. The most favorable report of indicated value is the result of a sampling of 20 tons of ore, broken near the so-called Phillips stope, which is said by Mr. Powell, Superintendent, to have shown, on assay, 31 ounces of silver and \$6.00 in gold, per ton.

The mill results, as shown further on, afford no satisfactory indication of the value of the gold contained in the ore.

The samples taken at the mill from the wagons delivering the ore there, during the recent run, show an average assay result of 14.44 ounces of silver and \$1.36 in gold, per ton. 2 ounces of silver and \$1.20 in gold per ton.

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A short series of samples (Nos. 48 to 52 inclusive) were taken in the mine, at more or less regular intervals along the vein showing in the tunnel and stopes, which gave an average assay result of 3.6,000 ounces of silver and \$1.40 in gold, per ton, the average width of vein sampled being 2.3 feet.

These claims are known as the Crown, the Silver Moon and the Clipper, the last named patent covering the claims known as the Incline.

About 30 feet north-west of the Incline, at the main tunnel level, a cross-cut is driven in a south-westerly direction for a distance of about 70 or 80 feet, where it cuts a small parallel

vein known as the West Cleveland. This ledge is said to have been somewhat developed with very encouraging results by the former owners in other workings made from the surface, not now easily accessible. The cross-cut here referred to has been driven during your later operations.

The West Cleveland vein, where cut, shows a thickness of a few inches to something over a foot. At time of my inspection a little drifting had been done each way. Two samples (Nos. 53 and 54) were taken at the southerly face, one across a three inch seam, forming the richer part of the vein, which gave assay results of 20.6 ounces in silver and \$4.80 in gold, per ton; the other across 15 inches of vein, including the three inches of the foregoing sample (53) which yielded, on assay, 8.2 ounces of silver and \$1.20 in gold per ton. Two shafts, one

...along the vein showing in the tunnel and  
(inclined) more taken in the mine of more or less lead-  
...a short series of samples (Nos. 48 to 28

18.

18.

vertical and one inclined West of the Keystone there at  
apart, and connected here three other patented claims  
being WESTERLY in too far belonging to your Company, ex-  
which CLAIMS evidently extending for a distance of 2,000  
one or more veins which to 3,000 feet along the general  
...direction of the lode formation.  
These claims are known as the Crown, the Silver Moon  
and the Clipper, the last named patent covering the  
claims known as the Louisville, Shaw, Belcher and Van-  
derbilt. ... at bottom of the incline, gave an assay  
result of 1.50 ounces of silver per ton, ... gold, per  
ton.

#### CROWN

On the Crown claim are several surface openings and inclined shafts of more or less depth, all done long ago and now generally inaccessible below the surface.

They indicate in a general way the extension of the  
lode or lode-formation through this claim, south from  
the Crown, more or less parallel thereto and on the opposite side  
of Shoshone Canon.

#### 600 SILVER MOON

A two claim with very little if any distance (118 feet by apparent development) to this claim, without reaching, so far, any very definite results. This tunnel was inaccessible at the time of my visit.

#### CLIPPER

The Clipper has evidently received a good deal of attention from former owners and has been somewhat extensively prospected. Two shafts, one

vertical and one inclined and, perhaps, 200 to 300 feet apart, are connected below ground, at a depth of something less than 100 feet, by drifts and cross-cuts which have evidently been driven to find and prospect one or more veins which appear in various portions of the workings in a somewhat ill-defined and broken up condition. Our examination of these workings disclosed nothing of practical value, visible or prospective. One sample, taken across a narrow vein (8 inches) of quartz at bottom of the Incline, gave an assay result of 1.60 ounces of silver and \$0.40 in gold, per ton. The mill, built, about thirty or more years ago, of brick and stone and completely furnished at that time with all necessary appliances for treating ore by roasting and grinding. It was owned by The Company's Shamrock property also includes another claim of SHAMROCK sufficient known as the Berlin, lying about the BERLIN was about a quarter of a mile south from the CROWN, more or less parallel thereto and on the opposite side of Shamrock Cañon. It is about 1,000 feet long and 600 feet wide. A tunnel has been driven for some distance (118 feet by your Company) to develop this claim, without reaching, so far, any very definite results. This tunnel was inaccessible at the time of my visit. The mill was repaired for one thousand dollars by Thomas Mitchell who repaired the Mill at considerable expense (\$2,000.) sufficiently for the purpose of milling ores

**KNICKERBOCKER****MILL**

The Knickerbocker Mill, belonging to your Company, was acquired with the Shamrock properties (or at about the same time) and is situated between two and three miles from them in a southerly direction. A fairly good wagon road connects the mines and mill; and a steel rail tram road, about 15,000 feet in length, was in course of construction and nearly completed at the time of my visit.

The mill is a large and costly establishment, built, about thirty or more years ago, of brick and stone and completely furnished, at that time, with all necessary appliances for treatment of silver-bearing ore by roasting and pan or barrel amalgamation processes. It was originally intended for a custom mill but the enterprise seems to have failed by reason of the lack of sufficient business to support it. The property was practically abandoned some time since by its earlier owners who, finding the high taxes too burdensome in its idle and unproductive condition, suffered the property to be sold by the Sheriff in default of their payment.

It was shortly after Mitchell's operations that your Company purchased the property and proceeded to add more stone

**MITCHELL'S****OPERATIONS**

It was purchased, it is said, for one thousand dollars by Thomas Mitchell who repaired the Mill at considerable expense (\$2,000.), sufficiently for the purpose of milling ores

21.

taken from the Shamrock mines, under the lease, already herein referred to, during which operation some portion of the ore treated is said to have been mined from the Indianapolis, while the greater part was obtained by assorting or selection from the ore dumps already on the surface at several of the mines on the hill. No precise record of these operations seems to be now available. It appears, from somewhat various statements, that the mill was run irregularly during six to nine months, partly in 1896 and partly in 1897, taking out altogether something over \$20,000., mostly in silver; that some portion or portions of these operations were profitable to the extent of perhaps \$4,000. in all, but that the last two months resulted in losses. Examination of the mill record and careful inquiry concerning it show that the assay values of the ores worked were very low in gold, averaging, probably, not more than \$2.00 or, perhaps, \$2.00 to \$3.00, per ton, even with the selected ores of higher grades included. The silver yield made a better showing, probably averaging for considerable quantities, 20 to 30 ounces, per ton. This came presumably from the better class of ore selected from the dumps.

It was shortly after Mitchell's operations that your Company purchased the property and proceeded to add more stamps with Frue Vanners and other necessary machinery, adapted to the purpose of milling the ores for plate amalgamation of the free gold and Vanner concentration of the sulphurets. At the time of my visit the Knickerbocker Mill had been repaired

While the disaster had not occurred on  
of the ore treated is said to have been mined from the  
previously referred to, and which operation some portion  
taken from the "Shovelock mines" under the Jones' lease.

22.

and improved at considerable expense and then contained  
twenty stamps in operation and ten more ready to be put  
in place, already provided for them. Six Frue Vanners  
had been provided, of which four were in place and in  
running order.

Cleveland	258,830	"
Total	1,114,222	"

or with small allowance for  
moisture

The mill began work February

Dry ton 28th and ran without any complete

and MILLING clean-up until June 6th, during  
OPERATIONS which period its full operation  
was frequently interrupted. No  
precise record of actual running

time for all the stamps appears to have been kept; but  
the mill seems to have realized only a small part of  
its actual capacity.

The hauling of ore from the Indianapolis  
mine to the mill began in December, continuing, with  
occasional interruptions, until the first clean-up,  
which was made June 6th. The hauling of ore from the  
Emigrant mine began February 7th and from the Cleveland  
February 12th. The ores from these three sources  
were separately weighed at the mill and occasional sam-  
ples were taken by hand from the ore wagons on arrival  
there, when the ores were passed into the mill together  
without further separation in treatment. It is,  
therefore, impossible to know separately the yield ob-  
tained from the several lots.

The tonnage of ore from these three sources is recorded as follows:-

Indianapolis-North Star	44.61	655.215	Tons	5
Emigrant	16.00	100.177		3.97
Cleveland	14.41	358.830		1.36
Total		1,114.222		"
or with small allowance for moisture	31.00	14.222		4.52
Dry tonnage		1,100.		"

and in round figures

Indianapolis-North Star	650.		"
Emigrant	100.		"
Cleveland	350.		"
Total	1,100.		"

The average assay value of this ore is best indicated by the battery samples. The wagon samples, picked by hand from the ore pile, with unavoidably rather more inspection than usual with Battery samples, are perhaps more likely to contain pieces chosen or taken for the visible mineral in them. The average assay values of wagon samples from the ores of these three mines are shown as follows:-

ASSAY VALUES OF ORE	
Total	9.41

Indianapolis - 100 tons  
 as is recorded as follows:-

The contents of one flow these times some-

24.

The average ass	Ounces of Silver per ton	Values in Gold per ton
Indianapolis	44.61	\$ 6.65
Emigrant	16.60	3.97
Cleveland	14.44	1.36
General average, with due regard to relative quantities from each mine, ore assay being	31.00	4.52
The average tailings assay being	3.13	

The battery samples, taken also by hand but without inspection, at regular intervals, usually every two hours, as the ore passes from the feeders into the mortars, and made into one or two samples for each shift, day or other period, as the case may be, are more likely to fairly represent the average quality of the ore.

The average assay values of all the battery samples, taken during the whole mill run were, per ton,

9.6 ounces of silver and \$3.65 in gold.

The average assay value of the ore, per ton, indicated by the average of battery samples assayed, reckoning silver at 60 cents per ounce, is

Gold	9.6 ounces silver at 60 cents	\$5.76
Silver	10,560 ounces at 60 cents	3.65
Value, per assay, in ore		
	Total	\$ 9.41

The tailings should contain

Gold		\$ 715.
Silver	3,443 ounces	2,065.80
		2,780.80

25.

The average assay value of the tailings, per ton, indicated by the average of all tailings samples assayed during the run, was

3.13 ounces of silver and \$0.66 in gold.

	Ounces of Silver	Value of Gold
The average ore assay being	9.60	\$ 3.65
The average tailings assay being	3.13	.65
The apparent extraction would be	6.47	3.00
Equal in percentages to	67.40%	82%

According to which there should have been produced in the mill from 1,100 tons of ore 7,117. \$ 3,300. and reckoning the silver at 60 cents per ounce there would have been in money value \$ 4,270.20

or for gold and silver together. \$ 7,570.20

Otherwise reckoned, 1,100 tons of ore, assaying (9.6 ounces of silver and \$3.65 in gold, per ton, should contain

Gold	\$ 4,015.
Silver, 10,560 ounces at 60 cents	6,336.
Value, per assay, in ore	10,351.
2,000 ounces of silver, at 60 cents	1,200.00

The tailings should contain

Gold	\$ 715.
Silver 3,443 ounces	2,065.80
	2,780.80

The product should apparently contain  
 Gold (1,100 tons at \$3.50) \$ 3,300.  
 Silver 7,117 ounces 4,270.20 \$ 7,570.20  
 indicating \$7,570.20 as the value to be  
 expected in the product, by comparison  
 of the assay values in the ore with the  
 assay values in the tailings.  
 traces, the actual yield obtained from the ore would  
 hardly exceed, perhaps not reach, \$1.25 per ton.

The clean-up of the mill was  
 made on June 7th and 8th, during  
 our visit at the mine. As you  
 are well aware the result was a  
 great disappointment, especially  
 as no intimation of the very small yield, as obtained  
 from day to day, had been given to you during the pro-  
 gress of the run.

The clean-up produced one bar of bullion,  
 weighing 210 ounces, being  $\frac{574}{1000}$  fine in silver and  
 $\frac{58}{1000}$  fine in gold, containing 120.5 ounces of silver  
 and 12.18 ounces gold worth, at \$20.67, say \$251.75  
 The concentrates obtained were estimated  
 to contain in assay values, gold 114.21  
 and 1,984 ounces in silver, making  
 with 120 " in the bar, about  
 2,000 ounces of silver, at 60 cents 1,200.00  
 or total value, say, \$ 1,565.96

The comparatively little gold in the ore is so associated

Silver 5,115 ounces      \$340.50      \$ 1,240.50  
Gold (1,100 tons at \$3.20) \$ 3,520.  
The balance should be about \$3,520.

27.

and leaving, as unaccounted for, more than 5,000 ounces of silver and nearly \$3,000. in gold, indicated by the assays as originally contained in the ore milled and not found in the product or apparent in the tailings.

After allowing for usual discounts and losses in realizing the available value of the concentrates, the actual yield obtained from the ore would not hardly exceed, perhaps not reach, \$1.25 per ton.

The great discrepancy between the supposed contents and available value of the ore and the yield obtained from it naturally calls for explanation. To some extent, misleading samples and inaccurate assaying may account for the disappointing results. It has been suggested that there may have been some stealing of amalgam in the mill. The methods of cleaning up the mill in daily operation and of keeping the amalgam in the office during the run have evidently been so very irregular and so lacking in usual precautions against theft that any person about the premises, so disposed, could easily have stolen it without difficulty. There seems, however, to be no sufficient reason to suspect any person there concerned of such wrongdoing. It seems to me more probable that the explanation may be found in the character of the ore and the method of its treatment. The principal value of the ore is in its silver, which cannot be saved by plate amalgamation. The comparatively little gold in the ore is so associat-

ed with the silver mineral that it goes with it over the plates without being amalgamated. The character of the ore is such, moreover, that it will not readily concentrate on the Vanners, much of it being light, oxidised, more or less earthy, not adapted to concentration. It passes over the tables and out of the mill, both silver and gold going with the rest.

It is true that this explanation does not explain why, such being the case, the tailings do not appear to contain more value. This remains mostly unaccounted for except by supposing imperfect sampling of tailings and, perhaps, inaccurate assaying. The value contained in the ore, as indicated by assays of battery samples, may also be somewhat overestimated, especially as to gold, it being notable that the average gold assays of all our ore samples taken in the Indianapolis-North Star and Cleveland Mines, would be less than one-half of the average assay for gold in the battery samples.

However this may be, the operations of the mill fully confirm the judgment, formed on inspection of the mine and examination of the ore, that the gold contained therein is too little in value to justify mining under existing conditions of cost.

The cost of mining alone in such small and broken veins, leaving out of view the cost of milling or metallurgical treatment, is also too great to admit of the profitable mining of such silver ores as

these mines have so far produced, under existing conditions affecting the market value of silver.

It is, of course, within the possibilities that deeper development of these mines might result in the discovery of ores much richer, both in gold and silver, than anything hitherto found there; but I see nothing in present conditions to justify, on your part, such an expectation, nor any reason to believe that you would ever receive back from the operation of these mines the money you have already invested in them or which you might, in the hope of improvement, still expend in their further development.

Cleveland Mine

Construction Accounts \$ 1,130.04

Development 1,770.76

Operation 1,533.00

# FINANCIAL

In the financial statements carefully prepared by Mr. A. C. Luck, showing all the outlays made by your Nevada Company for the improvement, development and operation of its mining and milling properties, from the beginning of operations in 1897 to June 1st 1898, the amounts so expended on the mining properties under present consideration appear as follows (not including purchase monies):-

Knickerbocker Mill Construction \$ 35,734.49

Boarding Houses \$ 4,032.65

Houses at Shafter \$ 60.

30.

Indianapolis Mine and its subsidiaries may still  
be for Construction Accounts at \$ 4,069.88 or properties.

Development 12,520.22

Ore extraction  
(655.215 tons at \$6.25) 4,098.61

Ore Milling  
(655.215 tons at \$3.36) 2,200.21 \$ 22,888.92

Emigrant Mine

Development and extraction \$ 3,270.82

Milling (100.177 tons  
at \$3.36) 338.21 \$ 3,609.03

Cleveland Mine and its subsidiaries may still  
be for Construction Accounts at \$ 1,930.04 or properties.

Development 4,130.16  
Ore extraction  
(358.830 tons at \$2.26) 813.54

Ore milling  
(358.830 tons at \$3.36) 1,206.27 \$ 8,080.01

Berlin Tunnel \$ 533.53

Tramway to Mill  
(on account) \$ 3,607.74

Knickerbocker Mill Construction \$ 35,734.49

Boarding Houses \$ 4,032.65

Houses at Shamrock \$ 60.

*The mill and its appurtenances may still be found useful in the operation of other properties.*

### CONCLUSIONS

*In conclusion I think it evident that the mines under present consideration are too poor in gold to repay the cost of mining it.*

*I doubt if they could be worked profitably for silver if the former standard value of that metal were restored; I am certain that they could only be operated at a loss under existing conditions, in which I see no indication or probability of such improvement as would justify, at present, their continued development. My advice is, therefore, that the operation of these mines be suspended.*

