



CONTACT INFORMATION
Mining Records Curator
Arizona Geological Survey
416 W. Congress St., Suite 100
Tucson, Arizona 85701
520-770-3500
<http://www.azgs.az.gov>
inquiries@azgs.az.gov

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Miss O'Connell 237
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Morning Glory Mining & Smelting Company

September 15, 1928.

Mr. President and Gentlemen of the Board of Directors:

Nine months after the beginning of actual mining operations I determined to utilize my vacation to visit our properties, located in Santa Cruz county, Arizona. I desire to give you a few of the first hand impressions of this trip for I feel that it is worth the while of any stockholder to make this trip for the country is wild and rugged and the views are gorgeous beyond expression. Best of all it is a section reached by the best trains of the transcontinental lines and aside from its scenic beauty is rich in the monuments and memories of Catholic missions, the hardy pioneer and his lurking foe, the savage Red Man of plains and mountains.

In order that you may gauge the time involved, I will give you my itinerary. I left Chattanooga Saturday night, September 1st, arrived at New Orleans Sunday morning at 9:00. Spent the day in the Crescent City and at 11:00 that night was on the Argonaut for El Paso, which I reached at 9:40 Tuesday morning. I detrained at El Paso and joined Mr. Schriever at 11:00 o'clock. We finished the trip together, arriving at Tucson in one of the rare rain storms of this section, at 7:30 Tuesday night. Our tickets permitted us to return, if desired, via Los Angeles, San Francisco, Denver, Chicago and Chattanooga and the fare for the round trip was \$101.36. The Pullman and meals, of course, were extra. We spent Tuesday night in Tucson with Mr. J. A. Hamilton, our mines manager, getting the news of the operations and especially in reading the report of Dr. R. J. Leonard, head of the Department of Geology and Mineralogy, College of Mines and Engineering of the University of Arizona, located at Tucson. This report was preliminary and intended largely for laymen, but we found it rather technical in the hotel at Tucson. After we had arrived at the mines and had studied the topography and underground workings, we could check up the report word by word and it was as lucid and clear to us as the alphabet.

Early Wednesday morning we set out by automobile from Tucson to Patagonia. This is a drive of 64 miles over good roads. The country gradually rises from an elevation of 2,430 feet at Tucson to approximately 5,000 feet at the town of Patagonia, which is located on the Fairbanks Branch of the Southern Pacific Railway. At Patagonia there are loading platforms utilized by many of the mines of the district for storing their ore until they accumulate enough for a carload and it is then simply a question of shoveling from these elevated platforms into the car below. There is now on the dock at Patagonia a good portion of rich ore from the Morning Glory operations, and we expect to complete this shipment when we reach our ore junctions through drifts we are now driving from 466-A.

We rode over an excellent road from Patagonia to the mines, a distance of 14 miles with a gradual rise of 700 feet from the railroad station to the mine, but the grade is very easy. The mountains which we approached from Tucson gradually shot up in height and leaving Patagonia, we were in their midst, winding around the foothills, over the dry water courses, which in the late summer are raging torrents right after a heavy rainfall, until we reached the mine, which is about half a mile from the main highway, up Alum Creek gulch. We have built from the county highway a good road, reinforced along the draws with concrete shoulders and located

far enough up on the side of the hill so that no rain storm can ever seriously damage it.

We arrived at the camp shortly before noon Wednesday just in time for the noon meal at our own boarding house. We are serving excellent food, splendidly cooked in a modern, well-ventilated fireproof, concrete building, which contains the manager's office and living quarters of the cook and her husband, who is our blacksmith, a big airy dining room and well-arranged kitchen. Mr. Hamilton has built, with small expense to our company, a large ice box, which serves to store our meats and perishables. In the side of the hill is a rock lined cave in which all other edible stores are placed. Further on up the gulch are bunk houses, three in number, which are serving to lodge sixteen men. There are also two open end sheds for our miners' cars, and both sheds and bunk houses pay a revenue to the company each month. On the left as you enter the canyon is the new ore bin, which holds about 100 tons of ore. It is built of 8 by 8 timbers, placed on concrete foundations, strongly reinforced by bolts and of most durable construction. This ore bin will serve to hold the rich ore if we wish to make shipments direct, or will serve to feed our treatment plant when it is erected, as it is on a direct line with the mine mouth and cars are drawn from the mine portal directly to the top of this ore bin and are unloaded by gravity drop. Between the ore bin and the mine is the large dump which contains many thousands of tons of muck and rock taken from the shaft, tunnel, and stoping winzes during the nine months of operations. It is estimated by our Mines Manager, Mr. Hamilton, that there is about 10,000 tons of this milling ore in the dump adjoining the waste rock. This ore will be used as soon as our treatment plant is erected and functioning.

Immediately after lunch we put on old clothes and entered the mine portals. We went a distance of about 1,500 feet straight into the mountain and then branched off into the workings now known as 306. This offshoot cuts the big Mineral Hill body east and west and at this point extends through solid breccia ore a distance of 190 feet at a depth of 300 feet underneath the outcropping of Mineral Hill ore body on top of the mountain, and the shaft is in the center of this ore body. We have driven a two-compartment shaft which penetrates Mineral Hill vertically a distance of 145 feet in the ore and then goes on down another 100 feet in various formations, making a total vertical depth from the top of the mountain of 565 feet. From this shaft we have driven northwest drift 467, which will go under the canyon and cut the lower block of Morning Glory vein in the large mountain directly to the west of it. At 566 feet we have driven a drift that turned from the shaft and went southwest and cut the Mineral Hill ore body and proved up a body of ore 90 by 200 feet of breccia ore. From the 466 foot drift Mr. Hamilton drove an incline and upraise to cut vein 308 on the southwest side of the Mineral Hill ore body 68 feet below the tunnel. And at 368, as we now call this drift, he encountered vein 308 in place, and in following it along, determined that this vein instead of dipping, was running flat and parallel with Morning Glory vein instead of cutting sharply away from Mineral Hill ore body and dipping to the south and west. He is now driving this drift to show this big ore body in place and has driven two cross entries, one of which, in 24 feet after leaving 368 drift, encountered Mineral Hill ore body in place. The second, at a distance of about 60 feet, also cut into Mineral Hill ore body and thus proved to some extent, its large size and continuance at the 368 foot level. If he does not locate the dip of vein 308 on 368 drift in about 40 feet, he will make an upraise from this drift in order to tell whether the vein is dipping, and if so, at what point he should cut 308 in 368 drift. We can then drift on this vein for ore ton-

nage for either shipments or ore treatment plant, depending upon the richness of the ore encountered.

After going through the workings in 368 we then went back to the main tunnel and continued through the breccia until we reached Morning Glory vein, upon which a great deal of drifting has taken place, and in which the vein has been blocked out for a distance of several hundred feet from its outcrop on the hill 300 feet above. By means of ladders we climbed this upraise clear to the top of the mountain, going through glistening sulphide copper ore all the way. At one point of small dimensions 21 cars had been stoped out and shipped to the Phelps-Dodge Corporation, which paid approximately \$20,000.00 for the ore.

At the top of the mountain we traced Morning Glory vein on the surface. We then came to the outcrop of the Mineral Hill ore body and finally swung around down the gulch in time for supper. Before we left the top of the mountain, however, we lined ourselves up so that we got a view of old Mowry mine and smelter, one and one-half miles eastward, Gold Hill to the south, and the other land marks of our property.

The second day we started early and climbed White Owl mountain, which towers to the west of the mine into the sky a distance of 7,000 feet. We followed the lime outcrop which Dr. Leonard had located as showing the trend of ore bodies through our property, skirted the mountain along its west side and finally reached the summit about noon. From this point a wonderful panorama spread before us. To the west and south, through the haze of the purple mountains, on the uplands lay the American-Mexican city of Nogales. Directly to the south, along the foothills of the far mountain, is the lead-silver mine, The Homestake, a very rich prospect, which is being opened up by California parties. Immediately below us stretched the Morning Glory property, with its claims running up to our feet and on up the mountainsides, and off toward Mowry Mine two miles away. To the north were high peaks with seared sides of granite and limestone, forming a great semi-circle of giant ramparts, leaving a free vista for the eye only to the east and south. The Mowry mine with its flats looked like a small parade ground, notable in this welter of crags and ranges because of its unexpected level floor. Farther to the southeast lay the Mexican mountains and the operations of the Greene Cananea Copper Company, the famous bonanza copper mine of the district. One could pick out its location by the blue haze of smoke from its smelters and switch engines. Off in the far distance to the southeast lay the far-flung operations of the powerful Phelps-Dodge Corporation, creator of untold mineral wealth. To the north, the great mines of United Verde and United Verde Extension, Inspiration and many others celebrated in the annals of copper mining, and known over the world for the richness of their deposits and the steadiness of their dividends. From the high altitude of 7,000 feet above sea level we looked down on Morning Glory camp and now that we were thoroughly instructed by Dr. Leonard's report, could trace the cosmic forces that split the Alum Gulch and Morning Glory vein. *The picture was clear, the landmarks were definite and the plan for future action*, as laid out by Dr. Leonard, was so definite that we felt we could almost lay our fingers on the unbroken ground ahead of drift 466 where the five quartzite beds offer such rich promise of big deposits undisturbed by fault planes. The face of the mountain extends along the western side of our White Owl claim, in which Dr. Leonard is sure we shall develop a very good mine and where we have ordered mining operations to start at once. This property is lead-silver. It gives every indication of containing real values.

From this lofty peak we descended to the White Owl claim and from the surface cuttings picked up samples of rich lead-silver ore found on the outcrop. In the afternoon, after a chicken dinner, we again went into the mine and descended the shaft from the 300 foot level to 466 and 467 levels, which we traversed to the working faces.

Friday we again donned our leggings and took strong clubs to ward off the ever-present and dangerous rattlesnake and, strangely enough, on the Rattler Claim, as we were passing along the half obliterated path, we heard the sharp sound of the rattle, but we did not follow him into the bushes. We first visited Gold Hill and inspected the shaft at this point, picking up numerous lead-silver nuggets from the dump. And then, under Mr. Hamilton's guidance, traced the five quartzite beds which traverse our property from the Morning Glory vein eastward towards Mowry. It is my pleasure to tell you that we located the fifth quartzite bed that morning, and with our picks broke off samples of rock that ran high in both lead and silver, with some copper as well. This exploration trip took us over the eastern tier of claims and we thus covered the entire property, both from the surface and from underground as well. The afternoon was spent again in the mine familiarizing ourselves with the workings and from the Morning Glory vein in the stope I picked down quite a quantity of ore and the samples that we have in the office are my own samplings, taken in the half light of our acetylene torches where selection was not possible, but only the light of the lamp enabled one to drive the pick in the vein and dislodge the ore. This ore is rich in bornite, the ore greatly valued by all companies because of its heavy mineralization and because of its promise of a vein going to great depth.

Saturday morning we checked in the office with Mr. Hamilton, our Mines Manager, future plans, expenses, and many matters of mine management and on Saturday afternoon we again went in the mine to study drift 368 and get its geography firmly fixed in our minds.

We left the mine about 4:00 o'clock in the afternoon after the day shift had come off and traveled to Nogales, where we spent the night. On Sunday we reached Tucson for lunch and immediately after lunch, by virtue of previous appointment, met Dr. R. J. Leonard, head of the Department of Geology and Mineralogy of the University of Arizona. We remained in his company all afternoon and evening, and had the pleasure of getting from him the results of more than six weeks of painstaking and minute examination of Morning Glory and Mowry properties, presented in the most clear and lucid way. With three assistants he spent the whole summer mapping these two mines. His map shows every contour, every ravine, fault plane, elevation, building, ore tunnel, or other disturbance of the ground. It also shows just where the different measures come in, what their trend is, how the ore bodies are lying and where the miner should drift to get big values. It is a piece of most wonderful engineering and the most admirable geology, all directed by a master mind, interested primarily in the science of his profession and keenly alive to the importance of correlating ore bodies and directing big men in a big way.

Dr. Leonard's conclusions in his letter to Mr. Hamilton regarding the Morning Glory property contained, among other things, the following statements:

"The rock formations of your immediate area consist essentially of altered sedimentary beds which have been fractured, faulted, metamorphosed and, in part, replaced by ore minerals. All of these changes in the original structure, texture and composition of the beds were undoubtedly

brought about in conjunction with and as a result of the intrusion of magma which produced the granitic and porphyritic igneous rocks now exposed to the north, south and west.”

“The ore beds or bodies and mineralized croppings are all conformable with the inclosing rocks, having a general N30° E strike and dipping 40°-60° northwesterly. They are properly classified as contact metamorphic ore deposits. Such ore deposits are those formed in intruded rocks by fluids—both solutions and gases—given off by intruding igneous magmas. The ‘Morning Glory vein,’ as underground development shows, occurs as a replacement in limestone. Along that portion of a certain limestone bed favorable to solution and controlled by fractures suitable for channel-ways, ascending hot ore-bearing fluids presumably passed, dissolving the lime and depositing the ore minerals,—chiefly sulphides of iron, copper and zinc.”

“In addition to the ‘Morning Glory vein,’ there are several manganiferous and ferruginous, more or less porous, quartzitic beds, interbedded with indurated gray and black shales, and some quartzites, outcropping in the Gold Hill-Chattanooga-Rattler area, on the White Owl and Old Oak No. 1 claims, and on the spur north of the dam. That these partially or wholly replaced beds were originally limestones, or in part perhaps, calcareous shales and sandstones, has been satisfactorily proven, as you know. That they are similar to the original Morning Glory outcrop and are potential sources of ore supply with depth can hardly be questioned.”

“The display of partially altered lime beds, which you and I discovered, outcropping in the draw north of the dam, is of further importance than merely proving the origin of the replaced beds. Field evidence strongly suggests it to be the ‘basement’ block of the Morning Glory deposit. As indicated at the dam, this limestone extends southerly into Morning Glory ground.”

“A continuation of 466, or of 466A, southerly to prospect at depth the mineralized beds cropping in the Gold Hill area, as mentioned above, is strongly advised. Also development work on the White Owl; this ground has every necessary geological indication for the occurrence of a valuable ore body.”

“Your present lines of development to intersect the Morning Glory ore body on the lower levels of the mine are quite logical and the methods of operation notably efficient. Also, your map and assay files are not only up to date, but the data is also excellently presented.”

“That the Morning Glory group of claims contains several well-mineralized and promising ore zones is clearly evident. That a continuation of systematic development in the most favorable zones may disclose important ore bodies cannot be definitely predicted, but geological indications distinctly suggest such a probability.”

Dr. Leonard has been with the University for two years and previously operated mines in Montana and Minnesota for ten years; was a soldier in the war, was gassed and came to Arizona to recuperate. He had to hobble on crutches then, but the climate and his own determination brought him through. He is now able to climb around the mountainside with the strongest prospector of the district. His methods of operation consist not only of carefully mapped areas and field work, but also of studying the rock under the microscope in his laboratory. He grinds the rock to wafer thinness, puts the ore on glass slides and then examines it with his trained eyes, observing the changes and what happened when igneous matter met beds of limestone and changed the rock to rhyolite, quartzite or replaced lime.

He looked for the Pennsylvania lime on Morning Glory and when he found it, he was able to correlate his ore bodies and tell us where we would strike our richest values. He will act as our consulting geologist in the field and will visit the property every two weeks, or oftener, if Mr. Hamilton desires it, and we believe, will direct us to the ultimate good fortune and big tonnage he firmly believes Morning Glory will attain. In answer to my direct question, he told me that neither Mowry mine, from which millions of dollars worth of ore has been taken, or Morning Glory's values, have as yet been touched. He is not a man given to extravagant statements, but rather weighs carefully each word. He refused to act as consulting geologist for a well-known promoter in our district as he said he did not care to be associated with a promotion project, and no money would tempt him to make a report for such an outfit.

TONNAGE

I asked Mr. Pierce, our Engineer, on the property, to give me an estimate of tonnage of vein ore. He reported that we have already blocked out 42,000 tons of Morning Glory and 308 vein ore. As to the tonnage in Mineral Hill, that can only be an estimate. Our lowest figures have been at one million tons and this estimate has been made by many experts. If we figure the profits of Mineral Hill ore at \$1.00 per ton, which I believe to be most conservative, every stockholder would receive his original dollar back and another dollar to go with it. Therefore, an investment in Morning Glory stock seems to be the most conservative and assured of any mining venture that I saw and examined in Arizona, especially since we have a number of additional ore bodies that we expect to cut at depth within the next ninety days.

TREATMENT PLANS

We believe that the flotation method of ore extraction best fits the ores already developed and those that we expect to reach. This method has been adopted by all the great mining companies. It gives recoveries of from 90 to 95 per cent of metals in complex ores and is equally good for lead-silver ore, of which we expect to have a large tonnage, and of copper-sulphide ores, as well. We are now erecting at the mine mouth a small laboratory flotation unit upon plans and information furnished us by the mineralogical departments of the University of Arizona and the great American Smelting and Refining Company. The latter concern allowed us to photograph its main experimental and testing laboratory at El Paso and its chief chemist, a man of international reputation and skill, offered to analyze personally any of our complex ores if we desired any special analyses.

By January 1st we shall have completed our study of methods for the treatment of our ore bodies, and we shall then be ready for the first unit of our flotation mill. We expect to have by that time valuable ore bodies of known extent and mineral content, and it is my firm belief, based on Dr. Leonard's study of the property, that we shall be extracting both lead-silver and gold-silver-copper ores in increasing volume for the first unit of our flotation mill. I hope and expect the first unit will soon be added to until we are treating large tonnages of good ore with consequent profits for each stockholder.

MECHANICAL EQUIPMENT

Our mechanical equipment has been carefully selected and is most efficient. Our power, air and lights are supplied by two 55 horsepower internally oil fired Diesel engines that work like watches. Our current cost

is around 1½c per k. w. hour. I found all machinery to be in first class shape, all construction to be of the most permanent character, all development work to be of the most approved type. I am proud of Morning Glory mine and what has been accomplished in 9 months of work. Ours is the model mine of that district and the Arizona chapter of the American Mining Congress, which meets at Nogales in November, will inspect our mine as the typical mine of the district.

Our camp site is excellent, our buildings are adequate, our water supply good and sufficient for all purposes for years to come. The nights at the mine even during the hottest weather are delightful. A blanket is always necessary. It is the ideal spot in Arizona in which to spend a vacation.

While at Morning Glory we visited the World's Fair mine, two miles distant by direct line and there saw a flotation unit handling 75 tons per day of mixed dump and freshly mined ore. The Superintendent told us he was getting 85 per cent recovery and on freshly mined ore believed it would go to 90 or 95 per cent. We are shown a boulder of lead-silver taken from a car which brought in \$9,000.00 for the shipment. This operation is one of several mines grouped together and will be one of the big producers of the district from all present indications.

We also visited Hardshell Mine, which is going to be operated by a Californian after years of standing idle. And the old Mowry Mine, just east of our property, is the most wonderfully located property for a camp in the whole district, as it used to have a golf course, together with a good many amusement buildings all laid out in a flat field directly underneath the towering limestone hills from which its lead-silver came.

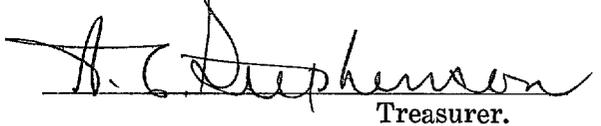
As to the feeling of the leaders in the mining industry of this section of Arizona towards Morning Glory and its management, I wish to quote a statement made by Dr. Leonard when we left his office at Tucson.

He said: "The Morning Glory Mining and Smelting Company is being managed in the interests of its stockholders and not for the benefit of promoters with expensive offices and extravagant tastes. Your money is coming to the mine and, therefore, the University of Arizona is backing you in every way possible." I asked him whether we had spent any money foolishly and whether any of our drifts were worthless. He replied: "No, you have been both wisely directed and very fortunate. Every drift is heading towards promising country and potential ore bodies. I do not believe you realize what a wonderful chance you have to develop a great mine."

Morning Glory properties now consist of twenty claims, all of which, from surface indications, are well mineralized. We have added to the original twelve claims eight claims at an expense of a few hundred dollars and have rounded out our properties both from the standpoint of water supply and of additional ore bodies, by filing on claims upon which assessment work had not been done. The property is now a compact body and is almost double the original acreage, as we now estimate we have approximately 420 acres. We expect to continue this policy of adding to the property when it can be done at small expense where we find adjoining claims that can be secured and that will add greatly to our reserve of minerals.

In conclusion: I hope that when you consider plans for vacation, your thoughts will turn to Arizona, the land of beautiful vistas and far distances, of great purple mountains that stretch into the blue sky and which give you an idea of the immense forces, call them mechanical, or call them creative mind, or spirit, just as you wish, which laid down these ponderous masses of rock and stone and in their hearts buried the rich treasures which we are developing and which men all around us have found to their own good fortune.

Respectfully submitted,


Treasurer.

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