

PROBLEMS OF MILLING PLATINUM ORE ON
CENTENNIAL MOUNTAIN,

By ANDREW J. HULL.

In order that you might understand the subject which I am presenting it will be necessary for me to explain the kind of an ore body which we have to mine and mill, the size, together with the average values, and the machinery which the Wyoming Platinum and Gild Mining Syndicate has installed to mill this ore.

There are numerous platinum-gold ore shoots within a radius of ~~one~~ one and one half mile in section 8 and 9 and 16 and 17 town 15 range 78. These ore shoots are of igneous character, classifying into hornblende, ~~pyroxene~~ and olivine and a large part of some of these shoots have been converted into serpentine by pressure and heat, and there is also small parts of the serpentine which has been re-replaced with quartz which seems to carry the pockets of high grade, and wherever these ore shoots have been exposed they have been proven to carry a commercial grade of ore in gold and platinum metals if milled on or near the location, but so far there has not been uncovered sufficient large bodies of ore of such value that it would pay to ship a great distance to be treated and pay treatment charges and freight.

Gold platinum values have been discovered in the Schnitzler or Empire property running five feet wide and opened up a distance of 100 feet, where the average grade of ore would assay from \$8.00 to \$40.00 per ton in platinum metals and streaks of high grade from one to two inches wide that would run from \$500.00 up as high as \$7,000.00 per ton. The high grade seems to be associated with copper and nickel.

There has also been discoveries in commercial values in workings on the Golden Crown group of claims running on the average of \$6.00 in gold and \$10.00 in platinum in ore running from a few feet to 15 feet wide.

Also on the Utopia property, where a 54 inch stratta of ore has been opened up carrying on an average of \$14.00 in gold and as high as \$14.00 in platinum metals.

Also on the Wolverine property there is an ore shoot opened up which is 31 feet wide which will run from \$1.00 to \$2.80 in gold and from \$12.00 to \$18.00 per ton in platinum metals.

Also on the O.M. Finley group of claims and the Prince group of claims, where numerous assay values have shown a good commercial grade of ore in gold and platinum metals.

The Queen ore shoot situated in the north west one fourth of section 16, seems to be the main neck of ~~xxx~~ or mother ore shoot of the district and is dipping to the south west and the north west at an angle of about 45 degrees. There has been considerable development work on this property, consisting of a double compartment shaft down to a depth of 160 feet.; this shaft averaging \$26.39 per ton from top to bottom in gold and platinum metals; also a crosscut at the bottom of this shaft 140 feet long which assayed \$19.54 per ton in gold and platinum metals across the entire 140 feet. The assaying of this ore was performed by the School of Mines of Wyoming, Thos. J. Dee and Co. platinum refiners of Chicago, Ills., Ferris and Co. of Salt Lake City, W.L. Piers of Denver and A. Mills Beam of Denver, and partially rechecked by H. H. Houston, who found the former assayers to be correct in their findings.

One thousand and twenty-five feet north east from this shaft this same ore body was opened up with a tunnel 153 feet long to test the ore at this point. It was carefully sampled and assayed every five feet with large samples and this entire tunnel averaged over \$20.00 per ton in gold and platinum metals after cutting out all high grade samples, Some ore being encountered which run \$740.00 per ton in Iridium.

About 1250 feet north east of this tunnel an open cut was made the entire width of the ore body and a careful sample taken across the entire width of 175 feet at this point averaged \$14.48 per ton in gold and platinum metals. The assaying at the tunnel and at this open cut was all assayed by H. H. Houston, Chemist and Assayer. And a careful sample of the open cut was also made by Frank Wheeler of Denver a former Chemist of the U.S. Government Mint and he and Mr. Houston carefully assayed the same and all samples taken by Mr. Wheeler run from \$1.00 to \$3.20 per ton in gold and from \$8.00 to \$15.00 per ton in platinum. Numerous other chemists, including Mr. Erickson of the U.S. Geological Survey, Mr. Davis of the U.S. Bureau of Mines, The Colorado Assaying Co. of Denver, Burlingame of Denver. J.W. Richards & Son of Denver, have assayed some of the ore bodies above mentioned giving values in gold and platinum of commercial quality.

Our Milling Problem.

The Wyoming Platinum & Gold Mining Syndicate are the first people to attempt to mine and mill this ore to save the platinum values. They have constructed a very modern, diesel engine electric plant, situated on the railroad at Platinium City to furnish cheap power to operate a mill which is situated at the foot of the Queen ore body on the east side of Centennial mountain. The Mill consists of coarse crusher, set of rolls, two ten foot Lane slimers for fine grinding, with at present equipped with amalgamating plates and two large Wilfrey concentrating tables. This mill is one of the most successful grinding plants that has ever been built and will grind 75 tons per 24 hours from 90 to 200 mesh or better and is very economical to operate and test runs made proved that the ore can be mined and milled at a cost of \$1.50 per ton in this plant.

Several small test runs were made during the past summer with the idea in view of taking the gold and platinum metals out directly either by gravity or by amalgamation. Due to the fact that the ore is of igneous character, there is a great many combinations of metals, including a little silver, gold, the platinum metals, iron, antimony of six and sixty two hundredths point gravity, arsenic of four and seventy two hundredths points gravity, molybdenum 8.6 point gravity. And we found in making the test runs that with the combinations the precious metals have with the other metals of low gravity, and owing to the fact we were grinding the ore to 100 mesh or better caused a greater per cent of the values to escape with the water.

In making tests runs to amalgamate with sodium-amalgam we found that the mercury would lode up in a few moments with a brown-black powder which was nothing but a high grade concentrates and therefore the balance of the values would pass over the plates as soon as the mercury became loaded with this powder and we would have had to have at least ten tons of mercury to pick up all the high grade concentrates which the mercury would load up with in every 24 hour run. In scraping the amalgam off from the plates it looked like the genuine article, being as thick as putty but upon retorting the same the concentrates would separate from the mercury riding on top.

However, in each test a small amount of silver-gold-platinum and iridium was recovered.

Therefore the management decided that the values in this ore cannot be recovered by gravity or amalgamation. That they must go to the harder way of concentration by Oil Flotation and then smelting the concentrates to recover the values in a matt. Preliminary tests have been made by oil flotation on sulphide ores coming out of the shaft at the top of the mountain and the first tests on these ores showed a saving of 80% of the values, also preliminary tests were made on the surface oxidized ore just above the mill where we saved one third of the gold and one fourth of the platinum.

Flotation has proved successful on sulphide ores coming from below the water level but only partially successful on oxidized ore, unless a gas plant was installed to add a sulphide gas to the pulp in the flotation cells to quote the oxidized metals with sulphide, so that it would be necessary to build a gas plant in order to work the oxidized ore successfully by flotation. We have decided to go at the matter an easier way and we are now driving a tunnel into the water level at which time after striking the sulphides we will put in a small flotation machine to work out the formula and for the different oils and reagents necessary to handle our particular kind of ore.

Down is South Africa, where they discovered the same kind of platinum ore which we have in our district, there are several mills milling their ore today, using the oil flotation, and are very successful in producing a good grade of concentrates and these mills have been producing from four ~~xxx~~ hundred to seven hundred ounces platinum per month and making a success. These people also have worked out three different methods of extracting the platinum metals and also the nickle and copper by three different wet processes, and I wish to say that we have in our possession the formulas for these different processes and that what they can do we can also do.

The Wyoming Platinum & Gold Mining Syndicate will add the necessary flotation machinery to our present mill shortly after the first of the year and that we will start making concentrates out of our ore, and as soon as this is demonstrated, it is the intentions of the management to build a 1000 ton mill together with a smelter and to increase the capacity to 5000 tons per day as quickly as it is convenient to do so.

The Queen ore shoot, if mined to a depth of 7000 feet will produce four hundred million tons of ore and keep a 5000 ton per day mill running for several generations. In order to handle this large amount of ore the management has purchased and taken over the Rhinesmith ranch which adjoins the property on the east for dump grounds and the water rights and we feel that we are well protected in the future to have the room to dump our tailings.

It is the ambition of the officers of the Wyoming Platinum and Gold Mining Syndicate not only to make the biggest mine but the greatest paying concern in the State of Wyoming. It is also our ambition to produce a metal which is of the greatest economic importance to this country in time of peace and especially in time of war and it is our determination to produce every ounce of platinum which the United States can use even if we have to mine and mill 20,000 tons per day.

Respectfully yours

Wyoming Platinum & Gold Mining Syndicate

Andrew J. Hull,
Managing Trustee.