

Messrs. McCune, Greshley & Logan.

Gentlemen:-

I beg leave to submit the manuscript of my report on your properties located in the Centennial Mining District, Albany County, State of Wyoming.

LOCATION.

The properties in question are located in section Nine (9) Township Fifteen (15) Range Seventy-eight (78) west, on the east slope of the "Medicine Bow" range of mountains, about three (3) miles west from the town of Centennial, Wyoming, on the Laramie Hahn's Peak & Pacific Railroad, at an elevation of about Nine thousand two hundred & ninety-four (9294) feet above sea level, and consists of Three (3) lode claims. A good wagon road runs to the property from the town of Centennial, not to exceed four (4) miles in length.

GEOLOGY.

The eastern slope of the "Medicine Bow" range of mountains, in the vicinity, and location of the properties above named, consist of pre-Cambrian rocks. Schists-shale-hornblende-amphibolite and pegmatite; the latter being instructive. The geological horizon for several miles along the strike of the mineralized zone, is a stratified vertical formation, being alternate stratas of schist (micaceous or otherwise) schale-hornblende-amphibolite and pegmatite.

The schists are of a number of varieties, some local and limited in extent. The usual schist being a fine grained hornblende schist, chloritic schist, and garnet schist, in bands varying from a few inches to several feet in width. Associated with these varieties are ledges or bands of pegmatite, which lie conformable with the including schist and are usually of considerable extent. The pegmatites contain varying proportions of one or more of the following minerals; quartz-silicious and magnetite-muscovite and pyrite, and are usually silicious and of igneous origin.

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Occasionally the pegmatite consists entirely of white or red feldspar, and at other times it assumes the phase of pure white quartz.

It is noted in many places the foregoing rocks show extensive and sometimes a complete metamorphism and change from their original composition and condition, leaving only the structure as a means of identification, the composing minerals being replaced quartz and silica.

On the east side of the "Medicine Bow" range of mountains, along the foothills, near the town of Centennial, the Carboniferous limestones are noted, with the succeeding sedimentary formation dipping away from the main range.

GENESIS OF THE ORE.

The ore deposits are difficult to classify on account of the insensible gradations between the most diverse types. A single deposit frequently displays very different characters in different rocks, so that it will conform to one type of deposit in one part, and another type in another. For convenience of description I shall give the following classification.

(1) Fissure veins.

(2) Replacement ores in pegmatite.

In all probability the ore bodies owe their existence to the intrusion of pegmatite dikes, and the presence of fissures, generally nearly vertical, in the country rock through which mineralizing waters have circulated. The intrusion of pegmatite dikes produced an important contact of metamorphism in the different rocks, which happen to adjoin them. This metamorphism resulted in metasomatic development of garnet-quartz-feldspar and pyrite, and also received a very substantial additions of oxides. The form of the ore bodies deposited is no doubt dependent on three (3) factors.

(a) Amount of open space in the fissures.

(b) Kind of rocks through which fissures pass.

(3)

(c) Intrusions and replacements.

The veins are fissures in the country rock, in general quite uniform, approximating an easterly and westerly direction. The dip of the fissures varies from a vertical position to about 60 degrees. Most of the veins are rather uniform and retain their width for the larger portion of their course without marked variation, although "pinches and swells" are to be observed. The relation of the ore in the fissures to the wall rock is peculiar. The ore is much more abundant and of very much higher grade when included between walls and is of much lower grade when the fissure pass into the schist or shale, a rock more capable of supporting larger ore deposit. The veins suffer no appreciable diminution in size with depth. They are widening with depth, but the richer ores seem to have been deposited only between the layers and stratified series of schist, shale and amphibole and small seams, which usually is of a high grade character. In all probability the gold bearing veins which consist schist, shale amphibolite and hornblende are of pre-Cambrian age, and the gold deposits are the same type as the Homestake mine, at Lead, South Dakota, and the southern Appalachian veins.

MINERALIZATION.

The mineralization may be said to be quite general throughout the formation just described, but varies in quantity. In the schist, amphibole and pegmatite rocks are found bunches and streaks of remarkably rich gold ores, which may not be part of, or related to, the main ore body. In a district as little developed as the Centennial country, it is evident that the precise ore conditions may not be fully understood, until more fully exploited.

At present development work has shown that the ores near the surface are uniformly low grade, due of course to the exposed conditions to the elements, for centuries. Immediately

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succeeding the surface, as depth is gained, it is evident the ores show remarkable increase in value and give place to the more permanent grade of ores as shown in samples taken. The lowest point to which the ores have been opened up does not exceed sixty-five feet in depth.

VEIN SYSTEMS.

The veins form a rather complicated system, consisting of quartz and hornblende, surrounded by a wide zone of oxidized schist-amphibole and shale, from sixty (60) feet to one hundred and twenty (120) feet in width, and stand vertically, having a strike north-east and south-west. There are two well defined veins paralleling one another, about sixty (60) feet apart. Their outcrops are rarely traceable, on account of being covered with surficial wash and debris, and they frequently branch, or lose themselves, but on the whole form two (2) distinct systems of linked veins, at depth, consisting of quartz and hornblende.

SAMPLING.

At the most not a little difficulty was experienced in taking samples. The surface could only be sampled in a very crude way. Trenches would have to be cut clear across the mineralized zone, this would entail a very large expense, and require a great deal of time-hence, while my time was limited I had to take samples where I could get at a ledge most conveniently. However, they show value and demonstrate fully the existence of pay ore in large quantity, at depth.

Due precaution was exercised in taking every sample, to avoid any and all high grade seams-they were entirely excluded from sample. My object of sampling in this manner was only to get the medium low grade ores. In every case from twenty (20) to twenty-five (25) pounds of broken up ledge matter, a general average across the

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vein was allotted for a sample. This allotted sample was then crushed down to small particles, thoroughly mixed and quartered down to a two (2) pound sample, sealed, and sent to the laboratory for assay, giving results as follows:

COPY OF ASSAYS.

THE WESTERN METALLURGICAL COMPANY
CHEMIST-ASSAYERS.

1912
Denver, Colorado, Sept. 6, 1912

Report on determinations made for,

THE AMERICAN MINERAL DEVELOPMENT COMPANY.

Sample Marks.	Gold ozs.hds.	Value per ton.
AA-53 Quartz and schist vein "Free Gold" 30 foot shaft, 2.1/2 feet wide.....	1. 84	\$ 36.80
AA-54 Same shaft, 15 foot depth, 2.1/2 feet wide.....	1. 06	21.20
AA-55 Same shaft, 20 foot depth, 2.1/2 feet wide.....	. 52	10.40
AA-56 Same shaft, 30 foot depth, 2.1/2 feet wide.....	. 62	12.40
AA-61 Open cut "Free Gold" 10 foot depth, 2.1/2 feet wide..	. 40	8.00
AA-62 Open cut "Free Gold" 10 foot depth, 2.1/2 feet wide	. 62	12.40
AA-63 Open cut "Free Gold" 10 foot depth, 2.1/2 feet wide	. 08	1.60
AA-64 Open cut "Free Gold" 10 foot depth, 2.1/2 feet wide	. 26	5.20
AA-65 Open cut "Free Gold" 10 foot depth, 2.1/2 feet wide	2. 84	56.80
AA-66 Open cut "Free Gold" 10 foot depth, 2.1/2 feet wide	2. 00	40.00
AA-67 Open cut "Free Gold" 10 foot depth, 2.1/2 feet wide	. 28	5.60
AA-68 Open cut "Free Gold" 10 foot depth, 2.1/2 feet wide, pure schist 66	13.20

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Assays continued.

AA-77	Open cut "Free Gold" 10 foot depth, 3 feet wide...	2.54	\$ 50.80
AA-69	Hornblende vein "Free Gold" six feet in width20	4.00
AA-70	Hornblende vein "Free Gold" small 6 foot shaft entire bottom	.46	9.20
AA-71	Hornblende vein "Free Gold" 5 feet in width	.12	2.40
AA-72	Hornblende vein "Free Gold" 4 feet in width, surface.....	.10	2.00
AA-73	Hornblende vein "Free Gold" 4 feet in width, surface.....	.18	3.60
AA-74	Hornblende vein "Free Gold" 5 foot depth, 4 feet wide.....	.28	5.60
19			<u>301.20</u>

The WESTERN METALLURGICAL COMPANY
Signed by Jas. J. Forney/

INFERENCES ON ASSAY RESULTS.

From the results obtained, it has been clearly shown that gold values in varying amounts are widely distributed throughout the mineralized zone, its entire full length. The samples taken cover an ore chute fully four hundred (400) feet in length. In order to show comprehensively the distribution, it remains now to describe in detail the bodies which contain a sufficient amount of metal to be classed as workable ore. Thirteen samples (13) taken across two and one half feet of ledge matter, along a course of three (300) hundred feet in length, open cuts and small shafts reveal an average of Twenty One (\$21.00) dollars and ten cents per ton. The other six (6) samples were taken on the Hornblende vein, including these with the thirteen (13) samples gives you an average of nearly Fifteen (15.86 dollars and eighty six cents per ton.

The assay results show conclusively throughout, and demonstrated the existance of commercial ores in large quan-

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tity, with greater depth.

TRANSPORTATION-WATER-TIMBER and LABOR.

The properties are ideally located for reasonable transportation rates, on all building material, mining supplies, etcetera, being only three (3) miles distant from the LARAMIE HAHN'S PEAK & PACIFIC RAILROAD, which connects at Laramie, Wyoming, Twenty-six (26) miles distant with the main line of the UNION PACIFIC RAILROAD.

The annual precipitation in the "Medicine Bow" range is known to be rather great, and while no data are at hand to determine actually the seasonal amount of rain fall, or snows during the winter months. The mines are exceptionally dry and will remain thus above the level of the bed of the middle fork of the little Laramie river, which is approximately twelve hundred (1200) feet below the surface outcrop of the mineralized zone, on the "Free Gold".

Great many of the canyons and hill tops are covered with a dense growth of timber, consisting of Yellow Spruce, Fir, Pinon Pine and White Pine. Many of the Yellow Spruce are from three (3) feet to three and a half feet in diameter, and one (100) hundred feet in length, suitable for lumber, and building material. The Fir, Pinon Pine and White Pine are from eight (8) inches up to two (2) feet in diameter and make ideal mining timber. At present this timber is under the "Medicine Bow" National Forrest Reserve-but, the government rate on saw timber (standing) is three (\$3.) dollars per thousand board feet, and Two fifty (\$2.50) per thousand on mining timber-board feet measure.

Skilled miners (machine men and hand labor) as well as skilled mechanics and machinists, and ordinary common laborers, may be drawn from the State of Colorado, or nearby towns, Laramie and Cheyenne, Wyoming. The usual wage scale for machine men is Three twenty five (\$3.25) per day, eight hours work, and from Two seventy-five (\$2.75) to per day, eight hours work.

The district is a camp, both summer and winter, and mining may be carried on through every day of the year.

FUTURE OF THE PROPERTY.

Gradual improvement in values with increasing depth is to be expected—there can be but little doubt that the ores will increase in values, as the assays from deeper workings conclusively have shown such is the case. It need hardly be added that before making search for other ore bodies, the zone upon which the known ore bodies exist should be thoroughly developed and exploited. Whether such development will prove true, cannot be decided out of hand, but the relations which have been brought out in the preceding descriptions seem to warrant the suggestion.

CONCLUSION.

In closing up my report, I cannot refrain from strongly recommending the sinking of a shaft to a depth of One hundred and fifty to Two hundred feet, upon the Hornblende vein. A small shaft has been started to a depth of about eight feet.

The time between the realized hopes of the prospector and the actual working out of a commercial mine calls for continued activity, and the legitimate development of ores known to exist.

Respectfully submitted,

(signed) Mr. F. H. Vahrenkamp, E.M.

Encampment, Wyoming,
September 12th 1912.