

THE WYOMING CENTRAL ASSOCIATION IRON LANDS.

Last Fall I spent several days with my assistant in examining the iron lands owned by the Wyoming Central Association; which are located at the base of Bradley's peak, the highest point of the Seminoe mountains. These iron claims are about thirty miles northeast of Rawlins, the county seat of Carbon County, and also a division point on the Union Pacific railroad.

This property, embracing upwards of 600 acres of land, comprises eleven claims, which vary in size from 20 to 154.70 acres; all of which are held under letters patents from the United States, and have pure and unquestionable titles. Seven of these claims are 20 acre tracts and the remainder are located in accordance with the natural subdivisions of the Government survey. All of these claims are contiguous and are easily accessible from the valley along the foot of the Seminoe mountains. Bradley's peak is about 9,500 feet above sea level and nearly 3,000 feet above the surrounding country. The iron claims extend from a point nearly 2,000 feet below the peak down the mountain slope nearly to the valley and cover a tract of land that is one and a half miles in its greatest length and a mile in width. The Midnight claim which embraces nearly a quarter section of the land, extends highest up the mountain and slopes at a high angle toward the rest of the property. Adjoining this, the iron claims are made up of low rounded hills that are separated by undrained depressions. About the hills there are a number of small knolls. Passing through the property from the foot of the peak to the valley there is a large gulch which affords ample drainage

for all of the claims as deep as the gulch has been cut. Nearly all of the hills and knolls are covered with iron ore or iron schists and there are many places where there are bands of very pure hematite outcropping.

The ore is as a rule, badly fractured and broken and in a rather loose condition. On account of the valleys and depressions being covered with soil and detritus it was impossible to ascertain whether the iron ore universally extends under the iron claims or not. It seems highly probable that the iron ore exists beneath much of the land that has not been prospected.

#### THE DEVELOPMENT.

The development is very meagre, and is not sufficient to warrant a thorough and complete report. Many shallow shafts have been put down but many of them are so badly caved as to bar inspection. In others the timbers are in a questionable condition and in no case was a ladder way to the bottom of any of the openings. A few tunnels have been driven; but these were in a worse condition than the shafts. In all openings of this class examined the timbering had given away and rendered them impassible or very dangerous. The present amount of development work has only proven a portion of the property; and there is much to do yet before any one can fully comprehend the situation. All of the work done thus far has been in large bodies of iron ore or iron schist, and in consequence a very large tonnage of ore has been exposed. All of the work on these claims was assessment work, done in order to prove up on them, not to ascertain the amount of ore.

#### MINING.

The mining of the ore means often great expense; but in this case it will be reduced to a minimum. All ~~xx~~ that will be needed at this property

for many years to come will be open quarries, in which steam shovels can be used as ore diggers. This dispenses with under ground work, expensive timbering, lighting, mining, pumping plants and steam haulage. It is possible to quarry the ore on this property for not to exceed twenty cents per ton. It would cost much less than this amount were it not for the fact in many places holes will have to be drilled and the ore shaken with powder.

#### QUANTITY OF ORE.

The quantity of ore is very large; but with the present development I would not pretend to reduce an estimate to tons; for such an estimate would have to be based on the ore in sight and this would not fairly represent the property; since only a small percentage of the claims have been opened. Again the openings that have been made furnish very poor data on account of the many caves. I am aware that many men have placed estimates on the ore in these claims by establishing limits and supposing conditions. Work done in this manner has no value and is usually very unreliable. I can assure you that there is enough ore in sight to last a large iron plant for a great many years, and that development should more than double the present showing.

#### QUALITY OF THE ORE.

The quality of the ores varies greatly; but chiefly in iron and silica contents. There are bands scattered throughout the property of nearly pure hematite. From ore of very high grade the bands change into a schistos character, in which the thin bands of iron ore and silica alternate. These bands vary greatly in thickness; in one locality iron will predominate, and in another the silica. On account of this variation it was very difficult to obtain representative samples for analyses. Some eight samples were selected which represent the grades of ore very well. In making these samples great care was taken to obtain as nearly as possible average ore in every case. Fragments were

broken from the entire exposure of schist where the various shafts and tunnels had cut them; the samples being broken at right angles to the beddings. At inaccessible places and where it was dangerous to take samples in the above manner grab samples were taken from the ore on the dumps that had been taken out of the openings.

On the sketch maps the Roman numerals indicate the approximate locations from which the samples were taken. In no instance was a sample made of the pure, or nearly pure hematite bands.

ANALYSES OF THE ORES.

The analyses were made in the usual way; but only a few of them were run for sulphur and phosphorus. The sulphur in every case was too small to weigh, and in some instances it was hardly a trace. Tests were also made for titanitic acid; but none of this very detrimental compound was found.

ANALYSES				
Number	% of Iron	% of Silica	% of Sulphur	% of phosphorus
1	32.20	48.04	.....	.....
2	57.86	14.40	trace	00.040
3	56.75	5.77	trace	.....
4	38.10	42.38	.....	.....
5	35.18	47.50	.....	.....
6	60.25	9.66	trace	00.0822
7	Not W. C. A. Ore			
8	58.82	15.27	.....	.....

Should these analyses be averaged it would make a low grade iron proposition. In mining it will be possible to select only average or high grade ores which would bring the iron value up to 50.00% and it may be possible to make it higher than that. To some extent, the favorable location, cheap fuel, cheap mining, cheap flux and the very cheap method of transporting the ores from the mines to the place of reduction compensates for the decrease in iron value. While the average of the ore as is represented by the analyses is not as high as is usually worked in the United States, it is on the other hand higher in iron than hundreds of properties that have been or are being worked. The greatest detriment to the ore is the high percentage of silica. The phosphorus is low and the sulphur is not high enough to be considered in an iron proposition. So far as the investigation has proven the ore will make equally a good grade of pig iron or steel.

All of the details necessary to consider before selecting a location for a reduction plant were not carried out. It was, however, observed that in a broad valley about a mile south of the property there was an excellent site for a general plant, and sufficiently below the mines to allow the ore to be transported by aid of an endless wire-rope tramway; which should cost not to exceed five cents per ton. The cost of erecting a plant at this point would be very moderate. Lumber can be had for about \$30.00 per thousand. Stone of various grades ranging from granite to limestone are found in great abundance near the valley. Lime can be burned within a few miles of the plant sight. Besides these, there are numerous beds of clay at hand that will make not only good building brick; but also fire brick for furnace use. None of these clays have been analyzed; but they belong to the same beds that the celebrated Colorado clays do and are very much like them in every way. In the

valley where it has been suggested that a plant could be easily erected, there is a small brook which would furnish a small supply of water. Should this fail a good supply of artesian water could be secured by drilling a shallow well. Underlying the valley are numerous veins of good coal, which resembles the Rock Springs but is not quite as valuable for heating purposes. This coal can be utilized for all purposes about an iron plant with the exception of reducing the iron in the large blast furnace and possibly it may be used for this. The coal does not coke in an open oven, and no one has tried to coke it in any of the ovens that are working for by-products. Possibly it may coke in some of the closed furnaces. In this connection it is well to remember that in some places in the world that iron ores are being successfully reduced with non-coking bituminous coal, that is used in the same way as coke. Before advocating a scheme of this kind it will be necessary to make some preliminary tests. This coal will work well in gas producers, which are being used to great extent in many manufacturing lines. The location, barring the coke supply is ideal. In case it is found that the coal can not be utilized for smelting ore then a company would have to depend upon the Colorado coke.

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COAL ANALYSES FROM THE SEMINOLE MOUNTAINS

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Name of coal vein	Water %	Vol Matter %	Fixed Carbon %	Ash %	Fuel %
Field House	12.24	34.31	46.87	6.58	81.21
Penn L. Co.	11.01	33.27	48.48	6.24	81.75
Miller	12.02	37.53	49.90	5.20	82.78

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At present these mines are located between the Northwestern and the Union Pacific railroads and can not be considered as tributary to either on account of the long distance they are away. Without some change in railroad facilities it will be impossible to work these mines. Fortunately some very desirable changes are being made at this time. Last summer the Burlington railroad surveyed and started work on a line west from Alliance, Neb. This line has been completed as far as Guernsey, Wyoming, which is twenty-five miles above old Fort Laramie, on the North Platte river. A number of preliminary lines have been extended westward, and now Burlington has a line surveyed into Ogden. There is no question but this road will build through Wyoming very soon, for there is not enough at Guernsey to warrant the construction of a railroad to that point. This main line of the Burlington will follow down the Medicine river and pass just south of the Seminoe mountains, if they build on the present survey, and it will be impossible for them to pass through the state south of the Seminoe mountains without running very near the Wyoming Central Association's iron mines. The distance of the present survey from the mines, is not over five miles and it may be less. When this road has been completed it will bring this property within reach of the commercial world, and will so increase its value that some company will soon see its possibilities and open up a great industry.

Already the demand for iron in the mining regions of the west has so increased that the present output of a single plant is wholly inadequate. The Pueblo plant that has been in operation for a quarter of a century has at last contracted for Wyoming iron ore in order to carry on their industry.

Only recently they closed a contract with the owners of the Hartville mines for a twenty year's supply. The average annual shipments will be about 250,000 tons. As the Burlington builds west the Seminoe mines will be the next to be developed along the line. As soon as this railroad has been completed to Ogden an iron company would have an excellent opportunity to enter the western territory with all kinds of iron goods.

In organizing an enterprise in the mountain country so far removed from the center of trade it will be well to consider every phase of the subject and start on a small scale and increase the plant as the demands require. To illustrate, at present all of the cast iron piping used in the mountain region is made in the East. All other heavy castings are also shipped in. A plant to start might simply manufacture large castings of all kinds and pay special attention to cast iron piping and car wheels. Then as the industry increased manufacture wrought iron and steel.

Very respectfully submitted,

( Signed ) Wilbur C. Knight.

Sept. 1892.