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*A Brief Review
of the
South Pass Gold District,
Fremont County, Wyoming.*

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HENRY C. BEELER,
State Geologist of Wyoming.

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The South Pass Gold District.

LOCATION.

This district is situated in the south central part of Fremont county, Wyoming, near the southern end of the Wind River range of mountains and about 60 miles in a direct line north of Point of Rocks station on the Union Pacific railroad, the nearest railroad point.

A daily stage and a mail route runs from Rawlins, on the Union Pacific railroad, to Lander, 135 miles, with connections at Meyersville, 90 miles out of Rawlins, for Lewiston, Atlantic and South Pass City.

Lander, the county seat of Fremont county, may be reached by team, about 40 miles from South Pass, and stage connections there made for Thermopolis and Cody, on the B. & M. railroad, and to Casper, on the Chicago and Northwestern railroad.

The principal road is from Rock Springs, on the Union Pacific railroad, a distance of 80 miles, having stations along the route and being used for freighting purposes.

The best method of reaching the district for a short stay is by team from Rock Springs, as the 80 miles to South Pass may be covered in two days without material inconvenience, and good accommodations had at Washington's ranch as a half way station.

South Pass has the best hotel, and this may readily be made headquarters while the district is being investigated.

HISTORY.

Gold was discovered in this region in 1842, and from that time until 1869 efforts were made to work the rich placers known to exist there, when the great rush to South Pass oc-

curred in the latter year; and the placers, rich enough to pay when worked on a limited crude scale, were promptly worked out, and the miners sought other opportunities in the then new fields of Colorado and Montana.

During this time the Carissa lode was opened up and paid large returns, followed by the Miners' Delight at Peabody Hill, the Burr at Lewiston and numerous other properties that were worked for a time with great success, but were allowed to run down or were abandoned when the level of water and base ores was reached.

Many attempts to start up these properties have been made, but usually by men of limited capital or little experience in mining; they becoming discouraged when they failed to treat the ores successfully, and for years little was done in the district, but with the new and cheaper methods in testing and treatment of refractory or difficult ores, a new era of prosperity is dawning upon this long neglected region.

GEOLOGY.

The district may be said to consist of an island of metamorphic schists of the Algonkian period lying upon the granites of the Archean, and with intrusions of granite and dyke rocks in the schists at different localities.

The granites of this section of the Wind River range are usually the common red feldspathic granite, and here show an occasional grey granite island or band, usually of limited extent. Dykes of diorite and allied rocks are also noted in the granite, but to the present time nothing of value has been reported from this region.

The schists show for a distance of about 30 miles long and from ten to twelve miles wide, the longer axis bearing northeasterly and southwesterly, in the same general direction as the strike of the schists, and with a general dip to the north, varying from 45 to the perpendicular.

Around these schists are the granites on the northwest and the succeeding sedimentary formations on the northeast, and the tertiary formations on the southerly sides.

The schists vary in composition in different parts of the district, but are usually hornblende schists, with some mica schist and chlorite schist associated therewith, and, as a rule, these varieties are very fine grained.

At various places, as near the William J. Bryan mine, formerly called the Rose, an exposure of a garnet schist is noted, and in the vicinity of the granites some gneisses are found, but these are usually of limited extent and only of local importance.

These schists frequently show tourmaline in small quantities, and, locally, pyrite and magnetite are found as a constituent part of the schist.

Nearly all the rocks of this region, but especially the above mentioned schists, show strong evidences of alteration and change, in many instances giving an appearance entirely foreign to the character of rock, but an examination with an ordinary field lens is often sufficient to determine the true character at once.

This altering material is usually silica, and where the rocks are weathered, as on an exposed outcrop, a hard quartzose character is noted, and these are frequently called "dykes," but are simply altered schists and frequently carry gold values.

Dykes occur in these schists, especially at the old Miners' Delight mine at Peabody Hill, where diorite and diabase dykes are noted, at the Mary Ellen Hill near Atlantic, at the Carissa at South Pass, and along the northwesterly edge of the schist in the vicinity of the Little Joe and at Gold Creek.

At the Miners' Delight dykes of porphyritic material are noted, and these extend to the "Rustler belt," north of Atlantic City, where the Mormon Crevice and Poirée estate properties have produced very rich ore.

TOPOGRAPHY.

The district, topographically, is a series of broad table lands, devoid of timber, rising from the Sweetwater river valley northward to the foot of the Wind River mountains, and cut by numerous creeks that furnish the water for the district, and whose beds and tributary gulches have held the placer gold that first attracted attention to this region. Willow Creek at South Pass, Rock Creek at Atlantic City and Strawberry Gulch at Lewiston are the principal creeks.

Four camps were established in the early days, but three of these survive, namely, South Pass, Atlantic and Lewiston, the camp at Miners' Delight being now deserted.

South Pass is the most westerly of these, and has been kept up for years by the work at the Carissa mine, this being the deepest and principal mine of the district.

THE CARISSA MINE.

This property, located in 1867, has been a phenomenal producer for many years, often under adverse conditions of working or management, and is today the best known and developed property in the South Pass district.

It is owned by the Federal Gold Mining Company, Chicago, Ill., and development work is being carried on at the present time.

The development consists of some 2,300 feet of drifting, etc., with a shaft 384 feet deep, following the dip to the vein, equipped with hoist and necessary appliances for handling the ore, the work being carried on with air drills.

The Carissa ore occurs in quartz lenses, lying in the schist, having the same dip and strike as the schist, and these lenses occur at irregular intervals.

This applies principally to the high grade ores, as the greatest development has been done on these high grade chutes, leaving the low grades to remain intact until the proper facilities could be at hand to treat them economically.

Associated with the quartz lenses are bodies of mineralized schist, carrying pay values in gold, and lying between or near the lenses have been found schist ores of very high grade, but with the usual intervals of lower grade material in the same ore.

In the upper portion of the Carissa workings the usual oxidized ores were found, and these were very rich, as shown by the early history of the mine. As development proceeded, the oxidized ores passed out and the sulphide forms came in, being mostly arsenical pyrites, but experience in milling these ores has shown the free gold character of the ore still pertains, and on the lower level from 60 to 90 per cent. of the gold values may be saved upon the plates, and ore is frequently met with that shows free gold associated with the pyrites, both in the quartz and adjacent schists.

The ore is run through a ten stamp mill, over amalgamating plates and concentrating tables, the concentrates being saved and the tailings settled with a view of cyaniding, this process having been experimented with and has given most successful results with these ores.

The full extent of the ores in this mine has not yet been determined, and will require a system of development by sinking to greater depths, cross cutting through and beyond the lenses now known to determine the extent of the profitably mineralized zone, and drifts on the vein to get under the formations that showed great values on the surface in former years, but which have been neglected, but it is without doubt that a great mine is here, and with proper development and treatment of the ore, may be yet made a great property.

At South Pass the Franklin, the Curry and the Carry Shields and others are lying idle for want of capital to push their further development, and are entitled to a close investigation. A recent discovery is the Copper Surprise, one mile north of the town, where a strong lead has been cut into and shows

considerable copper pyrites, carrying fair values in gold, that promises well for the future.

Between Atlantic and South Pass are a number of properties that have been worked at various times, and a great deal of ore shipped or milled from the properties that now lie idle.

The Doc Barr, Duncan, Richard Albert and others have shown considerable good ore when worked, and are yet undeveloped.

ATLANTIC.

Atlantic City is situated in the central part of the working district, four miles east of South Pass, and here is the working headquarters of the Dexter Mining and Development Company of Rochester, N. Y., the principal operator here at the present time, who have recently added to their original large holdings and are now operating the Tabor Grand and Dexter Tunnel, besides a number of smaller works for assessment, etc.

This company holds the placer ground on Rock Creek of the old Christina Lake Placer Company, taking the necessary water for hydraulic working from Christina Lake and Rock Creek, using about 25 miles of ditches, flumes, etc., for the purpose, and a good supply of water is secured.

The Tabor Grand is doing development work and stoping ore from a small slope above the main tunnel, the ore being treated in a Huntington mill and the tailings held for future treatment.

The Dexter tunnel is being driven to cross-cut several well defined and well known leads for development purposes, and will cut these different leads at depths varying from 217 feet to 395 feet, in a total length of 2,800 feet, some six leads crossing the line of the tunnel, which has reached a length of 360 feet, but, with the mechanical plant just installed, should proceed much faster than heretofore.

The William J. Bryan or Rose vein is on the line of this tunnel, and when this vein is cut good ore may confidently

be expected, as the Rose has produced some of the richest ore of the district, but what has hitherto been one of the most difficult ores to save.

The Mormon Crevice is another rich lead that crosses the tunnel line, and the tunnel will develop a number of properties at a depth sufficient to determine beyond a doubt their values and extent.

The Garfield mine at Atlantic is working under lease, and only development work being done on the lower level, but may be expected to make a good showing before long.

The Ground Hog group on Rock Creek, above Atlantic, is one of the best prospects in the district, and shows characteristics similar to the Carissa, having the lenses of quartz ore and the heavily mineralized schist carrying profitable values. Development work only has been done on this property, and it has shown up a fine proposition for further development on a large scale.

Development work has been done on the Mary Ellen, near the Tabor Grand, and the ore milled by a Huntington mill with success. This vein is a fissure, and shows very rich ore and is unique among the bedded veins of this locality, but is evidently a valuable property.

The Pay Rock group at Peabody Hill shows a number of veins or quartz stringers in what is evidently a huge body of ore, but so far developed only to a shallow depth and only on the rich streaks. Some 500 feet of development work has been done, mostly drifts, and considerable ore taken out, most of which milled profitably. A tunnel has been run in some 600 feet, at a point near the foot of the hill, but has not yet reached the vein.

On the east side of Peabody Hill the old Miners' Delight mine is located, and which is said to have produced \$1,000,000.00 in gold, but which has been abandoned for years.

The vein is a fissure from four to six feet wide, associated with the coarse crystalline porphyry noted above, and contained

very rich gold values, but was not developed over 200 feet in depth, as far as can now be ascertained.

This ore was free milling and milled on the ground, but no effort was made to do economical work, and the percentage saved was of small importance at that time.

LEWISTON.

At this camp, which was opened up in 1879, when the famous Burr mine was discovered, development has been slow for the past few years, but this season the several prominent properties have been taken up by new capitalists and renewed activity is apparent.

The Burr shows the same lense condition hitherto noted, and has been very rich, but, aside from the workings on the original lense, little development has taken place. The ore was free milling and easily handled.

The Bullion mine, Iron Duke, Ruby and others in this vicinity have produced heavily at various times, but have not been worked steadily.

Experiments have been made at the Bullion mill with the Cyanide process on the lower grade of ore with success, but results have not been given to the public.

PLACERS.

In recent years but little placer mining has been done, and that on a small scale, except the plant of the Dexter M. & D. Co. on Rock Creek, below Atlantic. This company has some 1,100 acres of patented placer ground on this creek and has made runs during the different seasons, but has not yet commenced operations for the present season.

The chief difficulty has been to handle the tailings, as the fall of Rock Creek at this point is not sufficient to handle them without special means, as the hydraulic elevator, etc.

Small placers with sluices, rockers, etc., have been worked

in nearly all the gulches of the vicinity with varying success, but at present this work has practically ceased.

ORES AND TREATMENT.

In the past the attention of the owner and miner has been directed to the high grade ores, but it is upon the great bodies of low grade ores, which certainly exist in this vicinity, that the district must depend in the future for the prosperity of the camps, although it is very likely that other lenses, fully as rich as those of the past, will be opened up and go to swell the production of the district.

The grade of ore of this district has certainly been remarkably high, and had proper care been used in handling or testing the ores, the percentage of values saved would have been equally high, but it is a fact in many instances that ores were sent to the nearest mill without regard to the fitness of the proposed treatment for the ore in question, and when the values were not saved the mine was turned down.

It is admitted that the process of stamping and amalgamating the free values is suited to some of the mines of this district, especially the Carissa, as shown by the mill figures from work actually done at the plant, but it should be stated with all possible emphasis that this method is not applicable to all the ores of this district.

Numerous instances have been stated on good authority, where different lots of ore have been milled and only 10 to 30 per cent. of the values saved, the balance going into the tailings dump or wasted in the creeks.

Varous reasons have been assigned for this state of affairs, and samples of ores examined have shown the gold in several forms, which left no doubt as to the variety or scope of the processes needed for treatment.

Space does not permit discussion of the ores here, but it may be mentioned that the "brittle gold" and "crystallized gold," as often spoken of here, has been found to be partially oxidized

tellurium minerals, which, of course, are not suited for stamping in their natural state and are wasted by such methods, the tailings values almost equalling the original ores in well defined instances.

"Rusty gold" is common and difficult of saving by amalgamation as usual, but may be handled with proper precautions.

No one process has yet come to light which would successfully treat all the ores of this district, and before any property is taken up a thorough test at some well equipped and reliable testing works should be made on as large an amount of ore as can be obtained of the grade or kind it is proposed to treat, and the works constructed according to the results obtained from this treatment.

In these tests especial attention should be given to the saving and handling of the fines, of which an unusual amount is often produced from the nature of the minerals and ore constituents.

Attempts have been made at different times to treat the old dumps with the Cyanide process, in some instances with success, but in many cases the people handling the work were not familiar with the process and the experiment did not succeed, owing to the ores experimented with not being properly crushed or handled, but it is believed this process, with proper precautions, to be determined by experiment on each ore or property, will be found to be adapted for a large amount of ore in this district.

WAGES, FUEL, ETC.

Standard union wages are paid throughout the district, and living is about the same as at other off-the-road camps.

Fuel used is wood, which is delivered by contract at from \$3.00 to \$3.50 per cord, and so far no difficulty has been experienced at the principal mines as to supply.

Lumber, etc., may be had at from \$20.00 to \$30.00 per M.

Provisions and miners' supplies may be had at South Pass, Atlantic and Lewiston, where well equipped stocks are kept.

and prices are about the same as obtain under similar conditions of transportation elsewhere.

Freight rates are quoted at \$1.00 per cwt., and when ore is loaded out to the railroad a rate of 50 cents per cwt. is made.

CLIMATE.

Work and freighting may be and are carried on at all seasons of the year, as the climate is no more severe here than at other places of similar altitude (viz. 7,500 feet), and the roads are usually in good condition at all seasons.

FUTURE TRANSPORTATION.

The principal drawback to the development of this certainly rich country is the distance from the railroad and the barren character of most of the intervening country, which makes it a necessity that the camps shall supply the whole business for the connecting road, has prevented any tangible attempt for railroad communication up to the present time, but with the wonderfully rich country that lies within a few miles of Lander and vicinity being so rapidly developed, it is certain that this objection will be removed within a comparatively short time and the question of transportation be solved.

Briefly, it may be stated that the South Pass gold district is not a bonanza country, although the past history of this region records some wonderful finds, but it is certainly worthy of the close attention and investigation of the mining investor who understands his business and is competent, both financially and technically, to develop promising prospects into paying mines under the present conditions of transportation, and to experiment with the ore conditions until a satisfactory process of treatment is developed.