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The Balm Creek Gold Mining company, which began operations about two years ago and in which much local capital has been invested, is a steady producer of concentrates and high grade shipping ore. The mill has had a steady run for the past year with the exception of a few weeks this spring when operations were shut down for repairs and the installation of pumps to unwater the lower levels of the mine.

Milling has consisted almost entirely of oxidized ores in the upper levels of the mine on which recoveries were limited due to the condition of the ore not being amenable to flotation. Some high grade ores were also shipped direct to the smelter from this zone, the recovery being more satisfactory by this method than by mill treatment.

Greater Recovery Expected

The water in the mine has been lowered to the 400 foot level and the ground is being timbered and caves caught up preparatory to starting milling again on the sulphide ores encountered at this depth. A greater recovery is expected from these ores. The ores encountered at a lower depth are also said to contain higher values in gold than those previously milled.

BALM CREEK Gold Mining Company has about completed installation of ball mill and flotation cells, and will start production around June 1. The property is near Keating, Oregon, comprising part of the old Oregon Copper Company holdings, and is managed by John Arthur, founder of Oregon Copper.

BALM CREEK GOLD MINING CO.

(2)

THE MINING JOURNAL PINK SHEET
Phoenix, Arizona

August 25, 1943

Oregon

A development program has been undertaken at the **Balm Creek** mine near Keating, Oregon, which will include the driving of several hundred feet of tunnel in an effort to pick up the vein on the west side of Balm Creek. Hal Bradley of Sumpter, Oregon, holds the contract for the work, which will require several months for completion. The development program, which is of a preliminary nature, is said to be financed by one of the large copper companies and it is understood that further work will be done if the present program indicates promising values. John Arthur, Box 207, Baker, Oregon, is the principal owner of the Balm Creek property.

Balm Creek Company Closes Keating Mine

Stockholders in the Balm Creek Gold Mining company received letters today announcing the cessation of work on the company's grounds.

Failure of the expected good ore to hold out, expensive timbering costs to prevent caveins from the crumbly ore encountered and the 50 per cent drop in the price of copper, a metal that has proved to be in abundance in the mine, combined to cause the shut-down.

The mine may be reopened at a later date if the price of copper rises, however, mining official intimated.

Baker Democrat Herald
Dec 16 1937
By

Balm Creek Mine
Mining Jourl(Phoenix) v. 21, no. 5, p. 14, July 30, 1937

"J. A. Herdlick, formerly general superintendent of the Cornucopia Gold Mines at Cornucopia, Oregon, who has been acting mill superintendent for a short while at the Balm Creek Gold Mines Company at Keating, Oregon, has been appointed superintendent of the Balm Creek mine and mill. John Arthur of Baker is general manager."

Mining Jour.(Phoenix) v. 21, no. 9, p. 49, Sept. 30, '37

"The Balm Creek Gold Mines Co. at Keating, Oreg., is planning to unwater the lower levels of the property and to undertake a development program designed to locate the west ore body. The mine is opened to a depth

The Mining Journal January 15 1938

According to reports, the **Balm Creek Gold Mining Company** has suspended operations at its Balm Creek property near Keating, Oregon. The company has been operating for nearly five years. Until recently over 50 men were employed in the mine and 100-ton flotation mill. John Arthur of Baker is general manager.

The **Balm Creek Gold Mines Company** at Keating, Oregon, is planning to unwater the lower levels of the property and to



undertake a development program designed to locate the west ore body. The mine is opened to a depth of 700 feet, but little work has been done on the 700 level. When operations are under way the 100-ton flotation mill will treat ore taken out during development, but will not be on a 24-hour schedule as heretofore. John Arthur of Baker, Oregon, is general manager and J. A. Herdlick, Baker, is superintendent.

EDITOR'S NOTE—The Herald presents a synopsis containing the outstanding points of the report of Dr. Waldemar Lindgren, world famous mining geologist on the Mother Lode and other properties of the Baker Copper Belt.

By Dr. Waldemar Lindgren
Introduction

It has long been known that copper deposits occurred in the foothills of Lower Powder river and that a similar belt extended along the Snake River about twenty-five miles further east. While a considerable output of copper is recorded for the Snake River deposits, particularly from the Iron Dyke Mines, less attention has been devoted to the former region. Recently, however, Mr. John Arthur, of Baker City, has conducted rather extensive prospecting operations on Balm Creek, Clover Creek and Goose Creek, and has demonstrated the existence of series of veins carrying copper which show promise of developing into producing mines. These deposits I examined at the request of the Mother Lode Mining Company during a visit of nine days in July, 1925, and they are briefly described in this report.

Location

The deposits are located in T. 7 S. R. 42 E and in T. 7 S. R. 43 E, about twenty-five miles in a straight line from Baker, a city of 9,000 inhabitants.

Topography

The approximate elevation is 3,500 feet at the camp, or about the same as Baker City. The Clover Creek Camp is about the same elevation while the Goose Creek Camp is a few hundred feet higher. Yellow pine timber begins at the 4,000 to 4,500 foot contour and the supply is sufficient for a long time to come. The country is well-watered by creeks and springs. The climate is mild with little snow in the winter and long dry summers. On the whole, conditions are very favorable for mining.

Geology

The geological formation, in which the ore deposits are contained, consists of a series of old volcanic flows associated with minor amounts of sediment, and it is of Triassic age. Upon close examination these rocks fall into three groups: 1. Andesites and andesites breccias; 2. Basalts; 3. Rhyolite porphyry; and 4. Rhyolitic tuffs. The sediment rocks consist of subordinate distinctly bedded rocks which appear grey, siliceous and cherty. Finally there are lenses of limestone, particularly on Clover Creek. The strike is generally East-West, and the dip mostly to the North at angles upwards of 45 degrees. Later than all of these rocks and intruded into them is the Sparta granite, and some granite porphyrys observed in the lower foothills North of Powder river may belong to the same intrusion. This granite is probably of earlier Cre-

trusion of this MAGMA has caused the

Dr. Waldemar Lindgren

Dr. Waldemar Lindgren, professor of geology at the Massachusetts Institute of Technology at Boston, is one of the world's most noted experts in the field of mining geology. He was born in Sweden, February 14, 1860, and graduated from the school of mines at Freiberg, Sweden in 1883.

Coming to America he joined the staff of the United State Geologic Survey where he was first assistant geologist 1884-95, geologist in 1895 and chief geologist 1911-12. Since 1912 he has been professor of geology at "Boston Tech," regarded as the greatest technical school in America. He is the author of "Mineral Deposits," and many reports in government publications and technical journals on mining geology. He is a member of the Geological Society of America, the A. A. A. S., the American Institute of Mining Engineers, and the Mining and Metal Society of America. His home is at Brookline, Massachusetts.

Dr. Lindgren spent nine days on the Baker copper belt in July and made a thorough examination of the Mother Lode and other properties. His report, which is highly conservative and deals only with the facts as he found them, is presented to the readers of The Herald today in order that the people of this district may see what Dr. Lindgren who is as high an authority in this line as can be found in America, thinks of our copper belt.

The attention of the reader is especially invited to his recommendations at the conclusion of the report. The fact that he recommends the expenditure of large sums of money in further development is proof of his confidence in its future.

The published account is not the full report which is about nine thousand words and contains minute descriptions of geological conditions which would not interest the average reader. The "meat" of the report is published herewith. The entire report can be seen at the Mother Lode offices here.

THE POORMAN TUNNEL ORIGIN OF VEINS.

The veins of the Mother Lode Company are definitely related to the barite-quartz-chalcopyrite type well known representatives of which are the SHASTA COUNTY, CALIFORNIA deposits and the MOUNT LUELL DEPOSITS OF TESMANIA. They were formed by hot solutions, EMANATING, I BELIEVE FROM THE SPARTA INTRUSION OF SODA-GRANITE, which solution's replaced the Triassic greenstones and rhyolites along certain fissures which, in general extend westward from that intrusive igneous body. I BELIEVE THAT THE VEINS WILL CONTINUE IN DEPTH AND BE FOUND PRODUCTIVE FAR BELOW THE PRESENT LEVELS.

Developments On Slide Creek And Balm Creek

The principal operations of the Mother Lode Copper Company are: 1. Poorman tunnel; 2. Shaft operations; and 3. Gilkeson and Balm Creek tunnels. Gilkeson tunnel is 2,000 from the junction of streams and trends north, while the portal of the Poorman tunnel is

The most important are the POORMAN, the BIG and the SOUTH VEIN.

The Shaft Level

The shaft is sunk to a depth of 150 feet below the collar and the tunnel level. The Poorman vein is cut 20 feet north of the shaft; it is 20 feet wide consisting of schist with disseminated sulphides, and continues to the face. The face, almost directly below the station 8 on tunnel level, and 635 feet from the shaft shows 5 feet of good chalcopyrite ore, the whole thickness not being disclosed; the average of these 5 feet is about 4 per cent copper. The vein here strikes N. 80 degrees W. and the dip is 65 degrees S.

The South Vein in The Shaft Level

From the shaft level, 150 feet below the surface, a south crosscut, 280 feet long, opens the South vein. Where cut the vein was about 20 feet wide with much barite. The barite mud contains an abundance of barite. The sets are now almost filled with the soft mushy material

cross the strike of the vein in all there are four trees 80 feet. I have not seen cuts, but it is stated that contain gold values up to over a considerable area. Reason to question these obtained by Mr. Arthur a Milnor Roberts.

Relation Of The South

Thus far the vein which best promise is the South is characterized by barite. It is to be expected good outcrops shown on towards the East that not discovered in a draft in the Towards the West the vein an East-West strike, and that more ore will be discovered Slide Creek. Anyway, the be extended in this direction

Relations Of The Poor

The Poorman vein lies a North of the South vein 100 feet. Its strike is N. 75 degrees. The same vein is opened in the the dip indicated by the 65 degrees S. Here, it seen two ore shoots, probably v be added to the latter as the drift progresses. The width definitely stated.

The Big Vein

Reference has been made big vein found 200 feet south Poorman vein on tunnel level. WIDE, wholly oxidized a much water, evidently red, strong footwall gouge. There are good that it will contain CHALCOCITE ore on the shaft

There is a good probability. ABLE ORE IN THE POORMAN SOUTH AND THE BIG VEIN ENCOUNTERED) WILL COULD BE DEPTHS.

Recommendations

The mining operations have been conducted with notable efficiency. For further work I recommend the following developments:

1. Raise to surface from the Slide Creek tunnel.
2. Development of the Poorman body in horizontal direction.
3. Sinking of 100 foot shaft.
4. Drifting continued on the Poorman vein on shaft level.
5. Drifting continued on the South vein on shaft level.
6. Raise from present face of Poorman vein on shaft level.
7. Drifting on Big vein on shaft level.
8. Opening of Big Vein on shaft level by South cross-cut from present face.
9. Crosscut north from shaft level.
10. Eventually sinking of shaft to 100 foot level, and crosscutting the Poorman vein.
11. For economy in future operations it would be highly desirable to install electric power to the mine.

whole, conditions are very favorable for mining.

Geology

The geological formation, in which the ore deposits are contained, consists of a series of old volcanic flows associated with minor amounts of sediment, and it is of Triassic age. Upon close examination these rocks fall into three groups: 1. Andesites and andesites breccias; 2. Basalts; 3. Rhyolite porphyry; and 4. Rhyolitic tuffs. The sediment rocks consist of subordinate, distinctly bedded rocks which appear grey, siliceous and cherty. Finally there are lenses of limestone, particularly on Clover Creek. The strike is generally East-West, and the dip mostly to the North at angles upwards of 45 degrees. Later than all of these rocks and intruded into them is the Sparta granite, and some granite porphyrys observed in the lower foothills North of Powder river may belong to the same intrusion. This granite is probably of earlier Cretaceous age, and I believe that the intrusion of this MAGMA has caused the mineralization described below.

The Ore Deposits

The deposits now prospected by the Mother Lode Mining Company are FISSURE VEINS, containing chalcopyrite, pyrite and very little zincblend, and galena in a gangue of fine-grained quartz and barite. The chalcopyrite carries from fifty cents to several dollars in gold and silver up to several ounces. The principal copper mineral is thus chalcopyrite, malachite and chrysocolla. In a few of the veins on Slide Creek barite is absent. It is a significant fact that the most persistent vein is the one carrying barite and that this appears to be continuous from Clover Creek over to Balm and Slide Creek. There is a strong probability that the Clover Creek tunnel is on the same vein which is opened by the Balm Creek and Slide Creek tunnels, and it is very likely the latter continues over to Goose Creek.

Oxidation

The depth of the oxidation is generally only about 50 or 75 feet. The large 50 foot vein recently cut in the Poorman tunnel, is however, fully oxidized except for a little chrysocolla and chalcocite at a depth of 200 feet below the surface. This is caused by the porous character of THIS REMARKABLE VEIN and by the fact that a strong, water tight clay seam has developed near the footwall which tends to concentrate the circulation water. On Balm Creek partial oxidation and CONSIDERABLE CHALCOCITE are found 75 feet below the surface.

At the surface the veins show strong silification and almost complete leaching. Many of the outcrops are 20 to 50 feet wide. In places the gold values show a strong concentration at the surface as best shown in the trenches above Balm Creek tunnel while values of about \$8.00 PER TON were shown over a width of 24 feet. In the veins thus far opened there is no strongly developed chalcocite zone, BUT IT MAY BE EXPECTED THAT A NOTABLE CHALCOCITE ENRICHMENT WILL BE FOUND AS DEPTH IS REACHED ON THE BIG VEIN RECENTLY CUT IN

The veins of the Mother Lode Company are definitely related to the barite-quartz-chalcopyrite type well known representatives of which are the SHASTA COUNTY, CALIFORNIA deposits and the MOUNT LUELL DEPOSITISTS OF TESMANIA. They were formed by hot solutions, EMANATING, I BELIEVE FROM THE SPARTA INTRUSION OF SODA-GRANITE, which solutions replaced the Triassic greenstones and rhyolites along certain fissures which, in general extend westward from that intrusive igneous body. I BELIEVE THAT THE VEINS WILL CONTINUE IN DEPTH AND BE FOUND PRODUCTIVE FAR BELOW THE PRESENT LEVELS.

Developments On Slide Creek And Balm Creek

The principal operations of the Mother Lode Copper Company are: 1. Poorman tunnel; 2. Shaft operations; and 3. Gilkeson and Balm Creek tunnels. Gilkeson tunnel is 2,000 from the junction of streams and trends north, while the portal of the Poorman tunnel is found 2,300 feet farther up on the East side, the shaft is 220 feet south of this portal. The Shaft and the Poorman tunnel are 75 feet above the Gilkeson tunnel. The so-called North Vein outcrops just above the boarding house 1,200 feet above the Poorman tunnel. Another set of outcrops show on the East slope of Slide Creek between the North Vein and the Poorman vein. No work has been done to show the character of these veins below the surface. Their strike is East-West.

The Poorman vein outcrops very prominently between the tunnel and the shaft, appearing like a 30 foot wide belt. This outcrop can be traced 500 feet eastward to an elevation of about 150 feet above the tunnel. It strikes N. 70 degrees W. and the vein dips steeply south.

Farther up the slope 1,100 feet from the portal of the Poorman tunnel and vertically 270 feet above it is a large outcrop about 25 feet wide. This evidently corresponds to the BIG VEIN in the 200 foot south crosscut from the tunnel level and which at the level is still oxidized. It's strike is about East-West and its dip 65 degrees south.

Going southward the south vein is encountered and can be followed up the slope for about 1,000 feet. Its strike is N. 60 degrees W. and its dip about 65 degrees S. The Vein descends on the Balm Creek side and its extensive silicified outcrops have been disclosed by several tranches 75 feet vertically above the portal of the Balm Creek tunnel. Extensive samplings has shown, I am informed, that they contain up to \$8 IN GOLD AND SOME SILVER. In the tunnel, 75 feet below, there is a CONSIDERABLE CONCENTRATION OF CHALCOCITE, AND GOLD IS PRESENT UP TO THE AMOUNT OF SEVERAL DOLLARS TO THE TON.

In all six veins have been observed, of which four have been developed to some extent

VEIN.

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The South Vein in The Shaft Level

From the shaft level, 150 feet below the surface, a south crosscut, 280 feet long, opens the South vein. Where cut the vein was about 20 feet wide with much barite. The barite mud contains an abundance of harder chalcopyrite-barite fragments and the sets are now almost filled with the soft, mushy material.

Mr. Arthur states that the first set assayed one half per cent copper; the second, 2 per cent, with 1.5 ounces in silver; the third 6.5 per cent copper; the second, 2 per cent, with 1.5 ounces in silver; the third 6.5 per cent copper with 3.5 ounces in silver. Under present conditions it is difficult to form an idea about the value of this lens, or shoot, which may be considered 60 feet long, with a strike of N. 40 degrees 60 degrees W. A CONSIDERABLE AMOUNT OF PAYABLE ORE IS PRESENT.

The Gilkeson Tunnel.

The Gilkeson vein is intersected a few feet from the portal, showing only disseminated pyrite with a little chalcopyrite. A branch is now driven in a westerly direction to open this vein below a prominent outcrop.

The south vein, characterized by much barite, outcrops rather prominently on the ridge about 140 feet above the tunnel. Its strike is nearly East-West and its dip steep to the South.

At the point of intersection, in the Gilkeson tunnel the vein shows as two feet of gough material with barite and scattered pyrite. The drift follows it for 160 feet, and its last exposure is in a small crosscut to the North. For 50 feet to the East of this point about two feet of good chalcopyrite-barite ore is shown. In these last 160 feet there is much disseminated ore material, with pyrite, chalcopyrite and chalcocite, the extreme width being about 20 feet.

The Balm Creek tunnel traverses soft crumbling greenstone for about 200 feet. The tunnel intersects the vein at an acute angle so that the actual width is more nearly 25 feet.

On the slope to 100 feet above the RICH ORE BODY at the end of the Balm creek tunnel are extensive siliceous outcrops. The longest trench

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