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DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES
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G M I SHORT PAPER

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ADVANCE REPORT
on
SOME QUICKSILVER PROSPECTS
in the
BUTTE FALLS QUADRANGLE, OREGON

(Covers economic aspects of work done
by Oregon State Geological Survey
during summer field season of 1940).

by

Dr. W. D. Wilkinson



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FOREWORD.

Some quicksilver prospects that warrant investigation by persons or mining companies interested in producing that metal were surveyed and described during August of this year by our State Geological Survey field parties. These prospects are located in what are known as the Tiller and Cold Hill Districts of southwest Oregon, lying southeast of Roseburg and north of Medford in the southern part of Douglas and the northern part of Jackson Counties. The area covered by our parties is officially designated as the "Butte Falls Quadrangle" by the United States Geological Survey.

In line with the policy early established by this Department to publicize, at the earliest possible time, matters of especial economic importance, this Department has decided to publish descriptions and locations of these principal quicksilver prospects several months in advance of the issue of the complete technical report with colored geologic map of the area surveyed.

Obviously, we cannot with propriety classify these prospects as to their relative merit. Since they are "prospects" for the most part, we do not have sufficient information to say definitely that any one has outstanding merit. Furthermore, it would be unfair to the several owners. However, it was the opinion of the men on the survey that a couple of these justify careful examination by any group looking for new quicksilver properties.

Owing to the rather complicated geologic relations in the district, a large amount of petrographic and laboratory analytical work must precede the writing of the full geologic report. It is expected, nevertheless, that this will be issued shortly after the first of the year 1941.

Earl K. Nixon, Director.

Portland, Oregon,
September, 1940.

ADVANCE REPORT ON SOME QUICKSILVER PROSPECTS

IN THE BUTTE FALLS QUADRANGLE, OREGON

by

W. D. Wilkinson

The problem of mapping the Butte Falls quadrangle, Oregon, was undertaken as a cooperative project of the State Department of Geology and Mineral Industries and the Department of Geology, Oregon State College. The preliminary field work was done in June, 1940, by the summer group of geology students of Oregon State College. The detailed work was done during July and August under the direction of W. D. Wilkinson, Oregon State College, and John Eliot Allen, geologist, State Department Geology and Mineral Industries, assisted by Wayne Lowell, Wallace Lowry, Herbert Harper, Richard Meade, Stewart Jones, Robert Littleton, and Merle Hutchinson.

This report embodies only a small portion of the geologic and economic information gained during the mapping of the area. Owing to the strategic nature and importance of cinnabar, which is one of the principal economic minerals of the region, a preliminary report seems advisable.

TRAIL OR ROGUE ELK DISTRICT

Several cinnabar claims have been located along the Rogue River between Trail and McLeod in Twps. 33 and 34 S., R. 1 W. and R. 1 E.

The relief in this region averages about 2200 feet. The Rogue River flows through a steep-walled valley from McLeod to Trail, and excellent exposures of the various formations may be observed along the valley walls of the Rogue River and its tributaries.

These formations are all Tertiary in age, and of igneous origin. The oldest of these rock materials is a tuffaceous flow-breccia which is quite characteristically green in color where fresh exposures are found. Overlying this tuff-breccia is a thick series of basalt flows which are in turn overlain by rhyolites or rock closely resembling rhyolites. Faulting has occurred, developing fault breccias which have later been altered and silicified. It seems probable that the mineralization which generally occurs in such altered brecciated zones is associated with the numerous small dikes cutting through the tuff-breccia and basalts.

ROGUE ELK MINING COMPANY

The Rogue Elk claim, formerly known as the Red Chief claim, is located near the center of sec. 33, T. 33 S., R. 1 E., and is now owned by Allen Rogers. It may be reached by crossing the Rogue River at McLeod bridge, and walking down the south bank of the river. Development work consists of two tunnels. The lower one, about 100 feet above the river level, which is known as tunnel #1, has been driven 51 feet south, thence 36 feet S52°E, thence 91 feet S10°E, a total distance of 178 feet. At a point 123 feet from the portal, a cross-cut has been driven 26 feet due west; 133 feet from the portal, a second cross-cut has been driven 27 feet S70°E, thence 20 feet S52°E to the face. The total amount of tunnel and cross-cut at this level is 288 feet. A second adit, 42 feet higher on the ridge, has been driven for a distance of 23 feet along a bearing of S10°E. In addition to the 311 feet of tunnel, there are many prospect pits which do not penetrate beyond the soil mantle and altered country rock.

Fifty-seven feet from the portal, a small fault striking S50°E and dipping 35°SW, contains cinnabar in the brecciated and fractured zone. At a point 87 feet from the portal, a well-developed fault plane is exposed on the west wall of the tunnel. Some cinnabar occurs along the minor fractures and slickensides.

From this point to the first cross-cut, a distance of 36 feet, the rock material is brecciated, and within the breccia some cinnabar colors were observed. The cross-cut follows the brecciated zone for a short distance, finally penetrating an altered basalt. Mr. Rogers reported assays from the portal of the cross-cut as high as 2 per cent.

Just back of the face in the second cross-cut, the hanging wall of a fault striking N75 W is exposed. Mr. Rogers reported an assay from this cross-cut of 8 per cent. From the portal of this cross-cut to the face of the main tunnel,

cinnabar colors were observed occurring mainly in thin streaks in the brecciated zone. Assays reported by the owner from samples taken near the face were reported as 2 per cent.

Cinnabar occurs throughout the main tunnel from a point about 50 feet from the portal to the face. The gangue material is a fault breccia with gouge along the fault planes, all of which has been altered. The country rock in the vicinity consists of basalt flows overlying a thick bed of pyroclastic material.

There has been no production of mercury to date.

POOLE CLAIMS.

The J. L. Poole claims are located in sec. 25, T. 33 S., R. 1 W., about one-quarter mile north of the Crater Lake Highway.

A series of four holes 6 to 8 feet deep at intervals of about 10 feet have been dug along a ridge which has a trend of N30°E. The rock material is brecciated and silicified. No mineralization could be observed, although this doesn't necessarily mean that cinnabar cannot be panned from the rock.

One-quarter of a mile northwest, along an old road, a tunnel trending N40°E has been driven for a distance of 40 feet. No faulting was observed, but two sets of major fractures were noted, one striking N60°E and dipping 65°W, and the other striking N40°W and dipping 26°S. Accompanying these fractures was a set of minor fractures of irregular dip and strike. The tunnel follows an altered zone lying between basalt walls. No cinnabar could be seen in the altered zone or wall rock.

A second tunnel, trending N58°E, two hundred feet north has been driven a distance of 72 feet. Near the portal this tunnel cuts a fault zone three feet wide, and continues through brecciated and silicified material to the end of the drift. No mineralization was observed along the walls of the tunnel, although disseminated cinnabar was found in specimens taken from the dump. The country rock, as in the case of the first tunnel, is basalt.

Higher on the ridge open-cuts have been dug. The largest, about thirty feet long, has a definite relation to a silicified zone striking N10°W. There are also a number of small pits which have been dug at random. No cinnabar was found in any of the open-cuts or pits. Wells and Waters (34, p. 48) described the property. 1/

1/ Wells, F. G., and Waters, A. C., "Quicksilver Deposits of Southwestern Oregon", United States Geol. Surv. Bull. #850, p. 48 (1934)

RAYOMES LAND

This prospect is located in the NE $\frac{1}{4}$ of NE $\frac{1}{4}$ sec.32, T.33 S., R.1 E. on property belonging to W. F. Rayomes. Development consists of three open-cuts about twenty-five feet long and eight feet deep, trending N55°W.

A fault zone having a trend of N55°W extends from the Crater Lake Highway through this property. This zone is probably a continuation of that on the Rogue Elk Mining property across the Rogue River.

The country rock is a basalt which has been brecciated and altered in the vicinity of the fault zone. Fault gouge about one foot thick occurs along the exposures of the fault plane.

A few cinnabar colors may be obtained by panning this fault gouge, but no cinnabar could be seen in the rock in place or in specimens from the dump. Nor were any colors obtained by panning material from limonite ribs which occur in a set of major fractures striking N74°E.

Mr. W. F. Rayomes has specimens which contained disseminated cinnabar and paint-thin streaks along fractures. This prospect, up to the present, has produced no mercury. No assay reports were available, so the actual tenor of the ore is not known.

ASH CLAIMS

The Ash claims are located on the south side of the Rogue River along the valley walls of a small tributary in sec.1, T.34 S., R.1 W., and sec.35, T.33 S., R.1 W. These claims were reported to be under option to W. N. Brewster and D. C. Anderson who plan to do some diamond drilling in the fall of 1940.

Workings consist of a number of shallow prospect holes, three short adits at vertical intervals of about 200 feet, and a shaft about 36 feet deep. Only assessment work has been done since the property was reported on in 1930. 2/

Country rock is rhyolitic in character, similar to the rhyolite observed on the north side of the river at Berry Rock. It is overlain by a porphyritic basalt which forms a rather flat surface dipping slightly to the west. The rhyolite has been fractured, and along the fractures limonite stain has developed. Drifting has been done along a fault which has a strike of N65°W. Samples taken show some smeared, paint-thin cinnabar.

RED CLOUD MINE

The Red Cloud group of claims is located 11 miles south of Drew on the Drew-Diamond Rock-Cow Creek Road. The present operators have built an excellent, although steep, road from the main Forest Service road to the mine. This property lies in sec. ~~20 and 21~~ ¹⁶, T 32 S., R. 2 W., at an elevation of about 3000 feet.

Workings

In 1906 when the prospect was worked as a gold property, a tunnel, now caved, about 30 feet above Cow Creek, was driven for a distance of 150 feet. The property was first explored for cinnabar in 1930 when a tunnel several hundred feet above Cow Creek, having a trend of S26°E, was driven a distance of 50 feet. Under lease in 1936-37, this lower adit was driven for a distance of 125 feet, and by 1940, it together with cross-cuts had been extended until there is at present some 400 feet of tunneling on the main level. All other tunnels were caved and inaccessible, although the mining program called for opening the upper level.

The main level follows a fault which has a strike of S25°E; dip almost vertical. Samples of gouge from the face of the main tunnel contained paint-thin streaks of cinnabar, and much better ore was reported as occurring in a raise. Good samples of cinnabar associated with calcite were shown the writer, but these were not seen in place. All of the tunnels were being driven into the May Creek Schist formation which outcrops extensively throughout the area.

The present operators have installed a jaw-crusher, bunkers, rotary furnace, and condenser. The plant is powered by electricity generated by diesel power. Some attempt to recover mercury had been made with little or no success, and as Mr. J. L. Pierson, mine superintendent, pointed out, a mine development program is essential to the successful operation of the recovery plant.

It is reported that sixty flasks of mercury were produced in 1932.

MEADOWS DISTRICT

The Meadows district is that portion of the Gold Hill area, drained by Evans Creek, lying in the $W\frac{1}{2}$ of Twps. 33 and 34 S., R. 2 W. Good gravel roads enter the area either from Gold Hill, a distance of 13 miles, or Medford via Beagle and Sams Valley, a distance of 20 miles.

The head waters of Evans Creek are about $\frac{1}{2}$ mile east of Railroad Gap Lookout Station. From this point, Evans Creek flows southward for ten miles through a narrow valley; here it turns almost abruptly westward and flows through a very narrow, steep-walled valley.

On the western side of Evans Creek the valley rises rapidly from an elevation of 1600 feet, to the top of the N-S trending ridge which reaches an elevation of 4000 feet. The east side of this valley is less abrupt, rising gradually to an elevation of 3000 feet. All of the tributaries, with the exception of Morrison Creek, are intermittent. They flow in steep-walled, V-shaped valleys. This has resulted in a rugged, late youthful topography in which the slope land predominates.

The rocks along the ridge on the west side of Evans Creek are the May Creek Schist formation, which is composed of mica schists, quartz hornblende schists and layers of quartzite. These meta-schists have been strongly folded and crumpled.

Overlying the May Creek Schist are the tuffaceous sandstones and shales of the Umpqua formation. These sandstones and shales outcrop along Evans Creek valley from the Mitchell Ranch southward. This formation is overlain to the east by a thick series of pyroclastics and volcanic lavas.

Structurally, the Umpqua formation lies unconformably upon the May Creek Schist.

There are two systems of faults, the older one having a general N-S trend, and a second set having a general E-W trend with dips varying from 30° to almost vertical.

WAR EAGLE MINE

The War Eagle Mine is the most active mine in the area at this time. It is located in sec. 7, 8, 17 and 18, T. 34 S., R. 2 W. "Total production up to 1927 was 565 flasks which was sold for \$59,325", which was estimated as being recovered from 1500 tons of ore. 3/

Workings.

"The present workings consist of the main level, comprising an adit 180 feet long and 1,230 feet of drift along the vein; a winze sunk from this level, now full of water but reported to be 100 feet deep; and a second level 65 feet above level 1, composed of 180 feet of drift along the vein and a crosscutting adit 53 feet long. Most of the vein above level 1 has been mined from two stopes, one between levels 1 and 2, the other from level 2 to the surface. There is another stope above level 1, but this was inaccessible when the mine was visited." 4/

The workings had not been extended beyond those described. Present work consists of cleaning the mine, re-timbering where necessary, building chutes and timbering stopes in preparing to deliver ore to the mill upon completion of the installation.

The main adit follows a fault zone which strikes N70°W, and which stands almost vertical. Walls of the fault zone are separated by about 4 to 6 feet of silicified breccia and fault gouge. The breccia is composed of chalcedony fragments surrounded and cemented by marcasite. Cinnabar is associated with the marcasite which also contains some arsenic. In the past the latter has caused difficulty in treating the ore.

3/ Kellogg, A.E., Min. Jour. (Arizona) vol. 11, pp. 7-14-15, Sept. 1927.

4/ Wells, F.G., and Waters, A.C., Op. cit., pg. 54.

The present operators have built a mill with which, by crushing and screening, it is planned to separate the marcasite and cinnabar from the breccia fragments. Then, by passing this initial concentrate over tables and, if necessary, through flotation cells, they expect to reduce 100 pounds of ore to 5 pounds of concentrate. These concentrates will then be run through a five-ton furnace. Mr. Bailey, the mill superintendent, informed the writer that by pre-drying and using indirect heat, the concentrate could be handled successfully. In a recent communication, Mr. Bailey reported that in the initial operation of the mill the concentrates ran 23 per cent.

QUICKSILVER PRODUCERS COMPANY

The claims belonging to the Quicksilver Producers Co. are located in secs. 5 and 20, T 34 S., R.2 W., and were originally staked by D. S. Force.

At the present time, the workings consist of tunnels described by Wells and Waters 5/ as follows: "Adits 2 and 1 were driven in 1928 and 1929. In 1930 the prospect consisted of 2,110 feet of tunnel distributed as follows: Level 3, 1,375 feet; level 2, 430 feet; level 1, 305 feet. Level 2 is 64 feet above level 1, and the two are connected by a raise that slopes 30°. Level 3 is 119 feet above level 1. From level 3 two raises formerly extended to the surface, but both are now caved. A winze 20 feet deep was sunk from level 3, and a small stope 10 feet long and 15 feet high was mined from this level.

"The geology of the mine is best exposed in level 1. The adit traverses 375 feet of Umpqua formation, cuts across a dike of basalt porphyry, passes through a fault, and penetrates quartz diorite for a distance of 310 feet".

The cinnabar occurs associated with calcite and quartz which fill fractures in the porphyritic basalt dike. There is also a brecciated zone composed of chalcedony fragments which contain some cinnabar. This ore is similar to the War Eagle ore except for the lack of a marcasite cement.

CHISHOLM CLAIMS

"W. P. Chisholm, of Gold Hill, owns several claims in secs. 17 and 20, T.34 S., R.2 W., which he has prospected by means of pits and short adits. These workings are scattered down the ridge from a point near its crest to a point about 200 feet above the valley bottom. Many of the older pits and adits were caved at the time of this study, but three adits that have a total length of 380 feet were accessible. Adit 1 is 90 feet long, trends N.43°E., and opens out at its end into a small inclined stope 25 feet long at right angles to the drift. Adit 2, about 300 feet west of adit 1, is 140 feet long, trends N. 53°E., and has a small winze 15 feet deep at the end. Adit 3, several hundred feet south of adit 2, is 150 feet long, and its trend, though irregular, is generally to the north."

5/ Wells, F.G., and Waters, A.C., op.cit. pg.55

"All these adits as well as the caved workings are in the Umpqua formation. The sandstone has been much sheared and faulted, and the strike of the slickensided surfaces is 15°NE . The rock shows the usual iron staining as a result of weathering, and a few narrow seams of limonite-stained silica are found. Cinnabar can be panned out of the rock, although it is hardly ever recognizable by the unaided eye in the unworked rock." 6/

In addition to this work, Mr. Stewart Chisholm has opened up a new claim known as the Palamar, located 1372 feet north from the SW corner of sec.16, T.34 S., R.2 W.

A tunnel 80 feet long follows a highly altered fault gouge zone in the Umpqua formation. Cinnabar occurs freely disseminated throughout the gouge and in paint-thin layers along slickenside surfaces. The best ore observed came from a shallow winze which was being sunk on the fault zone. Mr. Chisholm reported that the ore ran about 4 pounds over a width of 10 feet, and that the mineralized zone was 16 feet wide.

At present, the owner is hand-sorting and running the high grade ore through a makeshift furnace with water-pipe condenser. He reports that even with this type of equipment, his returns are better than average wages. He expects to continue development and prospecting along the mineralized zone in order to block out ore and indicate the possibilities of the property.

ROXANA GROUP

The Roxana group of claims belonging to H. H. Sharp and associates are located as follows:

- (1) Roxana - 1600' from SE corner of sec.5, T.34 S., R.2 W.
 - " #2 - #1 post $\text{NE}\frac{1}{4}$ sec.5, T.35 S., R.2 E.
 - " #3 - #1 post $\frac{1}{2}$ mile from NE corner sec.5, T.34 S., R.2 W.
 - " #4 - #1 post $\frac{1}{2}$ mile from NE corner sec.5, T.34 S., R.2 W.
 - " #5 - #1 post NE corner of $\text{SE}\frac{1}{4}\text{NE}\frac{1}{4}$ sec.5, T.34 S., R.2 W.
- (2) LaVena #2 post, about 100' N. of SE corner sec.5, T.34 S., R.2 W.

The work done on this group of claims has been entirely in the nature of prospecting in order to indicate proper methods of development. The work done consists of a series of trenches cutting across the strike of the ore-bearing rock, each trench being about 2 feet wide, and 30 to 40 feet in length. These vary in depth up to 4 feet, cutting through the slight over-burden and exposing in one or two places the top of the orebody. Additional test pits and cuts of varying size are distributed respectively as follows: Roxana #1, 12 openings; #2, 3 openings; #3, 9 openings and two tunnels; #4, 14 openings, counting the widely distributed trenches and cuts. Cinnabar is found distributed over the property and may be easily seen in the hand specimen. At the south end of Roxana #3, a tunnel bearing 380°E has been driven for 130 feet. There is also a second tunnel higher

6/ Wells, F.G., and Waters, A.C., op.cit. pg.55.

on the ridge which has been driven for 57 feet. This constitutes all of the work done so far on this group of claims.

Country rock in the vicinity of the Roxana group is the May Creek Schist which is here an altered mica schist containing some quartz. Cinnabar occurs in a highly silicified zone which strikes N20°E, and dips to the east.

A section of the silicified rock was examined, and the cinnabar was found to occur as a halo around minute sulfide areas, the sulfide probably being marcasite. The cinnabar also occurs as globules in open cavities in a cream-colored rhyolite.

This property is only a prospect, but the silicified zone traverses both the Roxana #3 and #4, and should continue north. If this is the case, with further development the property may prove valuable.
