

# State Department of Geology and Mineral Industries

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Portland 1, Oregon

Malheur County

STATE DEPT. OF GEOLOGY  
& MINERAL INDS.

## JORDAN CINNABAR

Progress Report No. 1 to basic report by N. S. W., February 7, 1956.

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Location: T. 18S, R. 42E, Sections 20 & 21.

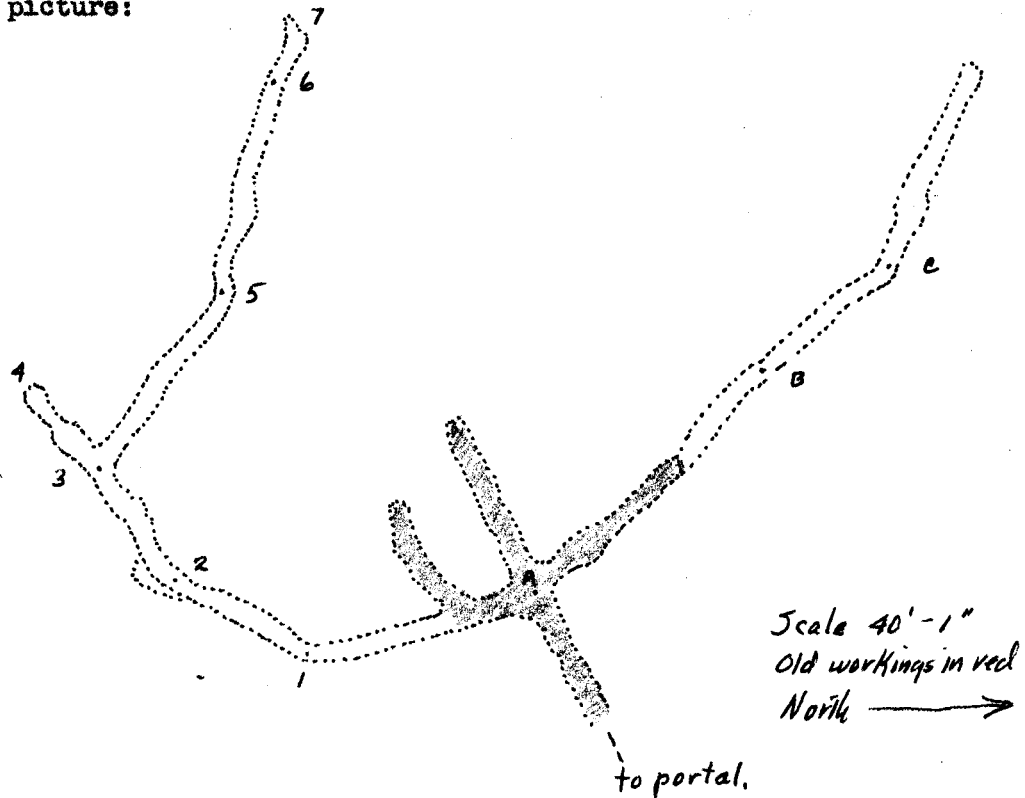
Owner: B. E. & R. L. Jordan, P. O. Box 395, Vale, Oregon.

Operator: H. K. Riddle, Payette, Idaho; S. P. Wilson, field superintendent.

Development: Three hundred and eighteen feet of new tunneling has been driven from the laterals on the lower tunnel since the first report was prepared. About 105 feet of this is on the northern lateral which continues on a generally northwestern direction. The remainder is on the southern lateral which is continued straight from the central adit station a distance of 50 feet on essentially the same course as the original stub. Thereafter it swings to about a S45 W course for 80 feet to end in a short stub tunnel. The main tunnel cuts off about 25 feet short of the face and continues with minor variation in strike for about 100 feet on an overall N 65 W bearing, leaving the face of the southern lateral approximately 85 feet dead ahead of the main adit face.

The foregoing descriptions are taken from a brunton survey (tripod mounted), but sufficiently adverse magnetic influence was encountered at the central adit station due to newly laid rails to render it unfeasible to offer any formally drafted map for the new workings at this time. The

following adjusted sketch is offered only as a generalized plat of the overall picture:



Geology: Formations exposed are the same as those encountered in the previous tunneling and are as described in the original report except that a fine-textured, hard, gray basalt or andesite is exposed at different places along the southern drift from stations 3 to 6. At a place or two, this basalt appears walled and dike-like, but at other places it looks distinctly like independent boulders. Several open crevices with a generally north-south trend are also present in this same section of drifting. These crevices are as much as 6 to 8 inches wide.

Cinnabar showings are present at places in both sections of the new tunneling, but there is a decided decrease in the number and size of the showings as well as a decrease in the development of opalite in comparison

with that reported in the lateral tunnels as they were exposed at the time of the February 7, 1956, report. No well defined mineralized structure has yet been disclosed to follow.

General: The company's D.M.E.A. application of last fall is understood to have been approved, but has not yet been granted. The company plans to continue development on their own and are currently engaged in laying rails. It is understood they contemplate sinking a shaft near the face of the main adit.

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Report by: N. S. Wagner, April 13, 1956.

Date of Examination: April 11, 1956.

Reference: Jordan Cinnabar report, N. S. W., February 7, 1956.

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# State Department of Geology and Mineral Industries

1069 State Office Building  
Portland 1, Oregon

Malheur County  
Unclassified District

## JORDAN CINNABAR

Forward: This is a preliminary report written for the purpose of recording the geologic highlights as revealed by the development workings to mid-November, 1955. Periodic revisions and eventual replacement will be made as development work continues and an enlarged store of basic data becomes available.

Location: On Hope Butte which is largely in section 21, T. 17 S., R. 43 E.

Access is by the Bully Creek road, from Vale. Total distance from Vale is  $14\frac{1}{2}$  miles, the last  $3\frac{1}{2}$  miles of which is a ranch road leading north from the Bully Creek school house. Elevation at the property, measured at the top of Hope Butte, is shown as 3640 feet on the Jamieson quadrangle topographical map.

Owners: Messers. B. E. and R. L. Jordan, P. O. Box 395, Vale, Oregon.

Lessees: Mr. John Stringer, Nyssa, Oregon, and H. K. Riddle, Payette, Idaho.

History: The presence of cinnabar at this location first came to this department's attention in the fall of 1951 when a reconnaissance examination was made in response to a request submitted by the Jordans for such an examination. Prior to this time there was no record of any cinnabar occurrence anywhere in this locality, and since no early prospect diggings were noted during the course of the examination, the indication is that his prospect had not been found by other prospectors previous to the time the Jordans made their discovery.

With confirmation of the validity of their prospect, the Jordans went ahead with their locations. No systematic prospect development work was undertaken, however, until the spring of 1955 when the present lessees started their exploration project

Development: Approximately 4600 running feet of dozer cuts and trenches had been made by December 1955, not counting access roads and scattered cuts and assessment workings made outside of the bounds of the principle concentration of workings covered by this report. A total of 330 feet of tunneling had been made on two headings and portals faced up at three other sites. The camp facilities include a residence office for the foreman, tool and storage sheds, and a powder magazine. Figure No. 1 is a map showing the nature and distribution of these workings, all of which are on the eastern flank of the butte.

Geology: Prior to the time this development work was done, the bedrock outcrops on Hope Butte consisted of an ill-defined and poorly exposed capping of a blocky, dark colored volcanic of semi-basic nature but with some rhyolitic tendencies. Occasional isolated exposures of this rock also occurred at random places on the flanks of the butte under circumstances wherein it was difficult to determine in all instances whether they were slump blocks or genuine outcrops of in-situ status. Just enough small float and occasional larger blocks of a hard, dark, predominantly iron-stained silicious material, together with some opalite, occurred at random places to show that such materials were also present in some manner in the bedrock framework of the butte. Otherwise the flanks of the butte were effectively blanketed by a mantle of soil and rock rubble with localized areas of highly rounded, coarse, hard, stream pebbles of a predominantly basic volcanic rock foreign to the immediate area and of late Tertiary fluviatile origin. Some traces of these pebbles were found high on the hill, but for the most part they occurred on the lower flanks where they exist in fairly thin skims as erosional remnants of a more extensive fluviatile series now largely removed by recent erosion.

Under the present circumstances of exposure, it is now apparent that the butte is made up of a very extensive accumulation of a white to light gray and buff

colored tuff which is in places loosely consolidated and ashey, in other places highly indurated, but not necessarily opalized, while in still other places, it is profoundly opalized. The opalite seems to be basically a light, pearly, translucent gray in character but it is also often mottled with beautiful shades of pink and salmon, as well as with coarser, darker, dirtier iron-red coloration.

Some of the tuff shows a distinct water-laid bedding, but more frequently than not, it exhibits a rather nondescript appearance from which it is now difficult to reconstruct whether the material as a whole originally possessed a bedding which has since been obliterated, or whether some of it was devoid of bedding in the first place. The writer is inclined to feel that the series is probably made up of both bedded and air-deposited horizons even though it is manifest that some of the presently non-bedded phases may reflect alteration due to the opalitization and other postdepositional factors. In any event, the bedded portions contain occasional conglomerate interbeds, the pebbles of which range from the size of small peas to coarser pieces, as much as two or three inches in diameter. Bombs of a dark gray volcanic material in sizes ranging from a few inches to a foot or better in diameter are also present at random horizons throughout both the bedded and the non-bedded phases of the tuff, indicating contemporaneous and spasmodic eruption of some nearby vent. These bombs are common, but not abundant, which suggests that the source was either small or else too far distant to subject the area under discussion to any very heavy fall.

The second bedrock type found in the area is the semi-basic volcanic previously described as outcropping on the summit of the butte. This rock is generally fresh and hard, but in many areas of possible contact with the opalitized tuffs, there are places where hydrothermal alteration and silicification is sometimes so great that it is difficult to determine on the basis of a casual inspection whether the parent rock is a more than ordinarily altered phase of the indurated tuff, or a leached

phase of the volcanic. As a result of this situation, together with the present limited circumstances of exposure in the contact area, it cannot be conclusively demonstrated at this time whether the volcanic is a dike, intrusive into the tuffs, or part of an old topographic high around which the tuffs have subsequently accumulated. Either way there is a strong probability that the tuff-volcanic contact may have played an important role in controlling and localizing the flow of hydrothermal waters. Proper recognition of the mode of occurrence could therefore have an important bearing on the eventual interpretation of the pattern of mineral distribution throughout the whole of the mineralized area. The way it is, there is some evidence of each possibility although the prospect workings have as yet exposed no clear-cut extension of a dike-like trend over any significantly great distance. Future work may reveal such a trend, or other data which will serve to establish the rock relationships, but until such data is available, it would seem best not to underestimate the alternative possibility that the rock could represent part of a pre-tuff exposure rather than an intrusive.

Two types of measurable structural conditions are recognizable, namely, (1) the bedding of the bedded tuffs, and (2) fracture trends. In the instance of the bedding the angle of dip varies from essentially flat to as much as 25 degrees, and the direction of dip varies from about north to nearly east, but is consistently in the northeast quadrangle in the exposures revealed thus far. Measurable exposures occur almost exclusively in the workings which flank the lower third of the hillside, and they occur on both the north and south ends of a 900 foot cut, as well as at various intermediate points. As a result of this distribution, the indication is that the bedding dips reflect a trend of attitude for the tuff series as a whole. It is to be noted, however, that the present dip exposures are separated by areas of broken rubble and obscurely bedded material so that bedding and measurable attitudes

thereof should not be visualized as everywhere present in unbroken continuity in the belt of occurrence just described. Indeed, there is much evidence to indicate that the tuff series as a whole has been cut and locally distorted in various places by post-depositional fracturing and faulting. This post-depositional disturbance is in some places conspicuous and readily traceable, but in many places it is altogether probable that some of the existent opalite areas reflect the presence of former fracture zones which have been obliterated by the opalitization action of the very hydrothermal solutions which they served to supply.

The strongest area of consistently measurable fracture trends occur near the summit of the hill in the vicinity of the two uppermost cuts. Here there is a strong northwest trend as demarked by a succession of predominantly vertical fractures and bands of opalite. What little deviation there is from vertical is to the southwest. The area in which this succession of fractures is exposed extends over a distance of 300 feet from the westernmost cut on the uppermost bench of workings, to the southern portion of the face on the next lower bench. The width of the area measured at right angles to the strike is about 180 feet, with the northeastern margin coinciding with a prominent fracture exposed on the face of the cut some 10 to 15 feet northeast from the portal of the tunnel located on the lowest of the two benches.

The rock traversed by these fractures is comprised chiefly of what is considered to be a highly indurated and silicified phase of the non-bedded tuff, along with minor amounts of material which clearly represents a profoundly altered phase of an associated volcanic believed to be related to the otherwise hard, gray volcanic already described as outcropping on the summit of the hill in close proximity to the area under discussion. The color of the material in this area is generally light gray to buff, punctuated in various places by patches and streaks of a dark



gray material, typical pearly white to pink opalite and dark, brownish-red stained siliceous matter.

Another strong northwest structural trend is demarked by a sharp formational break revealed in the drifts run from the lower tunnel located on the north end of the long prospect cut traversing the lower flank of the hill. In this instance, there is just one well-defined fracture without evidence of any notable succession of parallel fracturing, but the trend and direction of dip of the existent fracture is the same as for the hilltop area just described, namely, to the northwest with a steep and, in places, almost vertical dip to the southwest. A soft, clayey, green tuff (?) constitutes the hanging wall as against a fresher, cream to buff tuff on the footwall with opalite abundantly developed along the contact, especially so in the northwestern drift.

Notwithstanding their extent, the present prospecting workings still leave much to be desired in the way of data needed for the making of any fully coordinated description of structural conditions prevailing on the property at the present stage of prospect development; hence, no further comments will be made on structure at this time.

Cinnabar mineralization as revealed to date includes (1) lowgrade disseminations in the tuff, and (2) higher grade concentrations in association with opalite, with some of this type being beautiful specimen material. When considered as a whole though, this mineralization must be classed as predominantly low in grade, and spotty, as the highgrade has as yet not been found in kidneys or shoots of sufficient size to permit any long range schedule of selective mining operations. Neither has the disseminated ore been demonstrated to be consistently present in sufficient grade and tonnage to permit large-scale mining in any one place. Both types of mineralization have nevertheless been found over an impressively wide area, both in the area of the workings just described and in other isolated cuts not pictured on the accompanying map.

The largest of the highgrade areas occurs near the hilltop in the area occupied by the two uppermost benches. The ore has been found here in places in the tunnel driven into the face of the lower bench. Very pretty specimen material also occurs in the cut located above the tunnel portal on the upper bench. This is the area traversed by the previously described succession of parallel fractures, but there is no apparent indication that the ores from the two levels occur in common in any single fissure or fracture. The two occurrences are, however, obviously related to the extent that they both occur in close proximity to each other in the same general zone of alteration and opalization. The probability is that the deposition in this area is governed by the tuff-volcanic contact in some manner not fully disclosed by the present workings. This is why the importance of the tuff-volcanic relationship was stressed as much as it was in the preceding paragraphs dealing with the volcanic as a rock type.

The most promising single area in which lowgrade cinnabar mineralization is found widely disseminated throughout the tuff in a more persistent than usual manner, occurs in the strata penetrated by the lower tunnel and in the various cuts and benches adjacent to, and above, the portal. The formation here includes bedded tuff and other tuff strata not so clearly bedded, with both types showing varying degrees of induration and opalitization, including random small bunches of clean opalite and a stronger local development thereof in the formational break followed by the drifts run from near the face of the adit.

The clean opalite is often colored vivid shades of pink and salmon and is sometimes spotted with obvious kernels of cinnabar, but in the run-of-the-mill tuff the cinnabar is usually apparent in spots showing only the faintest of pink discoloration.

Mr. Wilson reports that samples were taken from each load of rock wheeled

from the adit during the course of its development, and that these samples were mixed and quartered each day. An insufficient number of assay returns were available at the time this examination was made to permit the offering of any estimate of average grade at this time, but when available, the assay results for these development samples should provide a reasonably reliable idea of the average grade of the penetrated strata. Until such assay data is available, there is little more that can justly be said concerning the possible grade of this rock.

Still other showings of cinnabar are found in other portions of the workings, either as disseminations in the tuff, or on thin fracture seams, or in association with small bunches or streaks of opalite. Similar showings have also been found in places beyond the group of workings just described, especially on the northwestern flank of the butte where only a very limited amount of prospect exploration work has as yet been done. These supplementary showings, both those in the area of the principle workings and the outlying ones, are for the most part quite weak. They do nevertheless serve to show that the tuffs have been permeated by mineralizing solutions over an appreciably extensive area, and this disclosure rates, along with the disclosure of the presence of tuff on the butte, as one of the most unexpected and perhaps one of the most pertinent pieces of data revealed so far. It is an encouraging factor which is rendered all the more encouraging by the fact that the prospect is a wholly new one about which so much remains to be learned.

In passing it might be worth mentioning at this point that the writer secured a 20 pound mercury per ton sample from a badger hole exposure of tuffaceous soil near the foot of the northwest side of the butte during the course of his initial visit to the property in 1951. Whether this particular site has been explored by one of the unvisited cuts is not currently known, but the sample nevertheless serves to indicate that highgrade mineralization is present in at least some amount in that

portion of the butte.

Conclusions: Generally speaking, much of the prospecting work done to date has of necessity represented a shot in the dark. It has, however, resulted in the disclosure of a considerably diversity of previously unknown information. This includes disclosure of (1) the presence of a tuffaceous bedrock not before known to occur in the area on anything resembling the scale indicated by the present workings, (2) evidence showing that this tuff has undergone postdepositional deformation and tilting and widespread, though erratic, opalitization, (3) a distribution of cinnabar showings throughout all parts of the area now known to be occupied by tuff, including highgrade specimen rock in certain select places, and tendencies toward disseminated development in others.

It is clear that a system of fractures have served to localize the flow of hydrothermal waters throughout the area occupied by the tuff, and it is in turn clear that the fractures have also served to govern the distribution and occurrence of both opalitization and cinnabar deposition. The present store of structural data is too incomplete however to permit recognition at this time of any pattern of structural trends and intersections throughout the whole of the property. To the extent to which this is so, much of the work which can be done in the immediate future will also have to be done blindly, particularly on the portions of the butte containing the outlying prospects, and until a more fully coordinated picture of the prevailing structural conditions is established.

Just where future work should be done, in what manner, and how much, will require careful thought and systematic planning, much of which will have to be studied out as development progresses and additional data becomes available. The widespread distribution of cinnabar showings, the already demonstrated tendency

for mass dissemination in certain portions of the tuff, and the occurrence of specimen grade ore along some fractures does combine with the basically favorable opalitized tuff bedrock to indicate that the area as a whole merits some measure of continued prospect investigation, however, as until all the factors controlling the mineralization are better understood, the possibility will remain that currently undisclosed tonnages of minable grade ore may exist somewhere in the area.

Report by: N. S. Wagner, February 7, 1956

<u>Dates of Examination:</u>	September 9, 1955	-- Preliminary visit.
	October 21, 1955	-- Establishment of plane table control with Corcoran and Ladwig.
	November 1, 2, & 3, 1955	-- Brunton work on base map details.
	November 7, 8, & 9, 1955	-- Geologic reconnaissance (with Don Alvord, D. M. E. A. geologist.)

Supplemental references: Base map showing extent of principle workings as of November, 1955. (Figure No. 1).

Informants: Jordan brothers and Mr. S. P. Wilson, foreman.