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PE-049-01

REPORT ON HUDSON CINNABAR PROSPECT, TOLOVANA DISTRICT

That traces of cinnabar occur in the gravels of some of the streams draining into lower Livengood Creek and the North Fork of the Tolovana River has been known from the days of the earliest prospectors. These streams are: Ruth Creek, Lillian Creek, Olive Creek and Ester Creek. They all head into a ridge extending west from Amy Dome and lying between upper Livengood Creek and the North Fork of the Tolovana River. This ridge is heavily mineralized and culminates in a minor prominence at the head of Olive Creek known as "Money Knob". From there it runs practically level to beyond the head of Lillian Creek, where it pitches steeply down to the confluence of Livengood Creek and the Tolovana River. For the sake of brevity, this ridge will be called "Money Ridge."

Previous Investigations

The geology of this district has been described in a general way by L. M. Brindle in Bulletin 525 and by A. H. Brooks in Bulletin 642, and in detail by J. B. Mertie, Jr. in Bulletin 662. In these reports, however, only brief references are made to the occurrence of cinnabar ores.

Location

The prospect herein described is situated at the head of the left or west fork of Olive Creek, a small stream flowing about due south into the North Fork of the Tolovana River from Money

Ridge, previously described. It is about 2 miles due south of the town of Livengood on Livengood Creek.

Description of Workings

The presence of cinnabar ore in place was originally revealed, according to Mertie, by a small land slip which occurred about 1916 on the east fork of Olive Creek. Subsequently at or near this place, a tunnel was driven into the hill in a northwesterly direction. This tunnel is now partly caved. The ore in it was not considered rich enough to mine.

The present workings of the James Hudson property, which is at the head of the west fork of Olive Creek and 1/2 mile west of the aforesaid old workings, consist of a main tunnel 134 feet long, course approximately N. 30° W. At a point 104 feet from the portal of this main tunnel, tunnel No. 1 branches off in an approximately due north direction for 85 feet. At the end of the main tunnel, tunnel No. 2 branches off in a rather winding course of approximately S. 60° W. for 50 feet. Ten feet back from the end of the main tunnel, a winze has been started and in July 1930 it was down about 6 feet. Just to the east of the portal of the main tunnel, the mill is erected.

Geology

According to J. B. Mertie, the rocks of the area in question are of Silurian (?) and Permian age. On the central part of Olive Creek, where the present placer mining operations are in progress, these rocks are black slate. Farther up on the hill below the Hudson Mine, they are of hand sandstone. In the Hudson tunnel,

beginning at a point about 20 feet from the portal, is a much altered acid granitic rock. On top of Money Ridge, according to Mertie, the country rock is of many different sedimentary types. However, the only types noticed by the writer were sandstone and slate.

In the main tunnel of the Hudson mine the altered granitic rock is heavily impregnated with cinnabar. The rock is so highly altered as almost to resemble talc or soft, white, impure sandstone. The ferromagnesian minerals are indicated by small black specks in the white ground mass. The cinnabar is evenly disseminated all through this rock in small red specks and grains. This same amount of alteration and mineralization continues back in the tunnel as far as the winze. From there on in, the cinnabar becomes rapidly leaner and the country rock gets harder and darker, resembling more the original rock from which it was rerived.

In tunnel No. 1, from a point opposite the winze, the cinnabar also begins to diminish rapidly and the rock assumes more the nature of a regular granite. In tunnel No. 1 the rock resembles very much that in the original discovery on the east fork of Olive Creek about 1/2 mile to the eastward.

In tunnel No. 2, the rock and the cinnabar content therein continue about the same as at the end of the main tunnel.

The hypothesis is suggested that the granitic rocks exposed by the Hudson tunnel may be directly or indirectly connected with an underlying large mass of similar material the intrusion of which was accompanied by the development of hot springs from which the cinnabar ores were derived.

The occurrence of cinnabar in the placer deposits of Ruth, Lillian and Ester Creeks suggests the possibility that hot springs were also active in the vicinity of each of these streams.

Cinnabar was not observed in rock exposures at the surface that occur within a few hundred feet westerly from the Hudson tunnel. A greater amount of development work will be necessary in order to reveal the extent of the cinnabar mineralization in other directions. In any event the work already done reveals the existence of a deposit that appears worthy of additional development.

Milling Plant

The old milling plant that was erected on the property is unsuited to the handling of cinnabar ores. The owners at that time evidently lacked technical advice and attempted to mill the ore in the manner employed in the case of gold-bearing quartz. Apparently the ore was finely ground and an effort was made to recover the cinnabar by the use of riffles in sluice boxes. Thus much of the cinnabar was undoubtedly so finely divided as to be carried beyond the sluices in suspension or floated away in the form of slimes.

MEMORANDUM

State of Alaska

DIVISION OF MINES AND GEOLOGY

TO: [redacted]

DATE : March 26, 1969

FROM: Gilbert R. Eakins
Mining Geologist

SUBJECT: Photogeologic study of Edward Hudson property, Livengood District, Alaska

Mr. Hudson recently requested that someone in our Division look at aerial photographs covering part of the Livengood district to see if they would help determine the geology of his property.

The geology of the area has been studied by Foster (1, 2, 3), who states that mineralization is associated with Tertiary(?) monzonitic "plugs". There are eight of the small intrusives with a one by three mile area NW trending. The approximate positions of these are outlined in yellow on the photo. Foster believes that the geochemical anomalies detected by the U.S.G.S., exposed small mineralized zones, and placer gold and cinnabar indicate possible ores at yet unexplored depths. Mercury is a prime objective, especially in the Olive Creek area, as suggested by geochemical anomalies and the presence of cinnabar in placer concentrates.

Foster interpreted the complexity of the area and positions of a variety of Paleozoic metamorphosed units as due to a number of south-dipping thrust faults. Drilling through the overlying thrust sheets of Paleozoic argillaceous beds, cherts, volcanic tuffs, and serpentinites adjacent to the monzonite intrusives, according to Foster, might reveal mineralized zones in an underlying chert-carbonate facies believed to be a favorable host rock. This approach to testing the area would be expensive and too chancy without much more detailed information.

The photos submitted by Mr. Hudson are enlarged sheets (1" = approximately 1300') with some sterio overlap. Quality near the edges of the photos in the critical area is poor, but a number of alinements are evident. The most notable lineaments, the approximate positions of the eight quartz monzonite stocks, and the area of Mr. Hudson's property have been penciled on photo 0244. The Hudson property is on the west fork of Olive Creek about one-half mile north of the Elliott highway and at an elevation of roughly 1500'. The photos are too old to show the trenching done by Mr. Hudson during the past four years. I cannot spot his property exactly, and it is not possible to do geology from the photos in sufficient detail to direct the prospector just where to make his next trench. The most that can be inferred is that some of the lineaments visible on the photos might be channels for ore fluids. It is reasonable to expect that faults cutting or close to the small monzonite body just north of Hudson's workings would be favorable zones to prospect. Bedrock has only a shallow cover or is exposed over much of the critical area, which includes Money Knob and the drainage area of the upper part of Olive Creek, so that soil sampling and trenching are quite practical. This writer believes it would be advisable to prospect the entire 2 1/2 by 4 mile area from Amy Dome to Money Knob by fairly closely-spaced soil sampling, 200' to 500' spacing, surface examination of the alinements found on aerial photos, and additional trenching where the best indications appear. Soil sample analyses should include mercury, arsenic, copper, and molybdenum. Sample spacings of 200' is recommended in the more favorable parts of the area and 400' spacing in the surrounding parts.

The two alinements indicated by blue lines and marked T1 and T2 are interpreted as possible thrust faults dipping to the south. Geochemical sampling and surface examinations along these trends might be advisable to search for evidence of underlying mineralized chert-carbonate rocks. Drainage and vegetation patterns make T1 and T2 quite pronounced.

The blue lines labeled L1, L2, and L3 are probably small faults or shear zones. L2 is the most conspicuous, and cuts across the west fork of Olive Creek just south of Hudson's property. It appears that all three of these trends would be good prospects, especially where they intersect other faults, dikes or folds.

Other alinements in the area pencilled in lightly are believed to be expressions of jointing and rock cleavage. These could also have an influence on ore fluid movements, but are less likely to than the more pronounced trends.

More explicit suggestions would require an on-the-ground examination.

GRE:mb

References

(1) Foster, R. L., Potential for lode deposits in the Livengood gold placer district, east-central Alaska, U. S. Geological Survey Circular 590, 1968.

(2) Foster, R. L., and Chapman, Robert M., Locations and descriptions of lode prospects in the Livengood area, east-central Alaska, U. S. G. S. open-file report, 1967.

(3) Foster, R. L., Description of the Ruth Creek, Lillian Creek, Griffen, Old Smoky, Sunshine No. 2 and Olive Creek lode prospects, Livengood district, Alaska, U.S.G.S. Open-file report, 1968.