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GEOLOGICAL ENGINEERING	Answered	427-470 GRANVILLE
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MEMO - Cities Service - O. Kingman

RE - Standard & Montgomery Properties - Revelstoke Area

Joe Sullivan dug me out another report on Stairs' copper properties in the Revelstoke Area, but it concerned a third showing called the 'Copper Queen' rather than the Standard or the Montgomery on which we had previous correspondence.

The Copper Queen is situated about five miles southwest of the others and only a mile east of the Big Bend Highway at mile 19 (north of Revelstoke). A zone of disseminated chalcopyrite and sphalerite, with pyrite and magnetite, outcrops in a cliff about twenty-five feet high and two hundred feet long.

The host rock is dioritic gneiss which strikes N 30 degrees W and dips 25 degrees E. The gneiss is 300 to 1,000 ft. thick but only parts of it are mineralized. The gneiss is overlain by limestone and underlain by quartzite.

The cliff face was channel sampled, and gave 20 ft. of Trace Au, 0.08 Ag, 1.21 Cu, and 1.23 Zn. Small outcrops above and below showed greater widths so Stairs drilled three holes, which showed mineralization dipping parallel to the main gneiss, i.e. 25 degrees NE. The intercepts of better grade were:

> Hole 1 - 38 ft. - 0.61 Cu - 0.23 Zn 2 - 44 ft. - 0.42 Cu - 0.12 Zn 3 - 36 ft. - 0.46 Cu - 0.40 Zn plus a higher zone (only in Hole 3) 22 ft. - 0.53 Cu - 0.53 Zn

I can't get excited about this prospect either.

The discrepancy in the reported widths of mineralization on the Montgomery led me to dig into my library of old government reports, and I enclose a reprint of the most comprehensive report. This makes it look as if the scouts who sampled 66 and 80 feet were sampling along strike, and the true width is only six to ten feet, as noted in the third report (see my previous memory)

RHS/LA Encls.

R. H. Seraphim

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the Roscberry on Carnes creek, a gold property; the Standard group at the head of 5-Mile creek, a copper property; the Montgomery group on Downie creek, a copper property; and others.

Tupe of Deposits.—The ore-deposits in this schist-belt occur as replacement deposits along sheared zones and represent mineralized bands conforming to the dip and strike of the formation.

From experience in the field and from personal observations, the writer would consider that this belt offers better possibilities for gold and copper deposits than it does for silver lead. The largest silver-lead deposits in the West Kootenay are invariably associated with carbonaceous slates and limestones. In the Big Bend district the northerly extension of these rocks probably continues farther back from the river, but the country, being an extremely difficult one to prospect, has been neglected.

Montgomery Group. This property, comprising a group of ten claims, is situated at the head of Canyon creek, which flows into Downie creek at a point 9 miles from its confluence with the Columbia river. In a direct line it is about 2 miles or less from Downie creek and about 4 miles by trail. The distance from Revelstoke is about 55 miles.

Topography.—The claims are located on a steep and narrow ridge of Downie mountain, on either side of which deep canyons have been cut by glacier-fed creeks. The country is rugged in the extreme; the steep slopes are scored and laid bare in many places by the action of snowslides. The elevation at the point where the mine trail leaves Downie Creek valley is 2,000 feet, and that at the end of this trail, where most of the work has been done, is 5,500 feet.

Geology.—The geology of this area is particularly interesting, for erosion has revealed an almost vertical section of formation for nearly 3,000 feet. From this it can be seen that the base of Downie mountain is composed of a large mass of granite, overlying which there is a series of highly metamorphosed rocks consisting of dark schists. Near the summit the rocks are of lighter colour, probably consisting of greenish-grey schists; in these there are several bands of limestone which form a distinct geological horizon. Near the granite-contact the metamorphism is more pronounced and the formation, which is contorted and foliated, has been invaded by numerous aplitic dykes. The general tendency of these has been to conform with the schistosity of the rocks, and as they form narrow bands of highly siliceous material, they might easily be mistaken by the inexperienced prospector for quartite or even quartz veins. The schists and limestone represent a thickness of from 300 to 500 feet, striking to the north-west and dipping to the north-east with marked regularity.

Ore Occurrences.—The ore occurs in mineralized bands, conforming to the dip and strike of the formation, possibly along the contact of a thin band of limestone and schist; the former having been replaced by mineral-bearing solutions. Although these bands exhibit continuity, the ore occurs in lenses where structural conditions have been favourable for deposition.

There are said to be five veins exposed between Canyon creek and the summit of the ridge some 3,000 feet above, along which there are exceptionally strong showings in bluffs and precipitous canyons swept by snowslides. Unfortunately weather conditions precluded an examination being made at higher altitudes. Such exposures only serve to show the extent and character of the mineralization, but as individual deposits they might as well be non-existent, owing to adverse climatic conditions and inaccessibility.

Workings.—The principal working is situated at the end of the trail at an elevation of about 5,500 feet. It consists of an open-cut about 100 feet long, exposing a width of 10 feet of ore along the dip of the vein, which strikes N. 55° W. and dips at an angle of 25° to the north-east.

The whole face is heavily stained with iron oxide. Upon breaking off samples at random, visual inspection showed that the bulk of the vein-matter consisted of massive pyrrhotite slightly discoloured in patches with chalcopyrite. In a few places where transverse shearing had produced fractures there has been a concentration of chalcopyrite associated with a quartz gangue. A sample of chippings taken at random along the face of the open-cut gave the following returns: Gold, trace; silver, 0.6 oz.; copper, 4 per cent. The bulk of the ore is so massive and hard that it is practically impossible to break off a representative sample with a moyle and prospecting-pick; hence the only satisfactory method would be to blast off large samples and quarter them down.

Another working about 300 feet higher up the hill on the same vein shows a width of about 15 feet for a length of 50 feet. Here the ore is more broken and mixed with country-rock. In the opinion of the writer, a representative sample would not carry more than 2 per cent. copper. The above work was done by the Granby Consolidated Mining and Smelting Company in 1917.

In conclusion, the surface showings are strong, the copper tenor of the ore is low, and whether a sufficient tonnage exists to constitute an ore-body of commercial importance yet remains to be proved by further work.

On the return journey from the above-mentioned property, an early start was made from McIntosh's cabin for Keystone mountain by taking the old trail which leaves the Big Bend trail at a point 40 miles from Revelstoke. The summit was reached after four hours' steady climbing and camp was made for the night in an old dilapidated cabin on the Carbonate Chief claim. On this property a good deal of prospecting-work had been done many years ago in an endeavour to exploit a few quartz-croppings, but nothing of importance had been disclosed. A sample of some of the most likely-looking quartz ran: Gold, trace; silver, 1.4 oz. The elevation at the cabin is 6,400 feet.

The next morning the weather was very cold and uncertain, so instead of examining the various claims on the northerly end of Keystone mountain, as was intended, it was decided to make for the *Standard* mine before a possible snowfall might prevent the trip. After travelling from early morning over the beautiful park-like country of the summits, the *Standard* was reached shortly before dark. The ronnded summits and ridges, together with the broken and crushed schists underlying the surface soil, give ample evidence that this picturesque summit was at one time the resting-place of an immense glacier.

Standard Group.

This property, comprising ten Crown-granted claims and eight fractions, is located at a distance of about 15 miles by trail from the Columbia river and thence about 35 miles to Revelstoke. The camp buildings, situated at an elevation of 6,500 feet, consist of two cabins. The accommodation at one

time was sufficient for ten or twelve men, but the buildings are now in a state of dilapidation. The camp-site is nearly a mile from the workings. The property was extensively developed some fifteen or twenty years ago, since which time it has been abandoned, and in 1917 was sold for taxes to R. Abernethy, of Marpole, B.C., who is the present owner.

The principal workings are situated on the easterly slope of a narrow ridge which forms the divide between two small branches of the South fork of Downie creek. On the westerly side of this ridge the strata, dipping at an angle of 25° to the north-east and striking to the north-west, are freely exposed in a series of rugged bluffs. On the easterly side of the ridge glacial action has scooped out an extensive basin-like depression, leaving a fairly gradual slope to a point some 500 feet below the summit. Along and near the summit of this ridge there are indications of mineralization and a number of pits and open-cuts show that early prospecting had been quite extensive.

The formation consists principally of greenish-grey schists, with occasional thin beds of highly metamorphosed limestone. In the vicinity of the workings the following order of stratification was noted: Greenish-grey schists, a thin bed of limestone overlying a black schist, which latter had been subjected to much movement, as evidenced by numerous slickensided surfaces. The ore, consisting principally of chalcopyrite, was evidently deposited along the contact of these black schists with the limestone. The limestone has been eroded away and the workings are in the black schists, in which the ore was found to occur in lenses within the foliations of the schist. It also probably replaced the limestone along the contact.

The ore-zone as developed constitutes a mineralized band conforming to the dip and strike of the formation and has been approached by three crosscut tunnels, which develop the vein to a vertical depth of 170 feet below the uppermost underground working. Unfortunately the various underground workings could not be examined, as they were either caved or full of ice and water.

A careful inspection of the dumps showed them to consist principally of crushed and slickensided black schists. No ore of any appreciable amount was noticed. According to a reliable assay plan in possession of the writer, the average values ran between 3 and 4 per cent. copper, with negligible values in gold and silver. Two other long crosscuts which had been driven were poorly located and did not develop ore.

It is roughly estimated by the amount of work done that the total expenditure on this property must have been at least \$50,000 or \$60,000. No doubt a lot of the money was thrown

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away through lack of good judgment in planning the development-work. For further reference see the Minister of Mines' report for 1905.

One of the most interesting geological features of this area was the presence of a large mass of serpentine, which outcropped near the easterly side of the basin. Upon investigation it was found to contain numerous stringers of chrysotile asbestos of inferior grade, but which might improve in quality at depth.



Waverly-Tangier<br/>Group.\*This property, situated at the head of the North fork of Downie creek, about<br/>1½ miles below the summit flats separating that creek from the North fork<br/>of the Illecillewaet river, was acquired in 1918 by the Waverly Mines Company,<br/>of Spokane (F. M. Martin, president; G. H. Walters, secretary). Although<br/>the property is tributary to Downie creek, which flows into the Columbia river 46 miles above

the property is tributary to Downie creek, which flows into the Columbia river 46 miles above Revelstoke, the present route is by an old wagon-road about 28 miles in length (estimated), following the North fork of the Illecillewaet river from Albert Canyon, on the main line of the Canadian Pacific Railway 21 miles east of Revelstoke. the The thei men incl and

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## MONTGOMERY PROPERTY - BIG BEND AREA - REVELSTOKE

Sullivan had three old reports - 1906 - 1912 - 1917.

No. 1 - 45 mi. N. of Revelstoke - rough country - schistose rocks - two exposures of sulfide. 1st has 1.3 Cu -0.3 Ag - nil Au - average of four samples in open cut 100 ft. long in ore. 2nd is a slide sampled over an area of about 20 ft. square 1.1 Cu - 0.3 Ag - nil Au. 1,000 ft. from (1). Area has a couple of other outcrops - 2,000 distant (each).

Recommends work to see if continuity.

- No. 2 Three parallel leads dip 45 degrees into hill, lowest is 4,900 ft. elev. - 66 ft. wide of almost solid pyrrhotite - 0.9 Cu - nil Au - nil Ag. Next is 5,125 ft. elev. - not blasted to be fresh enough for sampling - "should the deposit open up all right it could, I think, be economically worked from a mining standpoint".
- No. 3. Altered sedimentaries with a vein 6 ft. to 8 ft. wide carrying about 1% Cu "too low grade to pay".
- RHS Note: This one is worth an examination if one is in the district.

## STANDARD PROPERTY - REVELSTOKE

Owned by I. C. Stairs.

Sullivan Reports:

(1)May 20, 1964 - based on literature - area is normally snowed in until late June. 6,000 ft. elev. - old property staked 1896 - idle since 1912 has 2,300 ft. of tunnel in five levels.

> Area has granite and closely folded limestone, argillite, quartzite, schists with horizontal plunges. Most mineralization in area is Zn Pb Ag - but this one is pyrrhotite, pyrite, chalcopyrite in narrow lenses 1 to 3 ft, wide, some disseminated in wall rock.

- (2)Sept. 15, 1964 - had spent summer in area with helicopter support and crew of geologists and prospectors, mapped 40 sq. mi. and held 209 claims, which covered -
  - (a) small bedded gtz. veins with tetrahedrite.
  - (b) fine disseminated tetrahedrite in dolomite and serpentine.
  - (c) 10 ft. wide siliceous shear with heavy arsenopyrite.
  - (d) 8 ft. bedded zone of arsenopyrite and pyrite.
  - (e) Standard Mine which they resampled and surveyed the report provides no specific data on size and grade but does not recommend further work.
- RHS Note: None of the above appears of sufficient potential to interest 'Cities'.