Title 3000-33 Stope, Island Mountain

Author asb

Date and Typist October 3/52 cs

014756

Examination of 3000-33 stope, Island Mo ntain

September 20, 1952, by A. Sutherland Brown.

The 3000-33 drift, which was opened up two years ago, showed auriferous pyritic replacement in the back but it could not be worked until it could be ventilated. This has recently become possible by the completion of a raise up from the 2850 level.

The ore occurs in 3000-33 drift and a 30 degree raise from it. This drift is in the northeast section of this property by the Cariboo Gold Quartz boundary and under Jack o' Clubs Lake. It is bordered by the Jack o' Clubs fault No. 2, a northeasterly (030/50 NW) striking fault that is believed to be a thrust, and to be a late fault cutting the Aurum etc. The stope is near what is believed to be the Rainbow-Baker contact and a fault that is believed to be the Aurum is, cut by the Jack o' Clubs fault nearby. If all this is so, it is the local of the normal limestone replacement ore.

The orebody is 2 to 4 feet thick over a minable width approaching 50 feet and averages 1.8 ounces of gold per ton over the 80-foot length developed. The black argillites it replaces is not noticeably limy. There are stringers of quartz and considerable silicification as well as the auriferous pyritization. The pyrite cube edges ~~many~~ vary from a fraction of a millimeter to greater than a centimeter. Complete small dragfolds of argillite have been replaced.

Whether the orebody projects up the dip or the rake is uncertain. If the latter, only a small amount of ore remains below

the 3000 level before it is cut off by the Jack o' Clubs fault, whose movement is unsolved. The width of ore would be considerably more than 50 feet but would soon be in Cariboo Gold Quartz ground, up the rake. If the projection is up the dip, there is lots of room below the 3000 level where ore may be developed.

Although this type of replacement ore has not been reported in the area previously, pyritized argillite is fairly common, but it has previously not been economic nor as dense and continuous. Argillite, being less easy to replace than limestone, is probably only susceptible to economic replacement when in a very favourable position relative to ore-bearing fluids, which in this case may have migrated from the nearby Aurum fault and possibly even the Jack o' Clubs fault. There may well be other localities in the mines of the region where the necessary condition could be fulfilled.

VICTOR DOLMAGE

Consulting Geologist

93H/4E
&
93A/14W

Fitz Reward Mining Co.

REPORT

ON

SOME OF THE GOLD PROPERTIES

SITUATED ON THE

BARKERVILLE GOLD BELT

CARIBOO DISTRICT

B. C.

--ooOOoo--

CONTENTS

- ISLAND MOUNTAIN GOLD DEPOSITS. 93H 006
- BARKERVILLE MOUNTAIN. 93H 025
  STOUT'S GULCH LEDGE. 93H 120
- BONANZA LEDGE or B.C. MINE. 93H 019
  PROSPECTUS MOUNTAIN. 93H 021
- CUNNINGHAM CREEK SECTION. 93H 052
  SUMMARY.

V I C T O R D O L M A G E
Consulting Geologist

ISLAND MOUNTAIN GOLD DEPOSITS.

The Island Mountain deposits are a part of the large mineralised belt which runs in a northwesterly direction through the Barkerville area passing just southwest of Barkerville village. The Island Mountain veins are at the northern end of this mineral zone, just north of Jack of Clubs lake and about five miles from Barkerville on the main road to Quesnel. The veins were worked in the early days of the Cariboo gold boom. A considerable amount of gold was taken from the richer vein outcrops by the use of a rocker and later in 1890, a 10-stamp mill was erected on Jack of Clubs lake near its outlet. It was operated from August 20th to September 20th, 1890, when several hundred tons were milled. Some difficulty was encountered in an attempt to amalgamate the free gold and the sulphides were shipped for treatment to the government reduction works at Barkerville.

The mineral belt on which the Island Mountain veins are situated, occurs in the Cariboo schists runnin parallel to and a mile or less distant from the contact between the Cariboo schists and the younger limestone, quartzite, etc., of the Barkerville formation. The zone is composed of a number of large veins running parallel to the strike of the zone and nearly parallel to the schistosity and a vast number of smaller cross veins cutting the schistosity at nearly right angles. There are also a few veins having an intermediate strike. The larger veins are known as "A" veins and vary from six to sixty feet in width. The smaller cross ones, known as "B" veins, vary from an inch up to six feet, and are often numerous and closely spaced. They are generally more richly mineralized but the "A" veins in places also carry high values. The rich placers of this region are unmistakably associated with this belt and the creeks are richest just below where they cross the

quarts veins.

The veins of Island Mountain clearly belong to this mineral belt and yielded the large amount of gold taken from the Mosquito Creek placers. On Island Mountain the schists strike more nearly west than they do farther to the south and the principal veins strike north 75 to 85 degrees east cutting the schist at a narrow angle. They would therefore be classified on structural grounds with the"A" veins though in size and composition they more closely resemble the the "B" veins. Some "B" veins are present and also other veins following an intermediate direction.

In Bowman's report of 1895-6 he has described nine or ten "ledges" and several have since then been found, but as the mountain is heavily drift covered and on the southwest side deeply buried beneath thick deposits of clay, it is probable that many yet remain to be found. The large number found recently in the Cariboo Quarts tunnel just across the lake is a further strong indication of this probability. All but one of the veins on Island mountain examined by the writer were comparatively small averaging from two to three feet in width. The one exception is situated high up on the southwest side of the mountain; has an exposed width of seven feet but neither wall is exposed. Some of the veins mentioned by Bowman were not found.

The vein consists of quarts, pyrite and galena with varying amounts of gold and silver. On some of the higher veins there were rich secondary concentrations of gold which were mined and treated by hand methods to extract the free gold. One or two attempts were made at milling the ores but with poor success. The values were found to be low in some places and high in others but none of the working is deep enough to fairly test the unleached and unoxidized primary ore. The Cariboo Quarts tunnel across the lake has shown several "B" veins up to six feet in width carrying a good grade of primary ore, none of which was found on the surface. This fact warrants an expectation that many more veins may be discovered on Island Mountain and that some will be of commercial grade and size.

The veins described by Bowman are shown on the

accompanying copy of his plan of Island Mountain. It is not possible to correlate all these veins with those now exposed and which were examined by the writer. He shows several veins on the west side of Jack of Clubs lake and describes one under the name of "Lady of the Lake ledge" but it is not clear which one of these on the map is referred to in the text. In this locality a vein has been traced for 175 feet by open cuts and by a short tunnel 58 feet in length, at an elevation of 400 feet above the Jack of Clubs lake. About 300 feet lower and only 90 feet above the lake, is an old tunnel which follows for 60 feet a vein which is nearly on the strike of and evidently thought to be a continuation of the one exposed higher up. The tunnel ran out of the vein at a distance of about 60 feet from the portal but it was continued for several hundred feet without finding any vein. Since the writer's return from the field the upper vein has been traced by open cuts down the hill to a point 30 feet east of the old tunnel, thus proving that this tunnel was not on the same vein as the upper showings but on a parallel or a branch vein. The vein as traced down the hill is reported to be six to eight feet wide and mineralised with pyrite and galena. This vein may now be said to be traced for 500 or 600 feet in length and exposed over a vertical range of 300 feet.

The outcrops of the vein are completely leached and show little or no sulphide and assay very low, but in the tunnels considerable amounts of sulphide are present and some good assays have been had. Samples taken in the lower tunnel by Mr. Riel and Joe Leblanc gave the following results. $10.40, $3.60, $2.80, and $150.00 per ton. These samples were taken from the vein only a few feet below the surface of the ground and while the vein here contains much sulphide there are many signs of oxidation and a probability that some enrichment by surface solutions may have taken place. The vein was sampled in the upper tunnel by the writer. Sample 42 across two feet at the face assayed $14.00 per ton and sample 43 across four feet twenty feet from the portal assayed $7.40.

Johns Vein.

This vein is opened up by two tunnels for a length of 400 feet. The vein strikes north 75 degrees to 80 degrees east and dips south 40 to 65 degrees following irregularities in the dip of the schist. The vein is somewhat irregular in width but averages over three feet.

It is well mineralized with pyrite and carries good values. A sample taken by the writer across three feet four inches, thirty-one feet from the portal of the lower Johns tunnel gave $5.10 per ton. A sample taken by Mr. Biel from the face of the upper tunnel across four feet carried $8.80 per ton. Pure iron sulphides from the same vein assayed $39.20 per ton.

Sample 34 taken across two feet nine inches, thirty feet from faces of upper Johns tunnel gave $12.40 per ton.

Sample 35 taken across four feet, eighteen feet from the face of same tunnel gave $5.20 per ton.

Sample 36 across two feet ten inches at face of same tunnel gave $5.20 per ton.

Sample 37 across four feet of schist with small quarts stringers on the south side of tunnel near the face gave $2.20 per ton.

Above the Johns ledges are the Walker, Wright, Gadeu, Acheson and other ledges, some of which were not, at the time of examination, accessible. Three veins were examined; one in the Wright tunnel near the portal, one in the drifts at the end of the same tunnel and a third in a small tunnel a few feet northwest of the Wright tunnel, presumably the Atcheson ledge.

At a distance in the Wright tunnel of about thirty feet a vein comes in on the northwest side and follows this side of the tunnel for about fifty feet, when it pinches out. It maintains a width of twelve inches for about twenty-five feet in its central portion, giving it an average width of about nine inches. It consists of quarts with a fair amount of sulphide. A sample taken by the writer across twelve inches of this vein assayed

$9.00 per ton. The same vein was at one time exposed in a long trench above the tunnel which has since caved. Samples taken from this cut were reported to Bowman to have carried $50.00 per ton. The ore was probably partly oxidized. A sample of quartz taken by Mr. Riel from a dump in the cut above the tunnel assayed $38.00 per ton.

No other vein was seen in this long tunnel except at the very end where a cross vein was encountered and drifted on for fifteen or more feet in an easterly direction and a somewhat greater distance in a westerly direction. In the east drift is a number of small irregular cross veins. At the point where the two drifts meet the tunnel there is an irregular mass of quartz from which a fairly regular vein branches in a westerly direction. This was followed by the west drift which on account of water was not accessible. The veins contain a considerable amount of pyrite. A sample taken from the face of the east drift by Mr. Riel assayed $1.00 in gold. Sample 38 taken by the writer across three feet six inches on the east side of the tunnel intersection gave only a trace.

Sample 39 across four feet on the west side of tunnel intersection gave $1.00.

Sample 40 in end of east drift across seven feet of schist cut by three quarts veins averaging one inch in width gave $1.80 in gold.

The Atcheson tunnel, only a few feet north of the Wright tunnel, runs for forty-one feet in a south 75 degrees west direction. It exposes a small vein six to twelve inches in width for a distance of about twenty feet. Some galena is present in the ore but the vein is too small to warrant sampling.

A number of other veins including the Sadou, Walker, Fox and others occur in the near vicinity but the old workings are so badly caved that the veins could not be examined.

Bowman describes the Sadou ledge as striking south 30 to 45 degrees west, dipping nearly vertically and from two to four feet wide. "A milk-white quartz coated with hydrated peroxide, having pyrite cavities gave, gold, .658 ounces; silver, .233 ounces to the ton. Assay by Harrington, in 1876-7, of rusty quartz, with

mica slate, from the Sadon ledge gave gold, .175 ounces; silver, .802 ounces to the ton."

Bowman describes the Fox ledge as follows. "Strike, W.W.W., dip, southward 85 degrees. Country rock, slate; strike, N.W., dip, N.E., 40 degrees. An irregular broken ore body of considerable extent. Contents: An abundance of iron pyrites, and iron oxides containing free gold. Yielded colors of gold after roasting. An assay of selected ore is said to have yielded $60.00 and $70.00 to the ton."

The same author describes the Walker ledge as follows: "Walker ledge, 830 feet west of Johns. The ledge strikes S. 75 degrees W., and dips to southward 60 degrees. Strike of rock in cut near ledge, S.60 degrees to 65 degrees E.: dip N. 45 degrees. A heavy body of quartz is in sight, varying in thickness from three to six feet. The cut into the Walker ledge runs S. 50 feet, striking the ledge nearly at right angles. Contents; Honey-combed quartz, and brown iron oxide from decomposition, with glistening white talcose mineral resembling mica. From same locality, quartz, iron pyrites, and greenish talc. A quantity of rock milled by Riotte in 1887 (imperfectly roasted) yielded $19.03 to the ton. The bulk of the rock worked by Mr. Riotte was hauled to the Lane and Kurtz mill, and not roasted at all. Being most iron pyrites, with very little or no free gold, it yielded only a few dollars to the ton. During the winter of 1885-6 Mr. Mason worked 3000 pounds of ore from this ledge taken from the dump at the ore-house, and obtained $19.70. Mr. Walker reports a sample of the tailings sent to Pittsburgh for assay which yielded $61.00 to the ton. West of the Sadon ledge crossing, another cut ending in a short tunnel, has been run into the Walker ledge. It is 420 feet westward from the ore-house. The slate rock strikes N. 75 degrees W., and dips northward 45 degrees; perhaps is a little disturbed. A bearing taken along its strike, as indicated by Mr. Walker from his developments here and elsewhere, was S. 79 degrees W. About 500 feet further west in this direction, the ledge is again opened by a cut which discloses a body three feet and a half in width, nearly vertical, or dipping slightly to the south.

Mr. Dunlevy owns an extension here of 1500 feet. The ledge is traced another 1500 feet west, where it is known as "Joe Mason's extension". About a mile beyond that, to the westward, are the ledges elsewhere noted having a similar strike, at the head of Mosquito Creek."

Conclusions:

The writer's samples were not taken for the purpose of blocking out ore reserves but to find out how and where values were distributed in the veins and adjoining rock. Samples 37 and 38 consisted of 90% or more of schist and 43 of 60% schist and will tend to unduly lower the average values. On the other hand some parts of the veins were poorer than those which were sampled. Rock of the character represented by samples 37 and 38 which carried $1.20 and $3.80 per ton, is not nearly within the range of commercial ore at present, but it is extremely abundant and if large bodies of it could be blocked out, which is not impossible, it might sometime in the future be treated at a profit.

The writer's samples show an average value of $5.70 across an average width of three feet five inches, which widths and values are too low to constitute commercial ore. The veins moreover show signs of irregularity and discontinuity which further decrease their value. Samples taken from the surface openings on the veins are usually much higher in value and a considerable tonnage was mined in the early days which ran nineteen to sixty dollars per ton. This was, however, undoubtedly affected by surface enrichment, persisted only to ten or fifteen feet in depth and most of it was extracted from the known veins at that time. The future of the property must, therefore, depend on finding more and better veins. There are, however, good reasons to expect that (1) many more veins will be found; (2) that these on the average will be richer than those already found; (3) that some of them may be considerably larger and (4) that they may improve in size and regularity with depth. The probability of finding many more veins is suggested by the facts (a) that in a tunnel on the

adjoining property five veins were found in a distance of 150 feet, none of which was found on the surface; (b) that as a result of only a very limited amount of stripping a six foot vein was recently found only thirty feet from a tunnel on which considerable work had been done and which had been examined many times over a period of forty years and situated within a few hundred feet of the main highway of the district; (c) that the whole mountain is completely covered by a mantle of drift and on the western slopes by thick deposits of clay and only a very limited amount of stripping has been done; (d) that Island mountain is directly on the strike of the Barkerville mineral zone which is characterized everywhere by vast numbers of veins, and (e) that several springs depositing large quantities of iron oxide issue from the upper part of the mountain side, indicating the presence of pyrite, probably in quartz veins. The reasons for hoping that richer veins will be found are: (a) that there is a well marked tendency for the hard, unmineralized quartz veins to weather in relief and outcrop through the drift while the highly mineralized veins weather more readily, not only than the barren veins, but also than the enclosing schists and thus form depressions which are buried beneath the drift; (b) that the veins found in the Cariboo Gold Quartz tunnel contain the richest primary ore yet found in the district. It is of great significance that this tunnel taps the veins at a level 500 to 1000 feet lower than any openings previously made in the region and that a tunnel could be driven on the Island Mountain property at the same low level. That veins bigger than those already known may be found is also suggested by the size of some of the veins found in the Cariboo Gold Quartz tunnel. That the veins may be found to improve with depth is indicated by the fact mentioned that the Cariboo Gold Quartz tunnel is at once the lowest opening in the region and has exposed the richest primary ore and the most regular and persistent veins. This probability of improvement with depth is supported also by the following theoretical consideration, namely; fractures in the earth's crust always tend to be more numerous and promiscuous near the surface and to combine to a fewer number of larger more regular and persistent

fractures at depth.

It is important also not to overlook the probable value of the rich secondary ore. Numerous tests and small mining operations in all parts of the district have proven that this rich ore runs from twenty to one hundred dollars per ton and persists to depths of from ten to fifteen feet, and in no part of the district was this class of ore more abundant than in the vicinity of Island Mountain and the adjoining sections across Jack of Clubs lake. Even though these depths be slight and the veins narrow this secondary ore may be of considerable value. For example, the six new veins found on Cariboo Gold Quartz ground are all well mineralized and almost certainly will be found to have enriched surface zones. Assuming the six veins to have an average width of three feet, the ore to average fifty dollars, to persist to a depth of ten feet and a length of one hundred feet, they would contain $75,000.00 worth of easily mined and easily treated secondary ore. Where the veins become numerous this secondary ore might become a factor of great importance in the district generally.

These conclusions may be summed up as follows: The veins at present exposed do not constitute ore but may be regarded as an indication that better veins may be found. That more veins exist on the property is practically certain. That a great many more exist is a strong probability. That some of these will be bigger and richer than those already found also is probable and such would virtually insure the development of a gold mine. If many veins are found their rich secondary ore may prove to be of considerable importance. There is a possibility of the veins improving in width and continuity with depth. There is also a possibility, though a remote one, that large masses of schist with quartz stringers running from one to two dollars per ton, might be found, which, at some future time, might be mined at a profit.

Taking all of these possibilities into consideration the expenditure of a considerable sum of money on surface trenching and deep drifting and crosscutting may be recommended as a fair mining gamble.

I would recommend trenching from the lake shore near the Lake tunnel to and beyond the Johns tunnel. I would also recommend

connecting the Lake tunnel which is already in 250 feet, with the newly discovered vein which outcrops thirty feet to the northeast, and continuing to drift on this vein as far as a point underneath the tunnel which taps this vein three hundred feet higher and several hundred feet farther along the strike. If encouraging results are found a long crosscut to the north from the lake tunnel would then be justified.

BARKERVILLE MOUNTAIN

Barkerville mountain lies directly on the strike of the mineral belt and just south of Barkerville village. Considerable prospecting has been done by Elmore Armstrong and Tregillus and Blair. The latter own a group of claims (Tregillus-Blair Barkerville Group) which extend in a northwesterly direction along the southwest slope of Barkerville mountain from near the village to near the head of Stouts gulch, while Mr. Armstrong's Myrtle group extends northwesterly from here about a mile. The line of claims lies just above the old crown granted claims covering the Bonanza vein.

93H 025 Myrtle Group. As this group was under option only a brief cursory examination of the workings was made. On the most southeasterly claim of the group, known as the Morning Star claim, and 300 feet from its boundary with the Martha claim a two foot vein striking east and west and traced only for a few feet was sampled and found to carry $29.00 per ton. The vein was much oxidized and leached. The vein contains pyrite, galena and what appears to be the unknown mineral commonly found on the Cariboo Gold Quartz property.

On the Martha claim near the centre a small cut exposes a five foot vein of sheared and broken quartz mixed with slate and contains pyrite and much limonite. This sample (29) carried $20.40 per ton. The vein may have undergone some surface enrichment. It is exposed by two other cuts ten feet and fifty-five feet farther on. In the latter the vein gives very good tests by panning. Some of the free gold has, no doubt, been liberated by the oxidation of sulphides, indicating some surface enrichment.

About eighty feet from the above showing is a group of open cuts exposing a vein made up of thirteen inches of crushed quartz and sericite, twelve inches of schist and five feet of mixed quartz and slate. Samples of this material were panned by Mr. Armstrong showing in each case an exceptionally good prospect. There is probably some enrichment in this vein. A sample of schist taken from between two quartz veinlets and containing a little pyrite assayed $2.80 per ton. All these veins strike northwest and are of the "A" type.

The next showings are about a mile to the northwest on

the Marie claim. Here are many cross veins from six inches to fourteen inches in width, and from ten to twenty feet apart. Several small shafts have been sunk on three of these veins and the ore hauled down to the old Bonanza mine, where it was put through a Ross mill. Twenty tons of ore yielded $596.00, according to Mr. Armstrong. A sample taken by the writer from the dump of a shallow shaft near the Myrtle cabin gave $70.40 per ton. A sample from a nearby dump taken by C.P. Riel assayed $20.00 and one taken by F.M. Wells is said to have assayed $100.00. All of these veins are "B" veins striking generally in a northeasterly direction. Some of them are traced for a few hundred feet but none is opened to a depth of more than twenty feet and the greater width is about fourteen inches, the average being about one foot. They are spaced from ten to thirty feet apart and would offer some difficult problems in mining. Although some of the high assays obtained may be affected by surface enrichment it is the writer's opinion that many of these veins contain a good grade primary ore. Although no areas were observed in which ore bodies could be readily blocked out, the veins are extraordinarily numerous and it might be possible to find sections where either the veins are large enough or small veins are sufficiently closely spaced, particularly where they join veins of the "A" type, to enable workable ore bodies to be blocked out. Further prospecting should be directed with this in view.

VICTOR DOLMAGE

CONSULTING GEOLOGIST

****

X-REF

STOUT'S GULCH LEDGE

Cariboo District, B. C.

This ledge occurs on the south side of Stout's gulch about half a mile above its confluence with Williams Creek. The vein is not well enough exposed to enable its width or attitude to be determined but it is at least six feet and probably more in width. The quartz is mineralized with much pyrite, some of which has been leached, small amounts of galena, zincblende, and a bright metallic acicular mineral identical with that found recently in the Cariboo Gold Quartz tunnel. This mineral in the latter locality is associated with free gold and indicates high values. Its presence in the Stout's Gulch vein was not formerly known, though this vein has yielded several samples showing good values. In 1876 a sample assayed by Dr. Harrington and collected by G.M. Dawson of the Geological Survey, gave $6.70 per ton in gold. A sample taken by C.P. Riel gave $9.20 per ton in gold. A sample taken by the writer from a small branch vein with much pyrite assayed $8.80 per ton. As this sample contained a much higher proportion of pyrite than does the big vein where sampled by Riel and probably also by Dawson, and, as at this place small amounts of the unknown needle-like mineral were found, it seems reasonable to conclude that considerable gold is present where pyrite is very scarce and the unknown mineral present.

VICTOR DOLMAGE

Consulting Geologist

X-REF

BONANZA LEDGE OR B. C. MINE

CARIBOO DISTRICT, B.C.

This is a large vein twenty-two feet wide, situated on the south side of Barkerville mountain just above the divide between Lowhee and Stouts creeks.

It was opened up by the old B.C. Mining Company of Victoria in 1876, by a shaft 135 feet deep and a drift running 160 feet west and 60 feet east of the shaft. There are several crosscuts showing the vein to be about twenty-two feet wide. The same company imported sufficient machinery for a large stamp mill, including two large steam engines and boilers and a small sawmill. This machinery was transported by wagon to Barkerville at great expense, and stored in an old log warehouse on the company's property. The roof of the warehouse was long ago broken in by the snow but much of the machinery particularly the heavy parts, are still there in a remarkably good state of repair. The boilers and engines appear to be as good as when they were stored there in 1877.

In 1897 a French company took a bond on the property and sank a small winze in the western part of the drift, put down several drill holes and drove a tunnel which connects with the shaft fifty feet below the collar. They were apparently not satisfied with the results and did no further work. The property was examined by Angus Davis for the Consolidated Mining and Smelting Company and in 1912 R.R. Hedley sampled it.

The vein is a typical "A" vein of this district, striking northwest nearly parallel to schistosity of the Cariboo schists and dipping steeply to the northeast. At the shaft and for some distance on either side of it the vein, including some schist partings along the walls, is twenty-two feet wide. The open cuts are all caved and the shaft and drift flooded so that no part of the vein could be examined except a section in the foot wall penetrated by the tunnel.

The values in the vein are undoubtedly very low but

seem to improve towards the west. The oldest reports from 1877 to 1887 publish many encouraging assays from $6.00 to $33.00 per ton, which are evidently quite erroneous. A copy of a letter written by E.A. Lasell, who was in charge of the work for the French Syndicate, states that a diamond drill hole put down in the first crosscut in the drift went to a depth of ninety-six feet below the floor and was in ore all the way. It states further that "Just what the average assays of the ore were from top to bottom I cannot say positively, but believe it was between $16.00 and $17.00 per ton, as this hole was some distance away from the hanging wall, where the best ore is located, a higher value could not have been expected." "The second hole was drilled from an open cut made on the surface about 600 feet northwest on the ledge from the shaft house. This hole was put down 136 feet and was all in ore: the average of all assays from this boring was $23.50 per ton."

Three samples assayed by the Geological Survey in 1876 and taken by G.M. Dawson gave, respectively, $1.88; trace and trace. A specimen received at the Survey office in 1878 containing white quartz pyrites and carbonaceous matter assayed $11.45 per ton. Mr. Harper who worked some tons at Mason's mill claimed that it paid $3.00 to $4.00 per ton.

R.R. Hedley sampled this deposit in 1912 and reported that "the predominating assay was about $1.80 per ton and one shoot all too brief that carried $10.00 per ton and there were some about $3.00 per ton."

Angus Davis sampled it for the Consolidated Mining and Smelting Company and is reported to have got on the average not more than a trace.

The writer took three samples from the footwall of the vein, two just east of the shaft and one about forty feet west of it, and they each assayed forty cents per ton. A sample taken from the shaft-dump by the writer assayed $5.60 per ton. The material probably came from the small winze where Mr. Hedley found about $10.00 per ton. Another sample from the tunnel-dump assayed only forty cents per ton and checks with the samples taken from the tunnel.

It seems probable from the sampling so far done and from the old reports that this vein improves in grade towards the west and it would be interesting to test this possibility by a few drill holes put down from the surface west of the drift. The section of the vein in the vicinity of the shaft is certainly too low grade to warrant any further testing in that part.

VICTOR DOLMAGE

Consulting Geologist

****

X-REF

PROSPERINE MOUNTAIN.

A great many veins occur on this mountain and a considerable amount of work has been done in testing them. This has shown that there are two or three large veins running parallel to each other and to the crest of the ridge which forms the mountain. These veins cut the schists at a narrow angle and are classed as "A" veins. There are also many other smaller cross "B" veins on which only a small amount of work was done. The veins of Prosperine mountain were examined and sampled in 1918 by J.D. Galloway, who published a fairly optomistic report in the Minister of Mines report for that year. As a result of this the Mining Corporation of Canada took a bond on the properties and carried out a comprehensive scheme of testing under the direction of Robert Brice. After much work and sampling had been done the option was dropped, which was a serious blow to the quartz mining in the whole region. Some of the significance of this, however, is lost in the fact that an extension of time on a substantial payment was refused them by the owners. The results of the Mining Corporation are not known but it is safe to assume that a somewhat higher average gold content would be required by this company at that time than would be required at the present time.

There are, on this mountain, three large groups of claims extending from the northwest end of the mountain to Crouse creek at the southeast end. The northern group is owned by Seymour Baker and under bond to Howard Mining Company. It is referred to as Baker-Prosperine Group. Southeast of this is a group owned by Tregillus and Blair and known as the Tregillus and Blair Prosperine group. Farther to the southeast is Armstrong's Prosperine group. These are all described in detail in Uglow's and Galloway's report.

Baker's Prosperine Group.

On this property there are two veins, the Forrest and

the Wilkinson, each developed by shafts and open cuts. The Forrest shaft is vertical and said to be sixty-two feet deep with a crosscut to the vein at forty feet and at the bottom the vein dipping eighty-five degrees west. In the upper cut Mr. Baker reports three feet of eighteen dollar ore and in the bottom cut a four foot quartz vein with a shale parting in the middle, the whole averaging $18.00 per ton. A sample from the dump taken by the writer assayed $8.00 per ton. This part of the dump was said by Mr. Baker to come from near the bottom of the shaft. This vein was traced on the surface for ninety-five feet but gradually narrowed from three feet to a small stringer. It strikes north twenty degrees east and is therefore a "B" vein. A second vein parallel in strike and about thirteen inches wide was found three hundred feet to the east but was not sampled. Still another vein three feet in width was found three hundred feet to the northeast of the above vein. It is completely leached and was therefore not sampled.

The Wilkinson vein occurs on the Wilkinson and Prosperine claims and is opened up at intervals of one hundred to three hundred feet for a total length of 1100 feet by three shafts and a number of open cuts. The vein strikes in a northwesterly direction and nearly parallel to the schistosity. At the northwest end it is opened to a depth of fifty feet by an old shaft. Judging from the dump the shaft is entirely in vein material consisting of quartz with pyrite and some arsenopyrite. Two samples, numbers five and six, were taken from the dump from two cuts extending at right angles to each other from the centre to the edge. They assayed $3.60 and $1.60 respectively. On the surface the vein is irregular in width and mixed with schist. The greatest width of pure quartz observed is six feet but in the shafts it is reported to be fifteen feet in width. The dumps at the other two shafts showed a large proportion of schist. In one of these shafts a crosscut was run at a depth of sixty-seven feet, to cut the vein and, according to Mr. Baker who did the work, the cut is sixteen feet long and cuts into the vein but not through it. The other shaft, known as the "double compartment" shaft, is, according to Mr. Baker,

ninety-seven feet deep, and a sample from the bottom is said by him to run $16.00 per ton.

It is possible that there may be shoots of ore in this vein where it is intersected by the "B" veins, and there is no doubt that there are many of these not yet found. This vein appears to correspond with one or other of the two large veins which have been found on the adjoining properties to the south-east. The vein is undoubtedly large and the articulating "B" veins may be quite numerous. It should be prospected by trenching or drifting along the hanging or footwall so as to pick up the "B" veins with the aim of trying to block out ore shoots where the "B" veins are either large or numerous or both. This large vein viewed as part of one or other of similar large veins exposed on adjoining properties, has possibilities which warrant further testing on the surface and at depth.

Pani Vein. This is a large vein situated on Williams creek above Richfield. It strikes towards Prosperine mountain and is included in Baker's Prosperine group. It has been opened up by several promiscuous open cuts on both sides of Williams creek. It is about six feet wide and contains a considerable amount of galena and pyrite. Sample number one represents selected ore from these cuts and contained a fair amount of galena, but on assay showed only traces of gold. Sample number 2 is from the waste dump. It contained no visible galena and assayed a trace of gold. A picked specimen from the ore dump consisting largely of galena assayed only a trace of gold and 0.48 ounces of silver per ton. These results indicate that the presence of galena is not an indication of the presence of gold. The vein strikes parallel to the bedding and is therefore an "A" vein, but is not parallel in strike with the "A" vein, on Prosperine mountain, which cut the formation at a slight angle.

The Baker-Prosperine claims covering all the above mentioned veins are in good standing, are owned by Seymour Baker, and along with the claims on Island Mountain are bonded to the Howard Mining Company of Vancouver.

Tregillus-Blair Prosperine Group

The next group of claims to the southeast of Baker's is owned by Tregillus and Blair of Barkerville. As this property was under bond to other parties the writer did not examine it in detail and did not sample it. The workings are fully described by J.D. Galloway in Minister of Mines Report for 1918 and W.L. Uglow in Geological Survey Memoir 149, page 201, but considerable work has since been done. The principal vein on the property is a large "A" vein well developed on the Warspite claim. It is opened up by a shaft thirty-one feet deep. At this point it is six to seven feet wide on the surface and twelve and one half feet wide in the bottom of the shaft. A sample from the bottom is said by the owners to assay $18.00 per ton. The vein is intersected by two "B" veins four feet apart and eighteen inches and ten inches wide respectively. The large "A" vein is traced by open cuts for about fifty feet to the southeast, maintaining a width of about six feet. A similar vein is exposed in two long cuts 400 and 500 feet northwest and believed to be a continuation of the same vein.

Galloway got a number of encouraging assays on the Warspite claim. One vein four feet wide gave $28.00 and the adjoining eighteen inches $18.40 per ton, while a grab sample from the dump gave $4.40. In a large cut he got an average from seven samples of $19.80 per ton.

The property belongs to F.J. Tregillus and T.A. Blair, both of Barkerville, but at the time of the examination it was under an option until September 15th. Whether the option was dropped or extended is not known.

The Armstrong-Prosperine Group

This group of claims extends from the Tregillus-Blair group southeast to Grouse creek. The Mining Corporation of Canada did a large amount of surface work and sampling on this property. A long tunnel was started but is reported not to have reached its objective, when the option was dropped. One reason for their dropping the option is said to be that an extension of

time on a substantial payment was refused by the owners. It is obvious, also, however, that the large amount of sampling done was not entirely encouraging or the option would not have been dropped.

The large number of surface openings, mainly on the Independence claim, expose a complicated network of veins, but there appear to be two main parallel veins striking in a northwest direction, and about 150 feet apart. There are also many smaller cross veins. Number one or the southwest vein consists of a number of parallel bands of quartz veins separated by schist bands, making up a total width of about thirty feet. The intervening schist layers carry pyrite and arsenopyrite in about the same abundance as the quartz. The mass is crossed also by a "B" vein carrying considerable galena. Number two vein varies from several feet up to nearly fifty feet and is opened up by a large number of cuts and small shafts for a length of several hundred feet. The vein contains considerable pyrite, some arsenopyrite and in spots is heavily mineralised with galena.

The values in these veins are spotty but in places quite high. There is not sufficient data at hand to make any estimate as to average values. A sample from the shaft dump of what looked like low grade material assayed forty cents and one from the high grade dump $4.80 per ton. From the bottom of this shaft Galloway took a sample across thirteen and one half feet which gave $6.40 and a grab sample from the dump which gave $9.60 per ton. His sampling of the adjacent open cuts gave very erratic results ranging from a trace to $24.80 per ton. This may be accounted for in part by the irregular distribution of values in the quartz, probably influenced by "B" veins, but it is undoubtedly partly due to surface leaching and enrichment. All of the workings on Prosperine Mountain are above the 5,200 foot and the majority above 5,500 level. This is 1,200 to 1,500 feet above the level of the Cariboo Gold Quartz tunnel, which suggests the possibility that more uniform values and regular veins might be found at depth on these properties.

VICTOR DOLMAGE

Consulting Geologist

.....

X-REF

CUNNINGHAM CREEK SECTION

Campbell's Group.

The great mineral belt on which all the above properties are situated has not been prospected immediately southeast of Armstrong's Prosperine group but has been developed on Cunningham creek on what is known as the Campbell group and on the headwaters of Harvey creek on the Hudson group. Between Cunningham and Grouse creeks lie Antler and Nugget mountains, separated from one another by Antler creek, and while the continuation of the mineral belt has not been proven in this intervening section by prospecting its continuation is amply proven by the fabulous richness of the creeks draining this section, such as Antler, Nugget, Wolf and many others. The country was staked this fall.

In Cunningham creek John Campbell holds a number of claims on the mineral belt and has uncovered a number of interesting showings. He has two groups of workings in the bottom of the creek and about 300 feet apart. In the lower group three showings were examined and sampled. One of these gave $1.20 across three feet eight inches; another consisting of a solid mass of galena and pyrrhotite gave only twenty cents. A third across thirteen inches of quartz and six feet of schist gave forty cents. In the upper group of workings a sample across six feet of schist and quartz gave $4.00 and a continuation of the same sample across four feet ten inches of quartz and schist gave forty cents. The examination of this property was made under difficulties which prevented the taking of other samples from showings which fully warranted it. The mineralization is very widespread and many intersecting veins occur on the property. The property is bonded to the Reward Mining Company.

Hudson Group.

This group lies to the southeast of Campbell's group extending up to the summit of Round Top mountain and down opposite side towards the headwaters of Harvey creeks. Most of the showings occur near the summit on the Cunningham creek side at elevations of 5200 to 5500 feet. The property is reached by six miles of trail extending up Cunningham creek from a road leading from Barkerville and ending in Cunningham creek near the Treehouse placer mine. Should large scale operations ever be found warranted the property is much more easily accessible from the Harvey creek side by a road up Cariboo lake from the present end of the Keithley road.

A large number of intersecting veins are exposed on the property, the great majority of which are too small and low grade to be any value. Sampling by the writer narrows the possibilities of the property down to three showings which appear to be on one vein. A vein exposed in open cut about one hundred feet below the tunnel and consisting of a cream colored quartz carrying pyrite, galena, zinc blende, scheelite and siderite assayed $44.00 across six feet four inches. This vein strikes south fifteen degrees west and dips seventy degrees to the southeast. What appears to be a continuation of it is exposed in the tunnel near the face. Here a sample across three feet six inches of quartz gave $6.00 per ton and eight feet six inches of mixed quartz and schist on the hanging wall side assayed forty cents per ton. Above the tunnel on the summit of the ridge and along the line of strike, a vein of the same character and appearance assayed $4.40 across four feet. It is not proven whether these three showings are on one vein but this could be readily done by a small amount of surface work. All of the showings warrant further prospecting.

The ownership of this property is divided equally between F.M. Wells and the Reward Mining Company of 542 Howe Street, Vancouver. The ground between the Hudson and Campbell's group, as well as several claims northwest of Campbell's, were recently staked by Reward Mining Company, which gives this company control of a

large section along the southern extremity of the mineral belt.

SUMMARY

The above described properties are the principal ones on the Barkerville mineral belt. There are others on Cow and Burns mountains which were not examined but which are similar to those described and of equal importance.

Some of the outstanding features of the veins are as follows. They are extremely numerous over a belt more than twenty miles in length. They occur in a well defined belt in the Cariboo schists running parallel with a contact between the schists and a younger formation composed mainly of limestones and lying to the northeast. Some of the veins are nearly parallel to the schistosity and known as "A" veins. These are large but irregular in width and in some instances mixed with considerable schist. The Bonanza ledge is twenty-two feet wide, the Wilkinson fifteen feet, the Warspite fifteen feet and one on Armstrong's Prosperine group is over thirty feet wide. The "A" veins are barren in places and very low grade in others, but several shoots of ore have been found in them. Very little surface prospecting has been done and almost none at depth. Beside these "A" veins there is a well defined set of cross veins which cut across the schist and are known as "B" veins. Previous to the driving of the Cariboo Gold Quartz tunnel very little work had been done on the "B" veins and little was known regarding their size and value. The unsatisfactory exposure gave the general impression that while they carried good values they were small. The exposures in the Cariboo Gold Quartz tunnel, however, show, according to Douglas Lay, that "B" veins from two to six feet in width carrying high grade primary ore, exist in the region.

There is in places considerable leaching and some enrichment by surface solutions. Much of this secondary ore was removed by the early miners who extracted the gold by hand methods.

Judging from their work enrichment does not go to depths greater than fifteen feet, but where the veins are numerous or large or both the enriched zones might be of considerable importance. Great care must be taken in interpreting samples taken from veins within fifteen or twenty feet of the surface.

The veins besides being enriched are often leached to a remarkable degree and frequently the iron oxides, as well as the sulphides, are completely removed. It is probable also that any free gold which may have been present is also leached out and that samples taken from the leached outcrop may be as deceiving as those from the enriched zone. This possibility is supported by much evidence cited by Johnstone and Uglow indicating that the solution--and its precipitation in crystal form, was an active process during the weathering of the gold veins. There is also a well marked tendency for the barren veins to form the outcrops and the more heavily mineralised veins to form depressions and to be burried beneath the glacial drift. The veins found in the Cariboo Gold Quarts tunnel show that high grade primary ore containing native gold occurs in the district, and that veins are much more numerous than the meagre prospecting done to date would suggest. Since this tunnel is much the lowest opening made in the district it might be an indication of improvement in values and continuity with depth, to be expected generally throughout the district.

The possibilities of the district lie in (a) in finding larger "B" veins or of finding zones of closely spaced "B" veins which might, with the intervening layers of schist, constitute low grade ore; (b) in finding large shoots in some of the "A" veins, probably where they are intersected by large numbers of "B" veins, and (c) of finding a general improvement in concentration and regularity with depth. A large amount of prospecting with these possibilities in view is warranted.

(SIGNED) V. DOLMAGE.