

NAME

DEPARTMENT OF MINES AND PETROLEUM RESOURCES
VICTORIA, BRITISH COLUMBIA

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ANNUAL REPORT OF THE MINISTER OF MINES
FOR 1936.

Part F -- Special Report
by
J.S. Stevenson.

Bull Moose. The Bull Moose group is owned by William Uren of the Upper Deadman River and his associates.

The workings on this group are 4800 feet south 65 degrees east from the ranch house of William Uren near the upper reaches of the Deadman River eastward from Vidette mine, and may be reached by ten miles of auto road from the mine.

The workings are on a slightly wooded knoll on the south side of the extensive meadows through which the Deadman River flows. They consist of one 6-foot by 6-foot vertical shaft 14 feet deep and 8 trenches, several of which were filled with soil at the time of examination, all on a branching quartz vein.

In the shaft the vein strikes north 18 degrees west, dips 65 degrees westerly, is $2\frac{1}{2}$ feet wide, and consists of milky quartz containing small amounts of pyrite, chalcopyrite and ankerite carbonate; pyrrhotite occurs in tight joints in the wall-rock. A $2\frac{1}{2}$ -foot sample of vein quartz assayed nil in gold and silver, but picked samples of sulphides assayed: Gold, 0.02 oz. per ton; silver, 0.1 oz. per ton.

North from the shaft the vein, turning north-westward, has been traced by two trenches for 90 feet. This portion of the vein strikes north 35 degrees to north 45 degrees west and is narrower, averaging only 8 inches. Three trenches, 35 feet and 40 feet north 30 degrees west from here, failed to pick up the continuation of the vein; it is probable that they are too far north-eastward to cross the continuation of the vein. With one exception, the trenches southward from the shaft were largely filled with debris; however, in one 75 feet south, a lens of quartz 2 inches long and ranging from 12 inches to 4 inches in thickness was seen.

In the shaft the rock formation is highly silicified feldspar porphyry, containing films of pyrite and pyrrhotite along tight joint-planes; however, much coarser feldspar porphyry outcrops 172 feet in a direction north 75 degrees west from the shaft. Fifty-one feet in a direction north 30 degrees west from this outcrop, another shows porphyry which has been sheared in planes striking north 85 degrees east and dipping 55 degrees southerly to a buff-coloured, paper-thin schist.

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ANNUAL REPORT OF THE MINISTER OF MINES
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Part D -- Special Report
by
M.S. Hedley.

BOUNTY. This claim is being worked by Beaver Silver Mines, Limited, and together with the Bounty Fraction, Hoyland Fraction and Black Bess is under lease and bond to that company. The Bounty is on Dry Creek on Wallace Mountain at an elevation of about 4,500 feet, and the workings are on the timbered north bank one-quarter mile above the crossing of the Rambler Road. Access is by fair road.

The deposit is in Westkettle quartz diorite and consists of a narrow vein dipping southerly at about 65 degrees. The vein, where now seen, fills a rather tight shear-zone 1 to 8 inches in width between little-altered walls. Sulphides include sphalerite, pyrite, galena, pyrargyrite, tetrahedrite, and quartz is locally prominent; sphalerite is in most places abundant, but short sections contain considerable galena, and it is reported that sections carrying considerable ruby silver have been encountered in stopes. Development consists of two adit-crosscuts, No. 1, elevation 4,500 feet, 365 feet long, and No. 2, elevation 4,425 feet, 500 feet long; drifting on the vein includes 200 feet on No. 1 and 300 feet on No. 2. Stoping over a length of 140 feet has been carried out above each level and has apparently recovered most of the available ore in that section.

Drifting on the west end of No. 2 adit-level shows an irregularly-broken vein to a maximum width of 8 inches. The vein has not been picked up beyond two faults on the east end. Faulting is of two sorts; steep faults move the western segment of vein to the north and flat faults, encountered in the stopes, drop the higher segment into the foot-wall. It is reported that in the stopes the vein opens to better widths on an occasional roll.

Work, with a crew of four men, is under the direction of Gus Timmermeister.

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ANNUAL REPORT OF THE MINISTER OF MINES
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Part B -- Special Report
by

J. T. Mandy.

PAY ROLL - This property consisting of the two crown-granted claims, Pay Roll No. 3 (lot 5524) and Pay Roll No. 4 (lot No. 5525) is owned by R. W. Irwin, Ketchikan, Alaska. It is situated in the Portland Canal Mining Division on the Big Missouri ridge, around 2200 to 2750 feet in elevation and about $\frac{1}{2}$ mile south of No Name lake. The claims are adjoined on the north by the Silver Coin group, on the east by the Silver Cup group, on the south by the Indian group and on the west by the Boundary group. The property is reached by the Premier-Missouri motor-road from seaboard at the village of Stewart to the Big Missouri camp at elevation 2900 feet, a distance of $17\frac{1}{2}$ miles. From this place a trail extends south for about 2 miles to the claims, along the comparatively level but rock-knolled, ridged, gullied and locally swampy southern end of the Missouri ridge-crest.

The topography of the locality is not so roughly rugged as that which characterizes the higher mountainous sections of the Portland canal area. The deep canyon of Myrtle creek which cuts through the north-east corner of Pay Roll No. 4 claim is quite rugged and rough and east of this Pay Roll No. 4 embraces the upper portion of the Westerly side of the ridge sloping between 30 and 40 degrees to the Salmon River glacier. Pay Roll No. 3 claim, adjoining Pay Roll No. 4 on the east embraces the knolled and gullied crest of the ridge of about 2750 feet general elevation in this locality.

The locality is situated in the eastern contact-belt of the Coast Range granodiorite batholith and the claims are about $1\frac{1}{2}$ miles east of the main contact. The claims are underlain by an irregular complex of volcanic breccia and tuff, locally argillaceous, and greenstone of the Bear River formation (Hazelton group), intrusive into which are granitic and lamprophyre dykes. No work has been done on this property for several years.

The open-cuts on the siliceous-zone on the Missing Link Fraction described under the heading of the Boundary group approach to within 50 feet of Pay Roll No. 4 west boundary. The southerly projection of this zone should cut through the south-west corner of Pay Roll No. 4 claim. In this locality, at 2200 feet elevation, two very old trenches in clay about 3 feet

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deep and 20 feet long, on a flat bench of the steep west slope of the ridge expose severely oxidized rock containing locally heavy pyrite mineralization in a siliceous gangue. These trenches are badly caved and heavily overgrown with underbrush which obscures the width, attitude and mineral distribution of any mineralized structure which may occur here. This mineralization is about 150 feet east of the outcrop-projection of the Boundary group zone and unless this zone has been offset to the east represents a possible parallel zone. Further prospecting in this locality would be constructive. At elevation 2400 feet, about 1000 feet north of these trenches and at the edge of Myrtle Creek canyon an open-cut in tuffs exposes a width of 4 feet of quartz stringers and quartzose rock well-mineralized in one section across 2 feet with pyrite, galena and sphalerite. This vein strikes north 32 degrees west and dips 50 degrees north-easterly and a few feet north of the cut a crosscut-adit has been driven for 25 feet. This exposes silicified rock and irregular quartz patches across 12 feet, well-mineralized with pyrite, galena and sphalerite on the hangingwall-side. The rock-formation on the foot-wall of this vein is argillaceous tuff and on the hanging-wall is an acidic dyke.

About 1000 feet east on the crest of the ridge at elevation 2850 feet, approximately 1200 feet south of No Name lake, on the Pay Roll No. 3 claim, about 250 feet east of the south-east corner-post of the Silver Coin Fraction a well-defined siliceous-zone in tuffs outcrops prominently along the crest of a north-south ridge. This zone strikes north-easterly and can be traced southerly by natural outcrop from the Silver Coin Fraction boundary for about 500 feet where silicification disperses in a series of quartz stringers. To the north it can be traced along a continuous outcrop for about 500 feet in Silver Coin Fraction ground and disperses in a series of quartz veins, stringers and offset lenses. The zone is 10 to over 20 feet wide and composed of reticulated white quartz masses, stringers and veins and silicified tuff. Locally, quartz lenses "on echelon" to the main zone and connected with it by quartz veinlets and stringers appreciably extend the width of the zone. Several open-cuts and "pop-shots" along the outcrop expose white quartz generally very sparsely mineralized with blebs and streaks of pyrite with occasional specks and small blebs of sphalerite and galena.

This zone extending from Pay Roll No. 3 claim into the Silver Coin Fraction is easily accessible from the Missouri road.

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ANNUAL REPORT OF THE MINISTER OF MINES 1936

Part F -- Special Report

By
B.T. O'Grady

B.R. MOUNTAIN GOLDS LIMITED. This property, in the Lillooet Mining Division, consists of the Moraine group of nine surveyed mineral claims and fractions, and the Atlas group of seven claims, all of which are held by location. The mine camp is adjacent to the western side of Noel Creek 2 miles south of Cadwallader Creek.

The workings examined, at elevations ranging from 4,000 to 5,100 feet, are west of Noel Creek on the wooded eastern slopes of the ridge which rises to 7,000 feet elevation. The lowest or No. 3 adit, at 4,000 feet elevation (assumed aneroid datum), is on the locally gentle slope to the creek at 3,920 feet elevation. Above this adit the smooth slopes of the mountain-side become steep as the upper workings are approached. Noel Creek is a small stream flowing on a gentle gradient into Cadwallader Creek. The camp, 800 feet down-stream from the No. 3 adit and at about the same elevation, is reached by road 2.5 miles in length from Bralorne townsite. Of this the first 1.5-mile section is a logging road to where Noel Creek is crossed and the last mile was built by the above company.

The general geology of the immediate area indicates alternating belts of serpentine (Shulaps volcanics) and Bridge River series, these formations trending north-westerly with variable dips. Exposures noted on the Moraine Nos. 2 and 3 claims, which include the workings examined, are largely serpentized intrusives and metamorphosed sediments, a small area of fine-grained diorite being noted at the upper location. No definite vein, fissure, shear, or mineral deposit was seen in the developed area. Barren quartz and siliceous segregations are found in the rocks in places but without definition or structural boundaries.

The claims constituting the property were staked in 1932, 1933 and 1934, the present company having been incorporated in October 1933. Prior to 1933 the nucleus of the holdings is said to have been owned by the Florence Ann Mines, Limited.

At 5,020 feet elevation there is a caved open-cut adjoining which are boulders of quartz. The adjacent rock is massive, fine-grained, greenish diorite, serpentized in part. Immediately below this cut, and at 4,996 feet elevation, the No. 1 adit, said to be 75 feet in length, has been driven south 40 degrees west for 50 feet in broken, shattered, similar rock to where it

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is caved near a fault striking south-easterly and dipping at about 40 degrees to the south-west. Along the south-eastern wall, just back of the caved section, there are indefinite quartz lenses and stringers from which a grab sample assayed a trace in gold and silver. The No. 2 adit portal, at 4,647 feet elevation, situated 700 feet north 77 degrees 35 minutes east from the No. 1 adit location, comprises about 800 lineal feet of work. Averaging minor irregularities in direction, the main courses of this working are: From portal to first bend at "A" south 12 degrees west, 170 feet; from "A" to next station at "B", south 66 degrees 30 minutes west, 260 feet; and from "B" to face at "C", north 29 degrees 30 minutes west, 142 feet. In the central of these courses there are two crosscuts driven southerly of which the inner one is caved. The last course, to the north-west, contains two short branches, one driven north-easterly and the other south-westerly, near the face. The workings are unsafe for protracted inspection, being largely in serpentinized rock, much of which is soft and caving. There are also areas of soft argillaceous sedimentary rocks. The north-eastern branch near the face at "A" is a drift 11 feet long developing a quartz-filled fracture, 6 to 12 inches wide, and standing about vertical. A sample here across 8 inches assayed a trace in gold and silver. A grab sample from a small pile of quartz on the dump of the No. 2 level, where otherwise very little quartz was in evidence, assayed a trace in gold and silver, and selected specimens of quartz, with associated sericite, gave the same negative return. Work in the Nos. 1 and 2 adits, which are both in poor condition, has been suspended for some time and the new No. 3 level crosscut was being driven from a point at 4,000 feet elevation and distant 1,680 feet on a bearing of south 68 degrees east from the No. 2 adit portal. At the time of the writer's visit in August 1936 this adit, all in overburden, was 167 feet long on a bearing of north 88 degrees west. At the time of writing it has been advanced in the same direction to a point 477 feet in from the portal, all in overburden or soft broken formation, necessitating close timbering throughout. A wide smoothly eroded serpentine belt lies between the No. 3 and No. 2 adit locations. Serpentine and serpentinized greenstone are exposed in outcrops and an open-cut adjoining the western side of Noel creek 400 feet south-west of the No. 3 adit portal. In the open-cut the rock contains quartz without definition or mineralization of interest. The upper workings afford no evidence of an objective for the work being done on the No. 3 level, which is being advanced by hand. Substantial camp buildings, newly built when the property was visited, include connected bunk- and cook-house, affording good accommodation for about 10 men, and office.

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Part F -- Special Report
by
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REGINA GROUP. The Regina group comprises the Regina Nos. 1 to 3, inclusive, the Regina #2 Extension, and the Barney Barnato. Two of these, the Regina No. 2 and the Regina Extension, are Crown-grants in good standing; the remainder are reverted Crown-grants, but have been leased to various people.

The workings on these claims are in the heavy timber above the logging slash on the south side of China creek and from 1000 feet to 2000 feet west of Williams Creek, a small stream flowing northward into China creek almost opposite Mineral creek; they are at elevations ranging from 1850 feet to 2550 feet. At present they are most easily reached by following the 26-degree incline of the Albemni-Pacific Lumber Company, up the slope opposite Mineral Creek, to an elevation of 1880 feet, thence through the bush eastward for 125 feet to the first working, a short adit at an elevation of 1860 feet; from a point 40 feet above this working a trail winds eastward for 800 feet to an old cabin at an elevation of 2050 which place was formerly connected with China Creek by a pack-horse trail.

Near the workings the hillside is of uniform steepness, approximately 25 degrees, and heavily wooded by timber, which, although not merchantable, would be suitable mine timber.

Tight quartz-sulphide lenses in green andesite and pyritized, silicified greenstone have been explored by the various workings but nothing of value is as yet indicated.

The adit, previously mentioned, and at an elevation of 1860 feet, has been driven north 55 degrees east for 15 feet in highly silicified and leached andesite that contains such an abundance of disseminated pyrite and ankeritic carbonate that extreme oxidation has occurred. In this connection it may be mentioned that the "Big Showing" exposed at an elevation of 2100 feet on the incline consists of similarly altered and pyritized greenstone, a large bulk sample of which assayed 0.64 in gold and trace in silver; this was highly oxidized material.

One hundred feet south-west from the camp at an elevation of 2100 feet a 20-degree incline has been sunk south-eastward for a minimum, measured distance of 30 feet; at the time of examination it was filled with water. It has been sunk on a tight shear partly filled by quartz, that strikes north 50 degrees east and dips 20 degrees south-easterly. In the north-east wall of the open-cut leading to the incline a small lens of quartz and accompanying veinlets are exposed, and in the south-east wall close to the floor of the incline there is a zone of greenstone that has been highly

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silicified over a width of 25 inches, and contains a 4-inch quartz lens and numerous related stringers; pyrite and chalcopyrite accompany the quartz; this zone is not continuous for more than 5 feet along the strike. Samples taken across the 4-inch quartz lens assayed only a trace in gold, and 1.0 oz. per ton in silver; whereas a 25-inch sample including quartz veinlets and sulphides assayed: Gold, 0.02 oz. per ton; silver, 0.8 oz. per ton. A grab sample of quartz containing considerable pyrite, chalcopyrite and galena from the dump assayed: Gold, 0.66 oz; silver, 14.0 oz. per ton.

Eight hundred and fifty feet south from the incline and reached by a poorly defined foot-trail going south-westerly for half the distance and south-easterly the remaining half, a short adit has been driven south 20 degrees east for 15 feet at an elevation of 2300 feet. The adit is now mostly caved, but part of the face showed a 2-foot length of a 2-inch quartz-chalcopyrite-galena veinlet; and the east wall at the portal a silicified zone 2 feet wide containing concentrations of pyrite. The zone strikes approximately north 70 degrees east and dips 25 degrees south.

One hundred feet in a direction south 25 degrees east from the last working and at an elevation of 2370 feet an adit has been driven southward for 94 feet along a shear striking north 11 degrees west and dipping 70 degrees north-easterly. The shear contains approximately 1 foot of gouge and crushed greenstone; and over a width of 1 foot in the hanging-wall replacement veinlets of quartz and pyrite. A sample of this material contained, however, only traces in gold and silver. Twenty-five feet from the portal the shear has cut a sheeted zone 1 foot wide, striking north 80 degrees east, dipping 25 degrees southerly, and containing numerous 2-inch quartz veinlets and very little pyrite; this zone is seen in the east wall only of the adit. The main shear ends in the face against another and a barren shear striking east-west and dipping 60 degrees southerly. The rock in the working is dark green andesite, mostly massive, but sheared in the crushed zones.

Two hundred and twenty-five feet in a direction south 25 degrees west from the last adit and at an elevation of 2450 feet, a short adit has been driven south 45 degrees east for 20 feet from a pit at the portal 5 feet deep. The only metallic seen was disseminated pyrite in the rock formation, a highly silicified greenstone, and a small quartz veinlet at the face; a sample of the pyritized rock and quartz veinlet contained only traces in gold and silver.

One hundred and twenty-five feet south, 25 degrees west from the adit there is a caved out and 75 feet westward from this a second cut, showing similarly mineralized rock.

Seventy-five feet in a direction north 30 degrees west from the last cut and at an elevation of 2500 feet the longest adit

on the property has been driven south 17 degrees east for 33 feet, south 20 degrees east for 64 feet, and south 47 degrees east for 47 feet to the face. For 95 feet from the portal this working has been driven along a narrow shear containing crushed rock, and which strikes north 30 degrees west and dips 65 degrees north-easterly. The hanging-wall consists of silicified andesite containing disseminated pyrite and occasional quartz stringers and at 90 feet from the portal a one by two-foot lens of barren quartz. At 97 feet from the portal a 4-inch lens of barren quartz and chlorite strikes north 50 degrees east across the adit, dipping 30 degrees south-easterly. From here to the face the typical rock, andesite, prevails.

Various claims in the Regina group were apparently first Crown-granted in 1898 and 1899 to the Alberni Gold Development Syndicate. All the workings and cabin are very old, probably dating from the late 90's, the only recent work apparently being the cleaning out of the incline and possibly some in the open-cut adjacent.

Mention of the property may be found in the Minister of Mines Annual Reports for 1898, 1899, 1930, and 1933.

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Part B -- Special Report
by
J.T. Mandy

BUSH CONSOLIDATED GOLD MINES, LIMITED. The authorized capital of this company is \$3,000,000 divided into 6,000,000 shares of the par value of 50 cents each. O.B. Bush is the president and the head office is at 414 Hall Building, Vancouver, B.C. The company is a consolidation of Bush Mines, Limited, Extenuate Gold Mines, Limited, Gold Cliff Premier Mining Company and Chief Metals Company. It also owns 560,114 shares of Bush Cobalt Mines, Limited. The company was incorporated in the state of Delaware in April, 1927, and was registered in British Columbia in October of the same year. It became inoperative and void on April 1st, 1933 and was proclaimed by the Governor of the State of Delaware in January, 1934, for non-payment of taxes. It has since been re-instated in Delaware and application has been made for its restoration to the Register of Extra-Provincial companies in British Columbia but it has not yet been restored. It has not, therefore, any title to its property in British Columbia at the present time.

On March 15th, 1934, Bush Consolidated gave the Bush Cobalt Company an option on a 60 per cent interest in its mineral claims for a period of two years on certain terms which required the Bush Cobalt Company to advance funds for development. On July 25th, 1935, both companies entered into an agreement with J.G. Campbell, giving him an option to purchase a 55 percent interest in their properties. In November, 1935, J.G. Campbell transferred this option to the Cardinal Mining and Development Company, Limited. The terms of this agreement required the expenditure of \$75,000 on development, by the Cardinal Company within three years, the work to commence early in 1936. In this respect, no work was done during 1936, but it is understood the option has been extended.

The properties are undeveloped prospects, comprising about 37 claims located in one block in the Salmon River area of the Portland Canal Mining Division, adjoining and contiguous to the holdings of Silbak-Premier Mines, Limited. These properties include the Border and Sunshine claims, the Extenuate group, Start group, Maple Leaf group, Monitor group, a number of claims and fractions near the south end of Long Lake, the present status .

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of which is not definitely known to the writer, and an interest in the Exchange and Cobalt groups. The Gold Cliff Premier property is situated in Alaska, adjoining the Border claim, which is in British Columbia.

The general topography of the area covered by the properties embraces the characteristic ruggedness of the eastern section of the Coast Range. It is featured by deeply eroded creek-troughs, bordered by steep, heavily timbered rock-bluffed slopes to the bluffed and undulating rock-knolled crests of the mountain-ridges at elevations of 3500 to 4200 feet. Timber-line is at about 3000 feet elevation and above this are grassy and shrub-covered slopes.

The section is embraced by the eastern contact-belt of the Coast Range batholith. It is underlain by volcanic tuffs, breccias and intrusive porphyries of the Bear River formation (Hazelton group) of lower to middle Jurassic age and over 2000 feet in thickness (base unexposed.) In places this formation is gradually transitional into sandstone, conglomerate, intercalated argillite and chert and some tuff and porphyry of the upper Jurassic Salmon River formation (upper Hazelton group) of over 300 feet thickness. The latter formation is transitional upwards into argillite and slate of the upper Jurassic Nass formation (upper Hazelton group) of over 1000 feet thickness. In this area, these formations lie in several southerly-trending, more or less gentle, folds. The valley of Cascade Creek east fork and Long Lake is occupied by a gentle anticline, followed to the west by the syncline of Slate Mountain. To the west of this a small anticlinorium occupies the valleys of Cascade Creek and Harris Creek, followed to the west by the gentle anticline and syncline of Big Missouri Ridge. Intrusive into the Bear River, Salmon River, and Nass River formations are porphyritic initial differentiates of the Coast Range batholith. These include porphyritic granodiorite and monzonitic phases (so-called "Premier porphyry"), reddish porphyritic granodiorite and a greenish porphyritic gabbroic rock. Later intrusives include granitic dykes and tongues satellitic to the batholith, followed in age-sequence, especially in the northerly section of Long Lake ("Belt of dykes") by dykes varying from diorites to quartz porphyries and later lamprophyre.

In considering the geology of this area and these properties specifically, it is important to note that the porphyritic intrusives generally referred to and capitalized on as "Premier quartz porphyry sills" and conveniently projected along confined lines through the Silbak-Premier ground into

adjoining and contiguous property, is not quartz porphyry and are not "sills". On the contrary, these rocks compose irregularly intrusive and shaped masses of gradational and complex composition, as described above. These porphyritic rocks have been found to be favourable hosts for mineral deposits in the upper Salmon River area but it is by no means certain that where such rocks occur mineral deposits of value will also be found. It is quite possible that irregular areas of the favourable porphyritic rocks may be found to occur on the property of the Bush Consolidated Gold Mines, Limited. This must however be first established by careful and detailed geological mapping in the field and laboratory research. Such work has not been carried out on the Bush Consolidated Gold Mines, Limited, property. The mode of structural occurrence of the favourable porphyritic rocks in this area prohibits their lengthy and haphazard projection from adjoining and contiguous property where commercial mineral deposits are known to be associated with them.

As the various showings are scattered over a wide area and are associated with different geological conditions, the relative geology and detailed topography is referred to in the description of each individual mineral occurrence.

Other than limited exploration on the various holdings before the consolidation, only a small amount of prospecting and exploratory work has been carried out on its extensive holdings by this company. Most of this work was done during 1927 and 1928, since when the property has been generally idle. This work consisted chiefly of some diamond-drilling on the Border claim, crosscutting on the Extenuate group, crosscutting and drifting on the Sunshine claim and diamond-drilling and open-cutting on the Bush No. 1 claim at the south end of Monitor Lake.

The Border claim is located on the east side of the Salmon River adjacent to the international boundary and is reached by motor road for $12\frac{1}{2}$ miles from seaboard at the village of Stewart. The property adjoins the westerly section of the Premier-Silbak company holdings on the north and east and to the west abuts on the international boundary. The rocks in the locality are greenstone, tuff and intrusive feldspar porphyry of the Bear River formation. At elevation 800 feet on the steep slope to the Salmon River and about 300 feet above the river, some open-cutting has been done in a sheared phase of the porphyry adjacent to sheared greenstone. In places the porphyry shows some quartz stringers and silicification and is mineralized with disseminated pyrite with sparse blebs of sphalerite in the quartz. The shearing strikes in an easterly direction and it is understood that in 1927 some diamond-drilling was done in the sheared porphyry close to the point where the shearing crosses the Premier motor-road. The results of this drilling are not known to the writer.

The principal showings on the Bush Consolidated holdings consist of a series of silicified zones outcropping at 3200 feet elevation near the northerly boundary of the Sunshine claim on the east slope of Slate Mountain to Cascade Creek east fork. The showings are reached by a good trail up Cascade Creek east fork valley from the end of the B.C. Silver road at elevation 2500 feet, to the Sunshine cabin at elevation 3100 feet, a distance of about two miles. The rock-formation in this locality consists partly of bedded tuffs, volcanic breccias and greenstone of the upper section of the Bear River formation. These rocks strike north 65 degrees west and dip 85 degrees north-easterly and at the northerly boundary of the Sunshine claim are within 500 feet of their contact with tuffs, argillites, cherts and conglomerate of the over-lying Salmon River formation.

The major siliceous-zones strike in a general northerly direction and dip about 60 degrees west. They occupy prominent outcrops along a knolled ridge 3500 feet in general elevation, at the base of and parallel to Slate Mountain and extending from the north boundary of the Sunshine claim to the south end of Monitor Lake, a distance of about $\frac{3}{4}$ of a mile. Over $\frac{1}{2}$ mile of the northerly section of this distance is underlain by rocks of the Salmon River formation. The siliceous zones are equally well-defined in the tuffaceous rocks of the upper Bear River and lower Salmon River formations but become dispersed and appear to gradually fade in the argillaceous rocks of the upper Salmon River series around the southerly end of Monitor Lake. Numerous dykes of generally acidic character cut the veins and formations in an east-west direction, especially in the northerly section, around the south end of Monitor Lake, which is on the southerly fringe of the Long Lake "Belt of dykes". The siliceous-zones are characterized by numerous stringers, veins, masses and lenses of quartz up to 10 and 15 feet in width which in places stand up as prominent ridges and knolls. The quartz is generally barren of sulphide mineralization. Where this does occur it is mainly pyrite but occasional blebs of sphalerite and galena are sometimes found, especially in the narrower veins. The main north-south zones are intersected in places by cross-zones striking north-east to north-west, more vein-like in character and from 2 to 10 feet in width and also very sparsely mineralized.

The main outcrops can be traced in the Sunshine claim, towards its north-westerly corner, for a distance of about 400 feet. They then enter Sebakwe and Lake Shore ground in which they continue contiguous to the Bush Consolidated east boundary for a distance of about 1800 feet, crossing then into Bush No. 4 claim and continuing through Bush No. 1 claim to the south end of

Monitor Lake, a distance of about 1200 feet. With the exception of that in the northerly section of the Sunshine claim, the most pronounced development of the main silicified zones is the central section, 1800 feet in length occurring in Sebakwe and Lake Shore ground.

At an elevation of 3000 feet, on the Sunshine claim and about 350 feet south-west of the cabin, an adit is driven north 53 degrees west in greenstone for about 465 feet at which point red andesitic tuff, striking north, is entered. At 470 feet a quartz-calcite vein, three feet wide, striking north and dipping 70 degrees west is intersected in red tuff and on the foot-wall side of a pronounced parallel-striking and conformably-dipping shear. A sample across this vein, 2.5 feet wide and mineralized with some pyrite, assayed: Gold, trace; silver, trace. A drift north 8 degrees west, along the footwall-side of the shear with a crosscut for 10 feet to the west, to the foot-wall in red tuff, shows the shear to be 15 feet wide, with much gouge, severely brecciated and slightly mineralized with pyrite. At 40 feet the drift swings to north 2 degrees east but is in a badly caved condition and was not further examined.

At elevation 3375 feet about 600 feet north-east of the Sunshine adit and probably on Sebakwe ground, an adit driven for 16 feet west, crosscuts a dense quartz vein 15 feet wide in dark grey tuff. A sample 16 feet wide along the north wall of this adit, assayed: Gold, trace; silver, trace.

At elevation 3400 feet, on the Extenuate No. 8 claim, 1150 feet north of the Sunshine adit, a shallow open-cut across a quartz vein 10 feet wide striking east and dipping 50 degrees north exposes irregular dissemination and blobs of pyrite and some sphalerite. A sample across 24 inches of the best mineralization in this exposure, assayed: Gold, nil; silver, nil.

At elevation 3400 feet, about 2150 feet north of the Sunshine adit an open-cut in the main north-striking zone, adjacent to Busa No. 4 east boundary, exposes brecciated quartz 6 feet wide, irregularly mineralized with pyrite, some chalcopyrite and sphalerite, in a sandstone formation. A sample across 6 feet of this exposure, assayed: Gold, 0.02 oz. per ton; silver, 8.6 oz. per ton; copper, 1.1 per cent.; lead, trace; zinc, 0.1 per cent. A cross-vein at this point, striking south 53 degrees east, has been prospected on the adjoining Lakeshore ground by two open-cuts and an adit 40 feet long at its intersection with another north-south zone. A sample from an open-cut on this cross-vein, on the adjacent Lakeshore claim, across 6 feet, assayed: Gold, trace;

silver, 5.0 oz. per ton; lead; trace; zinc, 1.5 per cent. A sample of quartz and pyrite across 3.2 feet at the Lakeshore adit-portal, assayed: Gold, trace; silver, 2.0 oz. per ton. Numerous dykes, striking east-west, intersect the siliceous zones in this locality.

About 1200 feet north of these exposures a silicified zone occupies a prominent rusty outcrop at the south end of Monitor Lake, elevation 3350 feet, in sandstone and sandy argillite of the Salmon River formation. The zone is traced southerly in the Bush No. 4 claim for about 500 feet along the east side of a deep draw. Towards the southerly end of this exposure it disperses in a series of quartz stringers and lenses. Continuity to the north, in the bare bluffs fringing the south end of Monitor Lake, cannot be found. Along the outcrop in the draw, quartz and silicification across widths of 10 to 15 feet is exposed and in five open-cuts into the wall of the draw some irregular pyrite mineralization is seen. It is understood that during 1927 three diamond-drill holes were put down on this exposure. Information regarding these holes is not available.

At elevation 3650 feet on the Bush No. 4 claim and about 900 feet south-west of Monitor Lake a well-defined siliceous zone, about 20 feet wide, striking north 28 degrees west and dipping 50 degrees south-west, occurs in an altered porphyritic volcanic of the Salmon River formation. The vein outcrops in a precipitous bluff of the 50-degree easterly slope of Slate Mountain, about 800 feet south of the transitional border of the Salmon River formation with the overlying Nass River argillite which forms the bare crest (elevation 4100 feet) of Slate Mountain. The rock-formation dips 20 degrees west and composes the gentle anticline of Slate Mountain. The vein can be traced northerly for 350 feet, transversely across the bluff, from its foot at elevation 3630 feet to elevation 3725 feet. At the southerly end continuity of the vein is obscured by heavy talus overburden and at the northerly end silicification fades and stringers-out in the increasingly argillaceous rock. At elevation 3650 feet an old adit 24 feet long, bearing north 71 degrees west, intersects the foot-wall of the vein at 18 feet and continues in it to the face. The vein is dense white quartz, with sparse irregular patches and stringers of pyrite and generally extensively oxidized. A sample of the best mineralized portions of the adit-face and walls assayed: Gold, trace; silver, 0.6 oz. per ton. At elevation 3630 feet, 200 feet south 28 degrees east from this adit, an adit, starting in the foot-wall of the vein, crosscuts it for 16 feet exposing similar mineralization to that in the upper adit. A sample of both walls and face of this adit assayed: Gold, trace; silver, 0.6 oz. per ton.

The Start group was originally controlled by the Chief Metals Company, which was incorporated in Seattle, Washington, with an authorized capital of \$125,000 registered in British Columbia in February, 1924. This company was later absorbed by Bush Consolidated Gold Mines Limited. The claims were surveyed and crown-granted in 1925 and are situated on the west slope of the north end of Slate Mountain, on the east side of Cascade Creek valley. The property is reached by motor-road (Premier-Big Missouri road) from seaboard at Stewart for a distance of seventeen miles, to elevation 2800 feet, from where a trail ascends the steep, rock-bluffed and in places swampy, fore-slope of Slate Mountain to the camp-site in an extensive, flat, grassy meadow at the fringe of timber-line, on the south shore of a small lake at elevation 3175 feet on the Start No. 3 claim. The main mineral showings and workings are located in the north-west corner of the Start No. 2 claim about 600 feet south 12 degrees east of the camp-site and between elevations of 3220 and 3400 feet. They extend transversely across the 30 to 50 degree bluffed slope of Slate Mountain and are about 700 feet below the crest of the mountain at 4100 feet elevation.

The rock-formation of the locality consists of arenaceous tuff, breccia, sandstone, and chert of the Salmon River series, transitional into slate of the Nass formation which forms the steep, bluffed upper section of Slate Mountain. Acidic dykes, striking generally north-easterly, intrude these formations. The sediments dip 15 degrees north-easterly and form the westerly margin of the Slate Mountain syncline. The mineral showings and workings outcrop in the arenaceous sediments of the upper horizon of the Salmon River formation, 400 to 800 feet west of the overlying Nass formation slates.

At elevation 3220 feet, 200 feet south 60 degrees east of the camp-site, a quartz lens, 10 inches wide and 5 feet long occurs in a shear striking south 28 degrees east and dipping 60 degrees south-westerly in a brecciated rock exposed in a small open-cut. The quartz is mineralized with pyrite and Sphalerite in sparse blebs and veinlets. A representative sample of this lens assayed: Gold, nil; silver, 0.4 oz. per ton; lead, trace; zinc, 9.8 per cent. Continuity of this exposure is obscured in both directions by shallow clay overburden.

At elevation 3315 feet, 220 feet south 33 degrees east from this showing a well-defined brecciated and reticulated quartz replacement-zone, outcrops in a fine-textured arenaceous agglomerate on a bluff-face about 40 feet high. The zone strikes south 23 degrees east and dips 60 degrees south-westerly. At

this point the zone is 5.9 feet wide and irregularly mineralized with blobs and stringers of mainly pyrite and markasite. Quartz stringers and mineralized silicification penetrate the hanging-wall. An adit has been driven on the zone at this locality. This adit driven about 1925, was flooded and inaccessible and was not examined but judging from the dump it would be about 200 feet long. A sample across 5.9 feet of this vein at the portal, assayed: Gold, nil; silver, 0.2 oz. per ton; lead, nil; zinc, 0.2 per cent. The vein is traced southerly from the adit-portal for 100 feet to elevation 3355 feet. Here an open-cut exposes a width of 5 feet of reticulated quartz with unilicified inclusions of tuffaceous agglomerate. Irregular mineralization of pyrite, markasite, some sphalerite and galena, is seen in this exposure and on the hanging-wall a stringer 8 inches wide, well-mineralized with massive pyrite, sphalerite and galena occurs. A sample across the vein 5 feet wide in this open-cut, assayed: Gold, 0.10 oz. per ton; silver, 1.0 oz. per ton; lead, 3.4 per cent.; zinc, 2.6 per cent. Continuity of this vein at both ends of its surface exposure for 100 feet is obscured by clay and light talus overburden. This vein cannot be correlated with the shear described at elevation 3220 feet, the projected outcrop of which would pass about 100 feet north of the adit in conformity to the hill-slope.

At elevation 3325 feet, about 300 feet slightly southwest of the aforementioned adit, an old adit 40 feet long in tuffaceous agglomerate crosscuts a barren quartz vein which is 2 to 6 inches wide in the face. This vein strikes south 52 degrees east and dips 45 degrees to the south-west. Below the adit-portal (north-west) its continuity is obscured by deep talus and to the south-east it "stringers out" just above the adit, at its intersection with a sparsely mineralized reticulated quartz vein 18 to 24 inches wide. This strikes north 74 degrees east and dips 45 degrees south-easterly and can be traced north-east along the brow of a bluff for 150 feet between elevations of 3340 and 3425 feet, 50 feet south-east and 40 feet above the portal of an upper adit, where continuity is obscured in clay and talus overburden.

At elevation 3370 feet, 100 feet north 74 degrees east of the last-described adit an old adit 8 feet long crosscuts a reticulated and brecciated barren quartz vein 18 inches wide striking south 14 degrees east and dipping 70 degrees south-westerly. In the face a quartz stringer 2 inches wide branches east from this vein, striking south 58 degrees east and dipping vertically.

At elevation 3385 feet and 40 feet north 77 degrees east an old adit 18 feet long intersects the continuation of these veins and exposes the same condition. At this working there is also a branch drift for 25 feet on a sparsely mineralized reticulated and brecciated quartz vein 18 inches wide, striking south 48 degrees east and dipping 50 degrees southwest. In the face this vein is 18 inches wide and mineralized with irregular blebs of galena and sphalerite. A sample of the vein in the face assayed: Gold, trace; silver, trace; lead, 1.7 per cent;; zinc, 1.5 per cent. On the surface above the adit-portal, this vein can be traced for 50 feet in a southeasterly direction to its intersection with the north-easterly striking vein described at elevation 3340 feet. At the adit-portal barren reticulated quartz stringers across 7 feet are exposed in the bluff-face. This may be an intersecting quartzose zone but continuity below the adit to the north-west is obscured by talus overburden.

At elevation 3395 feet, 250 feet north 42 degrees east from this adit, barren reticulated quartz stringers in a fine-textured tuffaceous rock are exposed across 5 feet in the face of a small bluff. A few "pop-shots" have been put in this showing which appears to strike south and cannot be correlated with the showing at the last-described adit.

It is quite possible that showings, additional to those described, may occur on the extensively scattered holdings of Bush Consolidated Gold Mines, Limited, in the Salmon River area. During this examination, however, no information regarding any such possible showings could be obtained, nor could they be located.

References to this property also appear in the Minister of Mines Annual Reports for the years 1919, 1925, 1926, 1927 and 1928.

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ANNUAL REPORT OF THE MINISTER OF MINES
FOR 1936

PART D -- Special Report
by

J. S. Stevenson, Assistant Mining Engineer

Kenelm Group - The Kenelm group consists of the Kenelm Nos. 1 to 4 inclusive, mineral claims, staked in 1936 and owned by G. E. File and associates of McLure.

The workings are at an elevation of 3600 feet in a direction of north 70 degrees east from McLure station on the Canadian National Railway. However, it is reached by a steep foot-trail leaving the North Thompson road 3 miles north from McLure station, and climbing for 3 miles south-eastward to the property. In the vicinity of the workings the country is a gently rolling plateau-top, moderately wooded with pine, small fir and spruce.

On this property the prevailing rock formation, a coarse-grained syenite, is cut by 3 quartz veins. These veins have been traced a maximum distance of 400 feet, show a maximum lenticular width of 3 feet, and vary in strike from north to north 25 degrees west, averaging 45 degrees north-east in dip; southwards along the strike they gradually thin to narrow tight stringers. The habit of these veins, their conformity to a general direction of jointing in the syenite, and lack of fault gouge, indicate that they occupy one set of joints in this rock. Sulphide mineralization, consisting of pyrite, chalcopyrite and galena is slight and only rarely seen.

The first vein on the south-west strikes north 25 degrees west and dips 35 to 50 degrees north-easterly over the exposed length of 400 feet. It has been explored by a pit at the north-west end where a 3-foot width is exposed, and by numerous small strippings to the south-east, in which direction the vein pinches from 1 foot to mere stringers in the syenite.

The second vein is exposed for 150 feet between an incline at the north-west and a pit at the south-east. The incline is 550 feet in a direction south 45 degrees east from the north-west pit on the first vein. This second vein strikes from north to north 30 degrees west, dips 40 degrees north-easterly and varies in width from a few narrow stringers to 2 feet in the incline which has been sunk for 8 feet on a 40-degree slope north-eastward on the vein.

The third vein, more accurately described as a large quartz lens, outcrops in a bluff between the shaft and the adit

over a distance of some 150 feet. The adit is 196 feet north from the incline and has been driven south 65 degrees east for a distance of 27 feet. Fifteen feet in from the portal, 5 feet from the cap, the adit intersects a fine-grained diorite dyke 4 feet in width, striking north 10 degrees east and dipping 55 degrees east. This dyke, as is shown in the outcrop above the portal, is not a basic remnant in the syenite but definitely cuts both it and the quartz vein but does not displace the vein. The quartz vein occurs 1 foot from the face and sheared portions occur in the roof; this vein has been cut by faults that do not, however, cut the dyke. The vein is more lenticular than those previously described, ranging in width from 5 feet to 6 inches; it varies in strike from north 20 degrees to 30 degrees west and in dip from 30 degrees to 40 degrees north-east. With the exception of a heavy 6-inch streak of sulphides in the quartz near the face, sulphides are not abundant.

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ANNUAL REPORT OF THE MINISTER OF MINES

Part F -- Special Report

By

B.T. O'Grady

LUCKY JEM. This prospect, in the Lillooet Mining Division, consists of 13 mineral claims, held by location, and owned by Grant White. The group of claims is in the basin at the head of Eldorado Creek, which flows south-westerly into Gun Creek, their precise location being shown on B.C. Department of Lands Reference Map 25 T 269.

The camp, consisting of an old disused cabin and a tent-covered shack, is situated in the basin at 6,200 feet elevation and on the edge of timber-line. The prospected area covers the open, steep, southerly slopes of the mountain to the north of Eldorado basin, the two highest points on the summit forming the background being at 7,887 and 8,105 feet elevations respectively, and lowest points at 7,500 feet elevation. The lower slopes are grassy with scattered clumps of a shrub-like growth of evergreens, the ground being bare at higher elevations. The workings examined, varying in elevation from 6,365 feet to 7,505 feet, are mostly widely separated.

Present means of access is by the Taylor Basin pass pack-trail which branches off the road at the south-western end of Tyaughton Lake, 3.5 miles from the highway at a point 32.5 miles from Bridge River Station on the Pacific Great Eastern Railway. The Eldorado basin trail, crossing the head of the Taylor basin, where the Goldside trail descends Taylor Creek, continues over the divide and down to the Lucky Jem camp, about 2 miles below the summit at 6,950 feet elevation, making a total distance of about 9 miles of trail. In a direct line the Lucky Jem is about 3 miles north 85 degrees west from the Goldside camp to which a new road has nearly been completed as stated in the foregoing report on that property. The distance along a reasonable grade from the Goldside to the Lucky Jem would probably be about 4 miles.

Most of the showings seen are in northwesterly-striking metamorphosed schistose rocks. These rocks, occupying the lower slopes, are intruded by granodiorite of the Bendor batholith, which outcrops at about 6,735 feet elevation, the contact striking north-west by west. A few showings are found in the granodiorite which, extending up to the summit, underlies a large area. Mineralization consists of pyrite and arsenopyrite in a quartzose gangue, or in a matrix of silicified rock, showings being frequently oxidized and decomposed. A polished section, microscopically examined, consists of massive to crystalline arsenopyrite in a gangue of quartz with minor amounts of carbonate. In this case the mineral is rather fine-grained in places, although the bulk of the arsenopyrite is plus 100 mesh. In twenty-one samples the gold values ranged from a trace to 1.28 oz. per ton and silver values from a trace to

2.6 oz. per ton, the better gold values being present in selected material or in channel samples over narrow widths.

The claims were staked by Grant White in 1910, former references to the property being contained in the Report of the Minister of Mines for 1913, 1924, and 1933, and in Bulletin No. 1, 1932, "Lode Gold Deposits of British Columbia".

The workings expose widely separated showings and it is not possible to definitely correlate conditions. A compass survey was made of a portion of the area which will be described first. No. 1 adit, at 6,590 feet elevation, situated 3,400 feet north 30 degrees west from the camp, is driven north for 37 feet. It is a drift on the vein which, generally oxidized, is flat-lying and gently folded with a dip near the face of 15 degrees to the east. Samples were taken at points 37 (face), 30, 25, 20, and 15 feet in from the portal over corresponding widths as listed against respective assays, as follows: 20 inches: Gold, 0.02 oz. per ton; silver, trace; 22 inches: Gold, 1.0 oz. per ton; silver, 0.5 oz. per ton; 36 inches: Gold, 0.10 oz. per ton; silver, 0.6 oz. per ton; 32 inches: Gold, 0.36 oz. per ton; silver, trace; 28 inches: Gold, 0.04 oz. per ton; silver, 0.4 oz. per ton. In the section between the last sample and the portal, the vein, of similar character, is from 24 to 36 inches wide, the latter width being at the portal. The No. 2 adit, at 6,600 feet elevation, 210 feet north 85 degrees west from the No. 1 adit portal, is driven north 20 degrees west on a vein for 25 feet. At the portal there is a "Y"-shaped condition formed by two narrow veins, one on the western side, which dips 60 degrees to the east, and the other on the eastern side dipping at 80 degrees to the west. The combined width at their junction is 50 inches. At the portal and at some points inside the adit conditions were unsafe for sampling. At 15 feet in from the portal the two veins split and continue separated to the face. At 10 feet in from the portal a sample across 2 feet on the western side assayed: Gold, 0.04 oz. per ton; silver, 0.4 oz. per ton. Adjoining this section to the east a sample across 3.2 feet assayed: Gold, 0.04 oz. per ton; silver, trace. At 20 feet in, the western vein section, 1.4 feet wide, assayed: Gold, trace; silver, trace. The adjoining central rock parting gave the same result and the eastern section, 1.3 feet wide, assayed: Gold, 0.03 oz. per ton; silver, 1.4 oz. per ton. In the face, 25 feet in, the western vein section, 0.7 feet wide, assayed a trace in gold and silver; the central rock parting 4.2 feet wide, gave the same result; and the eastern vein section assayed: Gold, 0.02 oz. per ton; silver, 0.2 oz. per ton. Assuming a folded condition with a tight syncline at No. 2 adit, and a gentle anticline at No. 1 adit, the showings in both workings are probably part of one vein. This theory would explain the erratic flat-lying occurrences to be described later, erosion having apparently occurred in the plane of the folded vein leaving patches and

remnants without specific definition. The two adits comprise all the underground work done.

The nearest surface showing is open-cut No. 1 at 6,500 feet elevation, south 10 degrees west down the 33-degree slope from the No. 2 adit. Here a flat-lying exposure, 12 inches wide and 18 inches long, assayed: Gold, 0.16 oz. per ton; silver, 0.2 oz. per ton. Continuing in the same direction down the same slope, open-cut No. 2, at 6,440 feet elevation, exposes a similar showing, 15 inches wide and 4 feet long, which assayed: Gold, 1.28 oz. per ton; silver, 2.6 oz. per ton. Continuing down the same slope south 5 degrees west from No. 2 adit, open-cut No. 3, at 6,405 feet elevation, exposes a loose patch 10 inches square. Open-cut No. 4, at 6,365 feet elevation, and 240 feet south 62 degrees west from open-cut No. 3 exposes a flat-lying lens, 11 feet long and up to 20 inches wide, which, sampled throughout these dimensions, assayed: Gold, 0.1 oz. per ton; silver, 0.2 oz. per ton. At a point 625 feet south 75 degrees west from the No. 2 adit portal and at 6,610 feet elevation, a large ditch, made by ground-sluicing, extends southerly down the local slope of 28 degrees. It contains a compact, broken-down, section of banded, decomposed, oxidized material, 12 feet long and up to 6 feet wide, which assayed: Gold, 0.12 oz. per ton; silver, 0.6 oz. per ton across the widest point. All the above workings are in the schistose rocks of the Eldorado series, the showings hereinafter described being in the granodiorite area.

A trench, at 7,160 feet elevation, north 18 degrees west from No. 2 adit, exposes a flat, southerly-dipping showing, 2 feet long, 20 feet on the dip and from 20 to 40 inches wide, of oxidized, decomposed, granitic material, containing green-brown streaks. A sample across 40 inches assayed: Gold, 0.16 oz. per ton; silver, trace. On the summit of the rocky ridge overlooking Bonanza basin, there is a shallow cut, at 7,505 feet elevation, roughly north 30 degrees west from the camp. The showing, consisting of a 2-inch streak of oxidized arsenopyrite next to 6 feet of iron-stained decomposed material, is apparently associated with fracturing striking north-easterly with steep south-easterly dip. A sample across the 2 inches assayed: Gold, 0.20 oz. per ton; silver, 0.2 oz. per ton; and a sample across the 6 feet gave a trace in gold and silver. About 950 feet westerly along the ridge, and at 7,370 feet elevation, a small shallow cut exposes a 2-foot width of arsenopyrite mineralization in oxidized decomposed material, from which a selected sample assayed: Gold, 0.60 oz. per ton; silver, trace. The attitude of the showing, apparently striking north-easterly, was not ascertainable. Southerly from the last mentioned location an open-cut, not definitely placed, is at 7,255 feet elevation on the western edge of a rock-slide, the ground sloping steeply to Eldorado basin. At this point there is a showing of banded iron-

stained decomposed material, exposed for a length of 3 feet and a width of 20 inches, which dips flatly into the hill.

In addition to the foregoing described workings, extensive ground-sluicing has been done at lower elevations, but the ditches are largely caved.

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PART D ----- SPECIAL REPORT.

by
M. S. Hedley.

Hedley Dome Gold Mines, Ltd.: This property includes the Speculator group of 18 claims, owned in 1935 and 1936 by the Osoyoos Mining Syndicate. It is 2 miles east of the Lost Horse on a prominent ridge immediately south of Johns creek, at an elevation of 5,000 to 5,500 feet. This section flanks high broken summits to the west and drops off in timbered bluffs to the east; the south side of the narrow ridge is bare and grass-covered and on the north side are long wooded slopes. Outcrops are fairly plentiful. Water is obtained $\frac{1}{2}$ mile distant from the principal showing.

The claims are reached by the Paul Creek trail from which, about one mile south of the Lost Horse, a trail leads for 2 miles easterly -- a total distance from the river of about 7 miles. This connects with another trail from near Hedley which follows up Jameson creek and across the head of John creek; the latter trail is a little the longer.

The sedimentary rocks here include considerable limestone. The average strike is north 25 degrees west and the dip is 55 degrees south-westerly; there is a little contortion locally. Dykes of fine-grained augite andesite, many of which carry fine pyrrhotite, intrude the sediments. The east end of the ridge is granodiorite which forms part of an extensive body in this area, and a dyke of the same rock several hundred feet wide occurs 500 feet west of the main contact.

On the ridge referred to, elevation 5,250 feet, between the main body and dyke of granodiorite are a number of exploratory open-cuts. The open-cuts at random intervals, extend about 300 feet down the steep south slope and for 300 feet down the wooded northern slope. These are all in or near to a sill of diorite about 20 feet thick that follows fairly closely the sedimentary bedding. A 3- to 5-foot dyke striking east-west is seen in one cut, and a few thin granodiorite and pegmatitic dykes are seen in two others; one lamprophyre dyke has been exposed. The sill is an altered hornblende (?) diorite containing perhaps a little primary quartz and fine primary pyrrhotite. Mineralization is confined to the sill and traces of sulphide are seen locally in scarce cherty black argillite; the limestone contains no sulphide. In only one place on the sill, in cut No. 1 on the crest of the ridge, is there appreciable mineralization other than the scattered pyrrhotite. This cut is 40 feet long, trend north 55 degrees east across the sill at a point where the sill is cut

by a fault zone that dips 70 degrees north and which moves the north segment to the east some 10 feet. The zone is 3 feet wide, of decomposed and thoroughly oxidized material. Adjacent to the zone, on both sides for a total distance of 12 feet the diorite is strongly altered to whitish or pinkish fine-grained dense hard rock consisting of quartz grains, epidote, calcite, diopside (?) zeisite, apatite; granular massive arsenopyrite occurs in this material as replacement masses and seams, and is accompanied by some pyrrhotite and pyrite. Throughout the remainder of the cut there is some alteration and mineralization, but more erratic and less intense; the alteration and mineralization is not seen in nearby cuts except locally in cut No. 2 close by. Two chip-samples from near the center of the cut and from the southwest end, taken to include considerable arsenopyrite, returned 0.02 and 0.01 ounces gold per ton, respectively.

The mineralization and accompanying alteration are both locally strong and occur within the sill. The sill dips south-westerly and the fault 70 degrees northerly so that if the mineralization is as closely related to the fault as is indicated the mineralized body is likely to be pipe-like in form.

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ANNUAL REPORT OF THE MINISTER OF MINES
FOR 1936.

Part B -- Special Report
by

J. T. Mandy.

Parvati and Silver Den
Groups

The Parvati group of eight claims, (Parvati No. 1 to No. 8) and the north-easterly adjoining Silver Den group of 7 claims, (Silver Den and Silver Den No. 1, 2, 4, 5, 6, 7) are owned by H. W. M. Rolston and associates of Stewart. The property is located around elevation 4500 feet, above timber-line, on the westerly slope of Mt. Otter, on the south side of Harkley gulch, in the headwaters area of Bitter creek, about 16 miles from seaboard at the town of Stewart. The first claims were staked in 1934 and subsequently added to. The property is reached by eight miles of motor-road up the Bear River valley from Stewart to the mouth of Bitter creek from where a trail extends for eight miles to the showings. This trail starting at elevation 500 feet, follows a good grade mainly along benches of the north bank of Bitter creek and crossing the north fork at elevation 800 feet, at about four miles, emerges on the old end-moraine of the Bromley glacier at about five miles. The old moraine is followed for about one mile after which the trail continues from elevation 1100 feet by steep switch-backs up the steep slope leading to Harkley's cabin at elevation 2000 feet on the north side of Harkley gulch, and into the gulch-trough at about 2600 feet elevation. The trail then continues along the bouldery trough of Harkley creek and the talus slope of the south side, to the Parvati tent-camp at elevation 4000 feet.

The rugged topography of the locality, with timber-line at about 2500 feet elevation, is characterized by steep slopes, deeply eroded by lateral creeks. These have their source in a remarkable series of ice-filled hanging valleys and cirques fringing the glacier-capped high-ridges of the range which rises to serrated peaks of from 7000 to 9000 feet elevation. Harkley creek and gulch constitutes one of these lateral streams, rising on the glacier-covered slopes of Mt. Otter, elevation 9000 feet, and flowing into Bitter creek practically at its source at the toe of the great Bromley glacier.

The rocks of the locality are mainly a series of argillite, quartzite, conglomerate, limestone, volcanic breccia, tuff and lava, of the Bitter Creek formation (lower Hazelton group). These rocks underlie the central portion of the westerly slope of Mt. Otter, are more or less folded and strike generally north 6 degrees east, across Harkley creek, and dip 45 degrees east. Argillite and quartzite constitute the lower members of this formation and outcrop in the lower and central sections of Harkley gulch. These sediments are transitional into conformably overlying beds of volcanic breccias, calcareous tuffs and dark, tuffaceous limestone and some lava, which compose the upper horizon of the series. The sediments and volcanics occupy a belt of about 3000 feet in width striking northerly across Harkley gulch. Intrusive into this formation and enclosing it on its east and west sides is an irregular mass of augite porphyry. This strikes across the central section of Harkley gulch on the westerly side of the sediments in a sheet or sill-like band about 1500 feet wide and is probably responsible for the steep and canyoned drop-off the creek towards its mouth. The easterly side of the sedimentary-volcanic belt is bounded by an irregular boss-like mass of augite porphyry which strikes across the upper westerly slopes of Mt. Otter to Harkley creek in a general northerly direction and appears to constitute the bulk of Mt. Otter peak. The contact of intrusive augite porphyry and Bitter Creek volcanics is evident just below the ice fringing the upper slopes of Mt. Otter. To the north the contact veers to the eastward bordering the glacier-filled cirque of Mt. Otter's northerly slope, To the south the contact continues across the easterly shoulder of Mt. Otter at the head of Buster gulch. The sedimentary and volcanic rock-belt of the Harkley gulch area, in accordance with the augite porphyry outcrops, constitutes an inclusion or pendant relative to the intrusion or pendant relative to the intrusive. Isolated acid and basic dykes, probably derivative from the Coast Range batholith are noted intruding both the sediments and augite porphyry.

The mineral deposit consists of a series of seven small, generally parallel, quartz-carbonate veins, striking east across the formation and dipping vertically. These vary in width from about 2 to 10 inches and outcrop at about 4250 feet elevation, just below the ice fringing the westerly slope of Mt. Otter. These outcrop in the sediments and volcanics and in two instances are traced from this belt into the augite porphyry directly bounding the ice and continuing in this formation are further obscured by the ice-covering. Although short patches of mineralization occur in the veins in the sedimentary-volcanic rocks, the best development of mineralization occurs in the intrusive at its contact with the volcanics. The veins are naturally exposed in the recently glaciated rocks and No. 3 and No. 7 veins have been further explored by open-cutting from which work 15 sacks of high-grade ore have been extracted for shipment. No. 1, 2, 3, 4, and 5 veins are about 30 feet apart and outcrop as evident fractures in the bluff

of the 20-degree slope immediately fronting the ice surrounding the peak of Mt. Otter.

At elevation 4100 feet and about 300 feet east of the camp, No. 1 vein is naturally exposed for about 150 feet in a dark calcareous rock with some argillaceous bands. At its westerly end the vein stringers-out in argillite and at its easterly end is obscured by talus. The vein strikes east and is from one to three inches wide and composed of quartz, calcite and ankerite gangue with occasional specks and blebs of galena and sphalerite. At elevation 4200 feet and about 100 feet east of the easterly end of No. 1 vein, No. 2 vein is naturally exposed in dark calcareous tuff in which rock it can be traced for about 50 feet at which point it enters the augite porphyry, containing in this for about 50 feet and disappearing under the ice-capping. This vein is two to four inches wide; no work has been done on it and other than the oxidized outcrop no mineralization is evident in it.

About 30 feet southerly of No. 2, No. 3 vein striking east and dipping vertically, has also been traced for 50 feet in dark calcareous tuff and for a further 50 feet in augite porphyry at which point it disappears under the ice. The vein is two to ten inches wide and at the fringe of the ice for a length of about 15 feet is well-mineralized with galena, sphalerite and an unidentified mineral, some pyrite and chalcopyrite. At elevation 4300 feet and immediately adjacent to the ice-fringe, a small open-cut has been excavated on No. 3 vein. In the centre of the face of this cut the vein is split by a horse of rock, the apex of which plunges about 30 degrees west, towards the portal of the cut. In the roof of the cut above the horse, the vein is ten inches wide, mineralized mainly with galena, sphalerite and an unidentified mineral. This shoot of ore should be followed along the 30-degree upward slope of the horse into the hill. Ten sacks of ore had been extracted from this cut for shipment. A sample of this sacked ore assayed: Gold, 0.06 oz. per ton; silver, 700.0 oz. per ton; copper, 7.0 per cent.; lead, 18.0 per cent.; zinc, 23.0 per cent.; antimony, 4.5 per cent.; arsenic, trace. Vein No. 4, about 40 feet south of No. 3, outcrops in augite porphyry and has been traced for about 40 feet under a cavern in the ice-fringe, where it is about six inches wide and mineralized with galena and sphalerite in patches and blebs. Vein No. 5 is a branch fracture of No. 4.

No. 6 and 7 veins outcrop in tuffaceous rocks at 4000 feet elevation and about 1000 feet southerly from No. 3 vein. They are parallel, about 50 feet apart, strike east, dip vertically. No. 6 vein can be traced by natural exposure for about

150 feet, showing a width of from three to nine inches and mineralized in places with galena and sphalerite. No. 7 vein, the most southerly, is traced by natural exposure for about 100 feet and is obscured by talus at both extremities. It is from three to eight inches wide and mineralized in places with blebs of galena, sphalerite and grey-copper in a gangue of quartz, calcite and ankerite. At one place fairly massive mineralization, similar to that described in No. 3 is exposed for a length of 6 feet. A small open-cut has been excavated on this, and five sacks of selected massive ore extracted for shipment.

Several other quartz veins were observed on these claims but no work has been done on them. The general geology and grade of mineralization already discovered indicate that the locality is worthy of intensive prospecting.

On the Silver Den claim, located on the southerly slope of Mt. Otter to Buster gulch, and about 3000 feet southerly of the described showings, an entirely different type of deposit has been discovered. This consists of a bed vein intercalated between beds of conglomerate, sandstone and sandy shale, which constitute a belt about 1600 feet wide lying between andesitic volcanic rocks. This conglomerate belt composes the bluff confinement of the north side of Buster glacier. The bluffs rise precipitously from the ice surface at elevation 6000 feet to the crest of the ridge at 6300 feet elevation, separating Buster gulch on the south, from Harkley gulch on the north. The conglomerate beds strike north 5 degrees east and at the easterly side of the belt, dip 40 degrees east. Towards the west the dip of the strata gradually steepens and at their westerly contact with the volcanics the conglomerate and sandstone beds dip about 80 degrees west.

These beds can be traced by intermittent small exposures on the talus-covered ridge for about 1000 feet but are not found on the Harkley Gulch slope, 3000 feet to the north, where a coarse volcanic breccia is exposed on the projection-line of the Buster gulch conglomerates. To the south, continuity of the conglomerates is obscured by Buster glacier.

At about 1000 feet east of the westerly contact of the conglomerate with the volcanics (about the centre of the conglomerate belt) a reticulated quartz vein with calcite and ankerite seams and veinlets, 25 feet in width, is exposed on the face of the bluff at the edge of Buster glacier, interbedded in and conformable with coarse sandstone beds containing a few small rounded pebbles. The vein strikes north 5 degrees east and dips 45 degrees east. The hanging-wall is well-defined and marked by a

band six to twelve inches wide, well-mineralized with galena and sphalerite. On the foot-wall side of this bank the quartz is slightly oxidized in places and very sparsely mineralized with pyrite and a few specks of galena and sphalerite. At its southerly end the vein outcrops at the edge of the Buster glacier. To the north, the vein is exposed for a height of 30 feet on the 70-degree sloping face of the bluff after which it is obscured by oxidized talus. At about 75 feet elevation above the glacier a small cut through the talus exposes the hanging-wall band well-mineralized with galena, sphalerite and pyrite. Further continuity in this direction is obscured by over-burden. A sample of the hanging-wall band from the highest exposure, across 10 inches assayed: Gold, 0.02 oz. per ton; silver, 28.2 oz. per ton; copper, trace; lead, 16 per cent.; zinc, 2.0 per cent.; antimony, trace; arsenic, nil.

AT the time of this examination, appreciable float, identical to that described and well-mineralized with galena and sphalerite, was uncovered in heavily oxidized overburden towards the westerly side of the conglomerate sandstone belt, and about 500 feet west of the described vein. This is indicative of another similar vein in this locality. Further search for this should be prosecuted by trenching in the shallow overburden. Prospecting on the south side of Buster gulch should also be carried out for the purpose of locating the continuation of the conglomerate belt in this direction and possible continuity of the known or other bed veins.

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ANNUAL REPORT OF THE MINISTER OF MINES
FOR 1936.

Part D -- Special Report
by
J.S. Stevenson, Assistant Mining Engineer.

SILVER KING AND SILVER QUEEN GROUPS. The two groups of mineral claims, Silver King and Silver Queen, are variously owned by Miller B. Dawson, Edward F. Kilsby, and the Barriere Mining Syndicate. These groups were staked in 1934, and include the mineral claims, Silver King Numbers 1 to 8 inclusive, and the Silver Queen, Numbers 1 to 8 inclusive.

The property is accessible from Louis Creek, on the main line of the Canadian National Railway, by 17.5 miles of automobile road. The main workings are on the same hillside and three-quarters of a mile north-westward from the Homestake property.

Development work consists of three adits, two inclined shafts and several open-cuts. With the exception of two adits, the workings are on the steep, partly talus-covered hillside sloping steeply into the open valley of Sinmax Creek; two adits, numbers one and two, however, are at the level of a south-westerly flowing creek which flows in a steep-walled valley, approximately 100 feet deep in the vicinity of the adits.

The rock formations comprise platy greenstone-schist and quartz-talc schist. They vary in strike from north 60 degrees west to west, and dip 45 degrees north-easterly. The greenstone-schist occurs as a conformable layer, approximately 250 feet thick, within the quartz-talc schist. It is immediately north from the two shafts, but is south from all the other workings. The greenstone-schist may have been a sill which was intruded into the sediments, now the quartz-talc schist, previous to the metamorphism of a sediment, more basic than that giving rise to the quartz-talc schist, to a green schist facies.

The early work on the property was done on scattered quartz lenses in the schist. The lenses do not show great continuity, 200 feet being the maximum indicated length of any exposed; they are also extremely variable in width, pinching and swelling from a few inches to 5 feet. They are usually conformable in attitude to the schist, but a few of the lenses crosscut the foliation.

More recent efforts have been directed towards the exploration of a shear-zone, which strikes north 20 degrees west and dips 50 degrees north-easterly across the schist. The writer could not see both walls of this zone, but from exposures available, a minimum width of 15 feet and a length of 70 feet are indicated. The zone consists mainly of intensely sheared

schist, but includes small quartz-sulphide kidneys, averaging 4 inches by 12 inches, though larger ones are reported; there are no continuously filled fractures along the zone.

The position of the various workings will be referred to that of the camp cabin, which is 1400 feet north-east from, and 150 feet above the highway, to which it is connected by a road passable for auto traffic.

Number 1 adit, the main working, 900 feet north 30 degrees east from, and 300 feet higher than the cabin, has been driven north-westward from the valley of the creek which flows south-westward past the cabin. The main working is driven in a direction north 21 degrees east for 218 feet, then, becoming a drift on the shear-zone, it turns north 11 degrees west for 16 feet and north for 28 feet. Auxiliary workings include one at 132 feet from the portal, driven south 85 degrees east for 41 feet, intersecting the foot-wall of the shear-zone at 33 feet, and a second at 196 feet in, driven south 74 degrees east for an unknown distance; beyond 10 feet from the main crosscut this working was flooded and quite impassable. It may be noted that the foot-wall of the shear-zone is intersected where the last branch working leaves the crosscut.. From here to the face, the main working is within the shear-zone.

The shear-zone, the position of which has been indicated, is distinguished within the very schistose rock by closely-spaced shear planes that definitely cut the schistosity. These strike north 20 degrees west and dip 50 degrees north-easterly, whereas the schistosity strikes east-west and dips 50 degrees north. Numerous slips, containing up to one-quarter of an inch of black gouge, and which cut the zone at small angles, are common within the zone. Sulphides are not widespread but have been concentrated as occasional small kidneys or lenses of abundant pyrite, chalcopyrite sphalerite and galena, in a watery quartz gangue. Observed lenses range from thin streaks to a lens 4 inches by 12 inches in size, but larger ones have been reported. A sample across a 4-inch lens of heavy sulphides assayed: Gold, 1.42 oz. per ton; silver, 33.0 oz. per ton; lead, 0.9 per cent. The minimum width of the zone, as indicated by accessible workings, is 15 feet.

Quartz-sulphide occurrences outside the zone include three quartz veins ranging from 2 inches to 3 inches in thickness and containing some pyrite; these have been cut by the main working at 36 feet, 45 feet and 196 feet from the portal. Faults outside the zone include one at 100 feet, which strikes east-west and dips 20 degrees north, gouge and imbrication of the schist in the hanging-wall indicating that considerable movement has

taken place; another fault 40 feet farther in, strike north 15 degrees west, dip 30 degrees north-easterly, contains 2 inches of talc gouge.

The formation exposed in the adit is a grey quartz-talc schist, striking east-west and dipping 50 degrees north.

North 10 degrees west and 125 feet up the creek from the portal of number 1 adit, two short open-cuts expose two quartz lenses, 10 inches and 14 inches thick, containing small amounts of chalcopyrite and galena; the lenses are conformable to the enclosing schist, which strikes east-west and dips 50 degrees north.

An open-cut, 130 feet south 10 degrees east from the portal of the adit and at the same elevation, has been driven north 80 degrees east for 28 feet across talcose schist. It cuts a zone of intense faulting which strikes approximately north 10 degrees west, dips 30 degrees east and is 5 feet or more in width. This zone consists of very wet gouge and numerous slickensided pebbles and boulders of vein quartz which range in diameter from one-quarter inch to 10 inches and contain small amounts of pyrite and galena. An assay of the gouge and included pebbles yielded only traces in gold and silver.

Number 2 adit is 300 feet south 10 degrees west from and 150 feet below number 1 adit at the level of the same creek. It was in 20 feet in a direction north 55 degrees east at the time of examination, crossing quartz-talc schist, which contains small amounts of disseminated pyrite.

Two hundred and twenty feet south 40 degrees east from and 160 feet higher in elevation than number 2 adit, an open-cut has been driven north 55 degrees east for 27 feet on a 40-degree slope across a 10-foot zone of quartz veins ranging from 1 inch to 10 inches in thickness; towards the face a lens of barren quartz 5 feet thick is encountered. A sample across the zone assayed traces only in gold and silver. Small trenches for 50 feet on either side of this cut have sloughed in.

Number 3 adit is along the open hillside 1600 feet north 37 degrees west from and 50 feet higher in elevation than the cabin. The adit has been driven north 25 degrees east for 133 feet across grey quartz-talc schist, cutting two quartz lenses, one at 112 feet, which is 2 inches to 14 inches thick and has the same attitude as the schist, and the other at 130 feet, which is 2 inches to 4 inches wide and is vertical. The quartz contains no sulphides. However, at 65 feet the schist contains some pyrite lenses 2 inches thick and 1 foot long; an assay of this material shows neither gold nor silver.

One hundred and seventy-five feet north from the portal and 175 feet higher in elevation, a small cut exposes a lens 2 to 3 feet wide of barren quartz in the schist; this lens has been traced for 200 feet westward along the strike of the schist.

From the portal of number 3 adit, north 50 degrees east for 700 feet and 550 feet higher in elevation, a cut has been made for 15 feet north-eastward into the base of an exposure of quartz-talc schist that slopes up at 30 degrees for 47 feet and then continues further as precipitous bluffs. However, a 5-foot zone of this schist has been intensely silicified and mineralized by small amounts of disseminated galena and pyrite. A 5-foot sample of this material assayed nil in gold and silver, and 1.5 per cent in lead. This zone begins 20 feet up the slope from the mouth of the cut which is not far enough in to intersect it. The rock at the base of the steep bluffs changes imperceptibly to a squashed pebble phase of the quartz-sericite schist. Barite is reported to have been found in the bluffs above since the writer's visit.

Along the steep hillside south-eastward from the cabin two inclined shafts have been sunk, each on different lenses of quartz.

The first shaft is 1150 feet south 70 degrees east from and 360 feet higher than the cabin. It has been sunk in a direction north 51 degrees east for 31 feet on a 40-degree slope and for 26 feet on an 80-degree slope. Six feet north-east from the collar, an 18-inch quartz vein striking north 20 degrees west and nearly vertical outcrops; this has been cut by the shaft between points 6 feet and 20 feet down; in this distance it flattens and goes into the footwall. Sulphides are scarce in the quartz.

The second shaft is 520 feet south 55 degrees east from the first, and at approximately the same elevation. It has been sunk 18 feet in a direction north 25 degrees east and on a 42-degree slope, following a quartz lens that pinches to a seam and swells to 3 feet in thickness and splits into three smaller lenses towards the footwall. The quartz contains small amounts of galena and chalcopyrite; assays of it indicated only traces in gold and silver.

For short distances on both sides of these shafts, pits have been dug in an attempt to trace continuity of the quartz lenses, most of these were sloughed in at the time of examination.

The formation in the shafts is quartz-talc schist that strikes north 70 degrees west and dips 45 degrees north-

easterly. However, 10 feet north-eastward from each shaft a platy greenstone-schist forms the rocky bluffs north-westward up the hill. This is the south-easterly border of the belt of greenstone-schist referred to in the general discussion of the geology.

No ore has been produced.

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ANNUAL REPORT OF THE MINISTER OF MINES
FOR 1936.

Part E -- Special Report
by

H. Sargent.

The NORTHWIND GROUP includes the Northwind location held by W. H. Montgomery and the Mountain Rose location held in the name of Charles Hutchison, both of Paulson. The claims are situated in the Grand Forks Mining Division about 2.5 miles easterly from Paulson, north of Walker creek on the road leading from Paulson to the Inland Empire camp. The road elevation at the bridge is approximately 4,040 feet, which is about 480 feet higher than the railway crossing near Paulson.

The ground on which the claims are situated is a flat-topped ridge sloping southerly between one of the principal forks of Walker creek, and a gulch a short distance farther west. The ridge has been burned over and is now covered with small second growth, chiefly pine. Outcrops consist of greenstone, probably as remnants of the Rossland Volcanic group in the large area of somewhat porphyritic rock, mapped on Geological Survey of Canada, West Kootenay Sheet, as Nelson Granite.

The workings include a pit on the Mountain Rose, roughly 350 feet north of the Northwind boundary and 75 feet east of the location line. The bottom of the pit was full of water. On the dump there was a little altered greenstone, but most of the rock was pinkish granite in which the ferromagnesian minerals are altered to chlorite, and some specular hematite is developed. The granite is sheared over a width of 7 feet and contains some pyrite. Another pit, near the south boundary of the Mountain Rose, is about 6 feet deep. It exposes shearing in the granite over a width of 5 feet, striking about due north and dipping 65 degrees to the east. Along the foot-wall of the shearing, is from 0.3 to 0.9 feet of somewhat rusty quartz, a sample of which assayed, Gold, 0.06 oz. per ton; silver, 0.8 oz. per ton. There is also some quartz in the rest of the shear.

The principal working is approximately 250 feet from the south boundary of the Northwind claim. This consists of a cut driven in rock for about 40 feet following a shear striking 10 degrees west of north and dipping 65 degrees to the east. A flatter seam consisting of 0.1 to 0.7 feet of gouge and some quartz intersects the larger shear near the surface at the face of the cut. This seam dips at about 30 degrees to the east. A sample of material selected from the shear assayed, Gold, 0.52 oz. per ton; silver, 4.6 oz. per ton. Under the flatter seam the granite is sheared for

5 feet east of the main shearing, the 1.8 feet next the steep foot-wall slip containing quartz, some pyrite, and pyrrhotite. A sample across this section assayed, Gold, 0.01 oz. per ton; silver, trace; while a sample of 3.3 feet of sheeted granite containing some pyrite east of the foot-wall section assayed, Gold, 0.01 oz. per ton; silver, trace.

South-east across the bridge is a cut on a narrow joint striking north 45 degrees west and dipping to the north-east. About 50 feet below the road, on the steep slope to Walker creek, is a short adit following a joint striking north 20 degrees west. The wall-rock here is fine-grained.

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ANNUAL REPORT OF THE MINISTER OF MINES
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Part F -- Special Report
by
B. T. O'Grady

BRANDYWINE. This prospect, in the Vancouver Mining Division, adjoins the Blue Jack to the south-east and consists of eleven claims held by location and owned by W. Anderson, W. Barclay, and J. McKenzie. The cabin and main workings are on the banks of Brandywine creek about 2 miles north-north-west of Brandywine Falls (Brew) station on the Pacific Great Eastern railway north of Squamish. (See B. C. Lands Department Reference Map No. 62). The prospected area lies on the irregular, but generally steep, wooded slope on the western side of the creek at elevations varying from 1,800 to 2,200 feet as compared with 1,536 feet at the railway. The property is connected with the latter by trail, about 2 miles in length, which follows the creek, crossing it on foot-logs in places, and also with McGuire siding by pack-trail, about 1.25 miles in length, which is part of the Blue Jack mine trail. In the vicinity of the workings the predominating rocks are greenstones, grading from massive to schistose, with chloritic and sericitic schists, probably members of the Mesozoic series which include the Blue Jack and Astra-Cambria deposits.

On the Brandywine ground the strata are sheared along planes striking from north 20 degrees west to north 30 degrees west and dipping at angles from 65 to 70 degrees south-westerly. An intrusive body of altered diorite, containing a mineralized fissure, is exposed in the No. 1 adit area at the northern end of the workings. Between this point and the No. 2 adit, about 1,200 feet south-easterly measured along the western side of the creek, greenstone outcrops are visible at numerous points to the No. 2 adit location where this formation is intruded by felsitic dykes. Prevailing rock types in the section examined to the south-west are greenstones and schistose derivatives. The character of the mineralization developed by the No. 1 adit consists of a fissure, up to 3 feet wide, containing narrow bands and stringers of quartz, in which vugs are lined with quartz crystals. The quartz contains streaks and disseminations of pyrite, sphalerite, and galena, with occasional chalcopyrite. The altered diorite, separating quartz stringers, is pyritized and mineralized in planes with streaks of sphalerite, the fissure walls being coated in spots with manganese dioxide. Gold and silver values in the writer's samples were low, and a grab sample from about 10 tons of sorted material assayed: Gold, 0.04 oz. to the ton; silver, 2.8 oz. to the ton; copper, 0.3 per cent.; lead, 1.0 per cent.; zinc, 12.0 per cent. Another type of mineralization, as exposed at all other points visited, consists of scattered pyrite-sphalerite streaks and disseminations, associated with light irregular silicification, developed along shearing planes in schistose greenstone or chloritic schists. Two selected samples of such material assayed from 1.1 to 3.8 oz. silver to the ton and from 3.5 to 10.5 per cent. zinc, gold values being negligible.

The claims were staked in 1923 since when annual assessment work has been performed. Among past references to the property contained in the Annual Reports of this Department that for 1934, page F 14, contains assays of corroborative interest.

The fissure vein in the diorite strikes south 3 degrees east into the hill and dips at 80 degrees to the west. Its outcrop is exposed for a length of 15 feet north of the portal of No. 1 adit, adjoining the western side of the creek at 1,900 feet elevation. The weathered surface exposure includes from 8 to 12 inches of well-mineralized quartz along the western wall. Going southerly up the 35 degree sidehill slope the vein has been stripped at intervals to an elevation of 2,050 feet but debris and caving prevented examination. In the No. 1 adit, which is about 3/4 of a mile south-easterly from the Blue Jack lowest level, the vein has been drifted on for 140 feet south 3 degrees east, conditions being largely obscured by lagging along the back of the working.

The following samples were taken in the face from west to east: Quartz, 3 inches wide; Gold, 0.10 oz. to the ton; silver, 1.6 oz. to the ton; lead, 1.0 per cent.; zinc, 6.0 per cent.; then an altered rock parting 19 inches wide; Gold, 0.01 oz. to the ton; silver, 0.6 oz. to the ton; zinc, 3.0 per cent.; and finally quartz 6 inches wide, separated from previous sample by a 2-inch seam of gouge; Gold, 0.01 oz. to the ton; silver, 2.0 oz. to the ton; copper, 0.4 per cent.; lead, 0.5 per cent.; zinc, 7.0 per cent. The previously mentioned grab sample from 10 tons was from a pile outside the portal.

On the steep slope adjacent to the western side of the creek at a point about 1,000 feet south-easterly from the No. 1 adit and at 1,830 feet elevation, a lenticular quartz occurrence up to 5 feet wide, in sericitic schist, is imperfectly exposed by stripping, partly caved. The strike, not definitely discernible, is apparently about south 30 degrees east into the hill, with a steep dip to the south-west. A selected sample assayed: Gold, trace; silver, 0.8 oz. to the ton; lead, 0.5 per cent.; zinc, 6.0 per cent. Adjoining the foot-wall side of the vein, but diverging slightly in strike, there is a dyke, 4 feet wide, of carbonatized leached rock. About 200 feet south-easterly from this surface showing, and at 1,800 feet elevation, a felsitic porphyry dyke, 10 to 12 feet wide, is exposed at the portal of the No. 2 adit which is a crosscut driven south 54 degrees west for 105 feet (to October 20th, 1936.) The latter dyke, striking south 20 degrees east and dipping 85 degrees south-westerly, is cut by the adit at points between 6 and 20 feet in from the portal and the smaller dyke, which adjoins the surface showing, is cut at points between 77 and 81 feet in from the portal. With these exceptions the working is in schistose greenstone or chloritic schist. Rock of the latter description was exposed in the face where scattered streaks of pyrite and sphalerite, in lightly silicified country-rock, were associated with shearing planes striking south 30 degrees east and dipping 70 degrees south-westerly. A

selected sample here assayed: Gold, 0.01 oz. to the ton; silver, 1.1 oz. to the ton; zinc, 10.5 per cent.

Mineralization of similar character is very sparingly distributed in a crosscut adjoining the creek 120 feet south-easterly from the No. 2 adit and at the same elevation. This working, driven south 45 degrees west for 50 feet, cuts schistose greenstone, the planes of schistosity, in which the scattered mineralization occurs at widely separated points, striking south 20 degrees east and dipping 65 degrees south-westerly. Practically the same conditions are in evidence in a 50-foot crosscut, at 2,180 feet elevation, located on the locally irregular slope to Brandywine creek opposite or westerly from a point about 2,200 feet down-stream from the No. 2 adit location. Here the scattered, weak pyrite-sphalerite mineralization is accompanied by occasional specks of galena. A selected sample of this material assayed: Gold, 0.01 oz. to the ton; silver, 3.8 oz. to the ton; zinc, 3.5 per cent. Work is being carried on by hand in the No. 2 adit by Anderson and Barclay.

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FOR 1936.

Part F -- Special Report
by
D.T. O'Grady.

BLUE BELLS GOLD MINING SYNDICATE. The property of the Blue Bells Gold Mining Syndicate consists of the Ohio, Blue Bells, Gold Bug, Dashwood, and Black Prince Crown-granted mineral claims held under agreement from the owners, the G. W. Hutchings Estate et al., together with four claims held by location. The claims, on the Mainland Coast and in the Vancouver Mining Division, are situated on the north-western side of Frederick Arm, 3,500 feet from Cardere Channel, the precise location of the Crown-granted claims being shown on Department of Lands Mineral Reference Map 5T 280. The workings on the Blue Bells claim, at elevations ranging from 1,550 to 1,750 feet above sea-level, are located on the steep wooded ground sloping south-easterly to Frederick Arm, from which they are distant about 1 mile in a direct line. A switch-back trail, over which pack animals were used in former years, connects the workings with the camp and landing which are about 127 miles in a direct line north-westerly from Vancouver, or some 3 miles from Thurlow (Sheal Bay). Deep water extends close to the shore, transportation to Thurlow and local points being afforded by the Union Steamship Company boats.

The claims cover a portion of the area of Mesozoic roof-
pendant rocks indicated on Geological Survey of Canada Map 196-A,
"Vancouver Sheet". In the developed area this formation includes
argillites, which surround the deposits described later, and
limestones. Granitic rocks of the Coast Range batholith are exposed
not far to the north-east of the metamorphosed sedimentaries, the
contact apparently being approximately parallel to the northerly or
north-westerly strike of the stratified rocks. These dip to the
west or south-west at steep angles up to 80 degrees. The old
workings on the Blue Bells claim consist of six open-cuts and three
adits. These partially develop an extensive, irregular, body of
quartz coinciding in general with the attitude of the argillite,
which, more or less silicified, forms the walls of, and bands and
inclusions within, the quartz. The local strike is north 9 degrees
west with westerly dip of 80 degrees. No definite structural
boundaries were observed, the quartz extending irregularly in lenses
and stringers into the surrounding rock. The quartz is irregularly
mineralized with disseminated pyrite, minor amounts of pyrrhotite,
and occasional specks of sphalerite, galena, or chalcopyrite. Gold
values appear to be largely associated with the sulphides which are
of erratic distribution in the outcrop and upper adit and of sparse
occurrence in the lower adit workings.

Selected samples of the several types of mineralization
assayed as follows:-

**BLUE BELLS GOLD
MINING SYNDICATE.**

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| Location | Gold | Silver | Description |
|----------------------|----------------|----------------|--|
| | Oz. per ton | Oz. per ton | |
| No. 1 open-cut | 1.06 | 4.6 | Pyrite and quartz |
| do. | 0.06 | 1.0 | Quartz with no apparent sulphides. |
| do. | 0.16 | 1.6 | Quartz with disseminated pyrite, sphalerite, and specks of galena. |
| Upper adit | 0.80 | 7.2 | Quartz with sphalerite and light pyrite. |
| Upper adit (dump) | 0.05 | 0.4 | Pyrite with small amount of quartz. |
| Lower adit | 0.16 | 1.5 | Pyrrhotite and quartz. |
| do. | 0.04 | 0.4 | Quartz showing no appreciable amount of sulphides. |

The first recorded reference to the Blue Bells is that in the Report of the Minister of Mines for 1898 when the property was being developed by the Frederick Arm Mining Company, Limited, the greater part of the present workings having been driven by this company in 1898 and 1899. The next reference is in the same publication for 1920 when the old workings were reconditioned and a small amount of additional development-work done by the Ladysmith Smelting Corporation, Limited in connection with extensive sampling operations carried out to test the deposits as a possible source of large tonnage of siliceous flux containing sufficient values to pay the cost of mining and handling. The property, idle in the interval, was acquired by A.A. Davidson and associates of the Blue Bells Gold Mining Syndicate in 1934.

The Blue Bells workings are not now all in shape for examination as, of the six open-cuts sampled by the Ladysmith Smelting Corporation in 1920, only two are now open for inspection (one of them partially) and the winze sunk from the upper adit is inaccessible. Also a raise put up from the lower adit is not safe for inspection due to rotten timbers. At the time of the writer's visit in June, 1936, two men were engaged in prospecting pyritized quartz lenses in limestone on the Black Prince claim adjoining or a few hundred feet from the sea-shore.

The old surface workings on the Blue Bells claim consist of a series of open-cuts extending along the northerly-southerly

trend of the outcrop. Of these six are comparatively closely spaced above and adjoining the upper adit-crosscut-drift intersection to the south. Starting from a point directly above this intersection and chaining in feet southerly, along the gently descending slope of the ground, these open-cuts are located at points 10, 115, 155, 207, 273, and 401 feet distant. The quartz outcrop is best exposed in the No. 1 or first mentioned cut at chainage 10 feet south. This cut, 49 feet long, extends westerly up the steep ground and across the strike between elevations of 1,719 and 1,750 feet, the upper 12-foot section being nearly horizontal and the lower 37 feet being on a 40-degree slope. The showing, exposed for a 12-foot length along the strike, is practically all quartz but includes small areas of silicified rock. Samples, taken where the iron sulphides, chiefly pyrite, were comparatively abundant, assayed as follows:

| Location | Width in feet. | Gold Oz. per ton | Silver Oz. per ton |
|--|-------------------|---------------------|-----------------------|
| Going west in feet from zero at eastern end of open-cut, | | | |
| 4 to 12 | 8 | 0.10 | 0.5 |
| 32 to 37 | 5 | 0.05 | 0.8 |

At other points the exposure consists of quartz containing scattered pyrite or slightly iron-stained quartz. A selected sample of the best mineralization from various points in the big showing assayed: Gold, 1.06 oz. per ton; silver, 4.6 oz. per ton; while selected quartz, apparently containing no sulphides, assayed: Gold, 0.06 oz. per ton; silver, 1.0 oz. per ton. The next cut going southerly, at chainage 115 feet, is overgrown with moss and brush. Quartz and silicified, rusty argillite are visible in places. The next cut, at chainage 155 feet south, is obscured with brush and caved in part. A section of quartz, 8 feet wide, is clearly exposed which is apparently part of a zone 20 feet wide or more, quartz being visible in spots. The 8-foot section, iron-stained in part, contains some scattered pyrite streaks. The three southerly cuts at chainage points 207, 273, and 401 feet are full of debris and grown over with brush and moss. Chaining northerly along the outcrop from the original zero point small areas of iron-stained quartz and silicified rock are exposed at 140 feet adjoining the portal of the Creek adit and an adit (only in a few feet) 30 feet west of it. Elevations here are about 1,665 feet. Continuing northerly the ground falls sharply to a small creek at chainage 160 feet then rises steeply on the opposite side. At chainage 180 feet and elevation 1,675 feet an old excavation, 45 feet or more in length measured across the strike, is mostly covered with soil, moss, and roots. Patches of iron-stained quartz and silicified rock are visible in places, some

of the quartz containing sulphide casts.

To the north the ground continues to rise steeply into the Ohio claim, on which some work is reported to have been done in the late nineties but such workings as may exist were not examined due to the lack of a guide familiar with them. The upper adit, at 1,675 feet elevation, is driven as a crosscut for 228 feet along a bearing of north 75 degrees west. From a point in this working approximately under No. 1 open-cut, drifts extend northerly and southerly at 65 feet in from the portal. Adjoining the crosscut-north drift intersection to the east, a winze, reported to have been sunk 25 feet, is inaccessible. The north and south drifts are 65 and 76 feet long respectively. Chaining in feet westerly from the portal of the main adit, rock formation conditions are as follows: From zero to 17 feet, argillaceous rock, some quartz stringers; from 17 to 19 feet, crushed quartz, light pyrite mineralization with oxidized streaks and faint copper carbonate stains, a sample of which 2-foot section assayed: Gold, 0.02 oz. per ton; silver, 0.1 oz. per ton; 19 to 54 feet, argillites, silicified in part, some quartz stringers; 54 to 65 feet, chiefly quartz; from 65 to 71 feet, oxidized quartz, light iron sulphides, a sample of which 6-foot section, representing the crosscut-drift intersection, assayed: Gold, 0.05 oz. per ton; silver, 4.5 oz. per ton; 71 to 78 feet, quartz and silicified rock; 78 to 98 feet, chiefly quartz with minor rock inclusions; 98 to 128 feet, silicified rock, quartz stringers; 128 to 137 feet, all quartz; 137 to 161 feet, silicified rock; 161 to 173 feet, quartz 173 to 228 feet, silicified rock, quartz stringers and lenses. Between chainage points 71 and 228 feet quartz areas are generally iron-stained.

The south drift contains a crosscut 36 feet long to the east at 37 feet from the main adit, and a crosscut 20 feet long driven westerly at 59 feet from the same original point. The south drift is largely in quartz with small areas of rock inclusions. Pyrite, irregularly distributed in streaks and disseminations through the quartz, is fairly abundant in the first part of the drift between the main adit and the 36-foot crosscut, the drift here passing under the No. 11 open-cut zone of comparatively strong mineralization. In this section there are also scattered oxidized streaks and occasional copper carbonate stains. The crosscut to the east is in quartz up to 16 feet east of the drift, then in rock containing quartz lenses and stringers. The 20-foot crosscut to the west is in quartz for the most part.

The north drift starts in quartz which, towards the face, gives way to silicified rock and quartz stringers. The Creek adit is driven southerly for 62 feet from its portal, at 1,665 feet elevation distant 140 feet northerly from the crosscut-drift intersection in the previously described upper adit. The Creek adit, approximately in line with the north drift of the upper adit, but not connecting with it, develops iron-stained quartz containing scattered streaks

and disseminations of pyrite, and silicified rock. A sample taken across 52 inches in the face assayed: Gold, 0.05 oz. per ton; silver, 0.4 oz. per ton; and a sample taken across the same width at 48 feet back from the face assayed: Gold, trace; silver, 0.2 oz. per ton. The lower adit portal, at 1,550 feet elevation, is 197 feet distant along a bearing of south 72 degrees east from the upper adit portal. The lower adit is driven north 70 degrees west as a crosscut for 347 feet and drifts, both 89 feet long, extend northerly and southerly at a point 262 feet in from the portal. The lower adit drifts are practically under the corresponding workings in the upper adit though the two crosscut sections slightly diverge in strike. In the lower adit an approximately vertical raise, reported to be about 35 feet high, has been put up at a point in the north drift 9 feet from the crosscut but rotten timbers prevented examination. Chaining in feet from the portal of the main crosscut, conditions are as follows: From zero to 33.5 feet, limestone; from 33.5 to 248 feet, silicified argillite; from 248 to 333 feet, rusty quartz, sparse pyrite mineralization, minor inclusions of rock; from 333 to face at 347, argillite with occasional quartz stringers. A chip sample, taken along the wall of the 85-foot quartz section between chainage points 248 and 333 feet, assayed: Gold, 0.04 oz. per ton; silver, 0.4 oz. per ton. In this zone the walls are coated in places with seepages of manganese dioxide. The two drifts are practically all in quartz which also applies to the short crosscuts at the extremities of the two drifts. The lengths of these crosscuts are as follows: At the southern end of south drift, 10 feet to the east and 5 feet to the west; at northern end of north drift, 9 feet to the east.

In the lower adit workings sulphides are rare or absent. In the south drift, 21 feet back from the face, a sample of selected material from a patch of pyrrhotite mineralization, 6 inches in diameter, assayed: Gold, 0.16 oz. per ton; silver, 1.5 oz. per ton.

Large sampling operations would be necessary to determine the average gold and silver content of the quartz exposures. Values appear to be largely dependent on the presence of sulphides which as stated previously, are of sparse and irregular distribution with local concentrations such as in No. 1 open-cut and in the section of upper adit south drift directly below that open-cut. The irregular character of the mineralization, mixed nature of the quartz and argillite and absence of structural boundaries, make it difficult to correlate any specific zones of sulphide concentrations.

Recent work done on the Black Prince claim between the beach near the camp and a point 800 feet to the north-west, consists of extensive trenching along a band of limestone containing lenses of quartz or lenticular zones of silicification. The strike of the formation here is north 35 degrees west and dips are steep to the south-west. The quartz and silicified rock contain pyrite in places. Four samples of selected material from the various trenches gave no appreciable values in gold or silver.

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ANNUAL REPORT OF THE MINISTER OF MINES

Part C -- Special Report
By
Douglas Lay

AHBAU LAKE AREA. Quartz veins are known to occur at several points in this area. In addition to those described on Moosehorn Creek, others, situated 2 miles north-east of the south end of Ahbau Lake, are described in Memoir 118, Geological Survey of Canada, 1920. The occurrence of quartz veins is also reported at several points more immediately west of Ahbau and Lodi Lakes. In the case of those examined, the host-rocks are schistose sediments.

MOOSEHORN. This group, consisting of a number of claims owned by H. Guthrie of Cottonwood, is situated on Pre-emption Lot 5623 on Moosehorn Creek, a tributary of the Willow River. It is reached by following from Cottonwood the main Cottonwood-Ahbau Lake pack-trail across the timbered rolling plateau to a point near the south end of Ahbau Lake. At this point a branch from the main trail follows closely the east shore of the lake to its northern end, and thence runs north-easterly to the Willow River, which is crossed on a log-jam or at low water may be forded by horses. From this point the trail follows the right bank of the Willow River and the right bank of Moosehorn Creek to the owner's cabin situated at elevation 3200 feet in close proximity to the mineral showings. From a point 10 miles from Cottonwood onward for 12 miles the trail passes through an extensive burnt area. With this exception the plateau is well-timbered. More immediately west of the Willow River the trail passes over a hill, but a more favourable route could be found in this region. Except as noted, the grades on the trail are nowhere steep, but there are some soft places.

In the vicinity of the mineral showings, Moosehorn Creek has incised a steep-sided narrow valley. The right bank rises from the creek at an angle of about 30 degrees to steep bluffs, save that at one point a low bench occurs between the creek and the sharply-rising rim of the valley. The top of the bluffs is about 350 feet above the creek, and above this elevation the heavily-timbered slopes are less abrupt. Within the area occupied by the mineral showings, the formation is well exposed but elsewhere is obscured by dense timber and vegetation.

The formation consists of intercalated schistose argillites and quartzites which strike in main north-west, with dips varying from 25 to 78 degrees to the north-east. At one point in the vicinity of the principal vein, there is an anticlinal fold in the strata trending north-east. There appears to be a narrow acid intrusive tongue in the formation on the hanging wall-side of the principal vein. Other observers report the presence of several small dykes, but close search

failed to reveal them, and they may be obscured by extensive sloughing of the largest open-cut. A large number of quartz veins occur within an area about 1200 feet in length and 500 feet in width. The veins vary in width from mere stringers up to in one case 13 feet and in another case 5 feet, but are generally narrow. They are of two different types, some striking with the formation, others cutting across it at a small angle. The latter show considerable evidence of post-mineral movement, and both walls are free. Mineralization in evidence is on the whole sparse, occurs mainly in bunches, and consists essentially of galena and pyrite, with a small amount of sphalerite.

The property was discovered by H. Guthrie in 1918, and little beyond assessment work was carried out until 1933, when an option on the property was acquired by a syndicate known as "Eskridge Syndicate No. 2". The syndicate in 1933 erected a cabin, and commenced driving an adit-crosscut to explore the region below the principal vein. This adit was continued the following year to its present face a distance of 147 feet from the portal. Operations were thereafter suspended, and have not been subsequently resumed. (Refer to Annual Reports of the Minister of Mines for 1920 and 1933, and Memoir 118, Geological Survey of Canada, 1920, pages 99 to 101).

The surface showings comprise exposure by open-cuts of a number of quartz veins within a horizontal range of 1200 feet and vertical range of about 350 feet, and are situated entirely on the Willow mineral claim. Of these exposures, three are immediately adjacent to the creek and the remainder are on the steep slope on the right bank. Exposures do not afford much information regarding the veins or their continuity in depth or along the strike.

An open-cut 25 feet above the creek, on the right bank, exposes a vein, 20 inches in width, with several small stringers in close proximity to the hanging-wall. The vein strikes north 52 degrees west and dips 65 degrees north-easterly. A sample across 20 inches assayed: Gold, nil; lead, trace.

About 220 feet upstream on the left bank and just above creek-level is a vein of lenticular character, 8 inches wide, well-mineralized with pyrite and galena, strike north 57 degrees west, and dip 50 degrees north-easterly. A sample across 8 inches assayed: Gold, nil; lead, 0.2 percent. Another sample of the best mineralized portions only, assayed: Gold, trace; silver, 5.0 oz. per ton; lead, 2.0 percent; zinc, trace. This vein appears wider in the bed of the creek. Another quartz vein appears to cross the creek immediately south of it, but was inaccessible at the time of examination. These veins were called Nos. 1 and 2 by the owner.

Distant 320 feet north-east from the last-described vein, at an elevation of 3365 feet, is an open-cut exposing a quartz vein known as No. 3. This vein appears to be about 13 feet wide and to strike north-east and dip north-west. It is of drusy character and somewhat oxidized. A sample taken across 13 feet assayed: Gold, nil.

Distant about 800 feet in a north-westerly direction is the vein of apparent premier importance known as No. 5. It is exposed by 3 open-cuts and by natural agencies for a length of approximately 275 feet along its strike, and over a vertical range of about 125 feet. The ground in this region is precipitous, and access to the outcrop is limited. The average width of the vein where exposed is 5 feet and in places it contains bunches of galena and pyrite. The walls are free and it strikes north 63 degrees east, and dips 45 degrees north-westerly. The host-rocks at this point exhibit an anticlinal fold, strike nearly due east and west and dip north. This vein was sampled at 3 points along the strike at intervals of 10 feet. One sample assayed: Gold, trace; silver, 6.0 oz. per ton. The two remaining samples showed a trace of gold in one case, and no gold in the other.

Close to and somewhat above No. 5 is No. 6 vein, width 2 to 3 feet, exposed by an open-cut and natural agencies for a length of 25 feet along the strike. It strikes north 53 degrees east and dips 60 degrees north-westerly, and is therefore likely to intersect the No. 5 vein in depth. Three samples were taken at different points along the strike of this vein, all of which assayed: Gold, nil.

No. 7 vein is situated about 80 feet north of No. 6, and is exposed at one point only. It strikes north-east, dips 40 degrees north-west, and has a width of about 15 inches. It contains some galena and pyrite. A sample across 15 inches at the point of exposure assayed: Gold, trace; silver, trace.

No. 8 vein, about 15 inches in width, is approximately 35 feet north of No. 7, and its strike and dip are similar. A sample at the point of exposure across 15 inches assayed: Gold, nil.

Underground workings consist of two short adits, now caved, and inaccessible, at elevations of 3305 feet and 3310 feet. Another adit at 3210 feet elevation is driven on a bearing north 14 degrees east for a length of 147 feet to explore the region below the surface exposures of No. 5 and neighboring veins. Schistose argillites, strike north 17 degrees west,

dip 75 degrees north-easterly, are exposed in this edit, and six quartz stringers; four in the face, and two in the west wall near the face. The quartz stringers conform in strike and dip with the host-rocks. Samples taken from one of the more promising stringers, and also across the full width of the face, yielded negative results on assay.

Examination at the base of the steep bluffs on this property disclosed the existence of several additional small veins. One about 9 inches in width is continuous for at least 300 feet and its strike is similar to that of veins Nos. 5, 6, 7, and 8. There is evidence that the veins of this type may persist for considerable distances along their strike and dip, and in the circumstances, it is unfortunate that stronger evidence of gold values was not obtained.

All elevations in this report are barometric.

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ANNUAL REPORT OF THE MINISTER OF MINES
FOR 1936

PART D -- Special Report
by

M. S. Hedley.

Similkameen River Area

Marathon: -- This property, consisting of 4 located claims, is owned by George Drosos and associates of Penticton. It is situated immediately south of the Similkameen River 9 miles west of Hedley. The claims are on a steep hillside, opposite a sharp bend in the river, and extend from river-level to an elevation of about 4,000 feet. The ground here rises at an average angle of 35 degrees in bluff-covered burned-over slopes to an elevation of 5,000 feet. A rude foot-trail from the railway tracks at the river's edge zig-zags up to the showings; the river may be crossed on a foot-bridge $1\frac{1}{2}$ miles to the east. The location is well within a large body of granodiorite which is several miles in extent, and which is overlain on the summit above the showings by Tertiary conglomerate and lava.

A series of small workings at wide intervals extend up the hillside. These include a 15-foot adit, elevation 2,065 feet; a 15-foot open-cut, elevation 2,650 feet; an 18-foot open-cut with a 15-foot vertical face, elevation 3,140 feet; a stripping, elevation 3,225 feet. All are in a rhyolite porphyry dyke about 16 feet wide that dips steeply to the west. The dyke is a light-grey fine-grained rock with rather rare phenocrysts of quartz and orthoclase. In the showings it is somewhat sheared and is altered to a soft grey material composed of, besides quartz and orthoclase, sericite, calcite and epidote. This zone follows principally the east wall and is 2 to 5 feet wide. Mineralization within the zone consists of rare and erratically distributed seams and grains of sulphides including pyrite, chalcopyrite and galena and also an unknown fine-grained silvery sulphide; there is a little accompanying granular quartz but no vein-quartz proper. There is locally a little manganese stain. The lower showings carry only traces of sulphides and in the upper 18-foot cut sulphides make up a very low percentage of the alteration-zone. Three samples taken in the upper cut returned traces in gold and silver.

One quarter mile west of the uppermost showing, at a comparable elevation, a number of stringers strike north 25 degrees

west, dip vertical, occur in the granodiorite. There are single or branching veinlets of a maximum width of 4 inches, and consist of hematite, quartz and a little chalcopryrite. Some of the hematite is specular and some granular to massive. Still farther west some 200 yards, and 200 to 300 feet lower, there are bands of epidote which strike north 25 degrees west as well as masses of epidote, several feet across, that grade into unaltered granodiorite. Associated with the epidote are small amounts of hematite, a very little chalcopryrite and rarely quartz. Some stripping has been done here on the edge of a prominent bluff.

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ANNUAL REPORT OF THE MINISTER OF MINES
FOR 1936.

Part F -- Special Report
by
John S. Stevenson,
Assistant Mining Engineer.

HAMILTON CREEK. Hamilton Mines Limited owns a group of surveyed mineral claims lying north-westward from the Vidette property and south-westward across the valley from the property of the Savona Gold Mines, Limited. Since 1934 this property has been explored by drilling, and both surface and underground work. Previous descriptions may be found in Memoir 179 of the Canadian Geological Survey and in the Annual Report of the Minister of Mines for 1934. The camp and main workings are in the valley bottom of Hamilton creek, some workings are on the slope of the steep scarp forming the western wall of the valley, and others are westward beyond the valley rim. Mineralized shears striking north-westward and containing quartz veins in typical augite-porphry constitute the features of economic interest. The workings include three adits and many open cuts. The main working consists of a crosscut driven south 62 degrees west for 796 feet and 2 drifts driven from the crosscut at a point 91 feet from the portal.

The south-easterly drift follows a shear that contains discontinuous ribbons of quartz, in a direction south 20 degrees east for 30 feet to an intersection with a 2-inch banded quartz vein striking north 75 degrees west and dipping 40 degrees north-easterly, which it parallels for 13 feet to the face where a cross-fault has stepped-over the easterly continuation of the vein $2\frac{1}{2}$ feet south-westerly into the face. A bulk sample of this quartz assayed: Gold, 0.02 oz. per ton; silver, trace. The shear continues beyond the intersection with the 2-inch quartz vein, but is quite flat, dipping 10 degrees north-easterly and containing 2 inches of gouge with a little quartz or carbonate.

The north-westerly drift has been driven along the same shear, striking north 20 degrees west and dipping 50 degrees north-easterly, as occurs in the south-easterly drift, in a direction north 51 degrees west for 17 feet, then north 18 degrees west for 18 feet to its intersection with a fault containing 4 inches of gouge and a little quartz, which strikes north 60 degrees west and dips 60 degrees north-easterly, then in the foot-wall of this in a direction north 58 degrees west for 25 feet to a point where a banded quartz vein comes into the back. This vein strikes north 65 degrees west, dips 40 degrees north-easterly, ranges from 1 inch to 3 inches in width, and contains occasional concentrations of pyrite. A sample taken along a 20-foot length of this vein assayed: Gold, 1.43 oz. per ton; silver, 3.8 oz. per ton. The drift, still in the foot-wall of the fault, has been driven along this vein, in

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a direction north 52 degrees west for 22 feet, then north 68 degrees west for 40 feet to an intersection with a third fault or rather shear-zone, striking north 10 degrees west and dipping 70 degrees to 55 degrees easterly; this shear-zone apparently cuts off both the vein and the previous fault. The shear is characterized by 2 good walls between which the drift has been driven north 14 degrees west for 51 feet to a point where the hanging-wall of the zone bends to north 22 degrees east and steepens to a dip of 80 degrees south-easterly; immediately adjacent to this wall there is a 10-inch film of gouge containing occasional 1-inch quartz stringers. The working was driven along this wall for 37 feet, then away from it, crosscutting the wall-rock in a direction north 37 degrees west for 26 feet to the face in an attempt to pick up the continuation of the quartz vein previously described.

The main crosscut intersects 2 shears between the portal and the drifts; at 26 feet a 11-inch shear striking north 30 degrees west, dipping 57 degrees north-easterly and containing scattered lenses of carbonate; and at 70 feet, a one-foot shear striking north 30 degrees west and dipping 60 degrees south-westerly. At 110 feet from the portal the crosscut intersects a quartz vein, ranging from 1 inch to 4 inches in width, that has been cut and dragged by a flat fault which varies in dip from 20 degrees north-easterly in the back to 35 degrees north-easterly in the floor. A sample of this quartz and associated pyrite across 2 inches and along 2 feet of dip of this quartz and associated pyrite assayed: Gold, 0.02 oz. per ton; silver, trace. At 184 feet in the crosscut intersects a shear striking north 30 degrees west and dipping 65 degrees north-easterly, which contains gouge, crushed rock and a few one-inch quartz fragments; the wall-rock is leached for 2 feet into the hanging-wall. At 196 feet there is a tight 2-inch shear striking north-south and dipping 40 degrees easterly. At 208 feet in the crosscut intersects a 3-inch zone of crushed rock striking north 30 degrees west, dipping 30 degrees north-easterly, and containing a discontinuous 1-inch stringer of frozen quartz; at 228 feet a 2-foot zone of broken rock and 4 inches of gouge striking east-west, dipping 45 degrees northerly, and containing some banded carbonate; at 245 feet a zone striking north 30 degrees west, dipping 42 degrees north-easterly, containing 8 inches to 4 inches of crushed rock and gouge with 1 inch of banded quartz and carbonate and a few 1/32-inch pyrite crystals; at 280 feet a 6-inch zone of crushed rock and gouge striking east-west, and dipping 70 degrees northerly, with some 1/4-inch quartz veinlets in the foot-wall greenstone; at 293 feet a group of 3 intersecting faults striking from north-westerly to westerly and dipping from vertical to 50 degrees south-westerly, which contain gouge and 1/2-inch quartz stringers; at 320 feet a 1-inch vertical stringer striking east-west and containing 1/8 inch of banded quartz;

at 368 feet a 6-inch zone of crushed rock, striking north 30 degrees west, dipping 40 degrees north-easterly, and containing 2 inches of quartz with some pyrite; a sample of this material taken across 2 inches and along 3 feet of dip assayed: Gold, 0.14 oz. per ton; silver, 0.4 oz. per ton. From 400 feet to 600 feet the rock is all badly broken up, and contains fragmentary quartz and calcite; between 655 feet and 700 feet the rock formation changes from the usual augite-porphry to markedly amygdaloidal greenstone and continues as such to the face; at 655 feet there is a 6-inch mud seam striking north 30 degrees west and dipping 50 degrees north-easterly.

The rock formations in this adit comprise augite porphyry in the drifts, and in the crosscut the same rock from the portal to 655 feet in, where amygdaloidal greenstone is intersected. This contains oval-shaped amygdales of calcite ranging in maximum diameters from 1/8 inch to 1 1/2 inches. Small areas of silicification and of rhythmic banding, and of reported native copper in the joint planes indicate alteration of the amygdaloid by mineralizing solutions.

A second adit, No. 2, has been driven south 35 degrees west for 34 feet into the steep hillside from a point 135 feet higher than the valley floor and 850 feet in a direction south 35 degrees east from No. 1 adit. At 15 feet from the portal the adit intersects two shears, one averaging 1 foot in width, striking north 55 degrees west, dipping 30 degrees north-easterly, that contains a few blebs of calcite, and a second, striking north 25 degrees east, dipping 75 degrees south-easterly, and containing 2 inches of crushed rock. The rock formation is the typical augite-porphry. This adit was presumably driven to intersect structures possibly indicated in diamond drill hole No. 3, located in the valley bottom at point north 65 degrees east from the portal and 135 feet lower.

Forty feet horizontally in a direction south 30 degrees east from the adit and 30 feet higher in elevation, the dump of a nearly caved trench shows quartz containing disseminated chalcopryrite and pyrite; a grab sample of this material assayed: Gold, 0.12 oz. per ton; silver, 0.6 oz. per ton.

One hundred and fifty feet horizontally in a direction south 45 degrees west from the caved trench and 115 feet higher in elevation a stripping exposes a short length of a 2-inch quartz veinlet striking east-west and dipping 45 degrees northerly.

A third adit has been driven 20 feet in a direction north 65 degrees east into the south-westerly facing slope behind the main valley rim; the portal is 550 feet in a direction south

70 degrees west from No. 2 adit; it is 240 feet higher than No. 2 and is 38 feet below top of the valley rim. This adit shows some cross-shears and an 8-inch to 3-inch carbonate vein in typical augite-porphyry. Open-cuts and stripping elsewhere on the property include a pit on the plateau at a point 2900 feet in a direction south 60 degrees west from the portal of the main or No. 1 adit. This pit exposes a 12-foot length of "vein" averaging 6 inches in width, striking north 40 degrees west and ranging in dip from 50 degrees to 20 degrees north-easterly. The "vein" matter consists of approximately equal amounts of quartz, pink calcite and pink feldspar, and in the cleavage planes of the calcite, hematite. A sample of this material assayed: Gold, 0.12 oz. per ton; silver, trace.

The rock in this pit is a coarse-grained badly decomposed greenstone; although 30 feet south a narrow trench exposes feldspar-porphyry in contact with fine-grained augite porphyry containing numerous replacement grains of pink feldspar.

Between 500 feet and 600 feet north-westward from the cabin three trenches and one pit have been dug, extending south-westward up the hillside from the valley floor. These were mostly sloughed at the time of examination. The main pit, however, exposed approximately a 20-foot length of sinuous, pinching and swelling quartz vein averaging 6 inches in width. A diamond-drill hole, referred to as No. 3, has been driven south-westward on a slope of 41 degrees from the bottom of the slope.

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Part D -- Special Report
by
M.S. Hedley.

ARCAN. This group of two claims, formerly known as the Arawanna and owned by Hedley Mascot Holdings, Limited, is now part of the holdings of Hedley Shamrock Gold Mines, Limited, and is south of the Speculator group. It lies within and along the west margin of Indian Reserve 10-A just north of Paul Creek. The claims are on a steep bare side-hill covered with detrital materials and with rare outcrops. Access is by the Paul Creek Trail.

The sediments here are stratigraphically between those on the Lost Horse and Speculator ground. The strike is north 25 degrees west and the dip 60 to 65 degrees south-westerly. Granodiorite lies immediately to the east and two or more dyke-like bodies occur cross-cutting the sediments. At an elevation of 5,100 feet, the formation has been exposed across its strike by open-cuts and stripping for 190 feet along the side-hill. These are greenish and brownish quartzitic to dense argillaceous rocks on the west of which and apparently on the east are calcareous to argillaceous sediments. The main body of granodiorite is 200 feet to the east and granodiorite of unknown extent is 150 feet to the north; this latter body apparently continues as a dyke 200 to 400 feet west of the open-cuts. Three hundred feet down the slope and 100 feet west is a breccia-zone in calcareous sediments.

Where exposed on the face of the hill the sediments are seen to be altered to greenish, fine granular or cherty rocks bearing disseminated arsenopyrite which appears to follow the bedding selectively. The maximum percentage of arsenopyrite, except over narrow widths, is not high. The 190-foot thickness of sediments is not uniformly mineralized, and the stripping is not clean and continuous enough to permit of thorough examination and sampling.

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ANNUAL REPORT OF THE MINISTER OF MINES

Part C e- Special Report
By
Douglas Lay

RICHFIELD CARIBOO GOLD MINES LIMITED. This company, incorporated in 1933 with a capitalization of 3,000,000 shares of no par value, was organized to acquire from A.G. Henderson Syndicate, Limited, the Williams group of twenty-one mineral claims. A large number of adjoining claims comprising the El Dorado and Murray groups are also among the company's holdings. The registered office of the company is 716 Hall Building, Vancouver.

The property is situated on Bald Mountain and extends across Williams Creek to Proserpine Mountain. The mine camp is situated at the head of Mink gulch on the old road from Barkerville to Stanley, and is distant about 2½ miles from the former place.

The ground is timbered and steep in places.

Quartz veins of both "A" and "B" types in which the prevailing mineral is pyrite, accompanied in some instances by pyrrhotite and sphalerite, occur in the Richfield formation of the Cariboo series. The area covered by the company's property lies mainly without the "Barkerville Gold Belt" as delimited by Hanson⁽¹⁾

The company started operations in 1933, and in that year erected camp buildings, installed a portable Sullivan air-compressor, and commenced driving the adit, which is the main working-level. The objective of this adit is the exploration of the region below the surface showings. Work was stopped temporarily in the spring of 1934, but the adit was continued in 1935 and driving was in progress at the time of examination in April of this year. (Refer to Annual Reports of Minister of Mines for 1934 and 1935).

The surface showings examined consist of one "A" vein several feet in width, and a cluster of veins striking in an easterly and westerly direction, situated at elevations of between 5,850 and 6,000 feet on Bald Mountain above Mink Gulch. The showings, exposed by trenches and open-cuts, are situated about 2,400 feet south of the main working-level. The outcrops of the veins are much oxidized and show very little pyrite. Other surface showings on the slopes of Proserpine Mountain have not been examined.

(1) Hanson, G.: Geological Survey of Canada Memoir 181.

Underground workings consist of the adit mentioned, which is described in detail. In all, 40 moiled samples were taken from the veins exposed in this adit, but the assay in each case disclosed a trace of gold only.

Formation penetrated by adit. The adit, at 5200 feet elevation, follows a bearing of south 51 degrees east for 600 feet, thence mainly due south for 1949 feet, but varying some degrees to the west in its latter part. At 2530 feet in from the portal the main adit is deflected on a bearing of south 55 degrees west, to follow a fault-plane with a steep north-westerly dip encountered at this point, as the vein-outcrops lie considerably west of the adit in this region. On April 22nd last, the deflected part of the adit had reached a length of 116 feet, the total length of the adit on this date being 2646 feet.

Schistose sediments of the Richfield formation of the Cariboo series, strike from about north 75 degrees west to almost due east and west, dip 25 to 30 degrees northerly, are exposed in the adit. Owing to the fact that the adit does not coincide with the strike of the host-rocks, veins of the "A" type first appear in the floor and disappear in the roof as they are penetrated.

In detail, the rocks encountered are as follows:-

- From the portal to 237 feet, save for a few feet, the adit is tightly lagged.
- From 237 feet to 600 feet--argillite.
- From 600 feet to 769 feet--quartzite.
- From 769 feet to 900 feet--calcareous argillite.
- From 900 feet to 1090 feet--a somewhat carbonated rock of sill-like form, containing a ramification of quartz gash-veins, varying in width from mere stringers to 18 inches, and which do not extend into the overlying or underlying rocks.
- From 1090 feet to 1340 feet--a stratified, somewhat carbonated schistose rock.
- From 1340 feet to 2135 feet--argillite.
- From 2135 feet to 2330 feet--a coarse-grained stratified rock of dolomitic appearance interbedded with argillite.
- From 2330 feet onwards the formation is argillite.

The rocks show a considerable amount of pyritization.

Veins penetrated:-At 272 feet, an "A" vein, coinciding closely in strike and dip with the enclosing sediments, is exposed in the floor and disappears in the back of the adit at 320 feet. It strikes north 70 degrees west, dips 30 degrees north-east, varies from $4\frac{1}{2}$ feet to 6 feet in width, and a fair amount of pyrite is present. A sample was taken across 4.5 feet at 272 feet, and another sample across 6 feet at 316 feet.

At 648 feet, a strong-looking, fairly well-mineralized vein of "B" type, strike north 78 degrees west, dip 80 degrees north-easterly, varying in width from 4 feet to 5.5 feet, was cut. This vein is followed by drifts 25 feet east and 12 feet west of the adit, giving an exposed length of 44 feet on the strike. The appearance of the vein in the back is strong, but it pinches apparently at the horizon of the adit, possibly owing to the fact that the formation changes from argillite in the back of the adit to quartzite at the horizon of the adit. Two samples across 4 feet--one sample across 3 feet, and one sample across 2.75 feet--were taken across the back of the drifts on the vein at intervals of approximately 10 feet.

At 700 feet an "A" type vein with a maximum width of 5 feet, mineralized with pyrite, appears in the floor of the adit and disappears in the back at 754 feet. A sample was taken across 4 feet at 730 feet.

At 830 feet a small "B" type vein, strike north-westerly, dip southerly, from 6 to 8 inches in width, is cut. A sample was taken from this vein across 6 inches.

At 865 feet another small "B" type vein, from 10 to 12 inches in width, strike north-westerly, dip southerly, is cut. A sample was taken across a width of 12 inches.

At 880 feet a "B" type vein 2 feet in width, strike north-easterly, dip 60 degrees north-westerly, is cut. The south-westward continuation of this vein is apparently interrupted by a fault striking diagonally across it, and dipping in the same direction. A sample was taken from this vein across a width of 2 feet.

Between points 900 feet and 1090 feet, in a sill-like carbonated rock, occur a large number of quartz gash-veins varying in width from mere stringers to 18 inches, and mineralized with pyrite. These veins occur as a ramification, and the following samples were taken:--One sample across 6 inches at 900 feet; one across 10 inches at 930 feet; one across 4 inches at 940 feet; one across pyritized carbonated rock, at 945 feet (3 feet in width); one across 12 inches at 960 feet; one across 12 inches at 985 feet; one across 7 inches at 1025 feet; one across 18 inches at 1040 feet.

At 2100 feet, a small "B" type vein, not sampled, is penetrated.

Between points 2213 and 2313 feet, three closely-spaced, parallel "A" type veins are penetrated, mineralized with pyrite. Samples were taken at 2231 feet across 2 feet; at 2257 feet across 12 inches; and at 2293 feet across 2 feet 3 inches.

At 2528 feet, a fault-plane is exposed striking north 55 degrees east to north 57 degrees east, and dipping north-west at about 75 degrees. Just south of this fault an "A" vein, 18 inches in width consisting of seams of quartz mineralized with pyrite, separated by bands of argillite, appears in the floor of the adit and is exposed in the face at 2549 feet. It strikes approximately east and west, and dips at an angle of a few degrees to the north. At 2545 feet a "B" vein of much the same strike, cutting the formation at a steep angle, well-mineralized with pyrite and a lesser amount of sphalerite, 12 inches in width, is exposed in both walls of the adit immediately below the "A" vein mentioned, although it does not appear to intersect the latter. A sample was taken at 2549 feet across 18 inches from the "A" vein, and another taken from the "B" vein across 12 inches at 2544 feet.

As mentioned, the main adit is deflected at 2530 feet, and thereafter follows closely the fault first exposed at 2528 feet. The indications are that the block of ground on the west side of this fault moved downward in relation to that on the east side, but that the movement was not more than a few feet. The "A" vein mentioned as being exposed in the main adit, immediately south of the fault, to the face, is also exposed on both sides of the fault in the south-westerly branch of the adit for a distance of 62 feet. For the remaining length of the branch but little quartz is exposed. At 62 feet from the commencement, the fault-plane passes into the west wall of the branch, and therefore the dislocated portion of the "A" vein west of the fault is not exposed, and the undislocated portion of this vein east of the fault probably lies above the horizon of the adit. There is a well-defined gouge-seam along the fault-plane, and the "A" vein in the immediate vicinity of the east side of the fault shows considerable crushing, but there is no evidence of any great intensity of movement. The "A" vein consists of alternate bands of quartz and rock, and the greatest exposed width occurs on the west side of the branch adit at 2530 plus 42 feet, where the width is 6 feet. The seams of quartz in this "A" vein are well-mineralized with pyrite.

The following samples were taken in the south-west branch of the adit:-

One sample at 2530 plus 11 feet, across 8 inches, east side.
One sample at 2530 plus 16 feet, across 3 inches, west side.
One sample at 2530 plus 19 feet, across 3 inches, west side.
One sample at 2530 plus 19 feet, across 4 inches, west side.
One sample at 2530 plus 30 feet, across 18 inches, east side.
One sample at 2530 plus 30 feet, across 3 inches, east side.
One sample at 2530 plus 30 feet, across 2 inches, east side.
One sample at 2530 plus 38 feet, across 3 feet, west side.
One sample at 2530 plus 42 feet, across 6 feet, west side.
One sample at 2530 plus 46 feet, across 2.5 feet, west side.
One sample at 2530 plus 52 feet, across 2.0 feet, west side.
One sample at 2530 plus 62 feet, across 1.5 feet, west side.
One sample at 2530 plus 36 feet, across 1.5 feet, east side.
One sample at 2530 plus 48 feet, across 6 inches, east side.
One sample at 2530 plus 55 feet, across 6 inches, east side.
One sample at 2530 plus 116 feet, across 3 inches, face April 22nd.
One sample at 2530 plus 116 feet, across 6 feet, face April 22nd.

The face of the branch, on April 22nd, exposed very gently-dipping argillites, somewhat pyritized, in which occurred a small quartz seam of "A" type 3 inches in width. One sample was taken from the quartz seam only, and another was taken from back to floor of adit at right angles to the bedding, across 6 feet.

As previously stated, all of the 40 moiled samples mentioned showed on assay only a trace of gold.

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Part F -- Special Report
by
B. T. O'Grady

KELVIN GOLD MINES, LIMITED. This Company's property, consisting of 18 surveyed mineral claims and fractions, in the Lillooet Mining Division, adjoins the Minto property to the south as shown on B. C. Department of Lands Map 21 T 269. The Kelvin workings, at elevations of 2,300 to 2,860 feet, are on both sides of Davidson creek, and on the steep to precipitous, wooded, rocky ground sloping to Bridge river which, at about 2,135 feet elevation, flows through flats half-a-mile wide. A branch road, three quarters of a mile in length, connects the power-house with the highway, which is north of the river, at Minto City about 35 miles from Bridge River station on the Pacific Great Eastern railway.

The formation is composed of rocks of the Bridge River series. Local exposures include greenstones and sediments, the interbedded rocks having a general northerly trend with complex local structures. In places greenstone grades imperceptibly into a purplish volcanic rock. Adjoining the main workings, and east of Davidson creek, these rocks are cut by a south-easterly-striking dyke, about 50 feet wide, of dense, fine-grained, light-coloured porphyritic rock, approaching andesite porphyry in composition. A polished section of selected mineralization, examined under the microscope, was composed of disseminated crystals of pyrite and arsenopyrite in a quartz carbonate gangue containing relatively large, irregular masses of sphalerite, galena, and chalcopyrite. Pyrite and arsenopyrite grains were in places fractured and veined by other sulphides. The deposits, frequently oxidized, are associated with zones of fracturing or shearing in altered, occasionally silicified, greenstone. The principal vein-shear follows a curving, irregular course with a general south-easterly strike, dips being south-westerly from 57 degrees to 85 degrees, or vertical. Low average gold and silver values are present over narrow widths in the greenstone but where the shear encounters sediments its walls diverge and become obscure, while mineralization is limited to finely disseminated pyrite. At another point, widely separated from the first mentioned occurrence, a short adit has been driven along a bending fracture which has a south-westerly strike and steep south-easterly dip. In this case the greenstone is altered with light scattered silicification, some pyrite being present in places.

The claims comprising the present property were located in 1933 and 1934 by John Hagmo and Ivar Aston. Preliminary development, chiefly consisting in driving the Bridge adit on the Patnor claim, together with prospecting on other claims, was then carried on by the Mintonia Mining Syndicate. Late in 1934 the Kelvin Gold Mines, Limited was incorporated to continue development.

Work, carried on during the summer months of 1936, included the driving of about 560 feet (to September 13th) of adit workings on the Pat Fraction and Alpha Extension No. 11 claims. On the Patnor claim, at the western end of the property, the Bridge adit is at 2,215 feet elevation. Going south-westerly up the steep slope from the portal, an outcrop has been trenched to 2,255 feet elevation but caving prevented inspection at most points. At 2,240 feet elevation there is a partial exposure consisting of calcite and oxidized streaks up to 3 inches wide following a south-westerly trend. The adit is driven first south 45 degrees west for 20 feet and then south 15 degrees west for 45 feet to the face. It follows the footwall-side of a sharply defined curving fracture, dipping south-easterly 65 degrees to 75 degrees in altered greenstone showing light scattered silicification with accompanying pyrite. Samples were taken across widths of 30, 32, and 12 inches at points 10, 32 and 65 feet in from the portal respectively. The corresponding assays were: (1) Gold, 0.08 oz. per ton; silver, trace; (2) Gold, 0.02 oz. per ton; silver, 0.1 oz. per ton; and (3) Gold, 0.01 oz. per ton; silver, 0.1 oz. per ton.

The Pat Fraction adit, where work has recently been proceeding, is at 2,300 feet elevation and 2,210 feet distant along a bearing of south 73 degrees 30 minutes east from the Bridge adit. This vein outcrop is exposed at intervals in the bluffs above, and to the south-east of, the portal of the adit and along the north-eastern edge of a rock-slide. At 2,525 feet elevation there is a showing 40 feet long which, from 5 to 11 inches wide, has sharply defined, approximately vertical walls cutting greenstone along strikes of south 15 degrees east to south 30 degrees east. A sample, across 5 inches of oxidized and decomposed vein filling, assayed: Gold, 0.58 oz. per ton; silver, 1.8 oz. per ton. Going south-easterly for 175 feet, to elevation 2,610 feet, there is a similar showing, 4 to 6 inches wide and 15 feet long, in greenstone. Continuing in the same direction to 2,860 feet elevation, there is a sheared fracture, in silicified greenstone, striking south 25 degrees east and dipping 80 degrees south-westerly. A section sampled here consisted of 40 inches of rusty, sheared rock on the hangingwall-side; 3 inches of disseminated pyrite and arsenopyrite in quartz; and 12 inches of silicified, pyritized, greenstone on the footwall-side. The corresponding assays in the same order, were: (1) Gold, 0.03 oz. per ton; silver, trace; (2) Gold, 0.06 oz. per ton; silver, 0.15 oz. per ton; (3) Gold, trace; silver, trace. Above this point the outcrop is covered by talus, the 50-foot dyke, previously referred to, being exposed across the slide at 110 feet to the south-west of the sample location. Measuring from the portal, the Pat Fraction adit workings are described with reference to stations adopted for compass traverse, as follows: South 34 degrees east, 32 feet to #1; south 57 degrees 30 minutes east, 30 feet to #2; south 83 degrees east, 30.5 feet to #3; east, 27.5 feet to face at #3-A; (then reverting back to #3) south 18 degrees east, 127.5 feet to #4; south 23 degrees east, 39 feet to #5; south 37 degrees east, 34.5 feet to #6; south 52 degrees east, 34 feet to #7; south

51 degrees east, 29 feet to #8, south 40 degrees east, 29.5 feet to #9; south 62 degrees east, 29.5 feet to #10; south 47 degrees east, 51.5 feet to #11 at the face on September 13th, 1936. Crosscuts extend 22 feet to south 28 degrees west from the No. 4 station and 41 feet to south 22 degrees west from No. 7 station.

The shear is first intersected at No. 3 station, 92.5 feet in from the portal and is followed by the drift, in greenstone, to chainage 110 feet on the course between No. 3 and No. 4 stations. At this point the hanging-wall fracture is well-defined dipping at 65 degrees to the south-west. Just south-east of here, at chainage 133 and on the same course, this wall bends south-westerly and dips 57 degrees north-westerly where dark, silicified sediments are encountered. Except for small patches of flesh-coloured, altered, probably volcanic rock towards the face, the rest of the workings to the south-east are in these sediments which are soft and crushed in part and contain quartz and calcite streaks, finely disseminated pyrite being present at many points. The following samples were taken at chainages referred to the northern side of the crosscut opposite No. 3 station:

| Chainage in feet | Width inches | Gold Oz. per ton | Silver Oz. per ton | Chainage in feet | Width inches | Gold Oz. per ton | Silver Oz. per ton |
|---------------------|-----------------|------------------------|--------------------------|---------------------|-----------------|------------------------|--------------------------|
| Zero | 9 | 0.03 | 0.1 | 50 | 12 | 0.20 | Trace |
| 15 | 6 | 0.08 | 0.4 | 60 | 12 | 0.94 | 1.1 |
| 30 | 10 | 0.02 | Trace | 75 | 10 | 0.30 | 0.9 |
| 45 | 12 | 0.10 | 1.0 | 90 | 11 | 0.20 | 1.0 |
| | | | | 105 | 43 | 0.10 | 0.6 |

Of these, the sample at chainage 50 contained 2.6 per cent zinc. A selected sample from the same place gave: Gold, 0.42 oz. per ton; silver, 0.1 oz. per ton; lead, nil; zinc, 5.0 percent. The sample at chainage 60 was oxidized and decomposed. In addition to the above, fifteen samples spaced at 15-foot intervals, were taken across drift widths south-east of No. 4 station going towards the face. Of these, fourteen assayed a trace in gold and silver per ton and one assayed: Gold, 0.01 oz. per ton; silver, 0.4 oz. per ton. Samples taken along the south-eastern walls of the two crosscuts gave from a trace to nil in gold and silver. This sampling was done to ascertain if low values existed over a considerable area as had been suggested.

On the south-western side of the rock-slide, at 2,475 feet elevation, there is a short adit situated 360 feet south of the portal of the above described Fat Fraction adit. This working, driven south 65 degrees east for 25 feet, then south 15 degrees east for 7 feet to the face is, through its first course, in iron-stained argillaceous sediments along the foot-wall of the large dyke previously referred to, the last 7 feet being in the dyke which locally strikes south 70 degrees east and has an irregular south-westerly dip of about 75 degrees. Work was suspended at the property in October 1936.

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PART D -- Special Report

by

M. S. Hedley.

Paul Creek Area.

Shamrock: This group of 8 claims, formerly owned by Hedley Mascot Holdings, Ltd., is now part of the holdings of Hedley Shamrock Gold Mines, Ltd. It is situated immediately above the river-flat in the south-west angle between the Similkameen and Ashnola Rivers. Steep bluff- and slide-covered slopes rise from an elevation of 1,800 feet at the river-flat to mountain summits. The foot of the bluffs is 1 mile from the Ashnola River.

The rocks are dark-colored thin-bedded argillites and include interbedded greenstone; there is some contortion, and the structure as a whole is not apparent. Intrusive into these rocks are irregular dykes of granodiorite. Two dykes, trending north-easterly converge towards the south-west and a third, trending north 30 degrees west, crosses them where they are 200 feet apart. A fourth, smaller dyke is an east-west branch of the northernmost dyke. These dykes are probably all inter-related, and vary in width from 10 to 30 feet. Irregularly-spaced veinlets of quartz cross the dykes, and stop within a few inches of the contact with schistose sediments; a few, locally, follow the contact. The veinlets are from a fraction of an inch to a rare maximum of 16 inches in width and are far from regular; the vitreous quartz contains locally arsenopyrite and pyrite between somewhat altered walls. Where veinlets are closely spaced some alteration and light mineralization may be found in the granodiorite. The distribution of the veinlets is highly irregular.

An adit, elevation 1,900 feet, is driven 55 feet on the southernmost or No. 1 dyke where cross-veinlets of quartz occur over a length on the dyke of 150 feet. The adit is lagged near the portal, but in the inner 25 feet some 10 veinlets, many irregular and some discontinuous, aggregate about 36 inches of quartz; the average strike is north 40 degrees west and the dip 55 degrees south-west. Mineralization is erratic and not heavy, and some veinlets are barren of sulphides. On the second dyke, elevation 2,055 feet, an adit is driven 20 feet to disclose a few quartz-veinlets, to a local maximum of 8 inches wide, in quite fresh granodiorite. A third adit, about 50 feet above the second is only collared, and is in similar ground. Immediately above, elevation about

2,180 feet, a local enlargement of a narrow vein attains a maximum of 12 inches and contains a fist-sized pod of sulphide; a similar enlargement of another vein contains very little sulphide. A narrower cross-dyke in this vicinity is also seen to contain quartz-veinlets.

Where Nos. 1 and 2 dykes are cut by the third major dyke, elevation 2,405 and 2,450 feet, the third is not mineralized as are the first two in this vicinity. A little stripping at the junction between Nos. 1 and 3 shows no concentration of mineralization at this point.

Other sections of No. 1 and No. 2 dykes also contain veinlets, in no greater abundance than at the lower adit. No samples were taken by the writer; pockets of arsenopyrite undoubtedly carry good gold values and the white quartz does not. Mineralization so far encountered bordering the veinlets within the granodiorite is not particularly strong.

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ANNUAL REPORT OF THE MINISTER OF MINES
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Part E -- Special Report
by
H. Sargent.

SILVER BASIN MINING SYNDICATE. Two groups of claims described below under "Summit Group and "Basin Group", both situated near the head of Bugaboo creek, are held in the name of the above Syndicate. The Silver Basin Mining Syndicate is not registered in British Columbia but according to information supplied by W.H. Rowan it is registered in Alberta.

During the past two seasons the old waggon-road up Bugaboo creek has been reconditioned, and some sections have been relocated by the Silver Basin Mining Syndicate. The road though rough and somewhat narrow is passable for motor-trucks. Camps have been built at "23 mile" and at the end of the road, approximately 26 miles westerly from Spillimacheen on the Kootenay Central Railroad and the main motor highway in the Columbia Valley.

SUMMIT GROUP. The No. 21 and Western Cross mineral claims, owned by T. Mercier, of Golden, which have been optioned by the Silver Basin Mining Syndicate, and the three adjoining locations, Walker, Chipperfield, and Nix, held in the name of the Silver Basin Mining Syndicate, are situated at the head of Bugaboo creek on the ridge which is the divide between Bugaboo creek and Howser creek.

A pack-trail about 6½ miles in length runs south-westerly from the end of the waggon-road on Bugaboo creek, at 4,700 feet elevation, to the workings on the No. 21 claim at 7,100 feet elevation. For the first mile and three-quarters the trail runs at an easy grade along a timbered slope. For the next mile and three-quarters it is east of the stream; the valley floor here is almost level for a width of up to one-half mile. The stream is crossed again about 4 miles from the end of the road, and from this point there is a climb of 2,200 feet in two and one-half miles. In the last half of this section the trail crosses slides of boulders and softer material.

The claims are situated on the broad crest and on the eastern slope of a saddle in the divide between Howser creek on the west and the head of Bugaboo creek on the east. To the south-east rugged peaks project through a cover of glacial debris or of ice. North-east are steep bluffs of black schist cut by a series of flat-lying quartz veins up to 2 or 3 feet thick, in the nearer part of the bluffs, while farther north there is a similar series of steep-dipping veins which strike into the bluffs. Similar veins are exposed below the bluffs.

Judging from the float and from the whiteness of the veins in the bluffs, they are generally scantily mineralized. Below the bluffs, over a vertical range of 400 feet, hard, massive, granular rock, containing eyes of quartz is exposed. Specimens of similar rock from the Basin group were classified in the petrographic laboratory of the Department of Mines as porphyritic granite. The contact with the schist is hidden by talus. South of the bluffs, below the lowest part of the saddle, the steep eastern slope consists of fine, dark debris from the rapid erosion of the dark schist. At various points along the rounded grassy saddle are outcrops of grey and black schist, the foliation striking somewhat west of north and dipping steeply to the east. The schists are argillaceous and somewhat limy and in part sericitic. Limestone varying in colour and texture from light grey, fine-grained, to almost black granular, has been exposed in some of the workings.

Three types of mineralization were observed:

(1). The dark granular limestone--which effervesces in cold dilute hydrochloric acid, leaving a fine, black, insoluble residue--has been replaced irregularly by massive, fine-grained, mixed sulphides, called locally "black sulphides" consisting of galena, sphalerite, pyrite, and chalcopyrite. A sample of massive fine-grained sulphide from above the adit assayed, - Gold, trace; silver, 5.0 oz. per ton; copper, 2.0 per cent; lead, 16.0 per cent; zinc, 25.0 per cent.

(2). Quartz veins mineralized principally with well-crystallized galena, with some pyrite and chalcopyrite, occurring in fine grey limestone or limy schist. Quartz with well-crystallized galena from the surface cuts assayed, Gold, trace; silver, 20.0 oz. per ton; lead, 36.0 per cent.

(3). Veins and irregular quartz lenses in schist, mineralized by occasional bunches of pyrite and perhaps other sulphides. Selected quartz with pyrite, from the surface cuts, and from the veins in the bluffs gave nil assays in gold and silver.

The Crown-granted claims are of long standing, having been surveyed for crown grant in October, 1899. After preliminary work by the owner they were under development by the Golden and Fort Steele Development Company from 1897 to 1899. Work since then seems to have been quite limited. The crown grant plan shows three adits on the eastern slope and several cuts and pits on the saddle. Two short adits just below the grassy slope on the lowest part of the saddle had been cleaned out and some cleaning out of cuts had been done when the property was visited on July 24th. The third adit is mapped as well down in the slide. No sign of it was noted. All workings are on the No. 21, and the Western Cross claims.

The two adits are at an elevation of approximately 7,100 feet above sea-level. The more southerly one goes in twenty-five feet from the end of a 18-foot rock cut. The adit follows a quartz-filled shearing in bluish limy schist, striking about thirty degrees west of north. Ten feet from the portal the vein is 18 inches wide and is well-mineralized with galena and sphalerite but in the face it has pinched down to $1\frac{1}{2}$ inches of quartz, showing little or no mineral. A crosscut runs ten feet to the north-east from the end of the drift, but reveals no mineralization. Over the portal, about 15 feet above the floor, is a cut, the face of which exposes dark grey, granular limestone replaced irregularly by fine-grained, black, mixed sulphides, principally of lead and zinc. The lower margin of the limestone was partly obscured by debris which may also explain why the vein in the adit was not noted in the cut. The limestone appears to rest on an irregular surface of low dip to the west. Over a horizontal distance of 7 feet there is a good deal of sulphide of which 3 feet at the western end of the cut consists of massive sulphide, exposed through about 4 feet vertically. This material is represented by the first sample listed above. To the east, narrow fractures in the limestone are filled with quartz, mineralized principally by pyrite and chalcopyrite. The second adit is 50 feet to the north of the first; it goes in 25 feet due west as a crosscut in unmineralized limestone. Over the portal an unmineralized 3-inch formation vein was noted. South of the first adit, slide matter obscures the rock. Limestone was observed for 100 feet to the north; it is thick-bedded and appears to strike north 30 degrees west, and dip 40 degrees to the east. Its margins were not observed.

Immediately above the adits is a gentle grassy slope rising to the crest of the saddle about 700 feet west. The crest rises gently for about 1,300 feet north, where it commences to rise steeply to a rocky knoll. In the rectangular area extending about 1,300 feet northerly from the adits and 600 feet westerly, are numerous cuts or test-pits and some surface exposures of quartz as irregular lenses in schist and as narrow veins cutting fine-grained, grey limestone. The lenses in the schist may be as wide as 3 or 4 feet but are short and are mineralized occasionally with small patches of sulphides principally pyrite of which selected material gave "nil assays" in gold and silver. The veins in the limestone are from 2 inches to 4 inches wide and are mineralized with well-crystallized galena.

BASIN GROUP. Twelve claims staked in the past two seasons, location given as on Green Mountain, held in the name of the Silver Basin Mining Syndicate, were reported to be in good standing in July 1936. These claims are in a large basin reached by about three and one-half miles of trail from the end of the road up Bugaboo creek.

The trail to the Basin group branches from the trail to the Summit group at approximately one-half mile from the end of the road on Bugaboo creek. At the forks the elevation is approximately 4,850 feet. From this point a rather rough trail climbs the steep, timbered slope, gaining about 1,500 feet elevation in one and one-half miles.

Silver Basin.

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Thence it follows a southerly course, at an easy grade, along sparsely-timbered uplands, to the basin.

The basin is a hanging valley facing the east. At the rather steep eastern break-over the grassy floor is one-half mile wide, the elevation at the center being about 6,700 feet. The grassy floor extends west for about 2,000 feet rising to an elevation of about 7,000 feet. From this point west the floor is rocky and rises more steeply to the western rim at an elevation of about 7,500 feet. There are four small lakes in the basin. To the north is a terrace about 200 feet above the main floor, and from this a fairly steep slope rises to the northern rim on which the peaks reach an elevation of about 8,000 feet.

The rocks exposed consist of slates and schists, minor exposures of thin-bedded limestone and conglomerate, and intrusive into the foregoing, sills of porphyritic granite. The slates vary from light bluish-grey to almost black. The schists include greenish to black-coloured varieties; rather soft sericitic schists; and siliceous schists from grey to brown in colour, not infrequently mottled with small brown spots and again containing eyes of glassy quartz. It seems probable that close to the intrusives some schists have been silicified. The foliation in the slate and schists generally strikes from 10 degrees to 30 degrees west of north and dips to the east at varying angles. The conglomerate consists of white quartz pebbles and pebbles of quartzite in a cement of fine quartz grains and some iron oxide. There are numerous outcrops of hard crystalline porphyritic rock varying in colour and texture but usually marked by equidimensional quartz grains or phenocrysts which are commonly clear and glassy. There are also feldspar phenocrysts. Specimens of this rock were classified as "porphyritic granite" in the petrographic laboratory of the Department of Mines. The colour is generally a light greenish-grey, the texture of the groundmass varies considerably but it is usually finely crystalline. A good deal of this rock is altered and may be more or less schistose, as noted above some of the siliceous schist grades into schistose porphyry. In the north-west corner of the basin is a large outcrop which seems to be a phase of the porphyritic granite but which may be a breccia. This rock consists of closely-packed grains of quartz and feldspar, from the size of small peas to some grains one-half inch in length. The cement or groundmass forms a minor percentage of the whole. The colour is light brown, apparently due to iron oxide in the cement, this colour persists to a considerable distance from the surface. The porphyritic granite has been more resistant to weathering than the schists and slates - which it intrudes and accordingly stands out prominently. Though the contacts are commonly obscured by talus or drift it seems probable that the intrusions are in the form of sills, rather thick masses in relation to their length,

The south rim of the main basin rises steeply from the floor and gives a section through folded softer rocks with one forty-foot band of siliceous schist. It is evident that there has been faulting along the contact of the siliceous band with the softer schist. It is

also apparent that a mass of porphyritic granite at the western limit of the main basin has resisted the folding. The sill of porphyritic granite appears to be about 250 feet thick; it extends north well into the basin and marks the change from the gentle grassy slope to the steeper rocky slope rising to the western rim. It is, however, less prominent on the northern side of the basin. West of it the softer rocks are in bands of moderate width, sills or stocks of porphyry including the coarse-grained phase form the principal exposures. To the east the softer rocks are dominant, though about 250 feet east is porphyry of undetermined width. Two short adits near the southern side of the basin are in this last body of porphyry while the cuts on the Nix claim to the north, may be in it also. East of the ridge forming the southern rim of the basin is a good deal of siliceous schist, some of which may be derived from porphyry.

A great deal of quartz has been intruded into the various rocks. There are two ridges which appear to owe their existence to the plentiful intrusion of white quartz as lenses and criss-crossed veins in schist. This quartz is apparently quite unmineralized. One lens near the south-west corner of the main basin is from 20 feet to 25 feet thick and has about three times that length. In a few cases quartz in the schist, generally as a narrow vein following the foliation, is heavily mineralized with pyrite, and arsenopyrite. In the porphyritic granite are a number of prominent white quartz veins, while the toe of the large sill at the western margin of the main grassy basin is much jointed and the joints are filled with quartz. This quartz, too, is generally quite barren though in some veins it is mineralized with pyrite, arsenopyrite, and a little galena. In some places, also, quartz usually occurring with schist, contains bunches of a brown rhombic carbonate, apparently manganiferous siderite, with which pyrite is associated.

Erosion is obviously proceeding rapidly in most exposures, and it may be noted at some points that glaciation is still active. Accordingly, as would be expected, surface alteration of minerals is commonly wanting, and, where present, is usually quite shallow.

Samples taken by the writer, the assays of which appear below, gave negligible values in gold and in some cases low values in silver. Samples of selected material, assays of which appear in a report made for the syndicate, contain considerable percentages of lead; even in these samples the gold content is almost negligible, and the silver is low, averaging considerably less than one-half ounce of silver to one per cent lead. The writer examined the various workings and exposures carefully and saw very little galena excepting small bunches or kernels at one adit and the shaft.

Near the south-west corner of the main basin are two short adits at shallow depth. These with a shaft 8 feet deep, some 600 feet north-westerly from the adits, and two open-cuts on the Nix claim,

appear to be the workings described under Bugaboo group in the 1898 Report of the Minister of Mines. In the report the shaft depth is given as 22 feet. Three claims comprising the Bugaboo group were staked in 1897 and it would seem that the workings described were made in that year, subsequently the claims were allowed to lapse. Half a mile to the east is an adit about 105 feet in length. There are also some cuts above the terrace, north of the main basin. These workings lie outside the original Bugaboo group. When this latter work was done is unknown to the writer but it must have been quite a few years ago. The ground held by the Silver Basin Mining Syndicate was staked during the past two seasons. Work done by the syndicate up to the end of July 1936 appears to have been principally scouting, with very little stripping or similar work.

Near the south-western corner of the main basin is an adit which goes in 15 feet at north 50 degrees west from the end of a 30-foot rock-cut, following a vein in porphyry. The dip is 75 degrees to the south-west. At the portal the vein is honey-combed and rusty, and is mineralized with pyrite, arsenopyrite and some galena. A sample across 13 inches of vein assayed, - Gold, trace; silver, 2.8 oz. per ton. At the face of the adit the ground is disturbed and the vein is poor. Ninety feet due north of this adit is a cut about 40 feet long on a course of north 40 degrees west. At the outer end of the cut is a small pile of quartz well-mineralized with pyrite and arsenopyrite. Fifteen feet north-west of the end of the cut and 10 feet higher is a portal of an adit which goes in 25 feet at north 55 degrees west, following a fracture in porphyry, containing sheared wall-rock and some quartz. This adit is about 25 feet higher than the first. The ground rising gently to the north, neither adit gains much depth.

On a course of north 55 degrees west from the second adit, one crosses a shallow depression in which some dark grey schist outcrops. The large mass of quartz mentioned above outcrops to the south-west about 300 feet along the course. At 600 feet north-west and 120 feet higher than the second adit is a shaft about 4 feet by 5 feet in section and 8 feet deep, which was unwatered while the property was being examined. In the shaft is a quartz vein about 14 inches thick striking north 55 degrees west and dipping vertically. For 4 inches on the south-western side it is well-mineralized with pyrite and arsenopyrite and contains a little galena in scattered kernels. A sample across the full width assayed, Gold, nil; silver, nil; arsenic, 1.65 per cent. The vein is not exposed to the south-east but to the north-west it is exposed on the surface for 55 feet where it runs into a wider barren white quartz vein. The shaft vein is moderately-mineralized, its walls are free, the width varies from 12 inches to 20 inches. The mineralization dies out on approaching the junction with the large vein. Ten feet from the junction the shaft vein is cut by a narrow offshoot from the large vein. This narrower vein, 10 inches to 8 inches thick, is of white, unmineralized quartz, frozen to the walls. None of these veins appear to cut another. At the junctions the appearance is as of contemporaneous vein-filling. The large vein mentioned is from 2.5 feet to 3.5 feet wide; its strike is about due north and the dip is vertical. For 50 feet north of the junction with the shaft vein it is

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FOR 1936

PART D -- SPECIAL REPORT

by

J. S. Stevenson - Assistant Mining Engineer.

VICTORY GROUP - The Victory group includes 2 Crown-granted claims, the Treasure and Signet, located in 1928 and 1929 respectively, and owned by Bessie E. Wright and William Burnett Davidson of Vancouver; and 4 mineral claims, the Victory, owned by C. C. Keller of Barriere, the Eldorado, Dixie and Bullion, all staked in 1934; however, the last three claims have since lapsed.

The workings on this group are on the same steep hillside as those of the Homestake property and will be designated the Wright-Davidson adit and open-cut, the Dixie adit and the Bullion adit, progressively south-eastward from the Homestake workings.

The Wright-Davidson adit and open-cut are on the Treasure claim and are 1900 feet south 50 degrees easterly from main Homestake adit, but approximately 500 feet higher in elevation. This adit has been driven north 30 degrees easterly for 54 feet; at 43 feet in there is a 12-foot drift to the south-east, and an 18-foot to the north-west. The working cuts 3 quartz-pyrite kidneys in the schist, 6 inches at 37 feet, 2 inches at 40 feet, and at 43 feet a larger kidney, 4 inches by 6 inches, containing quartz, dolomite, pyrite, galena, and sphalerite; the face shows a quartz lens not yet broken into. The rock formation in the adit is a grey, quartz-sericite schist that strikes north 40 degrees west and dips 45 degrees north-easterly.

Thirty-five feet up the slope, and north from the portal of this adit, an open-cut has been driven north 40 degrees east for 15 feet across a highly siliceous zone consisting of massive fine-grained quartzite; and small lenses and stringers of watery quartz. The quartz contains small amounts of pyrite, galena and sphalerite. Schist similar to that in the adit below is encountered in the face of this cut.

The Dixie adit is approximately 3600 feet south-east along the same hillside and 600 feet lower in elevation than the Wright-Davidson showings. This adit is at elevation of 2150 feet. It is a long, very irregular working, and follows narrow crushed zones in the schist. From the portal the adit goes north 75 degrees east for 20 feet, a side working from here going south 70 degrees east for 22 feet cutting a quartz lens of maximum

width 2 feet and length 10 feet, containing galena, sphalerite and pyrite. A faulted portion of this lens lies above the portal; from 20 feet the adit goes as a drift north 50 degrees east for 71 feet following a steeply-dipping crush zone 6 inches to 1 foot in width; from here a branch working leads south 64 degrees east for 27 feet, south 12 degrees east for 24 feet, and south 18 degrees east for 14 feet, to the face. Thirty-five feet from the face a lens of heavy pyrite 10 inches wide, occurs in the schist; similar but smaller lenses occur from here to the face. A sample across 10 inches of the material assayed nil in gold and silver. Continuing from where this working branched, the drift, following an offsetting shear which dips 40 degrees east, goes in a direction north 27 degrees east for 18 feet to the junction with the former steeply-dipping shear which it follows in a direction of north 53 degrees east for 105 feet to the face. This main, steep shear is a zone 1 inch to 1 foot in width, containing crushed rock, quartz and sulphides. There is very little gouge present. The rock formation is a grey quartz-sericite schist, which except for minor variations, strikes north 45 degrees west and dips 50 degrees north-east.

The Bullion adit is approximately 1400 feet south-eastward from the Dixie and 60 feet lower in elevation. It has been driven in a direction north 41 degrees east for 109 feet. It intersects several small quartz-albite veinlets from 2 inches to 3 inches in width and containing small amounts of galena; and at 85 feet, a quartz-sulphide lens 2 inches to 1 foot in thickness. The rock formation in this adit is a buff-coloured, to grey quartz-sericite schist. The conspicuous alteration adjacent to the quartz-albite veinlets results in a definitely buff-coloured, silicified phase. Pyrite cubes are widely disseminated.

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Part F -- Special Report
by
J.S. Stevenson.

Bull Moose. The Bull Moose group is owned by William Uren of the Upper Deadman River and his associates.

The workings on this group are 4800 feet south 65 degrees east from the ranch house of William Uren near the upper reaches of the Deadman River eastward from Vidette mine, and may be reached by ten miles of auto road from the mine.

The workings are on a slightly wooded knoll on the south side of the extensive meadows through which the Deadman River flows. They consist of one 6-foot by 6-foot vertical shaft 14 feet deep and 8 trenches, several of which were filled with soil at the time of examination, all on a branching quartz vein.

In the shaft the vein strikes north 18 degrees west, dips 65 degrees westerly, is $2\frac{1}{2}$ feet wide, and consists of milky quartz containing small amounts of pyrite, chalcopyrite and ankerite carbonate; pyrrhotite occurs in tight joints in the wall-rock. A $2\frac{1}{2}$ -foot sample of vein quartz assayed nil in gold and silver, but picked samples of sulphides assayed: Gold, 0.02 oz. per ton; silver, 0.1 oz. per ton.

North from the shaft the vein, turning north-westward, has been traced by two trenches for 90 feet. This portion of the vein strikes north 35 degrees to north 45 degrees west and is narrower, averaging only 8 inches. Three trenches, 35 feet and 40 feet north 30 degrees west from here, failed to pick up the continuation of the vein; it is probable that they are too far north-eastward to cross the continuation of the vein. With one exception, the trenches southward from the shaft were largely filled with debris; however, in one 75 feet south, a lens of quartz 2 inches long and ranging from 12 inches to 4 inches in thickness was seen.

In the shaft the rock formation is highly silicified feldspar porphyry, containing films of pyrite and pyrrhotite along tight joint-planes; however, much coarser feldspar porphyry outcrops 172 feet in a direction north 75 degrees west from the shaft. Fifty-one feet in a direction north 30 degrees west from this outcrop, another shows porphyry which has been sheared in planes striking north 85 degrees east and dipping 55 degrees southerly to a buff-coloured, paper-thin schist.

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FOR 1936.

Part F -- Special Report
by
John S. Stevenson,
Assistant Mining Engineer.

TELLURIC CAMP. The Telluric camp and workings are at the west end of Willow lake, a small lake at an elevation of 4300 feet, 15½ miles eastward by road from the Vidette Mine. The topography is that of a typical plateau top, the hills low, rolling and covered with open stands of tall timber. The shaft and strippings are on a flat knoll approximately 1/4 of a mile northward from the west end of the lake.

The workings prospect a quartz vein that follows the foot-wall of an imperfectly developed shear-zone in amphibolite that has been varyingly affected by shearing and vein solutions. The workings consist of a vertical shaft, 50 feet deep, from the bottom of which a level has been driven along the quartz vein; 16 pits and strippings along the possible surface outcrop the vein found underground.

From the bottom of the shaft a short crosscut has been driven south 45 degrees west for 24 feet; from the end of this a sinuous drift has been driven along the vein south 50 degrees east for 10 feet, south 83 degrees east for 20 feet, south 65 degrees east for 22 feet, south 78 degrees east for 13 feet, and south 68 degrees east for 67 feet to the face.

The vein follows the foot-wall of a shear-zone which strikes north 65 degrees west, dips from 65 to 70 degrees northerly, and averages 4 feet in width, the quartz vein ranging in width from 8 inches to 14 inches, although at the face it widens to a short lens 28 inches thick, but this tails out towards the back end, in contrast to the more tabular portions of the vein, includes many unreplaced remnants of wall-rock. The vein and shear have been cut and displaced a maximum of a few feet by 3 narrow cross-faults, one 20 feet from the crosscut, striking north-south and dipping 40 degrees westerly, a second at 55 feet striking north-south and dipping 50 degrees easterly and a third at 80 feet striking north 22 degrees east and dipping 70 degrees easterly.

The quartz contains small amounts of pyrite, chalcopyrite, sphalerite and tetrahedrite; and the sheared rock, disseminated pyrite.

Samples taken in the drift are listed below:

| Distance north- westward from the face. | Width and Character. | Gold, oz. per ton. | Silver, oz. per ton. |
|---|---|-----------------------|-------------------------|
| 0 feet. | 28-inch quartz lens | 0.01 | Trace |
| 55 feet | 8-inch quartz vein | 0.30 | 0.1 |
| 60 feet | 4 feet of pyritiferous shear in back | 0.02 | Trace |
| 90 feet | 10-inch quartz vein | 0.01 | Trace |
| 132 feet | 8-inch quartz vein | 0.02 | Trace |

Surface workings consisting of 16 pits and trenches extend for 530 feet in a direction south 75 degrees east from the shaft. These are across and partly along a buff-weathering and partly decomposed shear-zone, about 10 feet wide and nearly vertical, that contains a discontinuous quartz vein which is probably the surface and eastward manifestation of that underground. The first showing of quartz is 60 feet south 80 degrees east from the shaft. Here a trench 17 feet long exposes a portion of the vein ranging from 2½ feet to 1½ feet in width accompanied by strong shearing. An 18-inch sample of this material assayed: Gold, 0.20 oz. per ton; silver, trace. 20 feet south-east from this, a second trench exposes the same quartz vein over a 28-foot length. A sample across the average 18-inch width of quartz assayed: Gold, 0.10 oz. per ton; silver, trace.

From here eastward the quartz vein loses its continuity, and occurs only as stringers ranging from 1 inch to a maximum of 6 inches in width, or as discontinuous lenses, in the still persistent shearing. It may be noted that the last pit eastward is not in sheared rock but rather in the hard hornblendite, and exposes a tabular quartz vein, 8 inches wide, striking north 35 degrees west and dipping 75 degrees south-westerly; a sample of this material showed only traces in gold and silver. This pit, although it is on the projected strike of the shearing, does not cut any of the sheared material as seen in the last pit best showing such, which lies 138 feet to the west.

The rock formation consists of varyingly altered phases of hornblendite. Where removed from the effects of shearing and vein solutions the relatively unaltered phase is a coarse-grained, dark green rock consisting of hornblende.

In the vicinity of the vein, however, as exposed in the pits and trenches, the rock is sheared and altered to a partly buff-coloured phase that consists of hornblende grains altering to prominent biotite, which accentuates the schistosity, all in a fine-grained ground mass of secondary quartz. In that portion of the vein which is underground and farther westward than that on the surface, vein-solutions appear to have been more abundant and active. As a consequence of this, the hornblendite in the vicinity of the vein has been leached to a buff-coloured kaolinitic rock cut by minute carbonate veinlets. The ancestry of this rock from the hornblendite can only be traced along the crosscut by noting the appearance of the hornblende phenocrysts, first as pale, apple green crystals in a buff groundmass, and then as darker phenocrysts in a correspondingly darker ground-mass, until finally at the foot of the shaft and in a short working driven north 30 degrees west for 11 feet and north 40 degrees east for 14 feet, the typical dark green hornblendite appears.

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Part F -- Special Report
by
J.S. Stevenson.

MOON GROUP. This group consists of the Moon, Caribou, Silver Dollar, Blossom, Lily, Grapevine, Sunday and May mineral claims, staked in 1934 and owned by William Uren of the Upper Deadman area, and associates.

The group lies approximately 2 miles south-westerly from the Telluric property and in the same rolling country, covered by open timber. The only working examined, one on the Moon claim, consists of a pit blasted into a tight quartz vein 2 inches wide, striking N. 70 degrees E, and nearly vertical, in a hard, green hornblendite. The quartz contains scattered areas of sphalerite and a little tetrahedrite. An assay of this material yielded: Gold, 0.02 oz. per ton; silver, 0.4 oz. per ton.

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Part F -- Special Report
by J.S. Stevenson, Assistant Mining Engineer.

WRECK BAY. Wreck Bay is an exposed bay a few miles north from Barkley Sound on the West Coast of Vancouver Island. It is north-westerly from Ucluelet, and may be reached from that village by $7\frac{1}{4}$ miles of automobile road and then by 1 mile of good trail to the seashore; it is understood that most of this trail has been improved to a road.

The beach extends for 3 miles between two rocky headlands and represents a retrograded shore, concave seawards and backed by an escarpment or sea cliff of interglacial superficial deposits designated as the Wreck Bay formation by Dolmage.

The foreshore of the beach, i.e., that width between high and low tides, is approximately 100 feet wide, whereas the backshore, that width between high tide and the base of the sea-cliff, ranges between 25 feet and 50 feet in width. The foreshore is mostly clear and lacking in boulders, but the backshore consists of low boulder ridges and numerous piles of driftwood.

Wreck Bay beach has long been known for its content of gold-bearing black sand; beach claims having been located as early as 1899 and the beach worked intermittently ever since. There is no definite record extant of the total amount of gold obtained, but that it must have amounted to several thousands of dollars is indicated by the report, that in 1930 the Ucluelet Placer Mining Company, the largest to operate, obtained \$9,400 worth of gold from 600 yards of gravel. This company and the other groups apparently worked portions of the beach down to the blue clay, the top of which occurs at depths ranging from the surface of the beach to 20 feet and more below the surface. Concentrations of the black sand appear to have been greatest after severe storms, and some persons have made a practice of working the beach after such periods of extreme agitation and jiggling of the beach sand. 1900 577

The great number of people who have worked the beach and the general poor reward for efforts during the last few years would indicate that the economically-obtained gold, concentrated by the waves from the sea-cliff since the ocean first started to wash them, had been obtained and, although concentration is still going on, sufficient time has not elapsed for workable deposits to be formed again. As a result, attention has lately been directed towards the material in the sea-cliff.

The sea-cliff is the front of a gravel plain that extends from the beach back north-eastward to Kennedy Lake, a distance of 4 miles, and ranges in height at the beach from 63 feet to 145 feet.

The material of this plain as exposed in the sea-cliff consists of a well-stratified series consisting of a basal clay and overlying sand and gravel. The clay is distinctly blue in colour, and occurs partly as discontinuous lenses a few inches thick in the sands, but mainly as a discontinuous basal layer as much as 20 feet in thickness, and frequently exposed at the base of the cliff. It is reported that pits dug into the beach have

encountered a similar thickness, but have never penetrated the clay to the expected bed-rock. The sands and gravels occur in alternating layers from a few inches up to 8 feet in thickness. The pebbles and boulders are well-rounded and range in size from small to 6 inches in diameter, a 2-inch size being very common; with the exception of an occasional boulder erratic in the blue clay, no large, glacial erratics were seen amongst the well-stratified sand and gravel.

The stratification, perfect sorting and succession of material in the cliff, indicate that it is a typical inter-glacial deposit. The basal clay--sand-gravel succession, is characteristic of widespread interglacial material known to extend northwards from the Puget Sound area to Duncan and probably beyond on Vancouver Island, and described as the Puyallup inter-glacial deposit. It has been sub-divided into a basal clay member comprising, on southern Vancouver Island, the Maywood clays, and into an upper coarser member comprising the Cordova sands and gravels. The material constituting the sea-cliff at Wreck Bay has been designated as the Wreck Bay formation by Dolmage.

The sea-cliff extends from one end of the beach to the other, a distance of 3 miles, and in this distance it is cut by only one creek, Lost Shoe Creek, entrenched to a maximum depth of 75 feet in the plain forming the sea-cliff, and issuing onto the beach at a point 1 mile south-east from the northwest end of the beach. A profile of the cliff from one end of the beach to the other indicates that a gentle depression ranging from 30 feet to 40 feet in depth exists between points 1000 feet and 3000 feet north-westerly from the mouth of the creek. The elevation of the cliff at this depression is 63 feet, but 1500 feet north-west it is 100 feet high and south-eastward above Lost Shoe Creek it is 75 feet, rising gently as one goes southward from here; 3000 feet south-east it is 75 feet; 6000 feet it is 86 feet; and at 11,000 feet it is 148 feet.

The depression continues north-eastward across the swampy gravel plain and crosses the Ucluelet-Tofino road about $1\frac{1}{2}$ miles north-westward from the bridge on Lost Shoe Creek; at the crossing the depression is about 1000 feet wide and has a maximum depth of 30 feet. Although there is no evidence available on the nature of the gravel or sands as seen in the sea-cliff, yet the topography of the depression would indicate that it may have been the bed of a stream, not old but yet not that of a stream of active erosion, that issued from the mountainous country inland, previous to coastal elevation and the diversion of drainage to the site of Lost Shoe Creek which has since actively eroded a deep course in this elevated plain. The material for the Wreck Bay

formation was undoubtedly obtained by the interglacial waters from the mountains situated inland from Kennedy Lake, and a little gold would be obtained by the erosion of the local, narrow, quartz veins carrying gold in small amounts; but the large amount of ground through which the gold, necessarily quite fine, is now dispersed, would make for a low unit content in gold, unless the gold had been concentrated into pay-streaks. A search for these pay-streaks would be difficult, inasmuch as the whole areal extent and depth of the plain would have to be prospected for the course of the main stream, at the time when it was forming placer/bars in the short distance, 4 miles, between Kennedy Lake and the beach. Such a course is now undoubtedly buried; the main surface depression existing, at present not necessarily being that of the stream when depositing placer gold.

The black sand and gold found on the beach itself has been immediately derived from the sea-cliff; a pan anywhere from the cliff will show a small amount of gold; but the concentration ratio as between cliff sand and the black sand of the beach, effected by the jiggling action of the waves, has been so great that the black sands do carry appreciable amounts of very fine gold.

To obtain an approximate idea of the amount of recoverable gold both in the Wreck Bay formation and the beach sand, several samples were carefully taken from various places. Except where otherwise indicated, all the samples of gravels and sands were one-quarter cubic-foot samples taken in a container specially designed for the purpose. These were carefully panned down to concentrates ranging between two and five pounds in weight; all panning was done entirely under water to prevent aeration of the material and a consequent loss of fine gold. These two to five-pound samples were then further carefully panned to much smaller samples and then assayed for the total gold content of each sample.

| Sample No. | Cents per cubic yard. | General Description. |
|------------|-----------------------|-------------------------------------|
| "a" | 122.10 | Beach sands. |
| "b" | 26.90 | " " |
| "c" | 1.67 | " " |
| "d" | 33.50 | " " |
| "e" | 5.87 | " " |
| "f" | .84 | Gravel samples from cliff sections. |
| "g" | .84 | " " " " |
| "h" | Trace. | " " " " |
| "i" | .67 | " " " " |

| | | |
|-----|--------|--|
| "j" | 3.35 | Gravel samples from cliff sections. |
| "k" | 1.67 | " " " " |
| "l" | Trace. | " " " " |
| "m" | Trace. | Gravels from pits on top of and behind the cliffs. |
| "n" | Trace. | " " " " |
| "o" | Trace. | " " " " |
| "p" | .33 | " " " " |
| "q" | .84 | Gravels from recent bed of Lost Shoe Creek. |

Description of Samples.

Beach Sands--Samples "a" and "b". These were taken from strips down the side of a pit 4 feet deep and one foot in diameter, dug in beach sand and at a place where some previous operators had their sluices, etc. for obtaining gold from black sand collected along the beach.

This place is 1400 feet north-west along the beach from the camp cabin, (located on the south-east bank of Lost Shoe Creek) and at the foot of the trail which leads up the cliff to an old log cabin referred to as the "Dumais' cabin".

Sample "c". Represents the gold contained in a pan-sample (1/150 cubic yard) of beach sand where some surface concentration of black sand had been performed by spring water flowing down the beach.

Sample "d". This was fine beach sand taken from the sides of three pits each 2 feet deep and dug down to the Blue Clay. They were spaced 25, 50 and 75 feet from the shore along a line normal to the shore line at a point 1600 feet north-west from the camp cabin.

Sample "e". Similar to the last, but the pits were at a point on the beach 150 feet north-east from the camp cabin.

Gravel Samples from Cliff Sections.

Sample "f". This is a sample consisting of fine sand and a few pebbles (up to 2 inches diameter) taken along a 4-foot cut on the wall of a prospect adit driven into the base of the cliffs for 10 feet from a point on the beach 500 feet north-west from the camp cabin.

Sample "g". This was taken along a strip $7\frac{1}{2}$ feet long across material consisting of approximately 50 per cent pebbles, the remainder intermixed sand and small pebbles; no marked stratification of the sand was evident. The strip was half-way up the cliff face opposite a point on the beach 650 feet north-west of the camp cabin.

Sample "h". This was a quarter cubic foot sample taken along a strip 9 feet long across well-stratified pebbles (3 inches, average diameter), fine sand and a 4-inch clay seam. Pebbles represented approximately 10 per cent of the material.

The strip was from the upper 9 feet of the gravel cliff opposite a point on the beach 750 feet north-west of the camp cabin.

Sample "i". This was taken along two parallel 3-foot cuts in the stratified sand and pebbles (2-inch diameter and representing approximately 10 per cent of the sample) immediately above some blue clay at the base of the gravel cliffs, some 800 feet north-west along the beach from the camp cabin.

The following three samples, "j", "k", and "l", were taken from various small pits dug along the trail leading from the camp cabin to the Ucluelet-Long Beach road. They were taken along that portion of the trail which ascends the bank on the north-west side of Lost Shoe Creek; all distances given are those measured on the trail, zero distance being at the creek.

Sample "j". This sample consists of rusty sand and 25 per cent of pebbles (averaging 4 inches in diameter); it was taken between 385 and 390 feet from the creek and represents a strip 5 feet long between elevations 52 feet and 48 feet.

Sample "k". This represents rusty sand containing a few pebbles and small boulders. The material was stripped from four small pits dug at distances of 280, 320, 350 and 370 feet from the creek and at elevations of 30, 34, 40 and 43 feet respectively.

Sample "l". This represented a 5-foot section across sand and 2-inch pebbles, well stratified and approximately of equal amounts. The sample was taken at the top of the trail, which is 120 feet from the creek and at an elevation of 75 feet.

Gravels from Pits on Top of and
Behind the Cliffs.

Sample "m". This was taken from a strip 10 feet long across well-stratified sand and gravel as exposed in a dry well referred to as the "Swede's well". This is some 1800 feet north-west from the camp cabin and is 65 feet above the beach.

Sample "n". This was taken from a shallow pit, 2 feet deep, dug in the black muck and gravel of a slight depression which lies east of the Swede's well and strikes northerly from the beach. The small pit was approximately 300 feet north-east from the Swede's well.

Sample "o". Represents a 1/2 cubic foot sample of sand and gravel taken from an old pit 8 feet by 8 feet by 4 feet deep, located at the south-west corner of Lot 63; this is approximately 1/2 mile north from the location of sample lettered "n". At the time of examination the pit was full of water and since no sample could be taken from the pit itself, one was taken from the nearby pile of gravel, which had undoubtedly come from the pit.

Sample "p". This is a sample taken from a gravel pit on the north-east side of the Ucluelet-Long Beach road at a point 5 1/2 miles from Ucluelet. The material was from a 7-foot strip across roughly sorted pebbles (up to 4 inches in diameter) and sand.

Gravels from Recent Bed of
Lost Shoe Creek.

Sample "q". This is a sample taken across 4 feet of well-sorted and stratified gravel and sand in the valley of Lost Shoe Creek and immediately above the present creek level; the material represents creek gravels laid down by the creek in the stage immediately preceding the present one. The point selected was approximately 1/2 mile from the mouth of the creek.

Several samples were taken of the blue clay for purposes of a general study. This material underlies both the beach sands and the well-stratified sands and gravels of the cliffs.

It is to be noted that although the blue clay contained a small percentage of very fine black sand, no gold could be found in it.

The author was shown over the ground by one of the company's employees, reputed to have knowledge of the location of all recent digging on the property. The only pit deeper than 2 feet was the one described under sample "o"; at the time of the examination the pit was filled with water, and it is therefore evident that the pit must have been dug the previous summer or earlier. The only other work of recent date was the caved adit (sample "f") and small strippings at the base of the cliff.

At the present time, A. Williams and associates of the Wreck Bay Placer Mining Company are installing recently developed,

fine-gold-saving machinery, at the base of the sea-cliff, in an attempt to obtain the fine gold disseminated in the Wreck Bay formation.

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ANNUAL REPORT OF THE MINISTER OF MINES
FOR 1936.

Part F -- Special Report
by B. T. O'Grady.

BRETT GOLD MINES LIMITED. The property of this syndicate, in the Yale Mining Division, consists of nine mineral claims held by location. The group is situated on the southern side of Fifteenmile creek, westerly from Jessica station on the Kettle Valley railway which is located along the western side of the valley of the Coquihalla river.

The topography is shown in 100-foot contours on Geological Survey of Canada Publication No. 1988, "Coquihalla River Area". The workings, at elevations of from 2,325 to 2,600 feet, are situated on ground sloping from 35 to 40 degrees towards the creek. At lower altitudes the general steep slope is interrupted by benches, Jessica being at 1,300 feet elevation. The area is well-wooded, the trees including some large hemlock and cedar, and the underbrush is fairly dense. The new camp, at 2,310 feet elevation, is reached by trail, 2 miles in length, roughly estimated, from Jessica. Of this the lower half-mile length, starting from the railway, has been widened to tractor road width.

The property is largely underlain by serpentine, which, a few hundred feet south-westerly from the principal workings, contacts with flaggy chert and intercalated schist of the Cache Creek series assigned to the Pennsylvanian. A diorite dyke, apparently about 100 feet wide, is exposed at points along the trail at approximately 2,100 feet elevation. In succession below this there are outcrops of andesite, serpentine, and diorite, the ground being covered at lower altitudes. The workings develop a series of sheared fractures and talcose seams in serpentine, strikes being north-westerly with variable, generally steep, south-westerly dips. In this area the serpentine is intersected by diorite dykes and by a "white rock" the composition and possible origin of which is discussed at length by C.E. Cairnes in Geological Survey of Canada Summary Report 1929, Part A, page 194-A.

Mineralization noted, of erratic distribution, consists chiefly of free gold in thin polished films on smooth "slickensided" surfaces of talc or talcose serpentine. Rare gold occurrences have also been found associated with chalcocite in stringers or small nodular masses of the "white rock" where it is composed partly of coarsely crystalline diopside and contains a little yellowish garnet.

Former references to the property are contained in the publications above referred to, under Fifteenmile group, and in the Annual Report of the Minister of Mines for 1929 under Pacific Mines, Ltd. The group was acquired by the Brett Gold Mines Ltd. in 1930.

Surface workings include a large amount of ground-sluicing, the bottoms of most of these excavations being covered with soil or debris, with serpentine bedrock exposed in places. The lower adit, at 2,325 feet elevation, is driven south 32 degrees west for 193 feet, its inner end being below a ground-sluiced area, now caved. Above the adit, 70 feet from the portal and at 2,375 feet elevation, there is a large excavation exposing a zone 4 feet wide of vertical shearing in serpentine, with which seams and spots of the "white rock" are associated. A sample across 3 feet assayed a trace in gold and silver. This shearing was not traced in the adit below where there is much lagging to a point 97 feet in from the portal. At this point there are two branches, identified for reference as C and D, which are driven respectively south 30 degrees east for 27 feet and south 85 degrees west for 17 feet. "B" branch, 133 feet in from the portal, extends west for 63 feet and "A" branch, 141 feet in from the portal, is driven south 52 degrees east for 15 feet. In the area containing the four branches there are flat-lying irregular patches and lenses of the "white rock" up to 2 feet in width, no definite mineralization being noted in this material, some of which is included in the two sample sections to be specified. Extending diagonally along "A" branch there is a shear striking south 35 degrees east and dipping 85 degrees south-westerly. A sample across 3.5 feet in the face assayed: Gold, 0.02 oz. per ton; silver, trace. In the face of "B" working there is a shear striking north 50 degrees west and dipping 75 degrees south-westerly, where a sample across 3.3 feet assayed: Gold, trace; silver, 0.2 oz. per ton. In the face of "C" branch the serpentine, containing fine talc seams, is sheared over a width of 6 feet, the strike being south-easterly with flat south-westerly dip. In the face of "D" branch fine talc seams, without definite shearing, dip south-westerly at from 60 to 65 degrees.

In the main adit, 136 feet in from the portal, a shear is intersected which strikes north 50 degrees west and dips 75 degrees south-westerly, where a sample across 3.5 feet assayed a trace in gold and silver. A grab sample from a pile of about 20 tons of sorted "slickensided" serpentine and "white rock" at the portal assayed: Gold, 0.2 oz. per ton; silver, trace; and a selected sample from the same place assayed: Gold, 0.48 oz. per ton; silver, 0.1 oz. per ton. Here also there were numerous specimens showing thin films of free gold.

The upper adit portal, at 2,515 feet elevation, is about 250 feet south-easterly from the lower adit portal. It is driven south 60 degrees west for 175 feet to a point where caving at a water course prevented further entry. Directly above this adit, at 2,585 feet elevation, and 100 feet from the portal, a trench exposes sheared, crushed serpentine containing parallel talc seams, the strike being north 55 degrees west with south-westerly dip of 50 degrees. A sample here, across 1.5 feet, assayed a trace in gold and silver.

This showing underlies a syenite dyke, a medium to fine-grained phenocrystalline rock, exposed over a width of 2.5 feet, but evidently wider. This shearing was not traced in the adit below which, however, is largely lagged up. South-easterly from the last-mentioned trench, along the contour of the steep hill-side, there are three closely spaced caved trenches and beyond these, at 2.595 feet elevation, and about 200 feet from the original point specified, the rock has been faced up for a new adit. Here the serpentine is crushed and largely altered to talc adjacent to a decomposed dyke. Its contact with cherty rocks lies 30 feet westerly from the adit. Summarizing conditions, the continuity of specific shears is not apparent and mineralization is generally indefinite.

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ANNUAL REPORT OF THE MINISTER OF MINES
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Part D -- Special Report
by
M.S. Hedley.

ADVANCE. This claim is controlled by the Advance Mining Syndicate. It is on the moderately-sloping flank of Wallace Mountain, one-half mile by wood-road and fair trail south-east of the lower Wellington adit. The rock is Westkettle quartz diorite.

An adit, elevation about 3,400 feet, is driven 35 feet on a bearing of 60 degrees, then forks into two irregular branches each 100 feet long. One of these, driven north, follows westerly-dipping shearing and faulting in the quartz diorite, and the other follows first a 2- to 3-inch mineralized zone, strike south 80 degrees east, for 40 feet to a cross-fault and then continues easterly to broken ground in the face. A second adit, 40 feet higher and 100 feet distant, bearing 55 degrees, is 60 feet long on the same line, and follows a shear-zone in diorite. A shaft, 90 feet higher and 250 feet distant from the lower adit on a bearing of 55 degrees, is said to be 35 feet deep and is now water-filled. Three sacks of ore on the shaft dump contain considerable quartzose material and some heavily mineralized with sphalerite and galena. This ore seems to have come from a narrow vein, although at the bottom of the shaft a section is reported to have been encountered 12 to 16 inches wide. The easternmost face of the lower adit was being drifted on by hand-work in 1936.

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ANNUAL REPORT OF THE MINISTER OF MINES
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Part D -- Special Report
by
J.S. Stevenson, Assistant Mining Engineer.

Highland Valley. Highland Valley is a broad valley extending north-west and south-east between the headwaters of Witches Brook flowing south-eastward to Guichon Creek, and those of Pukaist Creek flowing north-westerly and westerly into the Thompson River at a point 5 miles north from Spences Bridge. The divide between these creeks is at an elevation of approximately 4,000 feet. There are copper properties on both sides of this valley but only those comprising a group north-eastward from the valley were examined; these consist of the Transvaal, Highland, and Keystone properties.

Access is by a mountain road that leaves the Ashcroft-Merritt Highway at a point twenty miles south-easterly from Ashcroft; this branch road is approximately 7 miles long and climbs 1,800 feet in the distance from the road to the properties.

These properties are on the broad, gently sloping upper slopes of a round-topped summit known as Forge Mountain; and at their elevation of 5,000 feet to 6,000 feet are in openly wooded uplands; however, a very short distance down the hillsides from the properties, the slopes are densely wooded with timber suitable for mining purposes. This timber extends down the mountain slopes to the lower limit of abundant rainfall, and then the typical dry-belt growth prevails.

Geologically, the Transvaal and Highland properties are similar. The prevailing rock is granitic, ranging in composition from granite to quartz-diorite.

Although these are considered copper properties, copper minerals are not abundant. In order of abundance they consist of malachite, azurite, chalcopyrite and copper pitch. These form minor constituents in veins of a very unique type, veins that range in composition from 95 to 10 percent of sooty tourmaline, variety schorlite.

These veins range in width from a knife edge to 3 feet, although a width of approximately 10 inches is commonest; they are discontinuous, the general length of any uniform vein-width ranging from 10 feet to 20 feet. The common direction ranges from north 20 degrees east to north 20 degrees west, and the dips are nearly vertical; however, some of the exposures show veins striking in other directions. The texture of the veins indicates that the north-south ones occupy a jointing direction in the

granite along which considerable shearing and related fracturing of the granite and vein-quartz of an earlier generation has occurred, and that veins in other directions occupy conjugate joints along which there has been little movement.

Texturally the veins contain a central mass of either massive and sooty tourmaline, or of tourmaline, highly brecciated vein-quartz, and copper carbonates, bordered by brecciated and partly replaced fragments of wall-rock. Narrowing stringers of tourmaline commonly extend from the main vein for a distance of 1 foot and form a reticulate network of veinlets around angular fragments of granite. More siliceous phases of the veins consist of abundant broken angular fragments of vein-quartz, in part replaced by tourmaline, and of fine-grained magnetite and hematite isolating angular islands of dense tourmaline and quartz; or in addition, the copper carbonates, malachite and azurite may occur as crosscutting veinlets and masses. Chalcopyrite in abundance was seen in only one place, namely in a large open-cut north-west from the Highland shaft where a tourmaline vein containing abundant fragmented quartz showed cross-cutting veinlets of magnetite and chalcopyrite that constituted approximately 1 percent of vein matter.

The erratic and discontinuous distribution of the tourmaline veins, combined with an equally erratic and sparse distribution of copper minerals militate against the copper potentialities of this group of properties.

As far as is known none of these properties has shipped any ore.

Transvaal. The Transvaal property consists of six Crown-granted claims, the Transvaal, Pretoria, Mafeking, Imperial, Chamberlain, Ladysmith and Pretoria Fraction, staked in 1899 and owned by J. Hosking of Cobalt, Ontario, and George Novak of Ashcroft.

The workings lie between elevations of 6,000 feet and 6,200 feet between the north and south summits of Forge Mountain. They consist of two shafts, now thoroughly caved, sunk between the years 1901 and 1906, an adit, now open, commenced in 1905 and worked in until 1932; and of several open-cuts.

The only complete description of the property, found in the Annual Report of the Minister of Mines for 1907, page 135, indicates that: "It is reported to have been sunk 200 feet with, at the 100-foot level, a drift to the west of 160 feet in length, and another to the east of 180 feet, and from the latter a 40-foot crosscut was driven. At the 200-foot level a drift was made to the east for about 75 feet".

Approximately 900 feet in a direction north 60 degrees east from the shaft and at an elevation of 6,000 feet a sinuous adit with two main branch workings has been driven in a general direction of south 30 degrees east for approximately 350 feet. The details of the adit in plan are as follows:

From the portal:-

- South 10 degrees east for 97 feet;
- south 25 degrees east for 39 feet;
- south 10 degrees west for 36 feet;
- south 43 degrees west for 63 feet, a short branch here north 71 degrees east for 31 feet;
- south 68 degrees east for 30 feet, and a working south 10 degrees east for 21 feet;
- south 63 degrees east for 13 feet and No. 1 cross-cut north-east from here;
- south 43 degrees east for 28 feet and No. 2 cross-cut south-west from here;
- south 40 degrees east for 19 feet and south 19 degrees east for 35 feet to the face.

The details of No. 1 crosscut are, from the main drift:-

- North 30 degrees east for 21 feet;
- north 67 degrees east for 35 feet, a short working south 63 degrees east for 34 feet;
- north 67 degrees east for 17 feet, a working north 42 degrees east for 32 feet, north 13 degrees west for 5 feet and north 80 degrees west for 12 feet to the west.

The details of No. 2 crosscut south-west are, from the drift:-

- South 32 degrees west for 21 feet;
- south 67 degrees west for 21 feet, a working south 14 degrees east for 27 feet;
- south 73 degrees west for 16 feet, a short working north 27 degrees west for 22 feet;
- south 60 degrees west for 19 feet to the face.

Portions of a tourmaline vein ranging from 2 feet of massive tourmaline to a few inches of vein matter and considerable brecciated wall-rock, occur from a point 250 feet in from the portal, to the face. At only a few places was any copper carbonate seen. A picked sample across a lens of malachite and azurite 2 feet thick by 3 feet long, the only lens of such dimensions seen on the property, assayed: Gold and silver, nil; copper, 20.95 percent. Another sample taken nearby, across 2 feet of vein matter consisting of sooty tourmaline, hematite and some granite fragments, assayed: Gold and silver, nil; copper, 4.6 percent. A sample taken 20 feet from the face across a 4-foot shatter-zone

containing fragments of wall-rock laced by tourmaline veinlets, assayed: Nil in gold and silver; copper, 0.3 percent.

A second zone of discontinuous tourmaline veins occurs in the north-south section of the No. 1 crosscut north-east. Here sections of veins ranging from 10 feet to 5 feet in length and from 8 inches to 2 inches in width cut the granite; a sample taken across 8 inches of vein matter assayed: Gold and silver, nil; copper, 0.25 percent.

The rock formation in this adit is granite containing conspicuous pink feldspar; however, a feldspar porphyry dyke, averaging 20 feet in width and striking north 10 degrees east is exposed in the north-south section of No. 1 crosscut north-east and in the face of the main drift.

Numerous open-cuts are scattered over the hillside between the adit and the shaft and for 300 feet northward from it. These cuts expose discontinuous veins of tourmaline, carrying varying amounts of quartz fragments, magnetite and hematite; malachite and azurite, though occasionally occurring, are not abundant. Inasmuch as these veins tend to follow the jointing in the granite, they vary considerably in attitude. The most conspicuous surface exposure is in a large pit 130 feet eastwards from the shaft, where a vein of tourmaline, 3 feet in width and 10 feet long, siliceous in appearance because of the numerous watery quartz fragments, carries irregular stringers and masses of malachite and azurite in conspicuous but not abundant quantities.

Highland. The Highland group consists of six claims, the Highland No. 2, Glenora, Standard, Virginia, Nickel Plate and Glenora Fraction, staked in 1891 and at one time owned by the Bank of Montreal, Rossland.

The workings at an elevation of 6,000 feet are from one-quarter to three-quarters of a mile southwards from those of the Transvaal. They include a shaft sunk between the years 1905 and 1907, an adit, 2,000 feet north-easterly from the shaft, driven in 1902, and several open-cuts. The shaft and all but the entrance to the adit were caved at the time of the writer's examination.

An examination of the open-cuts extending northwards from the adit for approximately 2,000 feet indicates that the nature, size, distribution and copper content of the veins are similar to the Transvaal veins. An excerpt from the Annual Report of the Minister of Mines for 1907, page 136, describes the adit and indicates the similarity in mineralization:-

"Near the centre of the group there is a tunnel which has been driven in 115 feet, from which two cross-cuts have been driven to the left for a distance of 15 feet. At this point the showing consists of a black trap-rock (sooty tourmaline vein-matter--present author), similar to that noted in the Transvaal, with small quantities of copper pyrites scattered through it".

It may be remarked that the rock at the Highland tends to be more dioritic in composition than that at the Transvaal.

Keystone. The Keystone group consists of six claims, the Douglas Pine, Waverly, Snowden, St. Boniface, Keystone Fraction and Mafeking Fraction adjoining the Transvaal group on the north-east, the workings being located about one mile north-east from the Transvaal adit and at an elevation of approximately 5,600 feet. These have been owned by George Novak of Ashcroft.

The small amount of work consists of two short adits, one caved, on the south-west side of a canyon-like dry draw in the granite; the heavily-timbered adjacent hillside sloping steeply towards the top of the north peak of Forge Mountain.

The open adit has been driven north 62 degrees west for 25 feet through highly sheared granite that contains seams and coatings of malachite.

Two open-cuts, one 60 feet south-west and the other 80 feet eastward from the open adit are across similarly-sheared granite, coated with malachite. No tourmaline veins were seen. The average strike of the shearing in the workings is north 50 degrees east and the dip 45 degrees north-westerly.

Except for a capping of amygdaloidal basalt on the bluffs, some 100 feet higher in elevation, the rock is granite.

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ANNUAL REPORT OF THE MINISTER OF MINES
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Part F -- Special Report
by
B.T. O'Grady.

ENID-JULIE. This property, when worked by the Enid Julie Mines, Ltd. during 1934, included the following Crown-granted mineral claims: Enid, Julie, Jennie B., Stella, Empress, Champion, Commonwealth, and Monte Christo, together with 19 additional claims and fractions held by location, all situated in the Vancouver Mining Division. Part of the property, consisting of Crown-granted claims, was then held under agreement to purchase, the other claims having been staked on behalf of the company. The ground, with which these notes are concerned, adjoins the Doratha Morton group to the south-east and includes the Enid, Julie, Jennie B., Stella, and Empress Crown-granted claims, which are shown on B.C. Department of Lands Mineral Reference Map 5 T 280. The camp is distant about one mile westerly from the western shore of Phillips Arm or about 134 miles in a direct line north-westerly from Vancouver.

The workings, varying in elevation from 1,900 to 2,750 feet, are located on the steep easterly slope to tidewater, the ground being well-timbered with fir, cedar, and hemlock. A wide, steep trail, about 2 miles in length, connects the camp, at 2,026 feet elevation, with the landing. A tractor road was started from a point below the camp, a length of about 1,500 feet having been constructed towards the beach. The general area is largely underlain by granitic rocks of the Coast Range batholith which intrude intercalated sedimentary and volcanic strata, these occurring as remnants or roof-pendants. The older rocks, which trend north-westerly, have been altered to argillites, chlorite and hornblende schists.

The workings, mainly in the schistose rocks, which are cut by diorite dykes, develop a wide marginal contact zone containing numerous quartz bands and lenses which have a general north-westerly strike and south-westerly dip, coinciding with the regional shearing. The quartz, in places, contains pyrite, which is occasionally accompanied by galena, sphalerite, and chalcopyrite, mineralization being generally sparse. The better gold values are present in mixed sulphide material, a selected sample of which assayed: Gold, 0.84 oz. per ton; silver, 4.4 oz. per ton; copper, 0.2 per cent; lead, 1.2 per cent; zinc, 1.7 per cent. Selected quartz containing no sulphides assayed a trace in gold and silver.

References to the property are contained in Bulletin No. 1, 1932, "Lode Gold Deposits of B.C.", and in the Annual Reports of the Minister of Mines for 1933 and 1934. The Enid-Julie Mines Ltd. was incorporated in August 1933.

The principal working, at 2,100 feet elevation, is an adit driven north-westerly for 284 feet. Surface showings above the adit are on the steep, rocky slope along the north-eastern edge of a deeply cut ravine. Directly above the inner end of the adit there is a showing of interbanded quartz and schist aggregating 30 feet in width and at higher points there are irregular quartz outcrops along the trend of the zone. A 10-foot shaft, at 2,750 feet elevation, mentioned in the Report of the Minister of Mines for 1934, was not examined. The adit follows a fracture, dipping south-westerly at a steep angle, along which are quartz bands or zones of silicified rock containing streaks and patches of quartz, widths being from 2 feet to the full width of the drift. At several points narrow, "water-course" fractures strike north-easterly across the drift, streaks of limonite being present. There are two crosscuts, one of which extends for 94 feet south-westerly and the other 54 feet north-easterly. Parallel quartz stringers are exposed in the crosscuts, a north-westerly-striking diorite dyke being also intersected by the south-westerly crosscut. At 2,096 feet elevation, across the gulch and within a length of about 100 feet south-westerly from the main adit portal, there are two adjoining, disconnected, short adits, driven along an irregular north-westerly course. The most south-westerly of these two workings develops a lens or short faulted vein section, up to 3 feet wide, the quartz being iron-stained and fractured. The dump here contains a pile of quartz from which the selected sample of mixed sulphide material was taken. In addition to the above workings there are reported to be two 35-foot adits at other points on the claims, these not having been seen by the writer.

There was no activity at the time of examination in June 1936.

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ANNUAL REPORT OF THE MINISTER OF MINES
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Part D -- Special Report
by
M.S. Hodley.

LOST HORSE. This group of six claims was owned in 1936 by Hedley Mascot Holdings, Ltd., and is now part of the holdings of Hedley Shamrock Gold Mines, Ltd. It is 4 miles west of Similkameen River between elevations of 6,000 and 6,400 feet. The claims are high up on a prominent mountain mass that attains, 1 mile to the north-west, a maximum elevation of 6,616 feet. Two small steep summits rise from the claims, but in general the moderately-sloping ground is wooded and in no place precipitous. Outcrops are quite plentiful. Access is by trail up Paul Creek some 6½ miles in length from the Similkameen River. The trail climbs rapidly 1,000 feet above the river-flat up a steep hillside of blocky sediments and slide material; the route is then up open, and finally timbered, drift-covered slopes to a tent camp on a small creek at an elevation of 6,075 feet.

The geology in this section is rather complex. Steeply tilted, banded sediments strike north-south and are intruded by dykes and sills of augite and/or hornblende andesites and diorites. Just north-west of the claims are banded, purple and green andesite flows and some breccias, and to the west to at least as far as the 6,616-foot summit is a light gray intrusive dacite. Cherty (probably sedimentary) breccias lie between the sediments and the andesite and dacite on the west. The sediments are argillaceous to quartzitic rocks, all metamorphosed, and are in many respects similar to those encountered on Nickel Plate Mountain; the average strike is 5 degrees west of north and the dip is nearly vertical. An anticlinal fold occurs in the centre of Lost Horse Nos. 2 and 4 claims, immediately to the west of which are chert breccias grading northerly into banded andesites and intruded on the south-west by dacite. The dacite is a fresh, variable rock of considerable area and contains phenocrysts of quartz and feldspar. The distribution of diorite and andesite dykes in the sediments is irregular; these rocks are probably closely related in age and origin and include many medium to fine-grained greenish-colored types, some of which carry fine pyrrhotite that is apparently related to the pyroxene constituent.

Mineralization includes, besides the primary (?) pyrrhotite, arsenopyrite, pyrite and pyrrhotite. It is found almost entirely in the sediments and appears to occur selectively in a fine dense brownish rock which is probably an altered shale. Sulphides, particularly arsenopyrite, are closely associated with green to whitish alteration of this rock in a system of fine interlocking and coalescing veinlets, an inch in width to paper-

thin. The green colour is due to diopside and less actinolite in one thin-section studied; the lighter seams, sometimes appearing marginal to the green seams, represent a kaolinization of the rock. Work on the property is insufficient to show the extent of this alteration and mineralization, except to indicate that the two are very closely associated.

At the time of the writer's visit in June, 12 open-cuts had been made at scattered intervals and others were made later in the season. Many of these open-cuts were designed principally to expose the formation and were not directed to follow up particular mineralization; they will not be described individually. The principal points at which mineralization has been encountered are in or close to the bed of the small creek. Alteration of brownish fine sediments in reticulating veinlets, is accompanied by scattered crystals and thin seams and blebs of arsenopyrite; local patches of alteration of irregular shape may contain lenses and masses of arsenopyrite an inch in width and several inches in length. The total amount of sulphides is low. Two picked samples returned 0.01 ounces gold per ton and trace in silver. Structural conditions on this ground appear not unfavourable, although to date no commercial mineralization has been found.

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ANNUAL REPORT OF THE MINISTER OF MINES
FOR 1936

Part F -- Special Report
by
B. T. O'Grady

TUSCARORA GOLD MINES, LIMITED. The property of this company, in the Lillooet Mining Division, comprises fourteen mineral claims and fractions held by location. The camp, at 2,575 feet elevation, is situated on a bench half-a-mile west of the Bridge river (elevation 2,200 feet) just south of its junction with the Hurley river. The workings, located above the camp at elevations of from 3,020 to 3,400 feet, are on the ground sloping easterly from 35 degrees to 15 degrees down to the bench from the top of the ridge at about 4,000 feet elevation. The whole area is well wooded. The camp, consisting of five frame buildings accommodating a crew of 14 men, is reached by trail, about one mile in length, which leaves the Gun creek road at a point 200 yards southerly from its junction with the highway about 40 miles from Bridge River station on the Pacific Great Eastern railway.

Rocks exposed in the workings are cherty quartzites and argillites, with small irregular areas of greenstone, being members of the Bridge River series which have a general north-westerly strike. Diorite shows at one point in the lowest adit. Within the stratified rocks there are sheared, silicified, rusty zones, from 2 to 12 feet wide, striking north-westerly with variable north-easterly and south-westerly dips. Sulphide mineralization is generally absent, disseminated pyrite being noted at one point in the upper adit. In an open-cut rusty quartz contained rare specks of galena. Eight samples taken on the surface and in the upper adit assayed a trace in gold and silver.

The company, with office at 409 Rogers Building, Vancouver, was incorporated in August 1934.

An area of stripping, 20 feet by 30 feet (No. 1), on the 35 degree slope at 3,460 feet elevation, exposes a zone of iron-stained silicified argillites for a length of 25 feet and a width of 3 feet. The strike is north-westerly with a south-westerly dip of from 40 degrees to 45 degrees. A sample across 3 feet assayed: Gold, trace; silver, trace. A short distance to the west an open-cut (No. 2) on the same steep slope, at 3,400 feet elevation, exposes a sheared fracture in quartzite adjoining a small irregular area of greenstone. Associated with the fracture, which strikes north-westerly and dips north-easterly from 20 to 25 degrees, there is an iron-stained quartz stringer from which selected specimens showed specks of galena. A sample across 10 inches assayed: Gold, trace; silver, trace. Other open-cuts in the vicinity are chiefly in quartzites. The upper adit, at 3,260 feet elevation, and directly below or easterly from the No. 1 surface cut, is all in sediments. Chaining from the portal it is driven south 70 degrees

west for 127 feet to Station B, then south 35 degrees west for 58.5 feet to Station C, and finally south 41 degrees west for 72 feet to the face at D. Drifts extend as follows: 44 feet to the north-west at chainage 115.5 feet on the first course of the main adit, and 19 feet to north 66 degrees west opposite Station C. At the first drift location two samples, both across 2 feet, taken at the crosscut-drift intersection and 5 feet back from the face of the drift respectively, assayed: Gold, trace; silver, trace. The drift opposite Station C develops a width of 5 feet, being part of a sheared, rusty, silicified zone, 12 feet wide, dipping south-westerly 60 to 65 degrees. Two samples, each across 6 feet, at the crosscut-drift intersection, assayed: Gold, trace; silver, trace; and a muck sample from the face, where the material is partly decomposed, gave the same result. A sample across 12 feet of altered, crushed, rusty silicified rock in the main adit between points 15 and 27 feet back from the face at D, assayed: Gold, trace; silver, trace; no definite walls being apparent here.

The lower adit, at 3,020 feet elevation, and 615 feet south-easterly from the upper adit portal, is located on gently sloping ground just above the bench. Chaining from the portal it is first driven north 30 degrees west for 121 feet to point F. Along this course at chainage 81 feet, or point E, the working continues to north 20 east for 20 feet to point G; then to north 45 degrees west for 36 feet to point H; and finally north 40 degrees west for 72.5 feet to the face at J. In this last course, 5 feet north-west of Station H, a branch working extends to south 85 degrees west for 15.5 feet to point K. From the portal to E the adit is close lagged, from E to F, where sheared greenstone was encountered, the ground has largely caved. The rest of the workings are in sediments except for a small area of diorite at point K.

Summarizing conditions there is no evidence that the sheared zones in the sediments can be regarded as channels of mineralization and as they coincide with the general trend of the formation there is no reason to expect a change in conditions within reasonable limits.

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1936

ANNUAL REPORT OF THE MINISTER OF MINES

Part C -- Special Report

By
Douglas Lay

NORTHERN REEF GOLD MINES LIMITED. This company was incorporated in 1934 with registered office at 1405 Douglas Street, Victoria. Although the company has to date confined its operations mainly to its placer leases, which are described under "Placer Deposits", Annual Report of the Minister of Mines, 1936, Part C, it holds 6 mineral claims closely adjacent to the placer leases.

The property is situated on the McDougall River below the junction of Reed Creek, and is reached by following the water-route from Summit Lake, distant 32 miles by motor-road from Prince George, to Fort McLeod, distant 66 miles from Summit Lake. From Fort McLeod, a tractor-road, 17 miles in length, follows the timbered rolling Nechako plateau to the company's camp, situated on a bench about 100 feet above the river.

Save on the banks of the river, at one point near the common boundary of the Jason and Midas claims, and on the Pearl mineral claim, in which the river occupies a steep-sided rock-walled valley in which rock-exposures occur frequently, the formations are almost entirely covered by glacial debris or re-sorted gravels. In this region the right bank of the river is flanked by hills of glacial debris which rise steeply from the river to the plateau level, though at some points they rise from low-lying benches. The left bank of the river from Reed Creek down-stream to the mouth of Tent Creek, is flanked by a large low-lying flat. At the back of this flat glacial banks rise sharply

to a height of 200 feet above the river. The area has been burned over, and is covered, save locally, with sparse second-growth timber.

The formation where exposed below Reed Creek consists of numerous outcrops of schistose argillites, between which occur at some points crystalline and schistose metamorphic rocks, and at others greenish-coloured carbonated rocks which are not always schistose. It is difficult to determine stratigraphic relationships as contacts are rarely exposed. An unconformable contact between andesite and schistose argillites is exposed on the Jason and Midas mineral claims. The greenish-coloured carbonated rocks mentioned may be carbonated volcanics. Some of the crystalline and schistose rocks may also be metamorphosed volcanics. The strike of these rocks varies from north-west to north-east and dip from southerly to northerly, due, presumably, to folding. Anticlinal folding of the argillites is suggested between Reed and Tent Creeks. Schistose argillites are exposed in both hydraulic pits, and also at one point in the long open-cut shown on the map. Immediately south of No. 2 hydraulic pit are two rock-knolls of elliptic shape, the larger of which rises sheer from the river to a height of 40 feet. These knolls are composed of a carbonated greenish-coloured rock, which shows little or no evidence of bedding, but which contains some small quartz gash-veins. One of the latter, 18 inches in width, sparsely mineralized, was, it is understood, investigated by diamond-

drilling. A similar rock, also carbonated, is cut by Tent Creek where it enters the large flat. Definite evidence of bedding is present at the latter outcrop, and the strike is north 72 degrees west and the dip is 85 degrees to the south-west. Analysis of specimens of the carbonated rocks mentioned disclosed in both cases 16.9 percent of calcium carbonate and from 1 percent to 3.3 percent of magnesium carbonate. About 1000 feet farther up Tent Creek, there is an outcrop of a schistose greenish-coloured spotted rock. The strike of the schistosity is north 37 degrees west and the dip is 48 degrees south-west. Greenish-coloured rocks, similar to those exposed in the knolls, rise sharply from the left bank of the river at the sudden bend, a short distance downstream from the large quartz exposure. They strike north 63 degrees east and dip 55 degrees south-easterly. Argillites and greenish-coloured rocks rise sharply from the right bank of the river opposite the large quartz exposure described later. The contact between the argillites and the other rocks mentioned is not exposed.

Investigation of the mineral showings was commenced by the company after incorporation and continued until operations were suspended in 1935. (Refer to Annual Reports of the Minister of Mines for 1934 and 1935).

Surface showings comprise a large outcrop of quartz in schistose argillites; some small gash-veins in the other rocks mentioned; and a heavy pyritization at the contact of schistose

argillites with andesitic volcanics on the Jason and Midas mineral claims. The chief surface showing on this property is a large outcrop of quartz, 60 feet long by 22 feet wide, trending north 82 degrees west, sparsely mineralized with a little pyrite and galena, and somewhat oxidized, situated close to the left bank of the river in the immediate vicinity of the corner post common to the Pearl, Flossie, Myrtle, and Ruby mineral claims. The host-rocks are schistose argillites, which strike from a few degrees west of north to 32 degrees west, and dip north-easterly at from 20 to 30 degrees.

Surface workings at this point comprise some open-cuts in the quartz exposure mentioned. A 22-foot sample taken across the full width of the quartz exposure at the open-cut at the eastern extremity assayed: Gold, trace; silver, 0.2 ounces per ton. Another sample taken from the most promising-looking parts assayed: Gold, trace. An open-cut in the western knoll exposes a quartz gash-vein at the collar of a diamond-drill hole. A sample taken across 18 inches assayed: Gold, trace; silver, trace.

Another surface showing is situated on the right bank of the river immediately adjacent to the latter near the boundary between the Jason and Midas claims. At this point an open-cut 27 feet in length exposes the contact between schistose argillite and andesite immediately instream from the river. The former strike north 62 degrees west and dip 70 degrees north-easterly, and the latter strike north 58 degrees east and dip 15 degrees north-westerly. The contact is well-defined and strikes

north 72 degrees west and dips 60 degrees north-easterly. Both rocks in the vicinity of the contact are heavily pyritized, and the andesite shows a considerable amount of hydrothermal alteration, and also oxidation. Save immediately adjacent to the river and in the bed of the latter, the rocks are overlain by vegetation, surface soil, and glacial debris. Samples were taken from the more heavily pyritized parts of each formation. A sample of pyritized argillite assayed: Gold, trace; silver, 0.4 oz. per ton. A sample of pyritized andesite assayed: Gold, trace; silver, 0.2 oz. per ton.

Underground workings, save for the adit mentioned later, were filled with water and could not be examined. An adit is driven 5 feet above river-level on a bearing north 72 degrees west for a distance of 50 feet, in schistose argillites north of the quartz exposure at the point shown on the map. A small quartz vein 18 inches wide is exposed at 3 feet from the portal. A sample, across 18 inches, assayed: Gold, 0.02 oz. per ton; silver, 0.4 oz. per ton.

It is understood that a winze was sunk to a vertical depth of 50 feet at the end of the adit, and connected by a cross-cut to a shaft, sunk immediately south of the quartz exposure.

Two hundred feet west from the portal of the adit is a shaft sunk in gravel to a depth of 17 feet, and full of water at the time of examination.

No. 34

ANNUAL REPORT OF THE MINISTER OF MINES

FOR 1936

PART D -- Special Report
by

J. S. Stevenson - Assistant Mining Engineer.

Jamieson-Lanes Creek Area - This area lies on the west side of the North Thompson River and may be reached from Kamloops by a road on the west side of the river; Lanes Creek being 12 miles and Jamieson Creek 15 miles distant from that city. The area includes the following groups of claims and properties: In the vicinity of Jamieson Creek -- Honestake, Molly Gibson, Francis (Mackay) group, Gold Bug, Hykaway's, Bear Cat; between Jamieson and Lanes Creek -- Shue Fly, Polestar, Lakeview; and in Lanes Creek and its tributary, Porphyry group and the Royal Inland.

Three short roads and numerous pack-horse trails furnish access westward in to the area. A road beginning half a mile north from Lanes Creek goes for 1½ miles to the Inskip ranch; another commencing half a mile south from Jamieson Creek leads to the Hyde ranch; and another goes for half a mile up Jamieson Creek from the road to an irrigation dam; formerly a wood-road followed up this creek for three miles, but high water has washed out the small bridges.

For the most part the area consists of rolling and partly open range-land, but above 3000 feet and on the steep slopes into Jamieson Creek, dense growths of small to medium-sized conifers prevail; details of local topography will be given in the individual descriptions of the properties to follow.

Two cross-cutting stocks of granite characterize the area. The northerly of these has a minimum diameter of 1 mile, and is exposed north-easterly from Jamieson Creek, on the Honestake and Molly Gibson claims. Jamieson Creek and a narrow area of sediments intervene between this, and the southerly stock. Outcroppings of this stock extend southward along the west valley-side of the North Thompson for 2 miles, to within 1 mile of Lanes Creek, and westward for about a mile and a half. The granite is a peculiar type; it weathers to a yellowish surface, is medium-grained, and contains conspicuously blocky orthoclase and sodic plagioclase in about equal amounts, considerable quartz and small amounts of greenish biotite. In view of the sodic nature of the plagioclase and lack of monzonite texture the rock is described better as a granite rather than a quartz monzonite.

The emplacement of these granite stocks was followed by the intrusion of numerous feldspathic dykes. These include feldspar

porphyry and feldspar-quartz porphyry that transect the intruded rocks for some distances from the granite. A characteristic of these dykes is the widespread occurrence in them of short quartz veins filling transverse fissures and extending only from wall to wall of the dyke.

The intruded rocks include a few outcrops of altered greenstone and a series of slightly metamorphosed sedimentaries that commonly strike north 20 degrees west and dip 25 degrees north-easterly, although there are local variations to north-easterly strikes and south-easterly dips. The sedimentaries comprise black argillites, paper shales, phyllites, quartzites and hornfels, all somewhat limy. That a considerable thickness of these rocks occurs is indicated by the fact that in traverses up Jamieson and Lanes Creeks, which flow south-easterly, the author found the same group of rocks to prevail for 6 miles up either creek.

The mineral deposits in the area consist of sparsely mineralized quartz veins, containing small amounts of gold. The following vein-types occur:

- (1) The filling of 1 set of fractures of a conjugate fracture-system in the granite, such as those on the Homestake and Molly Gibson.
- (2) Filling transverse fissures in porphyry dykes, such as those on the Gold Bug, and Francis.
- (3) Irregular lenses in the sedimentary cover-rocks. This is the commonest type.

The sulphides found in the quartz include small amounts of pyrite, galena, sphalerite, and arsenopyrite. For the most part the veins lack persistence both along their strike and dip, and none have so far been proved to have values high enough or sufficiently persistent to indicate commercial ore.

Three of these properties have been known for some time; Dawson describes the Homestake occurrence in his Kamloops Memoir published in 1896; the Molly Gibson has been described in the Minister of Mines Report for 1899, and the Polestar in the same Report for 1913.

Most of the recent work on the various properties has been done, however, since the increase in the price of gold to \$35.00 an ounce.

A bibliography of the properties includes: the Geological Survey of Canada, Part B, Volume 7, 1896, on the Kamloops

map-sheet, and the Geological Survey of Canada Summary Report, 1921, Part A, on the North Thompson area; and the Annual Reports of the Minister of Mines, for 1899, 1901, 1904, 1913, 1930, and 1931.

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Homestake. -- The Homestake property comprises only the Homestake Crown-granted claim located as such in 1904 though previously staked; and owned by O. Redpath (deceased), Catherine C. Way, and Thomas Bulman, all of Kamloops.

The workings and cabin lie between elevations of 2500 feet and 2700 feet on the gentle slopes of a semi-open hilltop, approximately 1 mile north-west from the highway and $\frac{1}{2}$ mile north-east from Jamieson Creek. They may be reached by a pack-horse trail $1\frac{1}{2}$ miles long which leaves the west side of the highway at a place approximately $\frac{1}{2}$ mile north of the highway bridge across Jamieson Creek.

The deposit consists of quartz veins, some filling fissures that follow the direction of most prominent jointing in a stock of granite, and others representing replacement from such fissures to form thick, lenticular bodies. These veins pinch and swell noticeably along both strike and dip, from a maximum of 15 feet to a mere joint. In one good exposure, as many as five veins were seen across a 20-foot width; these however, pinched and swelled along the plane of the confining joint in the granite. The workings explore only the three widest and most continuous veins on the property; these veins vary in strike from north 30 degrees west to north 45 degrees west and in dip from 60 degrees to 80 degrees south-west. The sulphide content of the quartz is small, and consists of predominant pyrite with a little galena, sphalerite and arsenopyrite.

The granite is a peculiar type. It weathers to a yellowish surface; is medium-grained and contains conspicuous blocky feldspars, orthoclase and sodic plagioclase in about equal amount; considerable quartz, and small amount of biotite; with the plagioclase non-calcic it could be termed a quartz monzonite, but in view of the sodic nature of the plagioclase and lack of monzonite-texture it is deemed preferable to call it granite.

Of the surface workings, most of which were caved, 8 opencuts, 1 adit, and 3 shafts were seen by the writer. That most of the underground workings have opened up considerable bodies of quartz is indicated by numerous conspicuous dumps of quartz.

120 feet north 10 degrees west from the cabin an adit, now completely caved, has been driven into the hillside at north 30 degrees west, encountering slightly mineralized quartz and granite as evidenced by material on the dump.

In the same direction, north 30 degrees west up the hill and 60 feet, 80 feet, and 100 feet respectively from this adit, 3 open-cuts in the granite expose parts of 3 quartz lenses, ranging from a few inches to 7 feet in thickness. A picked sample from the uppermost cut, containing galena and pyrite, assayed: Gold, 0.42 ounces per ton; silver, 12.2 ounces per ton.

Forty-five feet in a direction north 60 degrees west, an inclined shaft, now completely caved but of reported depth 75 feet (Annual Report of Minister of Mines 1930, page 190), has been sunk at an angle of 60 degrees to the south on a quartz vein that appears to have a width of 15 feet, as estimated from its occurrence both in and out of the shaft.

Twenty-five feet below the prominent top of the hill, which is 450 feet, north 15 degrees east and approximately 175 feet above the inclined shaft, a small cut exposes a 15-inch quartz vein containing a small amount of pyrite and galena therein striking north 10 degrees west, and dipping 70 degrees south-west. It is to be noted that the attitude of this vein is definitely that of the jointing in the granite forming the surrounding low bluffs.

A second shaft, elevation approximately 2650 feet, has been sunk for approximately 30 feet from a point 370 feet south 50 degrees west from the shaft first described. The south wall shows three two-inch quartz veins, these are represented on the north wall only as a zone of slight shearing containing a small amount of quartz. The shaft was inaccessible at the time of examination but the dump showed quartz carrying considerable pyrite, a little arsenopyrite, galena and sphalerite. A sample of this quartz assayed: Gold, 0.1 ounces per ton; silver, 4.0 ounces per ton. Between twenty-five feet and 50 feet north-west from this shaft, two strippings expose the possible north-westward continuation of the quartz as a 12-inch vein in the typical granite.

150 feet in a direction south 35 degrees west from the 2nd there is a 3rd shaft about 10 feet deep which has been sunk on a branching quartz vein, ranging from 10 inches to 2 feet in width, from north 45 degrees west to north 10 degrees west in strike, and from vertical to 45 degrees south-west in dip. The quartz contains considerable pyrite.

An 18-inch quartz vein, associated with smaller ones, all striking north 20 degrees west and dipping 60 degrees south, occurs in a cut 200 feet south 10 degrees west from the 3rd shaft. This cut is 20 feet up from the base of some steep, rocky bluffs and is approximately 75 feet lower in elevation. Some 200 feet south-west around the base of the bluffs a lenticular quartz vein is exposed. The quartz is 18 inches to 2 inches in width, strikes north 30 degrees west and dips 65 degrees south-west.

The only sediments seen in any of the workings were some badly mashed shales in a caved trench in the flat, open area, some 400 feet south-west from the rocky bluffs.

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Molly Gibson. -- The Molly Gibson is a Crown-granted claim located in 1896. It adjoins the Homestake immediately on the south-west and extends down the open bluffy hillside to within 600 feet (vertical) of Jamieson Creek.

The workings are few, and the writer only found one caved, and evidently shallow, shaft, and 2 open-cuts. The shaft is at an elevation of 2300 feet and some 1200 feet horizontally south from the most southerly or 3rd Homestake shaft. The walls of the Molly Gibson shaft show a quartz vein, 1 foot wide, striking north 30 degrees west and dipping 25 degrees south, in a 3-foot zone of shearing in the granite. The quartz contains small amounts of galena and pyrite.

Approximately 500 feet to the south-west there are 3 small cuts on a lenticular quartz vein varying from 10 inches to 3 feet in width. The strike is north 20 degrees west and the dip is steeply southward. The quartz shows no sulphides.

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Francis Group. -- The Francis Group includes six claims, the Francis, Alexander, City, Ethal, Jenny and Brass Tacks, variously staked in 1933, 1934 and 1935, and owned by George Mackay, Kamloops.

There are two groups of workings. The first group, including the cabin, is on Jamieson Creek, 3600 feet upstream from the dam on the Creek, the dam being 1½ miles north-west from the highway, and may be reached by road as far as the dam and thence by good trail to the workings. A wood-road was formerly available, but this road crossed the creek several times and the log bridges have been washed away. The second group, an adit and an open-out, lies at an elevation of 1150 feet on the open hillside approximately 1500 feet north-west from the dam, and be reached by following the road to the "Hyde place" for three-quarters of a mile from the highway, the workings being only a few hundred feet north-west from this road.

A working 2500 feet upstream from the dam consists of a right-angled out 50 feet above the trail, which has been driven along a pink feldspar dyke for 18 feet at north 30 degrees west on a 30 degree upslope, and from the south-east end of this slope, driven for 17 feet at north 60 degrees east on a downslope of 30 degrees. The dyke is 4 feet thick, strikes north 10 degrees east and dips 20 degrees north-east, cutting paper-thin shales at a small angle. The dyke is cut by numerous ladder veins of quartz, which terminate at the dyke-shale contact, vary from 2 inches to one vein 12 inches thick, and contain small amounts of pyrite, arsenopyrite and chalcopyrite. A sample across the 12-inch vein assayed: Gold, trace; silver, trace. One of picked material assayed: Gold, .01 ounces per ton, and silver, 0.2 ounces per ton.

The adit, at an elevation of 1450 feet and 200 feet in a direction 550 feet east from the cabin, has been driven 59 feet in a direction north 70 degrees east across alternating shales and coarser-grained clay sediments, all of which have been intruded by numerous sill-like quartz stringers; the sediments strike north 20 degrees west and dip 25 degrees north-east, although the uniformity of attitude is modified by numerous small drag folds of amplitude varying from 1 inch to 1 foot. A shaft, 10 feet deep, has been sunk at the face of the adit on a fractured zone 2 feet wide, striking north 10 degrees west and dipping 80 degrees east. There is no mineralization in the zone.

Two hundred feet horizontally and 225 feet vertically in a north-east direction from the adit, a pit, measuring 10 feet in each direction, has been dug across the full width of a feldspar-porphry sill that is traversed by numerous quartz ladder veins; these are lenticular, varying in thickness from ½ to 3 inches and containing small amounts of pyrite.

The sill is in paper-shales that strike north 20 degrees west and dip 55 degrees north-east. Below the adit and only 10 feet above the creek bed, there are the remains of three caved adits, which were presumably wholly in old creek gravels. Blasting in a feldspar-porphyry sill, striking north 40 degrees east and dipping 30 degrees south-east, 300 feet west from and 700 feet above the dam, has exposed some small quartz ladder veins; the mineralization has been slight.

The workings south-west from Jamieson Creek consist of an open-cut at an elevation of 1750 feet, and approximately 500 feet north of the Hyde road, and of an adit at an elevation of 1650 feet and 235 feet horizontally at north 47 degrees east from the cut.

The cut, approximately 15 feet in diameter, is on a quartz-feldspar porphyry dyke, similar in attitude to that in the adit below, of which it is the probable continuation. The adit has been driven south 38 degrees east for 30 feet, south 15 degrees west for 20 feet and south 45 degrees west for 10 feet. For 30 feet from the portal it cuts lustrous black phyllites and then enters a feldspar-porphyry sill, that strikes north 25 degrees east, dips 25 degrees south-easterly, and has a minimum width of 10 feet. The sill is cut by quartz gash veins up to 8 inches wide and these contain small amounts of pyrite, galena and sphalerite.

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Gold Bug. -- The Gold Bug group includes the following mineral claims, variously staked 1933, 1935 and 1936: Gold Bug, Eagle, Iron Cap, King Tut, Golden Axe and Porcupine. They are owned by Mike Salk and associates of Kamloops, B. C.

The workings are between elevations of 2800 feet and 3000 feet, on the north-west side of a small creek that is the first tributary upstream entering Jamieson Creek from the south-west.

The property is reached by a trail $4\frac{1}{2}$ miles long from the dam on Jamieson Creek. This route follows the old wood-road up the creek for 3 miles to the tributary creek, and is quite passable for horses, but from here the trail climbs the steep clay side-hills up the side creek and at present is unsuitable for pack-horses. Near the camp and workings the sparsely-wooded hillside slopes steeply and uninterruptedly to the creek bottom some 400 feet below.

The mineralization consists of quartz-filled fissures in sill-like intrusions of feldspar porphyry, and of irregular quartz lenses in sediments, which vary from shales to phyllites and include small thicknesses of biotite hornfels. The workings include a small open-cut, two vertical shafts, and workings therefrom.

The open-cut is 70 feet south 18 degrees westerly from the cabin and exposes a few small blebs of quartz in porphyry.

The first shaft is 120 feet above the cabin and 240 feet horizontally in a direction south 70 degrees east from it. This shaft is 28 feet deep and has been sunk on a quartz-filled fissure which cuts 2 sills of feldspar porphyry. From the collar to 15 feet down the shaft cuts porphyry, the $1\frac{1}{2}$ feet of shale, then 3 feet of porphyry, after which it cuts shale for the remaining $8\frac{1}{2}$ feet to the bottom. The shale-porphyry contacts, which are conformable, strike north 60 degrees east and dip approximately, 40 degrees southerly. The vein, which strikes north 25 degrees west, and dips steeply north-east, varies in width from 4 inches to 6 inches and contains little sulphide. It is to be noted that the vein-fissure and contained quartz are considerably dissipated in the $1\frac{1}{2}$ foot middle shale-layer, and that in the lower shale layer, the fissure and the quartz have disappeared, indicating the incompetency of the shale to carry a clean-cut, open fissure, after the manner of the massive porphyry.

From the bottom of this shaft a level has been driven north 75 degrees east for 28 feet. Except for the roof, parts of which are in the lower porphyry sill, this adit, as well as the lower two, is in sediments which vary from shales to phyllites and to more massive quartz biotite hornfels.

Seven feet from the main shaft, another has been sunk from the first level to the second, 8 feet below. This has been driven south 64 degrees east for 20 feet. From this level two shallow shafts have been sunk, one, 5 feet from the face and 9 feet deep, and the other, 9 feet deep, from near that shaft extending between the first and the 2nd levels.

From this latter shaft a short level has been driven north 10 degrees east for 8 feet.

In all these levels the mineralization consists of short lenses of quartz in the shales. These lenses have no continuity along either their strike or dip. The maximum width of most lenses is 8 inches, and the sulphide mineralization is sparse, consisting of small amounts of pyrite and galena.

Four samples were taken across the various lenses in these levels and with one exception from the third level down which assayed gold, trace, silver, 0.6 ounces per ton, they assayed nil in gold and silver.

The upper shaft is 75 feet above the first and 110 feet north 60 degrees west from it. This shaft is 35 feet deep but the absence of ladders made it inaccessible. However, it could be seen that the shaft is partly in porphyry and partly in wavy phyllite, the latter containing numerous small lenses of quartz.

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Bear Cat. -- The Bear Cat group includes 8 mineral claims, Bear Cat Nos. 1 to 8 inclusive, staked in 1934 and owned by G. P. Miles and associates of Kamloops and Vancouver.

The only working, an adit, is at an elevation of 2500 feet on the north-east side of a small creek, the second one upstream flowing eastward into Jamieson Creek. The working may be reached from the dam on Jamieson Creek by 4 miles of trail which partly follows the old wood-road up Jamieson Creek; and then by another half a mile of steep trail up the tributary creek. The topography in the immediate vicinity of the adit consists of partly wooded steep hillsides and of bluffy gullies leading into the narrow creek bed.

The adit has been driven south-easterly for 80 feet, 70 feet of this being on a lenticular quartz vein, dipping steeply eastward, and ranging in width from 14 inches at the portal, to 6 feet at the top of winze, 40 feet in, which has been sunk 16 feet on the vein, to a knife edge at 70 feet and then disappearing as a joint in the wall-rock. The vein-quartz is sparingly mineralized with pyrite, chalcopyrite, sphalerite and galena, sampling of which showed only traces in gold and silver. The wall-rocks comprise limy phyllites and schists that strike north 25 degrees east and dip steeply south-easterly but near the portal they are highly contorted and 15 feet in, a small indefinite anticlinal structure occurs. Numerous cross-joints in the wall-rocks have been filled by $\frac{1}{2}$ inch quartz-calcite stringers.

Shue Fly. -- The Shue Fly group consisted of the Shue Fly Nos. 1 to 7 inclusive, and Shue Fly No. 10 mineral claims staked in 1934, owned by R. M. Reid and associates of Louis Creek, B. C.; these claims have, however, since expired.

The workings are situated on an easterly sloping open hillside between elevations of 2700 feet and 3000 feet equidistant between Jamieson and Lanes Creeks.

The property may be reached in part by a switch-back road $1\frac{1}{2}$ miles long leading from the west road up the North Thompson, from a point $\frac{1}{2}$ mile south of Jamieson Creek to the old Hyde ranch. From the ranch the open range affords easy horse travel to the workings, 1 mile to the west and north-west.

In the vicinity of the workings the area is semi-open range-land partly covered by weathered groves of small pine; near the adit the ground slopes steeply to the east but near the open-cuts the slope, still eastwards, is much less steep.

Three groups of workings were visited by the writer. These consisted of the south showings, comprising 1 adit and a large open-cut westward therefrom; the central showings comprising a group of 5 pits, $\frac{1}{2}$ mile north 30 degrees westward from the adit; and the north showings, comprising a group of 2 pits one-half a mile north 30 degrees east from the central group.

The adit, at an elevation of 2700 feet, has been driven west into the side of the hill for 21 feet from the cap, the outer 9 feet being open-cutting. Five feet in from the cap a nearly vertical 1 to $\frac{1}{2}$ inch quartz-calcite stringer strikes north 25 degrees west across the adit; at the face another similar one occupying a tight slip strikes north 45 degrees west and dips 65 degrees south-west. In the face, also, there is a quartz veinlet $\frac{1}{2}$ inch to 1 inch thick which contains some pyrrhotite. This strikes north 25 degrees west and is vertical. The wall-rock consists of dense, highly altered greenstone which in the face is jointed and contains finely disseminated pyrite and pyrrhotite, and of a contorted band of silicified argillite between 5 feet and 9 feet from the cap; this strikes north-west across the adit and is approximately vertical.

Fifty feet under the north end of the hill above the adit and approximately 100 feet above, an open-cut exposes an area of quartz 6 feet by 6 feet; this is quite lenticular, the maximum and minimum thickness being 3 feet and 2 inches respectively. The lens is in a feldspar porphyry dyke, which is 15 feet wide, strikes north 85 degrees west, and dips steeply towards the north. With the exception of another porphyry

dyke, of indeterminate attitude, the remaining rock on the hilltop above the west of the open-cut is massive greenstone containing minute amounts of disseminated pyrrhotite.

The central group, one-half mile north 30 degrees west from the adit, consists of a group of 5 open workings randomly distributed. On the south-east, Nos. 1 and 2 workings consist of two 10-foot open-cuts, No. 2 being 35 feet in a direction north 60 degrees west from No. 1. No. 1 is across alternation biotite schists, shales and quartzite bands containing disseminated pyrite; the various beds striking north 30 degrees east and dipping 20 degrees. No. 2 is across similar rocks but on the sloping face it exposes a quartz vein containing a little galena; the vein strikes north-east and dips 30 degrees south-easterly.

No. 3 is a shallow pit 8 feet in diameter, 82 feet in a direction north 27 degrees east from No. 2. It exposes an 8-inch to 10-inch barren quartz vein lying between a quartzite band and schists which strike north 20 degrees west and are nearly vertical. No. 4 is a 20-foot trench 146 feet in a direction north 52 degrees west from No. 3. It has been driven north 73 degrees west across schists and 2-inch to 3-inch quartzite bands. Three feet from the face it cuts a quartz lens pinching from 6 inches to 2 inches, and containing some galena, pyrite and chalcopyrite.

No. 5, 60 feet north 10 degrees west from No. 4, is a 10-foot area of irregular blasting in a quartz lens up to 12 inches thick, which lies both with the schist and across it. The quartz contains some pyrrhotite, sphalerite, galena and chalcopyrite. One hundred feet and 250 feet south-west from here there are two outcrops of feldspar-porphry.

The north showings consist of two 10-foot pits situated $\frac{1}{2}$ mile north 30 degrees east from the central groups. They represent blasted pits in typical feldspar-porphry that is traversed by $\frac{1}{2}$ -inch gash-veinlets of quartz and calcite, containing small amounts of pyrite, galena and sphalerite.

Polestar. -- The Polestar property comprises but one claim, the Polestar, Crown-granted and owned by the Frances Gold Mines, Limited, 829 West Pender Street, Vancouver, B.C.

The claim is at an elevation of 3350 feet and approximately 1 mile north-east from Lanes (Noble) Creek.

It is reached by 1½ miles of switchback road from the west road up the North Thompson River to Inskip ranch, thence by 2 miles of good pack-horse trail to the property.

The workings are on the southerly slopes of rounded knolls lying in open range land.

The rock formation is coarse feldspar porphyry, containing in one place a silicified remnant of phyllite. Lenticular quartz veins occur in the porphyry, and vary in thickness from 8 feet in the shaft, to a few inches in the open-outs.

The workings consist of 3 strippings irregularly distributed for 52 feet in a direction north 50 degrees west, and an inclined shaft 70 feet in a direction south 40 degrees west from the south-east end of the strippings.

The shaft is 35 feet deep and slopes at an angle of 42 degrees in a direction south 70 degrees east. It has been sunk on a quartz lens which, in the immediate vicinity of the shaft, is 8 feet wide, strikes north 17 degrees east, and dips 42 degrees south-east. The footwall-rock is bleached porphyry. The hanging-wall of the vein was not visible in the shaft. Sulphides are not abundant in this quartz, only small amounts of galena being present. A picked sample of this material assayed: Gold, 0.08 ounces per ton; silver, 8.6 ounces per ton. That higher-grade material has heretofore been found is indicated by the Annual Report of the Minister of Mines for 1913.

The 3 strippings have been attempts to find the continuity of this 8-foot quartz lens along its strike to the north-east. The strippings disclose only small disconnected lenses of quartz in porphyry. In the most north-westerly stripping 16 feet long an 8-inch lens of quartz has much the same strike as the vein in the shaft, and has furthermore its on the projected strike and dip of the shaft-quartz. The most south-easterly stripping, 22 feet long, exposes 2 portions of an 8-inch vein which strikes north 55 degrees west and dips 60 degrees north-east. The centre stripping, 12 feet long, shows only porphyry and debris. The porphyry in these strippings is cut by 2 shear-zones which strike north-west and dip north-east. These zones are only a few inches wide, but

the porphyry in them has been transformed into paper-schist. On the north-east side of the north-west trench a small patch of silicified argillite is exposed. This strikes north 60 degrees west and dips 70 degrees north-easterly. This is, however, not extensive, the main exposures in the vicinity of the workings being porphyritic granite.

The Lakeview Group formerly consisted of 8 mineral claims Lakeview Nos. 1 to 8 inclusive, staked in 1934 by R. M. Reid of Louis Creek, and variously owned by a group of Kamloops people. These claims have all lapsed.

The group, at an elevation of 3550 feet, was located in moderately timbered range land which slopes gently to the south-west and south-east. The workings lie 500 feet north-west from O'Connor Lake, a small shallow lake 1 mile north-east from the forks of Lanes and Macauley Creeks.

The property is reached from the main west road up the North Thompson River by $1\frac{1}{2}$ miles of steep switchback road to Inskip's ranch thence by 3 miles of good pack-horse trail through open country to the workings.

The workings consist of 2 open-cuts and 2 shallow pits. The lower cut has been driven north 35 degrees east for 20 feet into the grassy hillside; it is mostly in overburden but the last 6 feet are in altered porphyritic olivine-basalt, containing abundant olivine and augite. This is cut by a vertical shear-zone 2 feet wide, striking approximately east-west; there are no sulphides in this zone.

The second open-cut lies transverse to the first, the middle of it being 30 feet up the hill in a direction south 30 degrees west from the first. The work consists of a shallow stripping on a quartz vein for 16 feet in a direction north 40 degrees west and a 6 foot by 6 foot pit 2 feet deep on the north-west end. The quartz vein strikes north 40 degrees west, dips 45 degrees north-easterly, and ranges from 2 inches to 24 inches in width. It carries small amounts of pyrite, chalcopyrite and arsenopyrite. The country rock is massive silicified argillite and contains fine pyrite for a distance of 1 foot from the vein.

A sample taken from the north-west end of the pit and across 2 feet of quartz containing a little pyrite, chalcopyrite and some arsenopyrite assayed: Gold, .01 oz. per ton; silver, trace. A sample of the wall rock on the south-east end of the pit and for 8 inches from the hanging-wall of the quartz vein assayed: Gold, nil; silver, nil.

The vein has not been traced along its strike; of two pits lying north-west along the strike, one shows only silicified country rock, the other only debris. Within 500 feet northeast from the second trench there are four scattered outcrops of coarse feldspar-perphyry, which are in contact with silicified argillite on the south-east; excepting that found in the first trench, no other augite porphyry was exposed at the time of examination.

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Porphyry Group. -- The Porphyry Group includes 3 mineral claims, the Porphyry, Argyllite and Red Oxide, staked in 1936 and owned by Joseph H. Reid and associates of Kamloops, B. C.

The workings are on the valley bottom of Lanes (Noble) Creek, and include one group 900 feet west of the North Thompson highway and another group $\frac{1}{2}$ of a mile upstream on Lanes Creek from the highway.

Of the group near the highway, one adit has been driven north-west for 52 feet across interbedded black argillites and grey chert bands the latter probably representing highly silicified argillite. A 2-foot feldspar dyke was cut 10 feet in from the portal. The sediments strike north 50 degrees west and dip 30 degrees south-west; the dyke strikes north 50 degrees east and is approximately vertical.

The mineralization consists of numerous small pyrite nodules in the argillite and of a $\frac{1}{4}$ -inch stringer of quartz in a side-swiped portion on the north-east wall.

120 degrees south-west from the first, a second adit has been driven north 17 degrees east for 15 feet and north 30 degrees west for 18 feet across the contact; at 15 feet from the portal, of a highly altered greenstone dyke on the south-west and sediments such as those in the first adit. The contact strikes north 30 degrees west and dips 60 degrees north-easterly. Pyrite is present as nodules in the argillites; there are no quartz veins.

The workings, three quarters of a mile upstream on the Argyllite and Red Oxide claims consist of 2 or 3 small cuts which, in addition to the creek bed, expose crumpled argillites veined by numerous $\frac{1}{4}$ inch to $\frac{1}{8}$ inch quartz stringers; both argillite and quartz containing disseminated pyrite. Samples of this material assayed a trace in gold and silver.

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Royal Inland. -- The Royal Inland Group consists of 4 mineral claims, Royal Inland Nos. 1 to 4, located in 1935 and owned by Jas. H. Reid and associates of Kamloops. These claims are at an elevation of 4000 feet on Macauley Creek, the cabin and workings being near the junction of Macauley and Williams Creeks; these creeks are the headwater tributaries of Lanes (Noble) Creek.

The property is reached from the main west-road up the North Thompson River by $1\frac{1}{2}$ miles of steep switchback road to Inskip's ranch, thence by 5 miles of good pack-horse trail $2\frac{1}{2}$ miles of which is through open range, the remaining $2\frac{1}{2}$ miles through a dense growth of small timber.

In the vicinity of the only working, which is in the creek bottom, the valley of Macauley Creek, though steep-walled, is less than 100 feet deep; the surrounding topography consists of the low rounded hills marking the south-eastern side of the Tranquille Plateau. The forest cover consists of a dense growth of small conifers.

The main working is an open-pit and shallow shaft on the north-east side of Macauley Creek. This out has been driven north 10 degrees east for 12 feet and south 80 degrees east for 6 feet; at the end of this a shaft has been sunk 6 feet from the floor, which is now approximately 2 feet below the portal.

The out and shaft indicate that mineralization has occurred along the contact of a feldspar-perphyry intrusion and shales. The contact strikes north 70 degrees east and is vertical; the shales strike north 55 degrees east and dip 55 degrees south-east.

Along the contact the 2 adjoining rocks have been considerably altered by mineralizing solutions. The shales have been irregularly silicified for as much as 3 feet from the contact, the porphyry has been silicified and carbonatized over a zone approximately 5 feet in width; disseminated grains of cubic pyrite are common in this zone. A bulk sample of this altered and mineralized porphyry assayed: Gold, nil; silver, nil. The only additional mineralization is the development of $\frac{1}{2}$ inch veinlet of calcite, quartz and pyrite in a short gouge-filled fissure of average east-west strike and vertical dip. A bulk sample from this veinlet assayed: Gold, .01 ounces per ton; silver, 0.1 ounces per ton.

Two small and intersection faults cut and displace the contact; these faults strike 0 degrees west and south 35

degrees west; dip 10 degrees north and 90 degrees respectively. A sample taken from the intersection of these faults assayed: Gold, nil; silver, nil.

On the south-west side of Macauley Creek and approximately 500 feet below the first working described, some small blasts cut in a 10 foot by 10 foot bluff expose some 1/2 inch to 2 inch quartz-calcite stringers cutting quartzites and intruding feldspar porphyry; the quartzites strike north 60 degrees east and dip 45 degrees south-east; the porphyry strikes north 25 degrees east and dips 45 degrees north-west.

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ANNUAL REPORT OF THE MINISTER OF MINES
FOR 1936.

Part F -- Special Report

by

B. T. O'Grady.

NANI. This property, consisting of 16 claims held by location and owned by A. Nani and C. H. Unverzagt, is in the Vancouver Mining Division, being situated to the south-east of Daisy Lake which is on the eastern side of the Pacific Great Eastern Railway (see B. C. Department of Lands Pre-emptor's Map No. 3-K, Lillooet Sheet).

The area between the railway at 1,126 feet elevation and the lake, at 1,185 feet elevation, consists of gently undulating, wooded bench land. The workings, at elevations of from 1,700 to 2,075 feet, are on the rock-strewn, lightly wooded side-hill sloping westerly at from 30 degrees to 35 degrees to the flats below. The camp, adjoining the lake, is connected by a rough, narrow road, 2 miles in length, with Garibaldi station. The general geology of the area is shown on Publication No. 1711 accompanying the "Reconnaissance along the Pacific Great Eastern Railway between Squamish and Lillooet", Geological Survey of Canada Summary Report, 1917, Part B. In the immediate vicinity of the workings there are argillites, and sandstones grading to conglomerates, these being members of the stratified series, referred to the Jura-Triassic, which are shown as a band striking north-westerly towards Brew (now Brandywine Falls) between areas of granodiorite of the Coast Range batholith of Upper-Jurassic age. The local strike of the rocks is north 50 degrees west, dips being approximately vertical. Traversing highly metamorphosed argillites in an easterly-westerly direction there is a meandering body of quartz which, very irregular in width and attitude, lacks definite structural boundaries. The main showing, up to 15 feet wide with country-rock inclusions, has a southerly dip into the hill of from 20 degrees to 30 degrees.

Mineralization, which is light, consists of scattered streaks and disseminations of pyrite and chalcopyrite occurring chiefly along the walls or in shattered quartz areas. Oxidation is not important, being limited to iron stain with occasional decomposed streaks and quartz containing sulphide casts. Of five samples taken by the writer, at comparatively well-mineralized points, the highest values, contained in selected material, were: Gold, 0.12 oz. to the ton; silver, 3.6 oz. to the ton; copper 2.0 per cent.

The nucleus of the present holdings was formerly known as the Venetian group, the older part of the workings having been driven between 1917 and 1919. Work under A. Nani started in 1935, the property having been inactive in the interval.

From east to west the outcrop is well exposed between the portals of underground workings, 54 feet apart, at 2,075 and 2,050

foot elevation respectively. At the upper point, where a 20-foot crosscut-approach leads to a winze, there is on the western side of the portal, a 14-foot width of quartz with 15 inches of included rock towards the footwall-side while on the east side of the portal the same width of quartz contains rock inclusions throughout the 6-foot foot-wall section. Between this latter point and the lower point specified, where a 15-foot crosscut has been driven, the quartz outcrop is rolling and irregular with much included rock in places. The irregular, rusty quartz areas along the outcrop are sparsely mineralized with sulphides. Reverting to the upper location some pockety occurrences appear to have been stoped by the former operators adjoining the 20-foot crosscut-approach. Selected material from a stringer here assayed as stated previously. The winze is sunk in a somewhat small section on a slope of 30 degrees to south 20 degrees east. Believed to be about 50 feet deep, but only open for examination to the water level at 34 feet down, the winze is all in quartz with included bands or horses of rock. The quartz, rusty and shattered for the most part, is irregularly mineralized with disseminated pyrite, occasional chalcopyrite and decomposed streaks. A sample, across 4.75 feet at 29 feet down the winze, assayed: Gold, 0.03 oz. to the ton; silver, 1.0 oz. to the ton; copper, nil; and another, across a width of 4.25 feet, 5 feet below the collar, assayed: Gold, 0.01 oz. to the ton; silver, 0.2 oz. to the ton. The 15-foot crosscut, driven south 25 degrees east at 2,050 foot elevation, is all in irregularly mixed quartz and rock. A sample across 18 inches of quartz, being apparently the best mineralized section, located on the footwall-side adjoining the portal, assayed: Gold, 0.06 oz. to the ton; silver, 1.4 oz. to the ton; copper, 1.0 per cent. From here to the face rusty quartz areas contain rare sulphides. Going north-west down the steep hill-side there is an adit at 2,120 foot elevation which, with two main branches, develops the ground below and adjacent to the previously described upper workings. The main course, driven 172 feet to the south-east, contains two crosscuts to the south, 25 and 16 feet long respectively, driven at points 80 and 123 feet in from the portal. Underlying an andesite dyke, up to 4 feet wide, which dips at 40 degrees to the south-west, and on the south-western side of the adit between the last mentioned crosscut and a winze, 6 feet deep, at a point 20 feet to the north-west, there is a lens of quartz, of irregular width up to 2 feet, which splits into indefinite stringers at each end. A sample across 2 feet of quartz, with minor amounts of calcite and some included rock, assayed: Gold, 0.02 oz. to the ton; silver, 0.4 oz. to the ton. At the bottom of the winze this lenticular showing pinches to a streak of quartz. At 35 feet in from the portal a branch working extends southerly for 45 feet, then south-westerly for 45 feet, then southerly for 35 feet and finally easterly for 43 feet. In this working there is much quartz scattered irregularly in bands, lenses and stringers throughout the rock, no definite structure being observed. Sulphide mineralization, of generally sparse occurrence in the quartz, is found occasionally as streaks or disseminations of pyrite with rare

Nani.

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chalcopyrite. At the time of the writer's visit work was proceeding by hand in a lower crosscut, at 1,700 feet elevation, situated to the north-west of the above adit workings. At October 22nd, 1936, this lowest working, in sandstone containing scattered pebbles, had been driven 130 feet of which the first 100 feet was along a bearing of south 60 degrees east and the last 30 feet south 20 degrees east. Four men were then employed. The mine camp includes bunk- and cook-house accommodation for a crew of 12 men, and a manager's residence, garage, etc.

ANNUAL REPORT OF THE MINISTER OF MINES
FOR 1936.

Part F -- Special Report
by B. T. O'Grady.

DOUGLAS PINE The nucleus of this prospect, in the Vancouver Mining Division, consists of the Douglas Pine, Cone Fraction, Gold Exchange and Morning Star Crown-granted mineral claims owned by Abbott Estate, per Toronto General Trust Company. There are eight adjoining claims, held by location and owned by J. W. Morrison of Shoal Bay, who is the local agent for the above interests. The property is situated on East Thurlow island, 3,000 feet south-easterly from Thurlow (Shoal Bay) which is about 130 miles north-westerly in a direct line from Vancouver. The general character of the rugged topography of the island was indicated in the foregoing report on the Thurlow Gold Mines property.

The workings examined, ranging in elevation from 450 to 1,250 feet, are, with the exception of the shaft on a narrow bench, located on the very steep north-westerly slope to Cardero channel, the ground being densely wooded with second growth, among which are scattered large trees. The small cabin, at 800 feet elevation, is reached from Thurlow, first by a good trail about half-a-mile in length, then by steep foot-trail for about the same distance.

Owing to the dense vegetation and overburden, description of geological conditions is necessarily restricted to the immediate vicinity of the showings. Workings, at elevations between 890 and 1,250 feet, develop quartz lenses along a zone of shearing, known as the main vein, striking from south-easterly to southerly up the hill with steep north-easterly or easterly dips. A fine-grained, slightly porphyritic, white aplite dyke outcrops at numerous points along or adjacent to the western side of the occurrences. The vein and dyke are enclosed within augite andesite porphyry, a dark greenish porphyritic volcanic rock, frequently altered and silicified adjoining the deposits. The same formation is exposed in workings at 450 feet elevation where, at the portal of a crosscut, it is intruded by dark, medium to coarse-grained hornblende diorite. Microscopic examination of a specimen showed abundant albite-oligoclase, a few grains of orthoclase and a little interstitial quartz, felds consisting largely of green hornblende showing ophitic texture in regard to quartz. Relatively large apatites are present with minor amounts of chlorite and epidote. Veinlets carrying epidote, chlorite and calcite traverse the rock and iron ore is common. Minerals were present in the proportion of 40 per cent. albite-oligoclase and 50 per cent. hornblende.

The showings are generally short between numerous faults which cause minor westerly displacements going down-hill or north-orly. Mineralization consists of pyrite, pyrrhotite, and occasional chalcopyrite, the sulphides being usually of very sparse occurrence in the gangue of iron-stained quartz or crushed siliceous oxidized material. Selected specimens of the pyritic minerals show high gold values, with some silver. Work has also been done on three quartz veins, striking north-easterly with south-easterly dips of from 60 degrees to 70 degrees, in which iron sulphides are of rare occurrence and values correspondingly low.

Most of the underground work is reported to have been done in 1898 and 1899. References to the property are contained in the Annual Reports of the Minister of Mines for those years and for 1929 and 1930. In 1934 a small amount of development-work was done by the Pierce Mountain Mines, Ltd. Since then surface exploration has been carried on at intervals by J. W. Morrison.

Describing the "main vein" from the highest point, stripping and trenching on the steep slope at elevations of 1,250, 1,235, 1,220, 1,200, 1,180, and 1,100 feet, exposes at each point stringers, or lenses of quartz, containing rare sulphide mineralization, the showings being short and generally narrow with a maximum width of 3 feet. At 1,050 feet elevation there is an adit, driven south 50 degrees east for 44 feet, in which the vein, from 2 to 3 feet wide, is followed for 27 feet in from the portal to where it is cut off by a fault striking north 75 degrees east and dipping south-easterly at 50 degrees. At this point a 7-foot crosscut has been driven easterly along the inner or portal side of the fault. There is a massive streak of pyrite on the footwall-side at the portal, where the oxidized, copper-stained vein is 2 feet wide. Immediately adjoining the portal there is a shaft steeply inclined to the north-east, which is said to be 25 feet deep, but this is inaccessible and partly filled with debris. At 1,032 feet elevation just north-west of the shaft, an open-cut exposes a short length of quartz, with altered rock inclusions, 40 inches wide, which contains very scattered disseminations of pyrrhotite. In a large open-cut at 990 feet elevation, and 116 feet from the adit-portal, caving prevented inspection of conditions. At 960 feet elevation and 130 feet from the same initial point, an open-cut and stripping expose a patch of quartz, up to 54 inches wide, in a zone of cross-fracturing. A sample across 34 inches, containing disseminated iron sulphides, assayed: Gold, 0.02 oz. per ton; silver, 0.2 oz. per ton. In an open-cut at 948 feet elevation, and 146 feet from the adit-portal, there is a lenticular showing of quartz and oxidized material mineralized with iron sulphides where a sample, across 22 inches, assayed: Gold, 0.36 oz. per ton; silver, 4.0 oz. per ton. At 933 feet elevation and 151 feet from the same descriptive point, there is an 18-foot adit driven about south 40 degrees east along a slightly curving course. It develops an oxidized vein section, 2 to 1.5 feet wide and 6 feet

long, between points 12 feet in from the portal and the face. The north-western end of the showing is cut off by a fault striking easterly with a southerly dip of 78 degrees. A sample across 18 inches in the face assayed: Gold, 1.0 oz. per ton; silver, 1.4 oz. per ton; copper, 0.15 per cent. The vein was apparently picked up again as indicated by a poorly exposed showing in a trench, 25 feet long, situated 20 feet north-westerly from the adit portal, the displacement being about 14 feet. The collar of a shaft, at 890 feet elevation and 74 feet north-westerly from the portal of the 18-foot adit, is on a local narrow bench. This working, sunk south-easterly at about 60 degrees is not accessible, extensive caving around the edges having let loose a mass of timbers and rock which block entry from the top and from the adit connecting the shaft with the surface at the 40-foot level. The shaft was apparently sunk on a cross-vein at, or near, its intersection with the south-easterly shearing previously described. A selected sample from the shaft dump assayed: Gold, 0.50 oz. per ton; silver, 0.4 oz. per ton. The cross-vein, striking about north 48 degrees east and dipping south-easterly at 60 degrees, can be seen below the collar. On the surface just south-west of here it is cut off by a fault, but is picked up again in a few feet and exposed in the floor of a trench extending south-westerly for 22 feet. Here there are narrow streaks of quartz in a poorly defined zone up to 2 feet wide. The adit portal, at 850 feet elevation, is 95 feet north 60 degrees west from the shaft collar. This somewhat crooked working is driven about south 60 degrees east for the first 80 feet, then extends south 42 degrees east for 35 feet to where a small amount of stoping is said to have been done at the shaft connection. Caving prevented examination of the inner portion of the level. There are three short crosscuts in the section between chainage points 35 and 80 feet in from the portal where there is a zone of broken quartz bands, striking and dipping in various directions without definition or continuity. The quartz contains occasional spots of pyrite, sulphide mineralization being generally rare. The collar of a vertical shaft, said to be 30 feet deep, which was full of water, is situated at 870 feet elevation and 35 feet east of the adit portal. Continuing in a north-westerly direction down the steep slope from the shaft-adit workings, there are eight open-cuts enclosed within a length of about 300 feet extending along the 600-foot contour. These expose a quartz vein from 2 to 5 feet wide, which strikes approximately north 55 degrees east with steep south-easterly dip, the quartz, iron-stained in part, containing spots of pyrite at widely separated points. This vein has been traced for about 400 feet south-westerly from the open-cuts to a belt of argillites where it appears to terminate. At 450 feet elevation and north-westerly from the above open-cuts there is a crosscut driven south 20 degrees east for 45 feet. Just inside the portal it cuts an indefinite zone of quartz stringers which is along the trend of an outcrop striking north 65 degrees east with steep south-easterly dip, exposed by stripping and trenching adjoining the portal to south 65 degrees west for a length of 120 feet up to 500 feet elevation. The surface showings expose irregular

quartz streaks and bands up to 1 foot in width, the quartz being iron-stained in part and containing occasional spots of pyrite. A selected sample here assayed a trace in gold and silver.

Summarizing conditions, development-work has been scattered and inconclusive. The sulphide occurrences, as in picked specimens or samples at selected points, are localized in the section adjoining the 18-foot and 44-foot adits between 933 and 1,050 feet elevation. While no appreciable quantity of such ore is exposed, an objective for limited exploration is afforded by the good values in the face of the 18-foot adit and the sulphide showings adjoining the portal of the 44-foot adit. These indicate possibilities for discovering sulphide concentrations in the triangular area formed by the theoretical extension of the lower adit for about 185 feet to the projected position of the fault showing in the upper level. Development in this section might afford useful information regarding the character of the deposits.

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ASPEN MINE

Six Crown-granted claims, Aspen, Emma, Mohawk, International, Caroline and Silverton Fraction, comprise the ground on which the Aspen Mine workings are situated. These claims, according to current record, are held in the name of the Salmo-Malartic Mines Limited, Executive Office, 159 Bay Street, Toronto, Ontario.

The claims lie on the eastern side of Aspen (Deer) Creek except for the western tip of the Silverton Fraction. They are reached by a road up Aspen Creek, about 4.5 miles in length. This branch-road leaves the Sheep Creek road at a point about 3 miles easterly from the junction of the latter road with the Nelson-Nelway highway, some 4 miles southerly from the town of Salmo. The road up Aspen Creek climbs 1800 feet in its length of 4.5 miles.

The camp buildings are located on a flat not far from the creek, at approximately 4500 feet elevation. The ground rises gently to the east for 200 yards, then more steeply approaching prominent outcrops of limestone intruded by granite which rise steeply to the east. The "H" workings are about 100 feet above camp-level, while "B" tunnel is about 220 feet above camp. The elevation given on the mine plan would appear to be about 100 feet lower than the elevation shown on Geological Survey Map 299A.

This report is concerned principally with the "A" and "B" workings where most of the recent work on the property has been done. Recently the writer, with an assistant, spent three days examining and sampling these workings. Six weeks earlier a brief visit was paid to all the workings. In preparing this report previous reports of the Minister of Mines and Memoir 172 of the Geological Survey of Canada have been drawn upon. Recent surface-cuts south of "B" shaft were snow-covered when the examination of the "A" and "B" workings was made. The reader is referred to the accompanying plan of part of the workings, on which the elevations given, and the nomenclature, follow those in current use at the mine. Some workings will be referred to by an approximate elevation shown on the plan. In quoting former reports, where there is a difference in nomenclature, that now in use is inserted in brackets.

The general geology is shown on Map 299A accompanying Memoir 172 of the Geological Survey of Canada, in which is included a written description. The underlying rocks consist of limestones, of varying purity grading to limy argillites, intruded by small bodies of granite. The sedimentary rocks belong to the Pend d'Oreille series. A large mass of granite lies to the west of Aspen Creek, a considerable mass outcrops east of the creek, chiefly on the Mohawk claim; other granite outcrops, east of the creek, are small. According to Walker:-(1)

(1) WALKER, John F. - Geological Survey of Canada Memoir 172, "Geology and Mineral Deposits of Salmo Map-area, British Columbia".

"The limestone forms part of a large syncline, striking northerly, between argillaceous rocks of the Pend d'Oreille series on the east and granite on the west. The granite contact is irregular and many dykes and sills extend out from the main mass. The purer limestone in contact with the granite is ordinarily coarsely crystalline, but where the limestone contains argillaceous impurities it is altered to a hard, rusty rock".

The alteration of the limestone varies greatly. Some pure limestone has become coarsely crystalline white calcite. Other beds are highly siliceous and are now close-grained and very hard. Locally wollastonite is developed as fibres through the hard white rock, and as small masses of radiating fibres. In the argillaceous limestone, thin seams of white recrystallized calcite occur, while sulphide minerals principally pyrrhotite and pyrite have been developed, usually along bedding-planes. A sample of typical well-mineralized material assayed:

Gold, trace; silver, 0.8 oz. per ton.

Usually close to a fracture in the hard, white siliceous limestone, lenses of sulphide mineral occur, consisting of pyrrhotite, pyrite, sphalerite, galena and, very occasionally, a little fine-grained chalcopyrite. These lenses are narrow and localized. They appear to follow the bedding or to be developed in a fracture. Irregular lenticular alterations of the limestone which may cut the bedding are found in the same type of rock. These too, are of small extent though they may reach a thickness of 3 to 4 feet and may extend in narrow widths for perhaps 60 feet along the strike. The rock has a brownish-grey, translucent appearance and contains fine grains of sulphide disseminated through it. With the sulphides noted occur varying amounts of gold and silver. The average quantity of sulphide present over any appreciable width is small. From the data available it is apparent that the zinc sulphide is a poor carrier of silver. The quantity of gold present is very small. The silver content is variable, and while not large over any considerable width, it appears to average better in the fine-grained, disseminated mineralization than with the coarser-grained, more massive sulphides. Surface work to the north, west of the creek, shows some similar mineralization in which copper carbonate appears to be secondary after grey-copper. It may also be mentioned that some specimens showing ruby silver are to be seen at the mine.

Within the range of the "A" and "B" workings the sedimentary rocks strike from 10 degrees to 50 degrees west of the north and the dip varies from 10 degrees to 70 degrees in an easterly direction. The general strike is about north 30 degrees west and the dip about 35 degrees to the north-east. Altered argillaceous limestone, impregnated with pyrite and pyrrhotite, appears to overlie light-coloured siliceous limestone in the underground workings. In the inner end of the Upper "A" adit-crosscut the limy argillites have been sheared. The shearing strikes about north 10 degrees west and has an average dip of about 30 degrees to the east. Projected on average dip and strike this shearing would be above all the other "A" and "B" workings with the exception of the inner end of the lower "A" adit-crosscut. The sedimentary rocks have been folded and squeezed, with resulting local variations in dip and strike. One anticlinal roll is well-marked on the 95 foot level; the axis of the roll plunges to the east. It would appear also that there have been material disturbances along the dip of the bedded rocks.

Near the contact of the pyrrhotite-impregnated, argillaceous limestone with the white, siliceous limestone, fracturing has developed. The fracturing follows the general trend of the bedding, but also cuts the beds usually at small angles. Occasionally the beds are crumpled or closely folded close to a fracture. Some fractures depart materially from the general dip and strike.

Along the fractures there may be up to 3 inches of gouge and there may be some slickensiding of the wall-rock. Such fracturing is to be noted at numerous points in surface-cuts and also underground. As before mentioned, the most promising mineralization appears to occur in, or close to, a fracture in the underlying siliceous limestone. Apparently it has been considered that there is one continuous fracture; recent work has been in part guided by this theory. The workings do not follow any one fracture continuously and the writer doubts that there is a continuous fracture which could be followed. It seems probable that the fracturing is local and that there are numerous small fractures or slips, representing relief from the shearing and folding before mentioned. It seems rather improbable that a fracture of the type noted would extend for 1000 feet in length in such a rock formation and follow all the convolutions which it would be necessary for a single fracture to follow. The workings are quite irregular and certainly do not establish the continuity of a principal fracture.

The property has been prospected or developed over a period of 24 years, as shown by reference to the "Aspen" in various reports of the Minister of Mines since 1912. Early work appears to have been done near the northern end of the property and was extended southerly in numerous open-cuts, shafts and tunnels. A shipment of approximately $7\frac{1}{2}$ tons of sorted ore was made to the smelter at Trail in 1918. The settlement sheet gives the following assays:

Gold, 0.18 oz. per ton; silver, 61.7 oz per ton;
lead, trace; zinc 2.3 per cent; copper 0.2 per cent.

In 1926 the sleigh-road from the property was widened and made passable for trucks. That year the "H" workings on the Mohawk claim were commenced.

In 1927, Salmo-Malartic Mines Limited of Toronto acquired the property. Work was continued under the management of P. F. Horton, one of the former owners.

By the end of 1929, exploration had been carried out on the Upper and Lower "A" levels, "B" shaft had been sunk some distance from the surface, "B" tunnel had been driven as a crosscut some 550 feet into the hill going through a considerable thickness of siliceous limestone but not finding mineralization of promise. A campaign of diamond-drilling is said to have indicated zincy mineralization carrying no appreciable values in silver, in the vicinity of, and northerly from, the Lower "A" workings. A radiore survey had also been made.

Following a shut-down, work was resumed in 1933 under the direction of P. F. Horton. In the recent work "B" shaft was deepened and, by various rather irregular workings, connections have now been established between "B" tunnel and the Upper "A" Tunnel. The policy has been to follow mineralization or whatever was regarded as the most favorable indication. Due to the nature of the occurrence, the workings are irregular, inclines and winzes may have low dips, and, as reversals of dips occur, it has been found necessary to cut down through humps in order to continue the working. Some idea of the nature of the workings can be obtained by referring to the plan.

At present the total underground work amounts to about 4000 feet; diamond-drilling is reported to amount to a total of about 1600 feet, while there has also been a great deal of stripping and trenching done on the surface.

The accompanying plan, showing the "A" and "B" workings, is copied from the Company mine plan, with working faces brought to date, November 11th, 1936. On it the locations of recent samples taken by the writer, are indicated, and a number within a circle for reference is shown close to each sample or group of samples. In the following description, reference is made to the various points sampled, while the assays and other data are given in the accompanying table.

The quotations below are from Memoir 172 of the Geological Survey of Canada.

"The most northerly working examined is a prospect adit 57 feet long, driven across the contact of granite with limestone. The limestone is brecciated and holds a little brown iron oxide above the contact, and traces of pyrite and sphalerite near it. An open-cut 250 feet south-easterly from the adit exposes a little galena, sphalerite, and pyrite, in small fractures and disseminated in a bed of limestone. One hundred and sixty feet south-easterly from this cut is an inclined working, the lower part of which is flooded. At the mouth of this incline is a small slip that strikes 88 degrees, dips 60 degrees south, and cuts across limestone striking approximately 335 degrees and dipping north-east. A little fine-grained sphalerite and galena is in the limestone immediately below the slip. A small pile of ore indicates that a pocket occurred somewhere in the working. Two hundred feet south-easterly from this working is the portal of No. 1 (Upper "A") Adit. An open-cut beside the portal shows a slip that strikes north-west, dips 57 degrees and more to the north-east, and cuts limestone. Mineralization consisting of sphalerite and a little galena has a width of 2 feet in the limestone above the slip, but does not extend far into or along the rock face. No. 1 (Upper "A") adit is 97 feet long and extends easterly into the hill-side. At 43 feet from the portal a little pyrite, sphalerite, and galena are disseminated through the limestone. A raise from this point to the surface could not be examined."

At about 12 feet from the portal, a drift goes south 30 degrees east for 80 feet then swings to a more easterly course for 35 feet to the top of a raise from the 4800-foot sub-level. To 60 feet from the collar, the roof is timbered; at the inner end of the timbering there is a chute and some stoping has been done. The silicified limestone here strikes north 30 degrees west and dips 65 degrees north-easterly. There has been some movement along a fracture of the same strike, the dip of which at the northern end is steeper than the dip of the bedding. Near the bend in the drift the beds are somewhat twisted and at the bend, a fracture of the same strike but dipping 30 degrees goes off into the wall. No significant mineralization is to be seen.

"An adit (Lower "A") 61½ feet below No. 1 (Upper "A") is 325 feet long with, at 195 feet from the portal, a crosscut 110 feet long to the north, and another 90 feet long to the south. A raise, 135 feet from the portal, connects with No. 1 (Upper "A") adit at the point where mineralization is displayed. In the lower adit, a little pyrite, pyrrhotite, and galena occur as specks in limestone about 200 feet from the portal and a little pyrite is present at a point 50 feet along the north crosscut. A little mineralization was also seen in the raise near the bottom, and about 50 feet up."

The crosscuts mentioned essentially follow the trend of the bedding. That to the north has been extended to a total length of 380 feet, and from the end, a raise goes to the surface. Some zincy mineralization is indicated in these workings.

"Eleven open-cuts occurring at intervals for 600 feet south of No. 1 (Upper "A") adit were examined. No mineral could be seen in seven of them. One cut exposed a few inches of quartz with pyrite and specks of sphalerite. A long adit ("B" Tunnel) 200 feet below No. 1 (Upper "A") and about 500 feet south of it, has been driven easterly into the hill-side. It is 550 feet long and has a crosscut 130 feet north-westerly at a point 50 feet from the face. This adit extends into the hill 300 feet beyond a point vertically below the line of open-cuts. A few specks of sphalerite were seen 285 feet from the portal. A little mineralization, chiefly pyrrhotite and pyrite, was seen in the first part of the crosscut."

At 457 and 500 feet from the portal of "B" Tunnel drifts extend northerly, the first for about 35 feet, and the second for 140 feet. From midway along the latter a 20-foot crosscut has been driven westerly. Near the commencement of the longer drift there is from 1 inch to 4 inches of pyrrhotite along a bedding-plane for 15 feet. At 250 feet from the portal a vertical raise connects with the 95-foot level, and at 310 feet a raise, inclined to the north, connects about 65 feet up with a drift which, extending 25 feet northerly, connects with the bottom of "The Winze".

"Eight hundred feet southerly and 100 feet lower in elevation is "H" adit, an irregular working, in the form of a distorted H, with two portals 135 feet apart. This working explores a small limestone area between two masses of granite. A small lens of galena and sphalerite was encountered in this working and completely explored. It is almost flat-lying and fades out rapidly in all directions. About half of this lens, that is between 10 and 15 tons, was mined and shipped. Close to the north portal of this working is a small cut in limestone showing a brittle, metallic, grey mineral occurring in small seams. It is one of the less common lead sulphantimonides."

Returning to the Upper "A" level we shall describe the recent "A" and "B" workings, proceeding toward "B" Tunnel. The 4800-foot sub-level is a drift about 145 feet in length driven northerly from a raise or incline of low inclination put up from the 95-foot level. The raise leading to Upper "A" level is 85 feet north of the incline. Ten feet north of this raise the drift swings west for 30 feet, then turns northerly to the face; the heading was still being advanced. In this section the beds bend to a more westerly strike but appear to be resuming the normal attitude in the face. Apparently some bunched mineralization had been encountered from time to time in the drift. Results of sampling the poorly-mineralized, silicified limestone are given in the accompanying table, opposite (2) and (3); at (3) the drift is slashed out and direction changed, giving an 11-foot section. At 50 feet northerly from the top of the incline, on the west wall of the drift in a vertical distance of 4.5 feet, is an upper band, 1.5 feet, and a lower band, 0.8 feet, of the fine, disseminated mineralization. Five feet south, both bands have pinched materially and from this point to the incline they may be followed more or less continuously as streaks, not more than 3 inches wide in a vertical range of 3.5 feet. A sample was cut at (4), 25 feet from the incline. The drift bends to the west at 55 feet and should therefore crosscut any northerly continuation of the mineralization but the mineralization was not seen ahead. Near the bottom of the incline and extending northerly to another raise from the 95-foot level is a short sub-level drift. On the west wall of the drift, near the incline, is another occurrence of the fine-grained disseminated mineralization, here 3 feet wide, but 8 feet south the width is

reduced to 1.5 feet; from this point, it is traceable about 1 foot in width as far as the raise. This occurrence cuts the beds at a small angle. A sample was cut at (5), the widest place. The raise goes above the sub-level for a few feet. At (6), a sample was taken of siliceous lime-beds, overlying the beds in which the disseminated mineralization occurs.

On the 95-foot level, near the bottom of the raise just mentioned, a winze or slope known as the "shaft continuation" has been sunk, following a fracture dipping to the east. The fracture dips at 40 degrees near the top but flattens going down, and rises on the walls from the floor to the roof. About 80 feet down there is a horizontal roll, the axis striking considerably west of north. The reversal in dip made it necessary to cut down through the hump. The working is level from about 80 feet to the end, and swings to a southerly course, 120 feet from the 95-foot level. The beds in the roll are much disturbed and several fractures were noted. This winze and drift are for the most part in altered impure limestone, impregnated with pyrrhotite and pyrite.

At (7), on the 95-foot level, about 12 feet northerly from the centre line of "B" shaft, the roof of the drift is better mineralized than average. The roof was sampled in two sections. The drift, extending northerly from this point, shows very little mineralization.

"B" shaft is sunk from the surface chiefly in light-coloured silicified limestone. At the bottom, the shaft is a chamber about 15 feet wide. The silicified limestone here shows a very little sulphide mineralization.

From the bottom of "B" shaft, on the 95-foot level, a drift runs at south 30 degrees east for 120 feet to the top of the vertical raise from "B" Tunnel. Near the commencement of the drift, on the east wall, is a patch, 4 feet by 4 feet, of the fine grained, disseminated mineralization and a band from 0.5 feet to 1 foot wide extends for 50 feet southerly along the drift. A composite sample, averaging 0.7 feet wide, was cut at intervals along its length (9). A wider patch, $4\frac{1}{2}$ feet by 6 feet, shows in the south-west wall of the crosscut near the top of "The Winze". The two wide patches are indicated at (8) and a composite sample of them was made.

"The Winze" is sunk in a south-easterly direction on a slope of about 30 degrees. It flattens toward the bottom and a drift continues along the same course making connection with the inclined raise from "B" tunnel. From near the bottom of the winze a crosscut is driven 25 feet to the south-west and, from this crosscut, a drift, marked "El. 4710" on the plan, is driven for 65 feet to the south-east. This drift ends at a contact of the limestone and granite. Surface evidence indicates that the granite intrusive is small. A short raise follows up along the contact. From the bottom of the winze, a crosscut is driven for 25 feet at north 10 degrees east and from it the new winze goes down 55 feet at north 40 degrees east on a slope of 27 degrees. From the bottom of the new winze a drift was being driven at north 5 degrees east.

At the top of "The Winze" is a fracture striking north 30 degrees west and dipping 55 degrees to the north-east. It does not show in the winze but at the top of the new winze is a fracture of flatter dip which is followed down for some distance. At 60 feet from the bottom of the winze at (11), a sample was taken across the roof, width being 6 feet. On the south-west

wall, a vertical sample was cut for $4\frac{1}{2}$ feet from the roof down. This was silicified limestone containing a little sulphide. Near the bottom of the winze at (12), a sample was cut, consisting of a channel 2.5 feet in length on the roof and, 3.2 feet from the roof down the south-west wall, the width measured normal to the dip, being 4.2 feet. This section consisted of hard, siliceous limestone with some fine-grained sulphide. At (13) on the north-west wall of the crosscut to the south-west, a 4-foot sample was cut, normal to the beds below the beds sampled in (12). At (14) on the opposite side of the crosscut, including the roof of the 4710-foot drift, four samples were cut, widths being measured normal to the dip of the beds which is about 50 degrees to the north-east. The total width of this section was 20.5 feet. The section across the roof of the drift was fairly well-mineralized with sulphides of iron and zinc. At (16) on the east wall of the crosscut to the top of the new winze, three samples were cut normal to the beds, giving a 10.5 foot section of beds lying above those sampled at (14). At (15) across the roof of the 4710-foot drift to the granite, a 5-foot section was sampled.

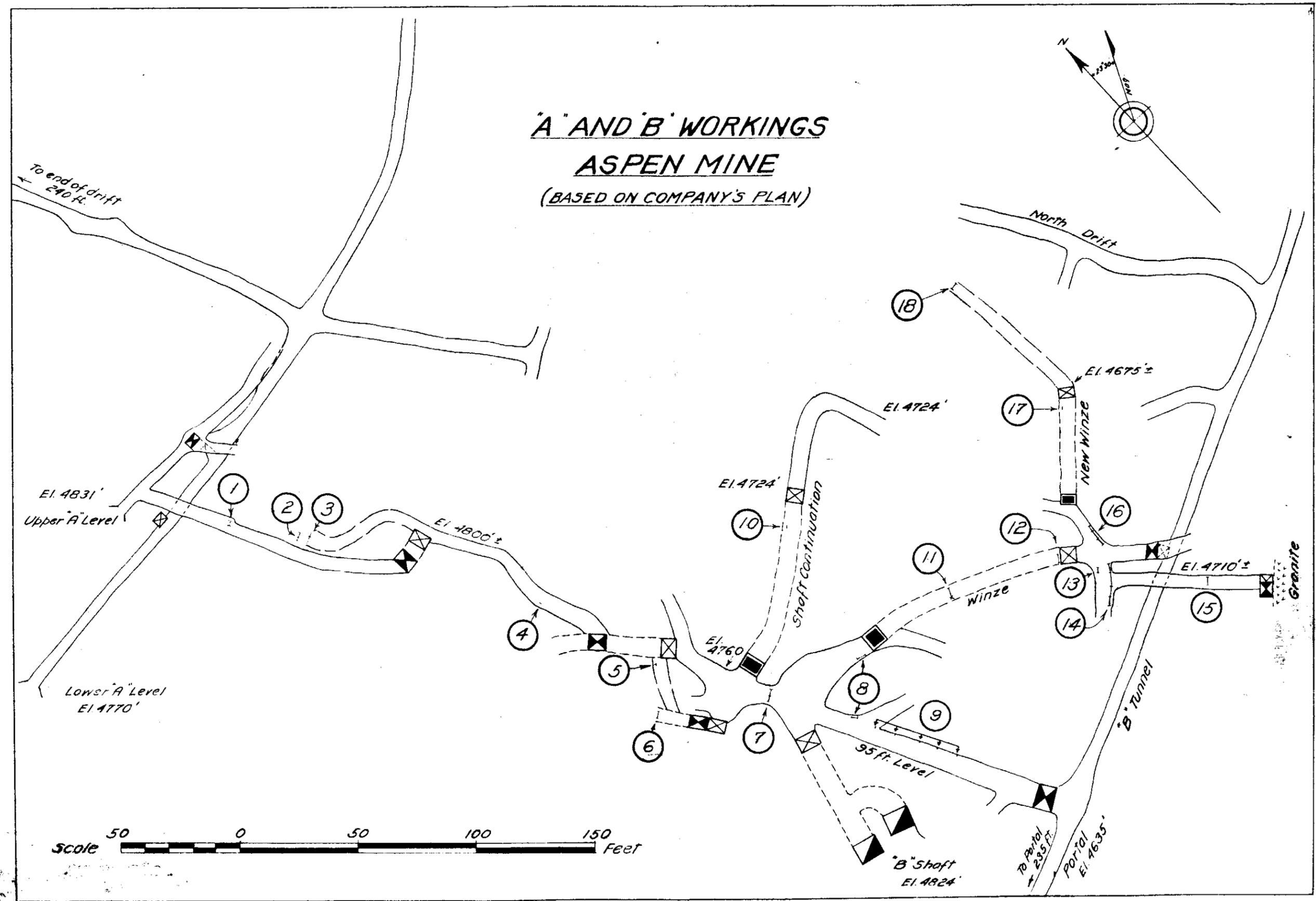
At (17) on the north-west wall of the new winze near the bottom of the slope, a small lens of sulphide was sampled, while (18) was taken from the face of the drift from the bottom of the winze where there was also a little sulphide.

In the sampling, an effort was made to determine the values carried by visibly-mineralized limestone and the limestone which showed little mineralization. Well-mineralized sections were sampled where seen. The brownish-grey, translucent, altered limestone with disseminated mineralization carries the best values in general; samples of this material varied from 3 to 23.5 oz. silver per ton. The several occurrences of mineralization of this type have been described above. Visible sulphides carry fair values but were found only in small lenses. Siliceous limestone with little visible mineral may also carry as much as 3 or 4 oz. silver per ton.

It is concluded that low-grade silver values extend over considerable widths but the grade appears to be sub-commercial and there is an obvious lack of continuity. Higher grade sections are limited to small widely separated occurrences, too low-grade and too small to be regarded as commercial ore-bodies.

| | <u>Au.</u> | <u>Ag.</u> | <u>Pb.</u> | <u>Zn.</u> | <u>Remarks</u> |
|------|------------|------------|------------|------------|--|
| (1) | tr. | tr. | | | 4.0' Horizontal cut, Upper A, in hanging of stoped ground. |
| (2) | tr. | 0.6 | Nil | Nil | 5.2' 4800 sub-level drift, face Nov. 10, channel normal to dip. |
| | tr. | 2.6 | Nil | 1.0 | 1.2' 4800 sub-level drift, face Nov. 10, central part of above channel, some sulphide. |
| (3) | tr. | 1.2 | | | 4.0' 4800 sub-level drift, normal to dip. |
| | tr. | 0.2 | | | 7.0' " " " " " " " " , to foot-wall of preceding. |
| (4) | tr. | 3.0 | Nil | 1.5 | 3.5' 4800 sub-level drift, vertical cut, west wall. |
| (5) | 0.02 | 12.4 | Nil | 0.5 | 3.0' Sub-level between raises, vertical cut, west wall. |
| (6) | tr. | 4.6 | | | 3.7' Normal to dip, face of raise. |
| (7) | 0.01 | 7.5 | Nil | 3.0 | 3.0' Channel, east side to centre drift roof, 95-foot level. |
| | 0.07 | 23.5 | Nil | 0.5 | 2.5' Channel, centre to west side drift roof, 95-foot level. |
| (8) | 0.04 | 20.5 | Nil | 2.5 | Chip sample of dark sulphide impregnated, brownish-grey limestone, 95-foot level. |
| (9) | tr. | 0.8 | Nil | Nil | 0.7' Composite, average width 0.7 feet, 95 foot level. |
| (10) | tr. | 0.8 | | | Large chip sample above fracture, N. W. wall of shaft continuation. |
| (11) | tr. | 3.0 | Nil | tr. | 6.0' Horizontal cut across roof of winze. |
| | tr. | 6.0 | Nil | 0.5 | 4.5' Vertical cut on S. W. wall of winze. |
| (12) | 0.02 | 7.6 | Nil | 1.0 | 4.2' Cut on roof and S. W. wall of winze; equivalent width normal to dip. |
| (13) | tr. | tr. | Nil | Nil | 4.0' Normal to dip on N. W. wall of crosscut. |
| (14) | tr. | 2.5 | | | 4.0' Width normal to dip, cut from S. E. wall of crosscut. |
| | 0.01 | 3.5 | Nil | 5.0 | 4.0' Equivalent width, normal to dip, cut from roof of drift. |
| | 0.03 | 6.5 | | | 7.5' Width normal to dip, cut from S. E. wall of crosscut. |
| | tr. | 2.0 | | | 5.0' Width normal to dip, cut from S. E. wall of crosscut. |
| (15) | tr. | 1.5 | Nil | 1.0 | 5.0' Across roof of drift to granite, El. 4710. |
| (16) | tr. | tr. | Nil | Nil | 1.8' Normal to dip S. E. wall of crosscut near top new winze. |
| | tr. | 6.0 | Nil | 1.0 | 4.2' Normal to dip S. E. wall of crosscut below preceding. |
| | tr. | 1.6 | Nil | Nil | 4.5' Normal to dip S. E. wall of crosscut below preceding. |
| (17) | 0.04 | 12.6 | Nil | 5.0 | 1.5' Sulphide lens west wall near bottom, New Winze. |
| (18) | tr. | 4.0 | Nil | 1.5 | 3.0' Normal to dip, face drift to north from new Winze. |

A AND B WORKINGS
ASPEN MINE
(BASED ON COMPANY'S PLAN)



Scale 50 0 50 100 150 Feet



Retyped Dec 14 1977

ROSSLAND

Special Report by -

H. Sargent
1936

British Columbia Department of Mines

Since 1935 extensive leasing operations have been carried on at mines owned by the Consolidated Mining and Smelting Company, situated principally on Red mountain north-west of the center of Rossland. With the incentive of the increased value of gold, efforts have been directed toward recovery of gold-copper ore in the upper workings of the company mines, which ceased production in 1928. Lessees have won substantial tonnage of gold-copper ore by sorting dumps, and working small blocks of ground, adjacent to the old stopes. In addition, the surrounding country has been examined for similar leasing ground about the workings of other old properties, and surface prospecting has also been carried out. The company has given assistance to the prospectors in a number of ways including a great deal of assaying of samples, and in sampling sections which lessees proposed to mine, or broken material which they proposed to ship.

The writer spent from June 17th to July 4th examining properties in Rossland and the nearby Paulson area. Recent work on company properties has been largely in the nature of salvage, which also applies to most other properties in the North Belt. No reports concerning such operations are offered here, neither are they given concerning properties on which earlier reports by the B. C. Department of Mines or the Geological Survey of Canada are more complete than the report of a recent examination would be. Of the non-company properties on Red and Monte Christo mountains, the Evening Star has been by far the largest producer in recent years. This property and the adjoining Silverine claim are described. Reports concerning several properties in the South Belt where the mineralization is more varied follow.

The general geology of the area, together with topographic maps, and descriptions of most of the old properties, are given in Memoir 77, "Geology and Ore Deposits of Rossland", British Columbia, by C. W. Drysdale, published by the Geological Survey of Canada in 1915. The lower workings of the large mines, and many other workings are now inaccessible. Descriptions by John S. Stevenson concerning the high grade gold properties at O.K. mountain appeared in the 1935 Annual Report.

The EVENING STAR claim, of which the Evening Star Mines, Limited, N.P.L., is registered owner, is situated on the eastern slope of Monte Christo mountain, one mile north-east of the town of Rossland. The claim is reached by a rather steep road. The property was located in 1890, and fairly actively developed until 1901, during which period considerable shipments of ore were made. Development consisted in driving two adits 55 feet apart in elevation, sinking from the lower one and driving from the shaft two levels, of which the lower one is reported to be 265 feet below the shaft collar. From 1901 the property has been operated occasionally by lessees. From 1932 to 1936 a group of Rossland lessees working from the surface, and above No. 1 level, shipped in the neighborhood of 1,241 tons of ore which contained ~~1,667~~ oz. of gold and 395 oz. silver. Total production to the end of 1936 was ~~2,658~~ tons containing 1,667 oz. of gold, and 445 ounces of silver.

Surface exposures consist of westerly dipping cherty slates of the Mount Roberts formation, intruded by monzonite, and several

porphyritic dykes and some basic dykes. The wall-rock from the No. 1 level downward is monzonite which also outcrops 100 feet north-west of the extensive surface workings. Ore in this property consists of quartz, the slates, and to some extent the monzonite, impregnated with arsenopyrite, pyrrhotite, and a little chalcopyrite. The presence of fine grains of chalcopyrite with the other mineralization is reported to be a good indication of gold values. The cobalt-bearing variety of arsenopyrite, danaita, was reported by Drysdale. The mineralization is quite irregular and is rather difficult to follow. The surface workings indicate a general south-westerly trending zone with several off-shoots striking from north 50 degrees east to south 75 degrees east along which small ore-bodies have been mined. The recent work has been done very largely from the surface, but includes some stoping underground not far from the portal of No. 1 level. Most of the ore has been mined from occurrences in the Mount Roberts formation though some has come from stopes near the portal of No. 1 adit, which may be in monzonite or have one wall of monzonite. Prospecting elsewhere on the claim has revealed somewhat similar mineralization in the Mount Roberts formation.

Near the portal of No. 1 level, stoping has been done on two fractures which extend southerly; and along the southwesterly trending mineralized zone, stopes have been carried from the level to the surface. Continuing southwesterly to a point 350 feet from the portal, stoping has been carried downward from the surface. A dyke, which strikes north 10 degrees west, is exposed in the surface workings from 185 to 200 feet southwesterly from the portal of No. 1 level and between 350 feet and 375 feet another dyke has about the

strike. A fracture, striking north 20 degrees west and dipping 70 degrees westward, 65 feet southwesterly from the second dyke, has been followed for 50 feet and some stoping has been done on it; 25 feet farther another fracture, striking north 75 degrees west and dipping 65 degrees northerly, has been followed for 75 feet and stoped to about 30 feet below the surface for much of its length. In general the mineralization is less than 20 feet in width. The surface stopes are usually from 10 feet to 20 feet deep. The vertical range of the recent workings is about 75 feet but all are comparatively close to the surface.

SILVERINE

This Crown-granted claim is owned by A.O. Fried and M. Penny of Rossland. It lies on the top and western slope of a ridge extending westerly from Monte Christo mountain. The rock exposures are principally fine-grained monzonite, but include some cherty remnants of the Mount Roberts formation. The principal development has been done at the crest of the ridge at 4,000 feet elevation between two shallow draws. The mineralization consists of sheared and altered wall-rock more or less replaced by pyrite and arsenopyrite with some quartz developed locally. The shearing strikes about north 50 degrees west and dips to the northeast. The hanging-wall appears to be altered augite porphyry. Pits have been dug for some distance both north and south of the draws. Northwest of the principal workings there is sheeting of north-westerly trend, in which some quartz and sulphides are developed. About 200 feet northwest are two pits exposing 1½ to 3 feet of sheared or sheeted monzonite, in which quartz and some sulphides are developed.

The principal workings include a shaft sunk on the dip of shearing. The depth of the shaft is reported to be 50 feet, it was closely bulkheaded at 25 feet above which point the recent work has been stopped to 20 feet in depth. At the collar of the shaft on the south side the dip is 45 degrees to the north-east, and the mineralization is from 3 inches to 1 foot wide. Down 8 feet the mineralization is wider where shearing strikes north 55 degrees east, dips steeply to the south-east, into the hanging-wall. A flat slip runs northerly from the shaft at about 8 feet below the collar; 45 feet north-west of the shaft, at a cross-fracture, stoping has been carried down from the surface for about 12 feet, and continued toward the shaft for about the same distance. Along the surface the ground has been taken out for some distance north-west. Apparently the flat slip, previously noted, continues to this point and offsets the hanging-wall for about 5 feet to the east. Quartz, pyrite and arsenopyrite are developed in the brecciated material along this slip. The mineralized thickness is from 5 inches to 1 foot. This mineralization appears to terminate north-westerly against the cross-fracture. Similar mineralization about 5 inches thick appears to continue along the slip into the hanging-wall, 80 feet south of the cross-fracture. Samples of the mineralized brecciated material across widths of 9 and 15 inches assayed, Gold, 0.4 oz. per ton; silver, trace. More heavily mineralized material of better grade has been shipped from the property but very little was to be seen in place.

From 20 to 40 feet south-east from the shaft, the ground has been mined 6 feet to 10 feet below the surface, the stoping width being

about 2 feet. A pit, 10 feet deep and 20 feet south-east from the end of the slope exposes 3 feet of ledge-matter in overburden or shattered rock. There is 1½ feet of dark rusty material next to the foot-wall and 4 inches of similar material next to the hanging-wall.

SOUTH BELT

South of Rossland, around the basin at the head of Trail creek, are a number of properties, which were developed and had some production in pre-war days. The mineralization here was more varied than in the more productive areas on Red and Monte Christo mountains in the north. Quite commonly in this section, the mineralization consists of galena or galena and sphalerite with pyrite and pyrrhotite. However, nearby such mineralization gold-copper ore is frequently found. A considerable part of this South Belt is underlain by rocks of the Mount Roberts formation.

With the stimulated activity in the main camp there has been a good deal of work done in the South Belt during the past few years. The following reports describe recent work on most of the properties, on which work has been done. In many cases the old workings are inaccessible, and are not described fully. The properties are all reached conveniently from Rossland by following a road southerly above the railroad track. The Nest Egg, Monday, and Bluebird claims have their workings principally on a bench above the road, west of the head of Trail creek. The Spring Creek Fraction, lies within the big loop on the railway 1.25 miles south of Rossland, while the workings on the Mayflower and Red Eagle properties are close to the railway at the eastern side of the loop. These properties are reached conveniently by a short trail from a point on the road west of the loop, about 2.25 miles from Rossland.

BLUEBIRD, this Crown-granted claim, lies about $1\frac{1}{2}$ miles by road southerly from the center of Rossland. The registered owner is Florence Marschante. Bedded rocks of the Mount Roberts formation striking about due north and dipping at 45 degrees to the west form the principal rock exposures. They have been intruded by some fine-grained light-coloured dykes, and are cut by a series of fractures striking east-west and dipping to the north, usually steeply. Along the fractures and to some extent in the dykes, sulphide mineralization carrying values in gold, silver, lead, and zinc, has been developed. The old workings consist of two shafts sunk from a bench and an adit driven from the slope to the east, below the road. The old buildings, machinery, and the shaft timbers have been destroyed by fire. Shipments made in 1908 and following years, according to official returns amounted to 418 tons, averaging, Gold, 0.21 oz. per ton; silver, 45 oz. per ton; lead, 5.6 per cent. and some zinc.

Recently, leasees have made a cut and driven two short adits into the slope, above the road and north of the old main shaft. The most northerly, a 30-foot adit 100 feet north of the old shaft, exposes several inches of rusty carbonates in a fracture with low dip to the north. This is 110 feet east of the old inclined shaft which was sunk on a fracture dipping 65 degrees to the north. A 15-foot cut, 175 feet at north 75 degrees west from the incline, exposes 6 to 8 feet of light-coloured limy dyke, striking westerly and dipping to the north. It is banded with sulphides of iron, zinc, and lead. A sample representative of most of this width assayed, Gold, 0.02 oz. per ton; silver, 0.2 oz. per ton; while a sample of $8\frac{1}{2}$ inches

of better mineralized material, at the hanging-wall, assayed, Gold, 0.03 oz. per ton; silver, 1.8 oz. per ton; lead, 0.7 per cent.; zinc, 1.5 per cent. A 2-foot mica dyke striking north 20 degrees east and dipping 75 degrees easterly is exposed cutting the mineralized dyke in the cut.

About 160 feet south, two narrow veins of quartz mineralized with pyrite are exposed in cuts, and east of these a cut exposes $3\frac{1}{2}$ inches of rusty vein which assayed, Gold 0.05 oz. per ton; silver, 30.6 oz. per ton. North-easterly from these cuts, about 60 feet west of No. 1 shaft, the leasees sank 15 feet and stopped 6 feet to the west for 12 feet above the floor. This work is on a fracture striking due west and dipping 65 degrees to the north, 2 feet of sheared wall-rock intruded by 6 inches of limy dyke is mineralized chiefly with pyrite.

The MONDAY claim, a reverted crown grant, was under lease from the crown in 1936. The claim is approximately $1\frac{1}{4}$ miles by road from the center of Rosslund. E.B. Pederson and W. Vlawvich, sub-leasees, sank a 30-foot shaft near the old workings. The rock on footwall-side of the new shaft is much altered and may be augite porphyry, while the rock hangingwall-side seems to be silicified argillaceous material, resembling some rock of the Mount Roberts formation. The foot-wall in the shaft is fairly well defined and strikes almost due north, dipping 65 degrees to 70 degrees east. The hanging-wall is irregular, and has been replaced by sulphides. Both walls are shattered. The width of mineralization varies from 3 feet near the surface to 6 feet at the bottom, and consists of mixed sulphides, including pyrite, pyrrhotite, galena, sphalerite, and possibly marcasite. Solid sulphides are developed in irregular masses and disseminated mineralization is found over considerable widths. While the solid sulphides contain a considerable proportion of visible galena, the admixture with pyrrhotite is so intimate that producing ore of good grade by sorting is difficult. Cuts 20 feet and 40 feet south of the shaft have exposed gossan. A grab sample of fine material at the shaft collar, assayed, Gold, 0.02 oz. per ton; silver, 6.6 oz. per ton; lead, 4.5 per cent.; zinc, 8.1 per cent.; copper, 0.1 per cent. Another from a pile of rejects accumulated in sorting ore from the shaft, assayed, Gold, 0.01 oz. per ton; silver, 6.4 oz. per ton; lead, 2.6 per cent.; zinc, 8 per cent.; copper, trace.

NEST EGG and CAPE COLONY FRACTION, these Crown-granted claims, west of Trail creek covering ground of moderate slope to the east and about 1 mile by road from Rossland, are owned by Emanuel Trigg of that city. The country rock is principally fine-grained monzonite. The old workings include a shaft, now filled, and another about 500 feet south of it. A little shearing is to be seen at the collar of the latter shaft and on the dump is some pyrrhotite-chalcopyrite mineralization. The principal old workings consist of another shaft, about 250 feet east, connected with an adit driven from the road level. The adit, about 20 feet lower than the shaft collar, starts from the end of a 25-foot open-cut, and follows about 2 feet of shearing due west, for 75 feet to the shaft. The dip is 75 degrees to the north. At the shaft the shearing is offset to the south. The shaft was full of water to the floor of the adit, there is reported to be a drift 25 feet down the shaft. Production to the end of 1934 amounted to 79 tons of ore averaging 0.15 oz. gold per ton; 6.6 oz. silver per ton; and 1 per cent copper.

Recently work has been done about 200 feet north of the adit. This work includes a pit sunk just west of the road, the depth being about 10 feet. It exposes about 2 feet of shearing striking north 60 degrees west and dipping 70 degrees northerly. To the west 30 feet is a cut, which runs 30 feet north-westerly through surface wash to a chamber in the rock, sunk perhaps 6 feet below the floor of the cut, and at the farthest point covered by 5 or 6 feet of rock. Both workings were full of water. The second exposes 2 to 4 feet of mineralized rock apparently of low northerly dip but because of water it was

impossible to determine accurately the attitude. About 15 tons of material from these workings was piled on a loading platform on the road. The mineralization consists of pyrrhotite and chalcopyrite. A grab sample taken from the finer material assayed, Gold, 0.05 oz. per ton; silver, trace; copper, 1.1 per cent.

MAYFLOWER.

The Crown-granted claim Olla Podrida, Lot 799, situated on the railway one mile south of Rossland is registered in the name of W.J. Scorgie. This property known as the Mayflower has a record of shipments at various times though the aggregate is not large. The property has been developed by three shafts, several adits, and some open-cuts. Open-cuts up the hill, east of the railway, show some shearing and a little calcite developed along a contact but little or no mineralization. There is a caved adit and nearby a shaft with some drifting and stopping from it about 100 feet east of the railway, leasees did some work here in 1935. In June 1936 the water level in the shaft was 25 feet below the collar and little mineralization could be seen. Three hundred feet, almost due west from former and west of the railway about 60 feet lower in elevation is another shaft, the bottom of which was also full of water. The shaft is reported to have reached a flat slip below which the mineralized fracture was not found. A drift extends for 35 feet due east from 15 feet below the collar. This is along shearing dipping steeply to the north. At the face is a dyke, low dip to the east, apparently later than the mineralization. Some ore has been shipped from this working.

East of the railway about 200 feet due south of the previously described workings a shaft, sunk from track-level, was full of water. An adit, caved at a few feet from the portal, was driven from the collar of the shaft. At 23 feet higher elevation, approximately 35 feet south 70 degrees east from the lowest adit, another adit is in about 25 feet following a shear in greenstone. Mixed sulphide mineral-

ization consisting of pyrite, pyrrhotite, galena, and sphalerite, is developed usually close to the walls of the shear. Approximately 65 feet above the track level, and 80 feet from the shaft, an open-cut about 40 feet in length follows shearing along the contact of augite prophyry lying south of greenstone. The shear, about 3 feet wide, strikes south 65 degrees east, dips steeply to the north, and along the south wall has $2\frac{1}{2}$ to 5 inches of mixed sulphide mineralization. Along the north wall a wider but less regular band shows as much as $1\frac{1}{4}$ foot of mineralization where slips dipping at from 40 degrees to 60 degrees to the north run off to east. Such a slip with 9 inches of mineralization has been followed for 7 feet east of dyke, at the end of the cut. A sample of selected sulphides from the cut assayed, Gold, 0.14 oz. per ton; silver, 21.5 oz. per ton; lead, 7.1 per cent.; zinc, 7.7 per cent. Shipments from the Mayflower, while not running very high in gold, have carried fair silver values associated with copper and lead.

RED EAGLE, this Crown-granted claim registered in the name of P.G. Erickson, of Rosslund, lies south of the Olla Podrida claim. Recently a shaft has been sunk 18 feet from a point about 60 feet east of the track and 35 feet above track level. From the shaft a drift extends about 35 feet following shearing in greenstone striking south 80 degrees east and dipping vertically. /Stopping extends 5 feet above the roof of the drift for 30 feet from the shaft. There was about 3 feet of water on the floor of the working. The north wall is of augite porphyry while the south wall appeared to be schistose greenstone. The shearing is 2 to 3 feet in width, and contains vein-filling, principally white calcite banded with sulphides. In the face the width of calcite appeared to be 4 to 6 inches. In the house over the shaft 3 or 4 tons of broken ore indicated widths of up to 8 inches of calcite with some added width in stringers or of brecciated wall-rock. From this pile of broken ore, a sample of well-mineralized material, consisting of calcite and wall-rock, containing well-crystallized, pyrite, galena, and sphalerite, with pyrrhotite; a little chalcopryite, and possibly some arsenopyrite, assayed. Gold, 0.06 oz. per ton; silver, 11.5 oz. per ton; lead, 0.8 per cent.; zinc, 3.5 per cent. From the track level, an adit has been driven 20 feet on shearing in greenstone, the portal being 50 feet south-west of the shaft. This working is 450 feet southerly along the track from the nearest Mayflower working.

SPRING CREEK FRACTION

A new location held by E. B. Pederson and W Vlawvich, appears to cover ground once staked as the Africa Fraction lying south of the

Copper Queen claim. The workings consist of a few cuts, the principal one west of a branch of Trail creek. The bottom of the principal cut was full of water. Sheared rusty greenstone to a width of 2 to 3 feet is exposed and some of the material on the dump contained unaltered sulphides. A sample of the sulphide-bearing material assayed, Gold, .05 oz. per ton; silver, 13.6 oz. per ton; lead, trace. The shearing strikes at about north 60 degrees west, and dips almost vertically.

ANNUAL REPORT OF THE MINISTER OF MINES
FOR 1936

Part E -- Special Report
by
H. Sargent

GOLDEN FAWN GROUP: Six Crown-granted claims, Golden Fawn, Mint, Empress, Mountain View, Rhomberg, and Nugget Fraction, and certain nearby locations, situated in the Sheep Creek area of the Nelson Mining Division, are held by the Fawn Mining Company, Limited, registered office, 678 Howe Street, Vancouver. The company also has an option on the Mastodon group of claims in the Revelstoke Mining Division and has acquired the La Plata mine in south-western Colorado, U.S.A.

The Golden Fawn group lies between the Reno and the Nugget Motherlode properties. It is reached by a branch from the road to the Reno mine. From Hanson on the Sheep Creek road, approximately 10 miles from Salmo, the road to the Fawn group climbs 2,800 feet in the distance of approximately 6 miles to the property.

In the vicinity of the workings the Crown-granted claims cover a saddle on the spur from Reno mountain, running south between Sheep Creek and Fawn Creek. From a rounded crest the ground slopes off steeply on both sides. There are good rock exposures on the crest and for some distance down the sides of the ridge.

The workings extend through a vertical range of 465 feet from the 500-foot adit approximately at 5,950 feet elevation to an open stope on the crest of the ridge approximately at 6,415 feet elevation. The elevations given are approximate. The names of the workings, and the differences of elevations used in this report, follow those on the company mine plan.

The underlying rocks consist of argillaceous quartzites, and argillites, of the lower part of the Reno formation; and white quartzites both thick-bedded and platy, with argillites of the upper Quartzite Range formation. These rocks strike from 10 degrees to 30 degrees east of north and dip from 50 degrees to 75 degrees to the east. They are cut by fractures striking from 65 degrees to the south. There appear to be two or perhaps three main fractures in a horizontal distance of about 100 feet. Generally they are tight, though with quartz developed in the walls there is at some points as much as 2 feet of quartz. Usually, however, the quartz within the fracture is less than 6 inches thick. Commonly the quartz shows little evidence of mineralization, and near the surface it may be free from rust or honey combing, which mark the oxidation of sulphide minerals. At some points, however, there is evidence of fair mineralization. The short, narrow lenses in the fracture explored in the 500-foot level main adit, show fair sulphide mineralization and occasional rusty cavities.

The property has been explored by six adit levels and by a number of surface cuts. A little stoping was done above and below the No.1 level, and the small open stope at the crest of the ridge was apparently mined from No.2 level.

There are occasional references to the property from 1908 on though the information on record is very limited. We appear to have no record of the returns from the stopes mentioned. Apparently the stoping was done prior to 1915. The present company became interested in the Property late in 1933. The old workings have been cleaned out, an additional 300 feet of work has been done on No.3 level, and the new 500-foot level has been driven, involving about 3,200 feet of horizontal work. In 1935 camp and plant were provided at a site convenient to the new 500-foot level. The plant includes a 500 cu.ft. compressor driven by a diesel engine, the blacksmith shop is equipped with a steel sharpener. The writer last visited the property early in October of 1936, the work at the property was suspended late in November.

The north fracture has been explored from the Fawn creek slope by No.1 adit, a drift about 140 feet in length at 6,365 feet elevation. To 25 feet from the portal the drift is in argillite from which point in white quartzite the vein is stoped above the drift for a length of 55 feet, and from 70 feet the vein is stoped for about 12 feet below the drift for a length of 36 feet. The stope width is approximately $2\frac{1}{2}$ feet. A small pit near the crest of the ridge and a trench on the easterly slope are probably also on the same fracture. A third surface-working, 50 feet north of the portal of No. 4 adit, exposes a tight fracture in quartzite. This also may be the same fracture.

No. 3 adit at 6,255 feet elevation is somewhat west of the projected position of the north fracture. It starts as a cross-cut through 55 feet of light quartzite, then turns to the left somewhat, through argillite, in which it picks up a tight fracture. The argillite band is 115 feet wide and from it the fracture was followed through white platy quartzite for 120 feet to the old face, at north 65 degrees east, which course brought it to a point vertically below the face of No. 1 adit. It is possible that the fracture is a split from the one explored in No.1 adit, in which case there should be another fracture a short distance to the north. The possibility could be tested by extending for a few feet a crosscut which follows the quartzite beds 20 feet northerly from a point in the drift 50 feet east of the argillite contact. The crosscut would come vertically below the stope on No.1 adit. From the old face the present company

continued the drift easterly for approximately 180 feet, following a tight fracture in light quartzite, with some argillite near the face. From the old face they also crosscut 80 feet at south 30 degrees east, picking up a tight fracture dipping 65 degrees to the south which they followed for 45 feet on a course of north 75 degrees east. This is probably the south fracture, the quartz-filling is about 2 inches at the widest.

No.2 adit at 6,330 feet elevation, also driven from the Fawn creek slope, is a drift on the south fracture. At the portal it is about 100 feet west of the north fracture but on its course of about north 65 degrees east, distance from the north fracture decreases. The drift for its length of 160 feet follows a fracture dipping from 85 degrees to 65 degrees to the south, between walls of white quartzite. Quartz-filling in the fracture is usually about 2 inches thick with occasional lenses 6 inches thick, and occasionally some vein-quartz is developed in the wall-rock. Near the face is a raise, reported to be connected with the surface stope on the crest of the ridge. The open stope at 6,415 feet elevation is about 40 feet in length, strike north 80degrees east dip steep to the south. At a depth of 20 feet the width appears to have been $1\frac{1}{2}$ feet to 2 feet. The wall-rock is thick-bedded light quartzite. Down the Sheep Creek slope at 6,290 feet elevation is No. 4 adit a drift 175 feet in length following a fracture in quartzite. The fracture swings to the north changing its course by about 15 degrees in the length of the drift. Its dip is steep to the south. In the first 100 feet the fracture has 2 inches of quartz-filling. Thence to the face there is from 2 inches to 6 inches of quartz between the walls and a good deal of vein-quartz developed along the bedding planes of the walls, giving widths up to 2 feet largely of vein-quartz.

No.5 adit at 6,215 feet elevation appears to be on the same fracture. This drift starts in white quartzite following a fracture westerly. From 20 feet to 40 feet from the portal there is a width of about 2 feet of quartz showing some pyrite. From 40 feet to 65 feet the south wall is of argillite and the north wall of quartzite. Thence to the face both walls are in argillite. The horizontal displacement along the fracture is accordingly 25 feet, the south wall having moved west relative to the north. The vein width is about 2 inches from 40 feet to the face at 80 feet.

The 500-foot adit at 5,950 feet elevation has been driven entirely by the present operators. At north 83degrees east it cuts through argillite and argillaceous quartzite to about 1,015 feet. From 300 feet to 400 feet the drive crosscuts a body of aplite apparently a sill. The aplite is jointed about parallel with the bedding planes.

At approximately 900 feet from the portal a narrow fracture was encountered, this may be the north fracture of the upper levels. The fracture is followed for some distance as a narrow vein in argillite

without changing the course of the adit. At 1,050 feet from the portal, just after entering white quartzite, the course of the fracture swings somewhat to the north. The fracture has been followed to a total distance of approximately 1,750 feet from the portal. It is in white quartzite from 1,050 feet to 1,500 feet beyond which black argillite is interbedded with the light grey quartzite. In the last 250 feet the fracture is generally a mere crack, followed with difficulty in the argillaceous bands. At one point it was lost but was recovered ahead by swinging the drift somewhat to the south. In the face the beds were argillaceous. Here the vein was a rusty streak. From 1,050 feet to 1,200 feet in which quartzite the fracture is well defined. There is generally 3 or 4 inches of quartz. There are, however, quartz lenses, 6 inches to 15 inches wide and a few feet in length, which show pyrite and rust.

At 1,160 feet from the portal a crosscut swings to the west and follows the formation strike at about south 15 degrees west. At 35 feet from the collar of the crosscut, a tight fracture was picked up and followed south-easterly for 90 feet, from which point a tight crack was followed on a more easterly course for about 60 feet. In the crosscut at 100 feet from the adit a tight fracture was picked up and followed westerly for 225 feet. A split runs off into the south wall at 100 feet. The face of the drift is in argillaceous quartzite. The vein width is usually not more than one inch though at one point there is a width of 6 inches of quartz. The crosscut continues for a total of about 430 feet from the adit following the formation strike in white quartzite.

A crosscut was driven north from a point in the adit 20 feet east of the crosscut to the south. This crosscut about 600 feet in length follows the formation, white quartzite, striking north 15 degrees east and dipping 50 degrees to 60 degrees to the east. At 280 feet it crossed a fracture containing 4 inches of quartz. This fracture was followed west by a drift 75 feet in length and for most of the length is a tight crack.