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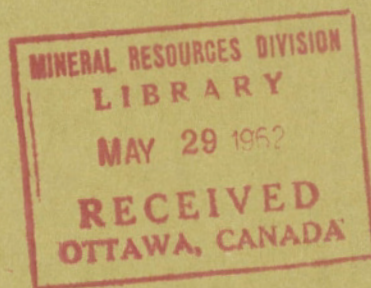
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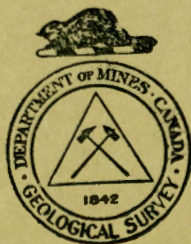
PRELIMINARY REPORT

KEITHLEY CREEK MAP AREA,  
CARIBOO DISTRICT  
BRITISH COLUMBIA

BY

A. H. Lang

Paper 36-15



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KEITHLEY CREEK MAP-AREA, CARIBOO DISTRICT, B.C.

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PAPER 36-15

MAY, 1936

## PRELIMINARY REPORT

### KEITHLEY CREEK MAP-AREA, CARIBOO DISTRICT, B.C.

By A.H. Lang

#### INTRODUCTION

Keithley Creek map-area (latitudes  $52^{\circ}45'$  to  $53^{\circ}00'$ , longitudes  $121^{\circ}00'$  to  $121^{\circ}30'$ ) is in the southern part of Cariboo district, its northern boundary being about 6 miles south of Barkerville. The area yielded an important production of placer gold in the past, and a few placer properties are still being operated. The gold-quartz veins discovered in the area have not yet been developed to any great extent, but interest in these deposits has recently been renewed due to the successful operation of the Cariboo Gold Quartz and Island Mountain mines near Barkerville.

In 1935 the writer engaged in a geological study of part of the map-area, the primary object being the investigation of the possible southerly continuation of the Barkerville Gold Belt, and the study of certain gold deposits near Yanks peak.

During 1885 and 1886 Amos Bowman made a geological reconnaissance of a large area of which Keithley Creek area forms a part. At the same time Bowman prepared maps of the principal auriferous creeks, including Keithley, Harvey, Cunningham, and Antler creeks, which provide valuable information regarding the position and extent of the early placer workings.

In 1922 W.L. Uglow mapped the bedrock geology of Barkerville map-area, which overlaps the northwestern corner of Keithley Creek area by a few square miles. In 1922 and 1923, W.A. Johnston made a detailed study of the placer deposits of Barkerville area, including those in the northwestern part of Keithley Creek area.



In 1934, George Hanson made a detailed investigation of the Barkerville Gold Belt between Island mountain and Grouse creek, the resultant map being published on the scale of 1 inch to 1,000 feet. Since the area covered by Hanson is immediately northwest of Keithley Creek area, it provides a key to the geology of the area now under discussion.

The northern part of Keithley Creek area is reached by road from Barkerville.. At Cunningham pass, 7 miles from Barkerville, this road branches, one branch extending to Sawmill flat, a distance of about 4 miles, the other proceeding through Cunningham pass and up Cunningham creek to a point a short distance above the Trehouse hydraulic camp, a total distance of about 12 miles from Barkerville.

The southern part of the area is best reached by a road some 70 miles long which leaves the Cariboo highway at the 158-mile house and terminates at Keithley Creek post office. From the latter point a road that is passable for automobiles of high clearance extends up Keithley creek to the Placer Engineer's camp, a distance of about 2 miles. Then a trail that is good, except for a few boggy spots, leads up Keithley and Snowshoe creeks to Yanks peak, a total distance of about 12 miles from Keithley Creek post office. This trail is wide enough for a narrow two-wheeled cart and team used for transporting supplies as far as the Yankee Belle mine, but an ordinary wagon cannot be used. A good trail leads from Cunningham pass to Cariboo (Swamp) River falls. Another extends from the end of the road near the Trehouse hydraulic to the Hudson claims, a distance of about 6 miles, whence horses can be taken to Yanks peak although there is no particular trail in places owing to the open nature of the country.

Small boats can be taken up Cariboo lake and Cariboo (Swamp) river as far as the lower falls, a distance of about 24 miles from Keithley Creek post office.

Assistance and courtesies were extended to the writer by all the residents and prospectors of Keithley area. C. Beadon of London, England, kindly furnished plans made during his examination of the Yankee Belle mine, and H.G.S. Heisterman of Victoria, B.C., supplied information regarding Saddle Mines, Limited. The writer was assisted in the field by N.G. Freshwater, J.R.E. Clark, and S.D. Ford.

#### GENERAL CHARACTER OF THE DISTRICT

Keithley Creek area is part of a semi-mountainous belt that forms a transitional zone between the interior plateaux and the Cariboo mountains, proper, whose high, serrated peaks rise to heights of between 8,000 and 10,000 feet immediately east of the area. The relatively flat summits of Keithley Creek area, which are generally between 5,500 and 6,500 feet in elevation, are the remains of an ancient, uplifted erosion surface. The present, almost alpine nature of the topography is the result of long-continued stream erosion during Tertiary time, followed by glaciation.

The master valley of the region, occupied by Cariboo (Swamp) river and Cariboo lake, extends diagonally through the area in a southwesterly direction, its elevation being about 2,850 feet near the northeastern corner of the area, and about 2,400 feet at the western extremity. This valley was cut during Tertiary time, and was rendered U-shaped and probably deepened somewhat by the valley glacier that occupied it during some phase of the Pleistocene glaciation. The valley is floored by an unknown

thickness of till and alluvium upon which the present Cariboo river meanders with many cut-offs and ox-bow bends. The valley at Cariboo lake is no wider than the part occupied by the river, the lake apparently occupying its position because of damming by alluvial or glacial material deposited at the mouth of Rollie (Duck) creek. The lake is almost divided by the delta of Keithley creek.

With the exception of the northwestern corner of the area, which drains northward to the Fraser by way of Antler creek and Bowron river, the drainage is tributary to Quesnel river. The drainage pattern exhibits a rude parallelism in two general directions corresponding to bedrock structures. The northwesterly and southeasterly flowing streams follow the strike of the bedrock, which is parallel to the trend of Cariboo mountains. The streams flowing northeast or southwest follow the well-defined cross-range faulting and fracturing that are so characteristic of the whole region.

GENERAL GEOLOGY  
TABLE OF FORMATIONS

Era	Period	Epoch	Formation	Lithology
Cenozoic	Modern	Recent		Sand, gravel, silt
		Pleistocene		Glacial and inter-glacial sand, gravel, silt, boulder clay
	UNCONFORMITY			
	Tertiary			Gravel
UNCONFORMITY				
Mesozoic	Jurassic?		Mount Murray intrusives?	Dykes of intermediate to basic composition
INTRUSIVE CONTACT				
Palaeozoic	Carboniferous	Mississippian	Slide Mountain series	Limestone conglomerate
UNCONFORMITY				
			Proserpine intrusives	Acidic sills and dykes
INTRUSIVE CONTACT				
Precambrian			Cariboo series (Pleasant Valley Formation)	Argillite, slate, phyllite, sericite, schist, quartzite
			Cariboo series (Barkerville formation)	Limestone, quartzite, argillite, sericite schist
			(Richfield formation)	Sericite schist, quartzite, argillite, and related types

### Cariboo Series

With the exception of the sills and dykes, which are too small and discontinuous to illustrate on the general map, and of a small territory in which the Slide Mountain series is represented, the part of Keithley Creek area under discussion is entirely underlain by altered sediments of the Cariboo series.

Bowman<sup>1</sup> classed these beds as "Cariboo-Silurian", although

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<sup>1</sup> Bowman, Amos: "Report on the Geology of the Mining District of Cariboo, British Columbia"; Geol. Surv., Canada, Ann. Rept., vol. III (pt. 1), pt. C, p. 23 (1889). (Out of print.)

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he recognized the possibility of their being Precambrian. Uglow concluded that their age is Precambrian and that they are probably the equivalents of the Beltian sediments of southeastern British Columbia.<sup>2</sup> Uglow's separation of the Cariboo series into formations

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<sup>2</sup> Johnston, W.A., and Uglow, W.L.: "Placer and Vein Gold Deposits of Barkerville, Cariboo District, British Columbia"; Geol. Surv., Canada, Mem. 149 (1926), p. 12. (This report is out of print, but a comprehensive summary is available in Sum. Rept. 1932, part AI, Geol. Surv., Canada.)

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was based entirely upon relative abundance of limestone. The lowest formation, the Richfield, consists of a great variety of altered sedimentary types, but contains only a few narrow beds of limestone. The Barkerville formation consists dominantly of limestone, but contains, in addition, a very considerable quantity of practically all the sedimentary types found in the Richfield. The top of the Richfield formation was placed at the base of the lowest conspicuous bed of limestone. The upper formation, known as the Pleasant Valley, is deficient in limestone although it contains a few narrow beds of that rock. The counterparts of almost all the types occurring in the Pleasant Valley formation can be found in the Richfield, but the



beds of the former are dominantly argillaceous.

The same separation into calcareous and non-calcareous formations may be made in Keithley Creek area and accordingly the base of the Barkerville formation has been placed where limestone first becomes conspicuous. Owing to the possibility of changing conditions of sedimentation along the strike of the beds there is no positive assurance that precisely the same horizon is represented in all cases.

Richfield Formation. The Richfield is the lowest and most extensive formation of the Cariboo series, and is found in the western half of the area. Its thickness is estimated at over 8,000 feet, but the true thickness is unknown because the base is concealed and because some of the beds may be repeated by folding and faulting. The most common rocks are altered, impure quartzites of various types, and argillites, interbedded with one another and with minor quantities of conglomerate, slate, graphitic schist, and limestone.

The quartzites are generally dark grey and are in places rusty weathering. They almost invariably contain some sericite and argillaceous material as impurities, and in some cases a few grains of feldspar. Many of the massive beds have a porphyritic appearance, and may be mistaken for intrusive sills. The micaceous varieties are markedly fissile, and quartz sericite schists, representing the extreme stage of metamorphism, are very common.

The summit of Yanks peak is composed of extremely hard, dense, non-fissile, light grey quartzite that weathers into large, angular joint-blocks. It is cut by many stringers of vein quartz that in many cases grade into the quartzite. Microscopic examination showed the rock to consist of interlocking quartz grains, but did not prove whether these grains resulted from the recrystallization of a relatively pure quartzose sediment or from replacement by

siliceous solutions. The latter explanation is plausible as no similar rock was observed in other parts of the formation, and because of the manner in which the stringers grade into the rock.

The most conspicuous bed of conglomerate was found at Observation point, immediately across Little Snowshoe creek from Yanks peak. The rock consists mostly of squeezed pebbles and boulders of quartzite in a schistose matrix, and is exposed for a width of about 50 feet.

A few narrow beds or lenses of limestone occur in the Richfield formation and are more common near the top of the formation, and indicate a gradation to the calcareous conditions of the Barkerville formation. This gradation is also exemplified in the quartzites and schists in the uppermost beds of the Richfield formation, which in many places are quite calcareous.

Barkerville Formation. Beds referred to the Barkerville formation occur in the eastern part of the area in two parallel belts separated by the Pleasant Valley formation. Uglow concluded that the two calcareous belts represent a single formation repeated by faulting, and the writer has adopted this interpretation in preparing the map. It must be pointed out, however, that at least in Keithley Creek area the stratigraphical sequence is not identical in the two belts and the limestone beds in the more easterly belt are thicker and purer than those of the western belt.

The limestone beds of the western belt extend in a southeasterly direction from Grouse creek to Harvey creek. Their distribution seems to necessitate postulating the presence of several northeasterly trending faults with large displacements. The manner of distribution of this part of the Barkerville formation is discussed at some length in the economic section of this report. Excellent exposures of the rock of the eastern belt occur on Ninemile mountain, in the canyon of lower Cunningham creek, and

on ridges northeast and southeast of Roundtop mountain.

The western belt is about 6,000 to 8,000 feet wide, whereas the eastern belt is about 10,000 feet broad. The apparent thickness of the formation in Keithley Creek area is greater than its average thickness in Barkerville area, possibly because of an increased thickness or as a result of repetition of beds by strike faulting.

Limestone is the characteristic rock of the formation, but with it are many interbeds of quartzite, schist, and argillite, many of which are calcareous. In the western belt the limestone is characteristically bluish, buff, or black. In many places the rock has been fractured and later has been partly replaced by limestone of a different colour, producing a mottled effect, and in other places it is veined by stringers of calcite. The black, argillaceous limestone, particularly that found in Antler creek and on Nugget mountain, might be mistaken for normal argillite. The limestone beds are generally from a few inches to about 10 feet thick - a few beds are 50 feet or more.

The eastern belt contains, in addition to the rock types already described, beds of massive, cream-coloured, recrystallized limestone 100 feet or more thick.

Pleasant Valley Formation. Rocks correlated with the Pleasant Valley formation occur in two parallel belts. One belt separates two belts of the Barkerville formation and is exposed over a width of about 8,000 to 9,000 feet and would have a true width of at least 5,000 feet if the thickness were not exaggerated by faulting. The rocks of the western belt are best exposed in the bed of Cunningham creek south of the Trehouse hydraulic and in the vicinity of Roundtop mountain. The eastern belt is exposed near Tinsdale creek and in the lower part of Cunningham creek.

The Pleasant Valley is essentially an argillaceous formation, the characteristic rocks being very fissile, black argillites, slates, and phyllites with minor interbeds of quartzite, schist, and limestone.

Roundtop mountain lies between the two calcareous belts mapped as Barkerville formation, and hence is included within the boundaries of the Pleasant Valley formation, but it is composed of hard, white, fissile quartzite which does not resemble other parts of the formation. This may be argillite or some such rock, completely replaced by silica in the manner already suggested as a possible explanation for the quartzite at Yanks peak.

#### Proserpine Intrusives

In Barkerville area the Proserpine intrusives are quartz, porphyry, felsite, and aplite. In Keithley Creek area they form narrow sills and dykes and are greatly altered. They are characteristically soft and buff-weathering, owing to alteration to siderite. Only a few of these intrusives were seen in Keithley Creek area. They are probably quite plentiful, but being softer than most of the sedimentary rocks they do not often form outcrops. Within the Richfield formation a few rocks were found that are now almost completely altered to carbonate and chlorite, but which show some altered plagioclase under the microscope. These are believed to represent more basic members of the Proserpine intrusives.

#### Slide Mountain Series

In Barkerville area a series of younger, less metamorphosed sedimentary formations overlies the Cariboo series with structural unconformity. In the part of Keithley Creek area under discussion only a few exposures are tentatively referred to this series,

although doubtless it is well represented to the east of Cariboo river.

A large outcrop of conglomerate composed almost entirely of limestone pebbles occurs in the canyon on Cariboo river, near the mouth of Limestone creek. Excellent exposures of limestone occur north of this conglomerate, forming the walls of the canyon at Cariboo River falls. No fossils were found in this limestone. Since the beds dip at low angles to the south they appear to underlie the conglomerate, and may belong to the Cariboo series.

#### Mount Murray Intrusives

In Keithley area the most conspicuous intrusive correlated tentatively with the Mount Murray bodies is a large diabase dyke outcropping in the saddle at the head of Lost creek, between Roundtop mountain and Quartz Comb ridge. The rock is sheared and somewhat altered to carbonate, so that it weathers readily and forms a slight depression. Judging by the weathering the width is about 100 feet, and the dyke strikes north 27 degrees east.

A few, small, fine-grained basic dykes outcrop in the bed of Petersgulch creek.

#### GEOLOGICAL STRUCTURE

The major structure of the area is a broad anticlinorium, whose axis strikes about north 50 degrees west. Near the north-western corner of the area this axis lies between mount Agnes and mount Burdett. In the central part of the area the axis is about one mile east of Yanks peak, and farther south it lies in the vicinity of Kay creek. Sediments of the axis are staggered successively to the southwest, apparently due to the same type of faulting that displaces the Barkerville formation. The strata in

the fold dip at angles varying from about 50 degrees to vertical, and occasionally are overturned owing to small, minor folds. The general angle of dip is about 60 to 70 degrees. Beds of the Barkerville and Pleasant Valley formations lie in the eastern limb of the anticlinorium, but have not been found in the western limb.

The numerous pre-mineral fractures in the rocks may be divided into three general groups. A northwesterly trending group is parallel to the strike of the rocks, or nearly so. Many of the fractures in this group follow the bedding planes of the strata, but others dip at an angle to the bedding. A northeasterly trending group of fractures are more or less perpendicular to the strike of the beds. A third group strikes approximately east.

The faults are divisible into two main groups: the faults of one group are transverse to the strike of the strata, those of the other parallel the strike. The strikes of the transverse faults vary from almost due north to about north 60 degrees east. Many of the more prominent faults or fault zones are occupied by streams, and show horizontal displacements of 1,000 to 4,000 feet. In some cases, such as the Grouse Creek fault, the displaced strata can actually be observed on either side of a narrow gorge; in other cases the existence of a fault can only be inferred from the general position of the strata. The faulting of the area is probably much more complex than is indicated on the map accompanying this report. Some of the faults are post-mineral. Small faults or slips parallel to the strike of the bedding are numerous, and are closely related to the shearing and cleavage of the strata. Uglow inferred the existence of a southwesterly dipping strike fault with a downward displacement of about 6,000 feet to explain the apparent repetition of the Barkerville and Pleasant Valley formations, and the same assumption may be made in Keithley area.



## ECONOMIC GEOLOGY

Gold deposits are the only mineral occurrences of commercial interest as yet discovered in Keithley Creek area. These are of two main classes: lode and alluvial deposits.

Quartz veins containing more or less gold occur in places throughout the area occupied by the Cariboo series, but appear to be concentrated in two localities. One of these extends from Antler mountain to Harvey creek and may be termed the continuation of the Barkerville Gold Belt. The second locality is in the vicinity of Yanks peak.

Some of the veins follow both the dip and the strike of the strata, others follow the strike but cross the dip of the beds. Both massive veins or lenses and sheeted zones containing partings of sheared rock occur. The quartz is in many cases fractured parallel to the walls. Pyrite in cubes, masses, and fine disseminations is the most common metallic mineral, and a large proportion of the gold appears to be associated with this mineral. In special cases galena and small quantities of sphalerite, chalcopyrite, and tetrahedrite have been observed.

Although valuable replacement deposits in limestone occur in Barkerville district the only deposits suggestive of limestone replacements, discovered to date in Keithley district, occur near Petersgulch creek and on the divide between that stream and Simlock creek.

### Barkerville Gold Belt

The more auriferous deposits near Barkerville occur in a fairly narrow belt striking with the formations, the fact being mentioned by Bowman<sup>1</sup> as early as 1887. Uglow<sup>2</sup> described the general

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<sup>1</sup>Bowman, Amos: "Report on the Geology of the Mining District of Cariboo, British Columbia"; Geol. Surv., Canada, Ann. Rept., vol. III, (pt. 1), pt. C, p.28 (1889). (Out of print).

<sup>2</sup>Johnston, W.A., and Uglow, W.L.: "Placer and Vein Gold Deposits of Barkerville, Cariboo District, British Columbia"; Geol. Surv., Canada, Mem. 149, p.187 (1926). (This report is out of print, but a comprehensive summary is available in Sum. Rept. 1932, part AI, Geol. Surv., Canada.)

belt of veins as varying in width up to 3 miles and extending for a distance of about 25 miles from Sugar creek to Roundtop mountain. In the general vicinity of Barkerville this belt is in the Richfield formation near its contact with the Barkerville formation. Douglas Lay mentioned the belt in several reports and introduced the term "Barkerville Belt".<sup>1</sup>

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<sup>1</sup>Lay, D.: Ann. Rept., Minister of Mines, B.C., 1932, p. 46, 1933, p. 115.

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In 1934 Hanson mapped in detail that part of the belt lying between Island mountain and Grouse creek and introduced the name "Barkerville Gold Belt". He was able to subdivide the upper part of the Richfield formation into members, and found that the majority of the commercial deposits occurred in the Rainbow member and the lower part of the overlying Baker member. The Rainbow member consists of interbedded quartzites and argillites, has an outcrop width of approximately 900 to 1,500 feet, and lies at 1,500 to over 2,000 feet from the contact between the Richfield and Barkerville formations. Hanson offers convincing evidence showing the position of the veins is closely related to the manner in which the rocks of the various members reacted to fracturing, the Rainbow member fracturing readily and the overlying Baker member being believed to have acted as a dam to the mineralizing solutions.<sup>2</sup>

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<sup>2</sup>Hanson, G.: "Barkerville Gold Belt, Cariboo District, British Columbia"; Geol. Surv., Canada, Mem. 181, p. 16 (1935).

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He also states:

"In the southeastern part of the belt (i.e. the part between the Morning Star claim and Grouse creek) the Rainbow member is not clearly the most valuable part of the belt. In this part of the belt the Rainbow and Lowhee members adjoin, are much alike in rock type, and presumably also in numbers and size of veins. The

body of the rock in which the stresses would be relieved is much wider as it there includes two members, and, therefore, veins may not be so numerous per unit of area as they are where the favourable fracture belt is narrow".<sup>1</sup>

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<sup>1</sup>Op cit., p. 18

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South of Grouse creek rock exposures are quite inadequate for the subdivision of the formations into members. Fairly good sections are exposed in parts of the creek beds, but very few outcrops occur on the hills, so that the details of one section cannot be correlated with those of another. Hanson's maps show that the members of the Richfield formation have a lenticular tendency, therefore it cannot be assumed that any one member maintains its identity for a great distance and in the following discussion of the probable continuation of the Barkerville belt it is the belt as a whole, and not specific zones such as the Rainbow member, that is being considered.

Regarding this part of the belt Hanson states<sup>2</sup> ; "From

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<sup>2</sup>Idem, p. 4.

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Grouse creek southeastward to Antler creek, a distance of 4 miles, correlations within the belt are unsatisfactory, the belt itself appears to swing more to the south, seems less clearly defined, and may be losing its identity. Southeast of Antler creek less is known about the belt. The mineral deposits there appear to be spread over a broader area."

Outcrops were too infrequent to permit subdivision of the gold belt into members southeast of Grouse creek. The belt appears to continue, however, and its position is marked by lode deposits such as those on the Hudson group, and by numerous placer workings. Traced in this way it crosses Stevens, Beggs, California, Wolfe, Nugget, Petersgulch, and Harvey creeks. Southeast of Antler creek it appears to depart from the upper Richfield and enter the overlying Barkerville formation.

DESCRIPTION OF PROPERTIES

Thompson Claim (2)<sup>1</sup>

The Thompson claim is on the west bank of Cunningham creek, about one-half mile south of the end of the Barkerville road. There an adit 137 feet long has been driven in fissile, black argillites. A quartz vein from 2 to 5 feet wide, containing a little disseminated pyrite, galena, and sphalerite, and striking north 50 degrees west parallel to the argillite beds, is exposed in the roof of the adit, but was lost at a point about 60 feet from the portal. Crosscutting for 25 feet to the north has failed to locate the vein. Mr. Thompson states that low gold assays were obtained.

Rand Group (5)

The Rand group, owned by Jos. Wendle and associates, is located near the mouth of Penny (Copper) creek. In the bed of Penny creek several quartz veins and shear zones occur in schistose sediments parallel to the strike of the bedding. The widest veins are 6, 8, and 10 feet wide. The veins contain variable amounts of pyrite, and some of them contain a little tetrahedrite and galena. Gold assays are stated to be low.

After the writer had left the district a discovery was made on these claims at a point near the east side of Petersgulch creek a few hundred feet north of the mouth of Penny creek. Specimens of the quartz are well mineralized with pyrite, and encouraging gold assays are stated to have been obtained.

Cunningham Claims (6)

The Cunningham claims, owned by the J.H. Campbell estate, are on Petersgulch creek near the mouth of Craze creek.

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<sup>1</sup>The numbers show the location on the accompanying map.

An adit 50 feet long has been driven on the west bank of Petersgulch creek. This follows a zone of quartz stringers and one vein 12 to 16 inches wide, all parallel to the bedding of schistose sediments striking north 40 degrees west and dipping about 80 degrees northeast. The veins contain a little pyrite and galena. A crosscut has been driven 60 feet southeast and exposes a few stringers.

#### Hudson Group (7)

The Hudson group, controlled by Cariboo Amalgamated Gold Mines, Limited, lies at the head of Pearce gulch at an elevation of about 5,700 feet near the Cunningham-Harvey Creek divide. It is reached by a pack trail about 7 miles long from the end of the Barkerville road. The First of July, Hudson, Glen Echo, and Fourth of July claims form a northwesterly trending line of claims, the Shasta and Shasta No. 2 claims adjoining the Hudson and Glen Echo to the southwest.

The rocks exposed on the claims are chiefly schistose quartzite and quartz-sericite schist, striking north 60 to 70 degrees west and dipping from 60 degrees northeast to vertical. Limestone beds occur to the east and west of these beds, and the writer considers that these sediments represent the Barkerville formation.

The principal deposits occur on the Hudson claim and consist of a number of veins of different types and different strikes. In the bed of Pearce creek four northwesterly striking veins up to 2 feet wide are exposed over a width of about 60 feet, and are mineralized with pyrite and galena. The schists at this point are not well enough exposed to determine whether or not these veins are exactly parallel to the schistosity. A caved adit, driven into the south bank of the creek apparently to follow this zone, is now inaccessible. At a point about 200 feet south of the creek, on

what is apparently part of this same general zone, an adit has been driven 51 feet, commencing in the hanging-wall of a strong vein striking north 7 degrees west. On the surface this vein has a maximum width of 7 feet. Several stringers up to 6 inches wide are also exposed in the adit, some being parallel to the schists, whereas others are transverse. The main vein is well mineralized with galena and pyrite, probably averaging about 10 per cent sulphides. Scheelites and siderite or ankerite, also occur. No gold was seen, but samples have been taken by different persons, and these are stated to have afforded good gold assays. Rusty schist at the face of the adit contains a few quartz stringers and is reported to assay in gold.

On the surface a second vein about 5 feet wide strikes north 55 degrees west, but its intersection with the main vein is not exposed. Trenching at intervals for about 400 feet northwest from the adit has exposed quartz veins, some of which contain galena and pyrite. This is apparently the general continuation of the zone, but it is not yet well defined.

Near the southeast corner of the Shasta claim considerable trenching has been done on irregular lenses of quartz up to 7 feet wide, containing galena and pyrite.

Limestone occurs to the east and west of the Hudson claims. The intervening belt of schistose sediments has fractured readily and provided many openings for the vein-forming solutions. Veins occur also in the overlying limestone, on the Bralco claims. The Hudson zone may be difficult to follow, but the assays reported are sufficiently attractive to warrant further work to test the continuity of the deposits.



#### Bralco Group (8)

The Bralco group, controlled by Jos. Wendle and associates, consists of a large block of claims adjoining the Hudson group to the northeast. Owing to extensive overburden there are few rock exposures except where trenching has been done. The rocks are interbedded schistose quartzite and limestone classed as the Barkerville formation.

Considerable trenching has been done on the Cunningham-Harvey Creek divide, where bedrock is in places close to the surface, and this has exposed many quartz veins and lenses lying roughly parallel to the planes of schistosity in quartz-sericite schist. The quartz is in places fairly well mineralized with galena and pyrite, but it is understood that only low gold assays have been obtained.

#### Sterling Group (9)

The Sterling claims are located at the head of Petersgulch creek and adjoin the Hudson group to the southwest. The rocks are chiefly schists and altered quartzites of the Richfield formation, with some argillaceous and calcareous beds. The limited amount of surface work exposes northeasterly and northwesterly striking quartz veins. Irregular vein zones up to 8 feet wide are imperfectly exposed. Pyrite was the only sulphide observed. Low gold assays have been obtained.

#### Holmes Ledge (10)

The following notes are quoted from Bowman's report. The approximate position of the ledge, as indicated on Bowman's map, is shown on the map accompanying the present report.

"The Holmes Ledge, Breakneck ridge, head of Six-mile creek, on the Antler trail, strikes east and west; attitude nearly vertical. It is a comb of slate extending down from the mountain, the country rock striking northwest, dip northeast 70 degrees.

Cleavage planes of large masses appear to correspond with the strike of the rock. Body of ore very considerable, in the shape of nests from 3 to 6 feet in width, the continuity of which has not been determined by openings. Contents: galena, and iron pyrites, with zinc blende, accompanied by white oxides; galena in considerable abundance. A sack of the ore was sent to San Francisco for a working test, which resulted very favourably, having yielded, it is said, a profit to the owner, above cost of test."

#### Hebson Ledge (11)

The Hebson ledge occurs on claims owned by B.E. Taylor and associates near Observation point, about 2 miles north of Yanks peak, at an elevation of 5,700 to 6,000 feet. It is reached by trail from Little Snowshoe creek or by way of Snowshoe plateau. A vein in schistose sediments including black graphitic schist has a somewhat variable northwesterly strike and is almost vertical. It is exposed at intervals for about 1,500 feet. The quartz is rusty and friable, contains very little pyrite on the surface, but may contain more pyrite below the zone of surface oxidation. It is stated that gold can be panned from the quartz, but that assays are low.

An adit on the steep sidehill has been driven about 90 feet on the west wall of the vein, which is here 6 to 8 feet wide. A second adit at a slightly lower elevation has been driven 24 feet without encountering the vein.

#### Claims of P. Gorrie and Associates (12-15)

The Gorrie claims cover a wide area on Snowshoe plateau, extending from Breakneck ridge southward to French Snowshoe creek. Many veins of different types are exposed, projecting through the overburden at intervals and thus not affording much information as to the rocks and structures in which they occur. The claims have been explored by test-pitting. Only the longer veins are described in this report.

A large quartz vein outcrops prominently immediately east of Observation point, 2 miles due north of Yanks peak (12). The largest outcrop is about 100 feet long and about 40 feet wide, but the vein is traceable at intervals for about 1,100 feet. The strike is almost due north, and the dip is steep. The wall-rock is exposed in two pits, where it is black, argillaceous schist. Judging from the strike of rock outcrops in the general neighbourhood, the vein crosses the bedding at a low angle. The quartz outcroppings have a bleached, barren appearance with very little pyrite or rust. Assays are reported to indicate low values in gold.

The Cornish ledges (13), occurring 4,000 feet due east of the above-mentioned vein, comprise a zone of ten parallel veins occurring over a total width of about 150 feet, and for a length of about 250 feet. The veins average 1 to 2 feet in width. The veins strike north 55 to 60 degrees west, and dip 85 degrees northeast. The walls are sheared quartzites and schists striking approximately parallel to the veins, the dips being uncertain. The veins contain a little disseminated galena and pyrite. It has been rumoured that a party of early Cornish miners mortared gold from the quartz, but pits on the vein failed to disclose gold-bearing ore.

A zone containing about ten veins is exposed on the Betty G claims (14), about 3,000 feet south of the Cornish ledges. The veins are from 6 feet to 18 inches wide, the total width of the zone being about 200 feet and the length some 300 feet. The veins contain disseminated galena and pyrite. They strike north 70 degrees west, transverse to the sheared quartzite and schist in which they occur. Along the strike of the zone, to the southwest, scattered quartz outcrops occur in quartzite, whereas to the northeast are beds of fissile graphitic argillite with no quartz veins.

Mr. Gorrie reports that a discovery was made on the Plateau d'Or group (15), which lies near the head of French Snowshoe creek, after the writer had left the district. This occurrence is stated to consist of two parallel northerly striking zones  $8\frac{1}{2}$  and 7 feet wide containing a mixture of quartz, wall-rock, and fairly massive galena. Selected samples are stated to have been high in lead and silver, but low in gold.

#### Pauline Claim (16)

The Pauline vein, on the Pauline claim held by E. Lang, P. Gorrie, and associates, is on the top of a small ridge separating the two main forks of Little Snowshoe creek. The southern continuation of this vein is much better exposed on the adjoining Jane group, therefore it is described under that heading. On the north slope of the ridge an adit has been driven 24 feet in sheared black argillite, but the vein has not been encountered.

#### Jane Group (17)

The Jane group, held by R. Reinhold and associates, covers the southern slope and part of the summit of the ridge separating the two main forks of Little Snowshoe creek. On the south slope of the ridge a series of veins containing in places a little pyrite and galena have been exposed roughly parallel to the strike and dip of schists and schistose quartzite. Four short adits have been driven, one of which does not reveal quartz. Of the others, two were driven many years ago and are known as the Haywood tunnels, and it is reported that gold was won from these by means of an arrastre. The veins and adits are described fully by Douglas Lay.<sup>1</sup>

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<sup>1</sup>Ann. Rept., Minister of Mines, B.C., 1929, p. 194C.

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A zone of veins is exposed on the top of the ridge, the most prominent one being from 3 to 12 feet wide and being exposed

at intervals for at least 200 feet. To the north it extends a short distance into the Pauline claim. It strikes north 15 to 20 degrees east and dips steeply to the east. It contains rust, but very little if any pyrite.

Saddle Mines, Limited (19)

Saddle Mines, Limited, hold the Midas group of claims, situated about one-half mile east of Yanks peak, on the ridge between Little Snowshoe and French Snowshoe creeks.

The claims are almost entirely covered with shallow overburden. The prevailing rocks are rather soft, impure, schistose quartzite and quartz-sericite schist, containing siderite or ankerite locally. Interbedded with these are small amounts of rather soft, fissile argillite and graphite schist. A little schistose conglomerate is exposed near the northeastern extremity of the claims. The property is a short distance southeast of the principal anticlinal axis of Keithley area, and the beds strike north 20 to 50 degrees west and dip at various angles to the southwest. Superimposed upon this major structure are the effects of minor folding, fracturing, and faulting.

The principal deposit is a vein having an average width of about 4 feet, striking north 10 degrees west and dipping at an average of 65 degrees northeast. This vein has a more northerly strike than the general strike of the beds in the vicinity, but the rusty weathering quartz-sericite schist on the hanging-wall and the graphitic schist on the foot-wall appear to strike parallel to the vein. The vein occupies a fault.

The vein is stripped on the surface for about 90 feet, and trenches at intervals still farther north expose what is probably its continuation.

An adit has been driven for about 600 feet, the portal being at the head of a small basin draining into Little Snowshoe

creek. The adit crosses the fault at 400 feet from the portal and 100 feet below the surface, but at this point the vein is absent. The vein was encountered near the fault, however, and was followed almost to the face of the adit. An inclined shaft has been sunk from surface, on the vein, and connects with the adit 500 feet from its portal. Near the face of the adit the vein either pinches out or is faulted.

The vein contains small masses and fine disseminations of pyrite, and a little sphalerite, galena, and chalcopyrite. Fractures in the quartz are parallel to the walls, and some of them contain seams of sulphides. Visible gold is rare, most of the gold apparently being associated with the pyrite. Pyrite is abundant near the shaft, and sampling there is said to have indicated a shoot of good grade ore.

Much surface trenching has been done to the east of the main or "Saddle" vein, exposing two groups of veins. The more westerly group, near the eastern boundary of the Saddle claim, consists of a number of small, irregular veins or lenses striking northeast. About 600 feet farther east, chiefly on the Midas claim, the eastern group is exposed over a total width of some 300 feet, for the full length of the claim. The veins are mostly small and lenticular, rarely more than 2 feet wide and 50 feet long, and strike in a general easterly direction. They contain some pyrite, and some contain a little visible gold, but assays are understood to be low. The irregular character of these veins is no doubt due to the soft, incompetent nature of the schistose sediments in which they occur, which yielded to stress by producing a number of small fractures.

It is possible that the Pauline vein and the large vein on the Gorrie claims represent faulted sections of the Saddle vein. Bowman's map shows an adit on the "Steele and Cunningham" ledge



on the north bank of French Snowshoe creek, at a point approximately on the strike of the Saddle vein. An unsuccessful search was made for this adit, and the prospectors of the district do not know of its existence.

Cariboo Yankee Belle Mining Company, Limited (21-23)

The Yankee Belle property comprises five claims and four fractions on the southern slope of Yanks peak, extending from near the summit to French Snowshoe creek.

Some underground development has been done in previous years, but no work was in progress during 1935.

Owing to overburden, rock exposures being practically confined to the workings, and since the latter follow the strike of the rocks, little information is available regarding the structure or the sedimentary succession. The workings lie south and west of the massive quartzite already described as occurring on the summit of Yanks peak. The rocks exposed near the veins are chiefly impure, schistose quartzite and quartz sericite schist, with some argillite and graphitic schist. These beds are somewhat disturbed, but the average strike is about north 20 degrees west and the dip 50 degrees west.

Veins are exposed in two localities known as the Talbot(21) and Corban (22) sections of the property. The Talbot veins occur at an elevation of about 5,600 feet at the northwestern extremity of the property. Several veins from 1 to 3 feet wide, most of which strike about north 60 degrees east, occur, but practically no attempt has been made to expose them, so that nothing can be said regarding the possible length or width of the zone.

The Corban veins outcrop about 1,500 feet southeast of the Talbot series at an elevation of about 5,300 feet. Here there are at least five veins striking north 50 to 60 degrees east. The

veins average about 18 inches in width and consist of rusty quartz containing some pyrite. The veins are exposed by three short drift adits and several pits. The total length of the zone exposed by these workings is about 600 feet and the width about 300 feet.

A crosscut adit (23), commencing at a point some 1,500 feet south of the Corban veins and 300 to 400 feet lower than them, has been driven 765 feet and is still about 600 feet from a point vertically below the Corban veins. This adit encountered twenty-two transverse veins that do not outcrop at the surface, ranging from small stringers to veins about 6 feet wide. No drifting has been done on these veins.

A fair amount of sampling has been done on the various veins on this property, and some high assays have been obtained. The gold distribution is apparently quite erratic, so that very thorough sampling will be required before any reliable estimate of the average gold content can be made.

#### Keithley Consolidated Gold Mines, Limited (24-26)

This company holds a large number of claims on the southern part of Snowshoe plateau and at the head of Nigger creek. Only a small amount of trenching and sampling has been done.

On the Edzel group (25), at an elevation of 4,800 feet on the ridge separating the two forks of Fourmile creek, two veins, 18 inches and 2 feet wide, strike south 80 degrees west and north 60 degrees west, respectively. The impure quartzite wall-rock contains pyrite cubes.

At the Brechin group (24), on the ridge between Weaver and Fourmile creeks, a vein 4 feet wide containing some pyrite strikes north 60 degrees west and dips 88 degrees southwest, and follows a contact between argillite and quartzite.

Most of the prospecting has been done on the Five Rainbow and Mandy group (26), at the head of the east fork of Nigger creek. The rocks there are quartzites and schists of various types. Some of the coarser grained, impure quartzites bear some resemblance to igneous rocks, but all those examined microscopically proved to be quartzites. Several veins up to 5 feet wide, containing some pyrite and roughly parallel to the strata, occur on the claims.

#### Gold Recoveries, Limited (27)

This company holds sixteen claims known as the Blue Nose and Pay Roll groups, extending up the valley of Kay (Blue Nose) creek from the north shore of Cariboo lake. The rocks exposed are sericitic and graphitic schists and schistose quartzites.

About 100 feet above the lake a vein zone about 20 feet wide parallels the strata. The vein zone is exposed on the west bank of the creek, but appears to pinch out on the opposite side where a small caved adit failed to encounter vein matter.

A parallel vein zone crosses the creek about 200 feet above the lake. An adit about 40 feet long, on the east side of the creek, intersects this zone obliquely and exposes a good deal of quartz, including one vein 8 feet wide well mineralized with pyrite.

About 300 feet above the lake a zone of six narrow quartz stringers striking northeast is exposed in the creek bed. The veins contain a little galena and pyrite.

#### Sylvain Claims (28)

The Sylvain group, owned by E. Levasseur and associates, is about one mile east of Nigger creek, on the slope overlooking the northeast end of Cariboo lake. When the writer visited the property the owners were absent, and although he observed some

apparently barren veins in impure quartzites and schists of the Richfield formation, he did not see the principal showing. It is described by Douglas Lay<sup>1</sup> as a northwesterly striking vein 15 to

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<sup>1</sup>Ann. Rept., Minister of Mines, B.C., 1934, p. 32c.

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20 feet wide, exposed for a length of about 150 feet, and occurring at an elevation of 4,450 feet. It is reported to contain a small amount of pyrite, and to carry traces of gold.