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PRELIMINARY GEOLOGICAL REPORT ON THE
YANK'S PEAK AREA,
CARIBOO DISTRICT, BRITISH COLUMBIA

An essay submitted in partial fulfillment
of the requirements of the course in
Third Year Applied Science at the
University of British Columbia

W.D. McCartney
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November 15, 1948

Matter: $\frac{22}{25}$
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[Handwritten signature]

1724 West 12th Avenue

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November 15, 1948

Dean J.N. Finlayson
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Dear Sir:

It gives me pleasure to submit the following
essay, Preliminary Geological Report on the Yank's
Peak Area, Cariboo District, British Columbia. This
is in partial fulfillment of the requirements of my
course in Third Year Applied Science at the University
of British Columbia.

Yours truly,

W.D. McCartney
(W.D. McCartney)

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East ridge and
north face of
Yank's Peak.
Faults occupy the
prominent gullies.
e

Valley of Little
Snowshoe Creek lead-
to junction with
Snowshoe Creek in
middle background.

Valley of Luce Creek.
Snowshoe Gold camp on
north slope.

Looking west to north west from the eastern ridge
of Yank's Peak.

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Introduction

The work in the vicinity of Yank's Peak to be described in this report was directed by Dr. Stewart S. Holland of the British Columbia Department of Mines. Assistants were Mr. D. Aitkens and the writer. During August and the first two weeks of September, 1948, the party mapped this area on a scale of 200 feet to the inch in an effort to find structural or lithological factors controlling mineralization. If such mineralizing controls are found, they will direct future prospecting, development, and production within the region. Because mineral prospects in the district

have already been described in considerable detail¹, this report will deal primarily with structure and lithology.

The area mapped, lying in the Keithly Creek section of the Cariboo District, British Columbia, at latitude $52^{\circ}51'$ and longitude $121^{\circ}25'$, is an approximate $1\frac{1}{2}$ mile square with Yank's Peak in the south west corner. This area forms part of the western border of the rolling, sparsely wooded Snowshoe Plateau and includes the entire upper valley of Luce Creek (a tributary of Little Snowshoe Creek and a part of the Keithly Creek system). West and south of Yank's Peak lie the heavily wooded valleys of Keithly^e and French Snowshoe creeks.



Ill. 1- Looking south to Yank's Peak across Luce Creek.

1 A.H. Lang: Keithly Creek Map Area, Cariboo District, British Columbia; G.S.C., Paper 38-16, pp.36-40. Annual Report, Minister of Mines, B.C., 1929, p.194.

Two routes offer access to the area. From 150 Mile House on the Cariboo Highway, a 67 mile unsurfaced road leads east through Likely to Keithly Creek. A rough 12 mile road² then winds northward from the village at Keithly Creek to about the 4700 foot elevation on French Snowshoe Creek. The final two mile road to Yank's Peak is suitable for either a tracked vehicle or a horse and cart. Alternatively, a road from Barkerville follows up Cunningham Creek for about twelve miles, then joins the rough road traversing Snowshoe Plateau from Yank's Peak.

It is estimated that, since the first placer discovery on Keithly Creek in 1860, this creek and its tributaries have yielded 400,000 ounces³ of gold. The early rich recovery in the region by the washing of stream gravels and by the arastral^f crushing and washing of some veins is illustrated by the enclosed map prepared by Amos Bowman in 1886. (See Map I). Present production is insignificant. Although some of the lode deposits have been explored, no gold is being produced from them. Limited placer work continues on

² Enquiries should be made about the condition of the road before it is used.

³ Because much of the gold produced prior to 1900 was not sold in British Columbia, no accurate record of production is available.

Keithly^e and French Snowshoe creeks. A pilot mill, recently installed on the Midas group of claims, should recover some gold in 1949.

General Geology⁴

The Snowshoe Plateau is underlain by Precambrian folded and altered sedimentary rocks of the Cariboo Series. This series is divided into three conformable formations in both the Barkerville and Keithly Creek areas. In ascending order, these formations are the Richfield, the Barkerville, and the Pleasant Valley. Members and formations commonly vary with distance along the beds. The major structure, as interpreted by Lang, is a broad anticlinorium, the axis of which parallels the regional north west strike of the beds and passes about one mile east of Yank's Peak. In the north east section of the Keithly^e Creek Sheet (Map II) , several major north east striking faults are shown, and throughout the area, minor north west, north and north east striking faults are indicated.

⁴ A.H. Lang, op. cit., pp. 3-5.

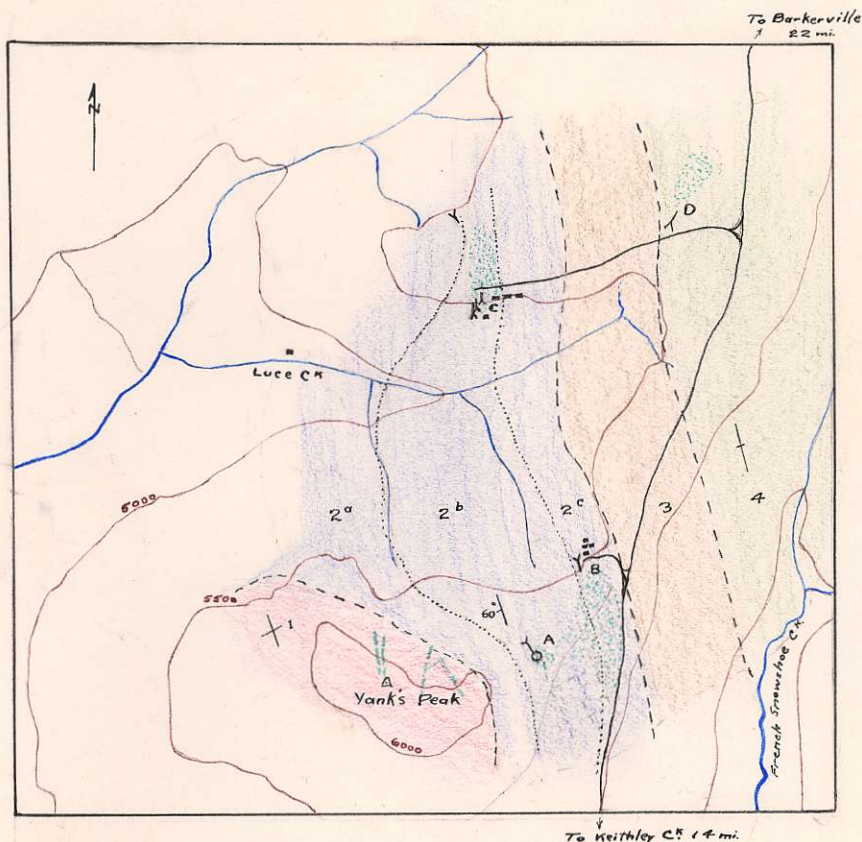
Lithology

The Yank's Peak area lies within the Richfield formation, important as the formation underlying most of the gold producing areas of the Barkerville region. In descending order and from east to west, the rocks of the map area are here divided into four apparently conformable members; the Yank's Peak, the Midas, the Conglomerate, and the Grey Quartzite members.

Yank's Peak Member

Outcropping on Yank's Peak from the western ridge along the northern face and crest to the eastern ridge are four beds of massive and brittle white quartzite interbedded with argillaceous schist, black slate, and grey quartzite. Contacts between the argillaceous schist and white quartzite are well marked, but contacts between the grey and white quartzites are seldom clearly defined. In one band, high on the western ridge, a dark grey quartzite displays the crenulated and schistose appearance of the underlying schist and indicates some silicification. One outcrop on the road at French Snowshoe Creek extends the member about a mile to the south west and, because of the resulting extension of the white quartzite over a large area, indicates alteration of original quartzose beds rather than improbable widespread selective silicification.

Map III



YANK'S PEAK

Scale: 2" = 1 mi.

- | | | |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>1</p> <p>2</p> <p>3</p> <p>4</p> | <p>Yank's Peak member:
white and grey quartzite.</p> <p>Midas member:
2a; argillite
2b; grey argillite
2c; black quartzite</p> <p>Conglomerate member:
altered conglomerate</p> <p>Grey Quartzite member:
grey quartzite.</p> | <p>Mineralized zone</p> <p>Fault</p> <p>Adit</p> <p>Shaft</p> <p>Road</p> <p>Creek</p> <p>Contour
(500 ft interval)</p> <p>Contacts
between members</p> |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
- A : Saddle Claims
 B : Midas Claims
 C : Snowshoe Gold Claims
 D : Jim Claims

From these observations, the white quartzite beds appear to have developed by alteration of original quartzose beds accompanied or followed by silicification of lesser importance. On the east side of the central fault on the north face of Yank's Peak, a band of argillite schist varies in width from 2 to 15 feet because of flowage between two bands of white quartzite. The black slate and schist normally display mild folds and crenulations, but the white quartzite beds appear uniform throughout. This readily traced member, the most competent in the area, reflects the major structure.

Midas Member

The complex Midas member, underlying the Yank's Peak member, outcrops along the ridge north of Luce Creek and on the ridge east of Yank's Peak. In descending order and from west to east, the beds are composed of black argillaceous schist, grey argillaceous schist interbedded with sericite schist and green argillaceous schist, and black argillaceous quartzite. Below this black quartzite lies a thin and probably discontinuous bed of limestone.

Outcrops of the black argillaceous schist form prominent bluffs 200 feet west of the Snowshoe Gold camp. From the Yank's Peak quartzite to the western open cuts on the Saddle claims, this schist is

interbedded with black slate. In the intervening valley of Luce Creek, similar rocks are exposed opposite Meshia's hydraulic pit, but further exposures to the west are unlikely because of heavy overburden. Grey argillaceous schist with some sericite schist and slate underlies the Snowshoe Gold camp and open cut. On the Saddle and Midas claims, this schist is commonly interbedded with minor sericite schist and light green schist. Scattered exposures are found in Luce Creek. Some flat lying beds probably form the crests of large drag folds about 500 feet south west and 200 feet west of the Midas and French Snowshoe Creek road junction. The eastern part of Saddle Gold claims is underlain by finely laminated and crenulated black quartzite. Southward along strike, the laminations are commonly less distinct until they appear again in the lower exposures on the road leading to French Snowshoe Creek. The limestone bed is only 10 feet thick at the most and is probably lenticular. It is not indicated by outcrops or float north of Luce Creek. In the gully 400 feet north of the French Snowshoe and Midas road junction, the bed is repeated by an apparent drag fold and outcrops over 50 feet. Approximately 800 feet south east,^a similar though smaller structure is indicated, the limestone here being only 2 feet wide. In both exposures, highly carbonaceous buff weathering rocks are associated with

the limestone.

Although these individual beds may be fairly well differentiated north of Luce Creek, the complex internal structure of the member east of Yank's Peak prevents a satisfactory segregation of beds. The Midas member, containing both the Saddle-Midas and the Snowshoe Gold veins, warrants further detailed mapping of internal structure over the extensive open cuts of the Saddle-Midas properties and, after such mapping, further division of the member may be advisable.

Conglomerate Member

The readily identified Conglomerate member underlies the Midas member and outcrops west of the Jim claims and along the ridge east of Luce Creek. The upper bed is a blue-grey quartzitic grit which grades eastward into a coarse grey quartzite. The altered conglomerate further to the east consists of almond shaped quartzite pebbles in a siliceous matrix. These pebbles, ranging in length from one to five inches, are roughly aligned with the strike of the beds. Immediately west of the conglomerate on the ridge north of Luce Creek is found a distinctive arkosic grit of a somewhat porphyritic appearance composed of angular two to four millimeter feldspar particles. This grit could not be found elsewhere in the member.

Grey Quartzite Member

The Grey Quartzite member underlies the Jim group of mineral claims and extends to the east of the mapped area. The member is predominantly a light grey medium to fine grained quartzite with minor beds of argilla argillaceous schist, black slate, and distinctive dark grey quartzite made up of one millimeter rounded smoky-grey quartz grains in a siliceous matrix. In the grey quartzite, it is often difficult to distinguish between bedding and secondary foliation.

Structure

The beds strike about 325° and decrease in dip from east to west from the apparently vertical or steeply dipping to the south west beds of the Grey Quartzite member to the horizontal beds of the Yank's Peak member. The Yank's Peak member forms the most competent structural unit in the area against which the underlying members have been internally folded and contorted. This widespread internal folding commonly masks the true attitudes of the beds and often decreases the value of small drag folds and localized cleavage planes in interpreting the major structure. The majority of the drag folds indicate an anticlinal axis to the east and, in the grey quartzite

on the Jim claims, a series of small drag folds placed an axis in the position mapped by Lang. A major axis as mapped, however, should result in a repetition to the east of the western beds. Bad weather and a lack of time prevented an extension of mapping to the east as planned, but a rapid traverse indicated the continuation of the grey quartzite for approximately $1\frac{1}{2}$ miles to the north east of the axis indicated by Lang. Although considerable lithological changes are common within the beds, some correlation of members may be possible after further work and may either corroborate the mapped position of the axis or place the axis farther to the east. Contorted planes of schistosity and cleavage indicate at least two periods of deformation and further complicate the solution of the structure. Faults are intersected in all underground workings and three north striking faults, ^{each} with a total displacement of 30 to 200 feet, are well exposed in the north face of Yank's Peak. The veins are seldom folded but are frequently faulted, indicating that there has been, since the last major folding and faulting, at least one period of mineralization followed by further faulting.

Veins

The gold bearing quartz veins in the mapped area may be divided into three groups. Regular veins up to 8 feet in width strike from 350° to 10° . Two sets of smaller and more irregular veins strike from 40° to 60° and from 80° to 100° . Irregular replacement quartz bodies or 'blowouts' are common. These erratic bodies, together with the common pinching and variable value of the veins, necessitate a maximum amount of surface development prior to underground exploration. Large formational 'A' veins⁵, such as the Canusa and B.C. veins in Stout's Gulch, occur in the Barkerville area. Some prospectors and mining engineers have referred to the northerly striking veins of the Yank's Peak area as 'A' veins, but a comparison of the veins in the two areas shows that the use of the possibly misleading nomenclature is neither warranted nor advisable.

The quartz is commonly crystalline and brittle but is sometimes vitreous and tough. Gold is usually disseminated through iron and lead sulphides, although fairly coarse gold particles are often present

⁵Johnston, W.A., and Uglow, W.L.: Placer and Vein Gold Deposits of Barkerville, Cariboo District, British Columbia; Geol. Surv., Canada, Mem. 149, p. 32 (1926).



Ill. 2- Looking north
along the 'Saddle'
vein. from



Ill.3- A north west
striking vein containing
free gold, pyrite, and
galena. The quartz is
somewhat shattered by
faulting.

in the cavities formed by the weathering of pyrite. High gold values are often found where the veins are cut by faults. In the Yank's Peak area, as in the Barkerville section, much of the coarse free gold is probably secondary in origin. Thus, if deep exploitation of a property is planned, the probable variations with depth of values and occurrence, and the effects of such changes on profitable production and milling methods, should be considered.

Conclusion

By the end of the 1948 field season, no definite mineralizing controls were found. It is probable, however, that faults are of more importance and the characteristics of the members are of less importance in the controlling of mineralization than was formerly thought. Dr. Holland will probably continue his work in the area and will present his reports in the regular publications of the British Columbia Department of Mines.

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Mem. 149, (1926)

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LEGEND

- PROTEROZOIC (LATE PRECAMBRIAN)**
- 4 PERMIAN OR CARBONIFEROUS, OR BOTH SLIDE MOUNTAIN SERIES**
Argillite, minor amounts of chert, limestone, grit and conglomerate
 - 3 CARIBOO SERIES**
PLEASANT VALLEY FORMATION: argillite, limestone, quartzite
 - 2 BARKERVILLE FORMATION:** limestone, minor amounts of quartzite, schist and argillite
 - 1 RICHFIELD FORMATION:** impure quartzite, quartz-sericite schist, argillite, limestone, conglomerate
1d; Lostway member; argillite
1c; Roundtop member; quartzite
1b; Bee member; argillite
1a; Hudson member; impure quartzite, schist, limestone

- Area of deep alluvium and glacial drift
- Geological boundary (assumed)
- Bedding (inclined; dip unknown; vertical)
- Fault (defined, approximate)
- Fossil locality
- Anticlinal axis
- Mine tunnel
- Shaft
- Road and buildings
- Road not well travelled
- Trail
- Passable pack-train route
- Post Office
- Power transmission line along road
- Intermittent stream
- Ditch
- Sand bar
- Marsh
- Contours (interval 100 feet)
- Height in feet above Mean sea-level

Geology by A. H. Lang, 1936, and 1937.

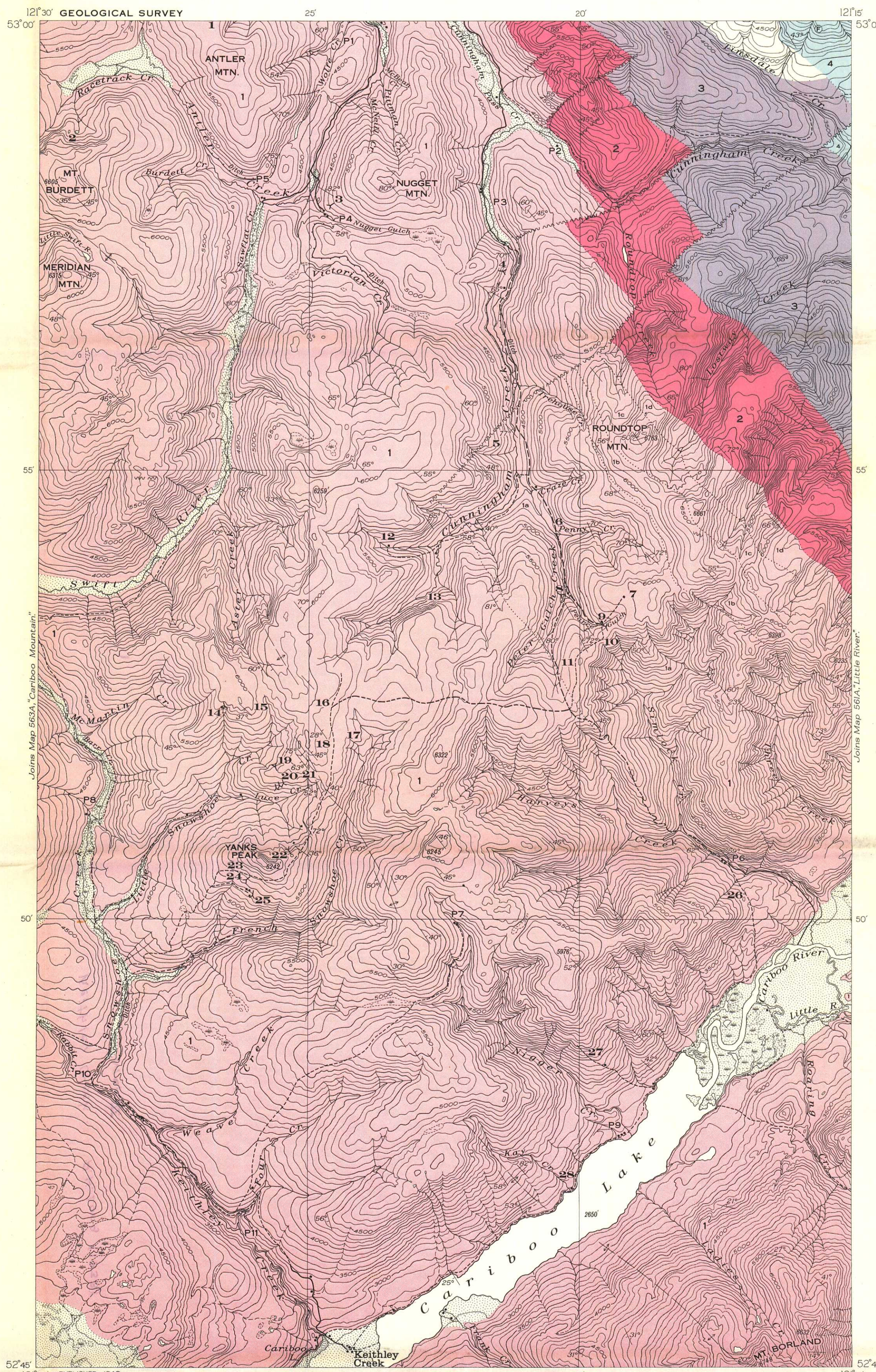
Base-map prepared by the Topographical Survey, 1938, from map supplied by the British Columbia Department of Lands, Cartography by the Drafting and Reproducing Division, 1939.

LODE PROPERTIES

1. Antler Mountain (Armstrong group)
2. Mount Burdett
3. Bridger and Johnston
4. W. E. Thompson
5. Canadian group
6. Wendle claims-North showing
7. Wendle claims-Bralco group
8. Cariboo Hudson Gold Mines, Limited-Cunningham and Cutler groups
9. Cariboo Hudson Gold Mines, Limited-Hudson claim
10. Cariboo Hudson Gold Mines, Limited-Glen Echo claim
11. Sterling group
12. F. M. Wells
13. Cariboo Nordine claims
14. B. E. Taylor (Hebson group)
15. Gorrie group-Imperial claim
16. Gorrie group-Cornish ledges
17. Gorrie group-Plateau d'or claims
18. Gorrie group-Crystal claims
19. Pauline claims
20. Jane group
21. F. H. M. Codville
22. Saddle Mines, Limited
23. Cariboo Yankee Belle Mining Co., Limited-Talbot veins
24. Cariboo Yankee Belle Mining Co., Limited-Corban veins
25. Cariboo Yankee Belle Mining Co., Limited-Main adit
26. Sylvain and Langis
27. Sylvain claims
28. Gold Recoveries, Limited

HYDRAULIC PROPERTIES

- | | |
|---------------------------|------------------------------|
| P1. Wolfe creek | P7. Baker and Peeling |
| P2. Bear claim | P8. Hesbrouck |
| P3. Trehouse | P9. Harvey Creek Mines, Ltd. |
| P4. Nugget gulch | P10. Halen |
| P5. Antler creek | P11. Placer Engineers, Ltd. |
| P6. Burrard Placers, Ltd. | |



PHYSICAL FEATURES

The area is a semi-mountainous region in which elevations range from 2,650 to 6,763 feet. The present topography has been sculptured by stream and glacial erosion from an ancient erosion surface now represented by isolated, fairly flat-topped summits. A deep trench occupied by Cariboo lake and river, in the southeastern part of the area, forms the master drainage, which is tributary to Quesnel river; the north-western corner of the area is drained northward by Antler creek to Bowron river. The central part of the area occupied by Snowshoe plateau, is a rolling upland averaging about 6,000 feet in elevation, from which many inter-valley ridges radiate. Rising above the general level of the plateau are peaks such as Yanks peak and Roundtop mountain, most of which are formed of hard, resistant quartzite. Many streams rise in steep-walled cirques formerly occupied by alpine glaciers. Most of the larger valleys were rendered U-shaped by valley glaciers and are floored by glacial drift and stream gravel, sand, and silt. The slopes and uplands are covered extensively by glacial drift and talus, bedrock being very poorly exposed except on the higher summits and in rock canyons.

Timber-line is about 6,200 feet above sea-level, therefore the uplands are comparatively easy to travel. The slopes and valleys are heavily wooded, chiefly with spruce and balsam and dense growths of buckbrush, alder, and willow. Traveling with horses is restricted to the trails and uplands.

The northern part of the area is reached by a road from Barkerville extending up Cunningham creek about a mile above the Trehouse hydraulic mine, a total distance of about 12 miles from Barkerville. From this point a tractor road leads to the Cariboo Hudson mine. A branch from the Barkerville road follows Antler creek to Snowmill Flat.

Keithley Creek village is reached by a road 62 miles long which leaves the Cariboo highway at the 158-mile house. A road extends from the village to the Placer Engineers camp. From this point a trail extends up Keithley and Snowshoe creeks to Yanks peak and Snowshoe plateau, and a team and narrow cart may be used as far as the Yankee Belle mine. Branch trails lead to the heads of Nigger and Little Snowshoe creeks. The trail shown following Barr creek, Swift river, and Snowmill Creek is not in good repair. In summer, horses can be taken across Snowshoe plateau from Yanks peak to the Cariboo Hudson mine, thus establishing a link between the Barkerville and Keithley Creek routes. A trail along the north shore of Cariboo lake leads to Harveys creek. Cariboo lake and river are navigable by small boats. Boats and horses may be obtained at Keithley Creek.

GENERAL GEOLOGY

The area is underlain by altered sedimentary rocks striking northwest. Almost all of these belong to the Cariboo series, of Precambrian age. They are the continuation of formations underlying Barkerville area, but differ lithologically, the change being exemplified chiefly by a marked increase of limestone.

On and near the divide between Peter Gulch and Simlock creeks bedrock is sufficiently exposed to permit subdividing the upper part of the Richfield into four members. The lowest of these, the Hudson member is divisible into three parts: a basal part composed of impure quartzite, schist, and limestone; a central part composed of impure quartzite and schist, with little limestone; and an upper part containing much limestone interbedded with quartzite, schist and argillite. Each of the overlying members consists in the main of single rock types. Scattered exposures indicate that the four members probably extend over wide variations, from Antler creek to Cariboo river, but the boundaries can be mapped only between Cunningham and Simlock creeks.

Overlying the Richfield on the northeast flank of the anticlinorium is the Barkerville formation, and overlying the Barkerville is the Pleasant Valley formation.

The Slide Mountain series rests unconformably on the Pleasant Valley formation. The lowest beds of the series, consisting of fine-grained conglomerate and grit equivalent to the Guyet formation of Barkerville area, are exposed in Tinsdale creek near its mouth. The remaining exposures are principally argillites less altered than those of the Cariboo series, and a little limestone.

The rocks of the Cariboo series are intruded by sills and dykes of altered felsite and quartz porphyry, termed the Prosperine intrusives, which are older than the Slide Mountain series; and by dykes and small, irregular bodies of diorite, gabbro, and gabbro which are probably Mesozoic. These intrusive bodies are small and are not shown on the map.

STRUCTURAL GEOLOGY

The major structure is the broad anticlinorium whose axis extends from Mt. Burdett to Mt. Borland. The strata are contorted further by small, open folds and drag folds.

The strata are displaced by numerous faults, the most prominent of which strike northeast. A fault north of Roundtop mountain displaces the Barkerville formation, and probably extends southwestward to Little Snowshoe creek, thus accounting for the offset of the anticlinal axis near the head of that creek; the disposition of the strata leaves little doubt regarding the existence of this fault, but its exact position cannot be determined from present exposures. Numerous faults of smaller displacement are widespread in the Richfield formation, and are divisible into three general groups: striking northeast; almost due north; and parallel to the strike of the strata.

ECONOMIC GEOLOGY

Gold placers and lodes are the only mineral deposits of commercial significance yet discovered in the area. Placer mining dates from 1860, and has resulted in a large production. Workable placers have been found only in and near certain creeks traversing the Richfield formation. Antler and Keithley creeks were very rich, and Cunningham, Harveys, Nigger, Little Snowshoe, French Snowshoe and Frank (Goose) creeks yielded substantially. A small production continues at present, chiefly from hydraulic mines at Cunningham and Nigger creeks. Large-scale hydraulic exploration has been carried out during the past few years at the Placer Engineers, Burrard Placers and Antler Gold Mines properties and at Nugget gulch. Several smaller operations are conducted by drifting and by hydraulicking.

At the time of writing no lode gold has been produced in the area, except from test shipments, but several properties are being explored by surface and underground work.

The lodes are of two main types: quartz veins and sulphide replacements in limestone. Veins are by far the most numerous and most important of the present discoveries. Several of the most important veins discovered strike almost due north, generally occupying faults. Other veins strike northeast, east, and parallel to the strike of the strata. Many deposits are complex vein-systems composed of veins, stringers, or lenses either parallel to one another or striking in different directions. Some of the gold is free; most of it is associated with pyrite and, more rarely, with other sulphides, and is so finely divided that it is visible only microscopically. Most of the veins occur in schistose and fissile, impure quartzites.

The principal discoveries have been made in the middle part of the Hudson member and west of the crest of the anticlinorium near Yanks peak. The upper part of the Richfield formation, between Antler and Harveys creeks, may be considered as a southern part of a general belt that in the Barkerville area contains most of the gold deposits, but the members constituting the upper Richfield in Keithley Creek area are dissimilar to the members of the Barkerville Gold Belt. As the deposits near Yanks peak are near the axis of the anticlinorium, the continuation of that structure offers a theoretical guide for prospecting. The recognition of these two parts of the map-area where activity is greatest does not preclude the possibility of discoveries in other parts of the Richfield formation. Some veins occur in formations other than the Richfield, but they do not appear to be important.

MAP 562A

KEITHLEY CREEK
CARIBOO DISTRICT
BRITISH COLUMBIA

Scale, 1/63,360 or 1 Inch to 1 Mile

Approximate magnetic declination, 27° East.

