

UPPER LEMON CREEK AREA.

002341

Introduction

Field work in the area adjacent to the headwaters of Lemon Creek, undertaken during the 1939 season, was complementary to similar work completed on the lower reaches of the creek during the previous year. Similar conditions prevail generally throughout these two entirely arbitrary subdivisions and reference to the Annual Report, Minister of Mines, British Columbia, 1938, which contains data on conditions farther down the creek, will probably be of assistance and permit a broader conception of the region as a whole. The sketch-map which accompanied the 1938 Report (Fig. 1) together with Fig. 2, which accompanies this Report, cover Lemon Creek for its entire length. Lemon Creek joins the Slokan River about 6 miles south from Slokan City.

The headwaters of Lemon Creek are accessible from the Trans-provincial Highway, at a point 5 miles easterly from Nelson. From the highway 7 1/2 miles of poor, but passable, road leads to the southerly end of Six Mile Lakes. Thence a pack-trail on good grade follows the east margin of the lakes and, in 3 1/2 miles, reaches Lemon Creek at Oro. The trail follows Lemon Creek up-stream, north-easterly, on good grade for 3 1/2 miles above Oro; at slightly over 2 miles above Oro a branch-trail leads off to the east, up Crazy Jane Creek, to the Oro Fino group. At 3 1/2 miles above Oro a second branch-trail leads northerly to the Barnett group. Above the Barnett branch-trail the main Lemon Creek trail continues for slightly over 1 1/2 miles to the Hudson Bay group, shown on Fig. 2 as the Nansen and Fram mineral claims. This 1 1/2 miles of trail is steeper than the lower sections and in poorer condition, owing partly to the fact that it rises above timber-line and receives considerably less protection from snow-slides and other erosive agents. For its entire length the main trail is passable for foot-traffic at the present time; as far as the Barnett turn-off it is barely adequate for horse-packing; above this point several small bridges and minor repairs will be necessary to permit the use of horses.

In the region topographic relief is marked owing to the depth of the stream-valleys which are deeply-incised, steeply-walled, straight, and the most noticeable topographic features below timber-line. Above timber-line, at approximately 6,000 feet in elevation, the smaller flow of water, the more intense effects of rock-disintegration, and the lack of protective growth combine to produce less defined drainage-systems. At the divides, between two or more main drainage-areas, large

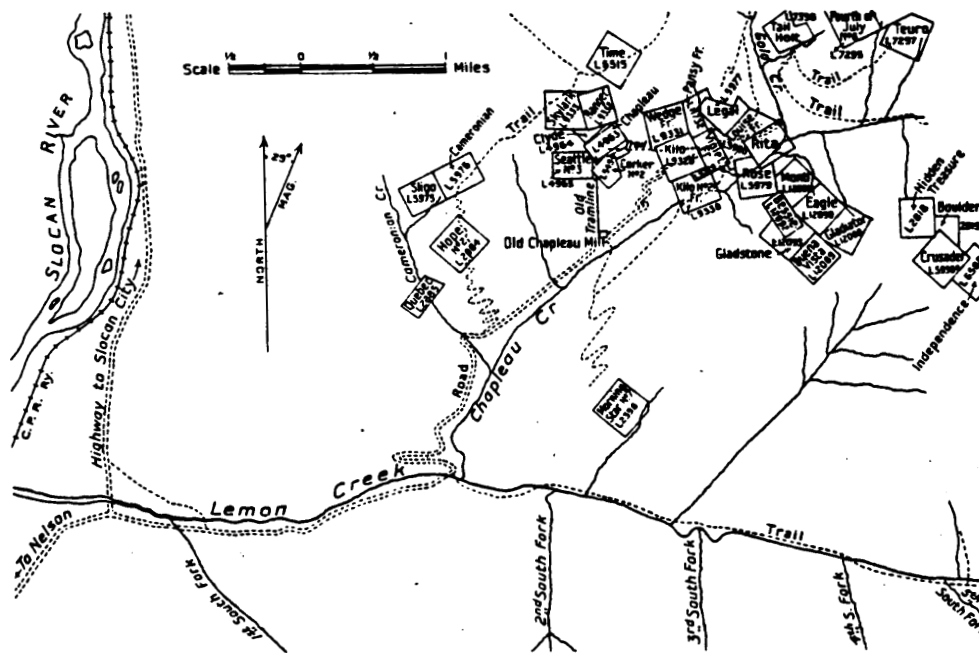


Fig. 1. Chapleau Creek - Lemon Creek Area.

basins filled with glacial debris indicate the recent presence of ice. In the district under consideration there is no permanent ice but slightly to the east of the map-limit there is a considerable amount on the higher peaks.

As usual in this section of the province, elevations which range between 4,000 and 8,000 feet are responsible for climatic conditions which permit only a short season for surface work, and easy, economical transportation. Snowfall is heavy, slides are obstructive and dangerous, spring-thaws make travel almost impossible; and the net result is, that under the present conditions of access, mining operations must necessarily be self-sufficient in heavy supplies from November until May or June.

Timber is plentiful up to elevations of 5,000 feet. Lemon Creek is of sufficient flow for any milling operation which may be expected in the district, but it is doubtful if more than a small amount of power could be developed economically.

Geological conditions in the district are broadly uniform. The rocks are members of the Nelson batholith and their exposures represent phases of the intrusive which vary from

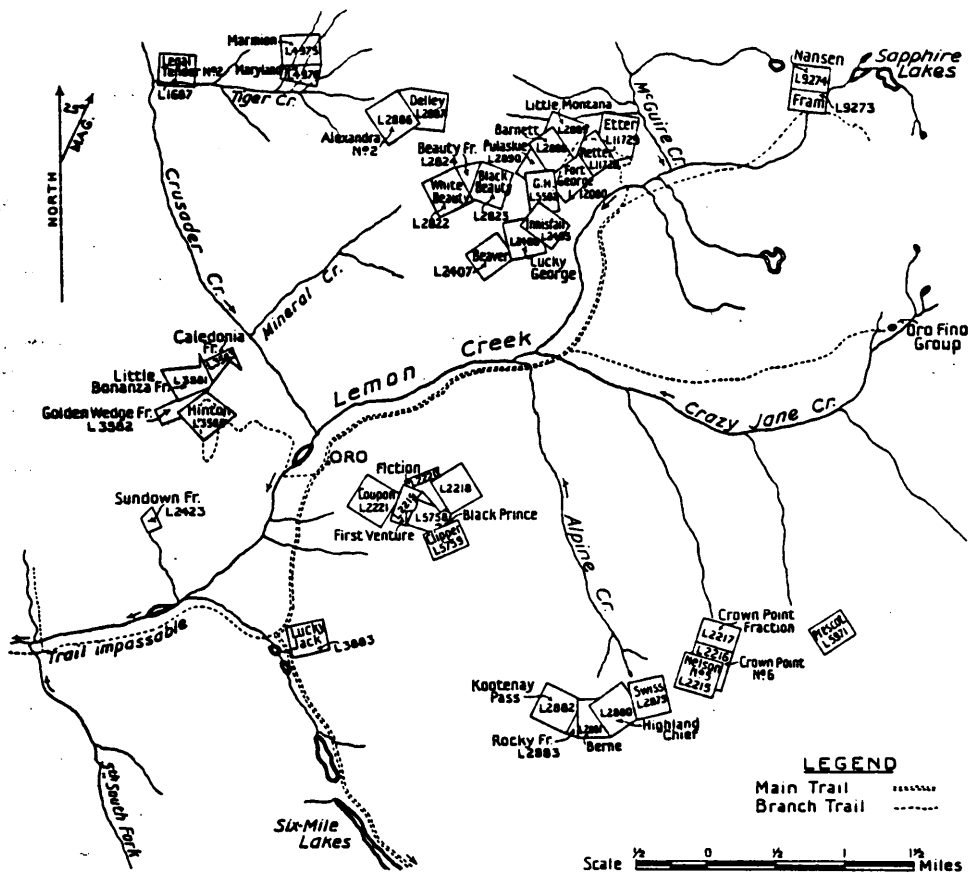


Fig. 2. Headwater area of Lemon Creek showing locations of surveyed mineral claims.

granite to quartz-diorite. The mineralization of current interest consists of an apparently simple sulphide association of pyrite, galena and sphalerite, which carries gold and silver, and occurs in a quartz and calcite gangue in narrow fractures and shear-zones in the granitic rocks. Although none were identified in the specimens examined microscopically, it is probable that the ordinary silver-bearing sulphides and sulpho-salts are present in the veins where the silver to gold ratio is high. By the evidence of the occurrences examined, these veins and shears have a general north-easterly strike and dip from flatly north-westward to steeply north-eastward.

At the present time there is little activity in the district although in years past there has been considerable preliminary development on some of the properties.

Persons unacquainted with the area are advised to ascertain carefully the gold to silver ratio on any particular property before basing estimates on data from near-by development, because this varies markedly between different veins, even though they may be comparatively close together.

This property, on the west side of McGuire Creek, a tributary to Lemon Creek from the north, is reported to be optioned by the Barnett Mining Company, head office in Seattle, Washington. The company is represented by R. G. McLeod. The claims in the group consist of the G. H., Lot 5502; Pulaskie, Lot 2890; Little Montana, Lot 2889; Barnett, Lot 2888; Fort George, Lot 12080; Etter, Lot 11729 and Retter, Lot 11728 (Crown-grants), owned by John Wallace Willoughby, 379 1/2 8th Ave. E., Vancouver, B. C., and three other mineral claims held by location.

There is considerable topographic relief on the surface of the claims, provided principally by the north valley-wall of Lemon Creek and by the McGuire Creek drainage-system, but only in isolated instances are conditions such as to provide unusual problems of transportation or operation. The slope from Lemon Creek to the camp is steep, but judicious location would permit a trail or road being built on a reasonably easy grade. On the property there are several surface locations from which underground work could be effected with safety and convenience. At present, as detailed in the introduction, access by road and the main Lemon Creek trail is reasonably easy as far as the point at which the Barnett branch-trail leaves the Lemon Creek trail and ascends the north wall of Lemon Creek. This branch-trail to the camp requires relocation over almost its entire length of 1 1/4 miles because it is extremely steep and entirely unsuitable for regular foot- or horse-traffic. The camp, which consists of one log-cabin and some tent-frames, is beside a small stream which flows into McGuire Creek from the west. The principal workings, on the Barnett vein, lie south-westerly from the camp and are reached by approximately a thousand feet of rough foot-trail which rises some 300 feet to an elevation of 6,200 feet at the north-easterly end of the workings. The stream at the camp provides domestic water, reportedly the year-round, but any larger supply could be taken only from Lemon Creek. Timber for all domestic and mining needs is available at or near the camp-site. In any projected expansion of development it would be necessary to give careful consideration to the local occurrence of snow-slides and their effect on planned systems of transportation and operation.

Gene

bath
ite
tur
the
ent
rocl
tur
to
nar
wit
spa
gal
sma

nor
pal
may
fac
of
lit
The
to
tur
al
dat
wit
by
it
ac
by
fe
th
th
ri
ti
ve
ly
th
st
th
al
th
ve
sy
tc

General Geology

The rocks of the area are typical members of the Nelson batholith and vary generally between granite and granodiorite. They are black and white in colour when freshly-fractured and are frequently porphyritic in texture; in most of the exposures examined, decomposition of the feldspar constituents was far advanced owing to lengthy exposure. Within these rocks, the features which have attracted attention, are structural weaknesses represented by openings which vary from joints to true shearing, and which strike mainly north-easterly. The narrower openings are quartz-filled; and the shears are filled with quartz, crushed wall-rock and gouge. The quartz is sparsely mineralized with sulphides, principally pyrite and galena, which carry varying amounts of gold and silver. Very small amounts of magnetite were also observed in the quartz.

The Barnett vein, of the flat-lying type, which strikes north-easterly, and dips north-westward, has received principal attention. This vein, which is generally narrow, with a maximum observed width of 18 inches, is well exposed by surface-cuts and stripping for a length of some 1,700 feet, much of which is on the Barnett claim. The walls are tight and give little indication of marked movement in relation to each other. The quartz-filling is generally fractured and jointed parallel to the walls. The quartz is commonly glassy, and drusy structures are frequent with marked development of crystals marginal to the openings. Pink- and brown-staining due to the oxidation of pyrite is typical. The quartz-gangue commonly occurs within the main fracture-walls as two distinct bands separated by a width of included granite wall-rock. This included granite and that adjacent to the vein is affected markedly by the action of the mineralizing solutions as evidenced principally by alteration of the feldspars and partial leaching of the ferro-magnesian minerals. Irregularities along the strike of the vein are caused by minor and apparently open, bending of the fracture and possibly by minor faults approximately at right-angles to the strike. It is reported that near locations where there is either actual or suggested faulting the vein narrows and values increase. If such conditions are firmly established by further development it may be found that at these locations faulting represents late relief of accumulated strains which are evidenced locally by fractures and joints that provided relatively easy access for final, richer mineralizing solutions. Apart from joints or fractures upon which there may have been such dislocation, and distinct from the vein-fracture itself, there is a third joint and fracture-system which strikes parallel to the vein but dips more steeply to the north-west. This type of fracture is exposed in many

places close to the vein on its hanging-wall.

The apparently incompatible association of glassy quartz, magnetite and drusy structures within the vein may possibly be explained by assuming that the mineralization of the fracture took place while the granitic host-rock still retained a considerable part of its heat, and subsequent slow cooling of both host-rock and fracture-filling. A possible alternative explanation is the assumed proximity of the vein to the source of mineralization, and, a long continued deposition from essentially weak solutions, which resulted in maintaining relatively high temperatures in the immediate wall of the fracture and permitted crystallization within the vein. Both suggestions are based upon the questionably diagnostic value of the glassy quartz and magnetite as representative of conditions of relatively high temperature.

In addition to the Barnett vein, two or three shear-zones have been developed on the property. At the present time, it is not absolutely clear whether or not correlation can be made along the strike of two of the three exposures of this type, hence, the doubt as to whether there are two or three separate occurrences. As developed, these are true shears which strike north 50 to 70 degrees east, and dip generally 60 to 80 degrees south-eastward. The dip is variable owing to rolling of the shear, and locally such irregularity may be developed sufficiently to produce dips to the north-west. Movement between the two granite-walls is marked. The maximum width observed between the shear-walls was 40 inches within which there are usually one or more defined quartz veins of a maximum observed width of 22 inches. The remainder of the filling between the shear-walls is composed of gouge and crushed, decomposed wall-rock. Noticeable amounts of calcite are associated with the quartz. Sulphide mineralization is generally sparse but there appears to be a greater concentration of galena in the defined quartz than in the Barnett vein. Wall-rock alteration extends for a foot on either side of the shears and in some cases this is so marked that the operators define certain lengths on the footwall-side as a dyke. In these widths narrow, irregular and barren quartz stringers occur.

Development

For several years the property has lain idle. During 1939 a crew, of up to seven men, has been engaged in cleaning out old workings and in extensive surface-stripping on the Barnett vein. Little new information has been gained from any of the work in the old adits because none of the faces have been advanced, but the stripping, which was done thoroughly

and well
on the s
the past
dition t
in the r
these w

Ap
other a
viously

Ir
are acc
ment.

Barnett

A
in cut
due no
in a
only.
gangu
side
er pa
of th

feet
of wh
cryst

No.
veir
west
acro
ver
veir
of
min
Gol

de
lan

gr

which contains no visible sulphide. The quartz is open at the centre of the vein and crystallization has there taken place. Original banding in the quartz is indicated by two narrow rust-streaks parallel to the walls, which may at one time have carried sulphide mineralization. A sample across 6 inches assayed: Gold, trace; silver, 0.6 oz. per ton.

The south-westerly end of cut No. 6, elevation 6,130 feet, is 500 feet north 40 degrees east from cut No. 5. The vein is exposed by continuous stripping for 85 feet from this point on a bearing of north 50 degrees east, and thence, at an elevation of 6,150 feet, the vein strikes north 20 degrees east and dips 10 degrees north-westward. A sample taken at the end of the 85-foot stripping across 21 inches of alternate bands of vuggy quartz and included granite assayed: Gold, trace; silver, 0.4 oz. per ton. The included granite has a reddish, burned look and contains more quartz than usual. The vein-quartz is barren except for leached pyrite which lies loose in drusy cavities.

The stripping on the vein continues along a bearing north 60 degrees east, and at 125 feet, at an elevation of 6,160 feet, reveals bands of rose-coloured quartz and altered wall-rock. The quartz is slightly mineralized with galena and pyrite. A sample across 11 inches, the full width of the vein, assayed: Gold, trace; silver, 0.2 oz. per ton. This marks the easterly limit of cut No. 6. Fifteen feet easterly, an adit has been driven 35 feet on a bearing north 25 degrees west. At the face of this working the vein is 10 inches wide, strikes north 45 degrees east, and dips 15 degrees north-westward.

At 135 feet from this adit, on a bearing north 70 degrees east, at 6,140 feet elevation, the portal of a second adit is visible. This was driven below the vein in a north-westerly direction. Ore is reported to have been shipped from this working. The south-westerly end of cut No. 7, at an elevation of 6,158 feet is 60 feet on a bearing north 70 degrees east from this second adit. Within this 60-foot length there are indications of possible faulting for a total vertical distance of 10 to 15 feet on the east side of one or several of a series of narrow quartz-filled fractures, which strike north 10 degrees west and dip 85 degrees westward.

At the south-westerly end of cut No. 7 a sample across 19 inches of vein-material, which included 2 inches of decomposed granite, assayed: Gold, trace; silver, 0.2 oz. per ton. The remainder, 17 inches, was composed of white, vuggy and oxidized quartz which contained no visible sulphide. Another

sam
wal
ton

wes
6,1
bro
vei
nor
say

wer
of
oxi
gin
0.0

whi
per

thi
oz.
fai
par

fee
add

irc
0.1

whi
tra

the

dic
the

easterly lies 180 feet north 20 degrees east from the north-easterly end of cut No. 7. The vein is 3 inches wide, composed of well-crystallized glassy quartz, somewhat drusy, and contains minute specks of magnetite but no visible sulphide mineralization. A sample across this width assayed: Gold, nil; silver, nil.

For further information regarding the economic valuation of the Barnett vein, reference should be made to the Annual Report, Minister of Mines, British Columbia for 1921, page 141. At that time examination of the underground work was possible and it is stated:

"The ore so far exposed is chiefly found within a length of 200 feet along the outcrop of the vein, which follows the contour of the hill in a northerly and southerly direction. Three short tunnels crosscut this ore-shoot, but the vein is so flat that it remains in the tunnels throughout their entire length (the longest tunnel is 150 feet in). There are patches of ore in all three tunnels. On account of the soft, decomposed nature of the granite considerable timber is required to support the roof. The winning of ore from a small vein under these conditions is difficult and expensive."

It should be recognized that the granite was exposed only to shallow depths and will be considerably more solid at lower levels.

About 800 feet southerly from the centre adit on the Barnett vein, at an elevation of 5,625 feet, a drift-adit has been driven on the Fort George claim just westerly from the G. H. slide. This work was done to investigate one of the shears previously described. For a length of 130 feet in this drift the shear strikes north 65 degrees east and dips 75 degrees south-eastward. The shear-width varies from 10 to 40 inches and averages an estimated 22 inches within which are one or more persistent bands of quartz associated with calcite. The remainder of the shear-filling consists of gouge and crushed granite. A sample, taken at the face across 10 inches of quartz and gouge which represented the full width of the shear at this point, assayed: Gold, nil; silver, nil. Another sample was taken on the footwall-side of the shear across 44 inches of leached and altered granite in which quartz stringers are distributed irregularly. This sample, taken as far north-westerly as a fracture parallel to the shear which apparently marks the outer limit of the alteration in the granite, assayed: Gold, nil; silver, nil. Unfortunately the granite back of the working is so badly de-

co
th

ot
wo
th
fe
dr
60
le
th
se
so
wh
m
d
a
G
o
w
s
p
a
e
r
t
t
s

h-
-
and
e
on
141.
ble
s
o
ss
th

composed that it is not possible to take samples safely in the length of the drift.

On the G. H. claim, at an elevation of 5,595 feet, another drift-adit has been driven on a similar shear. This working is approximately 1,100 feet south 60 degrees west from the adit on the Fort George claim. The original exposure was found on the easterly side of the Lucky George slide. The drift follows the shearing, strike north 70 degrees east, dip 60 to 70 degrees south-eastward, for 75 feet. As in the adit last described, the shear is strong and well-maintained but the poor condition of the back prevents close examination or sampling along the full length of the drift. At the face, a sample taken across 18 inches of the shear, the filling of which is composed principally of vein-quartz, very slightly mineralized with pyrite, assayed: Gold, trace; silver, 1.0 oz. per ton. An additional sample, taken on the foot-wall across 14 inches of gouge and decomposed granite, assayed: Gold, nil; silver, nil. A third sample taken across 16 inches of similar wall-rock, adjacent to the shear on the hanging-wall-side, assayed: Gold, nil; silver, nil. On the surface, some 30 feet vertically above the adit, a small open-cut exposes the full shear-width of 18 inches in which is included a 4- to 6-inch streak of quartz abundantly mineralized with galena. This was the best sulphide mineralization seen on the property and a select sample of it, taken from a small dump beside the cut, assayed: Gold, trace; silver, 14.6 oz. per ton. Apart from this streak the remainder of the shear-filling consists of decomposed granite, without visible sulphide.

On the Retter claim, at an aneroid elevation of 5,635 feet, estimated at 2,100 feet north-easterly from the drift-adit on the Fort George claim, a third drift-adit has been driven on a shear believed by the owners to be the extension of the one exposed in the Fort George working. It was not possible to be certain of the elevation of the Retter adit as atmospheric conditions had been markedly affected by a severe thunderstorm at the time of the aneroid reading. For 60 feet this drift follows a shear which strikes north 50 degrees east and dips 80 degrees north-westward. This shear, filled with decomposed granite, gouge, crushed quartz and defined quartz-bands, lies between strong and well-defined granitic walls. Sulphide mineralization is pyrite and galena. Shear-widths vary up to 30 inches. A 22-inch sample of quartz, sparsely mineralized with pyrite, taken across the full width of the shear at the face of this drift, assayed: Gold, trace; silver, 2.3 oz. per ton.

A dump sample of select mineralization consisting princi-

pally of galena and smaller amounts of pyrite in drusy quartz assayed: Gold, 0.02 oz. per ton; silver. 43.2 oz. per ton.

ORO FINO. This property, at the headwaters of Nilsik (Crazy Jane) Creek, consists of the Oro Fino No. 2 and the Gold Cross Nos. 1, 2 and 3 mineral claims, held by location by Eugene Hird of Slocan City and E. J. Van Dulken at South Slocan. The claims cover the headwaters of Nilsik Creek and of Lemon Creek. Locally, surface-relief is very rugged. The surface consists principally of rock-debris and a thin, scattered layer of top-soil resulting from rapid weathering and disintegration. In the winter months, snow-slides are frequent from the side-rims and from the rim at the head of Nilsik Creek Valley and, naturally, these hamper winter-access and greatly increase the cost of winter-transportation. Access from the main Lemon Creek trail at a point slightly more than 2 miles above Oro is by 3 1/4 miles of pack-trail. For the lower 2 1/4 miles this pack-trail is extremely steep and needs considerable relocation before it would permit economical transportation by either back-packing or horse-packing. The camp and workings are at an elevation of 6,800 feet and above timber-line but timber adequate for all mining and domestic needs is available in the valley below the camp within a distance of a mile. Sufficient domestic water is available in a small creek which flows past the portals of the adits, and close to the camp-site. The camp consists of one new log-cabin, adequate for three men.

The rocks of the area are all members of the Nelson batholith. In the vicinity of the workings on this property the commonest rock-type is quartz-diorite which is frequently porphyritic. The feldspar phenocrysts may be large and are easily recognized. In the district, quartz-sulphide mineralization in the granites generally follows openings which vary from comparatively tight joints to shears several feet wide. On this particular property such mineralization occurs in a tight fracture showing little indication of movement. The walls are well defined and seldom more than a few inches apart. Maximum vein-width observed was about 12 inches, but there is reported to be a width of 24 inches at the bottom of a shallow water-filled winze. The vein-material is quartz mineralized with pyrite, galena and sphalerite. The quartz is strong in appearance with a decided blue cast in the higher grade sections of the vein. The wall-rock has been affected by hydrothermal leaching and alteration for a distance of a few inches on either side of the vein.

The original surface exposure was discovered on the northerly side of a small, well-defined draw, in granite, which

str
bas
str
war
pro
exp
At
to
nor
fee
the
sou
por
up
sic
fo
ti
ar
th
gr
50
at
sh
wa
po
tw
te
gr
in
an
lc
ti
ar
bc
.
ti
of
ve
up
ti
di
wh
ve
c
e
in