

BRITISH COLUMBIA DEPARTMENT OF MINES

HON. W.A. MCKENZIE, Minister

Report on

McCONNELL CREEK PLACER AREA

Omineca Mining Division

BULLETIN NO. 2, 1932

by:

DOUGLAS LAY, Resident Mining Engineer

Submitted by:

JOHN D. GALLOWAY, Provincial Mineralogist.

BUREAU OF MINES

Victoria, B. C.
September, 1932.

To the Honourable W.A. McKenzie,
Minister of Mines.

Sir:-

I beg to submit herewith a special bulletin, No. 2, 1932, on the McConnell Creek Placer Area, Omineca Mining Division, by Mr. Douglas Lay, Resident Mining Engineer, No. 2 District.

McConnell creek attracted many placer prospectors this year and, on your instructions, Mr. Lay made a thorough examination of the area in July. The facts and conclusions regarding this placer occurrence are of value not only with regard to McConnell creek, but also are useful in interpreting placer deposits in general in the northern portion of the Omineca Division.

I have the honour to be,
Sir,
Your obedient servant,

JOHN D. GALLOWAY,

Provincial Mineralogist.

McCONNELL CREEK PLACER AREA

Omineca Mining Division

Report by Douglas Lay, Resident Mining Engineer.

INTRODUCTION

McConnell creek, a large stream approximately 7 miles in length, flows south-easterly into the Ingenika river. It is situated in mountainous country, within the placer-gold belt, and is distant in a straight line about 170 miles south-east of the Dease Lake placer section, and about 100 miles north-west of the Manson placer section.

In 1899, P. Jensen of Hazelton, while prospecting the bars and benches of the Ingenika river, discovered gold at the mouth of McConnell creek. Returning in 1906, he located the Discovery claim (now covered by lease held by M.J. Brown), $3\frac{1}{2}$ miles above the mouth of the creek, which proved productive. News of this discovery soon spread to the outside world, and a rush took place to the creek in 1907 and 1908.

In 1908, in order to obtain authoritative information on the matter, the late William Fleet Robertson, then Provincial Mineralogist, went in to the creek by pack-horse train from Hazelton. His report appears in the Annual Report of the Minister of Mines for 1908. From this, it is clear that at that time, those who went in to the creek, with the exception of P. Jensen, formed the opinion that while the Post-Glacial mode of placer occurrence was rich in places, nevertheless the distribution was, as is inherent to this mode of occurrence, erratic, the season short, and the difficulty and expense involved in getting into this remote region very considerable. Excitement in these early days seems to have subsided comparatively rapidly; the creek was very shortly deserted by all save P. Jensen, who alone remained and who has worked on his ground on this creek practically every year since. There is every reason to suppose that this creek has provided him with more than a living.

Last year, M.J. Brown of Tulsa, Oklahoma, and certain associates, went in to this creek, staked several leases and in the spring of 1932, statements of coarse gold having been found by them on true bed-rock were in circulation, and once again history repeated itself, and after a lapse of nearly a quarter of a century, McConnell creek experienced another "rush."

The Resident Engineer went in to McConnell creek by Canadian Airways Limited aeroplane from Burns Lake on July 9th, and spent 10 days in an examination of the creek. It was ascertained that stories of coarse gold having been found on true bed-rock by the Brown party were entirely devoid of truth. Subsequent to the shaft sunk by P. Jensen in 1908 no attempt whatever has been made to reach true bed-rock. There is, however, a wide distribution of fine gold on low-lying benches within the wide creek valley, which will average over 2,000 feet in width for some two miles. The gold, although generally fine, is not excessively so and one piece up to about 50 cents in value was seen. The placer occurrence has resulted from post-Glacial waters cutting down through glacial debris, and effecting reconcentration of the gold contents on and above a false bed-rock of indurated silt, a glacial lacustrine deposit. While the distribution of gold in such cases is necessarily erratic, good prospects are obtained at widely separated points and the present operators by the methods now being followed, that is, by shovelling into sluice flume, have a prospect of making wages. Further, there seems warrant for systematic testing of superficial gravels overlying the false bed-rock by sinking pits to determine any large-scale possibilities. Platinum is also present in the creek gravels, and possibly another metal of the platinum group.

Study of bed-rock geology rendered evident that it is, generally speaking, of promise from the lode-mineral standpoint. Intrusive granitic rocks are much in evidence, and one quartz vein of considerable width, well-mineralized with arsenical pyrites, was discovered.

It is, however, desired to warn all and sundry that this region is not a "poor man's" country, and as far as placer is concerned, McConnell creek is in any case staked from mouth to source.

At the time of inspection, the total number of men on the creek, including the Deputy Mining Recorder, was thirty. Of these, some are employees of M.J. Brown and associates, and the remainder comprise six individual and independent groups owning leases, who, with the exception of P. Jensen, were led to try their luck on this creek at the instigation of M.J. Brown. The majority came from without this Province and did not apparently quite realize what was before them, and found that stories of the richness of this creek had been over-coloured. Going in to the creek by plane early in the spring, they rallied well under disappointment, and settled down to the hard task of whip-sawing lumber for sluices and other necessary preparatory work. At the time of inspection, nine sluices were in operation on McConnell

creek, and one on the Ingenika river a short distance below the mouth of McConnell creek. This is a very commendable result indeed to have been accomplished in such a short time and under great difficulties. P. Jensen has given ungrudgingly of his invaluable experience gained on the creek to one and all.

The thanks of the Resident Engineer are tendered to operators on the creek for hospitality and courtesies extended. It is also desired to express appreciation of the kind co-operation on the part of Canadian Airways Limited in connection with this inspection trip, likewise appreciation of the skill of the pilot, E.P. Wells.

TRANSPORTATION

McConnell creek is reached by following the "Ingenika" trail from Takla Landing, Takla lake, a distance of 134 miles. This trail crosses high summits and is only open for pack-horses for about $2\frac{1}{2}$ months each year. Takla Landing is distant 85 miles by pack-trail from Hazelton, but can be reached in 30 hours by motor-boat from Fort St. James. The journey by pack-horses from Hazelton to McConnell creek occupies about three weeks. An alternative mode of transport is afforded by the aeroplane, by means of which McConnell creek may be reached in $3\frac{1}{2}$ hours from Burns Lake, a station on the Canadian National Railways. Canadian Airways Limited has maintained an aeroplane service this year from Burns Lake as the starting point, landing being effected on a small lake at the head of the creek. The time occupied is about $3\frac{1}{2}$ hours including a stop of $\frac{1}{2}$ hour at Takla Lake for gas.

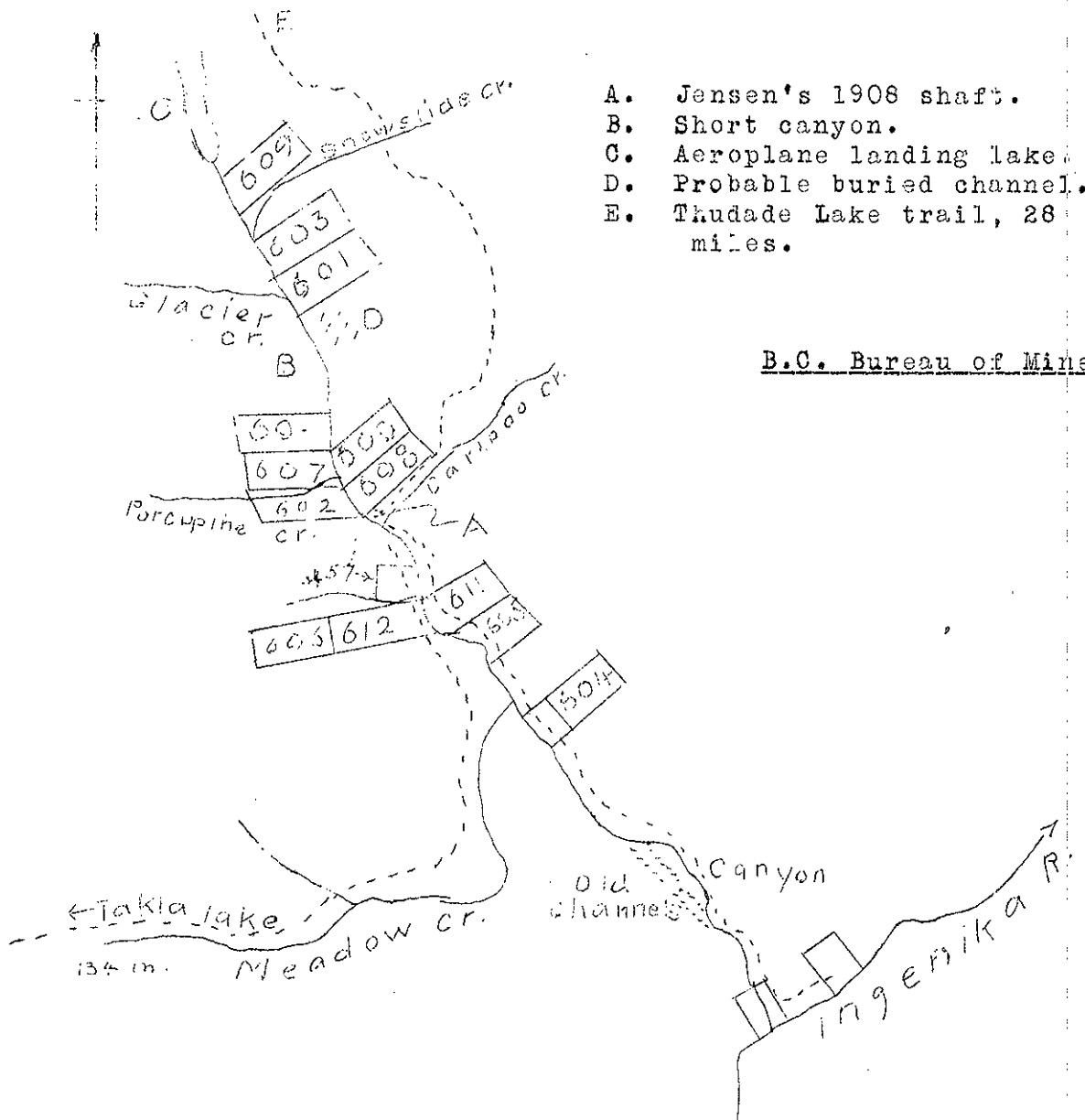
Should justification be found for large-scale operations, it seems quite likely that the solution of the transportation problem will be offered by the aeroplane. In this connection, the following excerpt is quoted from a letter just received from Major Donald R. McLaren, Assistant General Manager of Canadian Airways Limited:-

"It is our distinct purpose to establish a service and provide transportation hitherto lacking, to all prospectors and miners desiring to develop the north country. The success of the transportation medium, whether it be by steamship, rail, road, or by air, depends entirely on the traffic offered. We are endeavouring to establish a permanent operation which will be augmented by more aircraft carrying bigger loads when the traffic presents itself. We are able to take care of the movement of heavy tonnage in the shape of dredging equipment, tractors, hydraulic machinery, drills, saw mills, boilers, etc. through the use of our large Junkers, capable of carrying 6,000 pounds of pay load. This same type of aircraft was used in the

McCONNELL CREEK

Showing certain placer claims
To Accompany Report of D. Lay, 1932.

Scale: 1 inch = 1 mile



- A. Jensen's 1908 shaft.
- B. Short canyon.
- C. Aeroplane landing lake.
- D. Probable buried channel.
- E. Thudade Lake trail, 28 miles.

B.C. Bureau of Mines.

New Guinea Bulolo placer dredging operation, where 5,000 tons of dredging material from which two complete dredges were built, was flown a distance of some hundred miles over a mountainous range 5,000 feet."

SUMMARY AND CONCLUSIONS

McConnell creek has a total length of about 7 miles. For the upper $4\frac{1}{2}$ miles, save at one point, it meanders in a wide valley, the average width of which is not less than 2,000 feet and the rock walls of which are cliff-like, rising abruptly to a vertical height of about 300 feet. Above the rock walls the sides of the valley flatten to the lower slopes of high glaciated mountains. In this portion of the valley wide meadows and low-lying benches flank both banks of the creek. For the lower $2\frac{1}{2}$ miles the creek is contained in a narrow V-shaped canyon, which widens somewhat near its mouth in the Ingenika River valley.

The gradient of the creek from source to mouth including the canyon is low, well under 1 per cent. Two older channels formerly occupied by the waters of this creek, about 35 and 75 feet respectively above the present channel, are plainly discernible at the lower end of the creek above the canyon.

At the upper end of the canyon the indications are that bed-rock will be found at comparatively shallow depth. From the canyon entrance upstream, true bed-rock is evidently much below that in the canyon, which suggests reversal of drainage since Tertiary times. P. Jensen in 1908, at a point about 2 miles above the canyon entrance, sank a shaft in the left bank of the creek to a depth of 93 feet in indurated silt, and from the bottom of the shaft drilled to a further depth of 45 feet in the same material but did not reach bed-rock.

This indurated silt, evidently a glacial lacustrine deposit, apparently extends over the entire wide portion of the valley, the top of it lying at shallow depth. It is upon this false bed-rock that occur the superficial auriferous and platiniferous gravels that engage the attention of present operators on this creek.

These concentrations result from the Post-Glacial waters cutting down through the enormous mass of glacial debris which evidently filled this valley at the close of the Glacial period, effecting concentration of the gold and platinum contents in various sand and gravel strata on and above the false bed-rock. Above the latter, the creek has to a large extent cleared its valley of glacial debris, but large masses of the latter yet remain, which have been terraced by the

waters as they cut through.

The creek meanders through the wide portion of the valley and placer-mining operations are mainly confined to a length of about 2 miles from the canyon entrance upstream, where large low-lying benches flank both banks of the creek.

These low-lying benches situated not more than about 25 feet at the most above creek-level are quite extensive, and very good pans can be obtained on them. While good values may be obtained at widely separated points, distribution is erratic, a characteristic inherent to this mode of placer occurrence. One of these benches has been worked by P. Jensen practically each season for 25 years, and is not yet worked out.

The nature of the gold is fine, but not excessively so, one piece having a value of close to 50 cents was seen. The gold amalgamates by no means readily. Platinum, and possibly another metal of the platinum group is present in the gravels, which contain much black sand in addition to gold.

The method of mining employed is by shovelling into sluice flume, pole riffles being employed in the upper boxes, and expanded metal riffles over cocoa-nut matting in the last four boxes, which are widened to reduce velocity. Sluice grade is about 7 inches per 12-foot box.

The unconsolidated materials which rest upon the false bed-rock consist of creek gravels and sand intermingled with an immense number of glacial boulders, many of which are of large, and some of immense size. Lithologically with the exception of a few boulders of conglomerate, which have obviously been carried to this valley by the ice sheet, the unconsolidated materials are precisely the same as the rocks of which are composed the high glaciated mountains which fringe this valley. These rocks are mainly granitic with a small proportion of andesite into which they intrude. The glacial debris is therefore almost entirely of local origin. Very few quartz boulders indeed are to be found on the creek.

Study of bed-rock geology supports the view that undoubtedly the terrain is such as to have created deposits of placer gold of local origin on true bed-rock prior to the Glacial period. But in view of the intense glaciation to which this area has been obviously subjected, it would not seem reasonable to now expect sufficient values on true bed-rock in the deep portion of this valley to compensate for the cost of "deep lead" mining. Doubtless post-Glacial waters have effected concentration of some gold on the canyon bed-rock, just as on the lease of W.E. Hayes, $\frac{1}{2}$ mile downstream from the mouth

of McConnell creek, concentration of glacial debris has been effected on the bed-rock of an older channel of McConnell creek. Such concentrations are not what is understood by placer deposits of local origin. In the sense that the placer probably originated from the immediately surrounding terrain, even the placer concentrations on false bed-rock on McConnell creek may be regarded as being of local origin.

Present operators have accomplished a very great deal in the midst of many difficulties, and would seem to have a fair prospect of making wages in most cases commensurate with expenses incurred. It is quite possible that investigation may disclose that the platinum content is such as to warrant some means being taken to recover it from the black sands, such for example as the installation of a small central plant for the treatment of all concentrates from the creek. The supply of sluice water to the various leases is also susceptible of improvement, but operators cannot at present contemplate the expense involved.

It is obvious that the yardage of gravels lying above the false silt bed-rock is of the order of millions of yards, but systematic testing alone can determine whether large-scale possibilities exist. Such testing should take the form of sinking pits in superficial gravels down to the false bed-rock and of washing the entire contents of the shafts so that the value per cubic yard in place is known at each point with accuracy.

Certain difficulties and obstacles in the way of large-scale operations are apparent, whether such take the form of hydraulicking or dredging; for example, the very low gradient of the creek and the number of boulders of large size. On the other hand, the indurated silt false bed-rock would be ideal for dredging off, and the depth of overlying gravels would not probably for the most part exceed 25 feet. This silt false bed-rock has unusual physical properties. It is quite impervious to water, and can be drilled very quickly and readily with an auger, without any sign of the hole caving.

Inasmuch as certain areas are comparatively free from boulders of large size, it would seem that a mobile power-shovel mounted on caterpillar tracks or boom drag-line, would perhaps be best suited to conditions on this creek.

The arithmetic mean of 17 pan samples taken at widely separated points is \$1.64 per cubic yard in total values: Gold, \$1.52 per cubic yard, and platinum, \$0.12 per cubic yard, the latter being calculated at \$40.00 per ounce. While such does not by any means indicate that this is the average value of the great yardage of gravels over-lying the

false bed-rock, nevertheless there is clearly justification for thorough and systematic sampling, and a general detailed investigation covering all economic aspects. The results of pan samples indicate that consideration should be given to the matter of saving platinum values. While P. Jensen's bench lease is indicated as being the best ground, it should be borne in mind that very little work indeed has been accomplished to date at other points.

GENERAL GEOLOGY

Physiographic Features: McConnell creek is situated in a mountainous region, which forms a portion of the Cassiar Mountain System, and rises at the head of a chain of small lakes which drain partly into McConnell creek and partly into Thutade lake, and on one of which aeroplanes land.

The total length of the creek is nearly 7 miles, and from its source downstream the creek meanders for about 4 miles in a wide valley from which steep rock-walls rise abruptly to a height of upwards of 300 feet, at which point the valley sides flatten off to elevated plateaux. On the latter occur numerous morainal lakes, the topography exemplifying typical "pot and kettle" country. From these elevated plateaux rise the slopes of high glaciated mountains. With the exception of one constriction about 2 miles below the lake at the head of the creek, the valley width increases somewhat downstream, and is greatest at the point the creek enters a canyon in which it is contained for the last $2\frac{1}{2}$ miles of its length up to its junction with the Ingenika river.

The average width of the rock-walled valley above the canyon is about 2,000 feet, and in this portion of the valley large low-lying benches flank both banks of the creek. The direction of flow is south-easterly, and the gradient is well under one per cent.

The creek receives important tributaries and is a large stream. An approximate measurement above Meadow creek and an un-named tributary indicated a flow of 9,000 cubic feet per minute on July 17th, and the flow through the canyon at this time must have been at least 50% in excess of this.

Note: The Department of Lands has recently published a contoured map of McConnell Creek area as the result of recent surveys made by F.C. Swannell.

The following elevations were determined by aneroid barometer and therefore are probably only approximately correct:- Burns Lake station, 2,300 feet; aeroplane landing

lake at head of McConnell creek, 4,100 feet; McConnell creek at bridge by P. Jensen's bench lease, 3,985 feet; entrance to canyon, 3,915 feet; mouth of McConnell creek, 3,860 feet.

Bed-rock Geology: The terrain immediately surrounding McConnell creek consists of various phases of granitic rock intrusive into andesite. The intrusives in this region form portion of the Cassiar-Omineca batholith, which extends south-easterly into the Cariboo Mining Division, and north-westerly beyond the confines of this Mineral Survey District. Many different types of intrusives were observed from extremely acid quartz-feldspar to ultrabasic pyroxenite. The intrusive rocks are in places sparsely mineralized with chalcopyrite. Quartz veins do not appear to be numerous but a few were observed, one of large size, well-mineralized with arsenical pyrites on the Kings George mineral claim.

Study of bed-rock geology led to the following conclusions:-

- (1) The region exhibits promise from the lode-gold standpoint, and search therein for such deposits is warranted.
- (2) The rocks surrounding McConnell creek are precisely the same lithologically as the creek gravels and glacial debris overlying the false bed-rock of silt in the creek valley, save that the unconsolidated materials contain a few foreign boulders of conglomerate.
- (3) Although the placer concentrations in the strata overlying the silt false bed-rock originate in the first place from re-concentration of glacial debris, the latter is of local origin, and inasmuch as the bed-rock geology affords every evidence of a local origin of gold and the ultrabasic rocks indicate a possible origin of platinum group metals, it is deemed that the placer concentrations, although lying on a false bed-rock, are probably of local origin.

Placer Geology: McConnell creek bears evidence of intense glaciation. That the ice-sheet over-rode all but the highest peaks is evidenced by the rounded summits, and the occurrence of "erratics" thereon. The indications are that the closing stages of the Glacial period left this large valley filled to a height of about 1,200 feet above the present floor with glacial debris. Post-Glacial rejuvenation, still actively in progress, was by way of the Ingenika River valley, and to a large extent the creek has effected clearance of the glacial debris which formerly occupied its valley, down to the level of

the canyon, but in places large masses of glacial debris still remain, some terraced. The creek runs over or close to a false bed-rock of indurated glacial silt of great depth which is evidently lacustrine, and which appears to floor the entire valley above the canyon, or at any rate, a large portion of it, and upon it rest the creek gravels and glacial debris.

The occurrences of placer which engage the attention of present operators are undoubtedly due to post-Glacial waters cutting down through the immense mass of glacial debris, which formerly filled this valley, and effecting concentration of the gold and platinum, contained in the glacial debris, in various strata from the silt false bed-rock upwards.

It is evident that true bed-rock in the wide portion of the valley is below the level of that at the canyon entrance. This and other features suggest that in Tertiary times the flow of water in the creek may have been reversed from a north-westerly flow into Thutade lake to the present south-easterly flow into the Ingenika river. The movement of the ice-sheet was south westerly and southerly. Two older channels of the creek are very clearly discernible at the lower end of the valley above the canyon, one on the extreme western side of the valley and the other above the present channel on the east side; they are about 35 feet and 75 feet respectively above the present channel; both enter the Ingenika River valley below the bed-rock of the present channel of the latter. Excessive modernity is not suggested by the channels at the lower end of the creek, and the most recent is probably Pleistocene rather than post-Glacial. It seems likely that the channel on the west side of the present valley is the oldest and that the blocking of this channel by the moraine from Meadow Creek glacier in inter-Glacial times caused a lake in the valley until the waters cut through on the east side.

As to the question of gold values on true bed-rock the depth of which in the wide portion of the valley is purely conjectural. All that is known on this point is that P. Jensen in 1908 sank a shaft on the ground now covered by lease No. 608, through the indurated silt to a depth of 90 feet, and from the bottom of this shaft drilled a hole with an improvised drill with a 2 inch carpenter's auger as bit, to a further depth of 45 feet, at which point it is stated, sand was encountered. While study of bed-rock geology entirely supports the view that the terrain eroded is such as to have originated deposits of bed-rock placer in Tertiary times, nevertheless, in view of the evidence of intense glaciation, it would not seem reasonable to anticipate that sufficient values will be found on true bed-rock in the wide portion of the valley to compensate for the cost of "deep lead" mining. Doubtless Post-Glacial

waters have effected concentration of placer on the canyon bed-rock, and on the lease of W.E. Hayes, described later, such waters may have caused concentration on the bed-rock of a former channel of McConnell creek.

LODE-MINERAL POSSIBILITIES

From the description of bed-rock geology previously given, it is apparent that the region offers lode-gold promise. It seems likely that as yet there has been but little prospecting in this direction. A few quartz veins were observed, and one of considerable proportions on the King George group, a description of which follows:-

King George. This group of claims, owned by P. Jensen and associates of Hazelton, is situated in Glacier Creek canyon, a short distance above the mouth. The mode of mineral occurrence exhibited is that of a large quartz vein well-mineralized with arsenical pyrites occurring in granodiorite. A width of 20 feet or more of the latter rock is also well-mineralized on the foot-wall side of the vein. The precipitous nature of the exposure on which little or no work has been done, rendered it impossible to measure the width of this vein which is evidently considerably. On the opposite side of the canyon, the walls show broad bands of staining, and further prospecting is justified, even although samples of the mineral did not disclose more than traces of gold.

PLACER-MINING

Description of Workings: The method followed by present operators is that of shovelling into sluice flume. Pole riffles are used, save that in the last four boxes which are double the width of the others, expanded metal riffles on top of cocconut matting are employed. The number of boxes varies according to the requirements of the bench worked, varying from about 12 up to 22, each box being 12 feet long. The boxes are generally about 12" by 12" in cross-sectional dimensions, but some sluices 15" wide were in use. All lumber has to be whipsawed. At the time of inspection, 10 sluices were in operation, 9 on McConnell creek, and 1 on the Ingenika river. The average yardage per man per shift is from 6 to 8 cubic yards. A convenient shovelling range is about 12 feet from the sluice, so that with two men shovelling one on each side of the sluice, a cut about 24 feet in width can be carried through the bank.

The method of testing followed was to take pan samples at various points, reduce these to small bulk by panning on the ground, and to determine by fire assay the total gold and

platinum in each sample, results being calculated on the basis of 150 pans per cubic yard.

P. Jensen's Bench Lease No. 457. This has been operated by the owner for a great many years and is still far from being worked out, although the cream of the upper pay strata has doubtless been skimmed off a portion of the lease. The area covered lies wholly without the rock wall, and consists of extensive bench land, partly low-lying, and partly situated at an elevation of 35 to 40 feet above the creek. Water for sluicing is derived from an un-named creek, which rises in the mountains behind the lease. While it is stated that preliminary testing of the high-lying bench indicates promising values, attention has been practically entirely confined to the extensive low-lying bench which rises gradually from the creek to an elevation of 15 feet or so above the latter at parts remote from the creek. Effort has focussed mainly on an area about 175 yards square immediately adjoining the creek, a large portion of which has been worked off. On the bank of the creek, and for some distance inwards from the latter, boulders of large size are present, but in places the ground is comparatively free from boulders of large size, and is adapted to power-shovel or drag-line operation. Gold and platinum values occur in various strata from the surface down to the false bed-rock. While values are erratic, and in places best on the surface, on the whole they are distinctly good, as will be seen from samples.

At the time of inspection, a sluice was being advanced inwards from the creek in the south-eastern portion of the lease, two men being employed. The width of the pit was about 24 feet, and the height varied from 6 feet to 9 feet. Overlying the pay gravels there is a thickness of upwards of 2 feet of tailings from an earlier operation. A sample representing the working face of the pit, but excluding barren tailings overlie, indicated gold values of \$0.645, and platinum \$0.06 per cubic yard. A sample from this pit of the paystreak only 2 feet in width yielded: Gold values, \$2.44; platinum values, \$0.195 per cubic yard.

At another point from a pit 3 feet deep and 50 feet wide, which the owner proposes to work at a future date, samples yielded the following results:- Sample in middle: Gold, \$0.81; platinum, \$0.12 per cubic yard; sample at north end: Gold, \$2.82; platinum, \$0.675 per cubic yard; sample at south end: Gold, \$0.525; platinum, \$0.045 per cubic yard.

At another point of the lease at which there was a heavy deposit of sand, a sample of 2 rich paystreaks, 6 inches and 1 foot in thickness respectively, yielded: Gold, \$6.79; platinum,

\$0.33 per cubic yard. A sample of a paystreak 3 feet in width underlying the former but separated from them by a thickness of several feet of sand, yielded: Gold, \$0.78; platinum, \$0.165 per cubic yard. A sample of black sand from this lease from which gold had been partially removed by amalgamation assayed as follows:- Gold, \$988.80 per ton; platinum, \$72.00 per ton; iridium, trace.

M.J. Brown's Bench Lease No. 608. This lease covers P. Jensen's original "Discovery" claim which he worked to some extent before moving to his present lease on the opposite bank of the creek. On this lease or just without the southern boundary is situated also the shaft sunk by P. Jensen in 1908, previously described in this report.

The lower portion of this lease comprises a flat-lying bench a few feet only above creek level about 100 yards wide, which extends the length of the lease frontage. Above this is a smaller bench about 30 to 50 feet above creek-level, and above this the ground rises in irregular, partially terraced high benches gradually merging into the lower slopes of Jensen mountain. Cariboo creek, which supplies sluice water for this and the adjoining Bench Fractional Lease of L.E. Loveseth, cuts across the north-eastern corner of the lease and joins McConnell creek on the lease held by the R.E. Savage estate.

At the time of inspection, work was confined to a sluice near the eastern boundary on ground comprising P. Jensen's original "Discovery" claim, on a bench of about 30 feet above the creek-level. E.L. Fowler, T.G. Fraser, and C. Scotwold were working on a "lay" from M.J. Brown. A sluice had been brought in from McConnell creek at about 6 feet below the top of the bench, and the size of the pit was about 170 feet long by 20 feet wide by 5 feet deep.

A face sample of the pit representing a thickness of 4 feet yielded the following results: Gold, \$3.00; platinum, \$0.195 per cubic yard.

L.E. Loveseth's Bench Lease. This is a fractional bench lease about 250 feet wide and immediately adjoins M.J. Brown's Bench Lease No. 608 on the east. Operations on this lease were being conducted by John L. and A.L. Loveseth, and two sluices a short distance apart were running. The dimensions of one pit were about 30 feet by 108 feet by 9 feet deep, and those of the other about 18 feet by 60 feet by 6 feet.

A sample taken from the entire depth of the face of the first-mentioned pit yielded the following results: Gold, \$0.375; platinum, \$0.027 per cubic yard. A sample taken from the face

(entire depth sampled) of the second-mentioned pit yielded the following results: Gold, \$0.075; platinum, nil, per cubic yard.

It is to be noted that these two samples are by no means deemed to be representative of the average value of the ground in this region, and quite likely by chance, at the time of sampling, the faces of the pits were in a poor spot. Further, the sluice on M.J. Brown's lease and these two sluices are all closely adjacent within about 300 feet, and a closer idea of the value of the ground might be obtained by taking the average of the three face samples.

It is understood that owing to there not being a sufficient supply of mercury on the ground, there has been no "clean-up" from the operations to date on L.E. Loveseth's lease or on that of M.J. Brown, up to the time that the "lay" was given on the latter lease. Concentrates were merely removed from the sluice from time to time and piled in a heap on the ground pending arrival of mercury. There are thus no records available whereby the actual value of the ground in place can be calculated in terms of recovered values.

Bench Lease of H.K. Henry, No. 607. This lease has an abundant supply of water for sluicing from Porcupine creek, but no recent work has been done on it.

Bench Lease of R.E. Savage Estate. No work had been done on this at the time of inspection but Douglas Savage was on the creek at this time, and was to commence testing operations very shortly. The lower portion of this lease consists of the low-lying bench immediately adjoining that of L.E. Loveseth, and would seem to offer promise. Cariboo creek appears to have been diverted from its former channel (which probably passed over the centre of this lease) by the moraine of the glacier which formerly occupied its valley.

Bench Lease of J.W. Leedy, No. 605. The lower portion of this lease comprises about 35 acres of bench land about 25 feet above the creek which appears to offer considerable promise. The coarsest gold seen on the creek by the Resident Engineer was on this lease and good pans were obtained. Owing to shortage of sluice flume water, a supply had to be obtained from the other side of the creek, and a very commendable piece of construction work, with limited means available, was carried out under the direction of J.W. Leedy, an engineer. This involved construction of a water flume and trestling across McConnell creek. Actual sluicing operations had only just got really under way at the time of inspection.

One sluice had been installed close to the creek at the base of the bench.

A sample taken close to the creek at the edge of the bench yielded: Gold, \$2.80; Platinum, nil, per cubic yard. Another sample taken a little higher up the bench in the near vicinity, yielded: Gold, \$1.30; platinum, \$0.045 per cubic yard. A sample of black sand from this property from which gold had been removed by amalgamation, assayed: Gold, \$2.20 per ton; platinum, \$45.20 per ton. The coarsest gold obtained on this lease was a small nugget close to 50 cents in value. The general run of gold on this lease appears to be somewhat coarser than at other points.

At the back of the bench close to the rock-wall of the valley, the indurated silt false bed-rock is exposed by a cut about 2 feet deep. A small boulder of coal was found at this point, which had obviously been carried into this valley by the ice-sheet.

Bench Lease of Alex. Hyslop. This lease comprises an extensive low-lying bench, and appears to offer considerable promise. Indurated silt false bed-rock is exposed close to creek-level. One sluice had just been started at the time of inspection. A sample taken in the face of the pit, showing 4 feet of gravel overlying silt false bed-rock, yielded: Gold, \$1.06; platinum, \$0.069 per cubic yard. Another sample taken from another place immediately below grass roots yielded: Gold, \$0.93; platinum, \$0.039 per cubic yard. Where exposed, gravels showed an absence of large boulders.

Bench Lease of V. Brown. This is a fractional lease and adjoins that of Alex. Hyslop upstream, and comprises a portion of the same bench. One sluice was in operation on this lease. A pan sample taken from this lease a few yards only distant from the point at which a good pan was obtained on Hyslop's lease showed a few colours only. Physical conditions were precisely the same at both points sampled, and the difference in values is illustrative of the spotty mode of occurrence. It is not deemed that the pan taken was representative of this ground.

Bench Lease of F. Brandt. This lease adjoins Meadow creek on the west, and comprises mainly partially-terraced glacial debris, through which Meadow creek cuts, and which seems to be the moraine of the glacier which formerly occupied the valley of the latter creek. Apart from post-Glacial concentration, it is possible that in this material there may be concentration due to glacial streams. One sluice was in operation at the time of inspection on the left bank of

Meadow creek. One pan was taken which appeared to be representative of the face of gravels about 6 feet in height which were being shovelled into the sluice. This sample yielded: Gold, \$0.522 per cubic yard; platinum, nil. Investigation had only just been started on this lease, and in the absence of further work it is quite impossible to form an opinion as to average values. The yardage of gravel is undoubtedly large, as the lease is situated in the widest part of McConnell Creek valley immediately above the canyon, and thorough investigation of this ground is undoubtedly warranted.

Creek Lease No. 479 of P. Jensen. This extends upstream from a point in the canyon several hundred feet below the entrance. In past years P. Jensen constructed a wingdam, and diverted McConnell creek from its present channel to one south of it below Meadow creek and installed a sluice with a view to working the former bed of the creek and adjacent low-lying bench. In the future he proposes wing-damming the creek in the canyon and sinking to bed-rock at this point with the aid of a pump.

Creek Lease of C. Fredrikson. This is situated on the last $\frac{1}{2}$ mile of McConnell creek from its junction with the Ingenika river upstream. Many years ago, P. Jensen constructed a wingdam at this point and sank some distance in the left bank. Depth to bed-rock is an unknown factor at this point, but it appears to be below that of the Ingenika river which, as has been previously mentioned, seems to have formerly occupied a channel south of its present position, in this region. No work was taking place on this lease at the time of inspection.

Leases of G. Horn and C. Smith. Testing operations on these leases were being conducted by P. Vettorel at various points. The features of these leases differ materially from those of other leases previously described inasmuch as a high rock-wall is immediately adjacent to the left bank of the creek in this region, and at one point the creek passes through a gorge, the walls of which are only about 250 feet or less apart, and on the right bank of the creek in this vicinity gravels occur on a rock bench, the only instance of such observed on the creek. The indications are that the ancient channel of McConnell creek lies buried north of the rock wall which flanks the left bank of McConnell creek in this region. The ancient channel probably joins the modern either on the lower end of C. Smith's lease or on A.L. Loveseth's lease. It would seem advisable to endeavour to locate the silt false bed-rock on G. Horn's lease.

Lease of W.E. Hayes. This is situated on the Ingenika river. A sluice was in operation at the time of inspection, and encouraging results were being obtained. In fact, so far as it was possible to form an opinion, from actual recoveries being made, these indicated better ground than known by pan samples taken. The ground is doubtless "spotty" and bouldery, but exhibits considerable promise with prospect of concentration on true bed-rock. One pan sample taken from the face of pit 3 feet deep yielded: Gold, \$0.345; platinum, \$0.015 per cubic yard. Another sample from ground known to be good yielded: Gold, \$0.57; platinum, \$0.075 per cubic yard.

This lease is situated directly over the course of a former channel of McConnell creek, previously mentioned in this text as existing on the east side of the present channel of McConnell creek. Placer values would appear to owe their origin to reconcentration of glacial debris by post-Glacial waters on false bed-rock, and it would seem reasonable to anticipate some concentration upon true bed-rock of the ancient channel of McConnell creek mentioned.

Small-Scale Placer Possibilities: While the present method of mining is well-adapted to the present conditions which confront operators, certain modifications would seem likely to lead to improvements. The following points seem to warrant attention:-

- (1) In view of the presence of platinum, steps to save values contained in the black sands would seem advisable. The adoption of undercurrents, in order to make a close saving of black sands would seem to be justified. The installation of a small centrally-located plant for the treatment of black sands from all properties on the creek, if feasible, would appear to be a desideratum.
- (2) The gold does not amalgamate readily and matters in this respect might be improved by the use of cyanide, which would be practicable if a small treatment plant such as indicated were installed, but the present pioneer conditions render inadvisable the use of such an excessively poisonous reagent, and it has been wisely shunned by present operators.
- (3) McConnell creek runs on a low gradient and although containing such a large volume of water, a long ditch line would be required to render its waters available for sluicing. So far, water for sluicing has been taken from tributaries, a source of supply which with some exception fails towards the end of the season. Porcupine creek, entering the main valley as a hanging-valley, is capable

of supplying all sluices in the more immediate vicinity. While expense would be involved in delivering a water supply from this source to sluices, nevertheless a great improvement would result therefrom.

Large-Scale Placer Possibilities: Consideration in this connection focusses on the Post-Glacial gravels overlying the silt false bed-rock. The maximum thickness of these will probably not much exceed 25 feet. Some terraced benches of glacial debris are considerably thicker than this, and there may be some concentration in strata within these masses caused by glacial streams.

The total yardage of Post-Glacial gravels obviously runs into millions, and in view of the good values obtained at widely separated points, there is clearly warrant for systematic testing to determine large-scale possibilities.

Such testing, it is suggested, should take the form of systematic shaft sinking in the overlying gravels down to silt false bed-rock, and washing the entire contents of each shaft, so that values per cubic yard in place may be accurately determined, and likewise also the position at each point of the false bed-rock.

In connection with any hydraulic operations, diversion of water from Snowslide creek would give a head of about 115 feet at the upper end of the area now being worked. Diversion of McConnell creek below Glacier creek to include this large tributary would reduce this head by 25 feet at least at the point mentioned, but would give a head of about 165 feet at the lowest part of the wide valley.

Low creek gradient coupled with the number of large boulders are obviously factors adverse to major hydraulicking operations, although by stacking tailings, later hydraulicking of benches might be practicable, gravels being piped off down to the silt false bed-rock.

Favourable aspects of dredging possibilities are the shallow depth at which the silt false bed-rock lies, and the very favourable nature of the latter for dredging off. An unfavourable aspect is the number of boulders of large size.

In view of the fact that some areas are comparatively free from boulders of excessive size, a mobile caterpillar power-shovel or drag-line scraper would seem perhaps best suited to the conditions met with on this creek.

The foregoing observations are of course purely tentative, and in the absence of systematic testing no large capital outlay is justified.