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RECONNAISSANCE IN THE SMITHERS AREA

by

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Introduction.

In May of this year, a party consisting of a chief and five assistants, of which the writer was one, was organized to complete a study of the geology of the "Smithers Area".

At first it was planned to leave Vancouver on June 1st by boat for Prince Rupert and to proceed, by the Canadian National Railways, to Smithers. On the afternoon of departure, word was received that the unusually hot weather which had been experienced in Northern British Columbia had caused the water level of the Skeena and adjacent rivers to rise to record heights, due to the melting of the snow on the mountain tops, wiping out many bridges and several miles of railroad track between Prince Rupert and Hazelton.

Consequently it was decided to approach Smithers from the east, via Jasper. Accordingly the departure took place the following evening. In the meantime, the waters of the Fraser and Nechako Rivers had risen to such a height as to flood the engine fireboxes of the trains travelling between Jasper and Hazelton. Fortunately the waters receded so that after five days had passed, the members of the party found themselves at their destination.

General Position of the Area.

The "Smithers Area" lies between 54th and 55th parallels of north latitude and between 127th and 128th meridians of west longitude. The Bulkley river valley passes diagonally

across the northeast corner of the sheet, and it is here that the only inhabitants of the area live, with the exception of the few who own homesteads a short distance up the Telkwa river, an important tributary of the Bulkley.

At the junction of these rivers lies the town of Telkwa. Ten miles northward in the Bulkley valley is Smithers, a division point on the railway, with a population of about 1000 persons. Twenty miles farther to the north, and one mile north of the edge of the area, is the Indian village of Moricetown which is historically famous.

Unfortunately a good map of the area cannot be obtained, for the first complete map of this district was compiled only last year and is now in the engravers' hands at Ottawa.

Physical Features.

The outstanding feature of the area is the large, high, compact group of peaks a few miles west of Smithers. This is Hudson Bay mountain which, because of its height (8700 feet) and isolated position, is a conspicuous landmark that can be seen from points many miles away. Many theories pertaining to its origin and mineralization have been evolved by several geologists.

Along the northern edge of the area lies the rugged, barren Kitsequekla Range, while between these peaks and Hudson Bay mountain is the wide Kitsequekla valley. The valley floor is very heavily timbered, with thick underbrush and profuse

windfall. This type of landscape is common to the western edge of the sheet.

The area south of the Telkwa river is mountainous and for the greater part, consists of rounded hills covered with burnt timber, while upon the flattened mountain tops, up to a thousand feet above timber line, stretch great grassy meadows. The creeks flow in deeply incised valleys of stream erosion somewhat modified by glaciation.

Still farther to the south, in the vicinity of the Morice river, the country is low-lying, with many small lakes. For a distance of about five miles on both sides of the river stretch great terraced pine flats, evidence of the changing course of the river.

The western side of the area is mountainous, and is in the main extremely rugged, containing many steep-sided mountains with pinnacled peaks. These, although they do not rise to a greater height than 7000 feet above sea level, appear to be much higher, due to the deep valleys which separate them.

Previous Work.

Previous work has been done on parts of the area, first by W. W. Leach who in 1906 covered the greater part of the Telkwa valley, as well as much territory to the south and west. During the following year he extended his operations particularly in the examination of mineral claims and antive mines. A map of his work may be seen at the end of this essay.

Mr. Leach's work was supplimented by that of George Hanson

who surveyed the greater part of the Telkwa and Zymoetz valleys in 1925. This area extends approximately across the middle of the "Smithers sheet", leaving a little more than half of one square degree to be completed.

R. H. B. Jones, at about the same time, did considerable detailed work upon Hudson Bay mountain. Additional inspection of mines and claims was carried out here by F. A. Kerr in 1935.

Transportation.

Along both sides of the Bulkley river are several roads, all in good condition, most of which run parallel to the valley and do not digress to any great distance from the river. From Smithers, two roads, along which automobiles may travel a few miles westward, wind up the slopes of Hudson Bay mountain.

Stretching across the northern edge of the area for a distance of about twenty miles is a disused pack trail which we found necessary to reopen at considerable expense of time. The rugged nature of the land permitted us to continue only 5 miles farther westward from the end of the trail, at great peril to the pack horses.

In order to reach the larger southern region, three courses of travel are possible. The first route follows the south bank of the Morice river due westward from Houston, which is 44 miles south of Smithers. To approach the area from this point, however, we were compelled to travel 40 or

50 miles farther than necessary, and we were faced by the additional difficulty of trying to cross the Morice river, which feat we endeavored to do later, but we failed in the attempt.

The second route lies up the valley of the Telkwa river, and was reported to be in good condition, but the great floods of the previous months had carried out two bridges, thus making the trail impassible.

We were compelled, therefore, to proceed southwest up Goat Creek, a tributary of the Telkwa river, to Hunter basin over a trail which required considerable repair. From this point we travelled southward across the grasslands, above timber line for the greater part of our journey, to an unnamed southward-flowing creek a few miles south of Dominion basin. For nearly three weeks it was necessary to cut a trail through dense bush to the Morice river. Here we were fortunate to discover a trail, which had been re-opened by the topographical party which had mapped this area during the previous year. The trail followed the north bank of the Morice river for 18 miles to Clark creek up which it turned. We were compelled to cut a trail the remaining 8 miles through virgin forest to Morice Lake.

Since further progress westward from this point was impossible, we returned to the junction of the Clark and Morice rivers, and set out towards the west up the Gosnell river for 8 miles. From here we could proceed no farther westward, for

the extreme ruggedness of the country made even foot travel slow and difficult.

Upon leaving this region, we returned again to the junction of the Clark and Morice rivers, and followed the topographer's trail northward for 20 miles to the south of the Telkwa river, at a point about 2 miles north of Howson Lake. From here we travelled overland, again above timber line, to Hunter basin and returned from this point to Smithers by the route over which we had come.

Old maps of this vicinity indicated numerous pack trails, but these are now impassible.

Geology.

Of the general geology the writer knows not a great deal. Consequently only some of the unusual and interesting features will be discussed here.

The first point examined was Glacier Gulch on Hudson Bay mountain. This complex structure has been the basis of many theories pertaining to its origin. Here lie layers of volcanic and sedimentary rocks in close sequence, both being cut by narrow intrusives.

Of this location, F. A. Kerr states:

"The Glacier Gulch area has attracted much attention because of a small production from a number of pockets of very high-grade gold-bismuth ore of a unique type. There are also a number of other deposits, some of which have been developed, of the common types, containing mainly, gold, silver, lead,

zinc, and copper. With the exception of one vein under development in 1934, most of these are small and lie in irregular fractures.

"The dominating feature of the area is the great gash which the glacier has cut in the mountain. The location of the cut in this particular place may be due to a syncline, or a syncline and an anticline, which plunge toward the north-east parallel to the valley. To the south-west of the deposits there are reverse dips of the strata indicating the possibility of a local domal structure. Owing to the extensive erosion of the Skeena formation, which alone gives a clue to the structure, only remnants of such structures are visible."

The sedimentary rocks of the Skeena formation are largely sandstones and slates. The latter contain many good fossil specimens of ferns and marsh grass which indicate that the coal, large seams of which show in the valley walls, was formed during the Lower Cretaceous period.

Ten miles to the north of Glacier Gulch a more definite indication of the Skeena formation was seen at the junction of Trout creek and the Bulkley river. Here a fossiliferous mass perhaps 100 feet thick, containing pelecypods, brachiopods and belemnites of which many excellent specimens were obtained, was cut by an acidic post-Cretaceous intrusive which formed dykes and sills visible in the canyon walls.

Another interesting formation in this vicinity is that of a Tertiary rhyolite, the hexagonal columnar structure of which was visible from a considerable distance.

On the northeast side of the river, near the point just described, sedimentary beds, consisting mainly of sandstone of the Skeena formation could be seen in the canyon walls of the Bulkley river and its tributaries. In figure 6 there is one of the latter, while in figure 7 there is a formation which indicates a fault coincident with the river bed. On the farther side of the river, the bedding lies nearly at right angles to the bedding of the nearer side. The former is unfortunately not apparent in the photograph, but the schistose structure visible in the lower right corner is parallel to the fault.

A great part of the area south of the Telkwa river is very mountainous, and is cut by deep valleys, in the walls of which can be seen the nearly horizontal layers of andesite, mainly in the form of tuffs and breccias which dip toward the west as shown in 8.

Nearer to the Morice river, in the great reaches of low-lying country are large basin-like deposits of Lower Cretaceous coal-bearing sediments.

On the western side of the area, many granite and diorite intrusives cutting the Jurassic rocks of the Coast Range are apparent.

Mineral Deposits and Mines.

In this area the center of mining activity is that very important group of peaks, Hudson Bay mountain. The mineralization of Glacier Gulch has been mentioned previously, and is

typical of this region. The only active mine in Glacier Gulch is the Lake Kathlyn Coal Mine. All other mines on the mountain produce at least one of the following metals in important quantities: gold, silver, lead, zinc and copper. Concerning the first two metals, F. A. Kerr states:

"Production has been made of hand-sorted gold ore assaying 0.5 to 1.0 ounce a ton (3 ounces in one case) and of silver ore assaying 100 to 200 ounces a ton and such results are to be expected on some properties. Milling grade is not likely to be over 0.5 ounces for gold and for silver 50 ounces. Vein lengths up to 3,700 feet are known, but workable lengths have been demonstrated for only as much as 1,100 feet. Widths of 4 to 6 feet for 500 to 700 feet in the case of gold deposits are known. Widths in silver deposits are generally about 1 foot. Workable veins are known to extend for 600 feet below the surface."

Thus, it can be seen that this district presents some not unimportant mining possibilities.

In the region south of the Telkwa river, many claims had been worked earlier than 1906, when they were examined by W. W. Leach. These deposits consist mainly of copper ores, namely, azurite, malachite, copper glance, chalcopyrite and bornite, which are reported in some cases to carry good values in silver. Many of these claims have not been worked since 1907 when the high price of copper warranted their operation. The owner of one claim stated that the cost of transportation of

ore to the railroad from Hunter basin is \$41.00 per ton.

In this vicinity, at somewhat lower elevations, occurring in the Lower Cretaceous sediments, semi-anthracite coal is found. The only active mine here is that of the Cassiar Coal Company, whose production is sent by railway to Prince Rupert where it is consumed in the cannaries.

This coal is of great importance. Concerning this, Mr. Leach says:

"On the nearer approach to the newer eruptive areas the older rocks, including the coal beds, have been highly disturbed and the resultant heat and pressure have had a marked effect on the coal, altering it from a bituminous to a semi-anthracite; it must be expected, however, that more difficulties will be met with in mining due to the probable greater frequency of faulting and increased intensity of the folding."

Mr. Leach gives also a number of tables showing the various grades of coal to be found at different points in this region. A table showing the averages of these results is as follows:

Location	Moist- ure	Volume Comb.Mat.	Fixed Carbon	Ash
Cassiar Coal Company (Goat Creek)	4.40	29.95	59.67	5.98
Transcontinental Syndicate (Goat Creek)	0.85	9.05	78.70	11.40
Telkwa Mining & Milling Co. (Coal Creek)	0.91	10.93	80.81	7.35

"All of the above coals are non-coking and are classed as semi-anthracite."

Of the area to the south and west, little can be said of mining possibilities. Very little, if any, ore is to be found here, nor is it likely that any will be found in the future. There are large deposits of semi-anthracite coal extending southward from the Telkwa river to points far south of the Morice river. However, the problem of transportation precludes all possibilities of profitable mining.

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