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PRELIMINARY REPORT'

ON

MINING LOCATION NO.1 K.

LAKE OF THE WOODS.

BY

W. HAMILTON. MERRITT, F. G. S.

Associate Royal School of Mines; Member American Inst. of Hiping Engineers; Member Iron and Steel Institute.

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PRELIMINARY REPORT

ON

MINING LOCATION No. 1 K.

LAKE OF THE WOODS.

To D. B. WOODWORTH, ESQ., &c., &c.

SIR,—In accordance with your instructions, I have made a careful survey of the above Location, the result of which will be found below :—

GEOLOGICAL OUTLINES.

The Gelogical investigation of the district in which the above Location is situated has been but very superficial, therefore it was my first care to observe closely, and note the character of, the rocks we passed through in our journey there.

Mr. Robert Bell, C.E., F. G. S., in his report on the country between Lake Superior and Lake Winnipeg-Geological Survey report 1872-1873-describes six bands of the Huronian series he crossed, which lie in folds of the Laurentian. Of the one which occupies nearly the whole area of the Lake of the Woods, he states :

"The fifth or Minnietakie band beginning on the south "side of Great Sturgeon Lake and ending at the Pelican "Falls is the broadest one we traversed, having a width of "about 30 miles across the strike. At the Lake of the "Woods it has a breadth from North to South of about 40 "miles, but this increase in width is due to its folding round "upon itself."

Referring to the description of this region in his "Notes," in the report for the same year, the Director of the Geological Survey, Mr. Alfred R. C. Selwyn, F.R.S., remarked: "Apart from the Geological interest which attaches to the "determination of the distribution of these rocks and of "their precise relations to the underlying Laurentian gneiss, "the foregoing facts shew that it is economically important "that the extent of these bands should be defined; and that "their mineral characters should be closely investigated is "equally so, inasmuch as the Gold, the Copper and the "Iron of the region, as far as known, are associated with "similar strata, and thus, not only the best land, but like-"wise valuable mineral deposits are to be looked for within "the limits which they occupy."

The truth of the above supposition has been partially confirmed, for, though until very recently little or no explor ation had been carried on in this district, a number of veins are already reported to have been discovered in various parts of the lake by Indians and others who are now beginning to search for mineral occurances. Several promising looking pieces of vein matter were shown me, containing Lead, Copper and Molybdenite from localities in the vicinity of the lake which I had not the time to visit.

In the journey from Winnipeg the first Laurentian rocks appear 28 miles to the West of Cross Lake, striking in an East and Westerly direction, and continue from there Eastward to within half a mile from Darlington, where the Chloritic schists of the Huronian come in.

This junction takes place seven miles to the west of the Hudson Bay Post at Rat Portage, not at the Portage as is stated in Mr. Bell's report. At the junction the strike of the schists was nearly S. W. but going Eastward they changed to about S. of W.

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At the above mentioned Hudson Bay Post, now called by many Pequonga, the strike is 10° S. of W. as it is also for 12 miles down the lake and westward along Shoal Lake via Ash Rapids. Thence to the N.W. the Huronian schists are seen skirting High Lake, but between that and Falcon Lake a gneissic granite occurs on the portage. The schills, however, again came in on the N.E. corner of Falcon Lake and continued Northward up Hawk Lake, striking 10° S. 6

of W., till replaced by the Laurentian half way up the narrow part of the Lake.

A vein containing Silver-Lead is reported to have been discovered in the schists in the vicinity of the latter Lake.

In each case 1 saw the Huronian and Laurentian together, the change of character of the rocks was very abrupt and distinct.

DESCRIPTION OF ISLAND.

Kaw Ka Kaw Island, on which the above Mineral J cation is situated, is 400 acres in area and lies 12 miles due South from Pequonga.

On the neighboring Islands to the North the rock is a compact, though thinly laminated, schist with a strike of 10° S. of W., almost perpendicular dipping slighty to the North.

To the South rock of the same character also appeared.

The rocks of Kaw Ka Kaw Island I found to differ much from any others I saw about the lake. The South-East end is composed of unaltered chloritic schist dipping perpendicularly and striking 10° S. of W. To the North-West the character of the rock changed to a harder grey rock, becoming silicious, and evidently a baked schist.

This is succeeded by a highly metamorphosed crystalline rock of which the remainder of the Island, with the exception of two trap bands, is composed. This in parts contains crystals of felspar and then changes to a compact quartzite, in both of which there are numerous small crystals of Iron Pyrites. Its strike is also 10° S. of W.

A wide band of trap runs through the centre of the Island and a smaller one at the N. W. end, both striking in the direction of the quartzite.

The second contained in places a larger amount of Iron Pyrites disseminated through it. An average specimen I analyzed gave 4.25 % of Pyrites. On the West side of the first band there were eight distinct successive layers of ashes and lava which had been beautifully weathered out by the action of the lake; this substantially proved former volcanicaction in the vicinity.

From the above observations, which I made while making a tour of the Island; I have been enabled to shew approximately the position of the rocks of the Island on the map accompanying this report.

The outline and scale of the Island is correct according to survey by Mr. James McCallum of Rat Portage, P.L.S.

From the general character of the rocks composing the Island, coupled with the presence of the trap dykes and volcanic ashes and lava, it would seem that great metamorphic

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action has caused them entirely to loose their original character.

The quartzite occurred also on the opposite Island to the S.W. and here presented the same characters as on Kaw Ka Kaw Island.

OCCURANCE AND CHARACTER OF VEIN.

We camped close beside the vein that the prospector, Alick Baker, had found to contain argentiferous galena, and I shall allude to this as the "Camp vein" for a centre in my subsequent descriptions.

This vein occurs in the metamorphic crystalline rock on the S.W. side of the Island, and is seen coming out of a mass of rock on the N.W. corner of a little bay; it has a dip of 70° N.E. and strikes in a direction about 40° W. of N. Here, where the first traces of mineral were discovered, the vein is from 1 ft. 6 in. to 1 ft. 9 in. wide, and consists of several parallel layers of a hard compact, though brittle, milk-white quartz containing a little calc and felspars, some Iron Pyrites, and small bunches and irregular disseminations of argentiferous galena.

The cap of the vein is the hard white quartz described above and contains some galena; immediately below it is more decomposed and the iron from the Pyrites gives it a yellowish hue.

The South West or "Foot Wall" consists of a crystalline rock with irregular masses of quartz and a few crystals of felspar in a slender quartzite matrix, much stained by the Iron Pyrites disseminated through it. In places the reddish hue gives place to a green color from Serpentine, especially close to the vein.

The North East or "Hanging Wall" is less compact in texture than the "Foot Wall," rather more colored with decomposed Pyrites, but in other respects bearing the same characters. I tested specimens of the walls for Lead and Silver but could find none.

We blasted down about four feet on the vein, and I obtained a number of samples from different parts. As we got deeper in the vein, patches of Serpentine with the quartz became more frequent, and the indications of argentiferous galena were better.

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Owing to the rock being of a much harder nature than was represented to me before leaving Rat Portage, the 15 drills we brought were not sufficient to allow us to go as deep as I intended, and as it was impossible to obtain implements for further sinking, short of a very prolonged delay, I had to content myself with stripping and blasting down 4 feet.

Some 3 ft. 6 in. to the S.W of the above vein argentiterous galena was also found in a thin seam of

quartz, which, after running parallel, came abruptly across through a decomposed ferruginous quartzite and joined the other. I had the rock stripped and washed in a S.E. and southerly direction down to the water's edge, some 20 ft. The original vein from 1 ft. 9 in. gradually narrows, becomes more flaky, and after a few feet comes in contact with a solid mass of rock striking E. and W., and cannot be

The small branch to the S.W. becomes a little stronger running in S.S.E direction in irregular strings with some specks of lead in it, but it could not be traced quite to the water's edge.

followed here any further.

The ground was also stripped and cleaned on and about the vein to the N.W. From the excavation in the above direction, the vein continues about 1 ft 6, in. in thickness for 15 ft., where there is a cap piece 10 ft. wide, after which it suddenly narrows, and five yards further on, meeting a solid mass of quartzite with joint at right angles, it disappears completely and a couple of very minute cracks run right and left and die away in the solid rock. Several yards on I made a cross-cut, stripping and cleaning the rock for some distance but could find no traces of the vein.

I then made trips into the Island along lines 10° W. of N. and also 40° W. of N., but could find no traces of vein matter, the rock was for the most part thickly covered with moss. I also examined the N.W. shore, the western part particularly, but could find no traces of any vein.

On the S.W. shore, to the N.W. of the vein, the rocks are well exposed but gave no sign of a vein, except a small one, 6 in. wide, some three hundred yards off striking in a northerly direction, but in which no mineral could be detected.

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My search in a S.E. direction was attended with more success. In rounding the little bay there were several masses of vein stuff lying out of place, and on the opposite side, some fifty yards from the camp vein, in the bank above we found the vein in place as proved by digging about it. This vein, a little over a foot across, is in a direction 55° W. of N. from the camp vein and strikes 45° W. of N., therefore pointing directly toward the former. Its dip is about 60° N.E.

This vein is exactly similar in composition to the first found vein and also contains argentiferous galena. The rock through which it passes strikes about E. & W., and is also a crystallized quartzite. I did not see any sign of a vein on the Southern coast-line after rounding the point at the S.W end of the Island.

Fifteen feet from the latter another quartz vein 8" wide, dipping 40° N W and striking EN E in from the shore, evidently meets the former in some little distance. Lead was found in angular pieces of vein matter lying below. A few yards further on two other small veins strike N E in from the shore, but gave no indication of mineral. Eight hundred yards from the camp vein, in a direction 40° E of S, there is a quartz vein 9 in. across, running through a little peninsula and striking 40° E of S, or in a continuous line with the former. To the N W, after being visible for 10 feet, it suddenly disappears on coming in contact with a band of grey compact quartzite containing iron Pyrites, which strikes 10° S of W; as the rock in this N W direction went below water it was impossible to see if this vein came in again.

In the S E direction, however, it was seen to run under water. Iron Pyrites was the only indication of mineral I could find in this vein.

On a small island to the S S W, and about 100 yards from the camp vein, I observed several very thin veins striking about N and S, which contained specks of galena and iron Pyrites.

About thirty yards to the south of the above there is another still smaller island, scarcely 100 sq. yards in area; a quartz vein of a little more than a foot in thickness runs through it in an E and W direction containing iron Pyrites, and in which the prospector claimed to have found galena, though I was not able to detect any.

These islands are not included in the above mining location.

ANALYSIS.

Average specimens of the ore bearing part of the vein, were analysed by me in Professor Chapman's laboratory, which I found to contain 12 ounces, 4 pennyweights of silver, with 3 to 4 pennyweights of gold per ton of 2000 pounds of ore.

Three assays each gave the above result.

The galena is rather sparingly disseminated through the. vein and does not run over 160 pounds of lead to the ton of 2000 pounds of ore. This gives 152 ounces 10 pennyweights of silver, with 3 to 4 pennyweights of gold, to the ton of 2000 pounds of lead.

Therefore, if this ore increases in abundance it would pay to work, as the vein stuff is of a character which could be easily crushed and the ore concentrated.

SUMMARY.

From consideration of the above facts two inferences are to be drawn.

Firstly, — That the camp vein, striking in the same. direction, is again seen 800 yards off to the S E on the little. peninsula; also that it is met somewhere about the place.

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of excavation by the vein from the other side of the little bay. The facts which would lead to this belief are that the strike of these veins is directly toward, and practically the same as the camp vein; and that, striking across the general lie of the strata of the island, they are fissure veins, and therefore likely to be continuous for some distance.

Secondly,—That the camp vein, from its apparent dying out in both directions is an irregular repository formed in a lengthened joint of the rock formation, and therefore not stable. The same would probably apply in the case of the other veins.

There is very fair indicatic 1 of argentiferons galena, but whether it will change to some rich ore of silver, or be met with in greater abundance, can only be ascertained by sinking. I should have liked to have found the vein crossing the trap dyke, as it there might have shown evidence of a richer ore of silver, as is the case at Silver Islet, where the silver alone is found when the lode cuts through dyles of diorite trap.

I should therefore advise that, before any considerable expense was occured with a view to mining, an exploratory shaft should be sunk to test the stability of the deposit, as well as to ascertain whether it increases in richness.

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The best place to sink an exploratory shaft is undoubtly where I made the excavation, towards which spot, as will be observed from above, the other two veins are striking at a slight angle.

W. HAMILTON. MERRITT.

ST. CATHARINES, Oct. 17th, 1879.

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