

**CIHM
Microfiche
Series
(Monographs)**

**ICMH
Collection de
microfiches
(monographies)**



Canadian Institute for Historical Microreproductions / Institut canadien de microreproductions historiques

© 1997

The copy filmed here has been reproduced thanks to the generosity of:

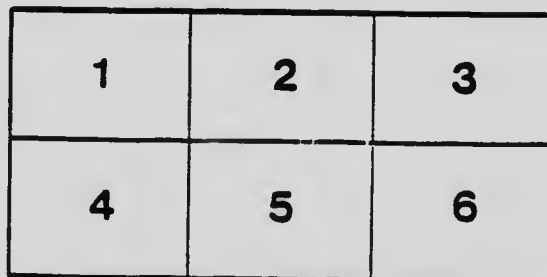
Library,
Geological Survey of Canada

The images appearing here are the best quality possible considering the condition and legibility of the original copy and in keeping with the filming contract specifications.

Original copies in printed paper covers are filmed beginning with the front cover and ending on the last page with a printed or illustrated impression, or the back cover when appropriate. All other original copies are filmed beginning on the first page with a printed or illustrated impression, and ending on the last page with a printed or illustrated impression.

The last recorded frame on each microfiche shell contain the symbol \rightarrow (meaning "CONTINUED"), or the symbol ∇ (meaning "END"), whichever applies.

Maps, plates, charts, etc., may be filmed at different reduction ratios. Those too large to be entirely included in one exposure are filmed beginning in the upper left hand corner, left to right and top to bottom, as many frames as required. The following diagrams illustrate the method:



L'exemplaire filmé fut reproduit grâce à la générosité de:

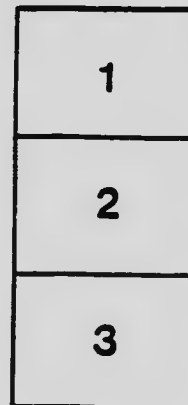
Bibliothèque,
Commission Géologique du Canada

Les images suivantes ont été reproduites avec le plus grand soin, compte tenu de la condition et de la netteté de l'exemplaire filmé, et en conformité avec les conditions du contrat de filmage.

Les exemplaires originaux dont la couverture en papier est imprimée sont filmés en commençant par le premier plat et se terminent soit par la dernière page qui comporte une empreinte d'impression ou d'illustration, soit par le second plat, selon le cas. Tous les autres exemplaires originaux sont filmés en commençant par la première page qui comporte une empreinte d'impression ou d'illustration et se terminent par la dernière page qui comporte une telle empreinte.

Un des symboles suivants apparaîtra sur la dernière image de chaque microfiche, selon le cas: le symbole \rightarrow signifie "A SUIVRE", le symbole ∇ signifie "FIN".

Les cartes, planches, tableaux, etc., peuvent être filmés à des taux de réduction différents. Lorsque le document est trop grand pour être reproduit en un seul cliché, il est filmé à partir de l'angle supérieur gauche, de gauche à droite, et de haut en bas, en prenant le nombre d'images nécessaire. Les diagrammes suivants illustrent la méthode.



MICROCOPY RESOLUTION TEST CHART

(ANSI and ISO TEST CHART No. 2)



1.45

1.50

1.56

1.63

1.7

1.75

1.8

1.87

1.94

2.0

2.06

2.12

2.19

2.25

2.31

2.38

2.44

2.5

2.56

2.63

2.7

2.75

2.8

2.8

3.2

3.6

4.0

2.5

2.2

2.0

1.8

1.6

APPLIED IMAGE Inc

1653 East Main Street
Rochester, New York 14609 USA
(716) 482 - 0300 - Phone
(716) 288 - 5989 - Fax



11
133
/

Collection C. Devlin

Compliments of R. Harvie.

**MCNG
H33**

PROVINCE OF QUEBEC

Department of Colonization, Mines and Fisheries

NOTES

... ON ...

SOME GOLD-BEARING VEINS

... IN THE ...

NORTHERN PART OF PONTIAC COUNTY

... BY ...

ROBERT HARVIE, JR.

MINING GEOLOGIST



*Published by authority of the Honorable C. R. Devlin
Minister of Colonization, Mines and Fisheries.*

QUEBEC, DECEMBER, 1910

PROVINCE OF QUEBEC

Department of Colonization, Mines and Fisheries

NOTES

— ON —

SOME GOLD-BEARING VEINS IN THE NORTHERN PART OF THE COUNTY OF PONTIAC

Owing to an influx of prospectors in the region adjacent to the boundary line, between Quebec and Ontario, in the county of Pontiac, the following notes, resulting from a short examination by Mr. R. Harvie for the Quebec Mines Branch, of the geological conditions which obtain in the Opasatica district, may guide the prospecting activities of those in search of mineral deposits. This examination was made in the latter part of September last.

As Mr. Harvie's report will probably not be available before late in the spring, the following summary of conclusions is published in advance of the report, so that the main results may early be in the hands of the prospectors :

ECONOMIC GEOLOGY OF THE OPASATICA DISTRICT

The geologically most favorable portion of the district is situated in the vicinity of the height of land, around the north end of Lake Opasatica. The rocks of this area extend westward, past the north

side of Larder Lake. The first discoveries of gold were made near two small lakes (Fortune and Renault) three miles northeast of McDonald's trading post, at the north end of Lake Opasatica or about forty-five miles in a direction slightly east of north from the north end of Lake Teniskaming.

The claim on which gold was first discovered is now the property of the Pontiac-Abittibi Mining Co., and up to date the only development work of any consequence in the district has been done here.

The gold is associated with quartz-ankerite veins cutting the Keewatin porphyrite and the Huronian breccia and associated dyke. The largest vein seen averaged about two and a half feet wide in an exposure of one chain in length, and it may be said that all of them seem to hold their width well. During the examination only one specimen was found having visible gold, but comparison of this with material collected by others from various veins, showed it to be quite representative. The quartz is partly massive, partly in free crystals, in both cases being commonly banded with *ankerite* and carrying sericite, iron pyrites and copper pyrites. The gold occurs both free and in combination with silver as the telluride *sylvanite*, in which mineral there is 24% of gold and 13% silver. The sylvanite was introduced later than the quartz and ankerite, being found in fractures in these minerals. The gold is chiefly in seams in the sylvanite.

Apparently here also, as has been found to be the case in other districts, the telluride has precipitated the gold, but the evidence yet obtained is too scanty to warrant saying whether or not this is a secondary enriched zone. At Crude Creek, in Colorado, in the zone of oxidation above the level of the ground water, the gold occurs free, having been left from the leaching of the tellurides. Below ground-water level, the tellurides have not been leached, and not only do they still contain their original gold content, but in addition they have caught and retained any free gold passing down in solutions from the zone of oxidation, thus causing an important secondary enrichment. The presence of the tellurides at the surface, at Lake Opasatica, indicates that the zone of oxidation has been removed by the heavy glaciation to which the district has been subjected. The present surface must, therefore, come either at the level of the zone of enrichment or below, but in either case, from this argument, it seems unwarranted to expect any great increase in values with depth, such as is regularly found to be the case in the mines of the Western States.

In one instance copper pyrites forms a large part of the vein matter, and the wall rock on either side is also heavily charged with sulphides, probably chiefly iron pyrites. An assay of the pure copper pyrites showed only half an ounce of silver and a trace of gold per ton: the wall rock gave only 40 cents gold per ton. Apparently, then, both these are unimportant as carriers of values.

The accounts so far published show that the geology of the Porcupine district is essentially similar to that of Opasatica, more especially the gold occurs in similar quartz-ankerite veins. Tellurides have not been reported as yet from Porcupine, but it has been reported that some apparently unpromising veins have yielded good assay values which values may well be due to the presence of tellurides. In other veins the free gold at the surface has been found to continue in slightly increasing quantity down to a depth of two hundred feet. If this represents the zone of oxidation, then an enriched zone might be expected not far beneath.

In the Opasatica region the Keewatin is intruded by a biotite gneiss or granite with its accompanying dykes of aplite and pegmatite, all known as Laurentian. The pegmatite grades into veins of almost pure quartz, and at several places on Lake Opasatica these attractive looking veins have drawn the attention of the prospectors. This class of veins contains molybdenite in the vicinity of Lake Keewagema, about fifty miles to the east, but they seem to be valueless at Opasatica. Careful search will generally show them to contain crystals of pyroxene or feldspar, by which fact they may be distinguished from the gold-bearing veins which cut the Keewatin porphyrite and the Huronian breccia and which are composed of quartz and ankerite.

SUMMARY

Summing up all the factors which seem to have any bearing on the subject, the following points may be enumerated as especially important to those prospecting in the Opasatica area.

The gold-bearing veins need not be confused with the Laurentian veins. Careful search will usually show the presence of molybdenite, feldspar or pyroxene in the Laurentian. The gold-bearing veins usually have abundant ankerite, a mineral which closely resembles cloudy calcite when fresh, but when weathered gives a residue of a rust. Ankerite is, however, appreciably harder to scratch than calcite.

The *quartz-ankerite* veins should be carefully examined for *sylvanite*, which mineral contains a large percentage of gold in its composition. *Sylvanite* has a high metallic lustre; of a steel gray colour, is heavy and very easily scratched and altogether closely resembles galena, except that it lacks cleavage, and hence does not break into the cubes so characteristic of the latter.

When free gold is present it will usually be found with the *sylvanite* if that mineral is also present. The full value of the gold present cannot be judged from inspection or even by panning, because the amount contained in the *sylvanite* is not shown by either of these processes. For this reason it is very essential that ores should always be tested by fire assay. Simple amalgamation or cyanidation will not recover the gold and silver values of the tellurides. The ore has to be thoroughly roasted before employing these processes.*

Quebec, December, 1910.

*It must be understood that the above observations merely state conclusions arrived at by Mr. Harvie from a comparatively short examination in the field and it is quite possible that on further investigation some of the conclusions may be altered. Bearing this in mind the notes can serve a good purpose in helping the prospector to distinguish between the two different classes of quartz veins such as are found in Opasatica.—
THEO. C. DENIS, *Superintendent of Mines.*

