O T T A W A June 5th, 1940.

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of the

ORE DRESSING AND METALLURGICAL LABORATORIES.

Investigation No. 850.

Microscopic Examination of Two Samples of Gold Ore from Bristol Township, Ontario.

BUREAU OF MINES
DIVISION OF METALLIC MINERALS
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CANADA
DEPARTMENT
OF
MINES AND RESOURCES
MINES AND GEOLOGY BRANCH

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Samples:

Two samples of gold ore from the discovery pit on the property designated as the "O'Neill-Flynn" in Bristol township, near Timmins, Ontario, were submitted to the Division of Metallic Minerals, Bureau of Mines, Ottawa, Ontario, on May 29th, 1940, by J. R. O'Neill, c/o Elliott House, Toronto, Ontario. Sample A consisted

of a small piece of quartz which contained grains of a grey mineral, and Sample B consisted of 6½ pounds of grey rock which contained disseminated sulphides.

Mr. O'Neill requested that a microscopic examination be carried out for the purpose of determining the mode of occurrence of the gold.

Assay:

Before proceeding to the preparation and examination of polished sections, Sample B was sent to the Assay Laboratory, from which the following report was obtained:

Gold - 0.245 oz./ton. (Perfect check on duplicate assays)

Microscopic Examination:

Five polished sections were prepared from each of the samples. These were then examined under the reflecting microscope.

Sample A -

Examination of Sample A under the microscope reveals that it consists of fine-textured light grey to brown iron-stained quartz in which occur irregular patches and stringers of galena and rare grains of pyrite. The brown stains are due to the weathering of the iron minerals, and the galena also shows some alteration.

Sample B -

Sample B consists of a rather fine-grained grey rock, predominantly siliceous and containing a small quantity of finely disseminated carbonate. Pyrite and

magnetite are quite abundant. The former occurs as coarse to fine irregular grains and cubes, and in places is sufficiently abundant to form granular masses; locally it has been altered to "limonite". Some of the larger grains of pyrite are somewhat fractured. Magnetite is disseminated as medium to small grains. Chalcopyrite is present as tiny inclusions in pyrite and as irregular grains in gangue; the quantity is very small.

Native gold is present as irregular grains associated with pyrite. It occurs in two ways: (1) along fractures in pyrite and interstitial to the grains of the pyrite masses where it sometimes forms thin films, and (2) as small grains in dense pyrite. The close association of native gold with pyrite, particularly that in dense pyrite, would suggest that the metal was precipitated during and immediately following the emplacement of the pyrite. The grain size of the native gold in the polished sections is shown in the following table:

Grain Size of the Visible Gold in Sample B of the O'Neill-Flynn Property in Bristol Township, Ontario.

MESH (Tyler)	(1) Gold along fractures in pyrite and interstitial to pyrite grains, per cent	(2) Gold in dense pyrite, per cent	Totals, per cent
+ 280	11.8	-	11.8
- 280 + 400	9.1	-	9.1
- 400 + 560	12.7	5.4	18.1
- 560 + 800	11.8	7.3	19.1
- 800 +1100	8.7	10.9	19.6
-1100 +1600	8.0	7.6	15.6
-1600 +2300	2.7	2.7	5.4
-2300	-	1.3	1.3
Totals	64.8	35.2	100.0

Conclusions:

No gold was seen in Sample A, and it is not known whether the quartz carries values.

The gold seen in Sample B is associated with pyrite and, as mentioned earlier, is thought to be partly contemporaneous with and partly later than the pyrite. If this be the case, it may be expected that the pyrite is auriferous and it is not improbable that some of the gold in the pyrite will prove to be refractory.

Based solely on the data obtained from the study of polished sections from this one sample, the following tentative predictions may be hazarded with regard to probable method of treatment:

1. Moderate grinding of the ore, followed by concentration of the pyrite. During this stage, introduction of some means (such as traps) to collect any coarse gold which may be present.

2. Concentration may be largely by gravity methods, but it would seem advisable to include flotation for recovery of the finer particles of pyrite.

3. If appreciable coarse gold is present, amalgamation of the concentrates containing this.

4. Regrinding of the combined concentrates (plus amalgamation tailings) followed by cyanidation.

5. If the proportion of refractory gold is high, the concentrates may need to be roasted, reground, and cyanided.

With regard to indicators of ore at the property, little can be said from a study of so small a sample. It would seem, however, that rock carrying the coarser pyrite, which tends to occur as stringers in the rock, might be expected to indicate favourable material.

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