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MINERALOGICAL REPORT ON A SAMPLE OF CYANIDE RESIDUE FROM McINTYRE PORCUPINE MINES LTD., SCHUMACHER, ONTARIO

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by

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EXTRACTION METALLURGY DIVISION

HP

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Mines Branch Investigation Report IR 61-28

MINERALOGICAL REPORT ON A SAMPLE OF CYANIDE RESIDUE FROM
McINTYRE PORCUPINE MINES LTD., SCHUMACHER, ONTARIO

by

M.R. Hughson* and S. Kaiman**

SUMMARY

Gold was observed in the cyanide residue from McIntyre Porcupine Mines Ltd. as free grains of the native metal, and no enclosed grains were noted. The most common metallic mineral in the residue is pyrite. Minor amounts of pyrrhotite, arsenopyrite, chalcopyrite, and tetrahedrite are also present.

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INTRODUCTION

During a visit in January to the McIntyre Porcupine Mines Ltd., Schumacher, Ontario, by Mines Branch staff, a request was made by Mr. E. Johnson, mill superintendent, for an investigation into the nature of the gold in the occasional higher-value cyanide tails. An 18 lb sample of the cyanide residue, our reference No. 1/61-7A, was supplied for the investigation. The mine assay for this sample was 0.117 oz Au/ton, which is approximately ten times the grade of normal tailings. The sample was submitted to the Mineralogical Section of the Extraction Metallurgy Division for investigation of the nature of occurrence of the gold.

PROCEDURE AND RESULTS

A representative sample of the cyanide residue was sized by means of a Haultain Infrasizer. It was found that 99 per cent was minus 56 microns in size. Gold assays were made on the minus 56 micron fractions and the distribution of gold is shown in Table 1.

A representative fraction of the minus 56 plus 40 micron size was superpanned to concentrate the gold. Polished sections of the superpanner fractions were examined with the ore microscope at X650. One free grain of native gold was found in the tip and one in the mids. To confirm these results a second sized fraction was

superpanned. The minus 28 plus 20 micron size was selected because it contains appreciably more gold than the minus 56 plus 40 micron fraction. Ten grains of free native gold were found in a polished section of the tip and one in a polished section of the midds. Figures 1 and 2 are photomicrographs of typical grains of gold.

In addition to the search for gold the other metallic minerals were identified. Pyrite is the most abundant, with small amounts of pyrrhotite, arsenopyrite, chalcopyrite, and tetrahedrite also present.

TABLE I
Distribution of Gold in Infrasizer Fractions of
Cyanide Residue

Fractions	Wt %	Au oz/ton	Au Distn %
+56 microns	0.90	---	---
-56 +40 "	6.84	0.095	6
-40 +28 "	17.11	0.10	16
-28 +20 "	15.82	0.15	22
-20 +14 "	13.71	0.185	23
-14 +10 "	10.49	0.13	13
-10 "	34.20	0.065	20
LOSS	0.93	---	
TOTALS	100.00	---	100

CONCLUSIONS

Free grains of native gold remain in this sample of cyanide residue of a flotation concentrate. No enclosed or partially enclosed grains of gold were found and no other reason for the non-dissolution of the free gold was noted.

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PHOTOMICROGRAPHS

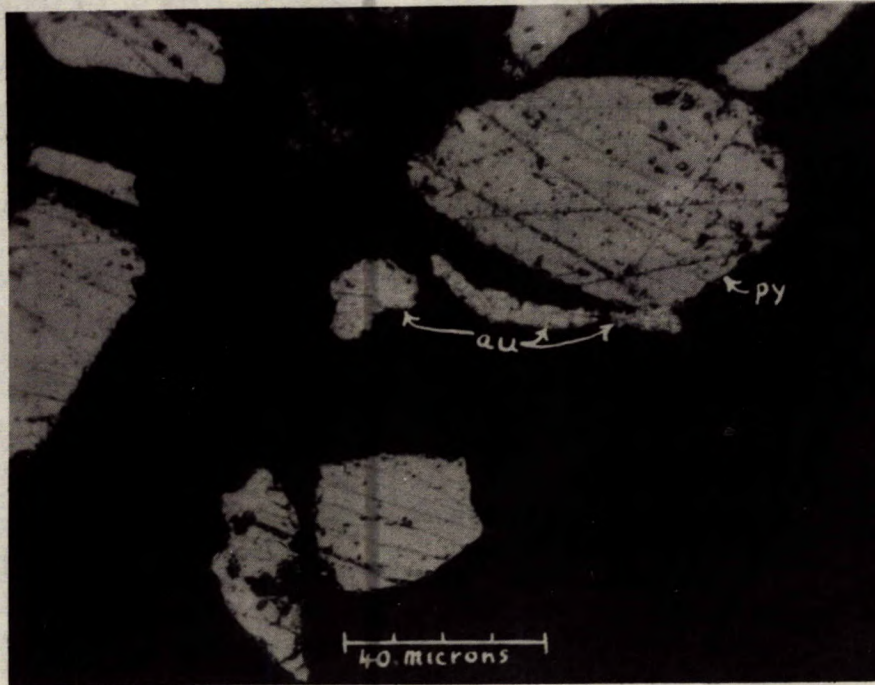


Figure 1. Native gold (au) and pyrite (py). Minus 56 plus 40 micron size. X650.



Figure 2. Native gold (au), pyrrhotite (pyrr) and arsenopyrite (asp). The unmarked grains are pyrite. Minus 28 plus 20 micron size. X1000.