



MINES BRANCH

Ottawa, Ont.

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R E P O R T
of the
ORE DRESSING AND METALLURGICAL LABORATORIES

Test No.173

The recovery of the values in a rich shipment
of Gold Ore from the Caribou Mining district
Nova Scotia.

by R. K. Carnochan.

A shipment of 89½ pounds of gold ore was received at the Ore Dressing and Metallurgical Laboratories from the Herman Hall mine, Caribou, Nova Scotia. This shipment had been sent in by Mr. W. R. Hitchcock, Cornwall, Ont.

The ore consisted of white quartz carrying a very large amount of free gold and small amounts of pyrite and galena. A few specimens were selected from the shipment and the balance, 86 pounds, was crushed in a breaker and a set of rolls to pass 40 mesh. A great deal of metallics was obtained on the screen. The -40 mesh was cut into quarters by means of a Jones riffle and a sample was cut from each quarter for assay. These samples gave the following values:

	<u>Au.oz/ton</u>	<u>Ag. oz/ton</u>
-40 mesh, 1st quarter	3.30	0.55
" 2nd "	2.08	0.60
" 3rd "	3.57	0.63
" 4th "	2.71	0.59
Average of four quarters	2.92	0.59

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The -40 metallics were cleaned by fluxing in an assay crucible. This gave 2.057 oz. of gold and silver from 86 pounds of ore, which is equal to 47.84 oz. gold and silver per ton. A test on this bullion gave 935.6 parts of gold per 1000. Therefore the metallics correspond to 44.76 ozs per ton gold and 3.08 ozs per ton silver. This added to the average value of the -40 mesh, makes the heads run:

Gold 47.68 ozs per ton
 Silver 3.67 "

Amalgamation and Cyanidation

Test No. 1 1127 grams of the -40 mesh material were mixed in a small pebble jar for three hours with 100 grams of mercury and 400 cc of water. The contents of the mill were then panned to recover the mercury. The tailing was dried and sampled for assay.

Product	Au. oz. ton	Ag. oz. ton	Per-cent Au.value	Per-cent Ag.value
Metallics	44.76	3.08	93.9	83.9
Amalgamated	2.56	0.47	5.4	12.8
Tailing	0.36	0.12	0.7	3.3
Heads	47.68	3.67	100.0	100.0

957 grams of tailing from amalgamation were ground to pass 200 mesh, and agitated for 18 hours with 6000 cc of water to which had been added 15 grams of sodium cyanide and 10 grams of lime.

Product	Au. oz. ton	Ag. oz. ton	Per-cent Au.value	Per-cent Ag.value
Cyanided	0.28	0.09	0.5	2.5
Tailing	0.08	0.03	0.2	0.8
Feed	0.36	0.12	0.7	3.3

Amalgamation, Tabling, Flotation, and Cyanidation

Test No. 2 1069 grams of -40 mesh material was ground for 3 hours in a small pebble jar with 100 grams of mercury and 400 cc of water. The contents of the mill were then panned to recover the mercury. The amalgamation tailing was tabled, making a concentrate and a tailing. The table tailing was floated in a small Ruth machine, making a concentrate and a tailing.

Product	Weight grams	Au. oz. ton	Ag. oz. ton	Au. grams x ozs. ton	Ag. grams x ozs. ton	% Au. value	% Ag. value
Metallics		44.76	3.08	47,848	3,293	93.87	83.94
Amalgamated				3,006	448	5.90	11.42
Table. conc.	28	0.84	3.50	24	98	0.05	2.50
Flot. conc.	63	0.52	1.02	33	64	0.06	1.63
Flot. tailing	844	0.06	0.02	51	17	0.10	0.43
Loss	134	0.06	0.02	8	3	0.02	0.08
Heads	1069	47.68	3.67	50,970	3,923	100.00	100.00

655 grams of flotation tailing were ground to pass 200 mesh and agitated for 33 hours with 6000 cc of water to which had been added 45 grams of sodium cyanide and 10 grams soda ash

Product	Au. oz.ton	Ag. oz.ton	% Au. Value	% Ag. Value
Cyanided Tailing	0.06	0.02	0.10	0.43
	0.00	0.00	0.00	0.00
Feed	0.06	0.02	0.10	0.43

CONCLUSIONS

1. Amalgamation alone on this ore gives a very high recovery. The metallics would be amalgamated in regular milling, so they should be added to the values amalgamated to give the proper recovery by amalgamation. If this is done the recoveries by amalgamation in test no. 1 are gold 99.3%, silver 96.7%, and in test no. 2, gold 99.77%, silver 95.36%
2. Although the recovery by amalgamation is very high, the amalgamation tailings are too high to discard and some further treatment should be given them.
3. In test no. 1, the amalgamation tailing was cyanided, but this failed to produce a low tailing.
4. In test no. 2, the amalgamation tailing was tabled, floated, and then cyanided. This produced a very low tailing.
5. It is possible that it would be sufficient to table and cyanide the amalgamation tailing.