

July 6, 1920.

REPORT OF ORE DRESSING AND METALLURGICAL LABORATORIES

TEST NO. 135

A shipment of 38 sacks of gold ore, net weight 2,572 pounds, was received from J.E.Cole, Esq., c/o A. G. Meindl, M.D., Winnipeg, Manitoba. The ore was from the Little Rice Lake district, Manitoba, and on examination was shown to contain chalcopyrite, and some oxidized copper minerals, and iron pyrites in a quartz gangue. Free gold was visible in small amounts, but no free silver was noticeable.

The ore was crushed to $\frac{1}{4}$ inch size and cut down in a Jones Riffled Sampler to a 35 pound sample for small test work. This 35 pound sample was further reduced by crushing to 40 mesh and sampled for assay, which gave the following:

Gold	- - - - -	1.07 ozs.
Silver	- - - - -	1.50 ozs.
Copper	- - - - -	1.43 %.

The test work conducted can be subdivided under the following heads:

1. Amalgamation, Tabling and Flotation.
2. Amalgamation, Tabling and Cyaniding.
3. Straight Flotation.
4. Amalgamation and Tabling.
5. Amalgamation and Flotation.

1. Amalgamation, Tabling and Flotation (Small Scale Test)

A small sample of 998 grams of the ore was cut from the 40 mesh sample and put in a pebble jar with 100 grams of mercury and 400 c.c. of water. The jar was rotated for three

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hours and the mercury was panned from the pulp. The amalgamation tailing was run over a small Wilfley table and a concentrate and tailing were made. The table tailing was ground wet to pass 100 mesh and floated in a laboratory Callow flotation machine, making a concentrate, a middling, and a tailing. The resultant products from this test were dried, sampled and assayed, giving results as shown in the following table:

Product	Assay		Content		% of Values	
	Wt., grams	Ozs. Au. : %	Cu. : %	Au. Wt. : X Assay	Cu. : grams	Au : Cu
Amalgamated	:	:	:	899.10:	:	84.2 :
Table concentrate	157 :	0.44 :	4.37 :	69.08 :	6.86 :	6.5 : 42.5
Flotation concentrate	55 :	0.38 :	12.42 :	20.90 :	6.83 :	2.0 : 42.3
Flotation middling	74 :	0.41 :	1.47 :	30.34 :	1.09 :	2.8 : 6.7
Flotation tailing	692 :	0.07 :	0.20 :	48.44 :	1.38 :	4.5 : 8.5
Ore	998 :	1.07 :	1.43 :	1067.86 :	14.27 :	100.0 : 100.0

2. Amalgamation, Tabling, and Cyaniding. (Small scale test.)

A small sample of 914 grams of the ore was cut from the 40 mesh sample and put in a pebble jar with 100 grams of mercury and 400 c.c. of water. The jar was rotated for three hours and the mercury panned from the pulp. The amalgamation tailing was run over a small Wilfley table, making a concentrate and a tailing. The table tailing was ground wet to pass 100 mesh and treated with the cyanide solution. The result of this test is given in the following table:

Product	Weight, grams	Assay		Content		% of Values	
		Ozs. Au. : %	Cu. : %	Au. Wt. : X Assay	Cu. : grams	Au : Cu	
Amalgamated and cyanided	:	:	:	893.34:	:	91.3 :	
Table concentrate	125 :	0.56 :	4.10 :	70.00 :	:	7.2 :	
Cyanide tailing	732 :	0.02 :	0.95 :	14.64 :	:	1.5 :	
Ore	914 :	1.07 :	1.43 :	977.98 :	:	100.0 :	

3. Straight Flotation. (Small scale test.)

A small sample of 885 grams of the ore was cut from the 40 mesh sample and further reduced to 100 mesh. It was then mixed with 1 c.c. of oil mixture--30 per cent hardwood oil, 15 per cent coal tar and 55 per cent tar creosote, and floated in the laboratory Callow flotation machine. A concentrate, middling and tailing were made. In crushing down the sample a small amount of metallics was caught on the screens. These were assayed separately. The results from this test are given in the table below:

Product	Weight, grams	Assay		Content		% of Values	
		Ozs. Au	% Cu	Au Wt. X Assay	Cu gms.	Au	Cu
Metallics				172.78		27.9	
Concentrate	74	4.15	11.72	307.10	8.67	49.6	70.4
Middling	45	0.72	2.50	32.40	1.12	5.2	9.1
Tailing	766	0.14	0.33	107.24	2.53	17.3	20.5
Ore	885	1.07	1.43	946.95	12.66	100.0	100.0

4. Amalgamation and Tabling. (Large scale test.)

The remaining portion of the ore not used in making the small scale tests was crushed to 40 mesh and run through an amalgamator and over plates. The tailing from amalgamation was sampled and the remaining portion after sampling run over a Wilfley table, making a concentrate and tailing. The results of this test work are shown in the following tables:

AMALGAMATION TEST

Product	Wt., pounds	Assay			Content			% of Values		
		Ozs. Au	Ozs. Ag	% Cu	Ozs. Au	Ozs. Ag	Lbs. Cu	Au	Ag	Cu
Metallics					.0647			6.4		
Amalgam					.5683	0.3284		55.8	18.2	
Tailing	2484.5	0.31	1.19	1.43	.3851	1.4783		37.8	81.8	
Ore	2484.5	1.07	1.50	1.43	1.3292	1.8634		100.0	100.0	

TABLE TEST ON AMALGAMATION TAILING

Product	Weight, pounds	Assay			Content			% of Values		
		Ozs.	Ozs.	%	Ozs.	Ozs.	Lbs.	Au	Ag	Cu
		Au	Ag	Cu	Au	Ag	Cu	Au	Ag	Cu
Concentrate	171.	3.06	12.40	15.30	.2616	1.060	26.16	66.0	91.7	74.4
Tailing	1,924.	0.14	0.10	0.25	.1347	.096	4.81	34.0	8.3	13.7
Loss	363.5			1.15			4.19			11.9
Amalgamation tailing	2,458.5	0.31	1.19	1.43	.3810	1.463	35.16	100.0	100.0	100.0

These results show the following recoveries:

	By amalga- tion	In con- centrates	Total Recoveries	Loss in Tailing
	%	%	%	%
Au	62.2	25.0	87.2	12.8
Ag	18.2	75.0	93.2	6.8
Cu	None	74.4	74.4	25.6

The amalgam from this from the clean up of the plates was retorted and reduced to bullion with the following weight and fineness:

Weight of bullion - 28.2312 grams - 0.9077 ozs. - 18.15 dwts.
 Fineness - Au, 633.3 Ag, 366 Cu, trace

5. Amalgamation and Flotation. (Large and small scale tests.)

A sample of the amalgamation tailing from Test No. 4 was ground wet in a pebble jar to 100 mesh, mixed with 1 c.c. of oil mixture as per Test No. 3 and floated in the laboratory Callow flotation machine, with the following results:

Product	:Wt., : :grams:	: Assay :			: Content :			: % of Values		
		: Ozs.:	: Ozs.:	: % :	: Au Wt.:	: Ag Wt.:	: Cu :	: Au :	: Ag :	: Cu
		: Au :	: Ag :	: Cu :	:X Assay:	:X Assay:	: gms.:	: Au :	: Ag :	: Cu
Concentrate	: 84 :	:1.48:	:11.12:	:12.70:	:124.3 :	: 934.1 :	:10.67:	:53.5:	:95.8:	: 72.5
Middling	: 67 :	:1.00:	: 0.37:	: 4.20:	: 67.0 :	: 24.8 :	: 2.81:	:28.8:	: 2.5:	: 19.1
Tailing	: 825 :	:0.05:	: 0.02:	: 0.15:	: 41.2 :	: 16.5 :	: 1.24:	:17.7:	: 1.7:	: 8.4
Amalgamation:										
tailing	: 976 :	:0.31:	: 1.19:	: 1.43:	:302.6 :	:1,161.4:	:13.96:	:100.0:	:90.0:	:100.0

These results show the following recoveries:

	:By amalgamation:	:In concentrate:	Total	: Loss in
	: % :	: and middling :	: recoveries:	: tailing
	: % :	: % :	: % :	: % :
Au	: 62.2	: 31.1	: 93.3	: 6.7
Ag	: 18.2	: 80.4	: 98.6	: 1.4
Cu	: None	: 91.6	: 91.6	: 8.4

Summary and Conclusions:

The results of the above test work show that the ore as submitted is amenable to treatment. Over 60 per cent of the gold values can be recovered by amalgamation, but a very small percentage of the silver values is recoverable by this method. The silver must, therefore, be for the most part in the form of the sulphide, and tabling or flotation is necessary to recover the silver and copper values. To make a high recovery of the silver and copper values and the remaining gold values after amalgamation, a combination of tabling and flotation would give the better results.

By amalgamation, tabling, and flotation, it is possible to make a 95 per cent recovery of the gold and silver values, and a 90 per cent recovery of the copper values in the ore.

From the above tables the concentrate from tabling and flotation would carry the greater proportion of the silver and copper values of a grade -- gold, 3 ounces - silver, 12 ounces - and copper, 15 per cent. This would be an ideal shipping product for the smelters.

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Note: This report is contained in Summary Report of Investigations, Mines Branch, 1920, (Report No. 574) pp. 29-33, Test No. 135.
