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DIVISION OF ORE DRESSING AND
METALLURGY

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REPORT OF ORE DRESSING & METALLURGICAL LABORATORIES

Test No. 117.

A sample of silica rock, weighing 300 pounds (3 bags) was received March 9th, 1919, at the testing plant of the Ore Dressing & Metallurgical Division, from Stinson-Reeb, Builders Supply Co., Ltd., Montreal, Que.

The sample consisted of a white silicious rock ranging in size from about 2 inches to fine dust.

A washing test was desired on this material to see if it would be possible to produce a good grade of glass sand.

The whole sample was dried and screened on 12 mesh, the oversize being crushed in rolls and screened alternately until it all passed through the screens. A sample for analysis was then cut out by means of a Jones riffle. This gave the following,-

Silica	96.76%
Alumina.....	0.62%
Ferric Oxide.....	0.86%
Lime.....	1.32%
Magnesia.....	0.37%
Loss in Ignition.....	0.94%

After sampling, the remainder of the material through 12 mesh, was weighed, and washed in a Richard's classifier. The washed material was dried and screened on 20 and 100 mesh screens, the three products from the screens being

weighed

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weighed separately. The following table shows the weights of the heads and different products of the above washing and screening test .-

<u>Product.</u>	<u>Weight, Lbs.</u>	<u>Percent by weight.</u>
+ 20 mesh	13.0	5.9
- 20 + 100 mesh	171.5	77.8
- 100 mesh	13.0	5.9
Washings	23.0	10.4
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Heads	220.5	100.0

The - 20 + 100 mesh material was sampled for analysis with the following results .-

Silica	99.50%
Alumina	0.06%
Ferric Oxide	0.22%
Lime	0.22%
Magnesia	none
Loss on Ignition	0.32%

Thinking that better results might be obtained by washing the silica rock in a more vigorous manner, six pounds of the -20+100 product were washed in one pound charges in the impellor compartment of a Janney flotation machine. Each charge was washed for 20 minutes in the machine, then withdrawn, the discoloured water poured off, and clear water added and decanted till no discolour remained. The six charges were combined, dried, weighed (5.33lbs) and sampled for analysis. The sample gave the following .-

Silica	99.70%
Alumina	0.03%
Ferric Oxide	trace
Lime	0.12%
Magnesia	0.12%
Loss on Ignition	0.18%

Four pounds of the -20+100 mesh material were put through an oil flotation process on the Janney machine in one pound charges. Each charge was mixed with the required amount

amount of oil in a small pebble mill for 5 minutes, and then treated in the flotation machine for 20 minutes, the charge being then withdrawn and the discoloured water being removed in the same manner as in the previous test. The combined four charges were dried, weighed (3.55 lbs) and sampled for analysis. The sample gave the following .-

Silica	99.70%
Alumina	0.04%
Ferric Oxide	0.15%
Lime	trace
Magnesia	0.05%
Loss on Ignition	0.16%

CONCLUSIONS .-

1. By the use of a log washer a product similar to that produced by washing the silica rock in the impellor compartment of a Janney machine would be obtained, and this product would be a very good glass sand.

2. The analysis of the material treated by the flotation process shows ferric oxide 0.15%. This is rust from the drying pans, and in reality this product would only run a trace of ferric oxide. It will be seen then that flotation leaves the alumina, ferric oxide and loss on ignition about the same, lowers the lime and magnesia, and thereby slightly increases the silica. A slightly better grade of sand might be produced by flotation, but the extra cost of production would hardly warrant it.

3. The analysis for magnesia in the different products do not check closely. This is due to the difficulty of the determination, especially when very small amounts are present.