

The following is a summary of the operations of the Granby plant (two furnaces) from August, 1900, to December, 1901:—

Month—1900.	Tons.	Daily Average. Tons.
August, 11 days	2,902	
September	8,753	291 2-3
October	14,215	468 1-4
November	18,050	601 2-3
December	18,467	595 2-3
Total for 1900	62,387	
1901.		
January	17,640	569
February	17,708	632 1-5
March	19,713	636
April	18,995	633 1-6
May	19,075	615 1-3
June	18,510	617
July	18,176	586 1-3
August	18,028	581 1-2
September	20,059	668 2-3
October	20,347	656 1-3
November	20,706	690 1-5
December	21,971	708 3-4
Total for 1901	230,928	

The plant has recently been enlarged by the addition of two furnaces and two sets of converters, the function of the latter being the conversion of matte into blister copper. The converter has been in operation since January 14 last, and is working satisfactorily. The new furnaces will be "blown in" within the next few weeks when the smelter will be in a position to treat an average of 1,500 tons of ore daily, and will make it the largest reduction works in Canada. Before giving a detailed description of the recent enlargement it will be well to briefly describe the original plant.

The water power developed on the north fork of Kettle river gives 1,200 h.p. at extreme low water under an actual head of forty-five feet. The dam gives about thirty feet of this head, the rest being made up between the dam and the power-house. The dam is 175 feet across the top, seventy-five feet from heel to toe on the bottom, built out of 12x12 inch sawn timbers, filled in with rock and gravel. The flume is 12x9 feet, and a mile long.

The power house is within 1,000 feet of the smelter buildings and 100 feet below them. The power with which the blowers, sampling works, converter, etc., are driven, is created by three double sixteen-inch turbine water-wheels, operating under an effective head of forty-five feet. These wheels are connected with the flume by steel intake pipes four feet seven inches in diameter. Each is directly connected with one Westinghouse rotating arm, alternating current generator. Another wheel is belted to two pumps each with a daily capacity of 750,000 gallons. These pumps furnish water and pressure to granulate the slag as it runs continuously from the furnaces.

The power-house, as originally planned, was 100 feet long by 30 feet wide, all the batteries being set in line, on one long concrete foundation.

The smelter proper consisted of two double-decked, steel-jacketed furnaces, 160 x 44 inches at the tuyeres, made by the Gates Works, of Chicago. The gases pass off from the top in a four-foot diameter downtake pipe, which is connected with the big flue dust chamber leading to the stack, the flue chamber being 10 x 10 feet on the inside and 300 feet in length. The stack 11 x 11 feet inside measurement, and 152½ feet high. The blower room is 50 x 58 feet, and is 42 feet from the furnace building. It contains three blowers, one for each furnace and one in reserve. These are connected with the furnaces by a 54-inch diameter blast pipe, all blow-

ers being connected with the one main pipe. Each of these blowers is driven by a 75 h. p. Westinghouse induction motor, which is belted directly to the blower.

The original sampler building is 64 x 70 feet, and is surrounded on three sides by ore bins. The ore train as it comes into the smelter, is carried on a trestle to a series of receiving bins, parallel to the front of the sampling works, twenty-three feet above the floor of the same and thirty-three feet distant. The bins are filled directly from the cars, which have a bottom dump. The ore is taken from the receiving bins by small iron cars, which dump into a No. 5 Gates gyratory crusher. This crusher has its opening a little below the floor of the sampling works and has a capacity of 1,000 tons daily. After the ore is crushed to the size of a four-inch ring it is elevated to the top of the building by a continuous steel bucket elevator. It is next sampled by a 60-inch Snyder automatic sampler. The bulk of the ore is distributed to the bins on three sides of the sampling works by a special cast-iron revolving spout.

Behind the smelter and at an elevation of about 100 feet above the works is a 100,000-gallon tank, which is supplied with water through an eight-inch steel-riveted pipe extending from the pump to the power-house, a distance of about 2,000 feet from the tank. This water is used principally for granulating the slag as it runs continuously from the settler in front of the furnaces. All the machinery is run by Westinghouse induction motors. There is a 75 h. p. motor for the sampling works, a 30 h. p. motor for matte sampler, a 25 h. p. motor for the machine shops, and a 10 h. p. motor for the elevator in the main furnace building. This embraces a brief description of the old plant.

The work of enlargement was started in May last. The power plant has been increased by a 250 h.p. horizontal turbine water-wheel and a 250 h.p. electric generator directly connected with the water-wheel, making a total of 250 h.p. developed for the use of the city of Grand Forks, the total water power thus developed on the Kettle river being 1,100 h.p. There has also been added two additional triplex power pumps which will each supply another 750,000 gallons of water daily for granulating the slag and for the water jackets. The new pump was furnished by the Stilwell-Bierce-Smith-Vaile Co. of Dayton, Ohio. The Dayton Globe Works furnished the 250 h.p. water-wheel.

The blower room has been increased by one No. 8 Connorsville blower, making four in all or one for each furnace. Two hundred feet have also been added to the dust flue. All the contracts for the supply of the motors and electrical plant were executed by the Westinghouse Electric & Manufacturing Co. of Pittsburg.

The main furnace room has been enlarged an additional 84x82 feet. The two new furnaces, like the old ones, were built by the Gates Iron Works, Chicago. They are set 39 feet apart, centre to centre, and room is left for two more, which the company is likely to add sometime during the current year. Their actual capacity, in consequence of the self-fluxing character of the ore treated, has been found to be about 380 tons each daily.

A new sampling and crushing plant has been built. It is 70x70 feet, and at its highest part it has a height of 65 feet. An additional No. 5 Gates crusher with automatic sampler, rolls, etc., has been installed. These additions will crush and sample 1,000 tons daily, making the total daily capacity of the crushing and sampling plant 2,000 tons daily. Additional ore bins have also been built. They will have a carrying capacity of 5,000 tons, and, with the existing bins, provide a total capacity of 10,000 tons.

A briquetting plant of 100 tons daily capacity is being