

ations of five smelters, and, through them, the whole community. Crow's Nest coke is exported in large quantity to Montana, and this demand, together with that of the local smelters, as well as the demand for coal for steam and other general fuel purposes, is causing a rapidly increasing yield from the mines.

Three dominant notes are then pointed out in the mining situation: First, that prospectors are feeling severely the effects of the check in the flow of mining capital to the province, as indicated by the fact that few, if any, properties of importance have been added to the list of mines during the year. Second, that the mining community has made a decided advance in the economies of production. Thirdly, that the provincial Government has done nothing to improve the conditions under which mining is conducted, but during the last session of the legislature further responsibilities were placed on those who operate mines, with a resultant tendency to keep back capital, and an increased risk to that already invested.

### BRITISH COLUMBIA COPPER CO'S SMELTER, GREENWOOD, B. C.

By PAUL JOHNSON.

The British Columbia Copper Company's smelting plant, of which a description was given in the Engineering and Mining Journal, of New York, for February 16th, 1901, commenced operations on the 18th of February, 1901, with one blast furnace, 42 by 150 inches at tuyeres. This was kept in blast till the 22nd of August, when it was shut down nine days for repairs, and started up again on the 31st of August, and since then has been continuously in blast. During the time from February 18th to December 31st, 1901, there were smelted in this one furnace 117,077 tons of ore, and produced

proper, in twenty-four hours, used twenty-nine men, viz., six charge wheelers, four coke wheelers, nine feeders (on eight hours shift), two charge weighers, two furnace men, two matte tappers, two roustabouts, two foremen; thus during December were handled 14½ tons of ore per man and shift. Counting the total force of the smelter, the sample mill requires ten men for unloading and crushing ore, sampling and distributing same into ore mixtures, and loading and shipping matte. Engineers, foremen, one blacksmith, with a helper, and one carpenter, add eight more men to the force, making the total number of men employed, including foremen, forty-seven, which at 422.5 tons of ore put through daily, makes nine tons of ore handled and smelted for every man employed, which I believe is a record.

As for the character of the Mother Lode ore, I will mention that I classify it into limy, irony and sulphur ores, and would like for the smelting to have reserves of these different kinds to help out at times, when in the daily tonnage from the mine I get too much of one or the other of these different kinds. I will here give the assay and analysis of three large lots of these different ores:

- a. Sample of Irony ore from 1,000 ton lot.
- b. Sample of Limy ore from 1600 ton lot.
- c. Sample of Sulphur ore from 120 ton lot.

	a. Irony Ore.	b. Limy Ore.	c. Sulphur Ore.
Copper .....	2.8%	2.2%	2.7%
Gold .....	0.11 oz.	0.09 oz.	0.15 oz.
Silver .....	0.58 oz.	0.48 oz.	0.43 oz.
Insoluble .....	28.7%	35.2%	29.8%
Fused Silica .....	16.9%	29.2%	24.5%
Iron .....	32.7%	14.7%	17.5%
Lime .....	5.6%	19.8%	16.0%
Sulphur .....	3.7%	5.3%	13.7%



British Columbia Copper Co.'s Smelter, Greenwood.

3,714 tons of matte, assaying from 45 per cent. to 60 per cent. in copper, from 2 to 6 ounces in gold, and from 10 to 30 ounces in silver. During 1902 there were smelted 148,000 tons of ore. Besides Mother Lode and Boundary ores there have been smelted some gold quartz ores of 80 per cent. to 90 per cent. silica, utilizing the basic character of the Mother Lode ore. The largest tonnage through one furnace was put through during the month of December, when 13,098 tons of ore were smelted, thus averaging for the entire month, for every twenty-four hours, 422½ tons of ore. The largest tonnage smelted in one single day was on January 10th, 1902, when the furnace put through 459 tons of ore. To handle this amount of material, and to break up and pile the matte produced there are in the blast furnace department

The character of these ores is not only self-fluxing, but at times rather basic. I have therefore sometimes smelted to advantage as much as 5% to 6% of straight quartz ores with them.

Before starting up the furnace I had my doubts whether I could make higher grade matte than 30% to 35% copper, without resorting to roasting the ore, but I found out by actual practice, what I had hoped, that the irony ore variety, which is magnetic oxide of iron  $\text{Fe}_3\text{O}_4$  in smelting and reducing its iron ore to  $\text{Fe}_2\text{O}_3$  for the slag, thus gives off one atom of oxygen for every molecule of  $\text{Fe}_3\text{O}_4$ , and this oxygen acts as a powerful desulphurizer, that I have in fact burned off as much as 85% to 90% of the sulphur on the charge at times. I have aimed at making a 45% to 50% copper matte,