matte. Formerly it used to be considered good smelting to have only 0.1 per cent. copper in the slag for every 10 per cent. copper in the matte; thus in making 30% Cu matte, 0.3% Cu in the slag was permissible, and so forth.

The amount of coke used is from 11½ per cent. to 12 per cent. of the weight of the ore. The blast used is from a No. 7½ Connersville Blower making 155 revolutions per minute and giving 80 cubic feet of air per revolution. The blast pressure averages 1¾-inch mercury, equal to 14 ounces.

The feed height above the tuyeres varies from 4 to 8 feet, when little sulphur of much coarse ore, feeding high, when much sulphur or much fine ore, feeding low. The best feed-height, for good running, I have found to be from 7 to 8 feet.

As to the running of the furnace, charges of 3 tons are put in at the feed floor by feeders and not by any mechanical devices which, as I have had occasion to find out, do not pay, but cost a great deal of money and give a bad working furnace and dirtier slags.

A charge comes down to the tuyeres in three-quarters of an hour. Slag and matte run together continuously through a trapped spout into a water-jacketed forehearth on wheels, inside dimensions being 8 feet long by 5½ feet wide by 3 feet deep. The matte, having a specific gravity of 5 to 5.3, sinks to the bottom, and the slag, of a specific gravity of about 3.4 to 3.5, overflows at the furthest end into a large settling pot, and from this into the granulating flume. The matte is tapped at intervals into matte pots, the contents of which are poured into matte-moulds, 2 feet wide by 5 feet long by 4 inches deep, thus cooling off the matte quickly, and delivering it into the shape of cakes 1 to 1½ inches thick. These matte cakes, when cooled, are knocked on the top with sledge hammers and broken up into 3 to 5-inch pieces, and are shipped in this way in bulk into box cars, the lots averaging 30 tons. This does away with a crusher and sacking, and makes the matte pots last longer.

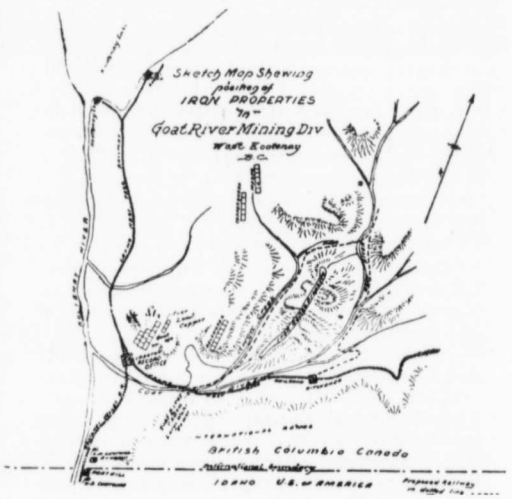
Enlargement of the Plant.—We have, during the latter part of 1901, been at work to double the capacity of the smelter, and to this end erected new sets of lower ore bins, 12 in number, with an increased storage capacity of 5,000 tons, making a total storage capacity for the lower ore bins of 10,000 tons. Another large 560 feet long railroad trestle has been built between the two previous ones in order to facilitate and make possible the handling of over 1,000 tons daily of material for the smelter by the railroad. The foundations for the furnace building extension and the new second furnace are in, and cast iron columns and deck-plates for the new second furnace have been put up. The furnace will be finished as soon as the weather allows the putting up of the brickwork for it. The new 7½ Connersville Blower is ready and in place for the furnace. With this second furnace, which is now completed, the plant has a daily capacity of over 800 tons of ore, and together with coke and coal and matte the railroad will have to handle nearly 1,000 tons daily.

We figure on getting eventually three to four furnaces going, and shall then add converter works for making the matte into blister copper.

THE IRON DEPOSITS NEAR KITCHENER, B. C.*

By W. Blakemore, M.E., Montreal.

THESE deposits consist of a series of parallel veins of hematite iron ore running continuously for a distance of ten miles, the full length of a solitary mountain known as the Iron Ridge, and situate, at its nearest point, a distance of three miles west of Kitchener Station on the Crow's nest Pass Railway. A reference to the accompanying diagram will show that Kitchener is 20 miles east of Kootenay Lake, 70 miles east of Nelson, which is the centre of the smelting industry of West Kootenay, and 120 miles west of the extensive coal fields of the Crow's Nest Pass Coal Company at Fernie. The mountain is peculiar in formation, being entirely separate from the other ranges in the district, and



presenting the appearance of an inverted boat. It starts from the level of the railway and Goat River 2,400 feet above sea level, rises gradually to an altitude of nearly 6,000 feet in a distance of two miles, continues with slight variations at this level for six miles, and then dips down again at the extreme north end at about the same angle as at the south. The main direction of the mountain is 20 degrees W. of N., and upon the east side Goat River flows parallel to it. At its base on the west side is a large creek known as Arrow Creek, and around the north end is a pass connecting the two. The original survey of the Crow's Nest line was around this pass, and it was only abandoned because it involved a detour of 20 miles. In view of the development of the property under consideration, this point is worth remembering, as the possibility of constructing a railway of easy grade all around the mountain was demonstrated by the survey referred to. The character of the ore is chiefly hematite, and upon a few claims this has been found to be slightly magnetic, but over the bulk of

*From a paper read before the Canadian Mining Institute.