prompt, decisive action, not only in the construction of their smelting works and the tramway, but in the inception and inauguration of other extensive enterprises that mean much for the improvement and advance of the mining operations of this district.

As was to be expected the ores from this new camp have offered at first some considerable difficulty in treatment, especially as the class of ore now mined is much more siliceous, and contains less copper than the early tests indicated, but now every furnace is working with much less trouble and up to their capacity, especially since the floods have subsided permitting the more regular supply of coal, and the smelter is now the scene of activity where, ten months ago were only sand bluffs of the Columbia.

The smelter now comprises: The sampling mill, daily capacity, 150 to 200 tons; bin capacity in the mill, 750 tons. The ore passing through a 12x20 inch Blake crusher, is run through a trommel, whence the fines go to a Constant cylindrical sampler, and the over-size to a 9x15 crusher and rolls, and then to the sampler and into the bins, until the lot of ore is settled, from whence it goes to the calcines or the bins from which it can be drawn in cars to the blast furnace. This sampler is inadequate for the amount of ore offered, and is now being enlarged so as to handle 350 to 400 tons per twenty-four hours.

In the roast house is one O'Hara automatic calcining furnace, with foundations laid for a second. This furnace is 120 feet long over all, and has two 90-foot hearths, one above the other, nine feet wide. One travelling chain passes along the centre of the hearths, carrying six plows and six trolleys or chain carriages, at the rate of about 25 to 35 feet per minute, and as yet very little repairs have been required, the chain, plows, and trolleys showing but little sign of corrosion in the furnace. Fifty tons of ore crushed to pass a half-inch ring are roasted per day, with a loss of 70 per cent. of sulphur contents, the ore taking twelve to fourteen hours to pass through the furnaces in which ten fire places fired with wood supply the heat. Besides this furnace there are in the furnace room six circular calciners, such as are used in Butte, placed above the reverberatories, the ore automatically fed, passing over six horizontal revolving hearths that discharge alternately from the rim and centre upon the lower one, thence into the hoppers below that are immediately over the hearth of the reverberatory. It is designed in this furnace that when once ignited no further fuel will be needed than the sulphur, but they must run continuously, and on account of irregularity, until recently, in the operation of the reverberatories, these calciners have not been used.

The dust chamber is 180 feet long, 10x12 feet inside, with wing walls from the sides every ten feet, not overlapping, but having a clear space through the chambers to the chimney, which is 140 feet high and eight and a-half feet square inside.

Furnace room, 60x310 feet, 68 feet to peak of roof. The ore is being smelted after two methods: (*a*) In four reverberatories, hearths 14x22 feet, forty tons each per twenty-four hours, in charges of roasted and unroasted ore, slag and limestone, are now being treated. The fuel is wood, but as this is not yet dry enough to give the required heat, coal is also being used, over seventy tons a day, from the Anthracite Coal Company's mines, on the eastern limits of the Rocky Mountains, whence it is brought over the Canadian Pacific Railway to Revelstoke, or Arrowhead, and thence in scows down the Arrow Lake and the Columbia to the smelter, whence it is raised up an incline 160 feet by a small steam hoist with cable and car, to a trestle along which the car can be run to the chutes wherever needed in the works.

(*b*) In a 40-inch circular furnace, twelve feet high to feed floor, water-jacketed, with six three-inch tuyeres, also with fore-hearth, forty-five to fifty tons of raw ore are now smelted in twenty-four hours. As the amount of sulphur in these ores is low, and that in the pyrrhotite not available for fuel, as already it is a natural matte, a typical form of pyritic smelting cannot be used, but more or less fuel is necessary, and a very satisfactory grade of coke is got from Fairhaven, Washington, although it carries from 20 to 24 per cent. ash. A small amount of limestone is added to the charge, but at present a very acidic slag, rather thick, but giving a good separation, is flowing, but very careful handling of the furnace is imperative. The analysis of this slag gives, SiO 2, 42 to 46 per cent.; FeO, 12 to 19 per cent.; Al 2 O 3, 14 to 19 per cent.; and MgO., 4 to 6 per cent.

A new 200-ton rectangular blast furnace, made by E. P. Allis & Co., Milwaukee, Wis., after a composite design by Mr. Bellinger and Mr. Wedekind, is being quickly erected. In this furnace, 120x38 inches at the tuyeres, the steel water-jackets will be five and a-half feet high; height to feed door, fourteen feet, with fourteen six-inch tuyeres with thimbles of smaller size that can easily be put in for the purpose of experimenting with the quantity and pressure of blast, for all arrangements are to be such that tests can be made under varying conditions, to determine the greatest possible efficiency for this furnace upon this class of ore. Another feature of this furnace will be that, besides the movable fore-hearth, the bottom or crucible of the furnace will also be mounted, so that if required it can be altogether withdrawn from beneath the water-jackets.

The bluff on which the smelter stands is sand, but the top and face of the dump, 120 feet high, is being covered with slag that flows in sand gutters from the reverberatories, or is wheeled out in the usual slag-pots from the blast furnace; but in a short time all slag will be run from the furnaces into water troughs, be granulated, and then swept out to the dump, which will be protected from scouring out by the slag covering.

In the engine room is a sixty-five horse-power engine, with a forty horse-power engine now on the way. A No. 5 Root blower is now used, but a No. 7 will be needed when the big blast furnace is blown in. Power is transmitted by shafting, but mostly by wire cables running over large pulleys to different parts of the works. However, steam power may soon be replaced by electricity, as a plant is to be erected at the foot of the dump and supplied with Pelton wheels and water under a 250-foot head. On a tributary of the Columbia, not far from Trail, a very large water power has been secured by Mr. Heinze, who proposes the installation of an electric plant for the distant transmission of electrical energy which may be brought to the mines, as electricity has now become so suc