

INTERCOLONIAL COPPER CO.

Later Details of the Mining and Milling Operations of this New Brunswick Corporation.

Since our remarks on the operations of the Intercolonial Company went to press we have received a copy of a recent report by Prof. Carmichael, of Boston, upon the property, from which we make the following extracts:—

Extending northerly from the village of Dorchester, N.B., is a broad ridge of sandstone which gradually becomes narrower and higher, and finally terminates upon the property of Intercolonial Copper Co., about three miles away. The sandstone is regularly bedded and dips gently to the S.W. Upon the westerly flank of the ridge on the land of the Company and upon the land of the Westmoreland Mining Company outcrop conglomerate and sandstone beds which are impregnated with copper. The copper exists principally in the form of sulphide or chalcocite. In the strata nearest the surface this mineral has in part by the action of the air and moisture been converted into carbonate, which colors the rock green. The chalcocite is associated with the carbonized remains of the carboniferous age to which the rocks containing these fossils belong. The chalcocite containing 79 per cent. of copper, is found occasionally in extended masses, but for the most part, is disseminated as minute grains throughout the working beds. Two distinct levels have been worked and others have been observed. The King lot level is that which outcrops and which has been followed three-quarters of a mile. It has been opened up by several shafts and tunnels.

The new main tunnel enters at the base of the ridge above described, and is a most important development of the company's property. It unwaters the mine and allows a considerable stream of water to flow out by gravity which must otherwise be pumped out at great expense. The water from the mine now furnishes an adequate and necessary supply for the mill below. The tunnel, which is 1250 feet long, has directly tapped, as anticipated, the ore bodies, and lateral tunnels have also opened up ore slopes of great extent. One branch of the tunnel extends in the direction of the King lot, and if, later, an uprise is made to the upper workings of the mine, excellent means of ventilating the new slopes will be secured, as well as a more economical route for sending the ore from the upper levels to the mill. For a thickness of about five feet the sand stone conglomerate of the lower level average about 1.8 per cent. of copper. In many places the ore is much richer, and with some selection, as at the present time, it can be delivered to the mill at 3 per cent copper contents. The development of the mine and the removal of large quantities of copper-bearing rock has shown no diminution in the amount of copper, but has strengthened the opinion constantly held that the amount of ore available is practically inexhaustible. Unlike most copper deposits, this is not a fissure vein formed by chemical action, or eruptive intrusion, but is a part of the original sedimentary formation, and its extension can be depended upon with greater certainty. The conditions for economical working are excellent. Labor is plentiful, intelligent, and much less expensive than is generally obtainable in mining districts. The rock is firm, and the workings require practically no timbering. With completion of tramway and power equipment the ore can be run on a level to the mill at a total cost of less than one dollar per ton.

MILLING THE ORE.

The copper is extracted by chemical means. The rock is first crushed in a powerful breaker, and then passed through reducing rolls and sifted, whereby the whole mass is brought to the predetermined degree of fineness, which at present is about twenty mesh. The ore passes from the screens to large bins, from whence it is automatically fed to the roasters. The object of roasting is the removal of sulphur combined with the copper, which would prevent the solution of the latter. At a red heat, in the presence of air, the copper mineral parts with sulphur and is converted into black oxide. The roasters consist of iron tubes of peculiar construction slowly revolving over fires which maintain them at a dull red heat. The roasted ore, as it escapes from the tubes, is received by a conveyor which delivers it to the lixiviation vats. These are circular, 21 feet in diameter, and rest upon massive masonry supports. They are of wood, lined with lead, burned at the joints, and the lead in turn is lined with brick laid in cement to protect the lead from mechanical injury. Upon the bottom of each vat is a filter, and at the centre a covered aperture which is open for the hydraulic discharge of the tailings after the removal of copper. The ore is treated in the vats with a sulphuric acid solution which readily dissolves the oxide of copper. The sulphate of copper solution flows from the vats into a storage tank, where it is impregnated with sulphurous gas. It is proposed to supply this gas without cost from the fumes of one of the roasters, which will be supplied with pyritic ore. The sulphate solution, of a bright blue color, gravitates to the electrolytic cells which are arranged in two series in a terrace. These vats contain lead plates suspended in close proximity, and so connected with the electrical supply that they are alternately positive and negative. Sulphurous gas is also blown through the solution in the cells. The sulphurous acid secures a low voltage, protects the positive plates from oxidation, and produces sulphuric acid necessary for extraction. The copper is deposited in smooth plates of any desired thickness; it is readily stripped from the lead, and is found to be of extreme purity. The liquor escaping from the cells contains the sulphuric acid liberated from its combination with copper as well as that generated from sulphurous acid, and is collected in a tank, from which it is pumped back into extracting vats for the treatment of successive lots of ore. The acid liquor is thus kept in continuous circulation. Theoretically the stock of sulphuric acid is doubled for each cycle, but practically the excess of acid is consumed in neutralizing the ore. The electricity is supplied from dynamos driven by a special engine.

The leaching and electrolytic departments of the mill, at present of less capacity than the crusher, rolls and roasters, can readily be extended at any time, so that a uniform production of copper can be maintained.

THE LE ROI POSITION.

Heavy Smelter Losses.—The Liabilities Exceed the Net Assets.

The directors of Le Roi Mining Company have issued the following circular to the shareholders under date the 13th inst:—

"On 28th April we published the following statement:—

"In consideration of the fact that 24,528 tons of ore mined during the month of March were estimated to yield a profit of only \$9,950, the directors cabled to Mr. Mackenzie, asking whether it would not be politic to conserve the ore reserves, pending a reduction of working expenses, and his reply (dated 27th April) has been received today (28th April):—

"Mr. Mackenzie says that with copper and silver at present prices, and fuel and freight at present prices, the March grade of ore leaves no profit, and he has already begun to sort the ore more closely, making April grade up to \$10.50 per ton. He also reports that he is experiencing difficulty with smelting operations, and has reason to believe a considerable percentage of the copper contents are not being recovered. He is, therefore, going to clean up at the smelter to ascertain to what extent this is so. If the clean-up shows losses which the difference between assay values and recovery indicate, Mr. Mackenzie strongly advises treating the ore on hand at the smelter, and then to shut down smelting works entirely until we can obtain satisfactory freight and fuel rates and prices have risen for metals, to push ahead with developments in the lower levels, work being done by contract, and reduce expenses to the lowest possible point.

"Mr. Mackenzie further informs us that he has written fully on this subject, and advises delaying any action pending the receipt of his letter and the result of the clean-up at the smelter."

"The correspondence here mentioned has come to hand, and includes a report made by the smelter manager.

"Mr. Mackenzie has also cabled the result of the clean-up at Northport, which shows the losses in smelting to be 22 per cent. of the copper contents, and 2 per cent. of the silver contents of the ores treated.

"Since 30th November, the value of the metals not recovered amounts to \$108,000. Mr. Mackenzie, in estimating profits, has apparently made no allowance for these losses; in reality, therefore, no profits have been made.

"The smelter manager reports that the extraction cannot be improved, and that it is quite as good as any obtained by other smelting works treating ore of similar grade and character. He also states plainly that to smelt Le Roi ore (of the present grade) alone, with present prices of copper and coke, will leave a very small profit, if any.

"Mr. Mackenzie, in his last monthly statement of the financial position of the company, gives assets in excess of bank indebtedness at 31st March to be \$63,000 (approximately). He now informs us by cable that at 30th April the total liabilities exceed the net assets by \$200,000, because, in addition to the \$108,000 already mentioned as the value of the metals not recovered, the clean-up shows a reduction in the value of the stock in hand of \$275,500.

"The situation is therefore a very serious one. The directors are in cable communication with the manager with a view to making the most satisfactory arrangements for the immediate future; at the same time they feel the only course open to them is to call the shareholders together, and this will be done as soon as possible."

MISCELLANEOUS.

Sawdust Fuel Briquettes.

Sawdust in cake form appears to have been used as fuel in Germany with rather promising results. "Cassier's Magazine" for April, quoting from a report of the United States Consul at Berne, says that the sawdust cakes are octagon shaped, 6½ in. long, 3½ in. wide, and three-quarters of an inch thick, weighing about half a pound each. In the district surrounding the factory where these cakes were made the schools were heated by them, the combustion leaving very little ash and proceeding without a large flame. No binding ingredient is said to be used, the sawdust being simply dried and pressed into the desired briquette shape, and owing thus to the absence of tarry or oily substances there is no smoke in burning. The weight of such a briquette indicates the heavy pressure under which it takes its shape, and the edges look like polished oak; in fact, it is heavier than a piece of hardwood of the same size. The demand created by the popularity of the fuel exceeded the supply of sawdust obtainable in the vicinity of the factory, and shiploads were, therefore, procured from Sweden and carloads from distant manufactories. Sawdust, which previously could be had for the asking demanded a market price as soon as it became known that a certain factory could make use of it. Even then it was profitable to manufacture the briquettes; but, unfortunately, the factory was destroyed by fire and operations came to a standstill. Making sawdust briquettes of this kind would, therefore, seem to be worth inquiring into further.

Belting: Its Use and Abuse.

That is the title of a paper read by Mr. W. H. McBarnes at a meeting of the Ohio Society of Mechanical Engineers. He contended that much better service would be obtained from belts if users would pay a fair price, but if they will insist on low-priced belts they must expect to get a quality accordingly. Again, belts wear out quickly because they do not get proper care. To let a belt run one moment after it gets too slack is bad practice, for it is apt to slip and burn all the staying qualities out of it. Another good reason why it should not be run slack is that the engineer or belt man, to save work, would be tempted to put on a dressing, or, worse yet, put on resin to make it pull, and, in the language of Rex, "the man who will put