

From September 1901 to May, 1902 when the mill was running steadily and doing the best work, the results were as follows:—

Tons milled, 8,630.5. Concentrates produced, 1,183 tons. Ratio of ore milled to concentrates produced, 7.3 to 1. Gross assay value of ore milled, Au. \$94,504.00 Ag. \$7,767.45. Gross smelter value of concentrates, Au. \$54,088.00 Ag. \$3,418.05. Percentage of recovery, Au. 57.9 p.c., Ag. 44 p.c. Average value of tailings in gold and silver, \$5.93 per ton.

Mr. Leslie Hill took charge of the property on April 1st, 1902 and closed down the mill on 14th. May, as soon as the ore in hand had been milled. The mine at that time was gutted; the late manager and foreman stated that the mine was worked out and could not be operated further without loss. Previous to March, 1901, a large amount of development work had been done and the ore body developed and its limits apparently determined. All this ore body which was developed, and which was much larger than any ore body subsequently found, had been stoped out and the ore gouged out wherever it was sufficiently rich to put through the mill. It was evident that the mill could not be run any longer, and in fact it was as hard looking a proposition as one could run up against. An examination convinced Mr. Leslie Hill that it was a mistake to attempt to concentrate such ore. Mixed sulphides containing iron, lead and zinc are very difficult to concentrate, and where the values are largely in the lead and zinc, cannot be concentrated without considerable loss, even in the best of mills, whereas in a cheap plant such as the Arlington mill, the loss was ruinously high. Concentration did not materially increase the value of the ore, so that there was no great saving in cost of transportation and smelting. The streaks and bunches of ore were defined, separate, and generally free from the vein-filling, so that a large amount of waste material was being broken down and put through the mill out of which nothing was gained. The vein was nearly horizontal and very irregular, sometimes forming hollows so that the cost of mucking was excessive, as the ore had to be moved by hand, and sometimes thrown up as much as 7 or 8 feet with a shovel. The roof being flat and disturbed the stopes required filling in to make them safe. Taking all these facts into consideration it was apparent that the proper method of mining this ore was by careful mining and sorting at the face. This plan was adopted and the mine at once paid its way; in fact, the ore which had been left behind as not good enough for the mill not only paid for extraction, but in addition paid for the development work necessary to open up further ore chutes, and the mine has been worked at a profit ever since. It is sometimes necessary to break down a great width of vein for a few inches of clean ore but the vein-filling is soft and can be broken down first and then the clean ore taken out with the gad, or with light shots, and the saving effected by filling back the stopes instead of mucking out a large quantity, more than makes up for the expense of sorting.

It is not often that a direct comparison can be made between the results of different methods of mining. The following statements will show the results in this case of the two methods, concentrating, and hand sorting at the face.

#### FOR 15 MONTHS, FROM MARCH 1ST, 1901, TO MAY 31ST, 1902.

Ore and concentrates shipped.....	2,322.7 tons	
Net smelter value .....	\$93,844.22	
Cost of mining and shipping.....	\$3,589.67	
Profit over mine cost .....	\$10,214.67	
The gross profit equals 10.9 p.c. of the net smelter returns.		
Average net smelter value per ton. ....	\$40.39	
Additional sums expended on capital accounts:—		
March 1st, 1901, to June 1st, 1901. ....	\$17,737.22	
June 1st, 1901, to June 1st, 1902.....	15,462.75	
Gross profit above.....		\$10,214.67
Mess house profit 15 months.....		1,979.50
Net deficit.....		21,005.80
	<u>\$33,199.97</u>	<u>\$33,199.97</u>

#### FOR 12 MONTHS, JUNE 1ST, 1902, TO MAY 31ST, 1903.

Quantity shipped .....	1,157.6 tons
Net smelter value.....	\$44,298.78
Total cost of mining and shipping .....	28,207.20

Profit over mine cost ..... \$16,082.58  
Average net smelter value of ore, \$38.26 per ton.  
The gross profit equals 36.3 p.c. of the net smelter value.  
Charged to capital account, Nil.

#### COMPARISON OF COSTS, PER TON.

1901-2		1902-3	
Supplies .....	\$2.46	Supplies .....	\$1.45
Development and stoping .....	9.88	Development.....	3.74
Surface and general exp .....	3.79	Stoping.....	8.71
Mucking.....	3.90	Surface and general .....	2.83
Timbering .....	1.50	Mucking.....	3.45
Hauling and shipping.....	2.60	Timbering.....	.34
		Hauling and shipping.....	3.03
			<u>\$23.55</u>
Mill working.....	9.31		
Fram " .....	.53		
Assaying.....	.98		
Stores, (for mill &c)....	.85		
	<u>\$11.67</u>		
	\$35.80—cost 1901-2, per ton produced.		
	23.55— " 1902-3, " "		
	<u>\$12.25—difference.</u>		

#### PROFIT AND LOSS.

1901-2	
10.9 p.c. of \$93,804.22 equals.....	\$10,214.67
1902-3	
36.3 p.c. of \$44,298.78 equals.....	\$16,082.58
Estimated profit in 1901-2 if worked on same plan as in 1902-3 :	
36.3 p.c. of \$93,804.22 equals .....	\$34,050.93
Actual deficit in 1901-2.....	21,005.80
	<u>\$55,056.73</u>

is the actual sum lost to the company through the building of the mill and adoption of the system of concentration. Of course the plant is at the mine, but if sold the net sum realized would be very small.

This vein dips at a less angle than the slope of the mountain, consequently the vein crops out so to speak on three sides, that is, to the south, east, and west, and therefore the future of the company's property is determined.

When the mill was erected the only ore body which could be calculated on was the body already blocked out, and if that would not pay for the mill there was nothing to justify its erection. As a matter of fact, this ore body turned out in stoping much better than was anticipated, and yet the ore extracted and milled did not pay for the erection of the mill and tramway, even though all cost of mining was charged against the clean ore, and nothing against the ore milled. If the milling ore had simply been thrown on the dump as waste a large saving would have been effected for the company.

#### Cobalt-Nickel Arsenides and Silver in Ontario.

By WILLET G. MILLER, Provincial Geologist, Toronto.

(This paper is a revised copy of that which appeared in the Eng. and Min. Journal, Dec. 10th. Analyses of samples of ore, which have recently been made, and notes on rocks are here added.)

During the last month, the discovery of deposits of cobalt-nickel-arsenic and silver ores in the northern part of the Province of Ontario has been made public. Little importance appears to have been attached to the deposits by those who first saw them, it being thought that they carried a small amount of copper, the niccolite being mistaken for this metal. Mr. T. W. Gibson, the Director of the Bureau of Mines, however, when on a recent visit to the district, received specimens of the minerals, and recognized that they represented valuable ore. The writer was, accordingly, instructed to make as thorough an examination