

Costs at the Blue Bell Mine, Kootenay Lake, B.C.

Mr. Fowler, who will later prepare his paper in fuller detail, made an appeal for voluntary publication of costs of operation of mines or dressing plants, stated in connection with all the conditions which control those costs. The object of obtaining these would be to afford means whereby those to whom the figuring should become accessible might more accurately forecast the results of new undertakings. In order to set an example Mr. Fowler presented figures of costs pertaining to the operation of the Blue Bell mine and ore-dressing plant, including all overhead charges except interest and sinking fund. A summary of the figures presented shows that in the treatment of 43,069 tons of ore (containing lead, iron, and zinc) during nine months prior to March 31, 1910, the cost of ore extraction was 98.4 cents; concentration, including weighing of ore and loading of product, 50.2 cents; and management and all general expenses, 37.6 cents; total, \$1.862 per ton. These costs were attainable only through the means of extraordinarily favourable physical conditions, but the result was also much assisted by the loyal co-operation of staff and mine and mill crew.

Property of Le Roi No. 2, Ltd., Rossland, B. C.

This property comprises more than 150 acres, situated in the vicinity of the mining groups of the Consolidated Mining and Smelting Company of Canada, Ltd., and the Le Roi Mining Company, Ltd., Rossland, B.C. It has been investigated by two mines—Josie and No. 1—and by numerous surface workings. Several veins have been worked. The country is much broken and displaced by numerous dikes, and the solution of the problem as to what is the result of these disturbances is still unfolded. The most important dike is that known as the Josie, which has an average width of 100 feet, striking approximately north and south and dipping 84 degrees to the west. Corresponding figures for the Tramway dike are: Width, 50 feet; strike, N. 20 deg. E., and dip 70 deg. E. Both are accountable for surface depressions, due to their adaptability to more rapid erosion. The minor dikes strike roughly parallel with the Josie, with dips, as a rule, not far from vertical. The main rock disclosed by the workings is the augite porphyrite which varies considerably in texture, hardness, and breaking qualities in different parts of the mines. The orebodies are erratic, both as to position and variability in size, as well as disposition of value; additional difficulty is experienced owing to the visible characteristics of the ore seldom indicating its value at all, and this involves constant recourse to assaying. The orebodies vary in width from a knife-edge to 30 feet, so that there have been called for both the square-set and "shrinkage" stoping methods of ore extraction. The latter system is exercised to as great an extent as practicable on account of its smaller cost. By far the larger proportion of past production has been derived from between the 300 and 700-foot levels of the Josie mine.

The Josie main shaft inclines at 74 deg., has three compartments, and extends to the 1,300-foot level. It is 14 feet 6 inches by 5 feet inside the timbers, and is equipped with a 150-h.p. double conical-drum hoist. In the shaft building are grizzlies, 4 inch and 1 inch spaces, on which hand-sorting of ore takes place. The ore is separated into first-class, second-class, and mill ore. First-class fines is shipped to the smelter, and the remainder sorted into shipping and mill ore, and waste; second-class fines is sent to the mill, and the

remainder distributed as in the case of first-class. Mill ore is trammed direct to the concentrator. No. 1 mine shaft is 3-compartment, 800 feet deep, and is equipped, similarly to the Josie, with hoisting engine and sorting floors.

Figures covering the operations of the last financial year will serve to give an idea of what is accomplished by hand-sorting. They are:

	Tons extracted.
First-class ore	42,770
Second-class ore	5,790
Mill ore	4,480
	————=53,040 tons.

which by sorting was resolved into:—

	Tons.
Shipping ore	29,776
Mill ore	17,553
Waste	5,711
	————=53,040 tons.

Stoping costs were:—

Ore production: labour	\$0.76
Explosives	0.32
Illuminants	0.03
Sundries	0.04
	————\$1.15
Ore sorting labour	0.21
General expense	0.35
Power plant: labour	0.07
Supplies	0.36
	————0.43
Mine general: Labour	0.33
Supplies	0.07
	————0.40

\$2.54

Average assay value of ore shipped was: Gold, 0.8882 ounces; silver, 0.8086 ounces; copper, 1.6305 per cent.

During the last financial year there was done: Drifting and cross-cutting, 4,202 feet; raising and winzing, 160 feet; total, 4,362 feet. Cost per foot, \$17.72. Cost was exceptionally high, however, due to greater depth of working (chiefly on 1,300-foot level), bad powder, and several other unusual conditions. The following comparative table will show corresponding costs of several consecutive years:

Year to Sept. 30.	Drifting and cross-cutting. Feet.	Raising and winzing. Feet.	Total Footage.	Total cost per foot.
1910	4,202	160	4,362	\$17.72
1909	3,220	338	3,558	14.35
1908	4,302	270	4,572	14.17
1907	2,538	255	2,793	14.58
1906	3,392	187	3,579	12.91

In addition to the work done in 1910, as shown above, the main shaft was deepened 193 feet, at a cost of \$1.73 per foot, and 11,508 feet of diamond drilling was done at \$1.73 per foot. The average depth of drilled hole was 371 feet.

The concentrator is capable of milling and treating 60 tons of ore per diem. The machinery is electrically driven by motors aggregating 100 h.p.; it comprises one 9 by 16-inch and two 8 by 12-inch Blake crushers, two 6-foot Chilean mills, and four Wilfley tables.

During the last financial year the grade of ore treated, and results, were: Mill feed, 17,235 tons; assay value, gold 0.122 ounces and silver 0.255 ounces per ton, and copper 0.554 per cent. Concentrate produced totalled 1,368 tons, assaying gold 1.297 ounces and sil-