during the first two months of 1900, new conditions were commencing to affect the mining industry of the Province unfavorably. The burdens of the eight-hour law passed by the Provincial Legislature during its session of 1899 were beginning to be seriously felt in Rossland, which was the only important district that continued mining work after the law became effective, paying the same wages for eight hours' work as was formerly paid for ten hours' work. The law had been in operation for the last eight months of 1899 and the returns were coming in a way that there was no mistaking the result. Careful calculations made by Mr. R. E. Palmer, chief engineer of the Le Roi mine during 1899 and part of 1900, and now assistant to Mr. W. A. Carlyle at the Rio Tinto mine, showed that the additional cost of operating the Le Roi since the eight-hour law became effective, amounted to a sum which added $0.72 per ton on the ore produced (250 tons per day).

During the same year (1899), contract work in the mines had been prohibited by the Miners' Union, and statistics showed that the mie costs during that year reached higher figures in the Rossland mines than in any other camp in the Rocky Mountain regions.

The Provincial Legislature during its session in 1900 passed a law doubling the tax which had previously been imposed on the gross output of metalliferous mines. Prior to this time the Provincial tax had been 1 per cent. on the gross value of the ore produced, less freight and treatment charges. This tax was raised to 2 per cent. on the same basis by the new law just passed.

It will, perhaps, be pardonable to digress for a moment, to say that the Mine Owner's Association protested vigorously against the passage of this law, pointing out that the regular annual addition of the new laws passed by the Provincial Legislature oppressive to the mining industry could only result in driving capital from seeking investment in the Province.

The law was passed, however, in disregard to the mine owners' protest and representations, and, I regret to say, the results then pointed out have come to pass. The mining industry, vigorously commenced in the early '90's in a new undeveloped mineral region of exceptional promise, should have advanced by leaps and bounds, but it has barely held its ground, and while the tonnage produced has increased in some instances, the dividends are few and far between.

Thus stood the economical conditions affecting the operations of the Le Roi mine in February, 1900, two months after the writer had assumed its management. The prospect was not very bright; in fact, it was very gloomy. All the per tonnage expense of mining, development, depreciation, renewals, hoisting and delivering the ore to the roast heaps at the smelter, government taxes, smelting ore to matte, loss in smelting operations, freight charges on matte to Eastern refineries, refiners' tolls and charges, interest and discounts, and Breen's profits of $2 00, amounting to $15.15, had to be paid from the gross values in the ore, which had fallen to an average of $12.50 per ton during the last quarter of 1899, and the balance was expected to be—profit, to pay dividends to shareholders.

Facts to be determined.—It could not be expected that the metals in the vein would reverse the persistent and natural tendency they manifested from the surface to the 800-ft. level already noticed, and become concentrated into smaller and richer streaks such as were found near the surface.

The average character and grade of the ore in the vein already found to exist below the circulation of surface waters was the best that could reasonably be hoped for in the deeper levels, that is the metals would be found distributed more or less uniformly throughout the entire width of the vein-filling in the deeper levels, which meant a larger tonnage and a lower-grade ore. Future operations would have to deal with these facts intelligently if they would be profitable.

The experience of the previous fourteen months, wherein 96,000 tons of ore were mined and smelted leaving practically no profit showed how futile it would have been to continue operations on the same scale in the face of a lower average grade of ore than was dealt with during that time. Could existing conditions be modified so as to make operations profitable? This was the problem which had to be solved affirmatively or the mine abandoned, for the company could not be expected to continue operations while making a loss of from $2.00 to $3.00 per ton of ore produced.

Of the numerous factors required for the solution of this problem, the main one was the determination of the quantity and grade of the ore in the mine, and the probability of its downward continuation. This was the one which had to be more or less accurately determined before it was worth while to consider the others.

In due course it was ascertained that there were approximately 1,000,000 tons of ore in sight in the mine, having an average gross assay value of $12.50 per ton, and it was considered probable that the ore bodies would extend indefinitely downward. The problem, thus simplified, then appeared as follows:—

Can the costs of realization, now $15.14, be so reduced as to leave profit on the $12.50 ore; and if so, what profit can be reasonably expected?

Contingent Calculations.—Proposed Plans.—Careful calculations showed that the costs of realization might be reduced to $8.00 per ton providing an expenditure of about $1,250,000.00 was made on new development and equipment of the mine, and increase of the capacity of the smelting plant. This expenditure provided for:

1. Freedom of the company from dictation of the Miners' Union so that, by the re-establishment of the contract system, the company could contract its work to the best workmen, and would have to pay only for the work actually done, instead of the time spent in doing it.

2. The purchase of Breen's one-fourth interest in the smelter, and his contract for smelting the ore.

3. The sinking of a five-compartment shaft on the mine, and the erection of a modern plant of hoisting machinery and handling facilities at its head, of adequate capacity for an output of 1,000 tons per day of 10 hours.

4. To enlarge the Northport smelter so as to have a marginal capacity of from 400 to 500 tons daily for custom ore, in addition to that required for smelting the increased production of the Le Roi, viz., a total capacity of 1,500 tons per day.

Difficulties Overcome.—When the position of the company, as above described, was fully understood by its directors, I was authorized to carry out these plans if the necessary financial arrangements could be provided for from the operation of the property.

The difficulty of making satisfactory arrangements for financing the company seemed, at first, almost insurmountable—the chartered banks of the Dominion being compelled by law to lend money to mining companies only on the security of liquid assets such as ore on dump or in stock in smelter yards or furnace products in transit. This required a margin of production over and above that required to finance the normal mining and smelting operations, sufficient to meet the cost of the new work.

Fortunately, however, this difficulty was soon solved. A two-compartment winze sunk on the vein from the Black Bear tunnel to the mine workings on the 700-ft. level was equipped with a 150 h.p. electric hoist and pressed into service as an auxiliary shaft. All mining timbers and supplies, the general mining traffic and the miners going to and from their work, passed through this new outlet. This relieved the congestion at the old shaft so that it was soon posssible to almost double the ore production. The output was immediately increased to