

phates. The output of the first five mentioned of these substances in Canada was never very large, and gradually ceased, owing to the fact that the more easily accessible supplies of these raw materials became exhausted.

Year.	Value of Production.	Year.	Value of Production.
1886.....	\$10,221,255	1900.....	\$64,420,877
1887.....	10,321,331	1901.....	65,797,911
1888.....	12,518,894	1902.....	63,231,836
1889.....	14,013,113	1903.....	61,740,513
1890.....	10,753,353	1904.....	60,082,771
1891.....	18,976,616	1905.....	69,078,999
1892.....	16,623,415	1906.....	79,286,697
1893.....	20,035,082	1907.....	86,865,202
1894.....	19,931,158	1908.....	85,557,101
1895.....	20,505,917	1909.....	91,831,441
1896.....	22,474,256	1910.....	106,823,623
1897.....	28,485,023	1911.....	103,220,994
1898.....	38,412,431	1912.....	135,048,296
1899.....	49,234,005	1913.....	144,031,047

During the period under consideration some extensive and very valuable ore bodies have been discovered in the Dominion, among which may be mentioned the nickel ores of the Sudbury district and the silver ores of Cobalt. The former has now developed into the greatest nickel-producing area in the world, and is known to contain such enormous ore reserves that the present production can be continued for many years. The Cobalt district, on the other hand, while not discovered till 1903, developed almost immediately into the greatest silver camp in the world, but has already passed its period of maximum production, and, although it will for years to come still produce large amounts of this precious metal, is already in a state of decline. This is but repeating the experience of the older countries of the world, where what were once great mining regions have become completely exhausted. As instances, the Kongsberg Mines of Norway may be cited—which at one time produced great masses of native silver rivalling those now obtained from Cobalt; the lead mines of Great Britain, now completely abandoned; the renowned mines of the region of Freiberg in Saxony, worked continuously since 1170 A.D., the last of which is now about to be closed down, and the great diamond fields of the Golconda district in India, which no longer yield these precious gems.

In modern times it must be remembered that with the introduction of high explosives and modern machinery, the exhaustion of a mineral deposit is much more speedily attained than in former times, when only a relatively small tonnage could be raised annually from any mine.

The discovery and development of mining districts in any country, even although these must be exhausted in time, always attract population and yield wealth to a community in the early stages of its development, and are thus frequently of the utmost importance in bringing about the opening up and settlement of tracts of country whose inhabitants subsequently engage in other industries and find other means of support.

In Canada, however, our mineral deposits are of great extent and importance. Our coal resources, as shown by the investigations undertaken in connection with the meeting of the International Geological Congress which was held in Canada last year, are among the countries of the world, second only to those of the United States. The geological structure of the Dominion

is furthermore such as to lead to the confident belief that as Northern Canada is made more accessible by the improvement of means of communication, thus facilitating exploration, large deposits of the metallic minerals will be found in the more remote portions of the Dominion, which, when opened up, will be important factors in the development of all the other latent resources of that great region, so that the mining industry of the Dominion, there is every reason to believe, will continue to grow and to play a very important part in the future history and development of the country.

While we cannot hope to increase our mineral resources by any process of conservation, it is of the greatest importance that, in working them, all waste should be avoided. The losses which have been sustained in other countries from lack of care and thought in this respect are enormous. Dr. Douglas estimates, for instance,—to take only one example—that at the Rio Tinto mines in Spain in a period of some thirty years, through an unskilful treatment of the ore, about 7,000,000 tons of sulphur, valued at not less than \$70,000,000, were wasted while through modern improvements in the method of handling the ore about 1,000,000 tons of sulphur are annually saved to the world which would otherwise have been burned and served simply to pollute the atmosphere. The same writer points out that only some sixty per cent. of the hundreds of millions of dollars yielded by the Comstock lode was recovered at the time, and at first the enormously rich tailings were not even collected, such was the haste of the miners to empty that stupendous deposit which should have made Nevada prosperous for generations instead of whirling the whole country into a mad dance of reckless speculation.

The primary cause of a large part of the waste which has taken place in mining enterprises is over-capitalization. This necessitates a large output at any sacrifice if the dividends are to be paid on the whole amount. Over-capitalization thus demands over-production, which in its turn almost invariably involves waste at some stage of the progress of the metal from the mine to the consumer. On the other hand, a lack of sufficient capital to develop a mineral deposit in the proper manner has in more than one case in Canada led to serious waste, since in the endeavor to make the mine pay the cost of its own development as mining proceeded, only the richer ore was taken out, leaving the leaner portions of the deposit in positions which rendered subsequent extraction difficult or impossible.

It may be stated, however, that in Canada at the present time the waste which is incurred in working our deposits of metallic minerals is small. It is, as a general rule, to the miner's interest to extract his ore completely and to avoid waste. Certain losses take place in the concentration of ores by allowing values to pass away in the tailings. But in recent years the methods of concentration have been greatly improved and the tailings are much lower in grade than in former years. It is doubtful whether there is in Canada at the present time any considerable waste in the concentration of metallic ores which can well be avoided. Furthermore, where the tailings, as in certain places in the Cobalt district, while still containing in the aggregate large amounts of metal, are too low in grade to permit of further extraction at the present time, they have been stored in such a way that if, in the future, it becomes possible to treat them again for the further extraction of their metallic contents, they will be readily available for that purpose.