

Nelson districts, with a corresponding increase in the Coast, Boundary, Trout Lake and Lardeau districts. In Nelson district the tonnage of ore mined was about the same as in 1902, but the assay value of the ore was materially lower. In Rossland the tonnage increased about 9½ per cent, but the gold production decreased about 10 per cent. In the Boundary the tonnage increased about 34 per cent, and the gold produced nearly 20 per cent, indicating that ores of a lower gold assay value have been treated, which reduction has, however, been more than met by cheaper methods of treatment and mining. The Coast district produced nearly three times as much gold as in the previous year, chiefly due to the output of Mt. Sicker properties. The Trout Lake and Lardeau districts each made an increase in lode gold output. Their total output of lode gold is not yet large, but they appear to be only at the commencement of their productiveness. In the Rossland, Boundary and Coast districts the gold is recovered, chiefly by smelting, from ores associated with copper, while in Nelson, Trout Lake and Lardeau districts it is obtained by stamp milling. The lode gold was derived, approximately as follows:

From direct smelting of copper-gold ores	\$4,327,206
From combined amalgamation and concentration	485,410
	<hr/> \$4,812,616

SILVER AND LEAD.—The total output of silver for the year was 2,996,204 ounces, valued at \$1,521,472. Of this quantity rather more than 70 per cent—about 2,103,000 ounces—was found associated with lead. The lead production was 18,089,283 pounds, valued at 689,744, the lowest output for seven years. In the Fort Steele Mining Division less than 1,000 tons of lead ore were mined in 1903, as compared with 87,000 tons in 1900. In the Slocan division only about half the usual tonnage of ore was produced. Ainsworth division mined much more ore than formerly and produced 30 per cent more lead, the result of the concentration of a very low grade ore of the Highland mine. The Act, passed at the last session of the Dominion Parliament, to provide for the payment of a bounty on lead contained in lead-bearing ores mines and smelted in Canada stimulated development and equipment, but too late to result in a material increase in the production of 1903. Its effects will be seen in the 1904 production.

COPPER.—The copper ores being mined in British Columbia are very low grade in copper, but, fortunately, contain values in gold or silver, without which they could not, for the most part, be worked profitably. The total output for the year, and the highest yet made in British Columbia, was 34,359,921 pounds, valued at \$4,547,535, which was produced in the following districts:

Boundary District	18,485,542 lbs.
Rossland District	8,652,127 lbs.
Coast District	6,861,171 lbs.

Nelson District	346,218 lbs.
Various other Districts	14,863 lbs.
	<hr/> 34,359,921 lbs.

In the Rossland camp the ores average about 1.2 per cent copper, and in the Boundary about 1.5 per cent, while on the Coast they average 3½ per cent copper.

OTHER MINERALS.—Very little iron ore was mined in 1903. Zinc has scarcely, as yet, become a factor in the mineral output of the Province, though at some of the Slocan mines, where it occurs as an impurity in galena ores, it is being separated and marketed as zinc ore. Oil-bearing shales have been discovered in the vicinity of Harper's camp, in the Cariboo District. From present indications there appears to be a large deposit of these shales, and, as far as can be determined at present, they do not appear to get their oil from any seepage from below. The occurrences of oil in the Fort Steele Mining Division, East Kootenay, were visited last summer by the Provincial Mineralogist, whose "Summary Report on the Valley of the Flathead River," is printed elsewhere in this issue of the MINING RECORD.

GENERAL DEVELOPMENTS.—Under the head of General Developments of the year the Provincial Mineralogist comments on the progressive features of the period under notice. He characterizes as the most noteworthy feature of the development work of the year the general recognition of the fact that the margin of profit, as a rule, lies in the large masses of low grade material, and the resulting attempts to overcome the difficulties in the way of mining and treating these low grade ores at a profit. He says: "In the Boundary District matters are most advanced in this respect. The smelting in that vicinity of very low grade ores must be considered as merely a 'concentration by a fusion method, which is considered the most applicable to such ores. This has been accomplished with most modern plants, the ore being taken from several mines and, by a judicious admixture of other ores as fluxes, the latter carrying values but not sufficient to be treated independently, concentration on a large scale has been possible, with a reduction in the costs of smelting greater than had at first been hoped for. With this cheaper cost of fire concentration, less discrimination had to be used in the mining of the great bodies of ore, much of which latter was of an assay value very near the line dividing profit from loss. As less discrimination had to be used in selecting the portions of the ore bodies to be mined, cheaper mining resulted, and it became possible to use steam shovels, together with power transportation in and about the mines, and a number of other economies.

In the Rossland camp, while much has been done towards lessening the costs of smelting, it has been recognized that certain of the constituents of the ore placed a limit upon the economies to be made in that direction, and hence steps have been taken to eliminate these constituents, so that not only might smelting be