

Silver-Cobalt-Nickel-Arsenic Ores.—The rich silver ores of the Cobalt district, the first shipments of which were made in 1904, are still to a large extent shipped out of Canada, even for first treatment.

Four Canadian smelters are treating these ores, and silver bullion, white arsenic, and nickel and cobalt oxides and mixed oxides or cobalt material are being recovered.

The Canadian Copper Company in 1906 established works for the treatment of these ores at Copper Cliff at which silver bullion, white arsenic, and cobalt material are recovered. The Coniagas Reduction Company built a plant at Thorold, Ont., in 1908, for the treatment of the ores of the Coniagas mine and also custom ore, the Deloro Mining and Reduction Company established works at Deloro, Ont., and in 1911 the Canada Refining and Smelting Company, Ltd., completed and placed in operation a plant at Orillia, Ont., for the treatment of cobalt-silver ores. At each of these plants, nickel and cobalt oxides are recovered in addition to silver bullion and white arsenic.

The treatment of these ores in Ontario in 1909, 1910, and 1911 gives the following results:—

	1909.	1910.	1911.
Ore treated..... Tons.	8,384	9,466	9,330
Products recovered:—			
Silver produced..... Ozs.	12,239,542	14,574,839	17,753,167
White arsenic..... Lbs.	2,258,087	3,003,467	4,194,209
Spells or residues..... Tons.	2,660	3,074	
Cobalt oxide and nickel oxide..... Lbs.		13,508	154,174
Mixed cobalt and nickel oxides and cobalt material..... "		108,178	1,260,832

* Fine ounces contained in silver bullion, fineness ranging from 850 to 998.

Lead Ores.—There was only one lead smelting plant in operation in Canada in 1911, viz.: that at Trail, B.C., operated by the Consolidated Mining and Smelting Company of Canada, Limited. This smelter is supplemented by a lead refinery employing the Betts Electrolytic Process and having a capacity of 100 tons per day. The main ore supply has come from the St. Eugene and Sullivan mines owned by the same Company, though practically all the lead ore produced in the Slooan district is smelted as customs ore. Supplementing the lead ores is a small tonnage of gold and silver ores, with some gold concentrates from stamp mills.

In the refinery, the bullion from the smelter is cast into anodes and re-deposited electrolytically upon cathode starting sheets of refined lead. The refined lead is cast into pigs of 100 pounds and 180 pounds weight, the latter being a special form for the Chinese trade.

The slimes from the tank room carry gold, silver, antimony, arsenic, and copper. The first two are recovered as fine metals, and the copper as copper sulphate.