

continued at the large Strathcona deposit in preparation for mining. Work continued at the Falconbridge mill on refinement of operations for the smelting of bulk flotation concentrates of copper-nickel sulphides. At Falconbridge's refinery at Kristiansand in Norway, a pilot plant operated on a modified refinery process which, if successful, will necessitate major refinery adjustments.

Sherritt Gordon Mines, Limited operated at normal levels. Development work at the Lynn Lake, Man., deposit on the 2,000-foot level continued from the Farley shaft. The company's refinery at Fort Saskatchewan in Alberta treated Lynn Lake concentrates and purchased bulk nickel-copper concentrates and nickel for refining on a toll basis. Sherritt Gordon purchased 3,431 tons of 19-p.c. nickel and 13-p.c. cobalt as calcines from the United States General Services Administration stockpile at Fredericktown, Miss., and also purchased an additional 87 tons of nickel-copper-cobalt matte. Powder-rolling facilities for the production of coinage blanks were expanded.

Giant Nickel Mines Limited in British Columbia signed a contract on Mar. 1 with the Japanese Sumitomo Metal Mining Company, Limited covering Giant's entire nickel-copper concentrate production for a further three-year period. As a result of an accelerated exploration program, indicated nickel-copper ore reserves were increased to about 1,000,000 tons. Daily mill capacity was increased from 900 tons to 1,200 tons. North Rankin Nickel Mines Limited operated its mine on Rankin Inlet on the west coast of Hudson Bay throughout the year and shipped nickel-copper concentrates to Sherritt Gordon's Fort Saskatchewan refinery.

Preparation for nickel production continued at Marbridge Mines Limited in La Motte Township of Quebec. Initial production, at a minimum rate of 300 tons of ore daily, is scheduled for the spring of 1962. Marbridge is owned by Falconbridge and Marchant Mining Company Limited and concentrates will be shipped to Falconbridge for smelting. Nickel Mining and Smelting Corporation announced that it is bringing its Gordon Lake property in northwestern Ontario into production. Shaft-deepening is in progress and regular production is planned for September 1962 at a daily mill rate of 500 tons. Nickel-copper concentrates will be trucked to Lac du Bonnet, Man., and shipped by rail to Sudbury for smelting by International Nickel.

Canadian reserves of nickel ore increased despite the mining and treatment of record tonnages during 1961. Reserves are sufficient for many years to come.

**Copper.**—Canada's copper production in 1961 reached a record amount of 444,635 tons valued at \$258,582,247; this was 5,373 tons above the 1960 output, an increase of 1.2 p.c. Although the percentage increase in production was lower than in previous years, exploration and development activity was greater than in any year since 1957—five new mines were brought into production, 13 mines were under development, and new discoveries were reported in many parts of Canada from Fort MacKenzie in New Quebec to the Nahanni River valley near the Yukon border.

Six smelters for the reduction of copper and copper-nickel ores and concentrates are operated in Canada. In the Sudbury area of Ontario, International Nickel operates smelters at Copper Cliff and Coniston, and Falconbridge Nickel Mines produces copper-nickel matte at its Falconbridge smelter. Hudson Bay Mining and Smelting Company Limited at Flin Flon, Man., smelts concentrates from its mines in Manitoba and Saskatchewan and, since September 1960, has smelted concentrates from Sherritt Gordon's Lynn Lake mine. Ores and concentrates from the copper mines in Ontario, Quebec and Newfoundland are smelted at the Noranda smelter of Noranda Mines, Limited and the Murdochville smelter of Gaspé Copper Mines, Limited, both in Quebec. Copper refineries are operated by International Nickel at Copper Cliff, Ont., and Canadian Copper Refiners Limited at Montreal East, Que. The capacity of the latter company's plant was increased in 1961 to 270,000 tons of copper a year and the combined production of the two refineries totalled 448,000 tons at the end of the year.