

ALL ABOUT NICKEL.

Exhaustive Report by Joseph H. Pratt, of the Geological Survey.

Mineral Resources of the United States, 1901, published by the United States Geological Survey, and now in press, David T. Day, chief of division of Mining and Mineral Resources, will contain the report of Dr. Joseph Hyde Pratt on nickel, cobalt, fluor spar and cryolite for 1901.

The two principal sources of nickel are the nickeliferous pyrrhotite, the most widely spread of the nickel ores, and genthite, especially the garnierite variety. In this country the domestic product of nickel has been a by-product from the lead ore of Mine Lamotte, in Missouri, since the shutting down of the Gap nickel mine in Lancaster county, Pennsylvania, about fifty miles west of Philadelphia, about ten years ago. This mine was worked from about 1863 to 1880, when work was discontinued because of the abundant supply of nickel matte from Canada. Traces and small amounts of the nickel minerals genthite and garnierite have been found in North Carolina, but not in commercially sufficient quantities, though a deposit of nickel ore averaging 1.5 per cent nickel is reported near Morgantown, Burke county. Similar occurrences of nickel silicate are found in Oregon, where the percentage of nickel ore is much greater than in the North Carolina minerals. The Oregon deposits are on Piney mountain, in Douglas county, about three miles a little north of west from Riddles, a station on the Southern Pacific railroad, and a high grade cobalt ore deposit is being developed in the eastern part of the state.

Nickel ore is reported to occur in some quantity at the Congress mine, in Upper Nine-Mile section, about fourteen miles north of Keller, Ferry county, Washington. This section was formerly worked for copper and gold, but was abandoned. In the latter part of 1901 the claims were again taken up and are now being developed for nickel.

The Wyoming nickel ores, near Sheridan, Sheridan county, do not seem to contain nickel in commercial quantity; at Piney creek, also, nickel ore is reported. Near the northern border of Churchill county, in Cottonwood canyon, about forty-five miles from Lovelock, Humboldt county, Nevada, deposits of niccolite and gersdorffite have been prospected as nickel ores; and deposits have also been reported at Bunkerville, Lincoln county, and near Candelaria, Esmeralda county. They have not yet been producers of nickel ores. It is reported that the Magnetic mine, near Tucson, Arizona, contains nickel ores in quantity and that they are now being investigated by eastern capitalists.

Nickel ores are reported also as found on Spring creek, in the Black Hills, South Dakota, about eleven miles northwest of Custer, and at the St. Joe mine, Blackbird, Lemhi county, Idaho.

A recent discovery of nickeliferous pyrrhotite is reported near the head of Skowl Arm, near Ketchikan, in southeastern Alaska, where the ore is stated to be in two parallel veins. Nearly all the nickel used in the United States is obtained from the mines in the Sudbury district, Canada, which produces probably one-half of the nickel used in the world. The other chief sources of nickel are the mines of New Caledonia, in the Pacific Ocean, and of Silesia, Austria. Nickel deposits are being developed satisfactorily near Hangesund, Norway; and a supposed extensive deposit of

nickel has been discovered on the headwaters of Tulameen river, British Columbia.

The first use of nickel was in making German silver. Nickel is also used extensively for coinage by the United States and many European countries. Nickel is also used, when welded upon iron and rolled into sheets, for making culinary utensils and other objects. The most important use of nickel is in making nickel-steel, now used in large quantities in the production of armor plates, turrets, propeller shafts, bicycles, etc.

Nickeloid, a nickel plated sheet of zinc which is non-corrosive and does not oxidize or rust, is largely used in making bathtubs, refrigerator linings, etc.

A new nickel alloy of nickel, aluminum and copper, which can be rolled into plates and bars, has recently been introduced by a Berlin manufacturer.

The only nickel and cobalt produced in the United States during 1901, were as by-products at Mine Lamotte, Missouri, and the matte containing the nickel and cobalt was refined at Constable Hook and Camden, New Jersey. There were obtained 6,700 pounds of nickel, valued at \$3,551, and 13,360 pounds of cobalt oxide, as compared with 9,715 pounds of nickel, valued at \$3,886, and 6,471 pounds of cobalt oxide produced in 1900. This is a decrease of 3,015 pounds in the production of nickel and an increase of 6,889 pounds in the production of cobalt oxide. Elaborate experiments have been made by the Canadian Copper company to refine, in Canada, the nickel copper matte from the Sudbury mines, but thus far in vain, the greater part of this matte being refined in the United States.

The amount of nickel imported and entered for consumption in the United States in 1901 was 117,364,337 pounds, valued at \$1,847,166, as compared with 57,955,988 pounds of nickel matte, etc., valued at \$1,323,630 in 1900. The amount of nickel produced from matte and ore imported into the United States was 10,497,007 pounds, worth between five and six million dollars. There was a decided increase in the production of nickel from New Caledonia ores in 1901. The price of nickel oxide has been about five cents lower per pound than the metal, while the cobalt oxide has been sold at \$2.20 a pound. The nickel industry is increasing rapidly, and there has been, also, a decided increase in the amount of nickel used in the United States. The export of nickel oxide and matte from the United States in 1901 was 5,869,655 pounds, as compared with 5,869,906 pounds in 1900.

The amount of cobalt oxide imported into the United States in 1901 was 71,969 pounds, valued at \$134,208, as compared with 54,073 pounds, valued at \$88,

651 in 1900. As the United States refines the greater part of the nickel matte produced at the Sudbury mines, naturally the United States exported nickel to the amount of 5,869,655 pounds in 1901, or 251 pounds less than was exported in 1900.

The production of nickel in Canada in 1900 was 8,729,000 pounds, valued at \$4,364,500; in France the production was 3,746,800 pounds, valued at \$1,020,000; in Germany it was 4,383,756 pounds, valued at \$1,999,940.

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