

## The Copper and Nickel Industry of Canada.

Among the mineral products of Canada during the year 1899, copper held third place and nickel fourth in point of the value of the product, the copper produced being valued at \$2,655,319, and the nickel at \$2,067,840.

The world's nickel production in 1898 was placed at 6,116 metric tons, to which amount New Caledonia contributed 3,608 tons, the United States 5 tons and Ontario 2,503 tons; Ontario's share being 40.8 per cent of the total.

Concerning the operations carried on in 1899, the report of the Department of Colonization and Mines for that year says that the Capetown copper mines were worked regularly. The total output was 38,928 gross tons of the low grade ore in the environs of Sherbrooke, of a value at the mine of \$157,062, of which 23,728 tons were shipped to the United States while the remainder was used on the spot.

Concerning nickel and cobalt, the Quebec Government Mining Engineer reported "The works done on Calumet Island, in the vicinity of Spirit Rock, do not appear to me to have yielded satisfactory results. The English Canadian Mining Co., was organized to work this deposit of which I spoke last year, but it seems to have abandoned its work after taking out a few tons of ore."

Four copper mining companies were in operation or in a position to work during the year.

The Bureau of Mines report for Ontario for 1899 gives the distribution of the various forms in which the metal occurs in the province, as follows:—

Native copper has been found at the following localities, among others:—O'Connor, Beaver Mine; Point Main, Maine; Spanish Island, St. Ignace. This mineral occurs at numerous places in the trappean rocks on the north and east shores of Lake Superior.

Copper pyrites occurs widely distributed in the Sudbury district and in other parts of the province.

Copper glance occurs at Bruce Mines; Gould, Barron location; Main, Maine; Michipicoten Island; Parry Sound.

Copper sulphate occurs at Lake, Hastings county, and other localities.

In Ontario the production of copper is closely associated with that of nickel. Of the extent of the operations in the province in recent years the report of the Bureau of Mines for 1899, says:—

"In the eight years, 1892-99, for which complete statistics are available, the quantity of copper and nickel ores smelted and reduced to matte in the Sudbury district was 763,082 tons, and the estimated metallic contents were 36,443,000 pounds nickel and 40,318,500 pounds copper. At the selling price of matte at the furnaces, which is the form in which it is exported to the refineries, the total value of the nickel produced in the eight years was \$3,235,000 and of the copper, \$1,480,000, or a total of \$4,715,000. At the average selling price of the metals during the eight years, the value of the refined metals would be \$12,606,000 for nickel and \$1,657,000 for copper, for a total of \$14,263,000. The total amount paid for wages in Ontario during the eight years was \$2,334,000.

"The total quantity of ore raised last year was 203,118 tons, and the total quantity smelted, 171,230 tons."

With an increase of nearly 50,000 tons in the quantity of ore smelted, the nickel contents in 1899 exceed those of 1898 by less than 100 tons, and the copper contents are actually less by 1,350 tons.

The statistics of labor show that there were employed at the mines and works last year: underground, 276, and above ground, 516; with 25 boys under 16 years of age above ground. The total amount of wages paid for labor was \$443,870.

In the course of an address on "The Nickel Question," at the annual meeting of the Canadian Mining Institute, last year, Major Leckie said:—

"The province of New Brunswick is likely to be a producer of nickel, unless the threatened fall in the price of nickel should fall from over-production. Near St. Stephen, large masses of pyrrhotite exist, which appear to be more extensive and continuous than those in Nipissing and Algoma.

the average in places running fully 3 per cent copper and nickel. Their location is admirable, being within half a mile of the railway and less than a mile from tidewater. Cheap labor, cheap fuel, and ample water-power, all favor economical mining and treatment of ore.

"Fort Steele district, British Columbia, has sent good samples of nickel ore; arseniferous, yielding from 3 to 8 per cent. nickel; and from Lunenburg county, Nova Scotia, encouraging samples of sulphides have been received."

In British Columbia the exploitation of copper has been steadily increasing until it now constitutes one of the mineral products of the province. In 1897, to the total of \$10,445,268, the value of the mineral products of British Columbia, copper contributed, \$266,258; in 1898, to a total of \$10,006,861, copper contributed \$374,781; and in 1899, to a total of \$12,350,553, copper contributed \$1,351,453.

Reviewing the situation, in so far as copper is concerned, the report of the Minister of Mines for 1899 says:—

"The amount of copper produced in the province during 1899 was 7,222,591 pounds, an increase of about 6 per cent. over last year. While this increase in the actual output is comparatively slight, the exceedingly good market prices ruling throughout the year caused the value of such production to amount to an increase of about 55 per cent. over that of 1898.

"As yet, the copper-producing districts are practically limited to three: Rossland, Nelson, and the Coast.

"Rossland produced about 75 per cent. of our total copper output this past year, with a tonnage of 172,065 tons, an increase of some 55 per cent. over 1898. The increase in the amount of fine copper produced was about 9 per cent., but the increase in the value of such production was about 58 per cent.

"The copper production of the Nelson Camp fell off this year some 100,000 pounds in fine copper; however, the increase in the market price obtained brought the value of the 1899 product up to about the same as that of 1898.

"Relatively, the copper production of the coast district has not as yet reached any very important figure. The output this year was some 654,972 pounds of fine copper, produced from some 5,200 tons of ore, the product of mines on Texada Island, on Mount Sicker, on the east coast, and near Alberni, on the west coast of Vancouver Island."

Although the returns for the year 1899 have not yet been completed, an estimate prepared for the department of labor by the mines department of British Columbia places the probable copper production of the province at 10,000,000 pounds, as compared with a production of 7,722,591 pounds last year.

Although Nova Scotia is not at present an active producer of copper, some attention is being directed to the metal there.

Almost the entire output of the Canadian mines is exported, either in ore or in matte, for refining mainly in the Eastern United States.—The Labor Gazette.

## The Mineral Production of the British Empire.

In a previous number of this Journal a summary was given of the chief mining industries of the world, with statistics of the total production of the most important metals during 1898, says the Imperial Institute Journal. The information contained therein may now be supplemented by briefly reviewing the figures for 1899 and considering the contributions which the British Empire makes to the respective totals. The necessary information for this purpose is furnished by the official report on "Mineral and Quarries: Part IV—Colonial and Foreign Statistics" by Dr. Le Neve Foster, which has just been issued from the home office, containing particulars of the chief home and colonial mining industries, the statistics relating to production, the number of persons engaged and accidents during 1899.

With reference to the United Kingdom itself it may be noted that in 1899 there were 4,010 mines in operation, employing a total of 704,106 persons, an increase of 8 mines and 23,041 persons over the previous year; the num-

ber of quarries under official inspection i. e., over 20 feet deep, was 3,064, giving employment to 67,006 persons, an increase of 40 quarries, but a decrease of 30,483 persons employed, on the figures of 1898. The death rate through accidents at all the mines was exactly the same as in 1898, viz.: 1.27 per 1,000 while that in the quarries was 1.10 per 1,000 against 1.00 per 1,000 for the previous year. The total value of the minerals obtained from all the workings is given as £97,470,200, and the metals obtained by smelting the various ores raised in the country represent £18,314,750, compared with £17,415,063 and £13,717,512 respectively in 1898. The principal increases are in coal, the output of which has risen from 202,064,511 to 220,004,781 tons; in gold, of which 3,327 oz. were obtained against 335 oz. in 1898; and in aluminium, the production of which increased from 310 to 550 tons. The increase in the coal output of this country, large though it was, did not equal that of the United States, which amounted to 30,000,000 metric tons, and for the first time the latter country became the largest producer. The large increase in the States, nearly equal in fact to the total output of France, is stated to be due to the extensive use of coal-cutting machinery, 23 per cent of the total coal being thus obtained, whereas in this country only 1.5 per cent of the total coal is mined in this way.

Gold.—The gold production of the British Empire for 1899 showed a considerable increase over that of the previous year, chiefly owing to the larger output from Western Australia and Canada, and formed more than one-third of the world's supply. Western Australia is now our premier gold-producing colony, the yield having increased at a marvellously rapid rate. In 1898 the output was 50 per cent. higher than that of 1897 and in 1899 a similar increase was recorded, the total production being 1,043,877 oz. or 593,004 oz. more than the previous year. The most important field is that of East Coolgardie, which in 1899 produced more than one-half the total. In the other Australian colonies, as well as in New Zealand, the gold industry was well maintained during 1899 and in most cases increased yields were recorded. In Canada the chief fields are those of Klondike in the Yukon district, where gold is obtained solely from alluvial deposits, and from here 774,000 oz. (more than three-fourths the total output of the Dominion) were obtained, an increase of 200,270 oz. British Columbia, from its fields in Kootenay, Cariboo, Omineca, and Cassiar, yielded 205,500 oz. In 1899, also a substantial increase, and the production in Nova Scotia was likewise augmented. The gold from India is chiefly obtained from the quartz veins of Mysore, though small quantities are extracted by the washing of river sands in many parts of the country. In 1899 there were 22 mines at work and these produced 488,071 oz., of which more than one-third came from the Champion Reef Gold Mine.

Silver.—Only one-ninth of the world's supply of this metal was furnished by the British Empire, the chief contributions being New South Wales, Tasmania and Canada. In the former colony the output from the celebrated mines at Broken Hill was well maintained.

Coal.—Nearly one-third of the coal raised in 1899 was supplied by the British Empire, though the colonies contributed but little to this result. It is interesting to note that the increase in the production of the United Kingdom during 1899 exceeds the total output of all the colonies of the present time. Many of the latter, however, possess important coal deposits, capable of much greater development. In Canada the chief coalfields are situated on the seaboard of the Atlantic and Pacific oceans and are, therefore, of considerable importance. On the Atlantic side thick seams of bituminous coal of true carboniferous age are being worked at Sydney (Cape Breton), Pictou and Springhill coalfields in Nova Scotia, and thin seams also extend into New Brunswick. No coal is found between the Atlantic coast and the western prairies, where large quantities of lignite occur, but on approaching the Rocky Mountains the seams yield good bituminous or anthracite coal. In the neighborhood of the Crow's Nest Pass several very valuable seams occur, and by the construction of a railway through the district these have now been rendered available for industrial purposes. On the Pacific coast coal, generally bituminous, is obtained from Nanaimo, Wellington and Comox in Vancouver Island, and both anthracite and bit-

uminous coal occur in Queen Charlotte Islands. The total production in 1899 showed an increase of nearly 357,000 metric tons on the preceding year. India also possesses immense coal resources, which are only very partially worked at the present time, though the production for 1899 shows an increase of nearly 350,000 metric tons. About three-fourths of the output comes from Bengal, the remainder being obtained from the northwest provinces and Oudh, Punjab, Central provinces, Assam, Burma, Central India, the Nizam's dominions and Baluchistan. The coal of Peninsular India is of Lower Gondwana (Permian-Triassic) age, while that of Extra-Peninsular India is Cretaceous and Tertiary. In South Africa the outbreak of war at the end of 1899 interfered considerably with the output of the mines, and finally stopped work altogether. Cape Colony, however, shows an increase of 15,000 metric tons over the output of 1898, and, but for the interruption of work, this would have been much greater. Of the amount raised India produced more than five-eighths, the rest coming from Cyphergat, Sterkstroom and Molteno. Outcrops of coal have been discovered at various places on the plateau lying between the Drakensburg range and the Matlwan mountains, and along the southern slopes of these mountains between the Kei and Umsinkulu rivers. From Natal no official report for 1899 has been received, but some particulars regarding the mines and figures of the production up to the outbreak of war have been already given in this Journal (Vol. vi. p. 237). The total production of the Australian colonies shows a net increase of over 50,000 metric tons on the figures for 1898, notwithstanding the fact that the output from New South Wales, by far the largest producer, fell off by over 110,000 tons. In Western Australia several large coal-bearing districts have been discovered, the most important at present being the Collie coalfield, where the production rose from 3,508 tons in 1898 to 54,336 tons in 1899, and is likely to increase rapidly. New Zealand, which had 100 collieries at work in 1899, the largest of which are on the west coast of Middle Island, also shows a substantial increase in its coal production. British Borneo also possesses valuable deposits of coal, which is said to be very suitable for steamers. In Rhodesia the coal resources are being tested with promising results, and in the British Central African Protectorate coal is being worked on a small scale on the Upper Zambesi.

Iron.—The production of iron or iron ores in the colonies is at present comparatively insignificant. Canada, however, possesses large supplies of ore in many of its provinces, and the output, though small, is steadily increasing. Various ores, viz. magnetite, hematite, limonite, and claystone, occur abundantly in several districts of India, but Barraker, in Bengal, is the only place where iron-smelting is carried on by modern methods on a comparatively large scale. Here the conditions are extremely favorable, as coal, iron ore, and limestone all occur in close proximity, and in 1899 the production was 19,031 tons of pig iron. Large and very valuable deposits of red hematite occur in Newfoundland at Bell Island, Conception Bay, which are now being mined on an extensive scale, and the ore shipped to Nova Scotia to be smelted. The amount of ore obtained increased from 103,657 metric tons in 1898 to 311,805 tons in 1899. For the first time Western Australia appears as a producer of iron ore, the amount being 13,058 tons.

Copper.—The condition of the British Empire to the world's supply of copper is small, but some of the colonies possess very promising mines, which, in view of the present price of the metal, are being vigorously worked. In Canada copper ore is mined in British Columbia, Ontario and Quebec, nearly one-half of the output being from the first-named province. In Cape Colony all the copper ore is obtained from Namaqualand, and the mines there are apparently not under official inspection. Newfoundland considerably increased its production of copper during 1899, and Tasmania, which only began to export in 1896, sent away 4,955 tons of the metal. In New South Wales and South Australia copper-mining is being carried on, and in the latter colony it is the most important mineral industry.

Other Metals.—The amounts of lead and zinc furnished by the colonies is not very important. Of the first, British Columbia and Tasmania are the