CANADA
DEPARTMENT OF MINES
HON. LOUIS CODERRE, MINISTER; A. P. LOW, LL.D., DEPUTY MINISTER.
MINES BRANCH
EUGENE HAANEL, PH.D., DIRECTOR.

# A GENERAL SUMMARY

OF THE

# MINERAL PRODUCTION

OF

# CANADA

During the Calendar Year

## 1912

JOHN McLEISH, B.A.

*Chief of the Division of Mineral Resources and Statistics.*

OTTAWA
GOVERNMENT PRINTING BUREAU
1913

No. 238

45060—1

## CONTENTS.



45060—1½

THE

# MINERAL PRODUCTION OF CANADA

During the Calendar Year

## 1912

### General Summary.

Canada's progress and growth in industrial development is strongly reflected in the statistical record of her mineral production. An annual record has been published since 1886, in which year the total value of the production was a little in excess of ten million dollars, or $2.23 per capita of population. In 1912 the value of the production according to revised statistics now completed was $135,048,296, or nearly $19 per capita, the preliminary record published in March last showing a value of $133,127,489 having been exceeded by nearly two million dollars.

Comparing last year's production with that of the years immediately preceding we find an increase over the 1911 value of output of $31,827,302 or 30·8 per cent. It will be remembered, however, that the mineral output in 1911 was somewhat restricted owing to long extended labour disputes in the coal mines of Alberta and British Columbia, and was less than that of 1910, in which year the production was valued at $106,823,623 or $14.93 per capita, and the highest record up to that year. Compared with 1910 the production in 1912 still shows an increase in total value of $28,224,673 or 26·5 per cent, and an increase in per capita production from $14.93 to $18.27 or 22·3 per cent.

### Annual Mineral Production in Canada since 1886.

| Year. | Value of production. | Value per capita. | Year. | Value of production. | Value per capita. |
|---|---|---|---|---|---|
| | $ | $ cts. | | $ | $ cts. |
| 1886 | 10,221,255 | 2 23 | 1900 | 64,420,877 | 12 04 |
| 1887 | 10,321,331 | 2 23 | 1901 | 65,797,911 | 12 16 |
| 1888 | 12,518,894 | 2 67 | 1902 | 63,231,836 | 11 36 |
| 1889 | 14,013,113 | 2 96 | 1903 | 61,740,513 | 10 83 |
| 1890 | 16,763,353 | 3 50 | 1904 | 60,082,771 | 10 27 |
| 1891 | 18,976,616 | 3 92 | 1905 | 69,078,999 | 11 49 |
| 1892 | 16,623,415 | 3 39 | 1906 | 79,286,697 | 12 81 |
| 1893 | 20,035,082 | 4 04 | 1907 | 86,865,202 | 13 75 |
| 1894 | 19,931,158 | 3 98 | 1908 | 85,557,101 | 13 16 |
| 1895 | 20,505,917 | 4 05 | 1909 | 91,831,441 | 12 70 |
| 1896 | 22,474,256 | 4 38 | 1910 | 106,823,623 | 14 93 |
| 1897 | 28,485,023 | 5 49 | 1911 | 103,220,994 | 14 42 |
| 1898 | 38,412,431 | 7 32 | 1912 | 135,048,296 | 18 27 |
| 1899 | 49,234,005 | 9 27 | | | |

## Comparative Statement of Mineral Production for Years 1911 and 1912.

| Product. | 1911. | | | 1912. | | | Increase (+) or Decrease (−). | | Increase (+) or Decrease (−). | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Quantity. | Value. (a) | Per cent of total. | Quantity. | Value (a) | Per cent of total. | Quantity. | % | Value. | % |
| *Metallic.* | | $ | % | | $ | % | | | $ | |
| Cobalt oxide and nickel oxide..... Lbs. | 154,174 | 221,690 | 0·22 | 349,054 | 156,256 | 0·24 | + 194,880 | 126·00 | + 98,554 | 44·46 |
| Cobalt material, mixed cobalt and nickel oxides..... " | 1,260,832 | | | 1,285,280 | 163,988 | | + 24,448 | 1·94 | | |
| Copper (b) ..... " | 55,648,011 | 6,886,998 | 6·67 | 77,832,127 | 12,718,548 | 9·42 | + 22,184,116 | 39·87 | + 5,831,550 | 84·67 |
| Gold..... Ozs. | 473,159 | 9,781,077 | 9·48 | 611,885 | 12,648,794 | 9·37 | + 138,726 | 29·32 | + 2,867,717 | 29·32 |
| Iron pig from Canadian ore (c) ..... Tons. | 42,186 | 613,404 | 0·59 | 36,355 | 450,886 | 0·33 | − 5,831 | 14·82 | − 162,518 | 26·49 |
| Iron ore sold for export (k).. ..... " | 40,137 | 88,570 | 0·09 | 118,129 | 328,950 | 0·24 | + 77,992 | 194·00 | + 240,380 | 271·00 |
| Lead (d) ..... Lbs. | 23,784,969 | 827,717 | 0·80 | 35,763,476 | 1,597,554 | 1·18 | + 11,978,507 | 50·36 | + 769,837 | 93·01 |
| Nickel (e)..... " | 34,098,744 | 10,229,623 | 9·91 | 44,841,542 | 13,452,463 | 9·96 | + 10,742,798 | 31·50 | + 3,222,840 | 31·50 |
| Silver (f)..... Ozs. | 32,559,044 | 17,355,272 | 16·81 | 31,955,560 | 19,440,165 | 14·40 | − 603,484 | 1·85 | + 2,084,893 | 12·01 |
| Zinc ore..... Tons. | 2,590 | 101,072 | 0·10 | 6,415 | 215,149 | 0·16 | + 3,825 | 148·00 | + 114,077 | 113·00 |
| Total.. ..... | ..... | 46,105,423 | 44·67 | ..... | 61,172,753 | 45·30 | ..... | ..... | + 15,067,330 | 32·69 |
| *Non-metallic.* | | | | | | | | | | |
| Actinolite..... Tons. | 67 | 736 | ..... | 92 | 1,000 | ..... | + 25 | 37·31 | + 264 | 35·87 |
| Arsenious oxide ..... " | 2,097 | 76,237 | ..... | 2,045 | 89,262 | ..... | − 52 | 2·48 | + 13,025 | 17·08 |
| Asbestos..... " | 101,393 | 2,922,062 | 2·83 | 111,561 | 3,117,572 | 2·30 | + 10,168 | 10·03 | + 195,510 | 6·69 |
| Asbestic..... " | 26,021 | 21,046 | ..... | 24,740 | 19,707 | ..... | − 1,281 | 4·92 | − 1,339 | 6·36 |
| Chromite..... " | 157 | 2,587 | ..... | ..... | ..... | ..... | − 157 | ..... | − 2,587 | ..... |
| Coal ..... " | 11,323,388 | 26,467,646 | 25·64 | 14,512,829 | 36,019,044 | 26·67 | + 3,189,441 | 28·04 | + 9,551,398 | 36·09 |
| Corundum..... " | 1,472 | 161,873 | 0·15 | 1,960 | 239,091 | 0·18 | + 488 | 33·15 | + 77,218 | 47·70 |
| Feldspar..... " | 17,723 | 51,939 | ..... | 13,733 | 30,916 | ..... | − 3,990 | 22·51 | − 21,023 | 40·48 |
| Fluorspar..... " | 34 | 238 | ..... | 40 | 240 | ..... | + 6 | 17·65 | + 2 | 0·80 |
| Graphite..... " | 1,269 | 69,576 | ..... | 2,060 | 117,122 | ..... | + 791 | 62·33 | + 47,546 | 68·34 |
| " artificial..... " | 1,086 | ..... | ..... | 1,151 | ..... | ..... | + 65 | 5·99 | ..... | ..... |
| Grindstones ... ..... " | 4,566 | 52,942 | ..... | 4,412 | 52,090 | ..... | − 154 | 3·37 | − 852 | 1·61 |
| Gypsum..... " | 518,383 | 993,394 | 0·96 | 578,458 | 1,324,620 | 0·98 | + 60,075 | 11·59 | + 331,226 | 33·34 |
| Magnesite ..... " | 991 | 5,531 | ..... | 1,714 | 9,645 | ..... | + 723 | 72·96 | + 4,114 | 74·38 |
| Manganese..... " | 51/2 | 300 | ..... | 75 | 1,875 | ..... | + 69½ | ..... | + 1,575 | ..... |
| Mica..... " | ..... | 128,677 | 0·12 | ..... | 143,976 | 0·10 | ..... | ..... | + 15,299 | 11·89 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mineral pigments— | | | | | | | | | | | | |
| Barytes | Tons. | 50 | 400 | ..... | 464 | 5,104 | ..... | + | 414 | ..... | + | 4,704 | ..... |
| Ochres | " | 3,622 | 28,333 | ..... | 7,654 | 32,410 | ..... | + | 4,032 | 111·00 | + | 4,077 | 14·39 |
| Mineral water | | ..... | 223,758 | 0·21 | ..... | 172,465 | 0·13 | ..... | | ..... | − | 51,293 | 22·92 |
| Natural gas (*g*) | | ..... | 1,917,678 | 1·35 | 15,286,803 | 2,362,700 | 1·75 | + | 3,642,646 | 31·28 | + | 445,022 | 23·21 |
| Peat | Tons. | 1,463 | 3,817 | ..... | 700 | 2,900 | ..... | − | 763 | 52·15 | − | 917 | 24·02 |
| Petroleum (*h*) | Bls. | 291,092 | 357,073 | 0·34 | 243,336 | 345,050 | 0·26 | − | 47,756 | 16·41 | − | 12,023 | 3·37 |
| Phosphate | Tons. | 621 | 5,206 | ..... | 164 | 1,640 | ..... | − | 457 | 73·59 | − | 3,566 | 68 50 |
| Pyrites | " | 82,666 | 365,820 | 0·35 | 81,526 | 314,085 | 0·23 | − | 1,140 | 1·38 | − | 51,735 | 14·14 |
| Quartz | " | 60,526 | 83,865 | ..... | 100,242 | 195,216 | 0·14 | + | 39,716 | 65·62 | + | 111,351 | 133·00 |
| Salt | " | 91,582 | 443,004 | 0·42 | 95,053 | 459,582 | 0·34 | + | 3,471 | 3·79 | + | 16,578 | 3·74 |
| Talc | " | 7,300 | 22,100 | ..... | 8,270 | 23,132 | ..... | ÷ | 970 | 13·29 | + | 1,032 | 4·67 |
| Tripolite | " | 20 | 122 | ..... | 38 | 230 | ..... | + | 18 | 90·00 | + | 108 | 88·52 |
| Total | | ..... | 34,405,960 | 33·33 | ..... | 45,080,674 | 33·38 | ..... | | ..... | + | 10,674,714 | 31·03 |

*Short tons throughout. (*a*) The metals copper, lead, nickel, and silver are for statistical and comparative purposes valued at the final average value of the refined metal. Pig iron, zinc ore, and cobalt oxides are valued at the furnace or spot, and non-metallic products at the mine or point of shipment. (*b*) Copper content of smelter products and estimated recoveries from ores exported, at 16·341 cents per pound, in 1912; and 12·376 cents per pound in 1911. (*c*) The total production of pig iron in Canada in 1912 was 1,014,587 tons valued at $14,550,999, of which it is estimated 978,232 tons valued at $14,100,113 should be credited to imported ores; in 1911, the total production was 917,535 tons valued at $12,307,125, of which 875,349 tons valued at $11,693,721 are credited to imported ores. (*d*) Refined lead and lead contained in base bullion exported at 4·467 cents per pound in 1912, and 3·480 cents in 1911, the average prices in Montreal. (*e*) Nickel content of matte produced valued at 30 cents in 1912 and 1911. (Increasing quantities of nickel-copper matte are now being used in making monel metal which is sold at a price much below that of refined nickel). The value of the nickel contained in matte, as returned by the operators, was about 10 cents per pound for both years. (*f*) Estimated recoverable silver at 60·835 cents per ounce in 1912, and at 53·304 cents in 1911. (*g*) Gross returns for sale of gas. (*h*) Quantity on which bounty was paid and valued at $1,418 per barrel in 1912, and at $1.22½ in 1911. (*k*) In 1912 and 1911 figures as reported by the producers, which differ slightly from those of the Trade and Navigation reports.

## Comparative Statement of Mineral Production for Years 1911 and 1912.—*Continued.*

| Product. | 1911. | | | 1912. | | | Increase (+) or Decrease (−). | | Increase (+) or Decrease (−). | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Quantity. | Value. | Per cent of total. | Quantity. | Value. (*a*) | Per cent of total. | Quantity. | % | Value. | % |
| *Structural Materials and Clay Products.* | | $ | % | | $ | % | | | $ | |
| Cement, Portland ..... Bls. | 5,692,915 | 7,644,537 | 7·41 | 7,132,732 | 9,106,556 | 6·74 | + 1,439,817 | 25·29 | + 1,462,019 | 19·13 |
| Clay products— | | | | | | | | | | |
| Brick, common..... No. | 645,550,517 | 5,420,890 | 5·25 | 769,191,532 | 7,010,375 | 5·19 | +123,641,015 | 19·15 | + 1,589,485 | 29·32 |
| Brick, pressed..... " | 87,350,539 | 1,094,582 | 1·06 | 125,180,422 | 1,609,854 | 1·19 | + 37,829,883 | 43·31 | + 515,272 | 47·07 |
| Brick, paving..... " | 5,220,400 | 79,444 | ..... | 4,579,500 | 85,989 | ..... | − 640,900 | 12·27 | + 6,545 | 8·24 |
| Brick, moulded and ornamental..... | 605,643 | 11,281 | ..... | 371,356 | 8,595 | ..... | − 234,287 | 38·68 | − 2,686 | 23·81 |
| Fireclay, and fireclay products..... | ..... | 89,130 | ..... | ..... | 125,585 | ..... | ..... | ..... | + 36,455 | 40 90 |
| Fireproofing and architectural terra-cotta | ..... | 409,585 | 0·39 | ..... | 448,853 | 0·33 | ..... | ..... | + 39,268 | 9·59 |
| Pottery..... | ..... | 102,493 | 0·10 | ..... | 43,955 | ..... | ..... | ..... | − 58,538 | 57·11 |
| Sewer-pipe ..... | ..... | 812,716 | 0·79 | ..... | 884,641 | 0·65 | ..... | ..... | + 71,925 | 8·85 |
| Tile, drain..... No. | ..... | 339,812 | 0·32 | ..... | 357,862 | 0·26 | ..... | ..... | + 18,050 | 5·31 |
| Kaolin ..... | ..... | ..... | ..... | 20 | 160 | ..... | ..... | ..... | ..... | ..... |
| Lime..... Bus. | 7,533,525 | 1,517,599 | 1·47 | 8,475,839 | 1,844,849 | 1·37 | + 942,314 | 12·51 | + 327,250 | 21·56 |
| Sand-lime brick..... No. | 51,535,243 | 442,427 | 0·43 | 96,448,402 | 1,020,386 | 0·76 | + 44,913,159 | 87·15 | + 577,959 | 131·00 |
| Sand and gravel (*n*)..... Tons. | 573,494 | 408,110 | 0·39 | ..... | 1,512,099 | 1·12 | ..... | ..... | + 1,103,989 | ..... |
| Slate.....Squares | 1,833 | 8,248 | ..... | 1,894 | 8,939 | ..... | + 61 | 3·33 | + 691 | 8·38 |
| Stone— | | | | | | | | | | |
| Granite..... | ..... | 1,119,865 | 1·08 | ..... | 1,373,119 | 1·02 | ..... | ..... | + 253,254 | 22·61 |
| Limestone..... | ..... | 2,594,926 | 2·51 | ..... | 2,762,936 | 2·04 | ..... | ..... | + 168,010 | 6·47 |
| Marble..... | ..... | 162,783 | 0·15 | ..... | 260,764 | 0·19 | ..... | ..... | + 97,981 | 60·19 |
| Sandstone ..... | ..... | 451,183 | 0·43 | ..... | 329,352 | 0·24 | ..... | ..... | − 121,831 | 27·00 |
| Total..... | ..... | 22,709,611 | 22·00 | ..... | 28,794,869 | 21·32 | ..... | ..... | + 6,085,258 | 26·80 |
| Grand total ..... | ..... | 103,220,994 | 100·00 | ..... | 135,048,296 | 110·00 | ..... | ..... | +31,827,302 | 30·83 |

(*n*) In 1911, exports; in 1912, partial record only of production.

The detailed comparative statement of production during the years 1911 and 1912, shown in the preceding table, is a gratifying indication of the fact that the Canadian mineral industry in 1912 has had by far the most successful year in its history.

This progress is all the more satisfactory because it is evidently due to a widespread and substantial development of the country's mineral resources. The only new camp of importance to contribute largely to the year's output was Porcupine, the gold production of which was about one and three-quarter million dollars. A slight scarcity of labour was reported, particularly in connexion with the asbestos and clay working industries. There were comparatively few labour disputes to interfere with output, the principal difficulties being a strike of coal miners on Vancouver island, beginning in September, and a labour dispute at Porcupine toward the latter part of the year. The actual output of coal and gold were, however, but slightly affected thereby.

A substantial increase in price in most of the metals, which took place early in the year and continued throughout, had a very important bearing on the year's operations, and contributed largely to the increased value of the output.

A feature of particular interest during the year has been the continued and extended development of ore reserves. The satisfactory results from these operations, particularly in the case of the nickel-copper ores of the Sudbury district, the Porcupine gold ores of Ontario, and a number of the copper and lead deposits of British Columbia, point to much greater annual outputs in the future.

Extension of ore smelting and refining facilities, and in a number of cases special improvements in methods of practice, have also been important factors in the year's operations.

In considering the total value of the mineral production as shown in the general table, due weight should be given to the basis on which the statistics are compiled. It is very difficult to draw a fine line of distinction between what may be termed the first or mine product and the subsequent products resulting from the treatment or manufacture of the mine products, so that in the end a compromise is a practical necessity. Thus in the tabular statement given the quantities of the metals shown are in general the quantities actually recovered or estimated as recovered from the ores shipped from the mines during the year, and the values placed upon them are based on the value of the refined metal in a recognized market. Non-metallic products are valued as at the mine, except in the case of clay products, lime, and cement, for which it appears more feasible to use the manufactured products as a basis of compilation both of quantity and value, the first materials having practically no intrinsic value beyond the labour expended upon them.

On this basis then the production of metalliferous products in 1912 was valued at $61,172,753, being 45·3 per cent of the total mineral output, and an

increase in value over the previous year of $15,067,330, or 32·7 per cent. The value of the production of non-metalliferous products (excluding structural materials and clays) in 1912 was $45,080,674, being 33·38 per cent of the total mineral output, and an increase of $10,674,714, or 31 per cent, over the value of the production in 1911.

The value of the production of clay products, lime, and stone, and other similar structural materials in 1912, was $28,794,869, or 21·3 per cent of the total production, and an increase of $6,085,258, or 26·8 per cent over the 1911 output.

It will be observed that these three classes of products maintained very nearly the same relative proportion of total output as in 1911.

Coal, which has for a number of years past been the most important product in point of value, maintained its position in 1912, contributing 26·6 per cent of the total value, as against 25·6 per cent in 1911. Silver was next in importance in both years, accounting for 14·4 per cent of the total in 1912 as compared with 16·8 per cent in 1911. Nickel, copper, and gold followed in the order named in 1912, each being credited with between 9 and 10 per cent. Clay products contributed 7·62 per cent, and cement 6·74 per cent. Copper advanced from seventh place in value of production in 1911 to fourth position in 1912.

In the case of iron only the amount of pig iron produced from Canadian ore is included in the general total. There is an important production of pig iron from imported ore (shown in the footnotes of the general table) and the total value thereof in 1912 exceeds that of the production of any other metal, with the exception of silver. There is also a large production of aluminium from imported ores for which no value is included in the general table of production.

The prices of metals upon which the value of the production directly depends showed in several cases important increases in the beginning of the year, which were well maintained throughout.

The average prices of nearly all metals were higher in 1912. Copper advanced from 12·376 cents per pound to 16·341 cents, an increase of 3·965 cents, or 32 per cent. The average price of lead in Montreal increased from 3·48 cents to 4·467 cents per pound, a gain of 0·987 cent, or 28 per cent.

Silver advanced from 53·304 cents to 60·835 cents per ounce on the New York market, a gain of 7·531 cents, or over 14 per cent.

The average price of spelter in New York increased from 5·768 cents per pound to 6·943 cents in 1912, and tin from 42·281 cents per pound in 1911 to 46·096 cents per pound in 1912.

## Metal Prices.

| —— | 1907. | 1908. | 1909. | 1910. | 1911. | 1912. |
|---|---|---|---|---|---|---|
| | Cts. | Cts. | Cts. | Cts. | Cts. | Cts. |
| Copper, New York | 20·004 | 13·208 | 12·982 | 12·738 | 12·376 | 16·341 |
| Lead " | 5·325 | 4·200 | 4·273 | 4·446 | 4·420 | 4·471 |
| " London | 4·143 | 2·935 | 2·839 | 2·807 | 3·035 | 3·895 |
| " Montreal * | 4·701 | 3·364 | 3·268 | 3·246 | 3·480 | 4·467 |
| Nickel, New York | 45·000 | 43·000 | 40·000 | 40·000 | 40·000 | 40·000 |
| Silver " | 65·327 | 52·864 | 51·503 | 53·486 | 53·304 | 60·835 |
| Spelter " | 5·962 | 4·720 | 5·503 | 5·520 | 5·758 | 6·943 |
| Tin " | 38·156 | 29·465 | 29·725 | 34·123 | 42·281 | 46·096 |

* Quotations furnished by Messrs. Thomas Robertson & Company, Montreal, Que.

With the exception of petroleum every important mineral mined in Canada shows an increased production in 1912, in so far as value is concerned. In the case of silver only is there a decrease in quantity, and this slightly less than 2 per cent, the increase in total value of silver being due to the much higher price obtained for the metal during the year. Among the metals, increases in quantity of output are shown as follows: pig iron 10·5 per cent; gold 28 per cent; copper 40 per cent, and lead 50 per cent. On account of the generally higher prices of the metals the increases in total value of output considerably exceed the increases in quantity, and are as follows: silver 12 per cent, nickel 31 per cent, copper 85 per cent, and lead 93 per cent.

The most important increases amongst non-metallic products are in coal, asbestos, gypsum, natural gas, and all of the structural materials. Coal shows an increase of 28 per cent in tonnage, asbestos 10 per cent, gypsum 11 per cent, natural gas 31 per cent in number of cubic feet. Cement increased 25 per cent in quantity and 19 per cent in total value, clay products 26·5 per cent in value, stone 9·2 per cent in value, and lime 12·5 per cent in quantity and 21·5 per cent in value.

It is a matter of regret to have to report a continued decrease in the production of petroleum. The Canadian output of this product a few years ago was about 50 per cent of domestic consumption. At the present time not over 5 per cent of Canada's consumption of petroleum and its products is derived from domestic sources.

## EXPORTS AND IMPORTS.

A very large portion of the mineral production of Canada is exported for consumption or refining outside of Canada. On the other hand considerable quantities of mine products, chiefly those which have been refined or subjected to partial treatment, or in the form of manufactured goods ready for consumption, are imported.

The total value of the exports of products of the mine, including direct mine products and manufactures thereof, in 1912 was $68,591,225, as compared with $52,546,593 in 1911. This value includes for 1912 mine products to the value of $54,349,640, and manufactures valued at $14,241,585. Practically the whole of the Canadian production of copper, nickel, and silver is exported, also a very large proportion of the production of gold, asbestos, and mica. There are also considerable exports of coal. These items alone contribute about 95 per cent of the value of the mine products exported. Manufactures of mine products exported consist chiefly of iron and steel goods, aluminium, calcium carbide, lime, acetate of lime, and coke.

The United States is the chief destination of Canada's mine exports, about 80 per cent having been exported to that country during the fiscal year 1911-1912, and about 13·4 per cent to Great Britain.

A great variety of mineral products, chiefly in a manufactured or semi-manufactured condition, are annually imported into Canada, and these imports are increasing with much greater rapidity than is Canada's domestic mineral production. The total value of such imports during the calendar year 1912 was $233,924,270, as compared with imports valued at $181,773,708 in 1911, and $147,305,012 in 1910. Of the total imports in 1912 nearly $50,000,000 in value was made up of the cruder forms of mineral products such as coal, ores of metals, diamonds unset and bort, asphaltum, etc., as against $48,000,000 for similar items in 1911. The imports of iron and steel and manufactures thereof in 1912 were valued at $124,376,986, as against $93,171,817 in 1911, and $75,758,594 in 1910. Imports of the metals, aluminium, antimony, copper, gold, silver, lead, platinum, tin, and zinc, and manufactures thereof, and metallic alloys, reached a total value of over $27,000,000, as compared with $19,500,000 in 1911, petroleum and products of, $11,858,533, as against $6,009,730 in 1911; clays and clay products, $6,592,537, as against $5,216,544 in 1911.

It will thus be seen that over 50 per cent of the imports represents iron and steel, and that the increased imports were chiefly in iron and steel and other metals, and in petroleum.

As has already been pointed out in previous reports the great excess of imports over exports would seem to indicate the existence of large opportunities for the development not only of Canada's mineral production, but also of many manufacturing industries which utilize mine products as raw materials.

No matter what Canada's development in industrial activity may be in the future, it seems certain that there must always be a large and mutually advantageous interchange of trade between this country and our neighbour to the south. Thus, notwithstanding Canada's possession of large supplies of coal, both in the east and in the west, the great central provinces of the country, at present the most highly populated, are situated nearer the coal fields of Pennsylvania and Ohio, and derive their chief supplies from that source, while similarly, British Columbia and Alberta coal is finding a considerable market in the adjacent

states of the United States. Our southern neighbours have developed the largest iron and steel industry of any of the world powers, and possess highly developed industries in the treatment and refining of metals of all kinds, and it is perhaps but natural that we send to them the greater part of our metal ores and smelter products, and take from them the refined and manufactured products.

In the case of lead Canada now refines practically the whole of the domestic ore production, and the exports in 1912 were insignificant. Similar development in the future will no doubt result in the refining in Canada of copper, nickel, zinc, and other metals. In like manner, the continued large export of crude unrefined ores and the corresponding imports of refined and manufactured products still point to opportunities for the development of industries for the treatment, refinement, and manufacture of non-metallic products.

## EXPORTS.

### Exports of the Products of the Mine and of Manufactures of Mine Products—Calendar Years 1911 and 1912.

| | | 1911. | | 1912. | |
|---|---|---|---|---|---|
| | | Quantity. | Value. | Quantity. | Value. |
| MINE PRODUCTS. | | | $ | | $ |
| Arsenic | Lbs. | 4,125,558 | 31,761 | 3,847,906 | 101,310 |
| Asbestos | Tons | 75,120 | 2,067,259 | 88,008 | 2,349,353 |
| Barytes | Cwt. | .... | ..... | 68 | 114 |
| Coal | " | 1,500,639 | 4,357,074 | 2,127,133 | 5,821,593 |
| Copper, fine in ore, etc | Lbs. | 55,208,054 | 5,459,770 | 76,542,643 | 8,800,267 |
| " black or coarse and in pigs | " | 79,656 | 7,955 | 1,945,921 | 236,212 |
| Feldspar | Tons | 16,150 | 56,085 | 12,779 | 44,114 |
| Gold | | ..... | 7,493,523 | ..... | 10,014,654 |
| Gypsum | Tons | 362,102 | 425,161 | 364,643 | 423,208 |
| Lead, in ore, etc | Lbs. | 65,100 | 1,826 | 299,240 | 8,193 |
| " in pig, etc | " | 71,961 | 2,806 | ..... | ..... |
| Mica | " | 693,940 | 242,548 | 895,338 | 334,054 |
| Mineral pigments | " | 3,999,925 | 27,070 | 6,032,640 | 34,513 |
| Mineral water | Gals. | 26,495 | 12,952 | 9,690 | 4,710 |
| Nickel, in ore, etc | Lbs. | 32,619,971 | 3,676,396 | 44,221,860 | 4,661,758 |
| Oil, mineral, crude, etc | Gals. | ..... | ..... | 18,500 | 3,964 |
| Oil, refined | " | 489 | 73 | 36,945 | 6,147 |
| Ores— | | | | | |
| Antimony | Tons | 57 | 4,946 | ..... | ..... |
| Corundum | " | 742 | 77,777 | 1,928 | 205,819 |
| Iron | " | 37,686 | 133,411 | 118,129 | 382,005 |
| Manganese | " | 4 | 225 | 10 | 300 |
| Other ores | " | 6,919 | 375,695 | 15,573 | 530,270 |
| Phosphate | " | 3 | 100 | ..... | ..... |
| Platinum | Ozs. | 39 | 961 | 92 | 3,821 |
| Plumbago | Cwt. | 16,263 | 43,249 | 33,074 | 70,763 |
| Pyrites | Tons | 32,102 | 120,585 | 5,938 | 11,935 |
| Salt | Lbs. | 454,600 | 5,055 | 289,150 | 3,723 |
| Sand and gravel | Tons | 573,494 | 408,110 | 660,090 | 459,952 |
| Silver | Ozs. | 31,216,725 | 15,807,366 | 34,911,922 | 19,494,416 |
| Stone, building | Tons | 83,767 | 25,103 | 108,516 | 28,795 |
| " ornamental | " | 168 | 1,796 | 2,339 | 1,826 |
| " for manufacture of grindstones | " | 15 | 22 | ..... | ..... |
| Other products of the mine | | ..... | 204,028 | ..... | 311,851 |
| Total mine products | | ..... | 41,121,688 | ..... | 54,349,640 |

# EXPORTS.

## Exports of the Products of the Mine and of Manufactures of Mine Products—Calendar Years 1911 and 1912—*Continued.*

| | | 1911. | | 1912. | |
|---|---|---|---|---|---|
| | | Quantity. | Value. | Quantity. | Value. |
| MANUFACTURES. | | | $ | | $ |
| Acetate of lime | Lbs. | 7,428,157 | 117,904 | 14,691,678 | 312,262 |
| Agricultural implements— | | | | | |
| Cultivators | No. | 5,923 | 138,377 | 5,059 | 100,043 |
| Harrows | " | 5,412 | 95,904 | 4,734 | 100,579 |
| Harvesters | " | 14,355 | 1,432,911 | 15,341 | 1,634,208 |
| Hay rakes | " | 11,085 | 317,842 | 6,646 | 199,092 |
| Mowing machines | " | 22,859 | 778,274 | 16,213 | 562,502 |
| Parts of | | | 796,246 | | 577,895 |
| Ploughs | No. | 20,437 | 508,095 | 13,580 | 412,460 |
| Reapers | " | 9,385 | 574,315 | 3,243 | 195,156 |
| Seeders | " | 174 | 13,795 | 70 | 7,040 |
| Threshing machine | " | 339 | 92,442 | 761 | 214,499 |
| All other | " | | 1,533,728 | | 1,964,071 |
| Aluminium, in bars | Cwt. | 49,901 | 747,587 | 182,857 | 2,002,363 |
| " manufactures of | " | | 1,555 | | 10,898 |
| Bricks | M | 394 | 3,977 | 694 | 8,493 |
| Calcium carbide | Lbs. | 4,888,975 | 142,402 | 7,549,137 | 230,503 |
| Cement | | | 4,067 | | 2,436 |
| Clay, manufactures of | | | 2,071 | | 256 |
| Coke | Tons | 9,852 | 39,823 | 57,744 | 252,763 |
| Earthenware, and all manufactures of | | | 6,101 | | 10,001 |
| Grindstones, manufactured | | | 29,184 | | 26,535 |
| Gypsum and plaster ground | | | 4,429 | | 6,495 |
| Iron and steel :— | | | | | |
| Castings, N.E.S | | | 33,441 | | 27,113 |
| Gas buoys and parts of | | | 68,485 | | 83,583 |
| Hardware, tools, etc | | | 94,513 | | 91,731 |
| " N.E.S | | | 44,199 | | 48,474 |
| Machinery (Linotype machines) | | | 12,239 | | 6,555 |
| " N.E.S | | | 431,493 | | 474,996 |
| Pig iron | Tons | 5,870 | 271,968 | 6,976 | 310,702 |
| Scrap iron and steel | Cwt. | 84,153 | 54,618 | 332,641 | 145,250 |
| Sewing machines | No. | 18,519 | 218,075 | 24,158 | 259,617 |
| Steel and manufactures of | | | 769,692 | | 785,731 |
| Stoves | No. | 1,176 | 20,626 | 1,390 | 21,110 |
| Typewriters | " | 4,771 | 318,935 | 4,025 | 277,583 |
| Vehicles— | | | | | |
| Automobiles | " | 1,509 | 1,184,506 | 3,028 | 2,013,784 |
| " parts of | | | 45,798 | | 105,330 |
| Bicycles | No. | 90 | 5,936 | 101 | 9,058 |
| " parts of | | | 50,828 | | 54,322 |
| Lime | | | 39,536 | | 35,097 |
| Metals, N.O.P | | | 175,716 | | 261,752 |
| Naphtha and gasoline | Gals. | 23,959 | 4,427 | 25,791 | 4,261 |
| Oil, N.E.S | " | | | 397,039 | 119,686 |
| Phosphorus | Lbs. | | | 543,620 | 66,806 |
| Plumbago, manufactures of | | | 33,956 | | 58,920 |
| Stone, building | | | 456 | | 163 |
| " ornamental | | | 980 | | 2,458 |
| Tar | | | 56,669 | | 76,261 |
| Tin, manufactures of | | | 30,176 | | 69,692 |
| Total manufactures | | | 11,424,905 | | 14,241,585 |
| Grand total | | | 52,546,593 | | 68,591,225 |

## EXPORTS.

### Showing Destination of Mine Products during the Fiscal Years 1909-10, 1910-11, and 1911-12.

| Destination. | 1909-10 Value. | 1910-11 Value. | 1911-12 Value. |
|---|---|---|---|
| | $ | $ | $ |
| United States | 33,488,464 | 33,129,505 | 33,259,580 |
| United Kingdom | 3,820,574 | 6,726,015 | 5,555,599 |
| Newfoundland, and Labrador | 528,031 | 580,632 | 618,766 |
| Hong Kong | 216,514 | 376,553 | 434,202 |
| Alaska | ..... | 392,715 | 305,086 |
| Germany in Europe | 43,975 | 239,596 | 248,925 |
| Australia and Tasmania | 212,950 | 161,017 | 178,260 |
| Mexico | 325,153 | 302,055 | 159,345 |
| Chinese Empire | 777,147 | 301,870 | 103,904 |
| Belgium | 177,675 | 220,244 | 101,661 |
| France | 110,222 | 116,326 | 74,487 |
| Bermuda | 53,071 | 66,525 | 62,494 |
| Japan | 202,071 | 85,247 | 58,773 |
| St. Pierre and Miquelon islands | 28,450 | 24,941 | 30,205 |
| Argentina | 4,516 | 1,383 | 24,313 |
| Cuba | 14,946 | 10,161 | 21,590 |
| Portuguese Africa | ..... | ..... | 20,340 |
| Chili | ..... | ..... | 19,669 |
| British West Indies | 13,552 | 11,904 | 13,635 |
| British South Africa | ..... | ..... | 10,460 |
| Holland and Netherlands | 17,218 | 21,609 | 5,260 |
| Italy | 10,956 | 8,000 | 4,358 |
| Peru | ..... | ..... | 3,682 |
| Philippines | ..... | ..... | 2,824 |
| Dutch Guiana | ..... | 48 | 1,492 |
| Spain | ..... | ..... | 1,471 |
| Austria-Hungary | 1,030 | 720 | 1,410 |
| New Zealand | 8,518 | 2,309 | 1,050 |
| San Domingo | ..... | 1,000 | 1,000 |
| Denmark | ..... | ..... | 448 |
| Switzerland | 73 | 300 | 159 |
| Uruguay | ..... | 1,742 | 68 |
| Other countries | 31,911 | 5,144 | |
| Totals | 40,087,017 | 42,787,561 | 41,324,516 |

# IMPORTS.

## Imports of Products of the Mine and Manufacture of Mine Products—Calendar Years 1911 and 1912.

| Products. | 1911 Value. | 1912 Value. |
|---|---|---|
| | $ | $ |
| Alumina | 372,009 | 448,061 |
| Alum, alum cake, and chloralum | 88,516 | 151,850 |
| Aluminium and manufactures | 648,046 | 533,705 |
| Antimony | 36,405 | 60,456 |
| Antimony salts | 2,418 | 7,197 |
| Arsenic, oxide and sulphide of | 6,823 | 21,153 |
| Asbestos | 319,815 | 461,449 |
| Asphaltum | 558,784 | 863,456 |
| Bells and gongs | 104,965 | 110,015 |
| Bismuth | 7,012 | 6,378 |
| Blanc fixe and satin white | 29,796 | 34,794 |
| Blast furnace slag | 141,136 | 110,148 |
| Borax | 120,213 | 112,022 |
| Brick and tile | 1,555,347 | 2,255,569 |
| Brick, fire, of a kind not made in Canada | 814,414 | 953,621 |
| Bromine | 40 | 145 |
| Burrstones | 1,642 | 1,409 |
| Cement, Portland and manufactures | 848,416 | 1,979,227 |
| Chalk, Cornwall stone, feldspar, fluorspar, etc | 147,640 | 167,990 |
| Clays | 270,247 | 288,394 |
| Coal, anthracite, bituminous, slack, and run of mine | 39,292,591 | 39,478,037 |
| Coal tar and coal pitch | 81,555 | 217,861 |
| Coke | 1,843,248 | 1,358,451 |
| Coke, ground for electric batteries | 6,840 | 4,792 |
| Copper and manufactures of | 4,936,769 | 7,047,356 |
| Cryolite | 29,602 | 56,591 |
| Crucibles, clay or plumbago | 56,814 | 82,324 |
| Chloride of lime | 118,501 | 113,346 |
| Cyanides of potassium, sodium, cyanogen, or cpd of bromine | 94,397 | 143,978 |
| Diamonds, unset, and bort | 2,612,150 | 3,623,424 |
| Earthenware | 2,516,536 | 3,094,956 |
| Earths, crude | 9,398 | 13,007 |
| Electric carbons | 56,529 | 58,951 |
| Emery | 150,444 | 177,187 |
| Fertilizers, compound or manufactured | 386,645 | 580,351 |
| Flint, quartz, silex, etc | 56,624 | 50,571 |
| Foundry facings | 21,816 | 23,536 |
| Fullers earth | 7,024 | 10,390 |
| Fossils | 1,180 | 3,994 |
| Gannister | 2,821 | 2,151 |
| Gold and silver and manufactures of | 2,480,017 | 3,618,701 |
| Graphite and manufactures of | 56,132 | 73,160 |
| Grindstones | 123,356 | 112,020 |
| Gypsum and plaster of Paris | 205,782 | 268,103 |
| Iron and steel—Total, 1911, $93,171,817; 1912, $124,376,986— | | |
| Agricultural implements | 4,508,094 | 4,358,074 |
| Bar iron or steel, rolled, whether in coils, bundles, rods or bars | 3,017,349 | 3,561,709 |
| Castings, iron or steel, N.O.P. | 1,073,587 | 1,592,930 |
| Cutlery | 1,041,412 | 1,337,782 |
| Engines, locomotive and others | 1,741,626 | 2,915,601 |
| Iron, pig | 2,610,989 | 3,512,969 |
| Iron or steel blooms, billets, puddled bars and loops, ingots, cogged ingots, slabs, or other forms, N.O.P., etc | 1,671,207 | 1,558,393 |
| Iron or steel, rolled, angles, tees, beams, channels, girders, etc | 5,091,695 | 6,636,978 |
| " " rolled plates, not less than 30" wide or ¼" thick | 1,563,123 | 1,750,175 |
| " " rolled plate, universal mill or rolled edge bridge plates | 857,537 | 1,158,135 |
| " " skelp, sheared or rolled in grooves, etc | 1,914,819 | 2,631,207 |
| " " sheets, flat galvanized, Canada plates, etc | 4,487,900 | 6,556,517 |
| Machines and machinery | 28,250,006 | 37,826,662 |
| Steel rails | 2,583,486 | 3,761,108 |
| Tubing | 2,372,182 | 4,044,377 |
| Tools and implements | 1,091,073 | 1,501,799 |

# IMPORTS.

## Imports of Products of the Mine and Manufactures of Mine Products—Calendar Years 1911 and 1912—*Continued.*

| Products. | 1911. Value. | 1912. Value. |
|---|---|---|
| | $ | $ |
| Iron and steel—*Con.* | | |
| Wire | 3,617,766 | 4,781,714 |
| All other iron and steel and manufactures of | 25,737,966 | 34,890,856 |
| Iron ore | (*a*) | (*b*) 3,932,074 |
| Iron sand | 8,340 | 13,347 |
| Kainite | 9,262 | 231 |
| Lead and manufactures; litharge | 1,049,276 | 1,806,221 |
| Lime | 161,985 | 207,481 |
| Lithographic stone | 12,344 | 7,081 |
| Manganese, oxide of | 22,612 | 27,707 |
| Magnesia | 11,012 | 29,641 |
| Meerschaum | 150 | 109 |
| Mercury or quicksilver | 67,416 | 72,171 |
| Metallic alloys:— | | |
| Babbitt metal | 35,073 | 49,387 |
| Brass and manufactures of | 3,218,942 | 4,942,531 |
| Britannia metal | 32,430 | 53,585 |
| German silver, nickel, and nickel silver | 147,315 | 172,344 |
| Type metal | 321 | 1,195 |
| Mineral and bituminous substances | 168,577 | 191,241 |
| Mineral water, including aerated water | 229,367 | 273,698 |
| Nickel anodes | 34,199 | 23,125 |
| Ochres, etc | 53,092 | 69,626 |
| Ores of metals, N.O.P | (*c*) 4,014,748 | 927,421 |
| Paraffin wax | 75,661 | 85,494 |
| Paraffin candles | 30,763 | 34,026 |
| Petroleum and products of | 6,009,730 | 11,858,539 |
| Phosphate (fertilizer) | 46,217 | 24,583 |
| Platinum and manufactures of | 176,101 | 232,161 |
| Potash and manufactures of | 203,989 | 324,968 |
| Precious stones | 344,659 | 522,298 |
| Pumice | 18,779 | 21,310 |
| Salt | 436,118 | 435,950 |
| Saltpetre | 101,082 | 100,500 |
| Sand and gravel | 240,613 | 445,781 |
| Slate and manufactures of | 169,685 | 200,643 |
| Sand paper | 164,474 | 189,782 |
| Soda products: barilla, bichromate, caustic, salt, and salt cake | 800,805 | 896,070 |
| Stone and manufactures of (including marble) | 1,140,846 | 1,467,143 |
| Soda, nitrate of | 867,778 | 1,537,379 |
| Sulphate of iron (copperas) | 4,773 | 5,178 |
| Sulphur and phosphorus | 450,875 | 810,702 |
| Sulphuric acid | 9,281 | 35,325 |
| Talc | 6,413 | 4,414 |
| Tin and manufactures of (including tinware) | 5,442,551 | 6,697,165 |
| Whiting and prepared chalk | 136,022 | 162,864 |
| Zinc and manufactures of | 1,227,660 | 1,824,519 |
| | 181,773,708 | 233,924,270 |

(*a*) In 1911 included in ores of metals, N.O.P.; (*b*) nine months only; includes iron ore in 1911.

## METALLIC ORES AND PRODUCTS.

*Antimony.*—The production of antimony during the past two years was limited to a few pounds of refined antimony recovered at the lead refinery at Trail, B.C. Shipments of antimony ore in 1910 were reported as 364 tons, valued at $13,906, whilst there was no production of refined antimony in 1910. There is no export of antimony ore recorded in 1912, as against 50 tons valued at $4,946, in 1911. The imports of antimony or regulus thereof, in 1912, were 998,045 pounds, valued at $60,456, and of antimony salts 55,683 pounds, valued at $7,197, or a total value of imports of $67,653. In 1911, the imports were antimony and regulus of 561,046 pounds, valued at $36,405, and antimony salts 18,420 pounds, valued at $2,418, or a total value of $38,823.

*Cobalt.*—Cobalt oxide and cobalt material are being produced in Canadian smelters, the production in 1912 of cobalt oxide and nickel oxide being 349,054 pounds, valued at $156,256, and of cobalt material and mixed cobalt and nickel oxides 1,285,280 pounds, valued at $163,988. During 1911, the shipments included 154,174 pounds of cobalt and nickel oxide, and 1,260,832 pounds of cobalt material and mixed cobalt and nickel oxides, the value being $221,690.

*Copper.*—The production of copper contained in blister, matte, or ore, which was practically all exported, was 77,832,127 pounds in 1912, valued at $12,718,548, as compared with 55,648,011 pounds in 1911, valued at $6,886,998.

The exports in 1912 were reported as 78,488,564 pounds, valued at $9,036,479, as against exports of 55,287,710 pounds, valued at $5,467,725, in 1911. The total imports of copper in 1912 were valued at $7,047,356; and included crude and manufactured copper to the extent of 42,832,747 pounds, valued at $6,741,895, together with other manufactures of copper of which the quantity is not recorded, valued at $305,461. The copper imports in 1911 were valued at $4,936,769, including 37,352,237 pounds of crude and manufactured copper, valued at $4,721,480, and other copper manufactures of which the quantity is not recorded, valued at $215,289.

*Gold.*—The total value of the production of gold in 1912 was $12,648,794, representing 611,885 fine ounces, as compared with $9,781,077, representing 473,159 fine ounces of metal in 1911.

The Yukon placer production in 1912 was 267,988 fine ounces, valued at $5,539,808.

Of the total production in 1912 about $6,106,677 were derived from alluvial workings; $2,270,331 as bullion from milling ores, and $4,271,786 from ores and concentrates sent to smelters. In 1911, $5,014,207 were derived from alluvial workings; $513,991 as bullion from milling ores, and $4,252,879 from ores and concentrates sent to smelters.

The exports of gold-bearing dust, quartz, nuggets, and gold in ore, etc., in 1912, were valued at $10,014,654, as against $7,493,523 in 1911.

The imports of gold coin during the calendar year 1912 were $7,496,492, and of gold bullion $1,360,735.

*Pig Iron.*—The total production of pig iron in Canadian blast furnaces in 1912 was 1,014,587 tons, valued at $14,550,999, of which it is estimated 978,232 tons, valued at $14,100,113, should be credited to imported ores, and 36,355 tons, valued at $450,886, to domestic ores. In 1911 the total production was 917,535 tons, valued at $12,307,125, of which 875,349 tons, valued at $11,693,721, should be credited to imported ores, and 42,186 tons, valued at $613,404, to domestic ores.

The exports of pig iron, including ferro-products, in 1912, were 6,976 tons, valued at $310,702, as against 5,870 tons, valued at $271,968, in 1911. The imports of pig iron in 1912 were 272,565 tons, valued at $3,511,599, ferro-manganese, etc., 19,810 tons, valued at $469,884, and charcoal pig 115 tons, valued at $1,370, as compared with imports in 1911 of pig iron 208,487 tons, valued at $2,610,989, and ferro-manganese, etc., 17,226 tons, valued at $429,465.

The total exports of iron and steel and manufactures thereof, in 1912, were valued at $10,682,484, as against $9,907,281 in 1911. The imports of iron and steel and manufactures thereof during the calendar year 1912 were valued at $124,376,986, as compared with $93,171,817 during the calendar year 1911.

*Iron Ore.*—The total shipments of iron ore from Canadian mines in 1912 were 215,883 tons, valued at $523,315, as compared with 210,344 tons, valued at $522,319, in 1911. The exports of iron ore in 1912 were 118,129 tons, valued at $382,005, as against 37,686 tons, valued at $133,411, in 1911. The quantity of imported iron ore used in Canada in 1912 was about 2,019,165 tons, as compared with 1,628,368 tons of imported ore used in 1911.

*Lead.*—The production of lead in 1912 was 35,763,476 pounds, valued at $1,597,554, as against 23,784,969 pounds, valued at $827,717, in 1911. The exports of lead in 1912 were: lead in ore, etc., 299,240 pounds, valued at $8,193; while in 1911 the exports were: lead in ore, etc., 65,100 pounds; pig lead, 71,961 pounds—total, 137,061 pounds. The total value of the imports of lead and manufactures of, in 1912, was $1,806,221, as compared with imports in 1911, valued at $1,049,276.

*Nickel.*—The production of nickel contained in nickel-copper matte produced in Canada and exported for refinement was, in 1912, 44,841,542 pounds, as compared with a production of 34,098,744 pounds in 1911. During 1912 there were smelted 725,065 tons of ore, producing 41,925 tons of matte, as against 610,834 tons of ore smelted in 1911, producing 32,607 tons of matte. Small quantities of nickel oxide are also produced in connexion with the treatment of the Cobalt District silver ores. The exports of nickel contained in ore, matte, etc., during 1912, were 44,221,860 pounds, valued at $4,661,758: being 5,072,867 pounds to Great Britain and 39,148,993 pounds to the United States. In 1911 the exports were 32,619,971 pounds, valued at $3,676,396: being 5,023,393 pounds

to Great Britain and 27,596,578 pounds to the United States. The imports of nickel and nickel anodes in 1912 were valued at $23,125, as against a value of $34,199 imported in 1911.

*Silver.*—The production of silver contained in bullion, or estimated as recovered from mattes and ore, etc., exported, was in 1912, 31,955,560 fine ounces valued at $1,440,165, as compared with a production of 32,559,044 fine ounces, valued at $17,355,272, in 1911. About 91·4 per cent of the production in 1912 was derived from "Cobalt District" of Ontario. The production of silver in 1905 was only 6,000,023 ounces, and in 1900, 4,468,225 ounces. The exports of silver contained in ores, mattes, etc., in 1912, were 34,911,922 ounces, valued at $19,494,416; as against exports of 31,216,725 ounces, valued at $15,807,366, in 1911. The imports of silver bullion during the calendar year 1912 were valued at $1,100,344, as compared with bullion imports of $847,645 in 1911.

*Zinc.*—The shipments of zinc ore in 1912 were 6,415 tons, valued at $215,149, as compared with shipments of 2,590 tons, valued at $101,072, in 1911. The total value of the imports of zinc and manufactures of zinc, in 1912, was $1,824,519, as compared with imports, valued at $1,227,660, in 1911.

## NON-METALLIC PRODUCTS.

*Actinolite.*—A production of 92 tons, valued at $1,000, was reported in 1912, as compared with 67 tons, valued at $736, in 1911.

*Arsenic.*—Smelter returns show a production in 1912 of 2,045 tons of arsenious oxide, valued at $89,262, as compared with a production in 1911 of 2,097 tons, valued at $76,237.

The exports of arsenic in 1912 were 1,924 tons, valued at $101,310, as against 2,063 tons, valued at $81,761, in 1911. The imports of arsenious oxide in 1912 were 76,528 pounds, valued at $1,722, as compared with 7,338 pounds, valued at $158, in 1911. The imports of sulphide of arsenic in 1912 were 451,928 pounds, valued at $19,431, and in 1911, 330,170 pounds, valued at $6,665.

*Asbestos.*—The shipments of asbestos in 1912 were 111,561 tons, valued at $3,117,572, and of asbestic, 24,740 tons, valued at $19,707. The shipments in 1911 were 101,393 tons, valued at $2,922,062, and of asbestic 26,021 tons, valued at $21,046. The shipments in 1912 consisted of 5,662·9 tons of crude asbestos, valued at $890,351, and 105,898 tons of mill stock, valued at $2,227,221. Considerable quantities both of crude and of mill stock were held in manufacturers' hands at the close of the year.

Exports in 1912 were 88,008 tons, valued at $2,349,353, as against 75,120 tons, valued at $2,067,259, in 1911.

Imports and manufactures of asbestos in 1912 were valued at $461,449, and in 1911, $319,815.

*Chromite.*—During 1912 no shipments of chromite were reported. Shipments from stock in 1911 were 157 tons, valued at $2,587.

*Coal.*—The production of coal in 1912 was 14,512,829 tons, valued at $36,019,044, as against 11,323,388 tons, valued at $26,467,646, in 1911. The exports of coal in 1912 were 2,127,133 tons, valued at $5,821,593, as compared with 1,500,639 tons, valued at $4,357,074, in 1911. The total imports of coal in 1912 were 14,595,810 tons, valued at $39,478,037, as against imports in 1911 of 14,558,892 tons, valued at $39,292,591.

The 1912 imports included 8,491,840 tons of bituminous round and run of mine coal, valued at $16,846,727; 4,184,017 tons of anthracite and anthracite dust, valued at $20,080,388; and 1,919,953 tons of bituminous slack, such as will pass through a ¾" screen, valued at $2,550,922.

In 1911 the imports included 8,905,815 tons of bituminous round and run of mine, valued at $18,407,603; 4,020,577 tons of anthracite and anthracite dust, valued at $18,794,192; and 1,632,500 tons of bituminous slack, such as will pass through a ¾" screen. The consumption of coal in 1912 was approximately 26,924,800 tons, as against 24,247,698 tons in 1911.

*Coke.*—The total quantity of oven coke made in 1912 was 1,406,028 tons, the quantity sold or used was 1,411,229 tons, valued at $5,164,331; as compared with 954,388 tons made and 935,651 tons sold or used, valued at $3,630,410, in 1911. The quantity of coal charged to coke ovens, in 1912, was 2,053,807 tons, as compared with 1,409,844 tons in 1911. The exports of coke in 1912 were 57,744 tons, valued at $252,763, and, in 1911, 9,852 tons, valued at $39,823. The imports of coke in 1912 were 496,830 tons, valued at $1,358,451, as compared with imports of 751,389 tons, valued at $1,843,248, in 1911.

*Corundum.*—The total sales of grain corundum in 1912 were 1,960 tons, valued at $239,091, as compared with sales in 1911 of 1,472 tons, valued at $161,873. Exports for 1912 were 1,928 tons, valued at $205,819.

*Feldspar.*—Shipments of feldspar in 1912 were 13,733 tons, valued at $30,916, as compared with 17,723 tons, valued at $51,939, in 1911. The exports are recorded as 12,779 tons, valued at $44,114, in 1912, and 16,150 tons, valued at $56,085, in 1911.

*Fluorspar.*—About 40 tons, valued at $240, were shipped from the mine in 1912, and 34 tons, valued at $238, in 1911. Canadian furnaces in 1912 used 9,709 tons of fluorspar. Imports of hydro-fluo-silicic acid were 302,918 pounds, valued at $24,891.

*Graphite.*—Shipments of crude and milled graphite during 1912 totalled 2,060 tons, valued at $117,122, as against 1,269 tons, valued at $69,576, in 1911. The production of artificial graphite in 1912 was reported as 1,151 tons, as compared with 1,086 tons in 1911.

Exports of plumbago in 1912 are reported as 1,654 tons, valued at $70,763, and manufactures of plumbago valued at $58,920. Exports in 1911 were: plumbago 813 tons, valued at $43,249, and manufactures of plumbago valued at $33,956. Imports of graphite in 1912 were valued at $155,484, and included: plumbago not ground $7,249; blacklead $9,587; plumbago ground and manufactures of, $56,324; and crucibles of clay or plumbago, $82,324. In 1911 the imports were valued at $112,946, including: plumbago not ground $4,940; blacklead $14,172; plumbago ground and manufactures of, $37,020; and crucibles of clay or plumbago $56,814.

*Grindstones.*—The production of grindstones, scythestones, and wood pulpstones, in 1912, was 4,412 tons, valued at $52,090, as compared with 4,566 tons, valued at $52,942, in 1911. The exports in 1912 were manufactured grindstones valued at $26,535; the exports in 1911 were stone for the manufacture of grindstones, 15 tons valued at $22, and manufactured grindstones valued at $29,184. The imports of abrasives in 1912 included: grindstones valued at $112,020; burrstones, $1,409; emery in bulk, crushed or ground, $46,616; manufactures of emery, carborundum, etc., $130,571; pumice stone, $21,310; also iron sand, $13,347; sandpaper, $189,782. The 1911 imports comprised: grindstones valued at $123,356; burrstones, $1,642; emery in bulk crushed or ground, $46,274, manufactures of emery, carborundum, etc., $104,170; pumice stone, $18,779; also iron sand, $8,340; sandpaper, $164,474.

*Gypsum.*—The total shipments of gypsum, crude and calcined, in 1912, were 578,458 tons, valued at $1,324,620, as compared with shipments of 518,383 tons, valued at $993,394, in 1911. The tonnage of gypsum mined or quarried in 1912 was 549,856 tons, and the quantity calcined 133,392 tons. In 1911, 495,979 tons of gypsum were mined or quarried and 76,718 tons calcined. The shipments in 1912 included: crude gypsum 453,577 tons, valued at $525,345; ground gypsum 15,487 tons, valued at $29,244, and calcined gypsum 109,394 tons, valued at $770,031. In 1911 shipments comprised: crude gypsum 449,823 tons, valued at $481,077; ground gypsum 7,149 tons, valued at $23,125, and calcined gypsum 61,411 tons, valued at $489,192. The exports of gypsum in 1912 were: 364,643 tons of crude gypsum, valued at $423,208, and gypsum ground or calcined valued at $6,495. The 1911 exports were: 362,102 tons of crude gypsum, valued at $425,161, and gypsum ground or calcined valued at $4,429.

The imports of gypsum in 1912 were valued at $268,103, including: crude gypsum, 3,503 tons, valued at $16,254; ground gypsum, 7,072 tons, valued at $19,651, and plaster of Paris, 32,496 tons, valued at $232,198. The total value of imports in 1911 was $205,782, made up of: crude gypsum 2,035 tons, valued at $11,792; ground gypsum 11,208 tons, valued at $3,619; and plaster of Paris, 28,518 tons, valued at $190,371.

*Magnesite.*—Shipments of magnesite in 1912 were 1,714 tons, valued at $9,645, and in 1911, 991 tons, valued at $5,531. Imports of magnesia in 1912 were 758,909 pounds, valued at $29,641.

*Manganese.*—There was a shipment of 75 tons, valued at $1,875, in 1912, as against 5½ tons, valued at $300, in 1911. The exports in 1912 were 10 tons, valued at $300, as against 4 tons, valued at $225, in 1911. The 1912 imports included 1,256 tons manganese oxide, valued at $27,707, as compared with 962 tons, valued at $22,612, in 1911.

*Mica.*—The value of the mica production in 1912 as reported by mine operators was $143,976, as compared with $128,677 in 1911. The exports of mica in 1912 were 895,338 pounds, valued at $334,054, as against 693,940 pounds, valued at $242,548, in 1911.

*Mineral Pigments.*—Shipments of barytes in 1912 were 464 tons, valued at $5,104, as against 50 tons, valued at $400, in 1911. The production of iron ochres in 1912 was 7,654 tons, valued at $32,410, as compared with 3,622 tons, valued at $28,333, in 1911.

In 1912 the exports of barytes were 68 hundredweight, valued at $114. The exports of iron oxides in 1912 were 3,016 tons, valued at $34,513, as against 2,000 tons, valued at $27,070, in 1911. The imports in 1912 were: ochres and ochrey earth and raw siennas, 1,737 tons, valued at $40,165; and oxides, dry fillers, fireproof umbers, and burnt siennas, 762 tons, valued at $29,456, as compared with imports in 1911, comprising: ochres and ochrey earth and raw siennas 1,477 tons, valued at $32,032; and oxides, dry fillers, fireproof umbers, and burnt siennas, 722 tons, valued at $21,060.

*Mineral Water.*—The value of the production of mineral water in 1912 for which returns were received was $172,465, as compared with a value of $223,758 in 1911. The imports of mineral and aerated waters in 1912 were valued at $273,698, as against a value of $229,367 in 1911. The exports in 1912 were valued at $4,667, as against $12,952 in 1911.

*Natural Gas.*—The value of the production of natural gas in 1912 was 15,287 million cubic feet, valued at $2,362,700, as compared with 11,644 million cubic feet, valued at $1,917,678, in 1911.

*Peat.*—Shipments of peat for fuel purposes in 1912 were 700 tons, valued at $2,900, as compared with 1,463 tons, valued at $3,817, in 1911.

*Petroleum.*—The production of crude petroleum shows a further falling off in 1912, the production being 243,336 barrels or 8,516,760 gallons, valued at $345,050; as compared with 291,092 barrels or 10,188,219 gallons, valued at $357,073, in 1911.

Exports of refined oil in 1912 were 36,945 gallons, valued at $6,147, and 489 gallons, valued at $73, in 1911. There was an export in 1912 of naphtha and gasoline of 25,791 gallons, valued at $4,261, and also an export of other oils, N.E.S. of 397,039 gallons, valued at $119,686, which may have included products of petroleum.

While the production has been decreasing the imports have been increasing; the total import of petroleum oils, crude and refined, in 1912, was 186,787,484 gallons, valued at $11,858,533, in addition to 2,144,006 pounds of paraffin wax and candles, valued at $119,520. The oil imports included: crude oil, 120,082,405 gallons, valued at $3,996,842; refined and illuminating oils 14,748,218 gallons, valued at $1,012,735; gasoline 40,904,598 gallons, valued at $5,347,767; lubricating oils 6,763,800 gallons, valued at $1,077,712, and other petroleum products 4,288,463 gallons, valued at $423,477.

The total imports in 1911 were 116,892,689 gallons, valued at $6,009,730, and 1,959,787 pounds of paraffin wax and candles, valued at $106,424. The oil imports included: crude oil 71,653,251 gallons, valued at $2,188,870; refined and illuminating oils, 13,690,962 gallons, valued at $722,403; gasoline 23,338,773 gallons, valued at $1,976,032; lubricating oils 5,308,917 gallons, valued at $806,452, and other petroleum products 2,900,786 gallons, valued at $315,973.

*Phosphate.*—Shipments of phosphate or apatite in 1912 were 164 tons, valued at $1,640, as compared with 621 tons, valued at $5,206, in 1911. There were no exports in 1912, while exports of 3 tons, valued at $100, were reported in 1911. There was an export of phosphorus in 1912, of 543,620 pounds, valued at $66,806. The imports of phosphate rock (fertilizer) in 1912 were valued at $24,586; phosphorus, 13,807 pounds, valued at $4,012, and manufactured fertilizers valued at $580,351. The imports in 1911 included phosphate rock (fertilizer), valued at $4,217; phosphorus, 14,818 pounds, valued at $4,384, and manufactured fertilizers valued at $386,645.

*Pyrites.*—The production of pyrites in 1912 was 81,526 tons, valued at $314,085, as compared with 82,666 tons, valued at $365,820, in 1911. The exports of pyrites in 1912 were 5,938 tons, valued at $11,935, as against exports of 32,102 tons, valued at $120,585, in 1911. The imports of brimstone or sulphur in 1912 were 38,647 tons, valued at $806,690, as against 21,931 tons, valued at $446,491, in 1911.

*Quartz.*—The production of quartz in 1912 was reported as 100,242 tons, valued at $195,216, compared with a production in 1911 of 60,526 tons, valued at $83,865. There were imported during 1912, 629 tons of silex or crystallized quartz, valued at $10,680, and 2,802 tons flint, valued at $39,891; and in 1911, 394 tons of silex, valued at $7,518, and 3,766 tons flint, valued at $49,106.

*Salt.*—The total sales of salt in 1912 were 95,053 tons, valued at $459,582 (exclusive of packages). The value of the packages used was $224,696. In 1911 the sales were 91,582 tons, valued at $443,004, and value of packages used $198,789.

Exports of salt in 1912 were 289,150 pounds, valued at $3,723, and in 1911, 454,600 pounds, valued at $5,055. The total imports of salt in 1912 were valued at $485,950, and included: 30,067 tons, valued at $133,869, subject to duty; and 109,639 tons, valued at $352,081, duty free. The 1911 imports were valued at

$436,118, and included: 23,176 tons, valued at $109,793, subject to duty; and 101,174 tons, valued at $326,325, duty free.

Among the imports of soda products in 1912 are included: soda ash or barilla, 52,167,811 pounds, valued at $421,959; soda bichromate, 584,424 pounds, valued at $33,744; caustic soda in packages of 25 pounds or more, 14,544,545 pounds, valued at $278,579; sal soda 9,996,562 pounds, valued at $64,020; nitrate of, 83,989,303 pounds, valued at $1,537,379, and sulphate of soda, 19,243,823 pounds, valued at $97,768.

*Talc.*—The production of talc in 1912 was 8,270 tons, valued at $23,132, as against 7,300 tons, valued at $22,100. Imports of talc for the calendar year 1912 were 195 tons, valued at $4,414.

*Tripolite.*—Thirty-eight tons of tripolite, valued at $230, were shipped in 1912, and 20 tons, valued at $122, in 1911.

## STRUCTURAL MATERIALS AND CLAY PRODUCTS.

*Cement.*—The total sales of cement in 1912 were 7,132,732 barrels, valued at $9,106,556, as against 5,692,915 barrels, valued at $7,644,537, sold in 1911, showing an increase of 1,439,817 barrels. The exports of cement in 1912 were valued at $2,436, as compared with exports valued at $4,067 in 1911.

The imports of cement in 1912 included: manufactures of cement valued at $9,698; and Portland cement 5,020,446 hundredweight (1,434,413 barrels), valued at $1,969,529. The imports in 1911 were: manufactures of cement, valued at $7,430; hydraulic cement 26,655 hundredweight, valued at $6,107; and Portland cement 2,316,707 hundredweight (661,916 barrels), valued at $834,879. The consumption of Portland cement in Canada in 1912 was approximately 8,567,145 barrels, as compared with 6,354,831 barrels in 1911.

*Clay Products.*—The total value of the production of clay products in Canada in 1912 was $10,575,709, as compared with a total value of $8,359,933 in 1911. Brick and tile products alone were valued in 1912 at $9,072,675, as against $6,946,009 in 1911. The value of sewerpipe production in 1912 was $884,641, as compared with $812,716 in 1911. The only clay products exported in 1912 were 694,000 building brick, valued at $8,493, and manufactures of clay valued at $256; against 394,000 building brick, valued at $3,977, and manufactures of clay valued at $2,071. The total imports of clay products in 1912 were valued at $6,592,540, and included: brick and tile valued at $3,209,190; earthenware and chinaware $3,094,956, and clays valued at $288,394. The total imports in 1911 were valued at $5,156,544, and included: brick and tile valued at $2,369,761; earthenware and chinaware $2,516,536, and clays valued at $270,247.

*Kaolin.*—In 1912 a shipment of 20 tons valued at $160 was reported.

*Lime.*—The total production of lime in 1912 was 8,475,839 bushels, valued at $1,844,849, as compared with 7,533,525 bushels, valued at $1,517,756, in 1911. The exports of lime in 1912 were valued at $35,097, as against exports valued at $39,536 in 1911. The imports of lime in 1912 were 329,925 barrels, valued at $207,481, and in 1911, 228,538 barrels, valued at $161,985.

*Sand-Lime Brick.*—The total sales of sand-lime brick in 1912 by 20 firms reporting were 96,448,402, valued at $1,020,386, an average value of $10.58 per thousand. The sales in 1911 by 16 firms reporting were 51,535,243 brick, valued at $442,427, an average value of $8.58 per thousand.

*Slate.*—The production of slate in 1912 was 1,894 squares, valued at $8,939, and 1,833 squares, valued at $8,248, in 1911.

The imports of slate in 1912 were valued at $200,643, and included: roofing slate valued at $88,911; school writing slate, $39,858; slate pencils, $6,978, and manufactures of slate, $65,896. The imports in 1911 were valued at $169,685, and included: roofing slate valued at $83,075; school writing slate, $35,049; slate pencils, $6,036, and manufactures of slate, $45,525.

*Stone.*—The total value of the production of stone of all kinds in 1912 was $4,726,171, as compared with a value of $4,328,757 in 1911. The value of stone exports in 1912 was $33,242, as against $28,335 in 1911; and the total value of stone imported in 1912 was $1,467,143, as against imports valued at $1,140,846 in 1911.

The production in 1912 included: granite, valued at $1,373,119; limestone, $2,762,936; marble, $260,764, and sandstone, $329,352. In 1911 the production of granite was valued at $1,119,865, limestone, $2,594,926; marble, $162,783, and sandstone, $451,183.

## PRODUCTION BY PROVINCES.

A summary of the mineral production by provinces in 1911 and 1912 is shown in the accompanying tables, in the first of which the total production in the several provinces, and the percentage of each, are given for the past three years. This record shows some slight changes in the relative importance of the production of each. The only change in the order of magnitude of output is that Alberta, the production of which had exceeded that of Quebec in 1910, but fallen below in 1911, on account of its restricted coal output, again takes premier place in 1912. Ontario is still the largest contributor to the total, being credited with 38·5 per cent, or $51,985,876; British Columbia comes second with 22 per cent, or $30,076,635; Nova Scotia third with $18,922,236, or 14 per cent; Alberta fourth with $12,073,589, or nearly 9 per cent; and Quebec fifth with $11,656,998, or 8·6 per cent. Manitoba, Saskatchewan, and New Brunswick, follow in the order named.

It should be remembered in dealing with these comparisons that Nova Scotia in the above record is given no credit on account of the large iron smelting and

steel making industries at Sydney, New Glasgow, etc. The pig iron made here is entirely from imported ore and naturally is not credited as a Canadian mine output. The same remark applies to a large percentage of the pig iron production in Ontario, as well as to the production of aluminium in Quebec.

There was an increased output in each of the provinces in 1913, the largest gains being in Alberta and British Columbia.

In Nova Scotia both coal and gypsum mining were particularly active, though a reduced production of gold is reported. Copper and asbestos mining in Quebec contribute chiefly to the increase in that Province. Ontario had important increases in nickel and copper, but more especially in gold from the Porcupine district. This Province has a large output of non-metallic products, including cement, clays, etc. In Alberta coal mining has had a record year, exceeding in tonnage the British Columbia production. In the latter Province the principal increase was in copper, with gold, silver, lead, zinc, coal, and structural or building materials as important contributors.

The last table shows the total mineral production of Canada by provinces for the years 1889 to 1912 inclusive.

## Mineral Production by Provinces, 1910, 1911, and 1912.

| Province. | 1910. | | 1911. | | 1912. | |
|---|---|---|---|---|---|---|
| | Value of production. | Per cent of total. | Value of production. | Per cent of tota l. | Value of production. | Per cent of total. |
| | $ | % | $ | % | $ | % |
| *Nova Scotia | 14,195,730 | 13·29 | 15,409,397 | 14·93 | 18,922,236 | 14·01 |
| New Brunswick | 581,942 | 0·54 | 612,830 | 0·59 | 771,004 | 0·57 |
| Quebec | 8,270,136 | 7·74 | 9,304,717 | 9·01 | 11,656,998 | 8·63 |
| Ontario | 43,538,078 | 40·76 | 42,796,162 | 41·46 | 51,985,876 | 38·50 |
| Manitoba | 1,500,359 | 1·40 | 1,791,772 | 1·74 | 2,463,074 | 1·83 |
| Saskatchewan | 498,122 | 0·47 | 636,706 | 0·62 | 1,165,642 | 0·86 |
| Alberta | 8,996,210 | 8·42 | 6,662,673 | 6·46 | 12,073,589 | 8·94 |
| British Columbia | 24,478,572 | 22·92 | 21,299,305 | 20·63 | 30,076,635 | 22·27 |
| Yukon | 4,764,474 | 4·46 | 4,707,432 | 4·56 | 5,933,242 | 4·39 |
| Dominion | 106,823,623 | 100·00 | 103,220,994 | 100·00 | 135,048,296 | 100 00 |

* Includes a small production of lime from Prince Edward Island

## Mineral Production of Nova Scotia, 1911 and 1912.

| Product. | | 1911. | | 1912. | |
|---|---|---|---|---|---|
| | | Quantity. | Value. | Quantity. | Value. |
| | | | $ | | $ |
| Gold | Ozs. | 7,781 | 160,854 | 4,385 | 90,638 |
| Iron ore sold for export | Tons. | 22 | 50 | 30,857 | 168,877 |
| Barytes | " | 50 | 400 | 464 | 5,104 |
| Coal | " | 7,004,420 | 14,071,379 | 7,783,888 | 17,374,750 |
| Grindstones | " | 380 | 3,382 | 374 | 3,760 |
| Gypsum | " | 353,999 | 406,457 | 376,082 | 481,493 |
| Manganese | " | 5½ | 300 | 75 | 1,875 |
| Tripolite | " | 20 | 122 | 38 | 230 |
| Clay products | | ..... | 274,249 | ..... | 272,053 |
| Lime | Bus. | 639,200 | 130,555 | 709,596 | 145,121 |
| Stone | | ..... | 292,914 | ..... | 324,630 |
| Other products | | ..... | 68,735 | ..... | 53,705 |
| Total | | ..... | 15,409,397 | ..... | 18,922,236 |

* The total production of pig iron in Nova Scotia in 1912 was 424,994 tons valued at $6,374,910, and in 1911, 390,242 tons valued at $4,682,904, all produced from imported ore.

## Mineral Production of New Brunswick, 1911 and 1912.

| Product. | | 1911. | | 1912. | |
|---|---|---|---|---|---|
| | | Quantity. | Value. | Quantity. | Value. |
| | | | $ | | $ |
| Iron ore sold for export | Tons. | 31,120 | 69,464 | 71,520 | 127,716 |
| Coal | " | 55,781 | 111,562 | 44,780 | 89,560 |
| Grindstones | " | 4,186 | 49,560 | 4,038 | 48,330 |
| Gypsum | " | 93,205 | 115,044 | 82,757 | 185,821 |
| Mineral water | | ..... | 19,843 | ..... | ..... |
| Natural gas | M cub. ft. | ..... | ..... | 173,903 | 36,549 |
| Petroleum | Bls. | 2,461 | 3,019 | 2,679 | 3,799 |
| Clay products | | ..... | 38,000 | ..... | 54,910 |
| Lime | Bus. | 613,728 | 132,897 | 616,835 | 133,742 |
| Stone | | ..... | 73,441 | ..... | 90,577 |
| Total | | ..... | 612,830 | ..... | 771,004 |

## Mineral Production of Quebec, 1911 and 1912.

| Product. | | 1911. | | 1912. | |
|---|---|---|---|---|---|
| | | Quantity. | Value. | Quantity. | Value. |
| | | | $ | | $ |
| Copper | Lbs. | 2,436,190 | 301,503 | 3,282,210 | 536,346 |
| Gold | Ozs. | 613 | 12,672 | 642 | 13,270 |
| Iron ore sold for export | Tons. | 3,616 | 6,479 | 1,185 | 4,232 |
| Iron, pig from Canadian ore (a) | " | 379 | 9,949 | ..... | ..... |
| Silver | Ozs. | 18,435 | 9,827 | 9,465 | 5,758 |
| Asbestos and asbestic | Tons. | 127,414 | 2,943,108 | 136,301 | 3,127,279 |
| Chromite | " | 157 | 2,587 | ..... | ..... |
| Feldspar | " | 17 | 255 | 100 | 2,000 |
| Graphite | " | 374 | 33,084 | 604 | 50,680 |
| Magnesite | " | 991 | 5,531 | 1,714 | 9,645 |
| Mica | " | ..... | 69,465 | ..... | 81,044 |
| Mineral water | Gals. | ..... | 63,637 | 92,873 | 36,736 |
| Ochres, iron oxides | Tons. | 3,612 | 28,173 | 7,654 | 32,410 |
| Peat | " | 200 | 800 | 500 | 2,000 |
| Phosphate | " | 586 | 4,909 | 164 | 1,640 |
| Pyrites | " | 39,122 | 247,555 | 60,849 | 243,396 |
| Quartz | " | 548 | 694 | 556 | 1,240 |
| Cement | Bls. | 1,614,730 | 1,963,139 | 2,714,685 | 3,134,499 |
| Clay products | | ..... | 1,341,467 | ..... | 1,680,300 |
| Kaolin | Tons. | ..... | ..... | 20 | 160 |
| Lime | Bus. | 1,428,392 | 356,453 | 1,729,614 | 474,595 |
| Slate | Squares. | 1,833 | 8,248 | 1,894 | 8,939 |
| Stone | | ..... | 1,894,892 | ..... | 1,957,703 |
| Other products | | ..... | ..... | ..... | 243,126 |
| Total | | ..... | 9,304,717 | ..... | 11,656,998 |

(a) The total production of pig iron in Quebec in 1911 was 658 tons valued at $17,282, while there was none whatever in 1912.

There was also in this Province an important production of aluminium from imported ores.

# Mineral Production of Ontario, 1911 and 1912.

| Products. | | 1911. | | 1912. | |
|---|---|---|---|---|---|
| | | Quantity. | Value. | Quantity. | Value. |
| | | | $ | | $ |
| Cobalt oxide and nickel oxide | Lbs. | 154,174 | 221,690 | 349,054 | 156,256 |
| Cobalt mineral and mixed cobalt and nickel oxide | " | 1,260,832 | | 1,285,280 | 163,988 |
| Copper | " | 17,932,263 | 2,219,297 | 22,250,601 | 3,635,971 |
| Gold | Ozs. | 2,062 | 42,625 | 86,523 | 1,788,596 |
| Iron ore, sold for export | Tons. | 5,379 | 12,577 | 14,567 | 28,125 |
| Iron pig from Canadian ore *(a)* | " | 41,807 | 603,455 | 36,355 | 450,886 |
| Nickel | Lbs. | 34,098,744 | 10,229,623 | 44,841,542 | 13,452,463 |
| Silver | Ozs. | 30,540,754 | 16,279,443 | 29,214,025 | 17,772,352 |
| Zinc ore | Tons. | ..... | ..... | 10 | 3,750 |
| Actinolite | " | 67 | 736 | 92 | 1,000 |
| Arsenious oxide | " | 2,097 | 76,237 | 2,045 | 89,262 |
| Corundum | " | 1,472 | 161,873 | 1,960 | 239,091 |
| Feldspar | " | 17,706 | 51,684 | 13,633 | 28,916 |
| Fluorspar | " | 34 | 238 | 40 | 240 |
| Graphite | " | 895 | 36,492 | 1,456 | 66,442 |
| Gypsum | " | 27,399 | 98,018 | 53,119 | 176,056 |
| Mica | ..... | ..... | 59,212 | ..... | 62,932 |
| Mineral water | ..... | ..... | 136,778 | ..... | 131,529 |
| Natural gas | M cub. ft. | 10,863,871 | 1,807,513 | 12,529,463 | 2,036,245 |
| Ochres | Tons. | 10 | 160 | ..... | ..... |
| Peat | " | 1,263 | 3,017 | 200 | 900 |
| Petroleum | Bls. | 288,631 | 354,054 | 240,657 | 341,251 |
| Phosphate | Tons. | 35 | 297 | ..... | ..... |
| Pyrites | " | 43,544 | 118,265 | 20,677 | 70,689 |
| Quartz | " | 59,978 | 83,181 | 99,686 | 193,976 |
| Salt | " | 91,582 | 443,004 | 95,053 | 459,582 |
| Talc | " | 7,300 | 22,100 | 8,270 | 23,132 |
| Cement | Bls. | 3,090,786 | 3,741,039 | 3,044,713 | 3,372,897 |
| Clay products | ..... | ..... | 3,916,575 | ..... | 4,864,700 |
| Lime | Bus. | 3,360,265 | 538,902 | 3,376,193 | 573,269 |
| Sand-lime brick | No. | 29,502,186 | 237,662 | 36,371,002 | 328,548 |
| Stone | ..... | ..... | 892,305 | ..... | 1,109,164 |
| Other products | ..... | ..... | 408,110 | ..... | 363,668 |
| Total | ..... | ..... | 42,796,162 | ..... | 51,985,876 |

*(a)* The total production of pig iron in Ontario in 1912 was 589,593 tons, valued at $8,176,089; in 1911, 526,635 tons, valued at $7,606,939.

## Mineral Production of Manitoba, 1911 and 1912.

| Product. | 1911. | | 1912. | |
|---|---|---|---|---|
| | Quantity. | Value. | Quantity. | Value. |
| | | $ | | $ |
| Calcined gypsum ..... Tons. | 43,000 | 372,000 | 66,500 | 481,250 |
| Clay products ..... | ..... | 834,428 | ..... | 1,018,051 |
| Lime ..... Bus. | 706,888 | 140,629 | 818,237 | 168,257 |
| Cement ..... Bls. | 21,350 | 28,289 | 12,127 | 16,068 |
| Sand-lime brick ..... No. | 9,679,985 | 98,376 | 27,594,874 | 294,700 |
| Stone ..... | ..... | 318,050 | ..... | 383,095 |
| Other products ..... | ..... | ..... | ..... | 101,653 |
| Total ..... | ..... | 1,791,772 | ..... | 2,463,074 |

## Mineral Production of Saskatchewan, 1911 and 1912.

| Prod ct. | 1911. | | 1912. | |
|---|---|---|---|---|
| | Quantity. | Value. | Quantity. | Value. |
| | | $ | | $ |
| Coal ..... Tons. | 206,779 | 347,248 | 295,342 | 368,135 |
| Brick, common and pressed ..... No. | 21,071,660 | 224,758 | 30,538,771 | 332,943 |
| Lime ..... Bus. | ..... | ..... | 4,000 | 1,440 |
| Sand-lime brick ..... No. | (a) | ..... | 16,292,114 | 207,671 |
| Other products ..... | ..... | 64,700 | ..... | 255,453 |
| Total ..... | ..... | 636,706 | ..... | 1,165,642 |

(a) In 1911, included in "Other products."

## Mineral Production of Alberta, 1911 and 1912.

| Product. | 1911. | | 1912. | |
|---|---|---|---|---|
| | Quantity. | Value. | Quantity. | Value. |
| | | $ | | $ |
| Gold ..... Ozs. | 10 | 207 | 73 | 1,509 |
| Coal ..... Tons. | 1,511,036 | 3,979,264 | 3,240,577 | 8,113,525 |
| Natural gas ..... M ft. | 780,286 | 110,165 | 2,583,437 | 289,906 |
| Cement ..... Bls. | 512,176 | 1,241,535 | 821,165 | 1,775,898 |
| Clay products ..... | ..... | 1,052,751 | ..... | 1,356,184 |
| Lime ..... Bus. | 434,038 | 100,407 | 704,035 | 166,520 |
| Sand-lime brick ..... No. | 3,500,000 | 20,000 | 10,732,000 | 139,952 |
| Sandstone ..... | ..... | 158,344 | ..... | 81,391 |
| Other products ..... | ..... | ..... | ..... | 148,704 |
| Total ..... | ..... | 6,662,673 | ..... | 12,073,589 |

## Mineral Production of British Columbia, 1911 and 1912.

| Product. | | 1911. | | 1912. | |
|---|---|---|---|---|---|
| | | Quantity. | Value. | Quantity. | Value. |
| | | | $ | | $ |
| Copper *(a)* | Lbs. | 35,279,558 | 4,366,198 | 50,526,656 | 8,256,561 |
| Gold | Ozs. | 238,496 | 4,930,145 | 251,815 | 5,205,485 |
| Lead | Lbs. | 23,784,969 | 827,717 | 37,763,476 | 1,597,554 |
| Silver | Ozs. | 1,887,147 | 1,005,924 | 2,651,002 | 1,612,737 |
| Zinc ore | | 2,590 | 101,072 | 6,405 | 211,399 |
| Coal | Tons. | 2,542,532 | 7,945,413 | 3,208,997 | 10,028,116 |
| Gypsum | " | 780 | 1,875 | ..... | ..... |
| Mineral water | | ..... | 3,500 | ..... | 4,200 |
| Cement | Bls. | 401,000 | 601,500 | 511,539 | 767,038 |
| Clay products | | ..... | 675,505 | ..... | 996,568 |
| Lime | Bus. | 351,014 | 117,756 | 517,329 | 181,905 |
| Sand-lime brick | No. | 2,953,072 | 23,889 | 5,458,412 | 49,515 |
| Stone | | ..... | 698,811 | ..... | 779,611 |
| Other products | | ..... | ..... | ..... | 385,946 |
| Total | | ..... | 21,299,305 | ..... | 30,076,635 |

*(a)* Smelter recoveries of copper.

## Mineral Production of Yukon, 1911 and 1912.

| Product. | | 1911. | | 1912. | |
|---|---|---|---|---|---|
| | | Quantity. | Value. | Quantity. | Value. |
| | | | $ | | $ |
| Copper | Lbs. | ..... | ..... | 1,772,660 | 289,670 |
| Gold | Ozs. | 224,197 | 4,634,574 | 268,447 | 5,549,296 |
| Silver | " | 112,708 | 60,078 | 81,058 | 49,318 |
| Coal | Tons. | 2,340 | 12,780 | 9,245 | 44,958 |
| Total | | ..... | 4,707,432 | ..... | 5,933,242 |

## Mineral Production by Provinces, 1899-1912.

| Calendar Year. | Nova Scotia.* | New Brunswick. | Quebec. | Ontario. | Manitoba. | Alberta. | Saskatchewan. | Yukon. | British Columbia. | Total. |
|---|---|---|---|---|---|---|---|---|---|---|
| | $ | $ | $ | $ | $ | $ | $ | $ | $ | $ |
| 1899 | 6,817,274 | 420,227 | 2,585,635 | 9,819,557 | 17,108,707 | | | | 12,482,605 | 49,234,005 |
| 1900 | 9,298,479 | 439,060 | 3,292,383 | 11,268,099 | 23,452,380 | | | | 16,680,526 | 64,420,877 |
| 1901 | 7,770,159 | 467,985 | 3,759,984 | 13,970,010 | 19,297,940 | | | | 20,531,833 | 65,797,911 |
| 1902 | 10,686,549 | 607,129 | 3,743,636 | 14,619,091 | 16,127,400 | | | | 17,448,031 | 63,231,836 |
| 1903 | 11,431,914 | 580,495 | 3,585,938 | 14,160,033 | 14,082,986 | | | | 17,899,147 | 61,740,513 |
| 1904 | 11,212,746 | 559,913 | 3,628,482 | 12,582,843 | 12,713,613 | | | | 19,325,174 | 60,082,771 |
| 1905 | 11,507,047 | 558,035 | 4,405,975 | 18,833,292 | 11,387,642 | | | | 22,386,008 | 69,078,999 |
| 1906 | 12,894,303 | 646,328 | 5,242,058 | 25,111,682 | 10,092,726 | | | | 25,299,600 | 79,286,697 |
| 1907 | 14,532,040 | 664,647 | 6,205,553 | 30,381,638 | 898,775 | 4,657,524 | 533,251 | 3,335,898 | 25,656,056 | 86,865,202 |
| 1908 | 14,487,108 | 579,816 | 6,372,949 | 30,623,812 | 584,374 | 5,122,505 | 413,212 | 3,669,290 | 23,704,035 | 85,557,101 |
| 1909 | 12,504,810 | 657,035 | 7,086,265 | 37,374,577 | 1,193,377 | 6,047,447 | 456,246 | 4,032,673 | 22,479,006 | 91,831,441 |
| 1910 | 14,195,730 | 581,942 | 8,270,136 | 43,538,078 | 1,500,359 | 8,996,210 | 498,122 | 4,764,474 | 24,478,572 | 106,823,623 |
| 1911 | 15,409,397 | 612,830 | 9,304,717 | 42,796,162 | 1,791,772 | 6,662,673 | 636,706 | 4,707,432 | 21,299,305 | 103,220,994 |
| 1912 | 18,922,236 | 771,004 | 11,656,998 | 51,985,876 | 2,463,074 | 12,073,589 | 1,165,642 | 5,933,242 | 30,076,635 | 135,048,296 |

* Includes a small production of lime from Prince Edward Island.

## MINE PRODUCTION.

The statistics of metalliferous production published in the tables preceding show in most cases the quantities of metals recovered or probably recoverable.

A general consideration of mine operations from the viewpoint of the actual tonnage of ore mined, the quantities concentrated, and the tonnage shipped to smelters is also of much interest.

The Mines Branch has been endeavouring to obtain from every mine operator in Canada an annual return with respect to:—

(1) The number of men employed and wages paid.
(2) The total tonnage of ores mined, the tonnage concentrated, and the quantities of concentrates produced.
(3) The tonnage of ores or concentrates shipped and the net value thereof.
(4) The quantities of metals as determined by settlement assays contained in the ores shipped, and the quantities of metals for which payment was made by the purchasing smelter or recovered by the operators' smelter.

There are unfortunately two industries in which it has not as yet been feasible to obtain a complete record. These are the production of placer gold on the one hand and of petroleum on the other. In both cases, while a record of production is available, there is no record as to the number of men employed or the amount paid in wages. With respect to the other industries, while it has not been possible to obtain returns from every mine operator, the missing returns usually represent comparatively small productions, and sufficient information is available to give a fairly close estimate of results.

The metalliferous ores mined in Canada at present fall naturally into a number of more or less broad groups as follows:—

(1) Iron ores.
(2) Milling gold ores, including certain dry ores shipped to smelters.
(3) Silver and silver cobalt nickel ores of Ontario.
(4) Nickel copper ores of Ontario.
(5) Silver lead and zinc ores.
(6) Copper-gold-silver ores (chiefly of British Columbia).

Statistics covering the years 1910, 1911, and 1912 are shown in tabular form herewith. Excluding placer and hydraulic gold workings the number of metalliferous mines shipping in 1912 was 163, as compared with 160 reported in 1911; the number of men employed in 1912 was 10,612 as against 9,622; wages paid $10,113,578 compared with $7,857,580 in 1911; tons of ore mined 4,194,517 in 1912 as against 3,195,330 tons the previous year; tons of ore, concentrates, or metal shipped, 3,360,432 in 1912 and 2,431,188 in 1911; total net value of shipments including placer gold $46,018,233 in 1912 and $34,760,513 in 1911.

In non-metalliferous mining, exclusive of stone quarries and clay pits, there were employed in 1912 an average of 33,954 men earning in wages $23,877,781.

The tonnage mined, chiefly coal, was 17,165,628 and tons shipped 15,548,981 having a net value of $45,080,674. There were employed in this class of mining in 1911 an average of 32,126 men, earning in wages $18,469,420; the number of tons mined was 13,890,468; tons shipped 12,247,348, having a net value of $34,405,960. The manufacture of cement, clay products, and lime, and the quarrying of stone, etc., employed in 1912 an average of 22,168 men, to whom were paid in wages $11,511,120, and the net value of products shipped was $28,794,869. These operations in 1911 engaged an average of 19,004 men, earning $8,827,508 in wages, and the value of products shipped was $22,709,611. Excluding the labour employed in placer gold mining and in the production of petroleum for which, as already explained, no record has been obtained, the total number of men engaged in the mining industry in 1912 was about 66,734 and wages paid $45,502,479. In 1911 the number of men was 60,752 and wages $35,154,508. It should be remembered that this is a record only of shipping mines and does not include the labour employed in prospecting or in developing new properties, neither does it include any record of labour employed in the smelting and refining of ores, or in blast furnace operations.

The total net value of mine shipments and the products of cement, clay, and lime plants on the basis shown in these tables was $119,893,776 in 1912, as compared with $91,876,084 in 1911.

This value it will be observed is considerably less than that shown in the Table of Mineral Production given on page 6, the difference being due entirely to the fact that values accrued through metallurgical reduction and refining are not included in these tables, they being intended to present, as indicated in the title, mine products. The values given in these tables are in general those furnished by the operators. In certain cases where mining, smelting, and refining operations are carried on by the same operator, it becomes a matter of no small difficulty to satisfactorily subdivide profits among the various operations, particularly when there is no general market for the class of ores treated. The nickel copper ores of the Sudbury district may be cited as a typical example. The value of $4 a ton placed upon this ore very probably does not include a sufficient proportion of the profits obtained in the ultimate refining.

## Mine Production 1910.

| — | No. of mines or works. | Men employed. | | Wages Paid. | Ores or minerals mined. | Metals, ores, concentrates or minerals shipped. | Net value of shipments. |
|---|---|---|---|---|---|---|---|
| | | Underground. | Surface. | | | | |
| METALLIFEROUS ORES. | No. | No. | | $ | Tons. | Tons. | $ |
| Iron ores | 8 | 971 | | 443,998 | 335,768 | 259,418 | 574,362 |
| Milling gold ores— | | | | | | | |
| Bullion shipped. | ..... | ..... | | ..... | ..... | ..... | 659,987 |
| Concentrate | 47 | 969 | | 725,989 | 138,021 | 8,997 | 565,340 |
| Silver-cobalt ores— | | | | | | | |
| Mine bullion shipped | ..... | ..... | ..... | ..... | ..... | 35 | 542,034 |
| Ore and concentrate | 38 | 1,632 | 1,322 | 2,642,133 | 274,780 | 35,627 | 15,344,470 |
| Nickel-copper ores | 7 | 660 | 286 | 719,237 | 652,392 | 652,392 | 2,609,568 |
| Copper ores | 3 | 118 | 97 | 105,366 | 54,220 | 36,714 | 172,162 |
| Silver-lead and zinc ores | 48 | 592 | 282 | 850,416 | 180,070 | 58,418 | 1,668,415 |
| Copper-gold-silver ores | 19 | 1,432 | 487 | 1,872,242 | 1,958,591 | 1,924,405 | 7,888,306 |
| Shipping mines not reporting: | | | | | | | |
| Silver-lead | 12 | ..... | ..... | ..... | 1,994 | 1,994 | ..... |
| Copper-gold | 9 | | | | | | |
| Placer mining— | | | | | | | |
| Yukon | ..... | ..... | ..... | ..... | ..... | ..... | 4,550,000 |
| British Columbia | ..... | ..... | ..... | ..... | ..... | ..... | 540,000 |
| Other provinces | ..... | ..... | ..... | ..... | ..... | ..... | 1,850 |
| Total metallic | 191 | 8,839 | | 7,359,381 | 3,595,836 | 2,978,000 | 35,116,494 |
| Total non-metallic | ..... | 36,210 | | 22,698,000 | 16,148,993 | 13,800,989 | 37,757,158 |
| Total structural material | ..... | 17,259 | | 7,547,000 | ..... | ..... | 19,627,592 |
| Total | ..... | 62,308 | | 37,604,381 | ..... | ..... | 92,501,244 |

## Mine Production 1911.

| — | No. of mines or works. | Men employed. | | Wages Paid. | Ores or minerals mined. | Metals, ores, concentrates or minerals shipped. | Net value of shipments. |
|---|---|---|---|---|---|---|---|
| | | Underground. | Surface. | | | | |
| METALLIFEROUS ORES. | No. | No. | | $ | Tons. | Tons. | $ |
| Iron ores | 8 | 943 | | 449,468 | 421,113 | 210,344 | 522,319 |
| Milling gold ores— | | | | | | | |
| Bullion shipped | | | | | | | 513,991 |
| Concentrates | 45 | 1,085 | | 954,659 | 118,758 | 8,026 | 663,213 |
| Silver-cobalt ores— | | | | | | | |
| Mine bullion shipped | | | | | | 130 | 2,007,440 |
| Ore and concentrate | 36 | 1,794 | 1,448 | 2,722,228 | 254,290 | 25,539 | 14,400,245 |
| Nickel-copper ores | 7 | 858 | 425 | 889,894 | 612,511 | 612,511 | 2,450,044 |
| Copper ores | 2 | 119 | 67 | 98,084 | 66,088 | 39,047 | 247,555 |
| Silver-lead and zinc ores | 40 | 528 | 297 | 809,862 | 120,323 | 48,660 | 1,186,996 |
| Gold-copper-silver ores | 22 | 1,495 | 563 | 1,933,385 | 1,602,247 | 1,486,931 | 7,727,696 |
| Placer mining— | | | | | | | |
| Yukon | | | | | | | 4,606,812 |
| British Columbia | | | | | | | 426,000 |
| Other provinces | | | | | | | 8,202 |
| Total metalliferous | 160 | 9,622 | | 7,857,580 | 3,195,330 | 2,431,188 | 34,760,513 |
| " non-metalliferous | | 32,126 | | 18,469,420 | 13,890,468 | 12,247,348 | 34,405,960 |
| " structural materials | | 19,004 | | 8,827,508 | | | 22,709,611 |
| | | 60,752 | | 35,154,508 | | | 91,876,084 |

## Mine Production 1912.

| — | No. of mines or works. | Men employed. | | Wages paid. | Ores or minerals mined. | Metals, ores, concentrates or minerals, shipped. | Net value of shipments. |
|---|---|---|---|---|---|---|---|
| | | Underground. | Surface. | | | | |
| METALLIFEROUS ORES. | No. | No. | | $ | Tons. | Tons | $ |
| Iron ores | 8 | 524 | | 371,938 | 171,792 | 215,883 | 523,315 |
| Milling gold ore— | | | | | | | |
| Bullion shipped | 43 | | | | | | |
| Concentrates | | 1,671 | | 1,551,006 | 296,297 | 6,114 | 669,727 |
| Silver-cobalt ores— | | | | | | | |
| Mine bullion shipped | 31 | | | | | 164 | 2,899,360 |
| Ore and concentrate | | 1,685 | 1,448 | 3,107,286 | 319,348 | 29,106 | 14,592,559 |
| Nickel-copper ores | 8 | 970 | 830 | 1,404,652 | 737,726 | 737,726 | 2,953,306 |
| Copper ores | 3 | 154 | 95 | 160,765 | 64,952 | 60,869 | 508,993 |
| Silver-lead and zinc ores | 50 | 597 | 331 | 1,002,203 | 202,343 | 66,377 | 2,767,741 |
| Gold-copper-silver ores | 20 | 1,434 | 873 | 2,515,728 | 2,408,059 | 2,244,193 | 13,113,144 |
| Placer mining— | | | | | | | |
| Yukon | | | | | | | 5,540,000 |
| British Columbia | | | | | | | 555,500 |
| Other provinces | | | | | | | 11,379 |
| Total metalliferous | 163 | 10,612 | | 10,113,578 | 4,194,517 | 3,360,432 | 46,018,239 |
| " non-metalliferous | 443 | 33,954 | | 23,877,781 | 7,165,628 | 15,548,981 | 45,080,674 |
| " structural materials | 831 | 22,168 | | 11,511,120 | | | 28,794,869 |
| | 1,437 | 66,734 | | 45,502,479 | | | 119,893,776 |

## Labour and Wages Statistics Covering Non-Metalliferous Mines During 1911 and 1912.

| — | 1911. | | | 1912. | | |
|---|---|---|---|---|---|---|
| | No. active mines or works. | No. employed. | Wages paid. | No. active mines or works. | No. employed. | Wages paid. |
| NON-METALLIC. | | | $ | | | $ |
| Asbestos and asbestic | 12 | 2,707 | 1,231,896 | 10 | 2,955 | 1,401,653 |
| Coal | 195 | 26,141 | 15,695,735 | 244 | 27,581 | 20,784,843 |
| Feldspar | 6 | 78 | 29,918 | 4 | 80 | 31,487 |
| Graphite | 7 | 302 | 106,000 | 7 | 221 | 86,831 |
| Grindstones, pulpstones, scythe-stones | 6 | 134 | 29,300 | 6 | 149 | 35,057 |
| Gypsum | 19 | 1,233 | 517,800 | 19 | 1,381 | 579,952 |
| Mica and phosphates | 30 | 231 | 73,870 | 26 | 241 | 95,415 |
| Mineral pigments, barytes, and ochres | 5 | 82 | 25,568 | 4 | 65 | 21,270 |
| Mineral water | 17 | 102 | 37,963 | 14 | 90 | 34,550 |
| Natural gas | 40 | 276 | 263,098 | 76 | 433 | 302,012 |
| Peat | 3 | 16 | 2,800 | 3 | 27 | 4,450 |
| Pyrites | 6 | 162 | 112,294 | 4 | 115 | 110,888 |
| Quartz | 8 | 145 | 52,543 | 7 | 128 | 80,340 |
| Salt | 12 | 225 | 123,040 | 12 | 231 | 155,648 |
| Others ‡ | 9 | 292 | 167,595 | 8 | 292 | 168,641 |
| Total non-metallic | 375 | 32,126 | 18,469,420 | 443 | 33,954 | 23,877,781 |
| STRUCTURAL. | | | | | | |
| Cement | 24 | 3,010 | 3,103,838 | 26 | 3,461 | 2,623,902 |
| Clay products | 419 | 9,131 | 3,524,058 | 460 | 10,450 | 4,504,213 |
| Lime | 75 | 1,056 | 523,518 | 78 | 1,103 | 576,217 |
| Sand-lime brick | 16 | 337 | 166,902 | 20 | 544 | 349,192 |
| Sand and gravel *(a)* | ..... | No record | ..... | 54 | 875 | 527,425 |
| Slate | 1 | 33 | 9,187 | 1 | 25 | 12,055 |
| Stone | 191 | 5,437 | 2,500,005 | 192 | 5,710 | 2,918,116 |
| Total structural | 726 | 19,004 | 8,827,508 | 831 | 22,168 | 11,511,120 |
| " non-metalliferous | 1,101 | 51,130 | 27,296,928 | 1,274 | 56,122 | 35,388,901 |

‡Includes: actinolite, chromite, corundum, fluorspar, magnesite, manganese, talc, and tripolite.
*(a)* No record in 1911. Partial record only in 1912.

## SMELTER PRODUCTION.

Statistics of the production of copper, lead, and silver smelters and refineries showing the tonnage of ore treated, the matte, blister, base bullion, or refined metal produced, etc., were collected for the first time by the Mines Branch in 1908 and were published in the report for that year. Similar returns covering each succeeding year have also been received through the courtesy of the various operating companies, a list of which follows:—

[1] The Canadian Antimony Co., St. George, N.B.

The Mond Nickel Co., Victoria Mines, Ont.

The Canadian Copper Co., Copper Cliff, Ont.

The Coniagas Reduction Co., Thorold, Ont.

The Deloro Mining and Reduction Co., Deloro, Ont.

The Canada Refining & Smelting Co., Ltd., Orillia, Ont.

The North American Smelting Co., Kingston, Ont.

The Consolidated Mining and Smelting Co. of Canada, Ltd., Trail, B.C.

The Granby Consolidated Mining, Smelting, and Power Co., Grand Forks, B.C.

The British Columbia Copper Co., Ltd., Greenwood, B.C.

[1] The Tyee Copper Co., Ltd., Ladysmith, B.C.

The aggregate quantities of ores and concentrates treated in these works during 1912 were 3,005,410 tons, as compared with 2,193,553 tons in 1911, an increase of about 37 per cent. The largest proportion of the total tonnage (over 70 per cent) consists of the copper-gold-silver ores of British Columbia, chiefly from the Boundary (Phoenix and Greenwood), Rossland, and Coast (Britannia and Texada island) districts. The nickel-copper ores of the Sudbury district, Ontario, contributed about 24 per cent of the tonnage, the balance being lead ores of British Columbia and silver cobalt ores of Ontario.

The quantities of these several classes of ores smelted during the past five years have been as follows:—

| Year. | Nickel-copper ores. | Silver-cobalt ores. | Lead ores. | Copper-gold-silver ores. | Totals. |
|---|---|---|---|---|---|
| 1908..... | 360,180 | 7,182 | 53,455 | 1,797,488 | 2,218,395 |
| 1909..... | 462,336 | 8,384 | 54,539 | 1,850,889 | 2,376,148 |
| 1910..... | 628,947 | 9,466 | 57,549 | 1,987,752 | 2,683,714 |
| 1911..... | 610,834 | 9,330 | 55,408 | 1,517,981 | 2,193,553 |
| 1912..... | 725,065 | 8,097 | 59,932 | 2,212,316 | 3,005,410 |

The products obtained in Canada from the treatment of these ores include: pig lead produced at Kingston, Ont., refined pig lead and lead pipe produced at Trail, B.C.; and fine gold, fine silver, copper sulphate, and antimony produced

[1] Not in operation during 1912.

from the residues of the Trail lead refinery; silver bullion, white arsenic, nickel oxide, and cobalt oxide produced in Ontario, from the Cobalt District ores. Refined antimony was produced in New Brunswick in 1909. In addition to these refined products, blister copper, copper matte, nickel-copper matte, cobalt material or mixed nickel and cobalt oxides are produced and exported for refining outside of Canada.

The aggregate results of smelting and refining operations may be summarized as shown in the next table. Unfortunately the figures cannot be taken to represent the total production from smelting ores mined in Canada, since considerable quantities of copper and silver ores are still shipped to other smelters outside of Canada for smelting.

It should also be explained that the figures include the results of the treatment in British Columbia of a small quantity of imported ores.

## Smelter and Refinery Production in Canada.

| Matte, blister copper, and other smelter products obtained and exported for refining. | 1908. | 1909. | 1910. | 1911. | 1912. |
|---|---|---|---|---|---|
| | Tons | Tons. | Tons. | Tons. | Tons. |
| (1) Blister copper | 15,418 | 14,239 | 13,918 | 10,710 | 17,063 |
| (2) Copper matte | 7,649 | 11,597 | 11,519 | 11,320 | 6,727 |
| (3) Nickel-copper matte | 21,210 | 25,845 | 33,033 | 32,607 | 41,925 |
| (4) Lead bullion | ..... | 2,010 | ..... | ..... | ..... |
| (5) Cobalt material | ..... | ..... | 54 | 630 | 642 |

| Refined products produced and metals contained in unrefined smelter products exported. | 1910. | | 1911. | | 1912. | |
|---|---|---|---|---|---|---|
| | Refined products. | Metals contained in matte, blister, base bullion, and speiss. | Refined products. | Metals contained in matte, blister, and base bullion. | Refined products. | Metals contained in matte, blister, and base bullion. |
| Antimony.....Lbs. | ..... | ..... | ..... | ..... | ..... | ..... |
| Gold.....Ozs. | 13,298 | 197,181 | 15,270 | 175,189 | 12,118 | 184,815 |
| Silver.....  " | 16,373,799 | 2,136,414 | 19,078,768 | 585,896 | 17,572,217 | 686,171 |
| Lead.....Lbs. | 32,987,508 | ..... | 23,525,050 | ..... | 35,893,190 | ..... |
| Copper.....  " | ..... | 56,149,299 | ..... | 29,855,868 | ..... | 58,405,910 |
| Copper sulphate....  " | 163,228 | ..... | 197,187 | ..... | 87,110 | ..... |
| Nickel.....  " | ..... | 37,587,676 | ..... | 34,098,744 | ..... | 44,841,542 |
| Cobalt oxide and nickel oxide.....  " | 13,508 | ..... | 154,174 | ..... | 349,054 | ..... |
| White arsenic.....  " | 3,003,467 | ..... | 4,194,209 | ..... | 4,090,768 | ..... |
| Arsenic.....  " | ..... | ..... | ..... | ..... | ..... | ..... |

(1) Blister copper carrying gold and silver values.
(2) Copper matte " " "
(3) Bessemer nickel-copper carrying small gold and silver values as well as metals, of the platinum group.
(4) Unrefined lead bullion carrying silver values.
(5) Cobalt material carrying nickel and silver values.

*Nickel-Copper Ores.*—These ores in the Sudbury district, together with a small tonnage from the Alexo mine in the district of Nipissing, Ontario, are treated in the smelters of the Canadian Copper Co., at Copper Cliff, and The Mond Nickel Company at Victoria Mines. The new smelter being constructed by the latter Company at Coniston was not in commission during 1912. A large portion of the ore is roasted in open heaps, before smelting.

The total quantity of ore mined during 1912 was 737,726 tons, and the quantity smelted was 725,065 tons. There was produced 41,925 tons of Bessemer matte containing 11,116 tons of copper and 22,421 tons of nickel. This is the largest production since the beginning of operations in 1886. In 1911 there was smelted 610,834 tons of ore, from which was produced 32,607 tons of Bessemer matte, containing 8,966 tons of copper and 17,049 tons of nickel.

Statistics of smelter production from these ores which are available since the commencement of this industry are shown in the following table:—

**Smelter Production of the Nickel-Copper Ores of the Sudbury District.**

| Calendar Year. | Ore mined. | Ore smelted. | Matte shipped. | Value matte. | Nickel content of matte. | Copper content of matte. |
|---|---|---|---|---|---|---|
| | Tons. | Tons. | Tons. | $ | Tons. | Tons. |
| 1886 | 3,307 | | | | | |
| 1887 | 567 | 30,000 | | | 900 | 1,500 |
| 1888 | | | | | | |
| 1889 | 44,990 | 40,146 | 3,274 | | 432 | 733 |
| 1890 | | | | | 718 | 651 |
| 1891 | 83,300 | 72,558 | 10,336 | | 2,018 | 2,064 |
| 1892 | 74,381 | 57,022 | | | 1,207 | 1,102 |
| 1893 | | | 9,425 | | 1,991 | 1,821 |
| 1894 | 103,223 | 96,038 | 11,681 | 766,422 | 2,454 | 2,604 |
| 1895 | 74,135 | 68,618 | 10,188 | 890,834 | 1,944 | 2,288 |
| 1896 | 94,966 | 71,027 | 10,759 | 416,594 | 1,699 | 1,584 |
| 1897 | 93,154 | 96,370 | 13,968 | | 1,999 | 2,750 |
| 1898 | 123,820 | 121,924 | | | 2,759 | 4,187 |
| 1899 | 159,957 | 172,761 | | 702,341 | 2,872 | 2,834 |
| 1900 | 196,420 | | 23,336 | 1,076,306 | 3,540 | 3,364 |
| 1901 | 315,692 | 255,958 | | 1,661,839 | 4,594 | 4,318 |
| 1902 | 269,538 | 211,847 | 25,311 | 1,327,448 | 5,347 | 3,553 |
| 1903 | 136,033 | 207,030 | 13,832 | 2,686,469 | 6,253 | 3,576 |
| 1904 | 203,388 | 118,470 | 10,154 | 2,193,198 | 5,274 | 2,455 |
| 1905 | 277,766 | 251,421 | 17,405 | 4,019,814 | 9,438 | 4,386 |
| 1906 | 343,814 | 340,059 | 20,310 | 4,628,011 | 10,745 | 5,264 |
| 1907 | 351,916 | 359,076 | 22,025 | 3,289,382 | 10,595 | 6,906 |
| 1908 | 409,551 | 360,180 | 21,210 | 2,930,989 | 9,572 | 7,503 |
| 1099 | 451,892 | 462,336 | 25,845 | 1,913,012 | 13,141 | 7,873 |
| 1910 | 652,392 | 628,947 | 35,033 | 5,380,064 | 18,636 | 9,630 |
| 1911 | 612,511 | 610,834 | 32,607 | 4,945,593 | 17,049 | 8,966 |
| 1912 | 737,726 | 725,065 | 41,925 | 6,303,102 | 22,421 | 11,116 |

*Silver-Copper-Nickel-Arsenic Ores.*—The first shipments of silver ores were made from the Cobalt district in 1904, and in 1906 the first works for the treatment of these ores in Canada were established by the Canadian Copper Co., at Copper Cliff, Ont. Subsequently plants were erected by the Coniagas Reduction Company at Thorold, the Deloro Mining and Reduction Co. at Deloro, and the

Canada Refining and Smelting Company at Orillia, at each of which nickel and cobalt oxides are recovered in addition to silver bullion and white arsenic. Other small plants have more recently been established at Kingston, North Bay, and Trout Lake.

A large proportion of the ore tonnage shipped from this district is still sent to smelters in the United States, although during the past two years there has been a growing tendency toward the treatment of these ores by cyanidation and the recovery of silver at the mine in the form of bullion. Thus we find a falling off, during 1912, in the production of silver at Canadian smelters and an increased amount of bullion produced at the mines.

The treatment of these ores in Ontario during the past four years has given the following results:—

| — | | 1909. | 1910. | 1911. | 1912. |
|---|---|---|---|---|---|
| Ore treated | Tons. | 8,384 | 9,466 | 9,330 | 8,097 |
| Products recovered— | | | | | |
| Silver produced† | Ozs. | 12,239,542 | 14,574,839 | 17,753,167 | 15,675,218 |
| White arsenic | Lbs. | 2,258,087 | 3,003,467 | 4,194,209 | 4,090,768 |
| Speiss or residues | Tons. | 2,660 | 3,074 | ..... | ..... |
| Cobalt oxide and nickel oxide | Lbs. | ..... | 13,508 | 154,174 | 349,054 |
| Mixed cobalt and nickel oxides and cobalt material | " | ..... | 108,178 | 1,260,832 | 1,285,280 |

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

*Lead Ores.*—There were two lead smelting plants in operation in Canada in 1912, a small plant having been constructed at Kingston, Ontario, for the smelting of ores of the Frontenac and other lead mines in Ontario. During 1912 this furnace was blown in on British Columbian and imported ores and lead waste. The smelter at Trail, B.C., treated practically all of the lead ore mined in southern British Columbia, with the exception of a small tonnage that went to Kingston.

In the lead refinery at Trail, the bullion from the smelter is cast into anodes and re-deposited electrolytically upon cathode sheets of refined lead. The refined lead is cast into pigs or manufactured into lead pipe. 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. Antimony is also recovered, though not regularly, and bearing metal is manufactured.

The annual production of refined lead, fine gold and silver, and copper sulphate has been as follows:—

| Calendar Year. | Refined lead | Fine gold. | Fine silver. | Copper sulphate. |
|---|---|---|---|---|
| | Lbs. | Ozs. | Ozs. | Lbs. |
| 1904 | 7,519,440 | 4,336 | 551,450 | 56,000 |
| 1905 | 15,804,509 | 8,602 | 1,088,328 | 77,175 |
| 1906 | 20,471,314 | 9,993 | 1,263,809 | 143,135 |
| 1907 | 26,607,461 | 10,395 | 1,631,422 | 97,751 |
| 1908 | 36,549,274 | 15,346 | 1,956,039 | 203,379 |
| 1909 | 41,883,614 | 18,241 | 2,003,003 | 51,405 |
| 1910 | 32,987,508 | 13,298 | 1,798,960 | 163,228 |
| 1911 | 23,525,050 | 15,270 | 1,325,601 | 197,187 |
| 1912 | 35,254,790 | 12,118 | 1,896,999 | 87,110 |

*Gold-Silver-Copper Ores of British Columbia.*—Of the four copper smelters in British Columbia, three were active during 1912. These were the Trail copper furnace of the Consolidated Mining and Smelting Company, treating the ores of the Rossland camp and other ores of the district; the Grand Forks plant of the Granby Consolidated Mining, Smelting, and Power Co., and the Greenwood plant of the British Columbia Copper Company, treating chiefly the low grade ores of the Boundary district.

On the coast the Tyee Copper Company's furnace at Ladysmith was idle throughout the year. A new smelter is being constructed at Anyox, Observatory inlet, Portland canal, by the Granby Company, to treat the ores of the Hidden Creek mines. It is expected that this smelter will be completed and in operation during 1913.

The aggregate production of British Columbia copper smelters during the past four years, including the foreign ores treated, was as follows:—

| —— | | 1909. | 1910. | 1911. | 1912. |
|---|---|---|---|---|---|
| Ore smelted | Tons. | 1,850,889 | 1,987,752 | 1,517,981 | 2,212,316 |
| Smelter products— | | | | | |
| Matte | " | 11,597 | 11,519 | 11,320 | 6,727 |
| Blister | " | 14,239 | 13,918 | 10,710 | 17,069 |
| Metallic content of matte and blister— | | | | | |
| Gold | Ozs. | 198,898 | 197,181 | 175,189 | 184,815 |
| Silver | " | 612,164 | 636,140 | 585,896 | 686.171 |
| Copper | Lbs. | 37,581,884 | 36,890,283 | 29,855,868 | 36,174,185 |

*Trail Smelter.*—Statistics of the production of the Trail smelter, including both the copper and lead furnaces, have been published in the annual reports of the Company, the figures since 1906 having been as follows:—

## Production of Trail Smelter.

| Year ending June 30. | Ore smelted. | Metals contained in matte and bullion produced. | | | |
|---|---|---|---|---|---|
| | | Gold. | Silver. | Lead. | Copper. |
| | Tons. | Ozs. | Ozs. | Lbs. | Lbs. |
| 1906 (6 months only) | 157,640 | 64,590 | 1,074,255 | 15,133,683 | 2,399,161 |
| 1907 | 222,573 | 69,168 | 1,100,271 | 20,283,083 | 3,443,310 |
| 1908 | 305,956 | 121,380 | 2,224,888 | 32,157,139 | 4,004,468 |
| 1909 | 347,417 | 114,920 | 2,443,475 | 43,675,077 | 4,637,631 |
| 1910 | 487,125 | 137,614 | 2,162,406 | 42,368,816 | 5,974,959 |
| 1911 | 388,785 | 119,067 | 1,458,758 | 24,026,015 | 4,421,988 |
| 1912 | 296,458 | 129,789 | 1,765,992 | 26,072,074 | 2,914,141 |
| Production from 1894 to June, 1912 | 3,143,927 | 1,146,912 | 20,224,623 | 250,970,644 | 50,789,983 |

*Granby Smelter.*—The Granby Smelter is situated at Grand Forks in the Boundary district and is operated by the Granby Consolidated Mining, Smelting, and Power Co. The ores treated are those of the Company's mines at Phoenix, together with a small tonnage of custom ore.

The Phœnix ores are of particular interest because of the low tenor of their metal values, their self-fluxing character, and the large tonnage treated. The recovery of metals during the year ending June 30, 1912, as stated in the Company's annual report, was: copper 1·25 per cent; silver 0·29 ounces, and gold 0·043 ounces.

The first furnace of 300 tons capacity was completed in 1900, and since that date the capacity of the plant has been increased from time to time until at present there are eight furnaces with a total capacity of about 4,500 tons per day. The converter plant was first installed in 1902, and enlarged in 1909.

The quantities of ores smelted and the total production of metals, shown in the next table, are as published in the annual report of the Company.

The smelter was shut down between August 11 and December 20, 1911, owing to the coal strike in the Crowsnest Pass District mines and the resultant coke shortage, which accounts for the falling off in production during the Company's year ending June 30, 1912. Throughout the calendar year 1912, however, the plant was continuously operated and a larger tonnage treated than in any previous year.

## Ores Smelted and Metals Recovered at Granby Smelter.

| Year ending June 30. | All material smelted. | | | | Metals produced. | | |
|---|---|---|---|---|---|---|---|
| | Granby ore. | Foreign. | | Total. | Gold. | Silver. | Copper. |
| | | Ore. | Matte. | | | | |
| | Tons. | Tons. | Tons. | Tons. | Ozs. | Ozs. | Lbs. |
| 1901 | 169,087 | 7,832 | ..... | 176,919 | 8,871 | 34,990 | 5,435,955 |
| 1902 | 293,645 | 4,454 | 3,001 | 301,100 | 30,786 | 274,511 | 10,836,851 |
| 1903 | 289,583 | 7,691 | 6,223 | 303,497 | 35,121 | 277,574 | 12,551,758 |
| 1904 | 516,059 | 36,182 | 4,290 | 556,531 | 54,493 | 275,935 | 16,020,986 |
| 1905 | 550,738 | 39,382 | ..... | 590,120 | 42,980 | 215,449 | 14,224,692 |
| 1906 | 796,188 | 36,158 | ..... | 832,346 | 50,020 | 316,947 | 19,939,004 |
| 1907 | 649,022 | 16,893 | ..... | 665,915 | 32,738 | 201,337 | 16,410,576 |
| 1908 | 858,432 | 24,179 | ..... | 882,611 | 40,068 | 300,204 | 21,092,288 |
| 1909 | 964,789 | 19,944 | ..... | 984,733 | 45,760 | 335,520 | 21,901,528 |
| 1910 | 1,175,548 | 21,829 | ..... | 1,197,377 | 48,752 | 356,746 | 22,754,899 |
| 1911 | 959,563 | 24,783 | ..... | 984,346 | 41,707 | 343,178 | 17,858,860 |
| 1912 | 721,719 | 17,800 | ..... | 739,519 | 33,932 | 225,305 | 13,231,121 |
| 1913 | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Total | 7,944,373 | 257,127 | 13,514 | 8,215,014 | 465,228 | 3,157,696 | 192,358,518 |

*Greenwood Smelter.*—The plant of the British Columbia Copper Company at Greenwood, B.C., includes three large furnaces, having a total daily capacity of from 2,400 to 2,500 tons.

The last annual report of the Company covers the fiscal period from December 1, 1911, to December 31, 1912. Frederick Keffer, Acting General Manager, reports that "The smelter ran steadily throughout the year, handling a larger tonnage than for any equal period in its history. During the first two and a half months, until a sufficient supply of coke was secured for the entire plant, only two furnaces were operated. The total tons smelted for the thirteen months of the fiscal year were 740,589, as compared with a total tonnage of 608,945 for the twelve months of the fiscal year of 1911. The sources of the ore smelted were:—

| | | |
|---|---|---|
| B. C. Copper Co.'s ores | 443,022 | tons. |
| Custom ores | 284,575 | " |
| Converter slags | 12,992 | " |
| Total | 740,589 | tons. |

The coke consumed was 103,154 tons.

The converter slags included:—

| | | |
|---|---|---|
| B. C. Copper Co.'s ores | 914 | tons. |
| Custom ores | 4,104 | " |
| Clay | 1,205 | " |
| | 6,223 | tons. |

There were produced 11,259,140 pounds of blister copper, containing:—

25,862·681 ounces of gold.
142,025·66 " " silver.
11,146,811 pounds of fine copper.

No material additions were made to the plant during the year, the machinery as a whole being maintained in its normal condition.

It is planned to use basic instead of acid linings for the converters should this be found practicable without material additions to the plant. Through decreased costs for clay, and elimination of labour in relining converters, it is probable that a decided reduction in the cost of converting can be effected."

*The Ladysmith Smelter.*—This smelter, owned by the Tyee Copper Company, was not operated during 1912.

*Anyox Smelter.*—At Anyox on Observatory inlet, Portland canal, the Granby Consolidated Mining, Smelting, and Power Co. is constructing a smelter to treat the ores from their Hidden Creek property. It is expected that this smelter will be ready for operation during 1913.