

CANADA
DEPARTMENT OF MINES
MINES BRANCH

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THE
PRODUCTION OF COPPER, GOLD, LEAD, NICKEL, SILVER, ZINC,
AND OTHER METALS

IN
CANADA

During the Calendar Year

1911

BY
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OTTAWA
GOVERNMENT PRINTING BUREAU
1912

THE PRODUCTION OF COPPER, GOLD, LEAD, NICKEL, SILVER, ZINC, AND OTHER METALS IN CANADA DURING THE CALENDAR YEAR 1911.

(Published as an advance chapter of the Annual Report on the Mineral Production of Canada during the Calendar Year 1911.)

COPPER.

The total production of copper in Canada in 1911, estimated on the basis of smelter recovery from ores treated, was 55,648,011 pounds, which at the average price of copper for the year in New York, 12.376 cents per pound, would be worth \$6,886,998.

The copper production in 1910, compiled on a similar basis, was estimated at 55,692,369 pounds, showing a slight decrease in production in 1911. The average New York price for copper in 1910 was 12.738 cents, the decrease in price being 0.362 cents or 2.8 per cent.

In the Province of British Columbia the copper production is mainly derived from ores carrying a very low content of copper metal. In the smelting of these ores the copper losses in slag are quite considerable, reaching as high, in some cases, as 25 per cent or more, of the copper content of the ore. With ores of this character there is, therefore, a wide difference between the copper content of ore shipped from the mine and the copper metal recovered by the smelters.

The statistics of copper production for the years previous to 1909 as given in Tables 1 and 2 include for British Columbia a record of the copper production in that Province as collected by the Provincial Bureau of Mines. These are compiled on the basis of the total metal content of the ores sent to smelters for which smelter returns were received during the year, and these show a relatively higher copper production than the figures published by the Province of Ontario, which are based on copper content of matte produced.

The independent collection of statistics on smelter production by the Mines Branch—through the courtesy of the smelter operators—has made possible the compilation and publication of statistics of production based on smelter recoveries as given above; thus providing for a more equitable comparison of the production of the several provinces, and the production of Canada generally, with other countries.

COPPER.—TABLE 1.

Production by Provinces 1909, 1910, and 1911.

| Provinces. | 1909.† | | 1910. | | 1911. | |
|---------------------|------------|-----------|------------|-----------|------------|-----------|
| | Lbs. | Value. | Lbs. | Value. | Lbs. | Value. |
| | | \$ | | \$ | | \$ |
| Quebec..... | 1,088,212 | 141,272 | 877,347 | 111,757 | 2,436,190 | 301,503 |
| Ontario..... | 15,746,699 | 2,044,237 | 19,259,016 | 2,453,213 | 17,932,263 | 2,219,297 |
| British Columbia... | 35,658,952 | 4,629,245 | 35,270,006 | 4,492,693 | 35,279,558 | 4,366,198 |
| Other districts* | ..... | ..... | 286,000 | 36,431 | ‡ | ..... |
| Total..... | 52,493,862 | 6,814,754 | 55,692,369 | 7,094,094 | 55,648,011 | 6,886,998 |

* Includes Nova Scotia and Yukon.

† The apparently large decrease in British Columbia copper production in 1909 as compared with 1908 is mainly due to the different basis of compilation adopted in 1909, for explanation of which see the text. The British Columbia copper production in 1909 based on copper content of ores sent to smelters was 45,597,245 pounds. (See Tables 8 and 9).

‡ A shipment is reported from New Brunswick.

With the exception of a small output of copper sulphate at Trail, B.C., the copper production of Canada is practically all exported. The exports of copper in ore, matte, regulus, etc., from Canada during the calendar year, 1911, are reported by the Customs Department as 55,208,054 pounds, of which 49,202,456 pounds were exported to the United States, and 6,003,818 pounds to Great Britain.

The exports in 1910 were recorded as 56,964,127 pounds. These figures agree fairly closely with the statistics of smelter recovery.

Prices.—The average monthly prices in cents per pound of electrolytic copper in New York are shown for a period of five years in the accompanying table.

Monthly Average Prices of Electrolytic Copper in New York.

| Months. | 1907. | 1908. | 1909. | 1910. | 1911. |
|--------------------|--------|--------|--------|--------|--------|
| | Cts. | Cts. | Cts. | Cts. | Cts. |
| January | 24·404 | 13·726 | 13·893 | 13·620 | 12·295 |
| February | 24·869 | 12·905 | 12·949 | 13·332 | 12·256 |
| March | 25·065 | 12·704 | 12·387 | 13·255 | 12·139 |
| April | 24·224 | 12·743 | 12·563 | 12·733 | 12·019 |
| May | 24·048 | 12·598 | 12·893 | 12·550 | 11·989 |
| June | 22·665 | 12·675 | 13·214 | 12·404 | 12·385 |
| July | 21·130 | 12·702 | 12·880 | 12·215 | 12·463 |
| August | 18·356 | 13·462 | 13·007 | 12·490 | 12·405 |
| September | 15·565 | 13·388 | 12·870 | 12·379 | 12·201 |
| October | 13·169 | 13·354 | 12·700 | 12·553 | 12·189 |
| November | 13·391 | 14·130 | 13·125 | 12·742 | 12·616 |
| December | 13·163 | 14·111 | 13·298 | 12·581 | 13·532 |
| Yearly average.... | 20·004 | 13·208 | 12·982 | 12·738 | 12·376 |

In London, the monthly average prices of standard copper were as shown hereunder in £ per ton of 2,240 pounds.

Monthly Average Prices of Standard Copper in London.

| Months. | 1907. | 1908. | 1909. | 1910. | 1911. |
|------------------|---------|--------|--------|--------|--------|
| | £ | £ | £ | £ | £ |
| January..... | 106·739 | 62·386 | 57·688 | 60·923 | 55·604 |
| February..... | 107·356 | 58·736 | 61·197 | 59·388 | 54·970 |
| March..... | 106·694 | 58·761 | 56·231 | 59·214 | 54·704 |
| April..... | 98·625 | 58·331 | 57·363 | 57·238 | 54·035 |
| May..... | 102·375 | 57·387 | 59·338 | 56·313 | 54·313 |
| June..... | 97·272 | 57·842 | 59·627 | 55·310 | 56·368 |
| July..... | 95·010 | 57·989 | 58·556 | 54·194 | 56·670 |
| August..... | 79·679 | 60·500 | 59·393 | 55·733 | 56·264 |
| September..... | 68·375 | 60·338 | 59·021 | 55·207 | 55·253 |
| October..... | 60·717 | 60·139 | 57·551 | 56·722 | 55·176 |
| November..... | 61·226 | 63·417 | 58·917 | 57·634 | 57·253 |
| December..... | 60·113 | 62·943 | 59·906 | 56·069 | 62·063 |
| Yearly average.. | 87·007 | 59·902 | 58·732 | 57·054 | 55·973 |

The price of copper in New York varied between 13½ cents per pound in December and a minimum of 11 cents in May.

Statistics showing the annual copper production in Canada since 1886 are given in Table 2, which shows the yearly increase or decrease, as the case may be, and also the yearly price per pound in New York.

COPPER.—TABLE 2.

Annual Production.

| Calendar Year. | Lbs. | Increase or decrease. | | Value. | Increase or decrease. | | Average price per pound. |
|----------------|------------|-----------------------|-------|------------|-----------------------|--------|--------------------------|
| | | Lbs. | % | | \$ | % | |
| | | | | \$ | | | Cts. |
| 1886..... | 3,505,000 | | | 385,530 | | | 11·00 |
| 1887..... | 3,260,424 | (d) 244,576 | 6·99 | 366,798 | (d) 18,752 | 4·86 | 11·25 |
| 1888..... | 5,562,864 | 2,302,440 | 70·60 | 927,107 | 560,309 | 152·70 | 16·66 |
| 1889..... | 6,809,752 | 1,246,888 | 22·40 | 936,341 | 9,234 | 0·99 | 13·75 |
| 1890..... | 6,013,671 | (d) 796,081 | 11·69 | 947,153 | 10,812 | 1·15 | 15·75 |
| 1891..... | 9,529,401 | 3,515,730 | 58·46 | 1,226,703 | 279,550 | 29·51 | 12·87 |
| 1892..... | 7,087,275 | 2,442,126 | 25·63 | 818,580 | (d) 408,123 | 33·27 | 11·55 |
| 1893..... | 8,109,856 | 1,022,381 | 14·40 | 871,809 | 53,229 | 6·50 | 10·75 |
| 1894..... | 7,708,789 | (d) 401,067 | 4·94 | 736,960 | (d) 134,849 | 15·46 | 9·56 |
| 1895..... | 7,771,639 | 62,850 | 0·81 | 836,228 | 99,268 | 13·47 | 10·76 |
| 1896..... | 9,393,012 | 1,621,373 | 20·85 | 1,021,960 | 185,732 | 22·21 | 10·88 |
| 1897..... | 13,300,802 | 3,907,790 | 41·60 | 1,501,660 | 479,700 | 46·34 | 11·29 |
| 1898..... | 17,747,136 | 4,446,334 | 33·43 | 2,134,980 | 633,320 | 42·17 | 12·03 |
| 1899..... | 15,078,475 | (d) 2,668,661 | 15·04 | 2,655,319 | 520,339 | 24·37 | 17·61 |
| 1900..... | 18,937,138 | 3,858,663 | 25·59 | 3,065,922 | 410,603 | 15·46 | 16·19 |
| 1901..... | 37,827,019 | 18,889,881 | 99·75 | 6,096,581 | 3,030,659 | 98·84 | 16·117 |
| 1902..... | 38,804,259 | 977,240 | 2·58 | 4,511,383 | (d) 1,585,198 | 26·00 | 11·626 |
| 1903..... | 42,684,454 | 3,880,195 | 10·00 | 5,649,487 | 1,138,104 | 25·23 | 13·235 |
| 1904..... | 41,383,722 | (d) 1,300,732 | 3·05 | 5,306,635 | (d) 342,852 | 6·07 | 12·823 |
| 1905..... | 48,092,753 | 6,709,031 | 16·21 | 7,497,660 | 2,191,025 | 41·29 | 15·590 |
| 1906..... | 55,609,888 | 7,517,135 | 15·63 | 10,720,474 | 3,222,814 | 42·98 | 19·278 |
| 1907..... | 56,579,205 | 1,369,317 | 2·46 | 11,398,120 | 677,654 | 6·32 | 20·004 |
| 1908..... | 63,702,873 | 6,723,668 | 11·80 | 8,413,876 | 2,984,244 | 26·18 | 13·208 |
| 1909*..... | 52,493,863 | | | 6,814,754 | | | 12·982 |
| 1910..... | 55,692,369 | 3,198,506 | 6·09 | 7,094,094 | 279,340 | 4·10 | 12·738 |
| 1911..... | 55,648,011 | (d) 44,358 | 0·79 | 6,886,998 | (d) 207,096 | 2·92 | 12·376 |

* The decrease is not as large as the figures would indicate because of the calculation of part of the 1909 production on a different basis from previous years. (See explanation in text).

Statistics of the exports of copper as collected by the Customs Department are shown in Table 3, and statistics of imports in Tables 4 and 5. The total imports of copper in so far as weights are given, amounted during the fiscal year ending March, 1911, to 30,586,768 pounds. During the calendar year, 1911, the total imports were valued at \$4,936,769, and included crude and manufactured copper to the extent of 37,352,237 pounds, valued at \$4,721,480, together with other copper manufactures valued at \$215,289, of which the quantity is not stated. In detail these imports comprise crude copper (pigs, ingots, scrap, blocks, etc.), 8,112,387 pounds, valued at \$823,374; copper in bars, rods, coils, etc., 25,495,400 pounds, valued at \$3,272,478; copper in strips, sheets or plates, 2,826,100 pounds, valued at \$434,574; copper tubing, etc., 562,826 pounds, valued at \$113,949; and copper wire, 355,524 pounds, valued at \$77,105.

COPPER.—TABLE 3.
Exports of Copper in Ore, Matte, etc.

| Calendar Year. | Lbs. | Value. | Calendar Year. | Lbs. | Value. |
|----------------|------------|---------|----------------|------------|-----------|
| | | \$ | | | \$ |
| 1885..... | | 262,600 | 1899..... | 11,371,766 | 1,199,908 |
| 1886..... | | 249,259 | 1900..... | 23,631,523 | 1,741,885 |
| 1887..... | | 137,966 | 1901..... | 32,488,872 | 3,404,908 |
| 1888..... | | 237,260 | 1902..... | 26,094,498 | 2,476,516 |
| 1889..... | | 168,457 | 1903..... | 38,364,676 | 3,873,827 |
| 1890..... | | 398,497 | 1904..... | 38,553,282 | 4,216,214 |
| 1891..... | | 348,104 | 1905..... | 40,740,861 | 5,443,873 |
| 1892..... | | 277,632 | 1906..... | 42,398,538 | 7,303,366 |
| 1893..... | 4,792,201 | 269,160 | 1907..... | 54,688,450 | 8,749,609 |
| 1894..... | 1,625,389 | 91,917 | 1908..... | 51,136,371 | 5,934,559 |
| 1895..... | 3,742,352 | 236,965 | 1909..... | 54,447,750 | 5,832,246 |
| 1896..... | 5,462,052 | 281,070 | 1910..... | 56,964,127 | 5,840,553 |
| 1897..... | 14,032,610 | 850,336 | 1911*..... | 55,208,051 | 5,459,770 |
| 1898..... | 11,572,381 | 840,243 | | | |

* Also 7,656 pounds 87,955, black or coarse and in pigs.

COPPER.—TABLE 4.

Imports of Pigs, Old, Scrap, etc.

| Fiscal Year. | Lbs. | Value. | Fiscal Year. | Lbs. | Value. |
|---|---------|--------|-------------------|-----------|---------|
| | | \$ | | | \$ |
| 1880..... | 31,900 | 2,130 | 1896... .. | 86,905 | 9,226 |
| 1881..... | 9,800 | 1,157 | 1897..... | 49,000 | 5,449 |
| 1882..... | 20,200 | 1,084 | 1898..... | 1,050,000 | 80,000 |
| 1883..... | 124,500 | 20,273 | 1899..... | 1,655,000 | 246,740 |
| 1884..... | 40,200 | 3,180 | 1900..... | 1,144,000 | 180,990 |
| 1885..... | 28,600 | 2,016 | 1901..... | 951,500 | 152,274 |
| 1886..... | 82,000 | 6,969 | 1902..... | 1,767,200 | 325,832 |
| 1887..... | 40,100 | 2,507 | 1903..... | 2,038,400 | 252,594 |
| 1888..... | 32,300 | 2,322 | 1904..... | 2,115,300 | 270,315 |
| 1889..... | 32,300 | 3,288 | 1905..... | 1,944,400 | 260,548 |
| 1890..... | 112,200 | 11,521 | 1906..... | 2,627,700 | 441,854 |
| 1891..... | 107,800 | 10,452 | 1907. (9 mos.) .. | 2,616,600 | 520,971 |
| 1892..... | 343,600 | 14,894 | 1908..... | 3,612,400 | 650,597 |
| 1893..... | 168,300 | 16,831 | 1909..... | 2,732,300 | 383,441 |
| 1894..... | 101,200 | 7,397 | 1910..... | 4,090,700 | 617,630 |
| 1895..... | 72,062 | 6,770 | 1911..... | 5,023,700 | 641,749 |
| 1911 { Copper, old and scrap or in blocks..... Duty free. | | | 366,800 41,128 | | |
| Copper in pigs or ingots..... Duty free. | | | 4,656,800 600,621 | | |
| Total | | | 5,023,700 641,749 | | |

COPPER.—TABLE 5.

Imports of Manufactures.

| Fiscal Year. | Value. | Fiscal Year. | Value. | Fiscal Year. | Value. |
|--------------|---------|--------------|-----------|-------------------|-----------|
| | \$ | | \$ | | \$ |
| 1880..... | 123,061 | 1891..... | 563,522 | 1902..... | 1,281,522 |
| 1881..... | 150,163 | 1892..... | 422,870 | 1903..... | 1,291,635 |
| 1882..... | 220,235 | 1893..... | 458,715 | 1904..... | 1,101,610 |
| 1883..... | 247,141 | 1894..... | 175,404 | 1905..... | 1,775,881 |
| 1884..... | 134,534 | 1895..... | 251,615 | 1906..... | 2,660,303 |
| 1885..... | 181,469 | 1896..... | 285,220 | 1907 (9 mos)..... | 2,545,600 |
| 1886..... | 219,420 | 1897..... | 264,587 | 1908..... | 2,713,060 |
| 1887..... | 325,365 | 1898..... | 786,529 | 1909..... | 2,086,205 |
| 1888..... | 303,459 | 1899..... | 551,586 | 1910..... | 2,870,630 |
| 1889..... | 402,216 | 1900..... | 1,090,280 | 1911..... | 3,742,940 |
| 1890..... | 472,668 | 1901..... | 551,045 | | |

COPPER.—TABLE 5—Continued.

Imports of Manufactures.

| | Duty. | Lbs. | Value. |
|--|-------|------------|--------------|
| 1911. { Copper in bars and rods, in coils, or otherwise, in lengths not less than 6 feet, unmanufactured.... | Free. | 21,396,800 | \$ 2,845,060 |
| Copper, in strips, sheets or plates, not planished or coated, etc. | " | 3,372,800 | 536,862 |
| Copper tubing in lengths not less than 6 feet, and not polished, bent or otherwise manufactured ... | " | 517,911 | 106,416 |
| Copper rollers, for use in calico printing ..... | " | ..... | 20,361 |
| Copper and manufactures of :— | | | |
| Nails, tacks, rivets and burrs or washers | 30 % | ..... | 2,158 |
| Wire, plain, tinned or plated | 15 " | 275,557 | 64,720 |
| Wire cloth, etc. | 25 " | ..... | 7,175 |
| All other manufactures of, N.O.P. | 30 " | ..... | 160,188 |
| Total. .... |  | ..... | 3,742,940 |

Nova Scotia.

No copper was produced during the year, development work only being done.

New Brunswick.

A small shipment is reported from this Province.

Quebec.

The copper production of Quebec was as usual from the pyritic ores of the Eastern Townships. There was a large increase over 1910, the copper production for 1911 being 2,436,190 pounds, valued at \$301,503, representing the estimated recovery from 39,122 tons of ore and concentrates shipped containing some 3,123,189 pounds of copper.

Statistics of the copper production in this Province since 1886 are shown in Table 6.

COPPER.—TABLE 6.
Quebec:—Production.

| Calendar Year. | Lbs. | Value. | Calendar Year. | Lbs. | Value. |
|----------------|-----------|---------|----------------|-----------|---------|
| | | \$. | | | \$ |
| 1886..... | 3,340,000 | 367,400 | 1899..... | 1,632,560 | 287,494 |
| 1887..... | 2,937,900 | 330,514 | 1900..... | 2,220,000 | 359,418 |
| 1888..... | 5,562,864 | 927,107 | 1901..... | 1,527,442 | 246,178 |
| 1889..... | 5,315,000 | 730,813 | 1902..... | 1,640,000 | 190,666 |
| 1890..... | 4,710,606 | 741,920 | 1903..... | 1,152,000 | 152,467 |
| 1891..... | 5,401,704 | 695,469 | 1904..... | 1,760,000 | 97,455 |
| 1892..... | 4,883,480 | 564,042 | 1905..... | 621,243 | 252,752 |
| 1893..... | 4,468,352 | 489,318 | 1906..... | 1,981,169 | 381,930 |
| 1894..... | 2,176,430 | 208,067 | 1907..... | 1,517,990 | 303,659 |
| 1895..... | 2,242,462 | 241,288 | 1908..... | 1,282,024 | 169,330 |
| 1896..... | 2,407,200 | 261,903 | 1909..... | 1,088,212 | 141,272 |
| 1897..... | 2,474,970 | 279,424 | 1910..... | 877,347 | 111,757 |
| 1898..... | 2,100,235 | 252,658 | 1911..... | 2,436,190 | 301,503 |

Ontario.

There is as yet comparatively little copper production in this Province besides that obtained from the nickel-copper ores of the Sudbury district. In 1911, productive operations were carried on by the Canadian Copper Company at the Creighton and Crean Hill mines, and by the Mond Nickel Company at Victoria mines.

The Ontario Government pays a bounty on copper over 95 per cent pure metal and on copper sulphate, produced from ore mined and refined in the Province. The text of the Act will be found in the chapter on cobalt under the heading 'Metal Refining Bounty Act.'

The total production of nickel-copper ore in 1911 was 610,834 tons. There were produced during the year 32,607 tons of Bessemer matte, containing 8,966 tons of copper and 17,049 tons of nickel, the shipping value of the matte being approximately \$4,945,592.

Details of the production from these ores are given more completely, and in tabular form in the article on nickel, and also under smelter production. Statistics of the copper production of Ontario since 1886 are given in Table 7.

COPPER.—TABLE 7.

Ontario:—Production.

| Calendar Year. | Lbs. | Value. | Calendar Year. | Lbs. | Value. |
|----------------|-----------|-----------|----------------|------------|-----------|
| | | \$ | | | \$ |
| 1886..... | 165,000 | 18,150 | 1899..... | 5,723,324 | 1,007,877 |
| 1887..... | 322,524 | 36,284 | 1900..... | 6,740,058 | 1,091,215 |
| 1888..... | Nil | Nil. | 1901..... | 8,695,831 | 1,401,507 |
| 1889..... | 1,466,752 | 201,678 | 1902..... | 7,408,202 | 861,278 |
| 1890..... | 1,303,065 | 205,233 | 1903..... | 7,172,533 | 949,285 |
| 1891..... | 4,127,697 | 531,234 | 1904..... | 4,913,594 | 650,070 |
| 1892..... | 2,203,795 | 254,538 | 1905..... | 8,779,259 | 1,368,686 |
| 1893..... | 3,641,504 | 391,461 | 1906..... | 10,633,231 | 2,050,338 |
| 1894..... | 5,207,679 | 497,854 | 1907..... | 14,104,337 | 2,821,432 |
| 1895..... | 4,576,337 | 492,414 | 1908..... | 15,005,171 | 1,981,883 |
| 1896..... | 3,167,256 | 344,598 | 1909..... | 15,746,699 | 2,044,237 |
| 1897..... | 5,500,652 | 621,023 | 1910..... | 19,259,016 | 2,453,213 |
| 1898..... | 8,375,223 | 1,007,539 | 1911..... | 17,932,263 | 2,219,297 |

British Columbia.

According to the returns received from smelters, the total quantity of copper contained in matte, blister, and copper sulphate produced in British Columbia smelters during 1911, and including an estimate of smelter recovery for the copper ores exported, was 35,279,558 pounds, after deducting the amount of copper produced from foreign ores. The production in 1910 on a similar basis was 35,270,006 pounds, and in 1909, 35,658,952 pounds. Returns of smelter pro-

duction in this Province were not collected by this Department previous to 1908, and a complete record of statistics of production on this basis is not available.

The production of copper in this Province according to statistics collected and published by the Provincial Department of Mines, reached a total of 36,927,656 pounds in 1911, as compared with 38,243,934 pounds in 1910. Statistics of the annual production since 1894, as ascertained by the Provincial Department of Mines, are shown in Table 8, and by districts since 1906, in Table 9.

According to direct returns in 1911, the ores of the Boundary district produced about 58.2 per cent of the total, the Rossland mines about 10.4 per cent, and the Coast district 31.4 per cent.

COPPER.—TABLE 8.

British Columbia:—Copper Content of Ores Shipped.†

| Calendar Year. | Copper contained in ores, shipped. | Increase. | | Value. |
|----------------|--|------------|--------|-----------|
| | Lbs. | Lbs. | % | |
| | | | | \$ |
| 1894 | 324,680 | | | 31,039 |
| 1895 | 952,840 | 628,160 | 193.00 | 102,526 |
| 1896 | 3,818,556 | 2,865,716 | 301.00 | 415,459 |
| 1897 | 5,325,180 | 1,506,624 | 39.00 | 691,213 |
| 1898 | 7,271,678 | 1,946,498 | 36.00 | 874,783 |
| 1899 | 7,722,591 | 450,913 | 6.00 | 1,359,948 |
| 1900 | 9,977,080 | 2,254,489 | 29.00 | 1,615,289 |
| 1901 | 27,693,746 | 17,626,666 | 177.00 | 4,448,896 |
| 1902 | 29,636,057 | 2,032,311 | 7.00 | 3,445,488 |
| 1903 | 34,359,921 | 4,723,864 | 16.00 | 4,547,735 |
| 1904 | 35,710,128 | 1,350,207 | 3.7 | 4,579,110 |
| 1905 | 37,692,251 | 1,982,123 | 5.6 | 5,876,222 |
| 1906 | 42,990,488 | 5,298,237 | 14.1 | 8,287,706 |
| 1907 | 40,832,720 | *2,157,768 | *5.02 | 8,168,177 |
| 1908 | 47,274,614 | 6,441,894 | 15.8 | 6,244,031 |
| 1909 | 45,597,245 | *1,677,869 | *3.6 | 5,918,522 |
| 1910† | 38,243,934 | | | 4,871,512 |
| 1911 | 36,927,656 | *1,316,278 | *3.4 | 4,571,644 |

* Decrease. † As published by British Columbia Bureau of Mines. ‡ Allowing 5 pounds copper per ton for smelter losses.

COPPER.—TABLE 9.

British Columbia:—Production* by Districts.

| | 1906. | 1907. | 1908. | 1909. | 1910.† | †1911. |
|----------------------|------------|------------|------------|------------|------------|------------|
| | Lbs. | Lbs. | Lbs. | Lbs. | Lbs. | Lbs. |
| Cassiar | 293,269 | 674,887 | 490,873 | 137,651 | ..... | 19,151 |
| East Kootenay..... | 6,910 | ..... | ..... | ..... | ..... | ..... |
| West Kootenay— | | | | | | |
| Nelson..... | 216,034 | 434,222 | 53,243 | 186,572 | 231,936 | ..... |
| Slocan..... | 2,861 | ..... | ..... | ..... | ..... | ..... |
| Trail Creek..... | 4,750,110 | 5,080,275 | 5,042,244 | 3,509,909 | 3,577,745 | 3,429,702 |
| All other..... | 1,145 | ..... | ..... | ..... | ..... | ..... |
| Yale— | | | | | | |
| Boundary..... | 32,226,732 | 31,521,550 | 40,178,521 | 40,603,042 | 31,354,985 | 22,327,359 |
| Ashcroft..... | 355,377 | 38,706 | 3,269 | ..... | 1,178 | 152,723 |
| Kamloops..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Coast districts..... | 5,138,000 | 3,083,080 | 1,506,464 | 1,160,071 | 3,078,090 | 10,993,721 |
| Total..... | 42,990,468 | 40,832,720 | 47,274,614 | 45,597,245 | 38,243,934 | 36,927,656 |

* Copper content of ores shipped. † After deducting five pounds of copper per ton of ore for slag losses.

The low grade ores of the Boundary district, in addition to being self-fluxing, are remarkably uniform in character, ranging from 1 to 2 per cent in copper, and from \$1 to \$2 in gold and silver. In this district the greater part of the production has been obtained from the properties of the four principal companies: The Granby Consolidated Mining, Smelting, and Power Company, Limited; The British Columbia Copper Company, Limited; The Consolidated Mining and Smelting Company of Canada, Limited, and the New Dominion Copper Company, Limited. The last named is controlled by the British Columbia Copper Company. The first three Companies operated their own smelters, and the first two convert their matte into blister copper.

The approximate ore shipments during 1911, and the total shipments of the chief producers to the end of 1911, were as follows:—

| | 1911. | Total. |
|---|---------|-----------|
| Granby Consolidated Mining, Smelting & Power Co., Ltd. | 505,880 | 7,415,880 |
| British Columbia Copper Co., Ltd..... | 366,485 | 2,751,485 |
| Dominion Copper Co., Ltd..... | 182,697 | 831,697 |
| Consolidated Mining and Smelting Co., of Canada, Ltd..... | 30,000 | 613,000 |

The Granby Company's mines at Phoenix are equipped for a daily output of about 5,000 tons. At the Company's smelter at Grand Forks, about 630,000 tons of ore were treated during the year 1911, producing about 11,400,000 pounds of copper.

The large falling off was due to the strike among the miners of the Crowsnest Pass coal district, causing a cessation of fuel supply, and though an attempt was made to secure eastern coke, it was found too costly and the Granby smelter was, therefore, closed for nearly five months of the year. The other smelters were

also adversely affected. The chief mines shipping were: the Granby mines; the Mother Lode, Emma, and Wellington of the British Columbia Copper Co.; the Rawhide and Athelstan of the New Dominion Copper Co., and the Snowshoe of the Consolidated Mining and Smelting Co.

Next to the Boundary, the Coast district was the most important copper producer of the year, due mainly to the greatly increased output of the Britannia and Marble Bay mines, especially of the former.

Rossland's gold-copper ores, though most valuable for their gold content, form another important source of the copper supply of the Province. Some shipments were also made from Kamloops. On the Coast a considerable amount of development is being carried on, the most important being on Alice arm, Observatory inlet, where the Granby Consolidated Mining, Smelting & Power Co. are doing extensive work on their Hidden Creek property, near which on Granby bay they are also erecting a smelter for their own and customs ores.

Yukon District.

No shipments of copper ores are reported from this district during 1911.

GOLD.

Refined Metal.—Gold bullion is received, assayed, and purchased at the Assay Office in Vancouver, operated in connexion with this Department, the bullion being resold. The total quantity of bullion thus received during the twelve months ending December 31, 1911, was 39,069.31 ounces, being the weight after melting, valued at \$647,416.38, after deducting assay charges.

A refinery has been erected at the Royal Mint at Ottawa, and small shipments of gold have been received from different provinces, but at present the greater part of the Canadian gold finds its way to the United States refineries or to the United States Mint.

There is but one other refinery in Canada producing fine gold; that at Trail, established in 1904, operated by the Consolidated Mining and Smelting Company of Canada, Limited, the annual output of which in ounces of fine gold for the years 1904-1911 is shown below. The gold is recovered from the ores treated in the lead furnaces.

Production of Refined Gold at Trail, B.C.

| Year. | Ozs. |
|------------|--------|
| 1904 | 4,336 |
| 1905..... | 8,602 |
| 1906..... | 9,993 |
| 1907..... | 10,395 |
| 1908..... | 15,346 |
| 1909..... | 18,241 |
| 1910..... | 13,298 |
| 1911..... | 15,270 |

Mine Production.—The production of gold in Canada—made up of gold derived from alluvial workings, gold obtained from the crushing of free milling quartz ores, and the gold obtained from other metalliferous ores sent to copper and lead smelters, etc.—reached a total, in 1911, of 473,159 fine ounces, valued at \$9,781,077, as compared with 493,707 fine ounces, valued at \$10,205,835, produced in 1910, a decrease of 20,548 ounces in quantity and \$424,758 in value, or 4.16 per cent.

The production by provinces in 1909, 1910, and 1911 is shown in Table 1 as follows:—

GOLD.—TABLE 1.
Production by Provinces, 1909, 1910, and 1911.

| | 1909. | | 1910. | | 1911. | |
|-----------------------|---------------|-----------|---------------|-----------|---------------|-----------|
| | Ozs. (fine ‡) | Value. | Ozs. (fine ‡) | Value. | Ozs. (fine ‡) | Value. |
| | | \$ | | \$ | | \$ |
| Nova Scotia..... | (b) 10,193 | 210,711 | 7,928 | 163,891 | 7,781 | 160,854 |
| Quebec..... | (b) 193 | 3,990 | 124 | 2,565 | (a,b) 613 | 12,672 |
| Ontario..... | (b) 1,569 | 32,425 | 3,089 | 63,849 | 2,062 | 42,625 |
| Alberta..... | (a) 25 | 525 | 89 | 1,850 | 10 | 207 |
| British Columbia..... | (c) 250,320 | 5,174,579 | 261,386 | 5,403,318 | 238,406 | 4,930,145 |
| Yukon..... | (a) 191,565 | 3,960,000 | 221,091 | 4,570,362 | 224,197 | 4,654,574 |
| Totals..... | | 453,865 | 9,382,230 | 493,707 | 10,205,835 | 473,159 |
| | | | | | | 9,781,077 |

‡ Calculated from the value: one dollar = 0.048375 ozs.

(a) Placer gold.

(b) Gold from vein mining.

| | 1909. | 1910. | 1911. |
|--|-----------|-----------|-----------|
| | \$ | \$ | \$ |
| (c) As follows: Gold from placer mining..... | 477,000 | 540,000 | 426,000 |
| Gold from vein mining..... | 4,697,579 | 4,863,318 | 4,504,145 |
| | 5,174,579 | 5,403,318 | 4,930,145 |

The exact value of fine gold is $\frac{833\frac{1}{3}}{375}$ dollars per ounce equivalent to \$20.671834. (United States Standard.)

In most cases, statistics of gold production are stated as crude bullion with value thereof. The fine ounces given in the tables in this report are calculated from the values by multiplying these by $\frac{375}{833\frac{1}{3}}$ or 0.048375.

Of the total production in 1911, about \$5,014,207 or 51.3 per cent is to be attributed to alluvial workings, \$513,991 or 5.2 per cent derived from stamp milling, and \$4,252,879 or 43.5 per cent obtained from ores sent to the smelters. There was a general decrease in all the provinces except Quebec and Yukon, which show a gain.

Statistics of the annual gold production of Canada are shown in Table 2.

GOLD.—TABLE 2.

Annual Production in Canada, 1858-1911.

| Calendar Year. | Ozs. (fine †) | Value. | Calendar Year. | Ozs. (fine †) | Value. |
|----------------|---------------|-----------|----------------|---------------|-------------|
| | | \$ | | | \$ |
| 1858. | 34,104 | 705,000 | 1885 | 55,575 | 1,143,829 |
| 1859. | 78,129 | 1,615,072 | 1886. | 70,782 | 1,463,196 |
| 1860. | 107,806 | 2,228,543 | 1887. | 57,460 | 1,187,804 |
| 1861. | 123,973 | 2,666,118 | 1888. | 53,145 | 1,098,610 |
| 1862. | 135,391 | 2,798,774 | 1889. | 62,653 | 1,295,159 |
| 1863. | 202,498 | 4,186,011 | 1890. | 55,620 | 1,149,776 |
| 1864. | 199,605 | 4,126,199 | 1891. | 45,018 | 930,614 |
| 1865. | 192,898 | 3,987,562 | 1892. | 43,905 | 907,601 |
| 1866. | 152,555 | 3,153,597 | 1893. | 47,243 | 976,603 |
| 1867. | 145,775 | 3,013,431 | 1894. | 54,600 | 1,128,688 |
| 1868. | 134,169 | 2,773,527 | 1895. | 100,798 | 2,083,674 |
| 1869. | 102,720 | 2,123,405 | 1896. | 133,262 | 2,754,774 |
| 1870. | 83,415 | 1,724,348 | 1897. | 291,557 | 6,027,016 |
| 1871. | 105,187 | 2,174,412 | 1898. | 666,386 | 13,775,420 |
| 1872. | 90,283 | 1,866,321 | 1899. | 1,028,529 | 21,261,584 |
| 1873. | 74,346 | 1,536,871 | 1900. | 1,350,057 | 27,908,153 |
| 1874. | 97,856 | 2,022,862 | 1901. | 1,167,216 | 24,128,503 |
| 1875. | 130,300 | 2,693,533 | 1902. | 1,032,161 | 21,336,667 |
| 1876. | 97,729 | 2,020,233 | 1903. | 911,559 | 18,843,590 |
| 1877. | 94,304 | 1,949,444 | 1904. | 796,374 | 16,462,517 |
| 1878. | 74,420 | 1,538,394 | 1905. | 684,951 | 14,159,195 |
| 1879. | 76,547 | 1,582,358 | 1906. | 556,415 | 11,502,120 |
| 1880. | 63,121 | 1,304,824 | 1907. | 405,517 | 8,382,780 |
| 1881. | 63,524 | 1,313,153 | 1908. | 476,112 | 9,842,105 |
| 1882. | 60,283 | 1,246,268 | 1909. | 453,865 | 9,382,230 |
| 1883. | 53,853 | 1,113,246 | 1910. | 493,707 | 10,205,835 |
| 1884. | 51,202 | 1,058,439 | 1911. | 473,159 | 9,781,077 |
| | | | | 14,398,624 | 297,646,065 |

†Calculated from the value: One dollar=0.048375.

It will be observed that previous to 1897 the production only twice exceeded \$4,000,000, the maximum during the period being, in 1863, when the output reached \$4,186,011. The discovery in 1896 of the rich placer deposits of the Yukon, however, caused a rapid increase in the production for the next four years, a record maximum being reached in 1900, when the total was only a little less than \$28,000,000. The following year showed a falling off in the Yukon output, as did each succeeding year until 1908. The Yukon production in 1909, 1910, and 1911 has shown an increase, and the total for Canada seems to have an upward tendency, though there is a decrease in the year 1911.

Nova Scotia.

The gold production of Nova Scotia, which is derived almost entirely from quartz ores, was 7,781 fine ounces, valued at \$160,854.

The principal operators in 1911 were:—

United Finance Co., Carleton.

Caribou Gold Mines, Caribou.

Albert Logan, Caribou.

Stillwater Mining Co., Moose River.
 Tributors, Moose River.
 Malcolm McLeod et al., Fifteenmile Stream.
 H. C. Borden et al., Fifteenmile Brook.
 Uniac Mines and Power Co., Gold River.
 E. F. Walton, Kemptville.
 Petpeswick Mining Co., Lake Catcha.
 W. F. Fancy et al., Malaga.
 Nova Scotia Gold Mines, Montagu.
 W. A. Brennan, Oldham.
 Tributors, Oldham.
 New England Mining Co., Stormont.
 Sydney Gold Mining Co., Stormont.
 Seal Harbour Leasing Co., Stormont.
 Boston and Goldenville Mining Co., Shiers Point.
 West Gore Antimony Company, West Gore.
 Dominion Leasing Co., Tangier.
 E. E. Fraser, Mooseland.
 Great Bras d'Or Gold Mining Co., Middle River.
 M. J. O'Brien, Renfrew.

Statistics of the annual production since 1862 are shown in Table 3, and the production of gold by districts during the twelve months ending September 30, 1911, as collected and published by the Provincial Mines Department, in Table 4, while the total production from 1862 to 1911, by districts, according to the same authority, is shown in Table 5.

GOLD.—TABLE 3.

Nova Scotia:—Annual Production.

| | Tons. treated. | Ozs. (fine). | Value. | Yield of gold per ton. | | Tons. treated. | Ozs. (fine). | Value. | Yield of gold per ton. |
|--------|-------------------|--------------|---------|------------------------------|--------|-------------------|--------------|---------|------------------------------|
| | | | \$ | \$ | | | | \$ | \$ |
| 1862.. | 6,473 | 6,863 | 141,871 | 21.91 | 1887.. | 32,280 | 20,009 | 413,631 | 12.81 |
| 1863.. | 17,000 | 13,180 | 272,448 | 16.02 | 1888.. | 36,178 | 21,137 | 436,939 | 12.08 |
| 1864.. | 21,431 | 18,883 | 390,349 | 18.21 | 1889.. | 39,160 | 24,673 | 510,029 | 13.02 |
| 1865.. | 24,421 | 24,011 | 496,357 | 20.32 | 1890.. | 42,749 | 22,978 | 474,990 | 11.11 |
| 1866.. | 32,157 | 23,776 | 491,491 | 15.28 | 1891.. | 36,351 | 21,841 | 451,503 | 12.42 |
| 1867.. | 31,384 | 25,763 | 532,563 | 16.96 | 1892.. | 32,552 | 18,865 | 389,965 | 11.98 |
| 1868.. | 32,259 | 19,377 | 400,555 | 12.41 | 1893.. | 42,354 | 18,436 | 381,095 | 8.99 |
| 1869.. | 35,144 | 16,855 | 348,427 | 19.91 | 1894.. | 55,357 | 18,834 | 389,338 | 7.04 |
| 1870.. | 30,824 | 18,740 | 387,392 | 12.56 | 1895.. | 60,600 | 21,919 | 453,119 | 7.47 |
| 1871.. | 30,787 | 18,139 | 374,972 | 12.17 | 1896.. | 69,169 | 23,876 | 493,568 | 7.13 |
| 1872.. | 17,089 | 12,352 | 255,349 | 14.94 | 1897.. | 73,192 | 27,195 | 562,165 | 7.68 |
| 1873.. | 17,708 | 11,180 | 231,122 | 13.05 | 1898.. | 82,747 | 26,054 | 538,590 | 6.50 |
| 1874.. | 13,844 | 8,623 | 178,244 | 12.87 | 1899.. | 112,226 | 29,876 | 617,604 | 5.50 |
| 1875.. | 14,810 | 10,576 | 218,629 | 14.76 | 1900.. | 87,390 | 28,955 | 598,553 | 6.85 |
| 1876.. | 15,490 | 11,300 | 233,585 | 15.08 | 1901.. | 91,948 | 26,459 | 546,963 | 5.32 |
| 1877.. | 17,369 | 15,925 | 329,205 | 18.95 | 1902.. | 93,042 | 30,348 | 627,357 | 6.68 |
| 1878.. | 17,989 | 11,864 | 245,253 | 13.63 | 1903.. | 103,856 | 25,533 | 527,806 | 5.08 |
| 1879.. | 15,936 | 12,980 | 268,328 | 16.83 | 1904.. | 45,436 | 10,362 | 214,209 | 4.71 |
| 1880.. | 13,997 | 12,472 | 257,823 | 18.42 | 1905.. | 57,774 | 13,707 | 283,363 | 4.90 |
| 1881.. | 16,556 | 10,147 | 209,755 | 12.66 | 1906.. | 66,059 | 12,223 | 252,676 | 3.82 |
| 1882.. | 21,081 | 13,307 | 275,090 | 13.04 | 1907.. | 58,550 | 13,675 | 282,686 | 4.82 |
| 1883.. | 25,954 | 14,571 | 801,207 | 11.60 | 1908.. | 61,536 | 11,842 | 244,799 | 3.97 |
| 1884.. | 25,186 | 15,168 | 313,554 | 12.44 | 1909.. | 56,790 | 10,193 | 210,711 | 3.71 |
| 1885.. | 28,890 | 20,945 | 432,971 | 14.98 | 1910.. | 43,006 | 7,928 | 163,891 | 3.81 |
| 1886.. | 29,010 | 22,038 | 455,564 | 15.70 | 1911.. | 18,328 | 7,781 | 160,854 | 8.78 |

Total fine ounces gold. 883,737
Total value. \$18,268,498

GOLD.—TABLE 4.

Nova Scotia:—District Details—Year ended September 30, 1911.

| District. | Tons crushed. | Total yield of gold. | | | Average yield of gold per ton. | | |
|---|------------------|----------------------|-------|-------|-----------------------------------|-------|-------|
| | | Ozs. | Dwts. | Grs. | Ozs. | Dwts. | Grs. |
| Stormont. | 5,733 | 2,615 | 2 | 19 | ..... | 9 | 2 |
| Wagamatcook | 125 | 23 | 4 | ..... | ..... | 3 | 17 |
| Uniacke. | 10 | ..... | 2 | ..... | ..... | ..... | 5 |
| Gold River. | 49 | 45 | 4 | 5 | ..... | 18 | 11 |
| Caribou | 754 | 850 | 4 | 18 | 1 | 2 | 13 |
| Caribou (Moose River). | 551 | 245 | 5 | 14 | ..... | 7 | 13 |
| Tangier | 5,202 | 1,746 | 13 | ..... | ..... | 6 | 17 |
| Oldham | 395 | 278 | 19 | 1 | ..... | 14 | 2 |
| Lake Catcha. | 863 | 320 | 5 | 8 | ..... | 7 | 10 |
| Fifteenmile Stream. | 242 | 155 | 7 | ..... | ..... | 12 | 20 |
| Fifteenmile Brook. | 250 | 25 | 15 | ..... | ..... | 2 | 1 |
| Kemptville. | 25 | 16 | 6 | ..... | ..... | 13 | 1 |
| Carleton. | 48 | 36 | 15 | 2 | ..... | 15 | 8 |
| Malaga Barrens. | 233 | 69 | 14 | 12 | ..... | 5 | 23 |
| Montagu. | 41 | 24 | 2 | ..... | ..... | 11 | 8 |
| Renfrew. | 3,493 | 1,527 | ..... | ..... | ..... | 8 | 18 |
| Shiers Point. | 14 | 7 | 6 | ..... | ..... | 10 | 10 |
| Sherbrook (Mortared). .... | ..... | 3 | 9 | ..... | ..... | ..... | ..... |
| | 18,128 | 7,990 | 15 | 7 | ..... | 8 | 20 |
| West Gore (Gold in concent- rates) | 191 | 398 | 16 | 21 | 2 | 1 | 18 |
| | 18,319 | 8,389 | 12 | 4 | ..... | 9 | 4 |

GOLD.—TABLE 5.

Nova Scotia:—Production of Gold from 1862 to 1911.

| District. | Tons crushed. | Total yield of gold. | | | Average yield of gold. | | | Value at \$19 per oz. |
|----------------------------|------------------|----------------------|-------|-------|---------------------------|-------|-------|--------------------------|
| | | Ozs. | Dwts. | Grs. | Ozs. | Dwts. | Grs. | |
| *Caribou and Moose River. | 217,647 | 58,881 | 3 | 6 | ..... | 5 | 9 | 118,742 |
| Montagu..... | 29,523 | 42,173 | 3 | 6 | ..... | 1 | 8 | 801,290 |
| Oldham..... | 53,421 | 67,215 | 17 | 22 | ..... | 1 | 3 | 1,277,102 |
| Renfrew..... | 58,411 | 47,325 | 17 | 19 | ..... | 16 | 5 | 899,192 |
| Sherbrooke..... | 300,213 | 153,090 | 1 | 4 | ..... | 10 | 5 | 2,908,711 |
| Stornont..... | 520,974 | 119,743 | 15 | 13 | ..... | 4 | 14 | 2,275,132 |
| Tangier..... | 60,262 | 27,069 | 6 | 19 | ..... | 9 | ..... | 514,317 |
| †Umiacke..... | 63,341 | 43,982 | 19 | 17 | ..... | 13 | 21 | 835,677 |
| Waverly..... | 155,520 | 69,980 | 10 | 16 | ..... | 9 | 0 | 1,329,630 |
| \|\| Brookfield..... | 93,527 | 33,709 | 2 | 2 | ..... | 8 | 7 | 735,473 |
| ‡ Salmon River.. | 118,819 | 41,852 | 5 | 20 | ..... | 7 | 1 | 795,193 |
| \|\| Whiteburn..... | 6,907 | 9,800 | 0 | 2 | ..... | 1 | 8 | 186,200 |
| \$ Lake Catcha..... | 28,065 | 27,306 | 11 | 17 | ..... | 19 | 11 | 518,825 |
| ¶ Rawdon..... | 12,189 | 9,606 | 5 | 10 | ..... | 15 | 18 | 182,519 |
| Wine Harbour..... | 77,396 | 34,992 | 15 | 11 | ..... | 9 | 1 | 664,863 |
| \|\|\| Fifteenmile Stream..... | 36,878 | 17,362 | 0 | 5 | ..... | 9 | 10 | 329,897 |
| Malaga..... | 22,924 | 20,305 | 12 | 6 | ..... | 17 | 17 | 385,806 |
| Other districts..... | 142,987 | 74,764 | 17 | 14 | ..... | 10 | 11 | 1,420,534 |
| | 2,004,006 | 904,163 | 6 | 7 | ... | 9 | 1 | 17,179,103 |
| Not included in above: | | | | | | | | |
| gold extracted from 1905 | 527 | 1,232 | 16 | 23 | 2 | 6 | 10 | 23,424 |
| or contained in stib- 1906 | 783 | 1,031 | 13 | 11 | 1 | 6 | 8 | 19,602 |
| nite or shipped from 1907 | 1,403 | 1,319 | 18 | 12 | ..... | 18 | 19 | 25,078 |
| West Gore, as per 1908 | 133 | 179 | 5 | 0 | 1 | 6 | 23 | 3,406 |
| returns..... 1909 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 1910 | 203 | 350 | 4 | 15 | 1 | 14 | 12 | 6,654 |
| 1911 | 191 | 398 | 16 | 21 | 2 | 1 | 18 | 7,578 |
| Total..... | 2,007,246 | 908,676 | 1 | 17 | ..... | 9 | 1 | 17,264,845 |

* From 1869. † From 1866. ‡ From 1883. § From 1887. \$ From 1882. ¶ From 1887.
|| From 1883.

The following notes with respect to operations during 1911, are taken from the report of the Provincial Department of Mines:—

"I regret to report that the amount of gold produced is the smallest since the production of the year 1862 and that the tonnage crushed is the smallest tonnage crushed since the year 1882. The direct causes of the small production of the year 1911 may be attributed to the closing down of the Richardson mine at Goldboro and the Oldham-Stirling mine at Oldham. These two mines have been in recent years the largest producers of bullion in the Province."

"Gold in this Province occurs in ore shoots or specially enriched zones in quartz veins both of the interbedded and fissure type, varying in width from one inch to several feet but usually from 2 inches to 24 inches. Carefully organized prospecting and developing operations carried on underground with strong financial backing are needed and for the individual or company that is prepared to undertake gold mining along these lines, Nova Scotia offers a promising field of operations."

Quebec.

The production of gold reported from this Province since 1903 has been almost entirely from the pyritic ores mined at Capelton and Eustis in the Eastern Townships. Very little gold has been obtained from the alluvial deposits of the St. Francis, Chaudière, and Gilbert rivers since 1894, when the output was returned as \$29,106. However, renewed activity in the installation of hydraulic plants has raised the alluvial gold production to an amount in excess of that from lode mining.

GOLD.—TABLE 6.

Quebec:—Annual Production.

| Calendar Year. | Ozs. (fine*). | Value. | Calendar Year. | Ozs. (fine*). | Value. |
|----------------|---------------|--------|----------------|---------------|---------|
| | | \$ | | | \$ |
| 1877.. | 583 | 12,037 | 1896.. | 145 | 3,000 |
| 1878.. | 868 | 17,937 | 1897.. | 44 | 900 |
| 1879.. | 1,160 | 23,972 | 1898.. | 295 | 6,089 |
| 1880.. | 1,605 | 33,174 | 1899.. | 238 | 4,916 |
| 1881.. | 2,741 | 56,661 | 1900.. | Nil. | Nil. |
| 1882.. | 827 | 17,093 | 1901.. | 145 | 3,000 |
| 1883.. | 860 | 17,787 | 1902.. | 391 | 8,073 |
| 1884.. | 422 | 8,720 | 1903.. | 180 | 3,712 |
| 1885.. | 103 | 2,120 | 1904.. | 140 | 2,900 |
| 1886.. | 193 | 3,981 | 1905.. | 191 | 3,940 |
| 1887.. | 78 | 1,604 | 1906.. | 165 | 3,412 |
| 1888.. | 181 | 3,740 | 1907.. | Nil. | Nil. |
| 1889.. | 58 | 1,207 | 1908.. | Nil. | Nil. |
| 1890.. | 65 | 1,350 | 1909.. | 193 | 3,990 |
| 1891.. | 87 | 1,800 | 1910.. | 124 | 2,565 |
| 1892.. | 628 | 12,987 | 1911.. | 613 | 12,672 |
| 1893.. | 759 | 15,696 | | | |
| 1894.. | 1,412 | 29,106 | | 15,556 | 322,162 |
| 1895.. | 62 | 1,281 | | | |

** Calculated from the value: one dollar = 0.048375 ozs.

Ontario.

The producing properties, in 1911, were:—

Cordova Mines, Ltd., Cordova mine, Peterborough Co.

Sturgeon Lake Development Co., St. Anthony mine, Sturgeon Lake.

Great Golconda Mines, Ltd., Laurentian mine, Gold Rock.

Kenora Mines, Ltd., Mikado mine, Kenora.

The Dome Mines Co., Ltd., Dome mine, Porcupine district.

The Hollinger Gold Mines, Ltd., Hollinger mine, Porcupine district.

American Eagle Mining Co., American Eagle, Porcupine district.

Swastika Mining Co., Ltd., Swastika mine, Porcupine district.

The past year has witnessed considerable activity in the Rainy River district. The Porcupine output would have been much greater had it not been for the fire causing such a lamentable loss of life and property. Statistics of production of gold in Ontario since 1887 are shown in Table 7, following:—

GOLD.—TABLE 7.

Ontario:—Annual Production.

| Calendar Year. | Ozs. (fine*). | Value. | Calendar Year. | Ozs. (fine*). | Value. |
|----------------|---------------|---------|----------------|---------------|-----------|
| | | \$ | | | \$ |
| 1887..... | 327 | 6,760 | 1901..... | 11,844 | 244,837 |
| 1888..... | Nil. | Nil. | 1902..... | 11,118 | 229,828 |
| 1889..... | Nil. | Nil. | 1903..... | 9,076 | 188,036 |
| 1890..... | Nil. | Nil. | 1904..... | 1,935 | 40,000 |
| 1891..... | 97 | 2,000 | 1905..... | 4,402 | 91,000 |
| 1892..... | 344 | 7,118 | 1906..... | 3,202 | 66,193 |
| 1893..... | 708 | 14,637 | 1907..... | 3,212 | 66,399 |
| 1894..... | 1,917 | 39,624 | 1908..... | 3,212 | 66,389 |
| 1895..... | 3,015 | 62,820 | 1909..... | 1,569 | 32,425 |
| 1896..... | 5,563 | 115,000 | 1910..... | 5,089 | 63,849 |
| 1897..... | 9,157 | 189,294 | 1911..... | 2,062 | 42,625 |
| 1898..... | 12,863 | 265,889 | | | |
| 1899..... | 20,394 | 421,591 | | 123,517 | 2,553,309 |
| 1900..... | 14,311 | 297,495 | | | |

* Calculated from the value : one dollar = 0.048375 ozs.

Alberta.

The value of gold derived from the placer deposits of the Saskatchewan river was, in 1909, \$525; in 1910, \$1,850; and in 1911, \$207.

Statistics of the production of gold from the Saskatchewan river since 1887 are shown in Table 8.

GOLD.—TABLE 8.

Alberta:—Annual Production.

| Calendar Year. | Ozs. (fine*). | Value. | Calendar Year. | Ozs. (fine*). | Value. |
|----------------|---------------|--------|----------------|---------------|---------|
| | | \$ | | | \$ |
| 1887..... | 102 | 2,100 | 1901..... | 726 | 15,000 |
| 1888..... | 58 | 1,200 | 1902..... | 484 | 10,000 |
| 1889..... | 967 | 20,000 | 1903..... | 48 | 1,000 |
| 1890..... | 193 | 4,000 | 1904..... | 24 | 500 |
| 1891..... | 266 | 5,500 | 1905..... | 121 | 2,500 |
| 1892..... | 508 | 10,506 | 1906..... | 39 | 800 |
| 1893..... | 466 | 9,640 | 1907..... | 33 | 675 |
| 1894..... | 726 | 15,300 | 1908..... | 50 | 1,037 |
| 1895..... | 2,419 | 50,000 | 1909..... | 25 | 525 |
| 1896..... | 2,661 | 55,000 | 1910..... | 89 | 1,850 |
| 1897..... | 2,419 | 50,000 | 1911..... | 10 | 207 |
| 1898..... | 1,209 | 25,000 | | | |
| 1899..... | 726 | 15,000 | | 14,611 | 302,040 |
| 1900..... | 242 | 5,000 | | | |

* Calculated from the value: one dollar = 0.048375 ozs.

British Columbia.

The gold production of British Columbia in 1911, as reported to the Department, amounted to \$4,930,145, comprising placer gold \$426,000, bullion from milling ores \$310,512, smelter recoveries \$4,193,633.

The placer production is as published by the Provincial Mining Bureau. The statistics for lode gold represent as closely as can be ascertained the actual gold recovery based on smelter recoveries and bullion shipments. This production is less than that published by the Provincial Bureau of Mines, which for lode gold is based on the gold content of ores shipped to smelters, etc. According to this authority the production for 1911 was \$5,151,513, as compared with \$6,073,380 in 1910, a decrease of \$921,867.

In lode mining, there were decreases in the Nelson, Trail Creek, and Boundary districts, while there was a large increase in the Coast gold production.

In alluvial gold recovery a general decrease was shown.

Of the 1911 production, 9 per cent was from alluvial workings; 6 per cent from free milling ores, and 85 per cent from ores sent to the smelters.

Statistics of the production by districts in 1911, as published by the Provincial Department of Mines, are shown in Table 9, while the total annual production since 1858 is given in Table 10.

GOLD.—TABLE 9.

British Columbia:—Production by Districts,* 1911.

| Districts. | GOLD PLACER. | | GOLD LOD. | |
|---------------------------|--------------|---------|-----------|-----------|
| | Ozs. | Value. | zs. | Value. |
| | | \$ | | \$ |
| Cariboo:— | | | | |
| Cariboo..... | 6,800 | 136,000 | | |
| Quesnel..... | 1,700 | 34,000 | | |
| Omineca..... | 500 | 10,000 | | |
| Cassiar:— | | | | |
| Atlin..... | 11,250 | 225,000 | 3 | 62 |
| All other..... | 300 | 6,000 | 500 | 10,335 |
| East Kootenay:— | | | | |
| Fort Steele..... | 150 | 3,000 | | |
| West Kootenay:— | | | | |
| Ainsworth..... | | | 4 | 83 |
| Nelson..... | 50 | 1,000 | 17,640 | 364,619 |
| Slocan..... | | | 47 | 971 |
| Trail Creek..... | | | 116,683 | 2,411,837 |
| Others..... | 100 | 2,000 | 57 | 1,178 |
| Lillooet..... | 250 | 5,000 | 71 | 1,467 |
| Yale:— | | | | |
| Grand Forks..... | 50 | 1,000 | 87,745 | 1,813,690 |
| Similkameen..... | 50 | 1,000 | | |
| Yale..... | 50 | 1,000 | 52 | 1,075 |
| Coast and all others..... | 50 | 1,000 | 5,815 | 120,196 |
| | 21,300 | 426,000 | 228,617 | 4,725,513 |

* From Annual Report of the Minister of Mines for British Columbia.

GOLD.—TABLE 10.

British Columbia:—Annual Production.

| Calendar Year. | Ozs. (fine†). | Value. | Calendar Year. | Ozs. (fine†). | Value. |
|----------------|---------------|-----------|----------------|---------------|-------------|
| | | \$ | | | \$ |
| 1858..... | 34,104 | 705,000 | 1886..... | 43,714 | 903,651 |
| 1859..... | 78,129 | 1,615,072 | 1887..... | 33,558 | 693,709 |
| 1860..... | 107,806 | 2,228,543 | 1888..... | 29,834 | 616,731 |
| 1861..... | 128,973 | 2,666,118 | 1889..... | 28,489 | 588,923 |
| 1862..... | 128,528 | 2,656,903 | 1890..... | 23,918 | 494,436 |
| 1863..... | 189,318 | 3,913,563 | 1891..... | 20,792 | 429,811 |
| 1864..... | 180,722 | 3,735,850 | 1892..... | 19,327 | 399,525 |
| 1865..... | 168,887 | 3,491,205 | 1893..... | 18,360 | 379,535 |
| 1866..... | 128,779 | 2,662,106 | 1894..... | 25,664 | 530,530 |
| 1867..... | 120,012 | 2,480,868 | 1895..... | 61,289 | 1,266,954 |
| 1868..... | 114,792 | 2,372,972 | 1896..... | 86,504 | 1,788,206 |
| 1869..... | 85,865 | 1,774,978 | 1897..... | 131,805 | 2,724,657 |
| 1870..... | 64,675 | 1,336,956 | 1898..... | 142,215 | 2,939,862 |
| 1871..... | 87,048 | 1,799,440 | 1899..... | 203,295 | 4,202,473 |
| 1872..... | 77,931 | 1,610,972 | 1900..... | 228,916 | 4,732,105 |
| 1873..... | 63,166 | 1,305,749 | 1901..... | 257,292 | 5,318,703 |
| 1874..... | 89,233 | 1,844,618 | 1902..... | 288,383 | 5,961,409 |
| 1875..... | 119,724 | 2,474,904 | 1903..... | 284,108 | 5,873,036 |
| 1876..... | 86,429 | 1,786,648 | 1904..... | 275,975 | 5,704,908 |
| 1877..... | 77,796 | 1,608,182 | 1905..... | 285,529 | 5,902,402 |
| 1878..... | 61,688 | 1,275,204 | 1906..... | 269,886 | 5,579,039 |
| 1879..... | 62,407 | 1,290,058 | 1907..... | 236,216 | 4,883,020 |
| 1880..... | 49,044 | 1,013,827 | 1908..... | 286,858 | 5,929,880 |
| 1881..... | 50,636 | 1,046,737 | 1909..... | 250,320 | 5,174,579 |
| 1882..... | 46,154 | 954,085 | 1910..... | 261,386 | 5,403,318 |
| 1883..... | 38,422 | 794,252 | 1911..... | 238,496 | 4,930,145 |
| 1884..... | 35,612 | 736,165 | | | |
| 1885..... | 34,527 | 713,738 | | | |
| | | | | 6,542,536 | 135,246,250 |

† Calculated from the value : one dollar = 0.048375 ozs.

The placer and hydraulic mining situation shows little change from 1910. There appears to have been a slight decrease, many of the larger companies being still engaged in constructive work. A shortage of water also interfered with the clean up.

Among the camps of the Province producing gold from lode mines Rossland ranks first. The principal companies carrying on active operations during 1911 were as follows:—

The Consolidated Mining and Smelting Company of Canada, Limited, with total shipments of 190,676 tons.

The Le Roi Mining Company, Limited, shipping 6,915 tons in the early part of the year. This Company having gone into voluntary liquidation, sold the Le Roi mine to the Consolidated Mining and Smelting Co. who are now operating it.

The Le Roi No. 2 Mining Company, Limited, shipping 24,800 tons of first class ore and 1,595 tons of concentrates, which were produced from the milling of 18,778 tons of second class ore.

Several of the smaller properties of the camp were actively operated during the year.

The Boundary district comes next in gold production. The output is largely due to the large tonnage of copper ores mined in this district. These ores will average in gold only from 0.04 to 0.05 ounces per ton. Included with this district is the Osoyoos Mining Division, in which is situated the Nickel Plate mine at Hedley, operated by the Hedley Gold Mining Company. In this Company's report for 1911, the following details of interest are given: "Total lineal feet of development in 1911, 1,315; total diamond drilling, 3,160 feet; tons milled, 57,815; assay value, \$10.55 to \$14.36 per ton; receipts, \$679,616.47; expenditures, \$370,814.29; profit, \$300,802.18."

Nelson Mining Division was rather inactive and may be said to have undergone a period of reorganization. The ore is in most cases free-milling, and several of the mines treat the ore in stamp mills producing bullion and concentrates. Others ship direct to the smelter.

There was an increase of production in the Coast district.

Yukon.

The production of the Yukon in 1911 was \$4,634,574, as compared with \$4,570,362 in 1910, an increase of \$64,212 or 1.4 per cent. In this is included \$54,574 produced by lode mines in the district. The statistics of the production of gold in the Yukon district during the years between 1898 and 1906, as given in Table 11, are based primarily on the receipts of gold at the United States mints and receiving offices and credited to the Canadian Yukon. Although a royalty was exacted on the gold output, it seems certain that particularly during the years of high production, considerable amounts of gold were produced which escaped royalty payment. During the past six years, however, the gold production of the Yukon, as ascertained by the Interior Department, and on which royalty of 2½ per cent is imposed, has agreed fairly closely with the quantities reported at the United States receiving offices as having been derived from the Canadian Yukon. For the purpose of collecting the royalty, a fixed value of \$15 per ounce is placed upon the crude gold. The actual value of the gold will average somewhat higher than this, however. The average value of the deposits for a number of years as shown by the experience of the United States assay office has been about \$16.50 per ounce. At the Canadian assay office at Vancouver, B.C., there were deposited during the twelve months ending December 31, 1911, 2,073.61 ounces from the Yukon, valued, after all charges had been deducted, at \$34,994.39, showing an average value of about \$16.88 per ounce.

The production of crude placer gold in the Yukon, during the past six years, as ascertained by the Department of the Interior, and upon which a royalty of 2½ per cent has been collected, is shown in the accompanying table.

Production of Crude Gold in the Yukon District.

| Month. | 1906. | 1907. | 1908. | 1909. | 1910. | 1911. |
|----------------|------------|------------|------------|------------|------------|------------|
| | Ozs. | Ozs. | Ozs. | Ozs. | Ozs. | Ozs. |
| January..... | 3,732·94 | 7,308·95 | 2,464·00 | 69·50 | 16·68 | .. |
| February..... | 11,693·99 | 213·00 | 47·80 | 115·33 | 749·28 | 435·66 |
| March..... | 10·30 | 66·80 | 16·65 | 848·39 | 193·81 | 13·30 |
| April..... | 781·77 | 202·80 | 947·00 | 3·75 | 0·50 | ..... |
| May..... | 64,060·66 | 35,736·62 | 6,851·96 | 117·33 | 43·83 | 16,719·16 |
| June..... | 57,578·27 | 31,402·14 | 51,530·90 | 62,254·92 | 54,301·17 | 38,499·39 |
| July..... | 49,012·36 | 26,793·50 | 55,291·11 | 52,126·43 | 37,942·31 | 42,783·38 |
| August..... | 54,947·07 | 22,392·10 | 37,930·99 | 47,440·83 | 47,673·06 | 47,677·49 |
| September..... | 53,487·08 | 33,119·51 | 39,654·27 | 44,466·20 | 57,695·65 | 48,383·63 |
| October..... | 51,799·53 | 35,539·70 | 37,023·98 | 26,572·23 | 51,888·18 | 58,690·82 |
| November..... | 131·81 | 200·30 | 1,989·39 | 4,858·69 | 21,404·29 | 11,097·51 |
| December..... | 3,352·83 | 52·80 | 5,491·76 | 892·75 | 3,563·75 | 13,130·63 |
| | 350,391·61 | 193,078·22 | 219,244·31 | 239,766·35 | 275,472·51 | 277,430·97 |

In 1911 the placer production is estimated as \$4,580,000 in gold, representing 221,557 fine ounces of metal, and 50,300 fine ounces of silver, valued at \$26,812, being at the average price of fine silver for the year, making a total valuation of the Yukon placer output of \$4,606,812. In 1910 the placer production was estimated at \$4,550,000, representing 220,106 fine ounces of gold, and 50,000 fine ounces of silver, valued at \$26,743, making a total valuation of \$4,576,743.

Statistics of the annual production of gold in the district since 1885 are shown in Table 11.

GOLD.—TABLE 11.
Annual Production in Yukon.

| Calendar Year. | Ozs. (fine†). | Value. | Calendar Year. | Ozs. (fine†). | Value. |
|----------------|---------------|------------|----------------|---------------|-------------|
| | | \$ | | | \$ |
| 1885 } | | | 1899..... | 774,000 | 16,000,000 |
| 1886 } | 4,387 | 100,000 | 1900..... | 1,077,553 | 22,275,000 |
| 1887..... | 3,386 | 70,000 | 1901..... | 870,750 | 18,000,000 |
| 1888..... | 1,935 | 40,000 | 1902..... | 701,437 | 14,500,000 |
| 1889..... | 8,466 | 175,000 | 1903..... | 592,594 | 12,250,000 |
| 1890..... | 8,466 | 175,000 | 1904..... | 407,938 | 10,500,000 |
| 1891..... | 1,935 | 40,000 | 1905..... | 381,001 | 7,876,000 |
| 1892..... | 4,233 | 87,500 | 1906..... | 270,900 | 5,600,000 |
| 1893..... | 8,514 | 176,000 | 1907..... | 152,381 | 3,150,000 |
| 1894..... | 6,047 | 125,000 | 1908..... | 174,150 | 3,600,000 |
| 1895..... | 12,094 | 250,000 | 1909..... | 191,565 | 3,960,000 |
| 1896..... | 14,513 | 300,000 | 1910*..... | 221,091 | 4,570,362 |
| 1897..... | 120,937 | 2,500,000 | 1911*..... | 224,197 | 4,634,574 |
| 1898..... | 483,750 | 10,000,000 | | | |
| | | | | 6,818,670 | 140,954,436 |

† Calculated from the value: one dollar=0·048375 ozs.

* Including a small production from lode mines.

Since 1898, a royalty to the extent of \$3,889,907 has been collected on the gold production of this district. The yearly amounts collected, as well as the annual production of gold as ascertained by the Interior Department, are shown

in the accompanying table. The difference between these figures and those shown in Table 11, which are based on the mint receipts of Yukon gold, has already been mentioned and is probably due to two main factors: (1) the fixing of the value of the gold for royalty purposes at \$15 per ounce, a figure from \$1 to \$2 less than the actual value of the gold, and (2) the probability that in the earlier years of royalty collection considerable quantities of gold dust left the camp unrecorded and escaped royalty payment.

Gold Production in the Yukon, and Royalty Collected.†

| Fiscal Year. | Total gold production. | Total exemption. | Royalty collected on. | Royalty paid. |
|----------------------|---------------------------|---------------------|--------------------------|------------------|
| | \$ | \$ | \$ | \$ |
| 1898..... | 3,072,773 | 389,845 | 2,732,928 | 273,292 |
| 1899..... | 7,582,283 | 1,699,657 | 5,882,626 | 588,262 |
| 1900..... | 9,809,464 | 2,501,744 | 7,307,720 | 730,771 |
| 1901..... | 9,162,082 | 1,927,666 | 7,236,522 | 592,660 |
| 1902..... | 9,566,340 | 1,199,114 | 8,367,225 | 331,436 |
| 1903..... | 12,113,015 | ..... | 12,113,015 | 302,893 |
| 1904..... | 10,790,663 | ..... | 10,790,663 | 272,217 |
| 1905..... | 8,222,054 | ..... | 8,222,054 | 206,760 |
| 1906..... | 6,540,007 | ..... | 6,540,007 | 163,963 |
| 1907 (9 months)..... | 3,304,791 | ..... | 3,304,791 | 82,622 |
| 1908..... | 2,820,162 | ..... | 2,820,162 | 70,505 |
| 1909..... | 3,260,282 | ..... | 3,260,282 | 81,507 |
| 1910..... | 3,594,251 | ..... | 3,594,251 | 89,844 |
| 1911..... | 4,126,728 | ..... | 4,126,728 | 103,168 |

† From the Report of the Yukon and Mining Lands Branch of the Department of the Interior.

LEAD.

The following statistics of the production of lead in Canada in 1911 are based on direct smelter returns and represent the amount of lead refined in Canada and shipped as pig lead or manufactured products.

The 1911 output was almost entirely from the mines of British Columbia, and a considerable decrease is shown, the production being 23,784,969 pounds in that year, against 32,987,508 for 1910. A small shipment was made from Quebec, but in regard to this figures are not obtainable.

In valuing the lead production for 1911, the average price per pound at Montreal has been used. The New York market is practically closed to Canadian lead by high tariff, and to the London market price must be added the freight, etc., to reach the Canadian market. The price at Montreal or Toronto is lower than that at New York, and higher than that at London, and is probably a more equitable valuation to place upon the Canadian production.

Statistics showing the lead production since 1887 are given in the following table:—

LEAD.—TABLE 1.
Annual Production.

| Calendar Year. | Lbs. | Price per lb. | Value. | Calendar Year. | Lbs. | Price per lb. | Value. |
|----------------|------------|---------------|-----------|----------------|------------|---------------|-----------|
| | | Cts. | \$ | | | Cts. | \$ |
| 1887..... | 204,800 | 5.400 | 9,216 | 1900 . . . | 63,169,821 | 4.370 | 2,760,521 |
| 1888..... | 674,500 | 4.420 | 29,812 | 1901.... | 51,900,958 | 4.334 | 2,249,387 |
| 1889..... | 165,100 | 3.930 | 6,468 | 1902..... | 22,956,381 | 4.069 | 934,095 |
| 1890..... | 105,000 | 4.480 | 4,704 | 1903..... | 18,139,283 | 4.237 | 768,562 |
| 1891..... | 88,665 | 4.350 | 3,857 | 1904..... | 37,531,244 | 4.309 | 1,617,221 |
| 1892..... | 808,420 | 4.090 | 33,064 | 1905..... | 56,864,915 | 4.707 | 2,676,632 |
| 1893..... | 2,135,023 | 3.730 | 79,636 | 1906..... | 54,608,217 | 5.677 | 3,089,187 |
| 1894..... | 5,703,222 | 3.290 | 187,636 | 1907 . . . | 47,738,708 | 5.325 | 2,542,086 |
| 1895..... | 16,461,794 | 3.230 | 531,716 | 1908..... | 43,195,733 | 4.200 | 1,814,221 |
| 1896..... | 24,199,977 | 2.980 | 721,159 | 1909..... | 45,857,424 | *3.690 | 1,692,139 |
| 1897..... | 39,018,219 | 3.580 | 1,396,853 | 1910..... | 32,987,508 | 3.687 | 1,216,249 |
| 1898..... | 31,915,319 | 3.780 | 1,206,399 | 1911..... | 23,784,969 | †3.480 | 827,717 |
| 1899. . . | 21,862,436 | 4.470 | 977,250 | | | | |

* In 1909 and 1910, average prices at Toronto as quoted by *Hardware and Metal*; in previous years average prices at New York, as quoted by *Engineering and Mining Journal*.

† 1911 average price at Montreal. Quotations furnished by Messrs. Thos. Robertson & Co., Montreal, Que.

Previous to 1904, lead ores mined in Canada were either exported as ore, or smelted in Canadian furnaces and exported in the form of base bullion to be refined abroad. A lead refinery employing the Bett's Electrolytic Process is now operated at Trail, B.C., in connexion with the smelter there, and has witnessed frequent enlargements until it is now treating the base bullion pro-

duced from the smelting of practically all the British Columbia lead ores by the Trail smelter.

Pig lead, fine gold, fine silver, refined antimony, copper sulphate, and babbitt metal are produced at the refinery, and lead pipe is also manufactured there. The refined lead finds a market in Canada, the United States, and the Orient. Of that used in Canada a great part is consumed in the manufacture of white lead, for which the Trail product is especially valuable on account of its purity.

The production of refined lead, including pig lead and lead pipe, etc., has been as follows:—

| Year. | Refined lead produced. | Year. | Refined lead produced. |
|-----------|------------------------|-----------|------------------------|
| 1901..... | 7,519,440 | 1908..... | 36,549,274 |
| 1905..... | 15,804,509 | 1909..... | 41,883,614 |
| 1906..... | 20,471,314 | 1910..... | 32,987,508 |
| 1907..... | 26,607,461 | 1911..... | 24,784,969 |

The price of lead in London averages from $\frac{1}{2}$ to 2 cents per pound lower than in New York.

The average price for soft lead in 1911, on the London market, was £13 19s. 3d. per long ton (equivalent to 2.992 cents per pound), as compared with £12 19s. (2.775 cents per pound) in 1910, and £13 1s. 8d. (2.803 cents per pound), in 1909.

The price of lead on the Canadian market at Montreal is intermediate between the New York and London values. Montreal is the main Canadian market. The Toronto price in winter is about the same as that at Montreal but the latter falls during the period of summer freight rates about 10 cents per 100 pounds below the former.

The average price of lead in Montreal in 1911 was 3.480 cents per pound, against 2.992 in London and 4.420 in New York.

The monthly and yearly average prices of lead in Montreal for the past five years are given in the following table:—

Price of Pig Lead at Montreal.*

| Month. | 1907. | 1908. | 1909. | 1910. | 1911. |
|----------------|-------|-------|-------|-------|-------|
| January..... | 4·94 | 3·67 | 3·35 | 3·48 | 3·31 |
| February..... | 4·88 | 3·60 | 3·38 | 3·40 | 3·32 |
| March..... | 4·92 | 3·54 | 3·42 | 3·34 | 3·34 |
| April..... | 4·92 | 3·44 | 3·35 | 3·21 | 3·26 |
| May..... | 4·84 | 3·21 | 3·26 | 3·13 | 3·20 |
| June..... | 4·93 | 3·11 | 3·23 | 3·15 | 3·27 |
| July..... | 4·98 | 3·17 | 3·12 | 3·13 | 3·33 |
| August..... | 4·69 | 3·31 | 3·08 | 3·11 | 3·45 |
| September..... | 4·85 | 3·24 | 3·14 | 3·11 | 3·63 |
| October..... | 4·56 | 3·29 | 3·26 | 3·23 | 3·77 |
| November..... | 4·25 | 3·42 | 3·28 | 3·31 | 3·93 |
| December..... | 3·65 | 3·37 | 3·34 | 3·35 | 3·95 |
| Average..... | 4·701 | 3·364 | 3·268 | 3·246 | 3·480 |

*Producers prices for car-load quantities ex cars Montreal as furnished by Messrs. Thos. Robertson & Co., Ltd., of Montreal.

The average monthly prices of lead in New York as quoted in the 'Engineering and Mining Journal' are shown in the next table.

Monthly Average Prices of Lead in New York, in cents per pound.

| Month. | 1901. | 1902. | 1903. | 1904. | 1905. | 1906. | 1907. | 1908. | 1909. | 1910. | 1911. |
|----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| January..... | 4·35 | 4·000 | 4·075 | 4·347 | 4·552 | 5·600 | 6·000 | 3·691 | 4·175 | 4·700 | 4·483 |
| February..... | 4·35 | 4·075 | 4·075 | 4·375 | 4·450 | 5·404 | 6·000 | 3·725 | 4·018 | 4·613 | 4·440 |
| March..... | 4·35 | 4·075 | 4·442 | 4·475 | 4·470 | 5·350 | 6·000 | 3·838 | 3·936 | 4·459 | 4·394 |
| April..... | 4·35 | 4·075 | 4·567 | 4·475 | 4·500 | 5·404 | 6·000 | 3·993 | 4·168 | 4·376 | 4·412 |
| May..... | 4·35 | 4·075 | 4·325 | 4·423 | 4·500 | 5·635 | 6·000 | 4·253 | 4·287 | 4·315 | 4·373 |
| June..... | 4·35 | 4·075 | 4·210 | 4·196 | 4·500 | 5·750 | 5·760 | 4·466 | 4·350 | 4·343 | 4·435 |
| July..... | 4·35 | 4·075 | 4·075 | 4·192 | 4·524 | 5·750 | 5·288 | 4·447 | 4·321 | 4·404 | 4·499 |
| August..... | 4·35 | 4·075 | 4·0·5 | 4·111 | 4·665 | 5·750 | 5·250 | 4·580 | 4·363 | 4·400 | 4·500 |
| September..... | 4·35 | 4·075 | 4·243 | 4·200 | 4·850 | 5·750 | 4·813 | 4·515 | 4·342 | 4·400 | 4·485 |
| October..... | 4·35 | 4·075 | 4·375 | 4·200 | 4·850 | 5·750 | 4·750 | 4·351 | 4·341 | 4·400 | 4·265 |
| November..... | 4·35 | 4·075 | 4·218 | 4·200 | 5·200 | 5·750 | 4·376 | 4·330 | 4·370 | 4·442 | 4·298 |
| December..... | 4·15 | 4·075 | 4·162 | 4·600 | 5·422 | 5·900 | 3·658 | 4·213 | 4·560 | 4·500 | 4·450 |
| Average..... | 4·33 | 4·069 | 4·237 | 4·309 | 4·707 | 5·657 | 5·325 | 4·200 | 4·273 | 4·416 | 4·420 |

The average monthly prices of soft lead in London, England, as published by Julius Matton of London, and 'Metallgesellschaft' of Frankfort-on-the-Main, were, from 1902 to 1911, as follows:—

Average Monthly Prices of Lead in London, £ per long ton.

| Month. | 1902. | | | 1903. | | | 1904. | | | 1905. | | | 1906. | | |
|----------------------|-------|----|----|-------|----|----|-------|----|----|-------|----|----|-------|----|----|
| | £ | s. | d. | £ | s. | d. | £ | s. | d. | £ | s. | d. | £ | s. | d. |
| January | 10 | 11 | 4 | 11 | 6 | 1 | 11 | 11 | 2 | 12 | 17 | 6 | 16 | 17 | 6 |
| February | 11 | 12 | 4 | 11 | 14 | 2 | 11 | 11 | 10 | 12 | 9 | 3 | 16 | 0 | 4 |
| March | 11 | 10 | 2 | 13 | 4 | 6 | 12 | .. | 9 | 12 | 5 | 11 | 15 | 17 | 9 |
| April | 11 | 11 | 11 | 12 | 8 | 1 | 12 | 5 | 1 | 12 | 13 | 2 | 15 | 16 | 6 |
| May | 11 | 12 | .. | 11 | 16 | .. | 11 | 15 | 11 | 12 | 15 | 3 | 16 | 13 | 6 |
| June | 11 | 5 | 5 | 11 | 8 | 9 | 11 | 10 | 5 | 13 | .. | .. | 16 | 15 | 6 |
| July | 11 | 4 | 8 | 11 | 7 | 8 | 11 | 13 | 4 | 13 | 12 | 2 | 16 | 11 | 7 |
| August | 11 | 2 | 5 | 11 | 2 | 11 | 11 | 14 | 9 | 13 | 19 | 2 | 17 | 1 | 3 |
| September | 10 | 17 | 10 | 11 | 3 | 4 | 11 | 15 | 9 | 13 | 19 | .. | 18 | 4 | 4 |
| October | 10 | 14 | 11 | 11 | 2 | 2 | 12 | 3 | 9 | 14 | 13 | 7 | 19 | 7 | 9 |
| November | 10 | 14 | 4 | 11 | 2 | 2 | 12 | 17 | 10 | 15 | 6 | 9 | 19 | 5 | 6 |
| December | 10 | 15 | 1 | 11 | 3 | 7 | 12 | 15 | 6 | 17 | 1 | .. | 19 | 12 | 6 |
| Yearly average | 11 | 5 | 3 | 11 | 11 | 7 | 11 | 19 | 8 | 13 | 14 | 5 | 17 | 7 | .. |

| Month. | 1907. | | | 1908. | | | 1909. | | | 1910. | | | 1911. | | |
|----------------------|-------|----|----|-------|----|-----|-------|----|-----|-------|----|----|-------|----|----|
| | £ | s. | d. | £ | s. | d. | £ | s. | d. | £ | s. | d. | £ | s. | d. |
| January | 19 | 16 | 8 | 14 | 10 | 6 | 13 | 3 | 6 | 13 | 3 | 11 | 13 | .. | 8 |
| February | 19 | 11 | 6 | 14 | 5 | 6 | 13 | 5 | 5 | 13 | 7 | 3 | 13 | 1 | 11 |
| March | 19 | 14 | 7 | 14 | 1 | 4 | 13 | 8 | 8½ | 13 | 2 | 9 | 13 | 2 | 11 |
| April | 19 | 16 | 4 | 13 | 13 | 10 | 13 | 7 | .. | 12 | 13 | 9 | 12 | 18 | 5 |
| May | 19 | 17 | 7 | 13 | 2 | 7 | 13 | 5 | 3 | 12 | 11 | 8 | 12 | 19 | 2 |
| June | 20 | 6 | .. | 12 | 15 | 7 | 13 | 2 | 4 | 12 | 13 | 9 | 13 | 5 | 5 |
| July | 20 | 8 | 2 | 12 | 19 | 6 | 12 | 13 | 3 | 12 | 11 | 8 | 13 | 10 | 11 |
| August | 19 | 5 | 3 | 13 | 9 | 10½ | 12 | 10 | 6 | 12 | 10 | 10 | 14 | 1 | 4 |
| September | 19 | 17 | 6 | 13 | 3 | 6 | 12 | 15 | 3 | 12 | 12 | 6 | 14 | 15 | 1 |
| October | 18 | 13 | .. | 13 | 7 | 3 | 13 | 4 | 4 | 13 | 2 | .. | 15 | 6 | 1 |
| November | 17 | 4 | 11 | 13 | 12 | 2 | 13 | 1 | 4½ | 13 | 4 | 6 | 15 | 15 | 5 |
| December | 14 | 9 | 4 | 13 | 3 | 6 | 13 | 2 | 11½ | 13 | 3 | 9 | 15 | 13 | 4 |
| Yearly average | 19 | 1 | 10 | 13 | 10 | 5 | 13 | 1 | 8 | 12 | 19 | .. | 13 | 19 | 3 |

Bounties.—In 1901, and again in 1903, the Dominion Government, to encourage the lead industry, authorized the payment of a bounty on the production of lead. The Act of 1903 provided for the payment under certain restrictions of 75 cents per hundred pounds on lead contained in ore mined and smelted in Canada, provided that when the standard price of pig lead in London, England, exceeded £12 10s. per ton of 2,240 pounds, such bounty should be reduced proportionately by the amount of such excess. Thus, when the price of lead in London rose to £16 or over per long ton, the bounty ceased. As the price of lead exceeded £16 sterling on the London market for a considerable period during 1906 and 1907 the bounty paid during those years was comparatively small.

The Act of 1903 provided that payment of bounty should cease on June 30, 1908, and as only a portion of the funds provided had been used, a new Act was passed in the latter year providing for further bounty payments at the rate of 75 cents per hundred pounds, or approximately £3 10s. per ton of 2,240 lbs., subject to the restriction that when the price of lead in London exceeds £14 10s. the bounty shall be reduced by such excess.

The Act, together with the regulation based upon it, is reproduced herewith in full.

ACT 7-8 EDWARD VII., CHAPTER 43.

AN ACT RESPECTING THE PAYMENT OF BOUNTIES ON LEAD CONTAINED IN LEAD-BEARING ORES MINED IN CANADA.

Assented to July 20th, 1908.

Whereas under the provisions of an Act passed on the 24th day of October, 1903, being chapter 31 of the Acts of 1903, payment of a bounty on lead contained in lead-bearing ores mined in Canada, not to exceed five hundred thousand dollars in any fiscal year, was authorized to be paid until the thirtieth day of June, 1908, and whereas the total amount of bounty paid thereunder up to the thirty-first day of March, 1908, was six hundred and sixty-seven thousand four hundred and four dollars, and it is estimated that a further amount of forty-five thousand dollars will be payable on or before the thirtieth day of June, 1908, leaving unexpended about one million seven hundred and eighty-eight thousand and seventy-eight dollars of the total amount authorized to be paid under the provisions of the said chapter 31: Therefore, His Majesty, by and with the advice and consent of the Senate and House of Commons of Canada, enacts as follows:—

1. The Governor in Council may authorize the payment of a bounty of seventy-five cents per one hundred pounds on lead contained in lead-bearing ores mined in Canada, on and after the first day of July, 1908, such bounty to be paid to the producer or vendor of such ores; Provided that the sum to be paid as such bounty shall not exceed five hundred thousand dollars in any year ending on the thirtieth day of June: Provided also that when it appears to the satisfaction of the Minister charged with the administration of this Act that the standard price of pig lead in London, England, exceeds fourteen pounds ten shillings sterling per ton of two thousand two hundred and forty pounds, such bounty shall be reduced by the amount of such excess.

The total amount of bounty payable under the provisions of chapter 31 of the Acts of 1903, and of this Act, shall not exceed two million five hundred thousand dollars.

2. Payment of the said bounty may be made from time to time to the extent of sixty per cent upon smelter returns showing that the ore has been delivered for smelting at a smelter in Canada. The remaining forty per cent. may be

paid at the close of the fiscal year, upon evidence that all such ore has been smelted in Canada.

If at the close of any year it appears that during the year the quantity of lead produced, on which the bounty is authorized, exceeds thirty-three thousand three hundred and thirty-three tons of two thousand pounds, the rate of bounty shall be reduced to such sum as will bring the payments for the year within the limit mentioned in section 1.

3. If at any time it appears to the satisfaction of the Governor in Council that the charges for transportation and treatment of lead ores in Canada are excessive, or that there is any discrimination which prevents the smelting of such ores in Canada on fair and reasonable terms, the Governor in Council may authorize the payment of bounty at such reduced rates as he deems just, on the lead contained in such ores mined in Canada and exported for treatment abroad.

4. If at any time it appears to the satisfaction of the Governor in Council that products of lead are manufactured in Canada direct from lead ores mined in Canada without the intervention of the smelting process, the Governor in Council may make such provision as he deems equitable to extend the benefits of this Act to the producers of such ores.

5. The bounties payable under the provisions of this Act shall cease and determine on the thirtieth day of June, one thousand nine hundred and thirteen.

6. The Governor in Council may make regulations for carrying out the intention of this Act.

REGULATIONS under the provisions of the Act 7-8, Edward VII, Chapter 43, intituled: "An Act to provide for the payment of Bounty on Lead contained in the lead-bearing ores mined in Canada."

(As authorized by Order in Council on the 3rd August, 1908.)

1. The Minister of Trade and Commerce is charged with the administration of this Act.

2. All producers or vendors of lead-bearing ores who desire to avail themselves of the provisions of the Act above quoted, and to be paid bounty, shall, before making claim for such bounty, notify the Minister of their intention to claim under the provisions of the Act, and shall declare the name of the mine producing such ore, its situation, the names of the President, Secretary, and Manager, as well as the name of the official authorized to make claim. Notice shall be given the Minister of changes in ownership and management. Where the bounty is claimed by Lessees, the consent of the owner shall be shown.

3. All claims for the payment of bounty shall be made and substantiated under the oath of the Manager of the mine, or of the official authorized to make the claim.

4. Claims may be made monthly, that is immediately after the close of each calendar month, and be in such form, and contain such evidence, as may seem to the Minister from time to time necessary.

5. No claims made otherwise than in conformity with these regulations, and in form required by the Minister, shall be recognized, allowed or paid by the Minister.

6. The smelting of all such ores shall at all times be under the supervision of the officer of the Department of Trade and Commerce, appointed or detailed for the purpose.

7. The supervising officer may at any time demand and receive a portion of the floor sample of any ore delivered at the smelter for smelting purposes.

8. The rate of bounty shall be computed according to the London quotation upon the day the ore is taken into stock at the smelter, such day not to be later than the last day of the calendar month during which the ore was unloaded from cars at smelter grounds.

9. The lead contents of ores shall for the purpose of this Act be ascertained by fire assay, as used in ordinary commercial assaying.

10. The books of the claimants, and those of the smelting works at which the ore is smelted, shall be at all times open to the inspection of such supervising officer, and of any officer of the Department of Trade and Commerce who may be detailed by the Minister for the purpose.

11. All claims shall be substantiated by the oath of the Manager of the Smelting Works at which the ores are smelted, and shall be verified and certified to by the officer of the Department of Trade and Commerce, appointed to supervise the smelting at the works where it has been carried on.

12. The cost of the supervision shall be paid by the claimants and may be deducted *pro rata* according to the quantity smelted during the fiscal year from the amount payable to such claimants at the close of each fiscal year."

Statement of Bounties paid on Lead during the fiscal years 1899 to 1912.

| Year ending. | Bounty paid. | Year ending. | Bounty paid. |
|---------------------|--------------|-------------------------------|--------------|
| | \$ | | \$ |
| June 30, 1899. | 76,665 | March 31, 1907 (9 mos.)'..... | 1,995 |
| " 30, 1900. | 43,335 | " 31, 1908. | 51,001 |
| " 30, 1901. | 30,000 | " 31, 1909. | 307,433 |
| " 30, 1902. | | " 31, 1910. | 340,542 |
| " 30, 1903. | 4,380 | " 31, 1911. | 248,554 |
| " 30, 1904. | 195,627 | " 31, 1912. | 179,288 |
| " 30, 1905. | 330,645 | | |
| " 30, 1906. | 90,196 | Total. | 1,899,641 |

Exports and Imports.—According to Trade and Navigation reports, the total quantity of lead contained in ore and concentrates, and pig lead, exported, during the calendar year 1911, was 187,061 pounds, valued at \$4,632, as compared with 7,759,053 pounds, valued at \$249,482, in 1910.

Details of exports, 1908 to 1911, are as follows:—

Exports of Lead, 1908 to 1911.

| | LEAD IN ORE, CONCENTRATES, ETC. | | PIG LEAD. | |
|----------------------|------------------------------------|---------|------------|---------|
| | Lbs. | Value. | Lbs. | Value. |
| | | \$ | | \$ |
| 1908. | | | | |
| To United States.. | 719,086 | 20,514 | 168,866 | 5,329 |
| To other countries.. | 3,792,845 | 132,880 | 13,773,797 | 463,731 |
| Total | 4,511,931 | 153,394 | 13,942,663 | 469,060 |
| 1909. | | | | |
| To United States.. | 6,096,852 | 126,478 | 280 | 8 |
| To other countries.. | 129,216 | 6,100 | 11,301,680 | 361,056 |
| Total | 6,226,068 | 132,578 | 11,301,960 | 361,064 |
| 1910. | | | | |
| To United States.. | 46,800 | 1,308 | 59,605 | 2,295 |
| To other countries.. | | | 7,652,648 | 245,379 |
| Total | 46,800 | 1,308 | 7,712,253 | 248,174 |
| 1911. | | | | |
| To United States.. | 65,100 | 1,826 | 71,961 | 2,806 |
| To other countries.. | | | | |
| Total | 65,100 | 1,826 | 71,961 | 2,806 |

The exports of lead since 1873 are shown in Table 2:—

LEAD.—TABLE 2.

Exports of Lead.

| Calendar Year. | Lbs. | Value. | Calendar Year. | Lbs. | Value. |
|----------------|------|--------|----------------|------------|-----------|
| | | \$ | | | \$ |
| 1873..... | | 1,993 | 1893..... | | 3,099 |
| 1874..... | | 127 | 1894..... | 5,792,700 | 144,509 |
| 1875..... | | 7,510 | 1895..... | 23,075,892 | 435,071 |
| 1876..... | | 66 | 1896..... | 26,480,320 | 462,095 |
| 1877..... | | 720 | 1897..... | 43,802,697 | 925,144 |
| 1878..... | | | 1898..... | 37,375,618 | 885,485 |
| 1879..... | | 230 | 1899..... | 15,799,518 | 466,950 |
| 1880..... | | | 1900..... | 57,642,029 | 1,917,690 |
| 1881..... | | | 1901..... | 45,590,995 | 1,804,687 |
| 1882..... | | 32 | 1902..... | 17,761,484 | 457,170 |
| 1883..... | | 5 | 1903..... | 18,624,303 | 426,466 |
| 1884..... | | 36 | 1904..... | 25,868,825 | 559,461 |
| 1885..... | | | 1905..... | 41,657,403 | 1,016,541 |
| 1886..... | | | 1906..... | 21,436,022 | 736,007 |
| 1887..... | | 724 | 1907..... | 25,591,833 | 1,029,898 |
| 1888..... | | 18 | 1908..... | 18,454,594 | 622,454 |
| 1889..... | | 18 | 1909..... | 17,528,028 | 493,642 |
| 1890..... | | | 1910..... | 7,759,053 | 249,482 |
| 1891..... | | 5,000 | 1911..... | 137,061 | 4,632 |
| 1892..... | | 2,509 | | | |

The principal imports of lead during the calendar years 1909, 1910, and 1911, were as follows:—

| | Cal. year 1909. | | Cal. year 1910. | | Cal. year 1911. | |
|--|-----------------|---------|-----------------|---------|-----------------|-----------|
| | Tons. | Value. | Tons. | Value. | Tons. | Value. |
| | | \$ | | \$ | | \$ |
| Old, scrap, pig, and block..... | 5,649 | 184,572 | 6,030 | 346,516 | 9,989 | 495,923 |
| Bars and sheets..... | 671 | 44,073 | 885 | 45,674 | 1,542 | 55,458 |
| Pipe..... | 71 | 4,884 | 202 | 15,365 | 256 | 19,426 |
| Shot and bullets..... | 5 | 489 | 3 | 311 | 4 | 1,053 |
| Manufactures of lead..... | | 102,370 | | 107,688 | | 108,012 |
| Tea lead..... | 1,113 | 116,461 | 1,186 | 117,399 | 1,344 | 134,160 |
| Litharge..... | 852 | 58,100 | 777 | 56,049 | 899 | 65,743 |
| Total..... | 7,822 | 510,949 | 9,083 | 689,002 | 14,034 | 879,775 |
| Metallic lead contained in imported lead pigments..... | 1,514 | | 1,461 | | 1,597 | 169,501 |
| | 9,336 | | 10,544 | | 15,631 | 1,049,276 |

Statistics of the annual imports since 1880 of lead and manufactures of lead, are shown in Tables 3 and 4; imports of litharge in Table 5; and imports of dry white and red lead in Table 6.

LEAD.—TABLE 3.

Imports of Lead.

| Fiscal Year. | OLD, SCRAP, AND FIG. | | BARS, BLOCKS, SHEETS. | | TOTAL. | |
|--------------|----------------------|---------|-----------------------|--------|---------|---------|
| | Cwt. | Value. | Cwt. | Value. | Cwt. | Value. |
| | | \$ | | \$ | | \$ |
| 1880..... | | | | | 30,298 | 124,117 |
| 1881..... | 16,236 | 56,919 | 18,222 | 70,744 | 34,458 | 127,663 |
| 1882..... | 36,655 | 120,870 | 10,540 | 35,728 | 47,195 | 156,598 |
| 1883..... | 48,680 | 148,759 | 8,591 | 28,785 | 57,271 | 177,544 |
| 1884..... | 39,409 | 103,413 | 9,701 | 28,458 | 49,113 | 131,871 |
| 1885..... | 36,106 | 87,038 | 9,362 | 21,396 | 45,468 | 111,434 |
| 1886..... | 39,945 | 110,947 | 9,793 | 28,948 | 49,738 | 139,895 |
| 1887..... | 61,160 | 173,477 | 14,153 | 41,746 | 75,313 | 215,223 |
| 1888..... | 68,678 | 196,845 | 14,957 | 45,900 | 83,635 | 242,745 |
| 1889..... | 74,223 | 213,132 | 14,173 | 43,482 | 88,396 | 256,614 |
| 1890..... | 101,197 | 283,096 | 19,083 | 59,484 | 120,280 | 342,580 |
| 1891..... | 86,382 | 243,033 | 15,645 | 48,220 | 102,028 | 291,253 |
| 1892..... | 97,375 | 254,384 | 11,299 | 32,368 | 108,674 | 286,752 |
| 1893..... | 94,485 | 215,521 | 12,403 | 32,286 | 106,888 | 247,807 |
| 1894..... | 70,223 | 140,440 | 8,486 | 20,451 | 78,709 | 169,891 |
| 1895..... | 67,261 | 139,290 | 6,739 | 16,315 | 74,000 | 155,605 |
| 1896..... | 72,433 | 173,162 | 8,575 | 23,169 | 81,008 | 196,331 |
| 1897..... | 65,279 | 158,381 | 10,516 | 29,175 | 75,795 | 187,556 |

| | OLD, SCRAP, FIG, AND BLOCK.* | | BARS AND SHEETS † | | TOTAL. | |
|-----------|------------------------------|---------|-------------------|--------|---------|---------|
| | | | | | | |
| | | | | | | |
| 1898..... | 88,420 | 260,779 | 22,214 | 39,041 | 110,634 | 299,820 |
| 1899..... | 114,659 | 283,432 | 44,796 | 39,833 | 159,455 | 323,265 |
| 1900..... | 62,361 | 207,819 | 15,493 | 58,506 | 77,854 | 251,325 |
| 1901..... | (a) 85,321 | 97,011 | 16,295 | 78,316 | 101,616 | 175,327 |
| 1902..... | (a) 122,279 | 104,672 | 18,596 | 49,261 | 140,875 | 153,933 |
| 1903..... | (a) 98,530 | 67,821 | 11,535 | 35,398 | 110,065 | 108,219 |
| 1904..... | (a) 94,602 | 121,165 | 14,102 | 39,644 | 108,704 | 160,809 |
| 1905..... | (a) 57,074 | 133,775 | 17,792 | 51,972 | 74,866 | 185,747 |
| 1906..... | 82,729 | 271,105 | 16,106 | 57,185 | 98,835 | 328,290 |
| 1907..... | 79,575 | 277,470 | 13,710 | 56,630 | 93,285 | 331,100 |
| 1908..... | 63,921 | 284,604 | 17,253 | 75,186 | 81,174 | 359,790 |
| 1909..... | 50,110 | 151,173 | 13,754 | 46,093 | 63,864 | 197,266 |
| 1910..... | 113,249 | 191,971 | 11,446 | 37,004 | 124,695 | 228,975 |
| 1911..... | 116,655 | 334,159 | 15,587 | 55,312 | 132,242 | 389,471 |

* Duty 15 per cent.

† Duty 25 per cent.

(a) Includes Canadian lead ore sent to the United States for refining, imported at price of refining only.

LEAD.—TABLE 4.

Imports of Lead Manufactures.

| Fiscal Year. | Value. | Fiscal Year. | Value. | Fiscal Year. | Value. |
|--------------|-----------|--------------|-----------|--------------|------------|
| 1880..... | \$ 15,400 | 1891..... | \$ 23,898 | 1902..... | \$ 120,020 |
| 1881..... | 22,629 | 1892..... | 22,636 | 1903..... | 134,161 |
| 1882..... | 17,282 | 1893..... | 33,783 | 1904..... | 129,093 |
| 1883..... | 25,556 | 1894..... | 29,361 | 1905..... | 147,177 |
| 1884..... | 31,361 | 1895..... | 38,015 | 1906..... | 163,793 |
| 1885..... | 36,340 | 1896..... | 50,722 | 1907..... | 162,425 |
| 1886..... | 33,078 | 1897..... | 60,735 | 1908..... | 243,926 |
| 1887..... | 19,140 | 1898..... | 63,179 | 1909..... | 213,167 |
| 1888..... | 18,816 | 1899..... | 91,497 | 1910..... | 234,930 |
| 1889..... | 16,315 | 1900..... | 104,736 | 1911..... | 235,248 |
| 1890..... | 25,600 | 1901..... | 107,260 | | |

LEAD.—TABLE 5.

Imports of Litharge.

| Fiscal Year. | Cwt. | Value. | Fiscal Year. | Cwt. | Value. | Fiscal Year. | Cwt. | Value. |
|--------------|-------|-----------|--------------|--------|-----------|--------------|--------|-----------|
| 1880..... | 3,041 | \$ 14,334 | 1891..... | 7,979 | \$ 27,613 | 1902..... | 13,002 | \$ 47,021 |
| 1881..... | 6,126 | 22,129 | 1892..... | 10,384 | 34,343 | 1903..... | 13,921 | 47,761 |
| 1882..... | 4,900 | 16,651 | 1893..... | 7,035 | 24,401 | 1904..... | 9,894 | 32,633 |
| 1883..... | 1,532 | 6,173 | 1894..... | 38,547 | 28,685 | 1905..... | 17,865 | 57,736 |
| 1884..... | 5,235 | 18,132 | 1895..... | 11,955 | 32,953 | 1906..... | 10,165 | 39,836 |
| 1885..... | 4,990 | 16,156 | 1896..... | 10,710 | 32,817 | 1907..... | 11,311 | 49,133 |
| 1886..... | 4,928 | 16,063 | 1897..... | 12,028 | 34,538 | 1908..... | 19,052 | 90,785 |
| 1887..... | 6,397 | 21,865 | 1898..... | 10,416 | 32,904 | 1909..... | 12,117 | 43,597 |
| 1888..... | 7,010 | 23,808 | 1899..... | 9,530 | 32,518 | 1910..... | 18,101 | 62,174 |
| 1889..... | 8,089 | 31,082 | 1900..... | 9,139 | 29,176 | 1911..... | 16,543 | 59,987 |
| 1890..... | 9,453 | 31,401 | 1901..... | 11,132 | 51,944 | | | |

The imports of white and red lead and orange mineral, in 1911, amounted to 4,072,433 pounds, valued at \$169,501. In 1903, the imports were 19,208,786 pounds, the falling off being due to the establishment of corroding works at Montreal.

• Detailed statistics of imports of lead pigments during the calendar years 1909, 1910, and 1911, are as follows; the statistics of imports since 1885 being shown in Table 6:—

Imports of White and Red Lead in 1909, 1910, and 1911.

| | CALENDAR YEAR 1909. | | CALENDAR YEAR 1910. | | CALENDAR YEAR 1911. | |
|--|---------------------|---------|---------------------|---------|---------------------|---------|
| | Lbs. | Value. | Lbs. | Value. | Lbs. | Value. |
| | | \$ | | \$ | | \$ |
| Lead, white, dry..... | 2,690,575 | 95,894 | 2,076,629 | 75,465 | 1,467,193 | 58,335 |
| Lead, white, ground in oil..... | 730,001 | 32,678 | 811,510 | 37,475 | 1,033,732 | 46,986 |
| Lead, red, dry and orange mineral..... | 516,032 | 25,341 | 881,788 | 31,803 | 1,571,508 | 64,180 |
| | 3,936,608 | 153,913 | 3,769,927 | 144,741 | 4,072,433 | 169,501 |

LEAD.—TABLE 6.

Imports of Dry White and Red Lead and Orange Mineral, and White Lead Ground in Oil.

| Fiscal Year. | Lbs. | Value. | Fiscal Year. | Lbs. | Value. |
|--------------|------------|---------|--------------|------------|---------|
| | | \$ | | | \$ |
| 1885..... | 5,540,753 | 198,913 | 1899..... | 14,507,945 | 514,842 |
| 1886..... | 6,703,077 | 213,258 | 1900..... | 14,679,920 | 634,492 |
| 1887..... | 6,998,820 | 233,725 | 1901..... | 10,241,601 | 461,368 |
| 1888..... | 6,361,334 | 216,654 | 1902..... | 15,584,164 | 603,582 |
| 1889..... | 7,066,465 | 267,236 | 1903..... | 19,208,786 | 758,371 |
| 1890..... | 10,859,672 | 381,959 | 1904..... | 16,923,585 | 662,098 |
| 1891..... | 8,560,615 | 337,407 | 1905..... | 17,376,588 | 638,381 |
| 1892..... | 10,288,766 | 351,686 | 1906..... | 10,412,891 | 417,444 |
| 1893..... | 10,865,183 | 364,680 | 1907..... | 5,956,626 | 290,629 |
| 1894..... | 10,958,170 | 353,053 | 1908..... | 7,830,860 | 420,537 |
| 1895..... | 8,780,052 | 282,353 | 1909..... | 4,687,416 | 195,258 |
| 1896..... | 11,711,496 | 367,569 | 1910..... | 3,585,921 | 141,114 |
| 1897..... | 10,310,463 | 347,539 | 1911..... | 3,967,091 | 161,897 |
| 1898..... | 12,682,808 | 448,659 | | | |

The production of refined lead as already shown was, in 1911, 11,892 tons; while the exports of lead were 69 tons, leaving 11,823 tons as the consumption of Canadian lead.

The imports of lead during the calendar year 1911 are shown above to have been 15,631 tons, not including certain manufactures of lead valued at \$108,012, so that the total consumption of lead in 1911 probably exceeded 27,500 tons.

Nova Scotia.

There was no production from this Province during the year. Some prospecting and development were done near Musquodoboit.

Quebec.

A small shipment is reported from Calumet island, but no details are obtainable.

Ontario.

There has been no production from this Province during the year, but the reopening of some of the older mines gives promise of a production in the future.

British Columbia.

As already stated almost all the production in 1911 was from British Columbia mines, and there was a decrease from the previous year as shown by Table 7 following:—

LEAD.—TABLE 7.

British Columbia:—Production.

| Calendar Year. | Lbs. | Value. | Price per pound. | Calendar Year. | Lbs. | Value. | Price per pound. |
|----------------|------------|-----------|------------------|----------------|------------|-----------|------------------|
| | | \$ | Cts. | | | \$ | Cts. |
| 1887..... | 204,800 | 9,216 | 4·40 | 1900..... | 63,158,621 | 2,760,031 | 4·370 |
| 1888..... | 674,500 | 29,813 | 4·42 | 1901..... | 51,582,906 | 2,235,603 | 4·334 |
| 1889..... | 165,100 | 6,488 | 3·93 | 1902..... | 22,536,381 | 917,005 | 4·069 |
| 1890..... | Nil. | | | 1903..... | 18,089,283 | 766,443 | 4·237 |
| 1891..... | Nil. | | | 1904..... | 36,646,244 | 1,579,086 | 4·309 |
| 1892..... | 808,420 | 33,064 | 4·09 | 1905..... | 56,580,703 | 2,663,254 | 4·707 |
| 1893..... | 2,131,092 | 79,490 | 3·73 | 1906..... | 52,408,217 | 2,964,733 | 5·657 |
| 1894..... | 5,703,222 | 187,636 | 3·29 | 1907..... | 47,738,703 | 2,542,986 | 5·325 |
| 1895..... | 16,461,794 | 531,716 | 3·23 | 1908..... | 43,195,733 | 1,814,221 | 4·200 |
| 1896..... | 24,199,977 | 721,159 | 2·98 | 1909..... | 45,857,424 | 1,692,139 | *3·690 |
| 1897..... | 38,841,135 | 1,390,513 | 3·58 | 1910..... | 32,987,508 | 1,216,249 | 3·637 |
| 1898..... | 31,693,559 | 1,198,017 | 3·78 | 1911..... | 23,784,969 | 827,717 | †3·480 |
| 1899..... | 21,862,436 | 977,250 | 4·470 | | | | |

* Average prices at Toronto for years 1909 and 1910. For previous years average prices at New York.

† Average price at Montreal. Quotations furnished by Messrs. Thos. Robertson & Co., Montreal, Que.

LEAD.—TABLE 8.

British Columbia:—Production by Districts.*

| | 1905. | 1906. | 1907. | 1908. | 1909. | 1910. | 1911. |
|-----------------------|------------|------------|------------|------------|------------|------------|------------|
| | Lbs. | Lbs. | Lbs. | Lbs. | Lbs. | Lbs. | Lbs. |
| Cassiar. | 5,500 | ... | ..... | ..... | ..... | 1,695 | 233,578 |
| East Kootenay— | | | | | | | |
| Fort Steele. | 48,248,828 | 44,487,481 | 37,526,194 | 30,204,788 | 27,004,528 | 23,874,562 | 17,158,069 |
| Other districts. | 149,584 | 167,691 | 73,842 | 358,270 | 18,724 | 66,010 | |
| West Kootenay— | | | | | | | |
| Ainsworth. | 1,002,114 | 3,173,353 | 3,654,775 | 4,790,216 | 10,298,343 | 2,558,353 | 289,009 |
| Nelson. | 1,368,388 | 1,034,553 | 1,582,113 | 345,424 | 1,097,069 | 1,245,844 | 1,928,336 |
| Slocan. | 5,399,330 | 2,975,674 | 4,305,826 | 6,572,268 | 4,976,199 | 6,406,358 | 6,705,871 |
| Other districts. | 339,833 | 469,000 | 570,534 | 903,552 | 979,916 | 470,241 | 522,615 |
| Yale. | 67,076 | 100,465 | 25,419 | 21,215 | 21,567 | 35,584 | 29,719 |
| | 56,580,703 | 52,408,217 | 47,733,703 | 43,195,733 | 44,396,346 | 34,658,746 | 26,872,397 |

* From the Report of the Minister of Mines, B. C.

The falling off in the output of this Province is the result of a number of causes.

The Slocan forest fires of 1910 by their interruption of traffic caused a cessation or decrease of shipments from several important properties. Then, too, the heavy decrease caused by the working out of the St. Eugene has not been entirely counteracted by the tonnage from the Sullivan. There are, however, several features of promise: the approaching completion of the Bear Lake Branch of the Canadian Pacific railway and its extension to Kaslo; the increased activity in the Slocan among the larger properties and the reopening of many of the older mines; the activity of the Consolidated Mining and Smelting Co. in Ainsworth and Sheep Creek camps, and the renewal of work at the Blue Bell mine, all pointing to increase in the lead production in the near future.

NICKEL.

The mining and metallurgical treatment of the nickel-copper ores of the Sudbury district of Ontario has become one of the most important of Canada's metal mining industries, and special interest is attached to this industry because of the fact that these deposits at the present time supply a very large portion of the world's demand for nickel, and also because the present known available supplies of ore in the district appear to be sufficient for many years' operations. Additional interest is now lent to these ores by the discovery of the valuable properties possessed by the new alloy of nickel and copper recently introduced to commerce under the name of monel metal, of which some particulars were given in the report for 1908.

These nickel-copper ore deposits have already been the subject of special reports¹ by the Geological Survey at Ottawa, and the Ontario Bureau of Mines at Toronto, to which reference may be made for comprehensive descriptions of the geology of the district.

The production of ore and its reduction to a bessemer matte, was carried on during 1911 to a less extent than in the previous year. There were mined during the year 612,511 tons of ore, much of which is subjected to open air heap roasting before being smelted. There were smelted 610,834 tons, from which were produced 32,607 tons of Bessemer matte, carrying approximately 17,049 tons of nickel and 8,966 tons of copper. The net value of the matte was returned as \$4,945,592. The matte, which is shipped to the United States and Great Britain for refining, carries from 77 to 82 per cent of the combined metals, having averaged for the past year 52.3 per cent of nickel and 27.5 per cent in copper.

For the production of monel metal a special matte is produced with contents of 22 per cent copper and 58 per cent nickel, which is included in the total given above. Monel metal is produced from this special matte without the intermediate refining of either the nickel or copper.

Compared with 1910, there was a decrease in matte production, in 1911, of 2,426, or 6.9 per cent, and the decrease in total nickel content of matte was 1,587 tons, or 8.5 per cent. The total copper content of the matte was 8,966 tons, a decrease of 664 tons, or 6.9 per cent from the previous year.

The following were the aggregate results of the operations on the nickel-copper deposits of Ontario during the past four years:—

¹ No. 873. Report on nickel and copper deposits of Sudbury, Ont., by A. E. Barlow, Geological Survey, Canada, 1901.
The Sudbury Nickel Region, by A. P. Coleman, Bureau of Mines, Vol. XIV, part III, 1904.

| | 1908. | 1909. | 1910. | 1911. |
|--------------------------------------|--------------------|--------------------|--------------------|--------------------|
| | Tons of 2,000 lbs. | Tons of 2,000 lbs. | Tons of 2,000 lbs. | Tons of 2,000 lbs. |
| Ore mined..... | 409,551 | 451,892 | 652,392 | 612,511 |
| Ore smelted..... | 360,180 | 462,336 | 628,947 | 610,834 |
| Bessemer matte produced..... | 21,197 | 25,845 | 35,033 | 32,607 |
| Copper content of matte shipped..... | 7,503 | 7,873 | 9,630 | 8,966 |
| Nickel " "..... | 9,572 | 13,141 | 18,636 | 17,049 |
| Spot value of matte shipped..... | \$2,930,989 | \$3,913,017 | \$5,380,064 | \$4,945,592 |
| Wages paid..... | 1,286,265 | 1,234,904 | 1,698,152 | 1,830,526 |
| Men employed..... | 1,690 | 1,573 | 1,882 | 1,885 |

According to Customs returns exports of nickel in matte, etc., were for twelve months ending December 31, as follows:—

| | 1907. | 1908. | 1909. | 1910. | 1911. |
|-----------------------|------------|------------|------------|------------|------------|
| | Lbs. | Lbs. | Lbs. | Lbs. | Lbs. |
| To Great Britain..... | 2,513,338 | 2,554,486 | 3,843,763 | 5,335,331 | 5,023,393 |
| To United States..... | 16,857,997 | 16,865,407 | 21,772,635 | 30,679,451 | 27,596,578 |
| | 19,376,335 | 19,419,893 | 25,616,398 | 36,014,782 | 32,619,971 |

The above figures of production do not include the nickel content of the silver-cobalt ores from the Cobalt district, of which it is difficult to obtain complete statistics. The shippers of silver-cobalt ores receive no return for the nickel content, although this metal forms an important constituent of the ore and is possibly, to some extent, saved by the refiners. Plants have been established by the Coniagas Reduction Company at Thorold, and the Deloro Mining and Reduction Company at Deloro, for the recovery of nickel and cobalt oxides.

During 1911, there were shipped from the cobalt-silver smelting works of Ontario, 154,174 pounds of cobalt oxide and nickel oxide, and 1,260,832 pounds of mixed cobalt and nickel oxides and cobalt material having a total value of \$221,690.

Bounty on Refined Nickel and Nickel Oxide.—Under the terms of “The Metal Refining Bounty Act,” 1907¹ of the Province of Ontario (7 Edward VII, Chap. XIV), a bounty is authorized to be paid on nickel-cobalt, copper, and arsenic under certain conditions and restrictions during a period of five years following the passing of the Act (April, 1907).

The sections affecting nickel are as follows:—

“The treasurer of the province may, under the authority of such regulations as may from time to time be made in that behalf by the Lieutenant-

¹ The full text of the Act and Amendment will be found in the chapter on Cobalt.

Governor in Council, pay in each year to the refiners of the metals or metal compounds hereinafter specified, when refined in the province from ores raised and mined in the province, a bounty upon each pound of such metal or compound so refined as follows:—

“Class 1.—On refined metallic nickel or on refined oxide of nickel, 6 cents per pound on the free metallic nickel or on the nickel contained in the nickel oxide; but nickel upon which a bounty has already been paid in one form of product shall not be entitled to any further bounty in any other form; and the amount to be paid as bounty on the nickel products herein mentioned is not to exceed in all \$60,000 in any one year.”

In March 1912, the Act was amended to cover a further period of five years.

The price of refined nickel in New York during 1911 was quoted at from 40 to 45 cents per pound. The quotations at the end of December being “large lots contract basis 40 to 45 cents a lb. Retail spot from 50 cents for 500 lb. lots up to 55 cents for 200 lb. lots. The price of electrolytic is 5 cents higher.” During 1910 the price of refined nickel was quoted in New York at from 40 to 45 cents per pound according to size and terms of order.

Statistics of the quantities of nickel contained in matte produced are shown in the following table, the values being based on the final value of the metal, either as refined or monel metal.

Statistics of the quantities of ore mined and smelted, matte produced, etc., will be found in the chapter on smelter production.

NICKEL.—TABLE 1.

Annual Production.

| Calendar Year. | Pounds of nickel in matte shipped. | Average price per lb. | Value. | Calendar Year. | Pounds of nickel in matte shipped. | Average price per lb. | Value. |
|----------------|------------------------------------|-----------------------|-----------|----------------|------------------------------------|-----------------------|------------|
| | | Cts. | \$ | | | Cts. | \$ |
| 1889..... | *830,477 | 60 | 498,286 | 1901..... | 9,189,047 | 50 | 4,594,523 |
| 1890..... | 1,435,742 | 65 | 933,232 | 1902..... | 10,693,410 | 47 | 5,025,903 |
| 1891..... | 4,035,347 | 60 | 2,421,208 | 1903..... | 12,505,510 | 40 | 5,002,204 |
| 1892..... | 2,413,717 | 58 | 1,399,956 | 1904..... | 10,547,883 | 40 | 4,219,153 |
| 1893..... | 3,982,982 | 52 | 2,071,151 | 1905..... | 18,876,315 | 40 | 7,550,526 |
| 1894..... | 4,907,430 | 38½ | 1,870,958 | 1906..... | 21,490,955 | 42 | 8,948,834 |
| 1895..... | 3,888,525 | 35 | 1,360,984 | 1907..... | 21,189,793 | 45 | 9,535,407 |
| 1896..... | 3,397,113 | 35 | 1,188,990 | 1908..... | 19,143,111 | 43 | 8,231,538 |
| 1897..... | 3,997,647 | 35 | 1,399,176 | 1909..... | 26,282,991 | 36 | 9,461,877 |
| 1898..... | 5,517,690 | 33 | 1,820,838 | 1910..... | 37,271,033 | 30 | 11,181,310 |
| 1899..... | 5,744,000 | 36 | 2,067,840 | 1911..... | 34,098,744 | 30 | 10,229,623 |
| 1900..... | 7,080,227 | 47 | 3,327,707 | | | | |

* Calculated from shipments made by rail.

The companies engaged in mining and smelting nickel ores are:—

The Canadian Copper Company (The International Nickel Company) of Copper Cliff, Ont., and New York.

The Mond Nickel Company, Victoria Mines, Ont., and London, England.

Reference has already been made to the occurrence of nickel as one of the minor constituents of the silver ores of the Cobalt district. The quantity of nickel contained in the ores shipped from this district has been estimated by the Ontario Bureau of Mines as follows:—

| Year. | Ore shipped. | Nickel content |
|-----------|--------------|----------------|
| | Tons. | Tons. |
| 1904..... | 158 | 14 |
| 1905..... | 2,144 | 75 |
| 1906..... | 5,335 | 160 |
| 1907..... | 14,788 | 370 |
| 1908..... | 25,624 | 612 |
| 1909..... | 30,677 | 766 |
| 1910..... | 34,282 | 604 |
| 1911..... | 26,653 | 392 |

A large portion of these ores, particularly the high grade, is now being reduced at Copper Cliff, Thorold, and Deloro, and as already mentioned cobalt and nickel oxides are being recovered in addition to silver bullion and white arsenic.

Statistics of the exports of nickel as compiled from the Customs Department's reports are shown in Table 2, and the imports in Table 3.

NICKEL.—TABLE 2.

Exports of Nickel contained in Ore, Matte, or other Product.

| Calendar Year. | Value. | Calendar Year. | Lbs. | Value. |
|----------------|-----------|----------------|------------|-----------|
| | \$ | | | \$ |
| 1890..... | 89,568 | 1903..... | 12,699,227 | 1,116,099 |
| 1891..... | 667,280 | 1904..... | 11,233,869 | 1,091,349 |
| 1892..... | 293,149 | 1905..... | 17,318,059 | 1,569,693 |
| 1893..... | 629,692 | 1906..... | 20,653,845 | 2,042,965 |
| 1894..... | 559,356 | 1907..... | 19,276,335 | 2,280,374 |
| 1895..... | 521,783 | 1908..... | 19,419,893 | 1,866,624 |
| 1896..... | 658,213 | 1909..... | 25,616,398 | 2,676,453 |
| 1897..... | 723,130 | 1910..... | 36,014,732 | 4,030,040 |
| 1898..... | 1,019,363 | 1911..... | 32,619,971 | 3,676,396 |
| 1899..... | 939,915 | | | |
| 1900..... | 1,031,030 | | | |
| 1901..... | 751,080 | | | |
| 1902..... | 1,007,211 | | | |

NICKEL.—TABLE 3.

Imports of Nickel and Nickel Anodes.

| Fiscal Year. | Value. | Fiscal Year. | Value. | Fiscal Year. | Value. |
|--------------|--------|--------------|--------|--------------|--------|
| | \$ | | \$ | | \$ |
| 1890..... | 3,154 | 1898..... | 5,882 | 1906..... | 15,976 |
| 1891..... | 3,889 | 1899..... | 9,449 | 1907..... | 19,511 |
| 1892..... | 3,208 | 1900..... | 6,988 | 1908..... | 36,870 |
| 1893..... | 2,905 | 1901..... | 12,029 | 1909..... | 14,930 |
| 1894..... | 3,528 | 1902..... | 15,448 | 1910..... | 23,266 |
| 1895..... | 4,267 | 1903..... | 26,177 | 1911..... | 22,693 |
| 1896..... | 4,787 | 1904..... | 14,682 | | |
| 1897..... | 4,737 | 1905..... | 19,076 | | |

During the calendar year 1911 there was an import of "nickel, nickel-silver, and German silver in ingots or blocks" to the extent of 124,710 pounds, valued at \$30,736, and "nickel in bars and rods" 490,774 pounds, valued at \$116,579.

The only other important producer of nickel ore outside of Canada is the French colony of New Caledonia. The exports of nickel ore from this source since 1898 have been as follows in metric tons:—

Exports of Nickel Ore from New Caledonia.¹

| Year. | Metric tons. | Year. | Metric tons. | Year. | Metric tons. |
|-----------|--------------|-----------|--------------|-----------|--------------|
| 1898..... | 53,200 | 1903..... | 77,360 | 1908..... | 108,000 |
| 1899..... | 103,908 | 1904..... | 98,655 | 1909..... | 86,000 |
| 1900..... | 100,319 | 1905..... | 125,289 | 1910..... | 99,000 |
| 1901..... | 133,814 | 1906..... | 118,890 | | |
| 1902..... | 129,653 | 1907..... | 120,107 | | |

¹ Statistique de l'Industrie Minérale en France et en Algérie, Paris.

The nickel ore of New Caledonia carries about 6½ per cent of nickel.

Practically all of the above ore is smelted in France, Germany, and England.

The production of raw nickel at smelting works (partly estimated), is given by the 'Metallgesellschaft' as follows, in metric tons:—

Production of Raw Nickel at Smelting Works, in Metric Tons.

| Producing country. | 1903. | 1904. | 1905. | 1906. | 1907. | 1908. | 1909. | 1910. | 1911. |
|--|-------|--------|--------|--------|--------|--------|--------|--------|--------|
| United States of North America and Canada. | 5,100 | 6,000 | 4,500 | 6,500 | 6,500 | 7,000 | 9,000 | 10,000 | 12,000 |
| England | 1,700 | 2,200 | 3,100 | 3,200 | 3,200 | 3,000 | 3,200 | 3,500 | 4,500 |
| Germany ¹ | 1,600 | 2,000 | 2,700 | 2,800 | 2,600 | 3,000 | 3,500 | 4,500 | 5,000 |
| France | 1,500 | 1,800 | 2,200 | 1,800 | 1,800 | 1,400 | 1,200 | 1,500 | 2,000 |
| Other countries. | | | | | | 200 | 400 | 600 | 1,000 |
| Total production ² | 9,900 | 12,000 | 12,500 | 14,300 | 14,100 | 14,600 | 17,300 | 20,100 | 24,500 |

¹ The figures of production stated for Germany only cover the output in the Kingdom of Prussia; nickel is also produced in the Kingdom of Saxony, but no data are obtainable of this production, which is, however, not important.

² The entire production of nickel, apart from quite insignificant quantities obtained in Germany, Norway, and the United States of America, comes from New Caledonian and Canadian ores.

Statistics of the average yearly prices of nickel in Europe are also given by the same authority as follows:—

Yearly Average Prices of Nickel in Europe in Cents per Pound, and Marks per Kilogram.

| Year. | Prices in marks per kilo. | Cents per lb. | Year. | Prices in marks per kilo. | Cents per lb. |
|--------------|---------------------------|---------------|--------------|---------------------------|---------------|
| 1889.. . . . | 4.50 | 48.6 | 1901.. . . . | 3.00 | 32.4 |
| 1890.. . . . | 4.50 | 48.6 | 1902.. . . . | 3.20 | 34.6 |
| 1891.. . . . | 4.50 | 48.6 | 1903.. . . . | 3.30 | 35.6 |
| 1892.. . . . | 4.50 | 48.6 | 1904.. . . . | 3.30 | 35.6 |
| 1893.. . . . | 3.80 | 41.0 | 1905.. . . . | 3.30 | 35.6 |
| 1894.. . . . | 3.60 | 38.9 | 1906.. . . . | 3.80 | 41.0 |
| 1895.. . . . | 2.60 | 28.1 | 1907.. . . . | 3.50 | 37.8 |
| 1896.. . . . | 2.50 | 27.0 | 1908.. . . . | 3.25 | 35.2 |
| 1897.. . . . | 2.50 | 27.0 | 1909.. . . . | 3.25 | 35.2 |
| 1898.. . . . | 2.50 | 27.0 | 1910.. . . . | 3.25 | 35.2 |
| 1899.. . . . | 2.50 | 27.0 | 1911.. . . . | 3.25 | 35.2 |
| 1900.. . . . | 3.00 | 32.4 | | | |

Mark = 23.8 cents. Kilogram = 2.20462 lbs.

SILVER.

Owing to the rapid development of the Cobalt silver camp in Ontario during the past five years, the production of silver in Canada has, in point of value, taken second place in the list of our mineral productions, being exceeded only by coal.

The total production of silver in 1911, including that produced as bullion and the metal estimated as recovered from ores sent to smelters or otherwise treated, was reported as 32,559,044 fine ounces, which, compared with a production of 32,869,264 ounces in 1910, shows a decrease of 0.94 per cent.

The average value of fine silver in 1911, according to New York quotations, was 53.304 cents per ounce, as compared with an average value of 53.486 cents in 1910, a decrease of about 0.34 per cent.

The total value of the silver production in 1911 was \$17,355,272, a decrease of \$225,183, or 1.28 per cent over the value, \$17,580,455, in 1910.

A comparison of the production of 1910 and 1909, shows an increase for 1910 of 5,339,791 ounces, or 19.4 per cent in quantity, and \$3,401,951, or 24 per cent in value, the average price in 1910 having increased about 3.85 per cent from 1909.

Statistics of the annual production of silver since 1887 are shown in Table 1.

SILVER.—TABLE 1.
Annual Production, 1887-1911.

| Year. | Ozs. | Value. | Average price, per oz. | Year. | Ozs. | Value. | Average price, per oz. |
|-----------|-----------|-----------|------------------------|-----------|------------|------------|------------------------|
| | | \$ | Cts. | | | \$ | Cts. |
| 1887..... | 355,083 | 347,271 | 98.00 | 1900..... | 4,468,225 | 2,740,362 | 61.33 |
| 1888..... | 437,232 | 410,998 | 94.00 | 1901..... | 5,539,192 | 3,265,354 | 58.95 |
| 1889..... | 383,318 | 358,785 | 93.60 | 1902..... | 4,291,317 | 2,238,351 | 52.16 |
| 1890..... | 400,687 | 419,118 | 104.60 | 1903..... | 3,193,581 | 1,709,642 | 53.45 |
| 1891..... | 414,523 | 409,549 | 98.00 | 1904..... | 3,577,526 | 2,047,095 | 57.22 |
| 1892..... | 310,651 | 272,130 | 86.00 | 1905..... | 6,000,023 | 3,621,133 | 60.35 |
| 1893..... | | 330,128 | 77.00 | 1906..... | 8,473,379 | 5,659,455 | 66.79 |
| 1894..... | 847,697 | 534,049 | 63.00 | 1907..... | 12,779,799 | 8,348,659 | 65.33 |
| 1895..... | 1,578,275 | 1,030,299 | 65.28 | 1908..... | 22,106,233 | 11,686,239 | 52.86 |
| 1896..... | 3,205,343 | 2,149,503 | 67.06 | 1909..... | 27,529,473 | 14,178,504 | 51.50 |
| 1897..... | 5,558,456 | 3,323,395 | 59.79 | 1910..... | 32,869,264 | 17,580,455 | 53.49 |
| 1898..... | 4,452,333 | 2,593,929 | 58.26 | 1911..... | 32,559,044 | 17,355,272 | 53.30 |
| 1899..... | 3,411,644 | 2,032,658 | 59.58 | | | | |

From 1887 to 1893, the production ranged in value between \$300,000 and \$400,000, and was derived chiefly from the Provinces of Ontario and Quebec. The next three years saw a rapid increase in the production due to the development of the silver-lead ore deposits in British Columbia, and in 1896 a production of over \$2,000,000 is recorded. From that year until 1905 the production

varied from \$2,000,000 to \$3,500,000, rising rapidly during the next six years to \$17,355,272 in 1911, as a result of the discovery of the rich ores of the Cobalt district. Ontario, in 1905, produced 40.9 per cent of the total output. In 1911 the production obtained from Ontario was 93.8 per cent, and was practically all from the Cobalt district, the contribution of British Columbia being almost 5.8 per cent.

Statistics of the annual production in each province are separately shown in Table 2.

SILVER.—TABLE 2.
Production by Provinces, 1887-1911.

| Calendar Year. | ONTARIO. | | QUEBEC. | | BRITISH COLUMBIA. | | YUKON TERRITORY. | |
|----------------|------------|------------|---------|---------|-------------------|-----------|------------------|---------|
| | Ozs. | Value. | Ozs. | Value. | Ozs. | Value. | Ozs. | Value. |
| | | \$ | | \$ | | \$ | | \$ |
| 1887..... | 190,495 | 186,304 | 146,898 | 143,666 | 17,600 | 17,301 | | |
| 1888..... | 208,064 | 195,580 | 149,388 | 140,425 | 79,780 | 74,993 | | |
| 1889..... | 181,609 | 169,986 | 148,517 | 139,012 | 53,192 | 49,787 | | |
| 1890..... | 158,715 | 166,016 | 171,545 | 179,436 | 70,427 | 73,666 | | |
| 1891..... | 225,633 | 222,926 | 185,584 | 185,357 | 3,306 | 3,266 | | |
| 1892..... | 41,581 | 36,425 | 191,910 | 168,113 | 77,160 | 67,592 | | |
| 1893..... | | 8,689 | | 126,439 | | 195,000 | | |
| 1894..... | | | 101,318 | 63,880 | 746,379 | 470,219 | | |
| 1895..... | | | 81,753 | 53,369 | 1,496,522 | 976,930 | | |
| 1896..... | | | 70,000 | 46,942 | 3,135,313 | 2,102,561 | | |
| 1897..... | 5,000 | 2,990 | 80,475 | 48,116 | 5,472,971 | 3,272,289 | | |
| 1898..... | 85,000 | 49,521 | 74,932 | 43,655 | 4,292,401 | 2,500,753 | | |
| 1899..... | 202,000 | 120,352 | 40,231 | 23,970 | 2,939,413 | 1,751,302 | 236,000 | 137,034 |
| 1900..... | 161,650 | 99,140 | 58,400 | 35,817 | 3,958,175 | 2,427,548 | 290,000 | 177,857 |
| 1901..... | 151,400 | 89,250 | 41,459 | 24,440 | 5,151,333 | 3,036,711 | 195,000 | 114,953 |
| 1902..... | 145,000 | 75,632 | 42,500 | 22,168 | 3,917,917 | 2,043,586 | 185,900 | 96,985 |
| 1903..... | 17,777 | 9,562 | 28,600 | 15,287 | 2,996,204 | 1,601,471 | 156,000 | 83,362 |
| 1904..... | 206,875 | 118,376 | 15,000 | 8,583 | 3,222,481 | 1,843,935 | 133,170 | 76,201 |
| 1905..... | 2,451,356 | 1,479,442 | 19,620 | 11,841 | 3,439,417 | 2,075,757 | 89,630 | 54,093 |
| 1906..... | 5,401,766 | 3,607,894 | 17,686 | 11,813 | 2,990,262 | 1,997,226 | 63,665 | 42,522 |
| 1907..... | 9,982,363 | 6,521,178 | 16,000 | 10,452 | 2,745,448 | 1,793,519 | 35,988 | 23,510 |
| 1908..... | 19,398,545 | 10,254,847 | 13,299 | 7,030 | 2,631,389 | 1,391,058 | 63,000 | 33,304 |
| 1909..... | 24,822,099 | 12,784,126 | 13,233 | 6,815 | 2,649,141 | 1,364,357 | 45,000 | 23,176 |
| 1910..... | 30,366,366 | 16,241,755 | 7,593 | 4,061 | 2,407,887 | 1,287,883 | 87,418 | 46,756 |
| 1911..... | 30,540,754 | 16,279,443 | 18,435 | 9,827 | 1,887,147 | 1,005,924 | 112,708 | 60,078 |

The average price of fine silver in New York during 1911 varied between a maximum of 55.7 cents per ounce in November, and a minimum of 52.1 cents per ounce in August, the average being 53.304 cents per ounce.

In London the average price of silver in 1911 was 24.592 pence per standard ounce of a fineness of 0.925. For the year 1910, the average price per fine ounce in New York was 53.486 cents, the highest being 55.6 cents in November, and the lowest 51.4 in March of that year.

The average monthly prices of silver in New York from 1906 to 1911, and in London during 1911, are shown in tabulated form following.

Average Monthly Prices of Silver.

| Months. | New York.—Cents per fine ounce. | | | | | London.— Pence per Standard ounce (a). |
|---------------------------|---------------------------------|--------|--------|--------|--------|---|
| | 1907. | 1908. | 1909. | 1910. | 1911. | 1911. |
| January..... | 68·673 | 55·678 | 51·750 | 52·375 | 53·795 | 24·865 |
| February..... | 68·835 | 56·000 | 51·472 | 51·634 | 52·222 | 24·081 |
| March..... | 67·519 | 55·365 | 50·468 | 51·454 | 52·745 | 24·324 |
| April..... | 65·462 | 54·505 | 51·428 | 53·221 | 53·325 | 24·595 |
| May..... | 65·981 | 52·795 | 52·305 | 53·870 | 53·308 | 24·583 |
| June..... | 67·090 | 53·663 | 52·538 | 53·462 | 53·043 | 24·486 |
| July..... | 68·144 | 53·115 | 51·043 | 54·150 | 52·630 | 24·286 |
| August..... | 68·745 | 51·683 | 51·125 | 52·912 | 52·171 | 24·082 |
| September..... | 67·792 | 51·720 | 51·449 | 53·295 | 52·440 | 24·209 |
| October..... | 62·435 | 51·431 | 50·923 | 55·490 | 53·340 | 24·594 |
| November..... | 58·677 | 49·647 | 50·703 | 55·635 | 55·719 | 25·649 |
| December..... | 54·555 | 48·769 | 52·226 | 54·428 | 54·905 | 25·349 |
| Average for the year..... | 65·327 | 52·864 | 51·503 | 53·486 | 53·304 | 24·592 |

(a) 925 parts fine.

Important quantities of silver are now being produced in Canada, both as fine metal and as silver bullion, ranging in fineness from 850 to 998·2. Fine silver is produced at Trail, B.C., by the Consolidated Mining and Smelting Company of Canada, Limited, chiefly from the silver-lead ores of that Province, and is shipped to China, the United States, and to the Ottawa mint.

The annual production of fine silver at Trail since 1904 has been as follows:—

| Year. | Fine ozs. | Year. | Fine ozs. |
|-----------|--------------|------------|--------------|
| 1904..... | 551,450 | 1909..... | 2,003,003 |
| 1905..... | 1,088,328 | 1910..... | 1,798,960 |
| 1906..... | 1,263,809 | 1911..... | 1,325,601 |
| 1907..... | 1,631,422 | | |
| 1908..... | 1,956,039 | Total..... | 11,618,616 |

In Ontario ores from the Cobalt district are treated by the following companies:—

The Canadian Copper Company at Copper Cliff, Ont.

The Deloro Mining and Reduction Company, Deloro, Ont.

The Coniagas Reduction Company, St. Catharines, Ont.

Canada Refining and Smelting Company, Orillia, Ont.

Silver bullion of a fineness varying from 850 to 998·2 is produced at the works, other products being white arsenic and more recently nickel and cobalt oxides or mixed oxides. The silver bullion, as a rule, finds a market in the

United States and in England. The bullion shipped in 1907 contained 4,449,722 fine ounces of silver; in 1908, 11,168,689 ounces; in 1909, 14,385,985 ounces; and in 1910, 17,365,165 fine ounces. In 1911 these smelters produced 17,753,167 fine ounces, or 53.9 per cent of the total production of Ontario.

Quebec.

The small quantity of silver credited to the Province of Quebec for a number of years, represents a small silver content of the pyritic ores mined at Capelton and Eustis in the Eastern Townships.

Ontario.

From a production valued at only \$118,376 in 1904, the silver output of the Province has grown to a value of over \$16,200,000 in 1911. Not only does it contribute almost 94 per cent of the total silver production of Canada, but it now forms a very appreciable part (estimated at over 13 per cent), of the world's production. According to returns received by this department, there were shipped during 1911, 15,417 tons of ore, and 9,329 tons of concentrates, or a total tonnage of 24,746 tons, having a value of \$14,271,964, besides silver bullion produced at the mines, carrying 3,766,022 fine ounces of silver.

The silver content of ore shipped was estimated as 20,065,621 ounces, or an average of 1,302 ounces per ton, and of the concentrates shipped 8,118,231 ounces, or an average of 870 ounces per ton; the total silver content of ore, concentrates, and bullion shipped from the mines being 32,949,874 ounces. The mine owners receive payment for only 93 to 98 per cent of the silver content, and in estimating and valuing the production a deduction of five per cent is made from silver contained in ore and concentrates to cover losses in smelting and refining. On this basis the silver recovery is estimated at 30,540,754 ounces, and valued at \$16,279,443. No payments for cobalt content were reported.

In the following table a record of shipments since 1904 is given, the figures for the first three years being those published by the Ontario Bureau of Mines.

Silver Ore and Bullion Shipments from Cobalt Mines, 1904-1911.

| Year. | SHIPMENTS. | | SILVER CONTENT. | | SILVER IN OUNCES, PER TON. | | Silver bullion shipments. Fine ounces. | Total value of silver. |
|---------------|------------|--------------------|-----------------|-------------------|----------------------------|--------------|--|------------------------|
| | Ore. Tons. | Concentrate. Tons. | Ore. Ozs. | Concentrate. Ozs. | Ore. | Concentrate. | | |
| 1904. | 158 | | 206,875 | | 1,309 | | | \$ 118,376 |
| 1905. | 2,144 | | 2,451,356 | | 1,143 | | | 1,473,192 |
| 1906. | 5,335 | | 5,401,766 | | 1,013 | | | 3,607,894 |
| 1907. | 14,644 | | 9,982,363 | | 682 | | | 6,521,178 |
| 1908. | 25,682 | * | 19,398,545 | * | 755 | * | | 10,254,847 |
| 1909. | 27,835 | 3,059 | 22,349,717 | 3,627,819 | 803 | 1,186 | 143,440 | 12,784,126 |
| 1910. | 28,684 | 6,943 | 23,797,111 | 7,111,579 | 830 | 1,024 | 1,003,111 | 16,241,755 |
| 1911. | 15,417 | 9,329 | 20,065,621 | 8,118,231 | 1,300 | 870 | 3,766,022 | 16,279,443 |

* Included with ore.

As the camp has developed, the average grade of the ore shipped has gradually diminished, although the introduction of concentration plants in 1908, and their increased use has tended to keep the ore shipped up to a high standard.

With respect to the nickel-cobalt and arsenic contents of these ores, the mining companies have been paid for only a small portion of the cobalt content, and nothing for the nickel and arsenic; in fact in certain cases the last two are penalized, and in 1911 payment for even cobalt ceased.

The total metal content of these ores, as estimated by the Ontario Bureau of Mines, is shown in the next table. The figures for ore shipments and silver content, while not identical, agree very closely with those given in the previous table.

Total Production Cobalt Mines, 1904-1911.*

| Year. | ORE AND CONCENTRATE SHIPPED. | METALLIC CONTENT. | | | |
|------------|------------------------------------|-------------------|---------|----------|------------|
| | | Nickel. | Cobalt. | Arsenic. | Silver. |
| | Tons. | Tons. | Tons. | Tons. | Ozs. |
| 1904. | 158 | 14 | 16 | 72 | 206,875 |
| 1905. | 2,144 | 75 | 118 | 549 | 2,451,356 |
| 1906. | 5,385 | 160 | 321 | 1,440 | 5,401,766 |
| 1907. | 14,788 | 370 | 739 | 2,953 | 10,023,311 |
| 1908. | 25,624 | 612 | 1,224 | 3,672 | 19,437,875 |
| 1909. | 30,677 | 766 | 1,533 | 4,294 | 25,897,825 |
| 1910. | 34,282 | 604 | 1,098 | 4,897 | 30,645,181 |
| 1911. | 26,653 | 392 | 852 | 3,806 | 31,507,791 |

* As per Ontario Bureau of Mines.

† Bullion shipments from mines included.

Nearly 30 per cent of the ore shipped from Cobalt was treated in metallurgical works in Canada, and white arsenic is being produced therefrom, of which record will be found under smelter production.

While the greater number of the operating companies hold unrestricted titles to their properties, several are operated on a royalty basis on mining lands owned and leased by the Timiskaming and Northern Ontario Railway Commission. Mr. Arthur A. Cole, Mining Engineer to the Commission, has in his annual report compiled some very interesting statistics covering the whole district with respect to ore shipments, concentration, power and labour, prices paid for ore, etc., from which the following tables and extracts have been freely drawn:—

Ore Shipments from the Cobalt District for the Years 1904 to 1911.

| Mine. | 1904. to 1906. | 1907. | 1908. | 1909. | 1910. | 1911. | Totals. 1904-1911. |
|---|----------------------|-----------|-----------|-----------|-----------|-----------|-----------------------|
| | Tons. | Tons. | Tons. | Tons. | Tons. | Tons. | Tons. |
| Badger..... | | | | | | 27'10 | 27'10 |
| Bailey..... | 30'00 | | 88'80 | 36'85 | | 20'00 | 175'65 |
| Beaver..... | | | | 51'38 | 140'06 | 790'81 | 982'25 |
| Buffalo..... | 1,193'60 | 1,241'54 | 536'90 | 648'86 | 1,185'77 | 1,275'19 | 6,081'86 |
| Casey Cobalt..... | | | 10'00 | 8'50 | 48'40 | 277'74 | 344'64 |
| Chambers-Ferland..... | | | 223'89 | 517'88 | 885'92 | 622'85 | 2,250'54 |
| City of Cobalt..... | | 50'61 | 761'04 | 566'82 | 329'40 | 281'30 | 1,989'17 |
| Cobalt Central..... | | 77'33 | 187'99 | 339'01 | 285'62 | 22'40 | 912'35 |
| Cobalt Lake..... | | | 225'97 | 95'47 | 296'80 | 2,111'32 | 2,729'56 |
| Cobalt Townsite..... | | 143'22 | 177'71 | 27'35 | 310'99 | 708'51 | 1,362'78 |
| Colonial..... | 15'00 | 40'38 | | | 178'60 | 114'10 | 348'08 |
| Cornagas..... | 452'62 | 2,447'37 | 610'25 | 806'93 | 1,261'46 | 1,813'89 | 7,392'52 |
| Crown Reserve..... | | | 657'35 | 3,107'52 | 2,814'25 | 977'32 | 7,616'44 |
| Drummond..... | 307'35 | 104'13 | 1,161'38 | 1,225'47 | 2,194'41 | 714'83 | 5,707'57 |
| Foster..... | 200'85 | 312'13 | 191'20 | 113'90 | | | 818'07 |
| Green Meehan..... | 37'03 | 98'39 | | | | 102'98 | 238'40 |
| †Hargrave..... | 28'45 | | | | 343'68 | 102'44 | 474'57 |
| Hudson Bay..... | | 149'53 | 1,094'23 | 743'64 | 260'33 | 898'88 | 3,146'61 |
| Imperial Cobalt..... | | 14'61 | | | | | 14'61 |
| Kerr Lake..... | 213'33 | 319'76 | 660'24 | 1,173'42 | 5,088'78 | 1,292'58 | 8,748'08 |
| King Edward (Watts)..... | 19'00 | 31'12 | 338'19 | 146'58 | 134'12 | 20'00 | 689'01 |
| LaRose..... | 1,522'52 | 2,815'45 | 4,843'17 | 6,757'21 | 5,131'53 | 3,681'54 | 24,651'42 |
| †Lawson..... | | 61'12 | | | | | 75'73 |
| McKinley-Darragh..... | 547'54 | 742'42 | 1,808'39 | 1,056'49 | 2,393'39 | 3,238'64 | 9,786'87 |
| Nancy Helen..... | | 30'10 | 201'32 | 116'32 | | | 347'74 |
| Nipissing..... | 2,668'10 | 2,538'26 | 3,571'96 | 6,470'52 | 6,833'81 | 2,952'20 | 25,034'85 |
| Nova Scotia..... | 43'95 | 272'21 | 237'95 | 224'79 | | | 778'90 |
| North Cobalt..... | | | | 6'87 | | 3'00 | 9'87 |
| O'Brien..... | 140'50 | 1,491'61 | 3,469'51 | 1,419'11 | 608'67 | 628'44 | 7,747'74 |
| Peterson Lake Leases (Little Nipissing)..... | | | 40'67 | 39'62 | 313'76 | 28'45 | 422'50 |
| (Nova Scotia)..... | | | | 121'15 | | | 121'15 |
| Provincial..... | | | 75'84 | | 52'05 | 100'54 | 228'43 |
| †Princess..... | | 3'93 | | | | | 3'93 |
| Red Rock..... | | 45'71 | | | | | 45'71 |
| Right of Way..... | 46'25 | 129'37 | 750'04 | 1,608'99 | 981'41 | 666'06 | 4,182'12 |
| Rochester..... | | | | | 28'30 | | 28'30 |
| Silver Bar..... | | | 0'58 | | | 2'72 | 3'30 |
| Silver Cliff..... | | | 160'44 | 149'06 | 156'84 | 92'30 | 558'64 |
| Silver Leaf..... | 9'00 | 46'36 | 197'03 | | | | 252'39 |
| Silver Queen..... | 175'57 | 478'57 | 885'70 | 316'64 | | | 1,856'58 |
| Timiskaming..... | | 204'32 | 795'20 | 852'14 | 1,119'12 | 855'60 | 3,826'38 |
| Timiskaming-Cobalt..... | 20'47 | 67'98 | | | | | 88'45 |
| Trethowey..... | 438'06 | 833'58 | 1,408'69 | 1,134'50 | 536'64 | 602'98 | 4,954'45 |
| †University..... | 171'28 | 60'23 | | | | | 231'51 |
| Victoria..... | | | 0'47 | | | | 0'47 |
| Violet..... | 36'00 | | | | | | 36'00 |
| Waldman..... | | | | | 38'81 | | 38'81 |
| Wyandoh..... | | | | | 24'15 | | 24'15 |
| Total..... | 8,331'08 | 14,851'34 | 25,362'10 | 29,942'99 | 33,976'97 | 24,921'71 | 137,386'26 |

† The shipment in 1905 was made by the White Silver Mining Co., the former owner of the Hargrave property.

‡ Shipments from Lawson, Princess, and University since 1907, included with LaRose.

Shipments from the Cobalt District for the Calendar Year 1911.

| Mine. | Jan. | Feb. | March. | April. | May. | June. | July. | August. | Sept. | Oct. | Nov. | Dec. | Total. |
|-----------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| Badger..... | | | | 27 10 | | | | | | | | | 27 10 |
| Bailey..... | | | | 20 00 | | | | | | | | | 20 00 |
| Beaver..... | 93 21 | 182 87 | 21 87 | | 60 73 | 31 25 | 31 50 | 247 08 | 30 38 | 59 38 | | 32 54 | 790 81 |
| Buffalo..... | 121 83 | 122 77 | 127 10 | 91 60 | 108 45 | 88 88 | 130 60 | 96 01 | 53 58 | 122 29 | 87 73 | 124 35 | 1,275 19 |
| Casey-Cobalt..... | | 19 00 | | 16 65 | 5 19 | | | | 40 00 | | 196 90 | | 277 74 |
| Chambers-Ferland..... | 64 95 | 32 80 | 64 15 | 65 40 | 63 45 | 64 40 | 64 70 | 64 00 | | 32 00 | 32 00 | 75 00 | 622 85 |
| City of Cobalt..... | 30 00 | 31 90 | 89 05 | 66 45 | 32 80 | 31 10 | | | | | | | 281 30 |
| Cobalt Central..... | | 22 40 | | | | | | | | | | | 22 40 |
| Cobalt Lake..... | | 345 45 | 189 20 | 181 50 | 98 00 | 265 25 | 89 96 | 154 73 | 214 46 | 230 20 | 162 51 | 180 06 | 2,111 32 |
| Cobalt Townsite..... | 122 33 | | | 14 40 | 35 25 | 23 50 | 48 65 | 70 64 | 133 07 | 110 55 | 23 58 | 121 54 | 708 51 |
| Colonial..... | | | | 21 40 | | 22 75 | | 23 70 | | 24 00 | 22 25 | | 114 10 |
| Coniagas..... | 82 15 | 168 18 | 266 54 | 121 30 | 181 68 | 155 77 | 60 60 | 291 84 | 101 98 | 132 60 | 149 90 | 91 35 | 1,813 89 |
| Crown Reserve..... | 78 67 | 86 41 | 77 40 | 114 15 | 135 70 | 57 90 | 131 44 | 95 85 | 78 63 | 30 66 | 48 92 | 41 65 | 977 32 |
| Drummond..... | | | | | | | | 138 70 | 183 83 | 212 30 | 90 00 | 90 00 | 714 83 |
| Green Meehan..... | | | | | 29 00 | | | | | 42 90 | | 31 08 | 102 98 |
| Hargrave..... | | | 20 55 | | | 60 00 | | | | | | 21 89 | 102 44 |
| Hudson Bay..... | 30 62 | 30 55 | 32 60 | 61 75 | 93 60 | 94 25 | 123 02 | 126 11 | 63 07 | 62 84 | 97 32 | 83 15 | 898 88 |
| Keir Lake..... | 212 70 | 150 78 | 60 05 | 120 75 | 90 55 | 90 05 | 90 90 | 149 00 | 90 74 | 93 80 | 111 47 | 31 79 | 1,292 58 |
| King Edward..... | | 20 00 | | | | | | | | | | | 20 00 |
| La Rose..... | 214 41 | 209 52 | 146 65 | 397 28 | 305 55 | 272 78 | 338 86 | 492 60 | 398 57 | 275 71 | 252 37 | 277 24 | 3,581 54 |
| McKinley-Darragh..... | 161 31 | 271 93 | 202 30 | 297 49 | 274 79 | 299 34 | 183 80 | 319 23 | 337 68 | 307 33 | 258 46 | 324 98 | 3,238 64 |
| Nipissing..... | 440 82 | 219 73 | 186 15 | 178 51 | 194 35 | 370 38 | 283 95 | 184 45 | 206 32 | 128 78 | 385 02 | 260 74 | 2,952 20 |
| North Cobalt..... | | 3 00 | | | | | | | | | | | 3 00 |
| O'Brien..... | 36 40 | 62 40 | 65 41 | 64 70 | 39 90 | 63 50 | 62 75 | 63 50 | 35 26 | 69 21 | 32 01 | 33 40 | 628 44 |
| Peterson Lake..... | 28 45 | | | | | | | | | | | | 28 45 |
| Provincial..... | | | | 20 00 | | | 30 35 | | 25 14 | | 25 05 | | 100 54 |
| Right of Way..... | 64 20 | 30 05 | 62 55 | | 67 32 | 94 34 | 32 95 | 90 67 | 89 53 | 61 25 | 41 12 | 32 08 | 666 06 |
| Silver Bar..... | | | | | 2 72 | | | | | | | | 2 72 |
| Silver Cliff..... | 24 25 | | 25 55 | 42 50 | | | | | | | | | 92 30 |
| Timiskaming..... | 31 65 | 67 43 | 110 21 | 32 54 | 96 02 | 42 77 | 90 26 | 70 26 | 51 86 | 101 84 | 67 78 | 92 98 | 855 60 |
| Trethewey..... | 48 40 | 24 45 | 67 90 | 25 25 | 105 47 | 35 35 | 56 00 | 24 45 | 50 40 | 79 75 | 29 88 | 55 68 | 602 98 |
| Total..... | 1,886 35 | 2,101 62 | 1,815 23 | 1,980 72 | 2,020 52 | 2,173 56 | 1,850 29 | 2,702 82 | 2,184 50 | 2,177 33 | 2,087 26 | 1,941 50 | 24,921 71 |

The ore produced in the years 1908 to 1911, was shipped to the following countries for treatment:—

| Country. | 1908. | | 1909. | | 1910. | | 1911. | |
|--------------------|-----------|----------|-----------|----------|-----------|----------|-----------|----------|
| | Tons. | Per cent | Tons. | Per cent | Tons. | Per cent | Tons. | Per cent |
| Canada | 7,401·14 | 29·18 | 10,230·64 | 34·47 | 9,922·40 | 23·20 | 8,746·21 | 31·02 |
| Great Britain..... | 222·08 | 0·88 | 30·25 | 0·10 | 393·73 | 1·15 | ..... | ..... |
| Germany..... | 299·46 | 1·18 | 106·51 | 0·35 | 232·14 | 0·69 | 218·66 | 0·85 |
| United States..... | 17,439·42 | 68·76 | 19,575·59 | 65·08 | 23,428·70 | 68·96 | 16,745·35 | 65·13 |
| Total | 25,362·10 | 100·00 | 29,942·99 | 100·00 | 33,976·97 | 100·00 | 25,710·22 | 100·00 |

With respect to concentration Mr. Cole reports: "Fifteen mills operated during the year, milling a total of 381,870 tons. The Hudson Bay mill started operations in March but the Silver Cliff, King Edward, and Cobalt Central mills were closed down most of the year. The King Edward mill has recently been rented by the City of Cobalt Mining Company for the treatment of their own ores.

"Mills are under construction for the Beaver and Nipissing Companies. Cyanidation is used in conjunction with regular water concentration in the O'Brien and Buffalo mills and in the case of the Nova Scotia it is a combination method of cyanidation and amalgamation. The latter combination is also to be adopted in the new Nipissing mill.

"The following is a list of the mills of the district showing their daily rated capacity:—

| Mill. | District. | Capacity per day. | Remarks. |
|----------------------------|---------------|-------------------|----------------------------------|
| Buffalo | Cobalt..... | Tons. 150 | Closed down. |
| Cobalt Central..... | " | 100 | |
| Cobalt Lake | " | 70 | |
| Colonial..... | " | 30 | |
| Coniagas..... | " | 160 | |
| Hudson Bay..... | " | 50 | Operated by City of Cobalt mine. |
| King Edward..... | " | 30 | |
| McKinley-Darragh..... | " | 120 | Customs Mill. |
| Nipissing Reduction | " | 75 | |
| Northern Customs..... | " | 200 | |
| Nova Scotia | " | 160 | |
| O'Brien..... | " | 90 | |
| Silver Cliff..... | " | 80 | Closed down. |
| Timiskaming..... | " | 80 | |
| Tretheway..... | " | 100 | Closed down. |
| Millerett..... | Gowganda..... | 30 | |
| Reeve Dobie..... | " | 30 | |
| <i>Under Construction.</i> | | 1,555 | |
| Beaver..... | Cobalt..... | 60 | |
| Nipissing..... | " | 200 | |
| | | 1,815 | |

"Following are tables of concentration which illustrate the advance made in this part of the industry during 1911.

| Mills and mines. | Tons milled. | CONCENTRATES. | | | Concentration ratio. |
|--------------------------|--------------|---------------|----------|----------|----------------------|
| | | Jigs. | Tables. | Total. | |
| Buffalo*..... | 43,930.00 | 236.00 | 735.00 | 971.00 | 45-1 |
| Cobalt Central..... | 1,478.40 | 3.82 | 12.37 | 16.19 | 91-1 |
| Colonial..... | 7,755.00 | | | 127.00 | 61-1 |
| Cobalt Lake..... | 3,800.00 | 39.15 | 55.15 | 94.30 | 40-1 |
| Coniagas..... | 53,150.00 | 318.70 | 952.40 | 1,271.10 | 42-1 |
| Hudson Bay..... | 18,294.00 | 239.00 | 427.00 | 666.00 | 27-1 |
| King Edward— | | | | | |
| City of Cobalt..... | 1,047.50 | 3.00 | 25.00 | 28.00 | 38-1 |
| King Edward..... | 12,019.00 | | | 16.50 | 73-1 |
| McKinley-Darragh..... | 46,497.00 | 644.00 | 1,884.00 | 2,528.00 | 18-1 |
| Millerett..... | 5,454.00 | 8.00 | 82.00 | 90.00 | 61-1 |
| Nipissing Reduction..... | 14,766.53 | 87.82 | 150.73 | 238.55 | 62-1 |
| Northern Customs— | | | | | |
| City of Cobalt..... | 5,911.08 | | | 233.07 | 25-1 |
| Cobalt Townsite..... | 12,569.97 | | 388.39 | 388.39 | 33-1 |
| Casey Cobalt..... | 362.00 | | | 12.00 | 33-1 |
| La Rose..... | 36,264.49 | | 1,721.10 | 1,721.10 | 21-1 |
| Nancy Helen..... | 519.00 | | 4.80 | 4.80 | 108-1 |
| Timiskaming..... | 34,720.00 | 177.44 | 588.23 | 765.67 | 45-1 |
| Trethewey..... | 30,925.00 | 107.68 | 341.12 | 448.80 | 69-1 |
| Total | 329,462.97 | | | 9,620.47 | 34-1 |

* The mill cyanided 8,804 tons slimes producing 4,565 lbs. of bullion.

Nova Scotia..... 19,152 tons milled, produced 686,406 ozs. bullion.

O'Brien .. 33,256 " 273,930 "

52,408

960,336

Total tons milled by water concentrating mills..... 329,462.97

" cyanide mills..... 52,408.00

Total tons milled..... 381,870.97

"From small beginnings and a comparatively insignificant position in the early history of Cobalt, concentration has developed till it is at present one of the dominating features of the situation. In fact, it is hardly too much to say that half the mines now shipping would be closed down if they had to depend on their high grade ore without their mills for their profits."

Sampling.

"The ore sampling works of Campbell and Deyell were in continuous operation throughout 1911 and during that time treated 5,653 tons of high grade ore. This represents about 70% of the capacity of the plant. The plant was designed to sample the high grade silver ores of the Cobalt district and details have been worked out with the greatest care. Machines are being installed which cut out the objectionable feature of floor sampling so that now the plant is practically automatic throughout. The work performed in this plant is equal to the best on the continent and having it located in Cobalt is a decided boon to the camp."

Power.

"The spring break up of 1911 was late in arriving and was not preceded by any considerable temporary thaws.

"So pronounced was the shortage of water that the production of power was materially affected.

"This noticeably cut down the volume of ore shipment during the first three months of the year.

"Towards the end of the year a consolidation took place of the two Montreal River Power Companies, viz.: The Cobalt Power Company and The Cobalt Hydraulic Power Company, under the name of the Northern Ontario Light and Power Company, Limited."

Smelting of Cobalt Ores.

"The following is a list of the smelting companies that received ore from the Cobalt district during 1911 accompanied by some of the schedules on which the purchases were made. As far as possible the tariffs given are those that were in force on January 1, 1912.

"The following is the list:—

Canadian Copper Company, Copper Cliff, Ont.

Canada Refining and Smelting Company, Orillia, Ont.

Coniagas Reduction Company, St. Catharines, Ont.

Deloro Mining and Reduction Company, Deloro, Ont.

American Smelting and Refining Company, New York, N.Y., U.S.A.

Balbach Smelting and Refining Company, Newark, N.J., U.S.A.

Beer, Sondheimer and Company, Frankfort-on-Main, Germany, and
New York, N.Y., U.S.A.

Pennsylvania Smelting Company, Pittsburg, Pa., U.S.A.

Government of Saxony, Saxony, Germany.

United States Metals Refining Company, New York, N.Y., U.S.A.

1. Canadian Copper Company, Copper Cliff, Ont.

"Recent changes have increased the capacity of the plant from 800 to 1,000 tons per month, giving a monthly output of silver of from 1,000,000 to 1,500,000 ounces. Another result of the enlargement and the changes that have been made is the quicker returns to shippers. Formerly the Company paid for 70 per cent of the silver in 35 days, and 30 per cent in 90 days from sampling date. Since December 1, 1910, payments are made 70 per cent in 30 days and 30 per cent in 60 days.

All purchases are made by the Orford Copper Company of New York, and the following is the curtailed schedule for arsenical-cobalt-silver ores.

Purchaser to make payment for:—

| | | |
|-----|---|-------------------------|
| 84 | per cent of silver per ton of ore (2,000 lbs.) when same assays | 200- 500 ounces silver. |
| 85 | " | 500- 600 " |
| 87 | " | 600- 800 " |
| 90 | " | 800-1,000 " |
| 92 | " | 1,000-1,300 " |
| 93 | " | 1,300-1,600 " |
| 93½ | " | 1,600-2,000 " |
| 94½ | " | 2,000-2,500 " |
| 95 | " | 2,500-3,000 " |
| 95½ | " | 3,000-4,000 " |
| 96 | " | 4,000-5,000 " |
| 96½ | " | 5,000 and over " |

Ore to be delivered to the Canadian Copper Company f.o.b. cars, Copper Cliff, Ont. Ore to be at shipper's risk until sampling is undertaken, as purchaser can assume no responsibility for the ore until same has been taken into its sampler.

Purchaser to sample at its expense, purchaser's and seller's representatives to be present. Assays to be made by Ledoux and Company of New York, at seller's expense, which assays are to govern in settlement.

Payment of 70 per cent of the silver returnable to the seller, as per the above scale, to be made at the New York official price for silver on the first settlement date, which shall be 30 days after the date on which sampling of the ore is completed, and the balance, 30 per cent, on the second settlement date, on the New York official price of silver on that day, which shall be 60 days after sampling of the ore is completed. The purchaser, however, reserves the right to deliver upon either or both of the settlement dates above specified, in lieu of cash, at his option, such silver bullion (commercial bar silver) as is due the seller in settlement upon these dates, such delivery to be made in New York city.

2. Coniagas Reduction Company, Limited, St. Catharines, Ont.

"The plant of the Coniagas Reduction Company treated about 6,000,000 ounces of silver during 1911, most of the resulting bullion being shipped to London, England.

The following is in condensed form the smelting schedule that went into effect on November 1, 1911.

Percentage of silver to be paid for on commercial assay of silver content per tons of 2,000 pounds as follows:—

| | |
|-----------------|---|
| 55 per cent for | 50 ounces and proportionate increase up to. |
| 73 | " 200 " |
| 78 | " 300 " |
| 84 | " 300 " |
| 91.5 | " 1,000 " |
| 92.5 | " 1,500 " |
| 93.5 | " 2,000 " |
| 95 | " 3,000 ounces and over. |

Sampling to be at vendor's expense.

All ore purchased to be at a refining charge of $\frac{3}{4}$ cent per ounce of silver content.

Seventy-five per cent of the amount 30 days after date of weighing and sampling report.

Twenty-five per cent of amount 90 days after date of said report. Price of silver to be determined by New York quotation, as given by Messrs. Handy and Harman to Western Union Telegraph Company on dates of settlement.

3. Deloro Mining and Reduction Company, Limited, Deloro, Ont.

"The smelting schedule of this Company published at the beginning of 1911 was still in force on the 1st of January, 1912, and is as follows:—

Treatment charge, \$25 per ton of ore.

Refining charge, three-quarters of a cent per ounce of silver contents on ore assaying 3,000 ounces and over per ton. One cent per ounce of silver contents on ore assaying 2,000 to 3,000 ounces per ton. One and a half cents per ounce of silver contents on ore assaying less than 2,000 ounces per ton.

Terms of payment, 75 per cent of net proceeds at Handy and Harman's New York quotation, 30 days after completion of sampling; 25 per cent of net proceeds at Handy and Harman's New York quotation, 90 days after completion of sampling. Ore to be delivered in carload lots f.o.b., Marmora station, C. O. railway, and to be at shipper's risk until sampling is undertaken.

4. Canada Refining and Smelting Co., Limited, Orillia, Ont.

"This Company blew in its furnace on February 20, 1911, but was closed down later on while the plant was being enlarged. Its present capacity is from 15 to 20 cars monthly or double what it was when operations started.

The smelting schedule remains unchanged and is as follows:—

| 84 per cent of silver contents by commercial assay | | | | 200 ozs. and over per ton, 2,000 lbs. | | |
|--|---|---|---|---------------------------------------|---|---|
| 86 | " | " | " | 300 | " | " |
| 89 | " | " | " | 500 | " | " |
| 91 | " | " | " | 750 | " | " |
| 93 | " | " | " | 1,000 | " | " |
| 93½ | " | " | " | 1,500 | " | " |
| 94½ | " | " | " | 2,000 | " | " |
| 95 | " | " | " | 2,500 | " | " |

Ores containing less than 3,000 ounces per ton are subject to a refining charge of ½ cent per ounce, and ores containing less than 1,500 ounces per ton are subject to a refining charge of ¾ cent per ounce. Ores containing less than 1,000 ounces per ton are subject to a treatment charge of \$10 per ton in addition to above.

Terms of payment for silver, 75 per cent of amount 30 days after date of weighing and sampling report. 25 per cent of amount 90 days after date of said report.

Price of silver to be New York official quotation.

Ore to be delivered f.o.b., Orillia, carload lots at owner's risk.

Weights to be taken after milling and moisture determination.

When so desired, Campbell and Deyell's sampling and weights will be accepted as final, and in case of dispute on assays, settlement will be made on

assays of Campbell and Deyell as umpire, or such other umpire as may be mutually agreed upon by parties.

5. American Smelting and Refining Company, New York, U.S.A.

"Of the foreign companies receiving silver ores from Cobalt, the American Smelting and Refining Company received the largest tonnage. The ore was consigned to both Perth Amboy, N.J., and Denver, Colo., and consisted of both high and low grades.

The prices offered by this Company vary according to the grade and analysis of the different ores submitted and also as to whether or not occasional shipments are involved or time contracts for entire outputs. Prices are also contingent to some extent upon length of contract and upon operating conditions at the smelter at the time any definite tonnage is offered. An idea of the prices ruling may, however, be gathered from the following contract rates which are now in effect:—

Tariff.—For ores assaying 1,000 ounces or over per ton.

Silver.—Pay for 95 per cent of the silver contents at New York quotation.

Treatment Charge.—\$7 per ton of 2,000 pounds, dry weight.

Arsenic.—An addition to the working charge will be made at the rate of 25 cents per dry ton for each per cent of arsenic in excess of five per cent. Sampling free.

Payment.—Thirty days after agreement of assays.

For ores under 1,000 ounces and over 60 ounces per ton.

Silver.—Payment for 95 per cent of the silver contents at the New York quotation.

Treatment Charge.—\$7 per ton of 2,000 pounds, dry weight.

Arsenic.—An addition to the working charge will be made at the rate of 25 cents per dry ton for each per cent of arsenic in excess of 15 per cent.

Payment.—Cash settlement on agreement of assays.

6. Balbach Smelting and Refining Company, Newark, N.J., U.S.A.

This smelting company has not been offering a regular schedule for silver ores from the Cobalt district. It did, however, make some purchases during the year, returning 93 per cent of the silver contents in ores assaying about 2,000 ounces silver per ton.

7. Beer, Sondheimer and Company, Frankfurt-on-Main, Germany.

"At the beginning of 1911, a few purchases of silver ores from Cobalt were made by the New York agency of Beer, Sondheimer and Company, but now the Company is out of the market for these ores.

8. Pennsylvania Smelting Company, Pittsburgh, Pa., U.S.A.

"The smelting schedule of the Pennsylvania Smelting Company, on the 1st of January, 1912, was the same as that which ruled throughout 1911, except that

on ores running over 2,800 ounces of silver per ton a sliding scale is offered which gives a better percentage recovery to the shipper in proportion as the ore increases in silver contents. It is now as follows:—

Schedule for ores below 2,800 ounces.

For ores containing less than 200 ounces of silver to the ton, we will pay the New York silver price, less $\frac{3}{4}$ cent per ounce for 95 per cent of the silver contents, less treatment charge of \$8 per ton.

For ores containing 200 to 400 ounces silver per ton, we will pay the New York silver price, less $\frac{1}{2}$ cent per ounce for 95 per cent of the silver contents, less treatment charge of \$8 per ton.

For ore containing 400 to 2,000 ounces silver to the ton, we will pay the New York silver price, less $\frac{1}{4}$ cent per ounce for 95 per cent of the silver contents, less a treatment charge of \$8 per ton.

For ores and coarse concentrates containing 2,000 ounces and upwards of silver per ton, we will pay the full New York silver price, for 95 per cent of the silver contents, no treatment charge.

For Vanner or Wilfley products, we will pay the New York silver price, less one cent per ounce for 94 per cent of the silver contents, less \$8 per ton treatment charge.

For jig concentrates containing from 400 to 2,000 ounces silver per ton, we will pay the New York silver price, less $\frac{1}{2}$ cent per ounce for 95 per cent of the silver contents, less treatment charge of \$8 per ton.

Low grade 'ores' are expected to run less than 10 per cent arsenic.

All the above f.o.b. cars our works, Carnegie, Pa., P.C.C. and St. Louis railway.

Schedule for ores above 2,800 ounces:—

No treatment or refining charge.

For ores between 2,800 and 3,000 ounces, 95 $\frac{1}{2}$ per cent of the silver contents is paid for, and increase in the percentage of silver paid for by $\frac{1}{10}$ of 1 per cent for every 200 ounces up to 4,800 ounces per ton. For ores assaying over 4,800 ounces the percentage of silver paid for is constant at 96 $\frac{1}{2}$ per cent. All other conditions are the same as for ores below 2,800 ounces.

Settlement assays to be the average of our results and shippers or shippers' representatives, if within splitting limits, otherwise reserve sample to be sent to umpire.

Splitting limits on ores of less than 150 ounces per ton to be 1 $\frac{1}{2}$ ounces, on ores of 150 ounces and less than 500 ounces, 1 per cent of contents, on ores of more than 500 ounces 8-10ths of 1 per cent of contents.

9. Government Smelter, Saxony.

"The Government Smelter of Saxony has been receiving some high grade ore from Cobalt on the following contract basis:—

Pay for 96 per cent silver contents on Hamburg quotation of silver.

Payment, 30 days after arrival in Hamburg.

Ore must assay at least 4,500 ounces silver per ton.

Above contract is made on a minimum of six cars.

10. United States Metals Refining Company, New York—Works at Chrome, N.J., U.S.A.

“The silver ores from Cobalt that are being purchased by this Company are comparatively low grade, the richest containing 400 ounces silver per ton. No regular schedule is published, but the prices vary with the character of the ore purchased.”

A number of the shipping companies at Cobalt have published, in annual reports, some details of their operations, from which the following extracts have been taken:—

Coniagas Mines, Limited, Year Ending October 31, 1911.

TOTALS OF SHIPMENTS FROM THE MINE.

| Year. | Ore. | | Concentrates. | | Total. | |
|----------------------------|---------|-----------|---------------|-----------|---------|------------|
| | Tons. | Ozs. | Tons. | Ozs. | Tons. | Ozs. |
| Nov. 1st-Oct. 31st. | | | | | | |
| 1905-1906..... | 289 | 657,513 | ..... | ..... | 289 | 657,513 |
| 1906-1907..... | 2,655 | 1,341,372 | ..... | ..... | 2,655 | 1,341,372 |
| 1907-1908..... | ..... | * | ..... | ..... | 627·5 | 1,457,210 |
| 1908-1909..... | 350 | 807,253 | 426 | 599,975 | 776 | 1,407,228 |
| 1909-1910..... | 330·1 | 979,630 | 645·5 | 949,901 | 975·6 | 1,929,531 |
| 1910-1911..... | 619·1 | 2,142,536 | 1,418·4 | 1,643,610 | 2,037·5 | 3,789,274 |
| Total to Oct. 31, 1911. .. | 4,243·2 | 5,928,304 | 2,489·9 | 3,193,492 | 7,360·6 | 10,582,128 |

* Ore and concentrates.

A canvas table plant has been installed and operating since January 1, which enables us to recover a low grade concentrate which was previously going to waste.

The total amount milled during the year was 52,320 tons, averaging 36·3 ounces per ton. The average value of tailings from the mill was 4·75 ounces per ton.

Crown Reserve Mining Company, Limited, Year Ending December 31, 1911.

SHIPMENTS.—TOTAL PRODUCTION.

| Shipments. | Weight. | Silver. | Gross value. | Treatment. | Net value. |
|---------------------------------------|-----------|-----------|--------------|------------|--------------|
| | Tons. | Ozs. | \$ cts. | \$ cts. | \$ cts. |
| High grade..... | 644·561 | 2,991,404 | 1,605,568 90 | 71,937 34 | 1,533,631 56 |
| Low grade..... | 390·266 | 64,284 | 33,802·33 | 8,319 62 | 25,482 71 |
| Bullion..... | 7·952 | 221,792 | 114,037 38 | 1,371 37 | 112,666 01 |
| | 1,042·769 | 3,277,480 | 1,753,468 61 | 81,628 33 | 1,671,840 28 |
| Milled ore (shipped as bullion) | 5·820 | 153,422 | 80,048 19 | 588 26 | 79,459 93 |
| Total shipments..... | 1,048·589 | 3,430,902 | 1,833,516 80 | 82,216 59 | 1,751,300 21 |

TOTAL SHIPMENTS TO DATE.

| Year. | Dry wt. Tons. | Gross oz. | Gross value. | Net value. | Cost per oz. |
|------------|------------------|------------|--------------|--------------|--------------|
| | | | \$ cts. | \$ cts. | Cts. |
| 1908..... | 650·78 | 1,798,954 | 910,350 62 | 854,788 89 | 7·508 |
| 1909..... | 3,093·00 | 4,034,325 | 2,080,156 08 | 1,895,484 92 | 10·31 |
| 1910..... | 2,753·00 | 3,248,196 | 1,757,824 27 | 1,633,716 65 | 11·97 |
| 1911..... | 1,048·59 | 3,430,902 | 1,833,516 80 | 1,751,300 21 | 10·671 |
| Total..... | 7,545·37 | 12,512,377 | 6,581,847 77 | 6,136,290 68 | |

Mine development to end of 1911:—

| | |
|--------------------------|-------------|
| Sinking and raising..... | 1,790 feet. |
| Drifting..... | 5,247 " |
| Cross-cutting..... | 5,172 " |
| Total..... | 12,209 " |

Kerr Lake Mining Company, Year Ending August 31, 1911.

"The total development to August 31, 1911, is 21,946 feet, equal to a little over four miles.

"The costs of production per ounce are as follows:—

| | |
|-------------------------------------|-------------|
| Mining and development costs..... | 9·71 cents. |
| Shipment and treatment charges..... | 4·59 " |
| Administration and general..... | 0·39 " |

Total..... 14·69 "

"The cost has been somewhat increased by reason of a larger proportion of development work compared with stoping during the year."

The La Rose Consolidated Mines Company, Year Ending December 31, 1911.

TOTAL SHIPMENTS TO DECEMBER 31, 1911.

| | Dry tons. | Ounces silver. | Gross value. Silver by-pro- duct paid for. | Net value re- ceived from smelter. |
|-------------------------------|-------------|----------------|--|--|
| | | | \$ cts. | \$ cts. |
| Previous to May 31, 1908.... | 5,583·0000 | 2,675,161·00 | 1,711,422 00 | 1,504,707 00 |
| May 31, '08, to May 31, '09. | 6,063·6705 | 2,915,706·58 | 1,516,881 55 | 1,320,698 25 |
| May 31, '09, to May 31, '10. | 6,313·9050 | 3,100,443·93 | 1,652,416 76 | 1,442,192 98 |
| May 31, '10, to Dec. 31, '10. | 2,380·6085 | 2,118,571·25 | 1,147,276 36 | 1,040,933 98 |
| During year 1911..... | 3,561·4120 | 4,092,709·33 | 2,191,524 34 | 2,014,391 49 |
| Total. | 23,902·5960 | 14,902,595·09 | 8,219,521 01 | 7,322,923 70 |

Development work done during 1911, 11,045 feet shafts, drifts, cross-cuts, and raises, stoping 13,589 cubic yards, trenches 15,095 feet.

SUMMARY OF SHIPMENTS.

| | |
|--|----------------|
| Dry tons shipped..... | 3,561·412 |
| Gross ounces of silver contained.... | 4,092,709·33 |
| Gross silver value..... | \$2,191,524·34 |
| Average price received per ounce—cents..... | 53·55 |
| Smelter deduction freight and treatment..... | 177,132·85 |
| Net value received from ore sales..... | \$2,014,391·49 |

Nipissing Mines Company, Year Ending December 31, 1911.

TOTAL SHIPMENTS TO DECEMBER 31, 1911.

| Year. | Dry weight. | Gross silver. | Gross value silver, plus by- products paid for. | Net value returned from smelter. |
|-------------|-------------|---------------|---|--|
| | Lbs. | Ozs. | \$ cts. | \$ cts. |
| 4..... | 124,659 | 32·13 | 24,163 90 | 23,887 52 |
| 1 05..... | 929,373 | 753,153·90 | 505,638 28 | 471,666 61 |
| 1906..... | 4,019,494 | 2,214,821·60 | 1,576,852 94 | 1,421,655 54 |
| 1907..... | 4,804,426 | 2,239,551·89 | 1,373,088 57 | 1,234,492 35 |
| 1908..... | 7,009,998 | 2,893,081·44 | 1,526,686 32 | 1,364,478 03 |
| 1909 .. | 12,825,169 | 4,646,869·21 | 2,417,767 21 | 2,180,407 02 |
| 1910..... | 13,397,860 | 5,597,778·61 | 3,008,000 98 | 2,742,321 23 |
| 1911..... | 5,829,254 | 4,678,074·14 | 2,507,196 98 | 2,381,712 54 |
| Total | 48,950,233 | 23,023,312·92 | 12,939,395 18 | 11,820,620 84 |

The mill for the treatment of first class ore was started February 1st, 1911, and is now successfully treating the entire product of the mine.

The process, which is a new one as far as its application to Cobalt ores is concerned, was devised by Charles Butters and his assistant, G. H. Clevenger;

James Johnston erected the plant and has had charge of it since. The process consists essentially of amalgamation in cyanide solution in a tube mill where more than 97 per cent of the silver in the ore is recovered as amalgam. The residue then undergoes regular cyanide treatment whereby an additional extraction is made. During the summer a refinery was erected, since which time the whole product of the mill has been shipped as fine bullion.

Trenching was confined to the section south and east of Peterson lake.

A force of 25 men completed 13.7 miles of trenches 2.7 feet deep at a cost of \$8,831.58.

Summary of underground work in 1911:—

Drifting, 3,675 feet; cross-cutting, 3,602; raising, 1,208; sinking, 296; total, 8,781 feet. Stopping, 13,841 cubic yards.

McKinley-Darragh Mines of Cobalt, Ltd., Calendar Year, 1911.

“Extent of mining operations:—

McKinley-Darragh to January 1, 1912, 20,066 feet drifts, cross-cuts, raises, winzes, and shafts; Savage, to January 1, 5,955 feet.

“Mill report:—

Total ore treated, 1911, 46,497 tons.

Number stamp days run, 318.66.

Average tons per day, 145.91.

Mill heads, 39.685.

Mill tails, 4.122.

Per cent of extraction, 89.614.

Ounces of silver recovered, 1,653,595.”

Timiskaming Mining Company, Limited, Calendar Year, 1911.

SUMMARY OF PROGRESS.

| Class of work. | Year 1911. | Since commencement of operations. |
|-------------------------|------------|-----------------------------------|
| Shaft sinking | 112.0 | 958.0 |
| Winzes and raises | 353.8 | 1,100.8 |
| Drifting | 2,184.2 | 8,549.2 |
| Cross-cutting | 936.0 | 2,202.0 |
| | 3,586.0 | 12,810.0 |

Total depth of No. 2 shaft from collar equals 628.0 feet.

PROSPECTING, DEVELOPMENT, AND MINING COST PER TON.

24,783 tons ore elevated.

40,937 tons ore and waste elevated.

| | Cost per ton, ore. | Cost per ton, ore and waste. |
|---------------------------|-----------------------|---------------------------------|
| | \$ cts. | \$ cts. |
| Prospecting..... | 1 32 | 0 80 |
| Development..... | 1 67 | 1 01 |
| Mining and timbering..... | 2 98 | 1 80 |
| Hoisting..... | 0 88 | 0 54 |
| Cost to surface..... | 6 85 | 4 15 |

" No payment was made this year on any of the by-products, cobalt, nickel, or arsenic. On the other hand we were penalized on an excess arsenic content by some of the smelters.

" The 34,720 tons treated in the mill produced 770 tons of shipping product which gives a ratio of concentration of about 45 into 1.

" The stamp duty was about 3.13 tons per 24 hours which is somewhat better than that of last year.

" The milling cost per ton covering all charges..... was \$3.00 per ton as compared with \$3.86 of last year, an improvement of 86 cents per ton."

British Columbia.

The chief sources of the silver production in this Province are the silver-lead ores of East and West Kootenay, supplemented by the silver contained in the gold-copper-silver ores of Rossland, Boundary, and Coast districts. The production in 1911, based on smelter recoveries, was 1,887,147 ounces, valued at \$1,005,924.

The leading silver producers among the mines of the Province in order of importance are the Van Roi, Sullivan, Rambler-Cariboo, St. Eugene, Ruth, and Standard.

The Granby mines at Phoenix on account of their large tonnage of copper ores come fourth as silver producers, with the others maintaining their relative positions.

Considerable attention is being paid to the silver-lead properties of the Slocan district, with probabilities of increased production, from the Sandon, Silverton, and Ainsworth camps. The following table is taken from the annual report of the Minister of Mines for British Columbia, 1911:—

SILVER.—TABLE 3.

Production in British Columbia by Districts, 1907-1911.*

| | 1907. | 1908. | 1909. | 1910. | 1911. |
|--------------------------------|-----------|-----------|-----------|-----------|-----------|
| | Ozs. | Ozs. | Ozs. | Ozs. | Ozs. |
| Cassiar..... | 2,291 | 14,169 | 4,569 | 1,454 | 29,976 |
| Kootenay East— | | | | | |
| Fort Steele division..... | 821,367 | 641,855 | 580,240 | 501,475 | 330,235 |
| Other divisions..... | 3,955 | 3,384 | 825 | 243 | |
| Kootenay West— | | | | | |
| Ainsworth division..... | 301,322 | 314,142 | 352,555 | 233,010 | 77,375 |
| Nelson "..... | 236,837 | 25,067 | 75,908 | 45,787 | 76,774 |
| Slocan "..... | 590,998 | 848,595 | 738,175 | 964,634 | 798,926 |
| Trail Creek "..... | 126,661 | 129,558 | 80,026 | 87,833 | 88,076 |
| Other divisions..... | 122,232 | 173,675 | 169,435 | 107,753 | 67,884 |
| Yale— | | | | | |
| Boundary..... | 469,206 | 451,323 | 492,333 | 460,945 | 326,849 |
| Yale..... | 223 | 23 | | 3 | 343 |
| Coast and other districts..... | 70,356 | 29,598 | 38,676 | 47,104 | 100,926 |
| Total..... | 2,745,448 | 2,631,389 | 2,532,742 | 2,450,241 | 1,892,364 |

* From the Minister of Mines Reports, British Columbia.

Yukon.

The figures of silver production of the Yukon, given in Table 2, represent the silver alloyed with the placer gold, together with a small amount from the lode mines of the district. On an average, about one ounce of silver is contained in each five ounces of crude bullion from the alluvial workings. In 1909, the production was 45,000 ounces of silver, all from the placer mines. In 1910, the placer production was 50,000 ounces, valued at \$26,743, and the lode production 37,418 ounces, valued at \$20,013, or a total of 87,418 fine ounces valued at \$46,756. In 1911 the placer production was 50,300 ounces, valued at \$26,812, and the lode production 62,408 ounces, valued at \$33,266, a total of 112,708 fine ounces with a value of \$60,078.

Exports.

The following table shows the statistics of silver contained in ore, matte, or other form exported from Canada since 1886, as compiled from the reports of Trade and Navigation published by the Customs Department. The exports during 1911 were 31,216,725 ounces, valued at \$15,807,366, as against exports of 30,699,270 ounces, valued at \$15,649,537, in 1910.

SILVER.—TABLE 4.

Exports of Silver in Ore, etc.

| Calendar Year. | Value. | Calendar Year. | Value. | Calendar Year. | Value. |
|----------------|---------|----------------|-----------|----------------|------------|
| | \$ | | \$ | | \$ |
| 1886 | 25,957 | 1895 | 994,354 | 1904 | 1,904,394 |
| 1887 | 206,284 | 1896 | 2,271,959 | 1905 | 2,777,218 |
| 1888 | 219,008 | 1897 | 3,576,391 | 1906 | 5,686,444 |
| 1889 | 212,163 | 1898 | 2,902,277 | 1907 | 9,941,849 |
| 1890 | 204,142 | 1899 | 1,623,905 | 1908 | 12,403,482 |
| 1891 | 225,312 | 1900 | 2,341,872 | 1909 | 15,719,909 |
| 1892 | 56,688 | 1901 | 2,026,727 | 1910 | 15,649,537 |
| 1893 | 213,695 | 1902 | 1,820,058 | 1911 | 15,807,366 |
| 1894 | 359,731 | 1903 | 1,989,474 | | |

ZINC.

The production of zinc ore in Canada in 1911, as obtained by direct returns from the producers, was 2,590 tons valued at \$101,072, the greater part being from British Columbia. The zinc content of these shipments was returned as 2,346,849 pounds, which if valued at the average New York price of spelter during the year would be worth \$135,132.

The ore shipped from British Columbia contains also a varying silver content, for which payment is made by the smelters and without which on account of the import duty to the United States and the long rail haul, it would not pay to ship. The Richardson, or Long Lake mine, in Olden township, Frontenac county, Ontario, did not ship during 1911.

The British Columbia shipments were seriously reduced as a result of the destruction of mills, mine buildings, and railway facilities by the forest fires of 1910, there being only two shippers in 1911.

The British Columbia zinc ore is exported for treatment to Kansas and Oklahoma smelters, and since the smelters demand over 30 per cent zinc, the maximum rate of the United States customs tariff affects Canadian ores.

The present schedule of the tariff on zinc is as follows:—

Ores containing less than 10 per cent, free of duty.

Ores containing 10 per cent or more, and less than 20 per cent, $\frac{1}{2}$ cent per pound.

Ores containing 20 per cent or more, and less than 25 per cent, $\frac{1}{2}$ cent per pound.

Ores containing 25 per cent or more, 1 cent per pound.

All rates being based on the metallic contents of the zinc.

The United States smelters usually pay on a basis of 45 per cent zinc content. The base price varies with the price of spelter at St. Louis, and a stated amount is added or deducted for every unit of zinc in excess of or less than the base. The silver is settled for at the New York price after making deductions for losses in treatment. Limits are frequently set which lead or iron contents may not exceed.

A typical example may be given. A certain mine was paid \$28.50 per short ton for zinc concentrates carrying 45 per cent zinc, when spelter was quoted at 5 cents per pound at St. Louis. For every unit above or below 45 per cent zinc 85 cents was added or deducted. For every increase or decrease of one cent per pound in the price of spelter at St. Louis, an increase or decrease was allowed of \$7 per ton of 2,000 pounds, and proportionately for fractions thereof. In the case of the silver content, six ounces per ton were deducted and 75 per cent of the remainder paid for at the New York price.

The sellers paid freight, customs duty, and collection charges.

The imports of zinc taken as an index of consumption, show a fairly steady increase. The total imports of zinc in blocks and pigs and spelter were, in 1880, some 744 tons. In 1889 they had risen to 1,427 tons, and remained fairly stationary until about 1899, in which year the imports were 1,213 tons. In the fiscal year ending March, 1909, they had risen to 4,610 tons, and for the calendar year, 1910, they totalled 7,037 tons, in addition to which there were 4,248 tons of zinc white, and zinc manufactures, to the value of \$21,829.

For the calendar year 1911, the total imports were 7,534 tons, in addition to which there were 4,269 tons of zinc white, and zinc manufactures to the value of \$30,862.

Statistics of the production and imports of zinc and the average monthly prices of spelter on the New York and London markets for two years are given in the accompanying tables:—

ZINC.—TABLE 1.
Annual Production of Zinc.

| Calendar Year. | ZINC ORE SHIPPED. | | METALLIC ZINC IN ORE SHIPPED. | |
|----------------|-------------------|-------------|-------------------------------|--------------|
| | Tons. | Spot value. | Lbs. | Final value. |
| | | \$ | | \$ |
| 1898..... | 1,162 | 11,000 | 788,000 | 36,011 |
| 1899..... | 865 | 18,165 | 814,000 | 46,805 |
| 1900..... | 261 | 4,810 | 212,000 | 9,342 |
| 1901..... | | | | |
| 1902..... | 168 | 1,659 | 142,200 | 6,882 |
| 1903..... | 1,000 | 10,500 | 900,000 | 48,660 |
| 1904..... | 597 | 3,700 | 477,568 | 24,256 |
| 1905..... | 9,413 | 139,200 | * | * |
| 1906..... | 1,154 | 23,800 | * | * |
| 1907..... | 1,573 | 49,100 | * | * |
| 1908..... | 452 | 3,215 | * | * |
| 1909 (a)..... | 18,371 | 242,699 | 16,468,204 | 906,245 |
| 1910..... | 5,063 | 120,003 | 4,361,712 | 240,766 |
| 1911..... | 2,590 | 101,072 | 2,346,846 | 135,132 |

* Figures not available.

(a) Includes 7,424 tons shipped late in 1908.

ZINC.—TABLE 2.

Imports of Zinc in Blocks, Pigs, and Sheets.

| Fiscal Year. | Cwt. | Value. | Fiscal Year. | Cwt. | Value. | Fiscal Year. | Cwt. | Value. |
|--------------|--------|--------|--------------|--------|---------|-----------------|--------|---------|
| | | \$ | | | \$ | | | \$ |
| 1880..... | 13,805 | 67,881 | 1891..... | 17,984 | 105,023 | 1902..... | 34,871 | 141,560 |
| 1881..... | 20,920 | 94,015 | 1892..... | 21,881 | 127,302 | 1903..... | 26,646 | 142,827 |
| 1882..... | 15,021 | 76,631 | 1893..... | 26,446 | 124,360 | 1904..... | 25,553 | 138,057 |
| 1883..... | 22,765 | 94,799 | 1894..... | 20,774 | 90,680 | 1905..... | 25,141 | 141,514 |
| 1884..... | 18,945 | 77,373 | 1895..... | 15,061 | 63,373 | 1906..... | 24,462 | 158,438 |
| 1885..... | 20,954 | 70,598 | 1896..... | 20,223 | 80,784 | 1907 (9 mos.).. | 18,427 | 126,221 |
| 1886..... | 23,146 | 85,599 | 1897..... | 11,946 | 57,754 | 1908..... | 30,362 | 191,081 |
| 1887..... | 26,142 | 93,557 | 1898..... | 35,148 | 112,785 | 1909..... | 26,222 | 141,066 |
| 1888..... | 16,407 | 65,827 | 1899..... | 18,785 | 107,477 | 1910..... | 35,040 | 201,777 |
| 1889..... | 19,782 | 83,935 | 1900..... | 28,748 | 156,167 | 1911..... | 34,659 | 206,746 |
| 1890..... | 18,236 | 92,530 | 1901..... | 20,527 | 103,457 | | | |

ZINC.—TABLE 3.

Imports of Spelter.*

| Fiscal Year. | Cwt. | Value. | Fiscal Year. | Cwt. | Value. | Fiscal Year. | Cwt. | Value. |
|--------------|--------|--------|--------------|--------|--------|-----------------|---------|---------|
| | | \$ | | | \$ | | | \$ |
| 1880..... | 1,073 | 5,301 | 1891..... | 6,249 | 31,459 | 1902..... | 18,356 | 80,757 |
| 1881..... | 2,904 | 12,276 | 1892..... | 13,909 | 62,550 | 1903..... | 23,159 | 110,817 |
| 1882..... | 1,654 | 7,779 | 1893..... | 10,721 | 49,822 | 1904..... | 33,952 | 164,751 |
| 1883..... | 1,274 | 5,196 | 1894..... | 8,423 | 35,615 | 1905..... | 37,941 | 206,244 |
| 1884..... | 2,239 | 10,417 | 1895..... | 9,249 | 30,245 | 1906..... | 50,137 | 290,686 |
| 1885..... | 3,325 | 10,875 | 1896..... | 10,897 | 40,548 | 1907 (9 mos.).. | 42,465 | 269,044 |
| 1886..... | 5,432 | 18,288 | 1897..... | 8,342 | 32,826 | 1908..... | 65,593 | 314,369 |
| 1887..... | 6,908 | 25,007 | 1898..... | 2,794 | 13,561 | 1909..... | 55,981 | 310,688 |
| 1888..... | 7,772 | 29,762 | 1899..... | 5,450 | 29,687 | 1910..... | 132,001 | 658,285 |
| 1889..... | 8,750 | 37,403 | 1900..... | 5,836 | 29,416 | 1911..... | 98,372 | 505,447 |
| 1890..... | 14,570 | 71,122 | 1901..... | 14,621 | 53,283 | | | |

* Spelter in blocks and pigs.

ZINC.—TABLE 4.

Imports of Zinc, Manufactures of.

| Fiscal Year. | Value. | Fiscal Year. | Value. | Fiscal Year. | Value. |
|---|--------|--------------|--------|---------------------|--------|
| | \$ | | \$ | | \$ |
| 1880 | 8,327 | 1891 | 7,178 | 1902 | 6,683 |
| 1881 | 20,178 | 1892 | 7,563 | 1903 | 9,754 |
| 1882 | 15,526 | 1893 | 7,464 | 1904 | 12,682 |
| 1883 | 22,599 | 1894 | 6,193 | 1905 | 11,912 |
| 1884 | 11,952 | 1895 | 5,581 | 1906 | 12,917 |
| 1885 | 9,459 | 1896 | 6,290 | 1907 (9 mos.) | 12,556 |
| 1886 | 7,345 | 1897 | 5,145 | 1908 | 19,240 |
| 1887 | 6,561 | 1898 | 10,503 | 1909 | 15,621 |
| 1888 | 7,402 | 1899 | 14,661 | 1910 | 15,495 |
| 1889 | 7,233 | 1900 | 11,475 | 1911 | 24,128 |
| 1890 | 6,472 | 1901 | 6,882 | | |
| 1911 { Zinc seamless drawn tubing | | Duty free | | \$ | |
| " manufactures of, N.O.P. | | 25% .. | | \$ 24,128 | |
| Total | | | | \$ 24,128 | |

World's Production of Spelter in Short Tons.*

| Country. | 1906. | 1907. | 1908. | 1909. | 1910. | 1911. |
|-------------------------|---------|---------|---------|---------|---------|---------|
| Australia | 1,131 | 1,098 | 1,198 | ..... | 560 | 1,120 |
| Austria and Italy | 11,883 | 12,522 | 14,063 | 13,931 | 14,666 | 15,350 |
| Belgium | 168,067 | 170,307 | 181,851 | 184,194 | 190,233 | 215,062 |
| France and Spain | 59,293 | 61,438 | 61,512 | 61,859 | 65,191 | 70,795 |
| Germany— | | | | | | |
| Rhine district | 75,729 | 77,459 | 80,670 | 82,863 | 86,823 | 103,863 |
| Silesia | 150,282 | 152,611 | 158,328 | 159,731 | 154,596 | 172,161 |
| Great Britain | 57,971 | 61,286 | 60,029 | 65,422 | 69,531 | 73,808 |
| Holland | 16,150 | 16,526 | 19,017 | 21,548 | 23,121 | 25,060 |
| Poland | 10,595 | 10,735 | 9,740 | 8,758 | 9,514 | 10,640 |
| United States | 224,770 | 249,860 | 210,424 | 255,760 | 269,184 | 285,526 |
| Total | 775,871 | 813,842 | 796,832 | 854,066 | 888,419 | 974,385 |

* Mineral Resources of the United States 1911.

World's Consumption of Spelter in Short Tons.*

| Country. | 1907. | 1908. | 1909. | 1910. |
|-----------------------|---------|---------|---------|---------|
| Austria-Hungary | 34,171 | 35,925 | 36,155 | 37,258 |
| Belgium | 60,627 | 74,936 | 68,343 | 86,531 |
| France | 76,720 | 85,956 | 73,744 | 61,949 |
| Germany | 192,792 | 198,580 | 207,232 | 196,209 |
| Great Britain | 154,653 | 152,627 | 171,408 | 195,989 |
| Holland | 4,189 | 4,188 | 4,409 | 4,409 |
| Italy | 7,496 | 9,257 | 9,039 | 8,929 |
| Russia | 19,290 | 19,946 | 20,282 | 27,447 |
| Spain | 5,180 | 5,290 | 4,850 | 4,740 |
| United States | 13,228 | 11,020 | 6,614 | 13,228 |
| Other countries | 226,969 | 214,167 | 270,730 | 245,884 |
| Total | 795,315 | 811,892 | 872,806 | 882,573 |

* Mineral Resources of the United States, 1910.

Average Price of Spelter in Cents per Pound at New York.*

| Month. | 1901. | 1902. | 1903. | 1904. | 1905. | 1906. | 1907. | 1908. | 1909. | 1910. | 1911. |
|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| January | 4.13 | 4.27 | 4.865 | 4.863 | 6.190 | 6.457 | 6.732 | 4.513 | 5.141 | 6.101 | 5.452 |
| February | 4.01 | 4.15 | 5.043 | 4.916 | 6.139 | 6.075 | 6.814 | 4.785 | 4.889 | 5.669 | 5.518 |
| March | 3.91 | 4.28 | 5.349 | 5.057 | 6.067 | 6.209 | 6.837 | 4.665 | 4.757 | 5.637 | 5.563 |
| April | 3.98 | 4.37 | 5.550 | 5.219 | 5.817 | 6.087 | 6.687 | 4.645 | 4.965 | 5.439 | 5.399 |
| May | 4.04 | 4.47 | 5.639 | 5.031 | 5.434 | 5.997 | 6.441 | 4.608 | 5.124 | 5.191 | 5.348 |
| June | 3.99 | 4.96 | 5.637 | 4.760 | 5.190 | 6.096 | 6.419 | 4.543 | 5.402 | 5.128 | 5.520 |
| July | 3.95 | 5.27 | 5.662 | 4.873 | 5.396 | 6.006 | 6.072 | 4.485 | 5.402 | 5.152 | 5.695 |
| August | 3.99 | 5.44 | 5.725 | 4.866 | 5.706 | 6.027 | 5.701 | 4.702 | 5.729 | 5.279 | 5.953 |
| September | 4.08 | 5.49 | 5.686 | 5.046 | 5.887 | 6.216 | 5.236 | 4.769 | 5.796 | 5.514 | 5.869 |
| October | 4.23 | 5.38 | 5.510 | 5.181 | 6.087 | 6.222 | 5.430 | 4.801 | 6.199 | 5.628 | 6.102 |
| November | 4.29 | 5.18 | 5.038 | 5.513 | 6.145 | 6.375 | 4.925 | 5.059 | 6.381 | 5.976 | 6.380 |
| December | 4.31 | 4.78 | 4.731 | 5.872 | 6.522 | 6.593 | 4.254 | 5.137 | 6.249 | 5.624 | 6.301 |
| Year | 4.07 | 4.84 | 5.40 | 5.100 | 5.822 | 6.198 | 5.962 | 4.726 | 5.603 | 5.520 | 5.758 |

* From the statistical publication of the Metallgesellschaft, etc., of Frankfort-on-the-Main, Germany.

Average Prices of Spelter, Ordinary Brands, in London.*

| Month. | 1902. | | | 1903. | | | 1904. | | | 1905. | | | 1906. | | |
|-----------------|-------|----|----|-------|----|----|-------|----|----|-------|----|----|-------|----|----|
| | £ | s. | d. | £ | s. | d. | £ | s. | d. | £ | s. | d. | £ | s. | d. |
| January | 16 | 13 | .. | 20 | 0 | 8 | 21 | 11 | 2 | 24 | 19 | 9 | 28 | 8 | 2 |
| February | 17 | 14 | 2 | 20 | 15 | 4 | 21 | 16 | 5 | 24 | 10 | 6 | 26 | 2 | 4 |
| March | 17 | 13 | 4 | 22 | 18 | 2 | 21 | 19 | 6 | 23 | 13 | 6 | 24 | 15 | 3 |
| April | 17 | 17 | .. | 22 | 8 | 7 | 22 | 5 | 1 | 23 | 14 | 3 | 25 | 19 | 3 |
| May | 18 | 9 | .. | 21 | 2 | 4 | 22 | 2 | 10 | 23 | 11 | 8 | 27 | 0 | 2 |
| June | 18 | 11 | 8 | 20 | 8 | 2 | 21 | 14 | 6 | 23 | 16 | 8 | 27 | 9 | 9 |
| July | 18 | 19 | 11 | 20 | 8 | 5 | 22 | 2 | 9 | 23 | 19 | 6 | 26 | 15 | 11 |
| August | 18 | 16 | 8 | 20 | 9 | 5 | 22 | 7 | 6 | 24 | 14 | 6 | 27 | 0 | 5 |
| September | 19 | 4 | 7 | 20 | 17 | 7 | 22 | 11 | 5 | 26 | 8 | 3 | 27 | 12 | 5 |
| October | 19 | 5 | 4 | 20 | 9 | 4 | 23 | 1 | 7 | 28 | 1 | 7 | 27 | 18 | 10 |
| November | 19 | 11 | 8 | 20 | 14 | 7 | 24 | 12 | 9 | 28 | 5 | 11 | 27 | 15 | 1 |
| December | 19 | 15 | 6 | 20 | 19 | 10 | 24 | 17 | 1 | 28 | 14 | 11 | 27 | 19 | 3 |
| Year | 18 | 0 | 11 | 20 | 19 | 5 | 22 | 11 | 10 | 25 | 7 | 7 | 27 | 1 | 5 |

| Month. | 1907. | | | 1908. | | | 1909. | | | 1910. | | | 1911. | | |
|-----------------|-------|----|----|-------|----|----|-------|----|----|-------|----|----|-------|----|----|
| | £ | s. | d. | £ | s. | d. | £ | s. | d. | £ | s. | d. | £ | s. | d. |
| January | 27 | 7 | 1 | 20 | 6 | 3 | 21 | 6 | 3 | 23 | 4 | 2 | 23 | 17 | 9 |
| February | 26 | 1 | 5 | 21 | 0 | 7 | 21 | 8 | 9 | 23 | 3 | 1 | 23 | 5 | 6 |
| March | 26 | 4 | 8 | 21 | 1 | 5 | 21 | 8 | 8 | 23 | 0 | 7 | 23 | 0 | 4 |
| April | 25 | 17 | 5 | 21 | 6 | 1 | 21 | 10 | 1 | 22 | 9 | 10 | 23 | 14 | 10 |
| May | 25 | 14 | 2 | 20 | 2 | 10 | 21 | 19 | .. | 22 | 1 | 1½ | 24 | 7 | 6 |
| June | 24 | 10 | 2 | 19 | 2 | 2 | 21 | 19 | 11 | 22 | 3 | 2 | 24 | 12 | 3 |
| July | 23 | 18 | 11 | 18 | 14 | 1 | 21 | 18 | 0 | 22 | 5 | 5 | 25 | 0 | 1 |
| August | 22 | 1 | 7 | 19 | 6 | 9 | 22 | 0 | 3 | 22 | 14 | 0 | 26 | 6 | 0 |
| September | 21 | 0 | 11 | 19 | 10 | 2 | 22 | 17 | 1 | 23 | 2 | 7 | 27 | 15 | 0 |
| October | 21 | 12 | 11 | 19 | 15 | 1 | 22 | 3 | 4 | 23 | 16 | 6 | 27 | 5 | 1 |
| November | 21 | 8 | 4 | 20 | 17 | 1 | 23 | 2 | 1 | 24 | 1 | 9 | 26 | 15 | 1 |
| December | 20 | 3 | 3 | 20 | 19 | 2 | 23 | 1 | 3 | 24 | 0 | 5 | 26 | 17 | 0 |
| Year | 23 | 16 | 9 | 20 | 3 | 5 | 22 | 3 | .. | 23 | 1 | 0 | 25 | 5 | 8 |

* From the annual publication of the Metallgesellschaft, etc., of Frankfort-on-the-Main, Germany.

MISCELLANEOUS METALLIC MINERALS.

ALUMINIUM.

No commercial ores of aluminium have as yet been found in Canada. Aluminium is, however, made in extensive works at Shawenegan Falls, Que., from bauxite ores imported from France, Germany, and the United States, by the Northern Aluminium Company. A wire mill for the manufacture of aluminium wire and cables is also operated by the same firm.

There being but one firm engaged in the manufacture of aluminium, we are precluded from publishing statistics of production.

Imports of alumina, which probably includes bauxite, and exports of aluminium, are, however, published in the reports of the Department of Customs.

During the twelve months ending December 31, 1911, the imports of alumina were 18,607,200 pounds, or 9,304 tons, while the exports of aluminium in ingots, bars, etc., during the same period, were 4,990,100 pounds, or 2,495 tons, besides manufactures of aluminium, valued at \$1,555. The imported alumina was valued at 2.00 cents per pound, and the exported aluminium at 14.98 cents.

The imports of alumina and exports of aluminium during the past eight years are shown in tabular form as follows:—

Annual Imports of 'Alumina' and Exports of Aluminium.

| Calendar Year. | Imports of alumina. | | EXPORTS OF ALUMINIUM. | | |
|----------------|---------------------|--------------|-----------------------|--------------|---------------|
| | | | Ingots, bars, etc. | | Manufactures. |
| | | | | | |
| | Lbs. | Value. \$ | Lbs. | Value. \$ | Value. \$ |
| 1905 | 5,360,800 | 138,765 | 2,535,386 | 508,219 | 1,588 |
| 1906 | 8,975,400 | 239,136 | 4,521,486 | 899,113 | 2,244 |
| 1907 | 12,705,300 | 268,502 | 5,478,203 | 1,109,353 | 1,499 |
| 1908 | 1,485,500 | 29,752 | 1,713,800 | 399,785 | 1,727 |
| 1909 | 11,794,100 | 234,544 | 6,134,500 | 918,195 | 3,453 |
| 1910 | 19,464,400 | 403,283 | 7,722,400 | 1,160,242 | 3,741 |
| 1911 | 18,607,200 | 372,009 | 4,990,100 | 747,587 | 1,555 |

Prices.—The price of aluminium (No. 1 ingots), in New York, during 1911, varied between the limits of 18½ and 22 cents per pound; during 1910, the price varied between 20 and 24 cents per pound, while practically the same prices ruled during 1909.

In Europe, prices for aluminium for several years have been considerably lower than in the United States.

In 1909, the prices per pound at works in Europe are reported by the 'Metallgesellschaft' as having ranged from 13½ cents to 16 cents; in 1910, from 14 cents to 17½ cents, and in 1911 from 11 to 13½ cents.

ANTIMONY.

A few pounds of refined antimony were produced at Trail, British Columbia, in 1911, but beyond that there was no production from Canada. The West Gore Antimony Company did not operate during the year.

The total production of antimony in 1910, as reported to this Branch, consisted of 364 tons of antimony concentrates, valued at \$13,906, shipped from West Gore, Nova Scotia. In 1909, in addition to the shipment of 35 tons of concentrates, there were produced about 61,200 pounds of antimony metal chiefly at the works of the Canadian Antimony Company, Limited, at Lake George, New Brunswick, a small recovery being also reported from the Consolidated Mining and Smelting Company's refinery at Trail, B.C.

In 1908, customs returns showed an export of 148 tons of antimony ore valued at \$5,443.

In 1907 the production was 2,016 tons of antimony ore shipped, valued at \$65,000, and 63,850 pounds of refined antimony, valued at \$5,108.

In British Columbia, some of the lead ores contain a small percentage of antimony—about one-third of one per cent—and some refined antimony was recovered at Trail in 1907 and 1909, the recovery being somewhat irregular.

The auriferous antimony property at West Gore, Hants county, Nova Scotia, formerly operated by the Dominion Antimony Company, Limited, was taken over in July, 1909, by the West Gore Antimony Company.

The mine and works of the Canadian Antimony Company, Ltd., at Lake George, New Brunswick, have not been in operation since 1909.

Annual Shipments of Antimony Ore.*

| Calendar Year. | Tons. | Value. | Calendar Year. | Tons. | Value. |
|-------------------|-------|--------|-------------------------|-------|--------|
| | | \$ | | | \$ |
| 1886..... | 665 | 31,490 | 1899 to 1904..... | Nil. | Nil. |
| 1887..... | 584 | 10,860 | 1905 (a)..... | 527 | |
| 1888..... | 345 | 3,696 | 1906 (a)..... | 782 | |
| 1889..... | 55 | 1,100 | 1907 ^b | 2,016 | 65,000 |
| 1890..... | 26½ | 625 | 1908 (b)..... | 148 | 5,443 |
| 1891..... | 10 | 60 | 1909 ^a | 35 | 1,575 |
| 1892 to 1897..... | Nil. | Nil. | 1910..... | 364 | 13,906 |
| 1898..... | 1,344 | 20,000 | 1911..... | | |

(a) As recorded by the Nova Scotia Department of Mines: no value given.

(b) Exports.

* In addition to the shipments shown in the table, refined antimony was produced in 1907 to the extent of 63,850 pounds valued at \$5,108, and in 1909, 61,207 pounds valued at \$4,235.

Export of Antimony Ore.

| Calendar Year. | Tons. | Value. | Calendar Year. | Tons. | Value. |
|-------------------|-------------------|--------|----------------|-----------------|--------|
| | | \$ | | | \$ |
| 1880..... | 40 | 1,948 | 1899..... | 6 $\frac{3}{4}$ | 190 |
| 1881..... | 34 | 3,308 | 1900..... | 210 | 3,441 |
| 1882..... | 323 | 11,673 | 1901..... | 10 | 1,643 |
| 1883..... | 165 | 4,200 | 1902..... | 90 | 13,658 |
| 1884..... | 483 | 17,875 | 1903..... | 33 | 4,332 |
| 1885..... | 758 | 26,250 | 1904..... | 160 | 7,237 |
| 1886..... | 665 | 31,490 | 1905..... | 525 | 27,118 |
| 1887..... | 229 | 9,720 | 1906..... | 420 | 17,064 |
| 1888..... | 352 $\frac{1}{2}$ | 6,894 | 1907..... | 1,327 | 37,807 |
| 1889..... | 30 | 695 | 1908..... | 148 | 5,443 |
| 1890..... | 38 | 1,000 | 1909..... | 4 | 120 |
| 1891..... | 3 $\frac{1}{2}$ | 60 | 1910..... | 239 | 14,095 |
| 1892 to 1897..... | Nil. | Nil. | 1911..... | 57 | 4,946 |
| 1898..... | 1,232 | 15,295 | | | |

Imports of Antimony.

| Fiscal Year. | Lbs. | Value. | Fiscal Year. | Lbs. | Value. |
|--|---------|--------|--------------------|---------|--------|
| | | \$ | | | \$ |
| 1880..... | 42,247 | 5,903 | 1896..... | 163,209 | 9,557 |
| 1881..... | | 7,060 | 1897..... | 134,661 | 8,031 |
| 1882..... | 183,597 | 15,044 | 1898..... | 156,451 | 12,350 |
| 1883..... | 105,346 | 10,355 | 1899..... | 289,066 | 16,851 |
| 1884..... | 445,600 | 15,564 | 1900..... | 186,997 | 20,001 |
| 1885..... | 82,012 | 8,182 | 1901..... | 350,737 | 24,714 |
| 1886..... | 89,787 | 6,951 | 1902..... | 504,822 | 39,276 |
| 1887..... | 87,827 | 7,122 | 1903..... | 868,146 | 65,434 |
| 1888..... | 120,125 | 12,242 | 1904..... | 418,943 | 27,112 |
| 1889..... | 119,034 | 11,206 | 1905..... | 186,454 | 12,828 |
| 1890..... | 117,066 | 17,439 | 1906..... | 403,918 | 56,297 |
| 1891..... | 114,084 | 17,483 | 1907 (9 mos.)..... | 321,385 | 71,493 |
| 1892..... | 180,308 | 17,680 | 1908..... | 484,899 | 66,484 |
| 1893..... | 181,823 | 14,771 | 1909..... | 444,254 | 32,133 |
| 1894..... | 139,571 | 12,249 | 1910..... | 563,662 | 40,681 |
| 1895..... | 79,707 | 6,131 | 1911..... | 640,208 | 42,234 |
| | | | | | |
| 1911 { Antimony, or regulus of, not ground, pulverized or otherwise manufactured..... | | | Duty free. “ | 567,087 | 35,796 |
| Antimony salts..... | | | | 73,121 | 6,438 |
| Total..... | | | | 640,208 | 42,234 |

COBALT.

Cobalt is an important constituent of the silver-cobalt-nickel-arsenides of Coleman and adjacent townships, more familiarly known as the Cobalt district, Province of Ontario, and these ores are now said to be the principal source of the world's consumption of cobalt.

With respect to the greater part of the ore shipped in which silver is the chief constituent of value, the purchasing smelters make no allowance for the cobalt content, and the mine owners, therefore, receive nothing for the cobalt.

The recovery of cobalt in Canada so far has been confined to the production of cobalt oxide and mixed cobalt and nickel oxides, by the Coniagas Reduction Company and the Deloro Mining and Reduction Company. During 1911, according to direct returns, there were produced 154,174 pounds of cobalt and nickel oxides and 1,260,832 pounds of cobalt material and mixed oxides of cobalt and nickel, the total value of all these products being \$221,690.

No information is available as to the quantities recovered from ores shipped to smelters outside of Canada.

It is also estimated that the total ore shipments from Cobalt during the past eight years have contained upwards of 5,901 tons of metallic cobalt.

The following table shows the ore shipments, estimated cobalt content, and value received by the shippers for cobalt, as published by the Ontario Bureau of Mines:—

| Year. | Ores shipped. | Estimated total cobalt content. | Per cent. | Value received by shippers for cobalt. |
|-----------|---------------|---------------------------------|-----------|--|
| | Tons. | Tons. | | \$ |
| 1904..... | 158 | 16 | 10·1 | 19,960 |
| 1905..... | 2,144 | 118 | 5·5 | 100,000 |
| 1906..... | 5,335 | 321 | 6·0 | 80,704 |
| 1907..... | 14,788 | 739 | 5·0 | 104,426 |
| 1908..... | 25,624 | 1,224 | 4·7 | 111,118 |
| 1909..... | 30,677 | 1,533 | 5·0 | 94,965 |
| 1910..... | 34,282 | 1,698 | 3·2 | 54,699 |
| 1911..... | 26,653 | 852 | 3·2 | 170,890 |

The production of cobalt has so largely exceeded the demand as to cause a very great fall in the price.

The price of cobalt oxide (78·6 per cent Co) in New York, during 1907, remained uniformly at \$2.50 per pound. In 1908, the price fell to \$1.45 in April, and \$1.40 in November. During the first three months of 1909, from \$1.45 to \$2.60 was quoted, after which the price again fell, quotations ranging from \$1.10 to \$1.75 until December. In the latter part of December there was a further falling off to prices ranging from 80 to 85 cents per pound.

During 1910 the price remained fairly constant at from 80 to 85 cents per pound, while in December, 1911, it fell to from 78 to 80 cents per pound.

In the "Statistique de l'Industrie Minérale en France et en Algérie" for 1910, the following statement is of interest: "The production of cobalt ores which was more than 2,360 metric tons in 1908 and which fell to 548 tons in 1909, was only 54 tons in 1910 with a value of 4,860 francs or an average of 90 francs per ton.

"Thus New Caledonia, which for a long time enjoyed a veritable monopoly of the cobalt ore market, was suddenly supplanted in these markets by Canada as a result of the exploitation of the argentiferous-cobalt ores of the Cobalt district."

In 1907 an Act was passed by the Ontario Legislature, authorizing the payment of bounties on certain nickel, cobalt, copper, and arsenic products mined and refined in the Province. The Act and Amendment are quoted following:—

AN ACT TO ENCOURAGE THE REFINING OF METALS IN ONTARIO.

Whereas it is desirable to encourage the refining of nickel, cobalt, copper and arsenic ores within the Province;

Therefore His Majesty, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows:—

1. This Act may be cited as "The Metal Refining Bounty Act."

2. The treasurer of the Province may, under the authority of such regulations as may from time to time be made in that behalf by the Lieutenant-Governor in Council, pay in each year to the refiners of the metals or metal compounds hereinafter specified, when refined in the Province from ores raised and mined in the Province, a bounty upon each pound of such metal or compound so refined as follows:—

Class 1.—On refined metallic nickel or on refined oxide of nickel, 6 cents per pound on the free metallic nickel or on the nickel contained in the nickel oxide; but nickel upon which a bounty has already been paid in one form of product shall not be entitled to any further bounty in any other form; and the amount to be paid as bounty on the nickel products herein mentioned is not to exceed in all \$60,000 in any one year.

Class 2.—On refined metallic cobalt or on refined oxide of cobalt, 6 cents per pound on the free metallic cobalt or on the cobalt contained in the oxide of cobalt; but cobalt upon which a bounty has already been paid in one form of product shall not be entitled to any further bounty in any other form; and the amount to be paid as bounty on the cobalt products herein mentioned is not to exceed in all \$30,000 in any one year.

Class 3.—On refined metallic copper or on refined sulphate of copper, 1½ cents per pound on the free metallic copper or on the copper contained in the sulphate of copper; or on any copper product carrying at least 95 per cent of metallic copper, one-half cent per pound; but copper upon which a bounty has

already been paid in one form of product shall not be entitled to any further bounty in any other form; and the amount to be paid as bounty on the copper products herein mentioned is not to exceed in all \$60,000 in any one year.

Class 4.—On white arsenic, otherwise known as arsenious acid, produced from mispickel ores and not from ores carrying smaltite or niccolite or cobaltite, one-half cent per pound; but the amount to be paid as bounty on the arsenic compound herein mentioned is not to exceed in all \$15,000 in any one year.

(1) Provided, however, that if so much of any of the above-mentioned classes of refined products is refined in the Province in any one year that the amount hereby set apart in respect of the said class would be insufficient to pay the bounties herein provided therefor, then the bounty payable to the refiners of such class of refined products shall abate and be payable upon a *pro rata* basis so that not more than the maximum amount herein specified for any of the said classes shall be paid in respect of said class in any one year.

(2) Provided, also, that the bounties herein provided for shall cease and determine with the payment of any sum or sums which shall have been earned during the period of five years from the passing of this Act.

(3) No person, firm or company shall be entitled to claim or receive any of the bounties in this Act provided for unless such person, firm or company shall have been at all times prepared and ready and willing during the period for which the bounty is claimed, to smelt, treat and refine ores from which the same product as that on which the bounty is claimed can be produced, belonging to any other person, firm or company, at rate and on terms and conditions approved by the Lieutenant-Governor in Council, or shall have been ready to purchase such ores at rates approved by the Lieutenant-Governor in Council as current market rates.

AN ACT TO AMEND THE ACT TO ENCOURAGE THE REFINING OF METALS IN ONTARIO.

His Majesty, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows:—

1. Subsection 2 of Section 2 of The Metal Refining Bounty Act is amended by striking out the word "five" where the same appears in the last line of the said Subsection, and substituting therefor the word "ten".

MERCURY.

There has been no production of mercury since 1897. The small production reported in 1895 and 1897 was derived from the deposits at the western end of Kamloops lake, B.C. These deposits consist of quartz veins containing pockets of cinnabar. These veins are in a zone of decomposed volcanic rock of Tertiary age.

During 1911 some development work was done by the Mercury Mines, Ltd., at Sechart, Vancouver island. Some ore was taken out but was piled on the dump for future treatment.

Production of Mercury.

| Calendar Year. | Flasks. (76½ lbs.) | Price per flask. | Value. |
|----------------|-----------------------|---------------------|--------|
| | | \$ cts. | \$ |
| 1895..... | 71 | 33 00 | 2,343 |
| 1896..... | 58 | 33 44 | 1,940 |
| 1897..... | 9 | 36 00 | 324 |

Imports of Mercury.

| Fiscal Year. | Lbs. | Value. | Fiscal Year. | Lbs. | Value. | Fiscal Year. | Lbs. | Value. |
|--------------|--------|--------|--------------|---------|--------|------------------|---------|---------|
| | | \$ | | | \$ | | | \$ |
| 1882..... | 2,443 | 965 | 1892..... | 30,936 | 15,038 | 1902..... | 97,283 | 56,615 |
| 1883..... | 7,410 | 2,991 | 1893..... | 50,711 | 22,998 | 1903..... | 164,968 | 91,625 |
| 1884..... | 5,848 | 2,441 | 1894..... | 36,914 | 14,483 | 1904..... | 151,107 | 80,658 |
| 1885..... | 14,490 | 4,781 | 1895..... | 63,732 | 25,708 | 1905..... | 103,330 | 48,412 |
| 1886..... | 13,316 | 7,142 | 1896..... | 77,869 | 32,353 | 1906..... | 150,364 | 69,505 |
| 1887..... | 18,409 | 10,618 | 1897..... | 76,058 | 33,534 | 1907 (9 mos.)... | 98,368 | 45,662 |
| 1888..... | 27,951 | 14,943 | 1898..... | 59,759 | 36,425 | 1908..... | 178,411 | 76,549 |
| 1889..... | 22,931 | 11,844 | 1899..... | 103,017 | 51,695 | 1909..... | 92,220 | 46,217 |
| 1890..... | 15,912 | 7,677 | 1900..... | 85,342 | 51,987 | 1910..... | 283,980 | 146,914 |
| 1891..... | 29,775 | 20,223 | 1901..... | 140,610 | 94,564 | 1911 Duty free. | 128,980 | 74,956 |

MOLYBDENUM.

Although there are numerous occurrences of molybdenite in Canada of more or less undetermined value, there has been very little production of the mineral.

In 1902, about 6,500 pounds of molybdenum, valued at \$400, were reported as having been taken from a deposit in the township of Laxton, county of Victoria, by John Webber, of Toronto.

In 1903, Mr. A. W. Chisholm, of Kingston, reported the shipment to the United States and elsewhere of 85 tons of molybdenum ore, valued at \$1,275, culled from about 500 or 600 tons of rock taken from the east half of lot 5, concession XIV, Sheffield township, Addington county.

According to "The Mineral Industry," published in New York: "The market for molybdenum ores is very narrow. The price fluctuates widely, and is generally subject to special negotiations at each particular sale. American buyers require concentrates to contain 90 to 95 per cent molybdenite, for which they will pay \$400 to \$450 per ton. The principal purchasers in the U.S. are Electrometallurgical Co. of America, New York; Primos Chemical Company, Primos, Penn.; DeGolia & Atkins, San Francisco, Cal. In Germany, Friederich Krupp, of Essen, is a large user of molybdenum."

During the year a report on the molybdenum ores of Canada was issued by the Mines Branch.¹

¹No. 93, Report on the Molybdenum Ores of Canada, by T. L. Walker, Ph.D., Mines Branch, Dept. of Mines, Ottawa, 1911.

PLATINUM AND PALLADIUM.

Although no production of platinum or palladium is reported for 1910, it seems probable that some recovery of platinum may have been made from placer mining on the Tulameen river, B.C.

In the former years the chief source of the platinum production in Canada was the placer gravels of British Columbia, principally in the Similkameen district.

The nickel-copper ores of the Sudbury district also carry small quantities of the metals of the platinum group, and from 1902 to 1906 considerable quantities of these metals were recovered from accumulated residues resulting from the treatment of the mattes from Sudbury. This recovery, however, has apparently ceased.

The Tulameen district of British Columbia was visited in 1910 by Mr. Charles Connel of the Geological Survey, who reports that "A few Chinese miners were again placer mining on a part of the bed of the Tulameen river between the mouths of Eagle and Champion creeks. This particular portion of the stream bed has been worked over a great many times since the first discovery of gold on it. Within the last twelve years it has been mined at least eight times, and the old cabins, gravel dumps, and abandoned machinery, show that it had already been worked over years before. Gold and platinum are obtained here in about equal proportions. The evidence suggests that the gold and platinum on the stream bed are replenished annually from some nearby source. What this source is, has not yet been determined. There are no prominent gravel deposits directly above this point, but it is significant that it lies immediately below a sheared and broken zone formed in the bed-rock, on the contact of pyroxenite with green schists. The method of working is to divert the water by wing dams to one side of the stream bed, and mine the other by sluicing. The amount of gold and platinum actually recovered was not ascertained, but it appears to have been satisfactory to the miners."

Annual Production of Platinum.

| Calendar Year. | Value. | Calendar Year. | Value. | Calendar Year. | Value. |
|----------------|--------|----------------|--------|----------------|--------|
| | \$ | | \$ | | \$ |
| 1887..... | 5,600 | 1894..... | 950 | 1901..... | 457 |
| 1888..... | 6,000 | 1895..... | 3,800 | 1902..... | 46,502 |
| 1889..... | 3,500 | 1896..... | 750 | 1903..... | 33,345 |
| 1890..... | 4,500 | 1897..... | 1,600 | 1904..... | 10,872 |
| 1891..... | 10,000 | 1898..... | 1,500 | 1905..... | 500 |
| 1892..... | 3,500 | 1899..... | 825 | 1906..... | * |
| 1893..... | 1,800 | 1900..... | Nil. | | |

* See under Palladium.

Annual Production of Palladium.

| | Ozs. | Value. |
|--|-------|----------|
| 1902 Palladium..... | 4,411 | \$86,014 |
| 1903 "..... | 3,177 | 61,952 |
| 1904 "..... | 952 | 18,564 |
| 1905 Metals of the platinum group..... | 1,562 | 28,116 |
| 1906 "..... | 314 | 5,652 |
| 1907-1910..... | * Nil | Nil. |

*Ontario Bureau of Mines Report, 1910.

Imports of Platinum.

| Fiscal Year. | Value. | Fiscal Year. | Value. | Fiscal Year. | Value. |
|--------------|--------|--------------|--------|--------------------|---------|
| | \$ | | \$ | | \$ |
| 1883..... | 113 | 1893..... | 14,082 | 1903..... | 21,251 |
| 1884..... | 576 | 1894..... | 7,151 | 1904..... | 28,112 |
| 1885..... | 792 | 1895..... | 3,937 | 1905..... | 61,719 |
| 1886..... | 1,154 | 1896..... | 6,185 | 1906..... | 54,494 |
| 1887..... | 1,422 | 1897..... | 9,031 | 1907 (9 mos.)..... | 113,485 |
| 1888..... | 13,475 | 1898..... | 9,781 | 1908..... | 60,390 |
| 1889..... | 3,167 | 1899..... | 9,671 | 1909..... | 45,534 |
| 1890..... | 5,215 | 1900..... | 57,910 | 1910..... | 84,435 |
| 1891..... | 4,055 | 1901..... | 20,263 | 1911*..... | 137,241 |
| 1892..... | 1,952 | 1902..... | 19,357 | | |

* Platinum wire and platinum in bars, strips, sheets or plates ; platinum retorts, pans, condensers, tubing and pipe, imported by manufacturers of sulphuric acid for use in their works ; crucibles. Duty free.

TIN.

Tin ores have not yet been found in sufficient quantities in Canada to be of economic importance.

The occurrence of tin ore has been reported from several localities, the most important, perhaps, being the recent discovery of cassiterite, near New Ross, Lunenburg county, Nova Scotia. This occurrence has not yet been found of economic value. It has been visited by several officers of the Geological Survey, and reports upon it may be found in the Summary Report of the Geological Survey Branch, of the Department of Mines, for 1907, pages 77, and 80 to 83, and in the report for 1908, page 154.

In further reference to the New Ross occurrences, Mr. Faribault, in his summary report for 1910, states that: "At New Ross, Lunenburg county, some distance east of the district surveyed last summer, two important veins, one bearing manganese and the other tin and copper, were opened last summer.

"A tin-bearing vein, also recently discovered by Ernest Turner, at Mill Road, four miles north of New Ross, has been prospected under the management of A. L. McCallum. It has been proved to a depth of 20 feet, and for a length of 250 feet, while the float has been traced half a mile towards the north. The vein is 24 inches wide, mostly made up of quartz, merging with granite at the sides, and carries at the middle a streak of rich ore from three to five inches wide. Several assays of the ore made by Mr. McCallum have given from 10 to 30 per cent tin, and 8 per cent copper, present in the form of cassiterite and chalcopyrite, with association of tungsten-bearing zinc minerals."

The imports of tin and manufactures thereof into Canada are shown in the following table:—

Imports of Tin and Tinware.

| Fiscal Year. | Value. | Fiscal Year. | Value. | Fiscal Year. | Value. |
|--------------|-----------|--------------|-----------|--------------------|-----------|
| | \$ | | \$ | | \$ |
| 1880..... | 281,880 | 1891..... | 1,206,918 | 1902..... | 2,293,958 |
| 1881..... | 413,924 | 1892..... | 1,594,205 | 1903..... | 2,712,186 |
| 1882..... | 790,285 | 1893..... | 1,242,994 | 1904..... | 2,389,557 |
| 1883..... | 1,274,150 | 1894..... | 1,310,389 | 1905..... | 2,791,757 |
| 1884..... | 1,018,493 | 1895..... | 973,397 | 1906..... | 3,336,948 |
| 1885..... | 1,060,883 | 1896..... | 1,237,634 | 1907 (9 mos.)..... | 2,719,813 |
| 1886..... | 1,117,368 | 1897..... | 1,274,108 | 1908..... | 4,059,281 |
| 1887..... | 1,187,312 | 1898..... | 1,550,851 | 1909..... | 2,985,361 |
| 1888..... | 1,164,273 | 1899..... | 1,372,813 | 1810..... | 3,822,443 |
| 1889..... | 1,243,794 | 1900..... | 2,418,455 | 1911..... | 4,647,784 |
| 1890..... | 1,289,756 | 1901..... | 2,339,109 | | |

| | Duty | Lbs. | \$ |
|---|-----------|------------|-----------|
| 1911 { Tin crystals..... | Free. | | 4,933 |
| { Tin in blocks, pig, and bars..... | " | 3,570,600 | 1,242,436 |
| { Tin plates and sheets..... | " | 88,050,400 | 2,859,611 |
| { Tin foil..... | " | 1,013,763 | 133,753 |
| { Tinware, plain, japanned or lithographed, and all manufactures of tin, N.E.S..... | 25% Free. | | 407,003 |
| { Tin strip waste..... | | 8,000 | 48 |
| Total..... | | | 4,647,784 |

TUNGSTEN.

Reference was made in the report for 1908 to the discovery of scheelite in Halifax county, Nova Scotia. Mr. Faribault of the Geological Survey visited this deposit again in 1909, and a preliminary report thereon will be found in the Summary Report of the Geological Survey for 1909, pages 228-234. During 1910 these deposits were being developed by the Scheelite Mines Company, who are reported to have obtained very satisfactory results. In his summary report for 1910, Mr. Faribault refers to a new discovery in Queens county, as follows: "A new discovery of tungsten ore, in the form of scheelite has been made by A. N. Prest, at Middlefield, Queens county, near the Fifteen-mile Brook gold mine, and prospecting was started last fall in order to trace the float to the parent vein."

During 1911, the Scheelite Mines, Ltd., continued development work and erected a mill.

The occurrence of wolframite has also been noted in association with molybdenite by Dr. Walker in New Brunswick, near the confluence of Burnt Hill brook and the Southwest Miramichi. The property is being tested by Mr. Freeze of Doaktown, N.B., and Mr. Matthew Lodge of Moncton, who are interested therein.