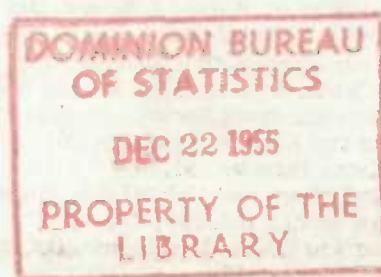


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THE SILVER-LEAD-ZINC MINING INDUSTRY 1954



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NOTICE

The annual reports prepared by the Industry and Merchandising Division of the Bureau of Statistics are divided into 3 volumes, as follows: **Volume I** — The Primary Industries, including mining, forestry and fisheries; **Volume II** — Manufacturing; **Volume III** — Merchandising and Services. The volumes are made up of parts, and the parts in turn are subdivided according to the industries which they comprise.

Volume I consists of the following parts:

- Part I — Mineral Statistics
- Part II — Forestry Statistics — Operations in the Woods
- Part III — Fisheries Statistics

Part I includes the following reports which constitute the complete series on Mineral Statistics of Canada. Individual reports are issued as the information becomes available; they are arranged in a form suitable for binding.

- A — General Review of the Mining Industry, 50¢
- B — The Gold Mining Industry, 50¢
- C — The Silver-Lead-Zinc Mining Industry, 25¢
- D — The Nickel-Copper Mining, Smelting and Refining Industry, 25¢
- E — The Miscellaneous Metal Mining Industry, 25¢
- F — The Smelting and Refining Industry, 25¢
- G — The Coal Mining Industry, \$1.00
- H — The Crude Petroleum and Natural Gas Industry, 25¢
- I — The Asbestos Mining Industry, 25¢
- J — The Feldspar and Quartz Mining Industry, 25¢
- K — The Gypsum Industry, 25¢
- L — The Peat Industry, 25¢
- M — The Salt Industry, 25¢
- N — The Talc and Soapstone Industry, 25¢
- O — The Miscellaneous Non-metal Mining Industry, 25¢
- P — The Cement Manufacturing Industry, 25¢
- Q — The Clay and Clay Products Industry, 25¢
- R — The Lime Industry, 25¢
- S — The Sand and Gravel Industry, 25¢
- T — The Stone Industry, 25¢
- U — Contract Drilling in the Mining Industry, 25¢

THE SILVER-LEAD-ZINC MINING INDUSTRY

1954

Definition of the Industry—General statistical data contained in this report pertain only to the mining of silver-cobalt and silver-lead-zinc ores. However, the output figures for specific metals represent the total production from all sources.

Silver mining is not a distinct mining industry in Canada inasmuch as the silver-bearing minerals usually occur in association with other metals of economic value — with lead and zinc; with copper, nickel and arsenic; with lode and placer free gold; in copper-gold and nickel-copper ores; and at

Great Bear Lake, Northwest Territories, with pitchblende. Silver-lead-zinc mining is a very important industry in British Columbia and in the Yukon Territory. In Eastern Canada, lead and zinc ores have been mined in Ontario, Quebec, Nova Scotia and Newfoundland.

It should be noted that, in addition to its recovery from silver-lead-zinc ores, zinc is produced in large quantities from copper-gold-silver ores mined in Quebec, Manitoba, Saskatchewan and British Columbia.

(a) The Silver-Lead-Zinc Mining Industry

There were 120 firms which did some work on 124 mines or properties. In this group there were 46 producers or shippers in 1954. The industry had an average employment of 6,386 persons to whom \$24,847,011 were paid in salaries and wages. Fuel cost \$1,816,606 and 162,950,610 kwh. of electricity were purchased for \$1,671,412. Process supplies

cost \$9,927,474 and freight plus treatment charges amounted to \$44,763,306.

There were some firms, formerly classified as silver-lead-zinc mines, which were transferred, for statistical purposes, to the copper-gold-silver mining industry, as the major portion of the value of their output was derived from copper and gold.

TABLE 1. Principal Statistics for the Silver-Lead-Zinc Mining Industry, Significant Years, 1921-1954

| Year | Establishments | Employees | Earnings | Cost of fuel and electricity at works | Cost of process supplies | Gross selling value of products (f.o.b. works) | Net ¹ value of production |
|------------|----------------|-----------|------------|---------------------------------------|--------------------------|--|--------------------------------------|
| | No. | No. | \$ | \$ | \$ | \$ | \$ |
| 1921 | 72 | 781 | 966,171 | 90,953 | N.A. | 2,177,053 | N.A. |
| 1929 | 168 | 4,153 | 6,482,392 | 793,139 | " | 22,748,089 | " |
| 1931 | 40 | 1,299 | 2,149,921 | 485,106 | " | 6,351,975 | " |
| 1933 | 43 | 1,100 | 1,501,012 | 284,277 | " | 7,569,867 | " |
| 1937 | 130 | 2,220 | 3,914,643 | 845,898 | 1,940,177 | 28,528,967 | 22,740,582 |
| 1939 | 83 | 1,646 | 2,803,057 | 667,661 | 1,619,385 | 18,254,851 | 13,555,609 |
| 1941 | 64 | 1,666 | 3,452,199 | 610,168 | 689,284 | 24,277,977 | 20,653,212 |
| 1944 | 20 | 2,769 | 5,810,290 | 860,231 | 1,752,087 | 21,291,957 | 16,802,759 |
| 1946 | 31 | 2,451 | 5,987,111 | 780,136 | 2,636,735 | 48,342,501 | 39,292,606 |
| 1949 | 101 | 5,438 | 15,676,043 | 1,989,632 | 7,181,113 | 100,349,929 | 67,108,165 |
| 1951 | 144 | 9,324 | 30,380,859 | 3,090,958 | 10,382,057 | 185,692,981 | 131,909,215 |
| 1952 | 171 | 10,330 | 37,643,614 | 4,417,393 | 10,192,616 | 165,126,784 | 104,937,002 |
| 1953 | 143 | 7,144 | 28,695,373 | 3,836,581 | 10,074,160 | 123,803,184 | 67,898,350 |
| 1954 | 124 | 6,386 | 24,847,011 | 3,488,018 | 9,927,474 | 136,256,758 | 78,077,960 |

1. The gross value from which the value of fuel, purchased electricity, process supplies, freight and treatment charges have been deducted.

TABLE 2. Ore Mined and Milled in the Silver-Lead-Zinc Mining Industry, 1953 and 1954

| | Newfoundland, Nova Scotia, New Brunswick | Quebec and Ontario | British Columbia | Yukon and Northwest Territories | Canada |
|------------------------------|--|--------------------------|---------------------|---------------------------------------|-----------|
| Tons | | | | | |
| 1953 | | | | | |
| Ore mined | 534,647 | 2,516,252 | 4,296,800 | 192,183 | 7,539,882 |
| Ore milled | 534,647 | 2,494,814 | 4,284,919 | 193,861 | 7,508,241 |
| Concentrates produced: | | | | | |
| Lead | 29,543 | 23,781 | 195,430 | 25,469 | 274,223 |
| Zinc | 73,348 | 225,617 | 339,063 | 22,565 | 660,593 |
| Pitchblende-silver | — | — | — | — | 1 |
| Precipitates and other | — | 29 | 396 | — | 425 |
| Copper | 19,467 | 1,165 | 12,636 | — | 33,268 |
| 1954 | | | | | |
| Ore mined | 580,913 | 2,462,411 | 3,988,938 | 239,749 | 7,272,011 |
| Ore milled | 579,914 | 2,461,910 | 3,986,831 | 211,655 | 7,240,310 |
| Concentrates produced: | | | | | |
| Lead | 39,882 | 18,239 | 234,311 | 25,079 | 317,511 |
| Zinc | 79,022 | 141,345 | 366,237 | 23,272 | 609,876 |
| Pitchblende-silver | — | — | — | — | 1 |
| Precipitates and other | — | — | 276 | — | 276 |
| Copper | 13,018 | 4,227 | 13,289 | — | 30,534 |

1. Data not available for publication.

TABLE 3. Destination of Shipments from Silver-Lead-Zinc Mines, 1953 and 1954

| | Tons shipped | Gross value, f.o.b. shipping points | Total metal content (without deductions) | | | |
|--|-----------------|---|--|-------------------|----------------------|--------------------|
| | | | Gold | Silver | Lead | Zinc |
| 1953 | | | | | | |
| To Canadian smelters: | | \$ | Troy ounces | Troy ounces | Pounds | Pounds |
| Lead ore | 2,238 | 190,102 | 365 | 84,719 | 939,561 | 301,631 |
| Lead concentrates | 214,766 | 37,677,257 | 5,001 | 11,277,447 | 247,232,962 | 43,024,879 |
| Zinc concentrates ¹ | 313,770 | 31,209,964 | 1,634 | 844,218 | 3,938,816 | 303,454,905 |
| Gold concentrates | 20 | 31,780 | 918 | 485 | 2,058 | 3,443 |
| Copper concentrates ² | 25 | 6,516 | 50 | 2,136 | 5,524 | 13,258 |
| Bullion, tin | 16 | 34,859 | — | — | — | — |
| Residues, slags, tailings | 14 | 667 | — | 672 | 1,943 | 2,371 |
| Total Canadian | 530,849 | 69,151,145 | 7,968 | 12,209,677 | 252,120,854 | 346,800,487 |
| To foreign smelters: | | | | | | |
| Lead ore | 224 | 68,228 | — | 45,365 | 328,200 | — |
| Lead concentrates | 97,311 | 17,480,121 | 19,090 | 4,390,584 | 106,652,504 | 14,348,196 |
| Zinc concentrates ¹ | 237,923 | 31,755,859 | 4,949 | 1,272,726 | 5,290,021 | 264,656,586 |
| Copper concentrates ³ | 23,168 | 3,711,600 | 14,395 | 749,161 | 3,078,635 | 1,926,514 |
| Gravity concentrates | 128 | 97,787 | 2,265 | 15,708 | 38,414 | 65,742 |
| Silver concentrates, bullion | 5 | 123,261 | — | 149,595 | — | — |
| Precipitates | 29 | 790,006 | 10,931 | 492,812 | — | — |
| Tin concentrates | 585 | 623,177 | — | — | 643,254 ⁴ | — |
| Total foreign | 359,373 | 54,652,039 | 51,630 | 7,115,951 | 115,387,774 | 280,997,038 |
| Total shipments | 890,222 | 123,803,184 | 59,598 | 19,325,628 | 367,508,638 | 627,797,525 |
| Cost of freight | — | 10,103,860 | — | — | — | — |
| Cost of fuel and purchased electricity | — | 3,836,581 | — | — | — | — |
| Smelter charges | — | 31,890,233 | — | — | — | — |
| Cost of process supplies | — | 10,074,160 | — | — | — | — |
| Net value of shipments | — | 67,898,350 | — | — | — | — |

TABLE 3. Destination of Shipments from Silver-Lead-Zinc Mines, 1953 and 1954 — Concluded

| | Tons shipped | Gross value, f.o.b. shipping points | Total metal content (without deductions) | | | |
|---|-----------------|---|--|----------------|----------------------|-------------|
| | | | Gold | Silver | Lead | Zinc |
| | | \$ | Troy ounces | Troy ounces | Pounds | Pounds |
| 1954 | | | | | | |
| To Canadian smelters: | | | | | | |
| Lead ore..... | 588 | 106,382 | 30 | 54,706 | 639,956 | 87,855 |
| Lead concentrates..... | 210,668 | 38,053,951 | 1,090 | 9,622,038 | 272,107,149 | 23,165,082 |
| Gold concentrates ¹ | 143 | 248,007 | 7,267 | 3,396 | 13,303 | 21,122 |
| Zinc concentrates ¹ | 365,288 | 39,423,568 | 2,111 | 1,299,493 | 49,734,538 | 350,354,828 |
| Copper concentrates ⁵ | 160 | 22,013 | 26 | 812 | — | — |
| Bullion, gold | ... | 5,858 | 170 | 122 | — | — |
| Total Canadian | 576,947 | 77,859,779 | 10,694 | 10,981,467 | 322,494,946 | 373,628,887 |
| To foreign smelters: | | | | | | |
| Lead ore | 781 | 124,002 | 353 | 95,245 | 448,810 | 29,457 |
| Lead concentrates..... | 103,566 | 22,142,323 | 111,356 | 7,076,147 | 120,508,871 | 12,411,273 |
| Zinc concentrates ¹ | 231,454 | 29,972,468 | 18,195 | 1,401,061 | 4,121,191 | 265,691,541 |
| Tin concentrates | 178 | 280,437 | — | — | 355,251 ⁴ | — |
| Copper concentrates ⁶ | 31,553 | 4,596,563 | 13,784 | 961,567 | 3,409,010 | 6,361,474 |
| Silver concentrates, bullion..... | 14 | 330,757 | — | 399,766 | — | — |
| Gravity concentrates..... | 135 | 76,915 | 1,807 | 13,326 | 59,654 | 68,051 |
| Precipitates | 28 | 873,514 | 14,251 | 439,566 | — | — |
| Total foreign | 367,709 | 58,396,979 | 159,746 | 10,376,868 | 128,547,536 | 284,561,796 |
| Total shipments..... | 944,656 | 136,256,758 | 170,440 | 21,358,335 | 451,042,482 | 658,190,683 |
| Cost of freight..... | ... | 11,186,792 | ... | ... | ... | ... |
| Cost of fuel and purchased electricity..... | ... | 3,488,018 | ... | ... | ... | ... |
| Relief charges | ... | 33,576,514 | ... | ... | ... | ... |
| Cost of process supplies | ... | 9,927,474 | ... | ... | ... | ... |
| Net value of shipments..... | ... | 78,077,960 | ... | ... | ... | ... |

Note. In addition to the metals contained in shipments listed in Table 3, there are considerable quantities of lead and silver contained in ores shipped from certain gold mines in British Columbia. Cadmium, bismuth, antimony, tin and sulphur are also recovered from the silver-lead-zinc ores produced in this industry.

1. Does not include any zinc concentrates produced from copper-gold-zinc ores in Quebec, Manitoba, Saskatchewan or British Columbia.

2. Copper content, in pounds, was 12,227.

3. Copper content, in pounds, was 9,669,080.

4. Tin content in pounds.

5. Copper content, in pounds, was 70,449.

6. Copper content, in pounds, was 13,300,680.

TABLE 4. Employees and Earnings in the Silver-Lead-Zinc Mining Industry, 1950-1954

| Year | Administrative | | Workmen | | Total employees | Total man- hours worked | Earnings | | Total earnings |
|------------|----------------|--------|---------|--------|--------------------|----------------------------------|----------------|------------|-------------------|
| | Male | Female | Male | Female | | | Administrative | Workmen | |
| Number | | | | | | | | | |
| 1950 | 653 | 52 | 5,185 | 49 | 5,939 | Not available | 2,747,691 | 14,885,064 | 17,632,755 |
| 1951 | 1,117 | 103 | 7,963 | 136 | 9,324 | 20,647,209 | 4,749,068 | 25,631,791 | 30,380,859 |
| 1952 | 1,220 | 110 | 8,884 | 117 | 10,330 | 23,421,755 | 5,830,281 | 31,813,333 | 37,643,614 |
| 1953 | 1,023 | 86 | 5,948 | 87 | 7,144 | 16,229,164 | 5,263,075 | 23,432,398 | 28,695,473 |
| 1954 | 899 | 82 | 5,318 | 87 | 6,386 | 14,400,821 | 4,468,140 | 20,378,871 | 24,847,011 |

TABLE 5. Number of Workmen, by Months, in the Silver-Lead-Zinc Mining Industry, 1953 and 1954

| Month | 1953 | 1954 | | | | | | |
|-----------------|-------|---------|--------|-------------|------|--------|-------|--|
| | Total | Mine | | | Mill | | Total | |
| | | Surface | | Underground | Male | Female | | |
| | | Male | Female | Male | | | | |
| January | 6,866 | 1,804 | 80 | 2,576 | 931 | 5 | 5,396 | |
| February | 6,713 | 1,762 | 80 | 2,490 | 924 | 5 | 5,261 | |
| March | 6,365 | 1,706 | 75 | 2,498 | 907 | 5 | 5,191 | |
| April | 5,984 | 1,722 | 72 | 2,361 | 903 | 5 | 5,063 | |
| May | 5,828 | 1,837 | 76 | 2,424 | 906 | 5 | 5,248 | |
| June | 5,912 | 1,972 | 86 | 2,503 | 960 | 6 | 5,527 | |
| July | 5,947 | 2,079 | 87 | 2,498 | 963 | 6 | 5,633 | |
| August | 5,929 | 2,083 | 84 | 2,548 | 967 | 6 | 5,688 | |
| September | 5,844 | 2,045 | 84 | 2,507 | 946 | 6 | 5,588 | |
| October | 5,738 | 1,999 | 88 | 2,494 | 931 | 6 | 5,518 | |
| November | 5,612 | 1,837 | 79 | 2,539 | 935 | 6 | 5,396 | |
| December | 5,454 | 1,720 | 75 | 2,517 | 929 | 6 | 5,247 | |
| Average..... | 6,035 | 1,881 | 81 | 2,498 | 939 | 6 | 5,405 | |

TABLE 6. Drilling Completed on Silver-Lead-Zinc Deposits, 1952-1954

| | Footage drilled | | |
|--|-----------------|-----------|-----------|
| | 1952 | 1953 | 1954 |
| Diamond drilling for exploration and testing: | | | |
| By mining companies with their own personnel and equipment | 128,739 | 45,545 | 12,004 |
| By diamond drilling contractors | 745,973 | 536,394 | 409,650 |
| Other diamond drilling: | | | |
| Blast hole diamond drilling: | | | |
| By mining companies with their own personnel and equipment.... | 502,874 | 499,521 | 376,509 |
| By diamond drilling contractors | 20,443 | 37,956 | 6,677 |
| Drilling by percussion or other machines ¹ | 8,548,404 | 6,387,075 | 4,733,972 |

1. Not complete as records are unobtainable at certain mines.

TABLE 7. Taxes Paid by Concerns in the Silver-Lead-Zinc Mining and Smelting Industry, 1952-1954

| Tax paid | 1952 | 1953 | 1954 |
|--------------------------|------------|------------|------------|
| | \$ | \$ | \$ |
| Dominion income tax..... | 21,353,199 | 12,231,457 | 13,406,884 |
| Provincial tax | 3,248,984 | 1,993,825 | 2,382,618 |
| Municipal tax | 748,332 | 772,328 | 818,893 |

TABLE 8. Cost of Prospecting by Canadian Silver-Lead-Zinc Mining Companies

| Province in which prospecting ¹ was conducted | By New- foundland, Nova Scotia, New Brunswick companies ² | By Quebec companies ² | By Ontario companies ² | By British Columbia companies ² | By Yukon and Northwest Territories companies ² | Total |
|---|---|--|---|---|---|-----------|
| Dollars | | | | | | |
| 1952 | | | | | | |
| Newfoundland | 104,474 | 52,000 | — | — | — | 156,474 |
| Nova Scotia | — | — | — | — | — | — |
| New Brunswick | — | — | — | — | — | — |
| Quebec | — | 599,786 | 3,090 | 2,855 | — | 605,731 |
| Ontario | — | 24,118 | 65,630 | 3,979 | — | 93,727 |
| Manitoba | — | — | — | 1,386 | 3,461 | 4,847 |
| Saskatchewan | — | — | — | 28,293 | 830 | 29,123 |
| British Columbia | — | 27,000 | — | 473,019 | — | 500,019 |
| Northwest Territories | — | 15,000 | — | 30,225 | 338,144 | 383,369 |
| Yukon | — | 149,000 | — | 556 | 345,509 | 495,065 |
| Canada | 104,474 | 866,904 | 68,720 | 540,313 | 687,944 | 2,258,355 |
| 1953 | | | | | | |
| Newfoundland | 269,727 | 35,109 | — | — | — | 304,836 |
| Nova Scotia | 71,563 | — | — | — | — | 71,563 |
| New Brunswick | 1,455,660 | 260,071 | 8,710 | 894 | — | 1,725,335 |
| Quebec | 15,279 | 231,736 | — | 5,878 | — | 252,893 |
| Ontario | 38,679 | 4,940 | 7,720 | 7,782 | 9,170 | 68,291 |
| Manitoba | 12,378 | — | — | 1,152 | — | 13,530 |
| Saskatchewan | 28,890 | — | — | 26,382 | 4,880 | 50,152 |
| Alberta | 765 | — | — | — | — | 765 |
| British Columbia | 37,603 | — | — | 904,828 | — | 942,431 |
| Northwest Territories | 2,945 | — | — | 26,590 | — | 29,535 |
| Yukon | 42,021 | — | — | 6,561 | 75,765 | 124,347 |
| Canada | 1,975,510 | 531,856 | 16,430 | 980,067 | 89,815 | 3,593,678 |
| 1954 | | | | | | |
| Newfoundland | 298,460 | — | — | 34,845 | — | 333,305 |
| Nova Scotia | 74,145 | — | — | — | — | 74,145 |
| New Brunswick | 2,671,638 | 44,789 | — | 1,276,644 | — | 3,998,071 |
| Quebec | 332,248 | 20,867 | — | 6,546 | — | 359,661 |
| Ontario | 453,986 | 17,576 | 4,579 | 270,105 | — | 746,246 |
| Manitoba | 38,254 | 307 | — | 10,212 | — | 48,773 |
| Saskatchewan | 165,622 | — | 194 | 136,597 | — | 302,413 |
| Alberta | — | — | 1,027 | 1,845 | — | 2,872 |
| British Columbia | 121,098 | — | — | 513,153 | — | 634,251 |
| Northwest Territories | 4,473 | — | — | 27,329 | — | 31,802 |
| Yukon | 82,580 | — | — | 104,270 | 130,508 | 316,358 |
| Canada | 4,242,504 | 83,539 | 5,800 | 2,381,546 | 130,508 | 6,843,897 |

Note. No indication is made of the kind of minerals sought.

- Prospecting includes the search for new mineral deposits on the surface and preliminary exploration.
- Province in which the companies' principal operations are conducted.

TABLE 9. Specified Expenditures by the Silver-Lead-Zinc Mining and Smelting Industry

| — | 1951 | 1952 | 1953 | 1954 |
|---|------------|------------|------------|------------|
| | \$ | \$ | \$ | \$ |
| Workmen's compensation | 1,075,654 | 1,250,725 | 957,436 | 885,573 |
| Silicosis assessment | 281,952 | 298,708 | 255,922 | 209,228 |
| Unemployment insurance | 579,677 | 407,049 | 304,868 | 278,460 |
| Aggregate cost of all supplies purchased | 25,961,024 | 20,700,368 | 16,476,408 | 15,099,449 |
| Aggregate cost of plant and equipment purchased | 17,818,447 | 12,184,469 | 4,031,118 | 3,103,221 |
| Cost of buildings, machinery and equipment erected or installed during year | 13,772,121 | 25,309,843 | 4,849,234 | 3,730,998 |

TABLE 10. Estimated Capital and Repair Expenditures, 1950-1954

| Year | Capital expenditures | | | Repair expenditures | | | Capital and repair expenditures | | |
|-------------------------|----------------------|-----------|--------|---------------------|-----------|-------|---------------------------------|-----------|--------|
| | Construction | Machinery | Total | Construction | Machinery | Total | Construction | Machinery | Total |
| Thousands of dollars | | | | | | | | | |
| 1950..... | 2,368 | 1,965 | 4,333 | 321 | 2,376 | 2,697 | 2,689 | 4,341 | 7,030 |
| 1951..... | 4,666 | 5,412 | 10,078 | 321 | 3,361 | 3,682 | 4,987 | 8,773 | 13,760 |
| 1952..... | 6,840 | 4,619 | 11,459 | 968 | 2,341 | 3,309 | 7,808 | 6,960 | 14,768 |
| 1953..... | 3,821 | 2,318 | 6,139 | 457 | 1,110 | 1,567 | 4,278 | 3,428 | 7,706 |
| 1954 ¹ | 2,841 | 1,579 | 4,420 | 776 | 477 | 1,253 | 3,617 | 2,056 | 5,673 |

1. Preliminary estimates.

Silver

Statistics on silver production are computed as follows: (a) recoverable silver in ores, concentrates and matte shipped for export; (b) silver in crude gold bullion produced; (c) silver in blister and anode copper made at Canadian smelters; (d) silver in base bullion made by the Consolidated Mining and Smelting Company of Canada Limited, at Trail, British Columbia, which is the only lead smelter in Canada; (e) silver bullion produced from the treatment of cobalt-silver ores by the Deloro Smelting and Refining Company Ltd., at Deloro, Ontario, and

by Quebec Metallurgical Industries Ltd. plant at Cobalt, Ontario.

The silver production in 1954 increased to 31,117,949 troy ounces from 28,299,335 troy ounces in 1953. The respective values were \$25,907,870 and \$23,774,271.

British Columbia continued to be the province which produced the most silver. Yukon was in second place with nearly 7 million ounces. Ontario, in third position, was closely followed by Quebec.

TABLE 11. Production of Silver (All Forms) from Canadian Ores, 1945-1954

| Year | Ounces | Value | Year | Ounces | Value |
|-----------|------------|------------|-----------|------------|------------|
| | | \$ | | | \$ |
| 1945..... | 12,942,906 | 6,083,166 | 1950..... | 23,221,431 | 18,767,561 |
| 1946..... | 12,544,100 | 10,493,139 | 1951..... | 23,125,825 | 21,865,467 |
| 1947..... | 12,504,018 | 9,002,893 | 1952..... | 25,222,227 | 21,065,603 |
| 1948..... | 16,109,982 | 12,082,487 | 1953..... | 28,299,335 | 23,774,271 |
| 1949..... | 17,641,493 | 13,098,808 | 1954..... | 31,117,949 | 25,907,870 |

TABLE 12. Production of Silver (All Forms) by Months, 1953 and 1954

| Month | 1953 | 1954 | Month | 1953 | 1954 |
|----------------|-----------|-----------|-----------------|------------|------------|
| | ounces | | | ounces | |
| January | 2,441,898 | 2,603,593 | July | 2,360,535 | 2,717,859 |
| February | 2,240,200 | 2,068,740 | August | 2,018,386 | 2,840,385 |
| March | 2,470,626 | 2,352,392 | September | 2,061,312 | 2,804,384 |
| April | 3,064,215 | 2,745,615 | October | 2,087,659 | 2,461,823 |
| May | 2,514,756 | 2,564,919 | November | 2,206,688 | 2,823,719 |
| June | 2,496,972 | 2,769,694 | December | 2,336,098 | 2,364,826 |
| | | | Total | 28,299,335 | 31,117,949 |

TABLE 13. Silver Production According to Nature of Ores, by Provinces, 1954

| Province | Crude placer gold | Auriferous quartz ores | Copper-gold-silver ores | Nickel-copper ores | Silver-lead-zinc ores | Silver-cobalt and other ores | Total |
|-----------------------------|-------------------|------------------------|-------------------------|--------------------|-----------------------|------------------------------|------------|
| ounces | | | | | | | |
| Newfoundland | — | — | — | — | 742,120 | — | 742,120 |
| Nova Scotia | — | 5 | — | — | 262,356 | — | 262,361 |
| Quebec | — | 165,401 | 1,807,935 ¹ | — | 2,933,968 | — | 4,907,304 |
| Ontario | — | 390,962 | 11,282 | 1,278,672 | 30,716 | 3,732,089 | 5,443,721 |
| Manitoba | — | 11,094 | 386,403 | 13,628 | — | — | 411,125 |
| Saskatchewan | — | — | 1,474,370 | — | — | — | 1,474,370 |
| Alberta | 18 | — | — | — | — | — | 18 |
| British Columbia | 1,250 | 33,581 | 266,695 | — | 10,524,088 | — | 10,825,614 |
| Northwest Territories | 7 | 59,030 | — | — | — | — | 59,037 |
| Yukon | 16,656 | — | — | — | 6,975,623 | — | 6,992,279 |
| Canada | 17,931 | 660,073 | 3,946,685 | 1,292,300 | 21,468,871 | 3,732,089 | 31,117,949 |

1. Contains a small quantity recovered from gold ores.

TABLE 14. Production of Silver, by Provinces and by Point of Computation, 1953 and 1954

| | 1953 | | 1954 | |
|---|------------|------------|------------|------------|
| | Quantity | Value | Quantity | Value |
| Newfoundland: | | | Ounces | \$ |
| In ores and concentrates exported | 648,389 | 544,712 | 742,120 | 617,867 |
| Nova Scotia: | | | | |
| In gold bullion and concentrates | 226,225 | 190,052 | 262,361 | 218,434 |
| Quebec: | | | | |
| In anode copper | 1,216,788 | 1,022,223 | 1,783,370 | 1,484,780 |
| In gold bullion made, and in concentrates exported | 3,354,585 | 2,818,187 | 3,123,934 | 2,600,894 |
| Total | 4,571,373 | 3,840,410 | 4,907,304 | 4,085,674 |
| Ontario: | | | | |
| In silver recovered in Canada from cobalt ores | 3,530,776 | 2,966,205 | 3,682,006 | 3,065,527 |
| In gold bullion | 345,668 | 290,395 | 386,384 | 321,692 |
| In blister copper | 1,157,886 | 972,740 | 1,199,750 | 998,876 |
| In ores, concentrates, residues, matte, etc., exported | 120,289 | 101,055 | 175,581 | 146,183 |
| Total | 5,154,619 | 4,330,395 | 5,443,721 | 4,532,278 |
| Manitoba: | | | | |
| In blister copper | 418,992 | 351,995 | 400,031 | 333,054 |
| In gold bullion (gold mines) and in ores exported | 10,516 | 8,835 | 11,094 | 9,236 |
| Total | 429,508 | 360,830 | 411,125 | 342,290 |
| Saskatchewan: | | | | |
| In blister copper | 1,257,622 | 1,056,528 | 1,474,370 | 1,227,516 |
| In gold bullion and in crude alluvial gold | — | — | — | — |
| Total | 1,257,622 | 1,056,528 | 1,474,370 | 1,227,516 |
| Alberta: | | | | |
| In alluvial gold | 6 | 5 | 18 | 15 |
| British Columbia: | | | | |
| In alluvial gold | 1,899 | 1,595 | 1,250 | 1,041 |
| In gold bullion | 23,073 | 19,384 | 24,247 | 20,187 |
| In base bullion and in ores, etc., exported | 9,283,902 | 7,799,406 | 10,800,117 | 8,991,854 |
| Total | 9,308,874 | 7,820,383 | 10,825,314 | 9,013,082 |
| Northwest Territories: | | | | |
| In gold bullion, placer gold and pitchblende ¹ | 63,592 | 53,424 | 59,037 | 49,152 |
| Yukon: | | | | |
| In alluvial gold | 13,463 | 11,310 | 16,656 | 13,867 |
| In silver-lead ores to smelters | 6,625,664 | 5,566,220 | 6,975,623 | 5,807,695 |
| Total | 6,639,127 | 5,577,530 | 6,992,279 | 5,821,562 |
| Canada | 28,299,335 | 23,774,271 | 31,117,949 | 25,907,870 |

Note. For 1954 silver was valued at 83.26 cents per fine ounce, the average price of domestic sales; for 1953 the corresponding price was 84.01 cents.

1. Complete data relating to recovery of silver from pitchblende ores are not available since 1942.

TABLE 15. Source of Silver Production, by Percentages, 1950-1954

| Source | 1950 | 1951 | 1952 | 1953 | 1954 |
|--|---------------|----------------|----------------|----------------|----------------|
| Per cent | | | | | |
| In silver-cobalt ores | 12.68 | 12.80 | 19.21 | 12.50 | 11.99 |
| In base bullion ¹ | 53.05 | 51.89 | 48.01 | 45.65 | 38.53 |
| In gold ores (bullion and placer) | 3.06 | 3.21 | 2.83 | 2.21 | 2.16 |
| In blister and anode copper ² | 22.04 | 21.88 | 18.66 | 14.32 | 15.61 |
| In matte, copper ores and silver-lead ores, etc., exported (other than silver-cobalt ores) | 9.17 100.0 | 10.22 100.0 | 11.29 100.0 | 25.32 100.0 | 31.71 100.0 |

1. Includes some silver bullion from silver-lead ores.

2. From copper-gold-silver and nickel-copper ores.

TABLE 16. Estimated Consumption of Fine Silver in Canada, for Industrial Purposes, 1945-1954

| Year | In anodes for plating | In making sterling silver and other silver alloys (except lead-silver alloys) | In making silver nitrate | In lead-silver alloys | Miscellaneous | Total |
|------------|-----------------------|---|--------------------------|-----------------------|---------------|-----------|
| Ounces | | | | | | |
| 1945 | 960,000 | 3,740,000 | 1,040,000 | 130,000 | 410,000 | 6,280,000 |
| 1946 | 1,301,000 | 3,490,000 | 937,000 | 40,000 | 404,000 | 6,172,000 |
| 1947 | 1,155,000 | 1,384,000 | 874,000 | 37,000 | 253,000 | 3,703,000 |
| 1948 | 1,365,000 | 1,800,000 | 956,000 | 5,000 | 248,000 | 4,374,000 |
| 1949 | 2,463,000 | 2,903,000 | 969,000 | 2,500 | 196,000 | 6,533,500 |
| 1950 | 1,166,000 | 2,708,000 | 1,025,000 | 5,000 | 304,000 | 5,208,000 |
| 1951 | 907,000 | 2,134,000 | 1,166,000 | 3,000 | 279,000 | 4,489,000 |
| 1952 | 1,116,500 | 1,181,000 | 1,083,000 | 26,000 | 379,500 | 3,786,000 |
| 1953 | 1,132,000 | 1,820,500 | 1,282,000 | 8,500 | 420,000 | 4,663,000 |
| 1954 | 978,000 | 1,436,000 | 1,249,000 | 9,000 | 569,000 | 4,241,000 |

Note. Amounts used for coinage not included in above figures.

TABLE 17. Imports and Exports of Silver and Silver Products, 1953 and 1954

| | 1953 | | 1954 | |
|--|------------|-------------------|------------|-------------------|
| | Quantity | Value | Quantity | Value |
| | | | Ounces | \$ |
| Imports: | | | | |
| Silver, unmanufactured..... | 287,497 | 231,165 | 60,165 | 50,403 |
| Silver, manufactures of, n.o.p. | ... | 710,100 | ... | 604,852 |
| Toilet articles of which the most important component, in value, is sterling silver..... | ... | 33,361 | ... | 29,151 |
| Coin, foreign, except gold..... | - | - | - | - |
| Total | ... | 974,625 | ... | 684,406 |
| Exports: | | | | |
| Silver contained in ore, concentrates, etc..... | 5,686,518 | 4,613,352 | 8,672,340 | 6,961,088 |
| Silver bullion..... | 14,632,914 | 12,231,882 | 14,467,015 | 11,991,817 |
| Silver manufactures..... | ... | 72,707 | ... | 54,245 |
| Total accounted for | ... | 16,917,941 | ... | 18,007,150 |

TABLE 18. Silver Production of the World, 1950-1954

(From the Annual Report of the American Bureau of Metal Statistics)

| Country | 1950 | 1951 | 1952 | 1953 | 1954 |
|--|--------------------|--------------------|--------------------|--------------------|-------------------------|
| Troy ounces | | | | | |
| North America: | | | | | |
| United States | 42,068,000 | 39,967,000 | 40,245,000 | 34,697,000 | 38,059,000 |
| Canada | 23,221,431 | 23,125,825 | 25,222,227 | 28,299,335 | 30,680,491 |
| Mexico | 49,140,311 | 43,796,723 | 50,352,398 | 47,886,437 | 39,895,546 |
| Total North America | 114,429,742 | 106,889,548 | 115,819,625 | 110,882,772 | 108,635,037 |
| Central America and West Indies | 4,700,000 | 4,200,000 | 4,800,000 | 6,436,000 | 4,085,000 |
| South America: | | | | | |
| Argentina | 1,150,000 | 1,253,879 | 962,948 | 895,474 | 1,639,688 |
| Bolivia | 6,566,766 | 7,156,590 | 7,065,413 | 6,112,808 | 5,043,563 |
| Brazil | 71,155 | 20,315 | 17,301 | 18,000 | |
| Chile | 742,472 | 1,191,061 | 1,246,327 | 1,497,804 | 1,488,995 |
| Colombia | 116,114 | 130,028 | 123,175 | 117,385 | 111,801 |
| Ecuador | 255,705 | 33,600 | 82,297 | 86,600 | 35,126 |
| Peru | 14,758,403 | 17,378,747 | 18,385,717 | 19,650,241 | 19,933,482 |
| Total South America, as reported | 23,610,615 | 27,164,220 | 27,883,178 | 28,378,312 | |
| Europe: | | | | | |
| Austria | 9,681 | 5,466 | 3,858 | 5,144 | |
| Finland | 115,933 | 157,278 | 150,076 | 235,788 | 239,453 |
| France | 549,669 | 546,550 | 353,650 | 344,005 | 305,425 |
| Germany, West | 1,637,116 | 1,819,957 | 1,877,700 | 2,314,435 | |
| Italy | 894,901 | 869,690 | 838,022 | 832,331 | 892,452 |
| Norway | 110,307 | 89,184 | 144,132 | 107,866 | 127,510 |
| Portugal | 68,288 | 65,427 | 77,740 | 59,447 | |
| Spain (refined) | 823,812 | 735,914 | 553,109 | 472,000 | |
| Sweden | 1,275,680 | 1,145,890 | 2,196,231 | 1,571,428 | 2,077,983 |
| United Kingdom | 18,153 | 26,777 | 30,734 | 28,914 | |
| Yugoslavia | 2,386,784 | 3,031,938 | 2,576,983 | 3,047,949 | 2,829,329 |
| Total Europe, as reported | 7,889,324 | 8,494,071 | 8,802,235 | 9,019,307 | |
| Oceania: | | | | | |
| Australia | 10,677,456 | 10,792,032 | 11,425,872 | 12,264,806 | 15,445,000 ³ |
| Fiji | 37,736 | 24,869 | 25,838 | 19,328 | |
| New Guinea ¹ | 30,399 | 33,603 | 51,275 | 50,000 | |
| New Zealand | 199,701 | 133,291 | 51,016 | 75,888 | 33,049 |
| Total Oceania | 10,945,292 | 10,983,795 | 11,554,001 | 12,410,022 | |
| Asia: | | | | | |
| Burma | 1,804 | 280,720 | 242,307 | 579,239 | 1,074,555 |
| India | 15,676 | 14,612 | 17,675 | 16,864 | |
| Japan | 3,964,572 | 4,609,924 | 5,288,707 | 6,560,400 | 7,001,016 |
| Korea, Republic of | 10,160 | 5,401 | 11,381 | 52,177 | 50,200 |
| Philippines | 216,034 | 274,602 | 693,751 | 572,046 | 527,160 |
| Saudi Arabia | 124,287 | 109,912 | 111,945 | 150,626 | |
| Taiwan (Formosa) | 20,603 | 26,388 | 30,000 | 40,700 | 20,062 |
| Total Asia, as reported | 4,353,136 | 5,321,559 | 6,395,766 | 7,972,052 | |
| Africa: | | | | | |
| Algeria | 31,764 | 8,681 | 8,648 | | |
| Belgian Congo | 4,468,953 | 3,795,179 | 4,726,050 | 4,961,581 | 4,550,061 |
| French Morocco | 1,095,125 | 1,391,902 | 1,914,147 | 2,054,803 | 1,993,300 |
| Gold Coast (exports) | 43,317 | 52,542 | 44,116 | 44,949 | 48,214 |
| Kenya | 2,586 | 2,150 | 17,315 | 21,758 | |
| Northern Rhodesia | 173,304 | 100,702 | 348,954 | 514,699 | |
| Southern Rhodesia ² | 85,549 | 79,731 | 81,356 | 84,566 | 81,657 |
| South West Africa | 826,953 | 759,667 | 1,064,335 | 795,702 | 900,542 |
| Tanganyika (exports) | 31,014 | 35,697 | 35,900 | 41,580 | 42,672 |
| Tunisia | 73,431 | 61,119 | 69,412 | 39,094 | 106,095 |
| Union of South Africa | 1,119,135 | 1,162,588 | 1,176,433 | 1,193,152 | 1,317,674 |
| Total Africa, as reported | 7,951,131 | 7,449,958 | 9,486,666 | 9,751,884 | |
| Russia ³ | 24,000,000 | 24,000,000 | 24,000,000 | 25,000,000 | |
| Total World, as reported | 197,879,240 | 194,503,151 | 208,741,471 | 209,850,349 | |
| Estimated World Total ⁴ | 203,000,000 | 199,100,000 | 216,800,000 | 216,400,000 | |

¹. Year ended May 31 of year following that stated.². Recovered from an accumulation of refinery slimes.³. Conjectural.⁴. This estimate includes the following countries who also produce silver and from whom definite figures are not available: Bechuanaland, Bulgaria, China, Cyprus, Czechoslovakia, Greece, Hong Kong, Hungary, Indonesia, Malaya, Mozambique, Nigeria, North Korea, Poland, Rumania, Sarawak, Sierra Leone, Swaziland, Turkey and Uganda.

Lead

Lead production is calculated as the lead in base bullion made from Canadian ores at the smelter of Consolidated Mining & Smelting Co. of Canada Ltd., at Trail, British Columbia, plus the recoverable lead content in ores and concentrates exported. The value is computed on the basis of the average price in Canadian dollars for refined lead.

The silver-lead-zinc mines of British Columbia produce the major portion of the nation's lead. Some of the lead-silver ores from the Yukon territory were smelted at Trail in British Columbia and part were exported to foreign smelters. In Eastern Canada most of the lead concentrates were shipped to foreign smelters for treatment. One mine in New

Brunswick produced some concentrates which were stockpiled. As these concentrates had not been shipped in 1954, the metal content was not included in the data for the year under review.

During 1954 the production of lead in all forms amounted to 218,495 tons valued at \$58,250,831 compared with 193,706 tons worth \$50,076,822 in the preceding year. The price range during the year was from 12.00 cents to 14.25 cents per pound; the arithmetical weekly average was 13.33 cents.

Output of refined lead, which included some recovered from imported ores, amounted to 166,005 tons in 1954 compared with 165,752 tons in 1953.

TABLE 19. Production¹ of New Lead, 1945-1954

| Year | Tons | \$ | Average price per pound (Canadian funds) | Year | Tons | \$ | Average price per pound (Canadian funds) |
|------------|---------|------------|--|------------|---------|------------|--|
| 1945 | 173,497 | 17,349,723 | 5.00 | 1950 | 165,697 | 47,886,452 | 14.45 |
| 1946 | 176,987 | 23,893,230 | 6.75 | 1951 | 158,231 | 58,229,146 | 18.4 |
| 1947 | 161,668 | 44,200,124 | 13.67 | 1952 | 168,842 | 54,671,021 | 16.19 |
| 1948 | 167,251 | 60,344,146 | 18.04 | 1953 | 193,706 | 50,076,822 | 12.93 |
| 1949 | 159,775 | 50,488,879 | 15.8 | 1954 | 218,495 | 58,250,831 | 13.33 |

1. Primary lead in base bullion produced plus recoverable lead in ores exported.

TABLE 20. Production of Lead, by Months, 1953 and 1954

| Month | Lead (all forms) | | Refined lead ¹ | |
|---------------------|------------------|---------|---------------------------|---------|
| | 1953 | 1954 | 1953 | 1954 |
| Tons (2,000 pounds) | | | | |
| January | 19,067 | 17,711 | 15,327 | 13,085 |
| February | 16,738 | 16,913 | 14,232 | 12,276 |
| March | 14,153 | 17,099 | 15,112 | 14,168 |
| April | 18,490 | 19,447 | 13,758 | 14,595 |
| May | 15,990 | 19,949 | 16,343 | 14,975 |
| June | 15,172 | 19,068 | 14,888 | 14,338 |
| July | 11,905 | 18,583 | 9,660 | 9,658 |
| August | 13,714 | 18,394 | 11,615 | 11,079 |
| September | 14,185 | 17,317 | 12,382 | 14,328 |
| October | 16,077 | 16,621 | 12,646 | 17,583 |
| November | 19,170 | 18,305 | 14,876 | 15,312 |
| December | 19,045 | 19,088 | 14,913 | 14,605 |
| Total | 193,706 | 218,495 | 165,752 | 166,005 |

1. Includes lead refined from foreign ores.

TABLE 21. Production, Imports and Exports of Lead, 1932-1954

| | 1952 | | 1953 | | 1954 | |
|--------------------------------------|--------------------|-------------------|--------------------|-------------------|--------------------|-------------------|
| | Pounds | Value | Pounds | Value | Pounds | Value |
| Production: | | \$ | | \$ | | \$ |
| Newfoundland..... | 36,118,414 | 5,847,571 | 35,403,172 | 4,576,214 | 37,052,168 | 4,939,054 |
| Nova Scotia..... | 1,556,645 | 252,021 | 3,652,126 | 472,074 | 4,186,143 | 558,013 |
| Quebec..... | 21,039,859 | 3,406,353 | 18,473,850 | 2,387,930 | 15,635,942 | 2,084,271 |
| Ontario..... | 1,803,455 | 291,979 | 656,735 | 84,992 | 2,815,611 | 375,321 |
| British Columbia..... | 258,769,430 | 41,894,771 | 297,634,712 | 38,472,263 | 343,535,334 | 45,793,259 |
| Northwest Territories..... | 27,445 | 4,443 | — | — | — | — |
| Yukon..... | 18,368,643 | 2,973,883 | 31,590,973 | 4,083,449 | 33,765,290 | 4,500,913 |
| Total | 337,583,891 | 54,671,021 | 387,441,588 | 50,076,822 | 436,690,488 | 58,250,831 |
| Imports: | | | | | | |
| Pig and block..... | 709,836 | 127,066 | 510,657 | 62,427 | 296,633 | 38,677 |
| Old and scrap..... | 259,389 | 45,873 | 52,704 | 9,912 | 24,200 | 2,907 |
| Bars and sheets..... | 4,433 | 1,988 | 61,102 | 10,921 | 60,083 | 9,573 |
| Lead pipe..... | 1,431 | 583 | — | — | 1,160 | 239 |
| Acetate of lead..... | 96,718 | 18,581 | 44,832 | 8,517 | 89,478 | 13,967 |
| Nitrate of lead..... | 128,736 | 23,122 | 150,337 | 21,917 | 237,984 | 34,516 |
| Other manufactures..... | ... | 214,325 | ... | 255,067 | ... | 200,784 |
| Shots and bullets..... | 2,341 | 1,367 | 2,827 | 1,207 | 5,020 | 1,731 |
| Lead tetraethyl, compounds of..... | 23,737,931 | 9,270,084 | 26,859,098 | 10,456,800 | 30,590,786 | 11,429,398 |
| Lead capsules for bottles..... | ... | 141,186 | ... | 97,384 | ... | 113,894 |
| Lead pigments: | | | | | | |
| Litharge..... | 1,172,500 | 231,159 | 1,643,300 | 274,654 | 2,004,300 | 326,260 |
| Dry white lead..... | 23,779 | 4,240 | 71,200 | 10,883 | 48,800 | 7,353 |
| White lead, ground in oil..... | 600 | 154 | 1,018 | 314 | 1,014 | 308 |
| Dry red lead and orange mineral..... | 151,401 | 27,844 | 210,813 | 34,212 | 188,503 | 30,449 |
| Total accounted for | ... | 10,107,572 | ... | 11,244,215 | ... | ... |
| Exports: | | | | | | |
| Lead, scrap..... | 10,426,100 | 1,163,151 | 1,045,100 | 74,488 | 1,739,800 | 158,761 |
| Lead, contained in ore..... | 47,934,200 | 6,897,640 | 123,365,700 | 14,884,744 | 119,510,600 | 14,568,258 |
| Pig lead..... | 259,480,900 | 41,614,984 | 205,758,600 | 22,976,167 | 232,818,300 | 25,802,738 |
| White lead..... | 842,300 | 153,518 | 1,500 | 248 | 1,100 | 2,018 |
| Lead manufactures, n.o.p..... | ... | 41,584 | ... | 24,937 | ... | 22,974 |
| Lead pipe..... | 97,600 | 25,312 | 126,200 | 29,205 | 54,900 | 10,719 |
| Total accounted for | ... | 49,896,189 | ... | 37,889,789 | ... | ... |

TABLE 22. Production, Imports, Exports and Domestic Consumption of Refined Lead, 1945-1954

| Year | Production in Canada | Domestic consumption | Exports ² | Imports | Stock ¹ at end of period |
|-----------|-------------------------|-------------------------|----------------------|---------|--|
| | | | | | Tons of 2,000 pounds |
| 1945..... | 163,142 | 62,263 | 107,291 | 8 | 19,900 |
| 1946..... | 165,744 | 62,784 | 102,000 | 6 | 21,230 |
| 1947..... | 162,000 | 64,131 | 118,214 | — | 9,134 |
| 1948..... | 160,025 | 59,542 | 108,302 | 53 | 3,866 |
| 1949..... | 146,149 | 51,281 | 99,010 | 2,154 | 10,959 |
| 1950..... | 170,023 | 54,723 | 115,864 | 1,237 | 11,061 |
| 1951..... | 162,000 | 60,348 | 104,893 | 1,227 | 10,365 |
| 1952..... | 182,943 | 62,466 | 132,406 | 521 | 10,281 |
| 1953..... | 165,752 | 67,718 | 98,686 | 540 | 21,184 |
| 1954..... | 166,005 | 67,947 | 114,427 | 178 | 16,971 |

1. Producers' and consumers' stocks.
2. Producers' shipments for export.

TABLE 23. Consumption of Refined Lead by Principal End-uses, 1950-1954

| Use | 1950 | 1951 | 1952 | 1953 | 1954 |
|---|---------------|---------------|---------------|---------------|---------------|
| Tons | | | | | |
| Solders and alloys | 10,480 | 9,466 | 13,274 | 16,128 | 12,727 |
| White lead, red lead and litharge | 6,183 | 8,289 | 7,438 | 6,602 | 6,739 |
| Storage batteries | 21,832 | 23,373 | 19,291 | 20,685 | 22,041 |
| Foil and collapsible tubes | 43 | 81 | 3 | 1 | 349 |
| Ammunition | 564 | 1,318 | 3,006 | 3,784 | 5,266 |
| Iron and steel | 1,531 | 1,982 | 1,626 | 1,635 | 515 |
| Cable covering | 12,758 | 14,269 | 15,959 | 17,635 | 19,368 |
| Miscellaneous | 1,332 | 1,570 | 1,869 | 1,248 | 942 |
| Total | 54,723 | 60,348 | 62,466 | 67,718 | 67,947 |

TABLE 24. World Production of Lead on Mine Basis, 1950-1954

(From the Annual Report of the American Bureau of Metal Statistics)

| Country | 1950 | 1951 | 1952 | 1953 | 1954 |
|--------------------------------------|------------------|------------------|------------------|------------------|------------------|
| Tons of 2,000 pounds | | | | | |
| United States ⁴ | 430,827 | 388,164 | 390,162 | 341,872 | 318,985 |
| Canada ^{3,4} | 165,697 | 158,231 | 168,842 | 193,706 | 219,280 |
| Mexico | 262,433 | 248,533 | 271,196 | 244,213 | 238,785 |
| Total North America | 858,957 | 794,928 | 830,200 | 779,791 | 777,050 |
| Argentina | 25,400 | 26,500 | 22,000 | 17,500 | 28,700 |
| Bolivia ² | 34,396 | 33,105 | 32,262 | 26,222 | 20,092 |
| Chile | 3,657 | 8,599 | 4,500 | 3,500 | 3,500 |
| Peru | 71,554 | 90,774 | 105,571 | 126,302 | 119,823 |
| Total South America | 135,007 | 158,978 | 164,333 | 173,524 | 172,115 |
| Austria | 4,894 | 4,985 | 5,763 | 5,677 | 5,432 |
| Finland | 157 | 238 | 238 | 239 | 292 |
| France | 12,115 | 11,105 | 13,024 | 12,710 | 11,486 |
| Germany ⁶ | 49,533 | 55,522 | 56,875 | 69,351 | 74,420 |
| Greece | 2,543 | 5,348 | 6,122 | 7,152 | 4,131 |
| Italy ⁴ | 42,230 | 42,620 | 44,293 | 47,950 | 50,044 |
| Poland | 20,000 | 20,000 | 22,500 | 23,500 | 24,000 |
| Rumania ⁵ | 1 | 1 | 1 | 1 | 1 |
| Spain ⁴ | 41,753 | 43,188 | 45,622 | 57,973 | 59,877 |
| Sweden | 24,992 | 21,708 | 22,700 | 28,146 | 33,454 |
| United Kingdom ⁴ | 3,381 | 4,585 | 5,295 | 7,439 | 7,598 |
| Yugoslavia | 94,837 | 86,807 | 87,048 | 93,864 | 92,736 |
| Total Europe | 296,435 | 296,105 | 309,480 | 354,001 | 363,470 |
| Burma ⁵ | 12 | 5,474 | 2,949 | 7,731 | 12,722 |
| India ⁵ | 702 | 962 | 1,268 | 1,897 | 1,974 |
| Japan | 12,011 | 14,187 | 19,482 | 20,006 | 22,036 |
| Korea, Republic of | 44 | — | 157 | 164 | 200 |
| Philippines | 969 | 629 | 2,535 | 2,683 | 2,014 |
| Total Asia | 13,738 | 21,252 | 26,391 | 32,481 | 38,946 |
| Algeria | 1,436 | 3,261 | 4,987 | 8,662 | 11,218 |
| French Equatorial Africa | 2,000 | 2,760 | 3,916 | 4,877 | 3,833 |
| French Morocco | 53,747 | 75,100 | 92,161 | 88,559 | 90,818 |
| Northern Rhodesia ⁵ | 15,237 | 15,646 | 14,112 | 12,891 | 16,800 |
| South West Africa ⁴ | 29,802 | 37,636 | 50,324 | 55,022 | 65,308 |
| Tunisia | 20,789 | 23,331 | 25,638 | 26,455 | 30,388 |
| Total Africa | 123,101 | 157,734 | 191,138 | 196,466 | 218,365 |
| Australia ⁴ | 231,971 | 238,578 | 247,719 | 258,521 | 311,506 |
| Russia | 123,000 | 141,500 | 170,000 | 202,000 | 228,500 |
| Total⁷ | 1,782,209 | 1,809,076 | 1,939,261 | 1,996,784 | 2,109,952 |

1. Unknown.

2. Exports.

3. Base bullion from domestic ores plus recoverable content of ores exported.

4. Calculated as recoverable.

5. Same as pig lead production.

6. Federal Republic of Germany.

7. A.B.M.S. totals are exclusive of any estimate for the Soviet Zone of Germany, 1947-1954, North Korea, 1947-1954.

Besides the productions tabulated above, there are small productions in Ecuador, Guatemala, Bulgaria, Hungary, Norway, Portugal and several other countries.

Zinc

Zinc production is calculated as the refined zinc recovered from domestic ores at Canadian smelters plus the recoverable zinc in ores and concentrates shipped for export. The quantity arrived at in this way is valued at the average price in Canadian dollars for Grade A electrolytic zinc.

New zinc in all forms produced in 1954 amounted to 376,491 short tons valued at \$90,207,285 compared with 401,762 tons valued at \$96,101,386 in 1953. Refined zinc output, including zinc refined from foreign ores, amounted to 213,775 tons in 1954 and 250,961 tons in 1953.

Zinc concentrates from Buchans Mines in Newfoundland, and from Mindamar Metals in Nova Scotia,

were exported for treatment. In Quebec, zinc concentrates were produced from ores classified as copper-gold-silver, of the Quebec, Normetal, Weedon Pyrite and Waite Amulet mines. Other zinc producers were classified as lead-zinc mines.

The zinc concentrates produced in eastern Canada were exported for treatment. The Hudson Bay Mining and Smelting Company's refinery at Flin Flon, Manitoba, treated ores from the Flin Flon and Cuprus mines. A large portion of the zinc ores mined in British Columbia were treated in the smelter at Trail. Ores from the Mayo district in the Yukon were sent to Trail, British Columbia, and to United States for refining.

TABLE 25. Production¹ of Zinc From All Types of Canadian Ores, 1945-1954

| Year | Tons | \$ | Average price per pound (Canadian funds) | Year | Tons | \$ | Average price per pound (Canadian funds) |
|------------|---------|------------|--|------------|---------|-------------|--|
| 1945 | 258,607 | 33,308,556 | 6.44 | 1950 | 313,227 | 98,040,145 | 15.65 |
| 1946 | 235,310 | 36,755,450 | 7.81 | 1951 | 341,112 | 135,762,643 | 19.90 |
| 1947 | 207,863 | 46,686,010 | 11.23 | 1952 | 371,802 | 129,833,285 | 17.46 |
| 1948 | 234,164 | 65,237,956 | 13.93 | 1953 | 401,762 | 96,101,386 | 11.96 |
| 1949 | 288,262 | 76,372,147 | 13.25 | 1954 | 376,491 | 90,207,285 | 11.98 |

1. Refined zinc made in Canada plus recoverable zinc in ores, etc., exported.

TABLE 26. Production of Zinc, by Months, 1953 and 1954

| Month | Primary zinc in all forms | | Refined zinc ¹ | |
|-----------------|---------------------------|---------|---------------------------|----------------------|
| | 1953 | 1954 | 1953 | 1954 |
| January | | | Tons of 2,000 pounds | Tons of 2,000 pounds |
| | 32,671 | 27,096 | 18,670 | 17,155 |
| February | 33,462 | 25,336 | 18,977 | 15,199 |
| March | 36,976 | 29,136 | 20,993 | 16,540 |
| April | 33,409 | 31,788 | 20,303 | 16,249 |
| May | 33,366 | 30,400 | 20,390 | 16,530 |
| June | 34,045 | 30,123 | 20,889 | 17,007 |
| July | 34,118 | 32,361 | 21,895 | 17,917 |
| August | 32,904 | 32,822 | 21,903 | 18,755 |
| September | 33,659 | 31,495 | 21,457 | 18,013 |
| October | 34,753 | 35,013 | 21,980 | 18,871 |
| November | 30,774 | 34,578 | 21,351 | 19,622 |
| December | 31,625 | 36,343 | 21,153 | 21,917 |
| Total | 401,762 | 376,491 | 250,961 | 213,775 |

1. Includes zinc refined from foreign ores.

TABLE 27. Zinc Production According to Types of Ores, by Provinces, 1953 and 1954

| Year and province | Recovered from copper-gold-silver ores | Recovered from silver-lead-zinc and other ores | Total | Value |
|------------------------|--|--|---------|------------|
| Tons of 2,000 pounds | | | | |
| 1953 | | | | \$ |
| Newfoundland | — | 28,002 | 28,002 | 6,698,029 |
| Nova Scotia | — | 7,349 | 7,349 | 1,757,964 |
| Quebec | 34,442 | 65,988 | 100,430 | 24,022,766 |
| Ontario | — | 86 | 86 | 20,546 |
| Manitoba | 15,766 | — | 15,766 | 3,771,315 |
| Saskatchewan | 49,965 | — | 49,965 | 11,951,537 |
| British Columbia | 7,102 | 184,048 | 191,150 | 45,723,183 |
| Yukon | — | 9,014 | 9,014 | 2,156,046 |
| Canada | 107,275 | 294,487 | 401,762 | 96,101,386 |
| 1954 | | | | |
| Newfoundland | — | 30,002 | 30,002 | 7,188,595 |
| Nova Scotia | — | 8,493 | 8,493 | 2,034,810 |
| Quebec | 36,910 | 70,091 | 107,001 | 25,637,532 |
| Ontario | — | 710 | 710 | 170,122 |
| Manitoba | 16,253 | — | 16,253 | 3,894,226 |
| Saskatchewan | 50,670 | — | 50,670 | 12,140,475 |
| British Columbia | 8,828 | 142,711 | 151,539 | 36,308,784 |
| Yukon | — | 11,823 | 11,823 | 2,832,741 |
| Canada | 112,661 | 263,830 | 376,491 | 90,207,285 |

TABLE 28. Imports and Exports of Zinc, 1953 and 1954

| | 1953 | | 1954 | |
|---|---------|------------|---------|------------|
| | Tons | Value | Tons | Value |
| Imports: | | \$ | | \$ |
| Zinc dust | 335 | 104,831 | 298 | 82,708 |
| Zinc in blocks, pigs, bars and rods and zinc plates, n.o.p. | 29 | 16,048 | 98 | 31,538 |
| Zinc in sheets and strips, and zinc plates for marine boilers | 1,297 | 587,732 | 1,257 | 526,408 |
| Zinc slugs for dry batteries | ... | 388,991 | ... | 386,829 |
| Zinc white (zinc oxide) | 1,382 | 343,820 | 1,035 | 262,149 |
| Zinc sulphate | 1,265 | 142,547 | 1,407 | 123,535 |
| Zinc chloride | 136 | 29,457 | 148 | 27,722 |
| Zinc, manufactures of, n.o.p. | ... | 2,368,677 | ... | 1,740,685 |
| Lithopone | 3,348 | 474,638 | 2,541 | 350,149 |
| Exports: | | | | |
| Zinc, manufactures of | ... | 127,003 | ... | 76,945 |
| Zinc contained in ore | 192,657 | 22,923,232 | 180,172 | 18,838,883 |
| Zinc, scrap, dross and ashes | 4,183 | 355,477 | 5,114 | 364,866 |
| Zinc, slab or cake | 158,388 | 34,292,884 | 206,038 | 39,188,377 |
| Zinc oxide | — | — | 1,190 | 271,112 |

TABLE 29. Production, Exports and Domestic Consumption of Refined Zinc, 1945-1954

| Year | Production | Domestic consumption | Exports | Stocks ¹ at end of period |
|----------------------|------------|----------------------|---------|--------------------------------------|
| Tons of 2,000 pounds | | | | |
| 1945 | 183,317 | 55,663 | 121,969 | 37,700 |
| 1946 | 185,683 | 54,969 | 151,885 | 23,265 |
| 1947 | 178,264 | 51,065 | 127,036 | 21,275 |
| 1948 | 196,575 | 46,899 | 147,454 | 13,849 |
| 1949 | 206,045 | 45,669 | 159,353 | 12,101 |
| 1950 | 204,367 | 54,370 | 148,205 | 13,048 |
| 1951 | 218,578 | 61,023 | 152,661 | 18,742 |
| 1952 | 222,200 | 51,581 | 160,864 | 25,116 |
| 1953 | 250,961 | 50,717 | 158,388 | 60,959 |
| 1954 | 213,775 | 47,284 | 206,038 | 11,839 |

1. Producers' and consumers' stocks.

TABLE 30. Consumption of Refined Zinc¹, by End-uses, 1952-1954

| Use | 1952 | 1953 | 1954 |
|----------------------------------|---------------|---------------|---------------|
| Tons | | | |
| Brasses | 11,983 | 9,485 | 6,776 |
| Galvanizing | 23,091 | 21,975 | 24,413 |
| Die castings | 7,909 | 9,064 | 6,713 |
| Zinc oxide | 5,189 | 7,012 | 7,154 |
| Zinc sheet | 1,257 | 1,206 | 1,264 |
| Miscellaneous | 2,152 | 1,975 | 964 |
| Total accounted for | 51,581 | 50,717 | 47,284 |

1. Secondary zinc is not included.

TABLE 31. World Production of Zinc Ore, by Countries

(From the Annual Report of the American Bureau of Metal Statistics)

In tons of 2,000 pounds of zinc content, either by assay or estimated as recoverable

| Country | 1950 | 1951 | 1952 | 1953 | 1954 |
|---|------------------|------------------|------------------|------------------|------------------|
| United States ^{1,2} | 623,375 | 681,189 | 666,001 | 547,430 | 465,245 |
| Canada ^{1,3} | 313,227 | 341,112 | 371,802 | 401,762 | 373,448 |
| Mexico ⁴ | 246,375 | 198,485 | 250,635 | 238,691 | 246,638 |
| Total North America | 1,182,977 | 1,220,786 | 1,288,438 | 1,187,883 | 1,085,331 |
| Argentina ⁴ | 13,998 | 17,058 | 16,971 | 17,735 | 20,852 |
| Bolivia ⁸ | 21,572 | 33,659 | 39,262 | 26,427 | 22,485 |
| Peru ⁴ | 96,869 | 111,504 | 139,423 | 151,759 | 170,882 |
| Total South America | 132,439 | 162,221 | 195,656 | 195,921 | 214,219 |
| Austria ⁴ | 3,274 | 3,698 | 4,696 | 4,826 | 5,149 |
| Finland | 2,399 | 3,391 | 1,523 | 3,555 | 4,964 |
| France ⁴ | 11,162 | 11,489 | 13,203 | 10,128 | 8,663 |
| Germany ⁵ | 76,389 | 80,398 | 88,933 | 100,579 | 103,877 |
| Greece ¹ | 3,510 | 9,298 | 9,988 | 12,327 | 5,506 |
| Italy ¹ | 78,166 | 94,086 | 103,002 | 90,270 | 106,382 |
| Norway ⁴ | 6,285 | 6,028 | 6,160 | 5,661 | 5,842 |
| Poland ⁶ | 95,000 | 95,000 | 105,000 | 120,000 | 137,500 |
| Spain ⁴ | 69,803 | 79,298 | 84,635 | 89,532 | 92,054 |
| Sweden ⁴ | 40,918 | 42,238 | 51,987 | 49,706 | 63,196 |
| Yugoslavia | 41,990 | 43,453 | 52,679 | 66,106 | 63,052 |
| Other Europe ⁷ | 2,100 | 2,400 | 3,000 | 3,500 | 4,000 |
| Total Europe | 430,996 | 470,777 | 524,806 | 565,190 | 600,176 |
| Burma | — | — | 1,437 | 4,756 | 7,112 |
| India | 300 | 1,176 | 2,255 | 2,650 | 2,493 |
| Philippines | 50 | 171 | 1,759 | 823 | — |
| Japan ⁴ | 57,355 | 71,010 | 96,417 | 105,891 | 106,645 |
| Other Asia | 200 | 200 | 300 | 500 | 600 |
| Total Asia | 57,905 | 72,557 | 102,168 | 114,620 | 116,850 |
| Algeria ⁴ | 7,900 | 10,434 | 13,052 | 20,976 | 29,712 |
| Belgian Congo ⁴ | 82,458 | 97,780 | 108,556 | 138,665 | 90,804 |
| French Equatorial Africa ⁴ | 685 | 571 | 369 | — | — |
| French Morocco ⁴ | 14,122 | 21,445 | 31,252 | 38,895 | 37,908 |
| Northern Rhodesia ⁸ | 37,969 | 36,555 | 37,026 | 39,023 | 34,811 |
| Southwest Africa ¹ | 9,288 | 11,110 | 14,001 | 14,672 | 17,939 |
| Tunisia ⁴ | 3,276 | 3,911 | 3,905 | 4,022 | 5,707 |
| Total Africa | 155,698 | 181,806 | 208,161 | 256,253 | 216,881 |
| Australia ¹ | 186,284 | 179,507 | 185,557 | 223,004 | 299,296 |
| Russia | 142,000 | 163,000 | 205,000 | 233,500 | 250,000 |
| Total, as reported | 2,288,299 | 2,451,068 | 2,709,786 | 2,776,371 | 2,782,753 |

1. Calculated as recoverable.

2. U.S. Bureau of Mines.

3. Dominion Bureau of Statistics.

4. Calculated as zinc content by assay.

5. Federal Republic of Germany starting 1949.

6. Smelter production.

7. No estimates have been made for Soviet sphere countries.

8. Exports.

Note. Estimates for Russia and to some extent countries grouped under "Other" have been based on U.S.B.M. and other publications.

Cadmium

Cadmium is recovered from the silver-lead-zinc ores treated by the smelter of the Consolidated Mining and Smelting Company of Canada Limited, Trail, British Columbia, and from the copper-gold zinc ores processed at the smelter of the Hudson Bay Mining and Smelting Company Limited,

Flin Flon, Manitoba. Production in 1954 was 1,086,780 pounds compared with 1,118,285 pounds in the preceding year. These figures include recoverable cadmium in exported concentrates, but do not include cadmium recovered in Canada from foreign ores.

TABLE 32. Production of Cadmium in All Forms, From Canadian Ores, 1945-1954

| Year | From copper-gold-silver-zinc ores | From silver-lead-zinc ores | Total |
|------------|-----------------------------------|----------------------------|-----------|
| Pounds | | | |
| 1945 | 135,632 | 510,432 | 646,064 |
| 1946 | 166,333 | 636,315 | 802,648 |
| 1947 | 172,896 | 545,638 | 718,534 |
| 1948 | 148,864 | 617,226 | 766,090 |
| 1949 | 181,092 | 665,449 | 846,541 |
| 1950 | 141,456 | 706,950 | 848,406 |
| 1951 | 147,168 | 1,179,752 | 1,326,920 |
| 1952 | 205,911 | 742,676 | 948,587 |
| 1953 | 157,997 | 960,288 | 1,118,285 |
| 1954 | 154,596 | 932,184 | 1,086,780 |

TABLE 33. Production, Exports and Domestic Consumption of Cadmium Metal, 1945-1954

| Year | Production | Domestic consumption | Exports |
|----------------------|------------------|----------------------|---------|
| Tons of 2,000 pounds | | | |
| 1945 | 323 | 87 | 175 |
| 1946 | 401 | 96 | 296 |
| 1947 | 359 | 72 | 309 |
| 1948 | 383 | 92 | 275 |
| 1949 | 423 | 113 | 279 |
| 1950 | 419 ¹ | 116 | 349 |
| 1951 | 633 ¹ | 146 | 460 |
| 1952 | 410 ¹ | 116 | 310 |
| 1953 | 489 ¹ | 133 | 485 |
| 1954 | 529 | 113 | 392 |

1. Includes cadmium recovered from foreign ores.

(b) The Silver-Cobalt Mining Industry

The silver-cobalt mining industry is centred in the Temiskaming district in Ontario. Mining started in the Cobalt area early in this century when the silver discovery was made during the construction of a railway.

There was an average of 808 persons employed in 1954 to whom \$2,614,266 were paid as salaries and wages. Fuel cost \$110,340 and 21,851,293 kwh. of electricity were purchased for \$156,678. Process supplies were valued at \$466,390.

TABLE 34. Principal Statistics of the Silver-Cobalt Mining Industry, Significant Years, 1921-1954

| Year | Estab- lishments ¹ | Em- ployees | Earnings | Cost of fuel and electricity at plant | Cost at plant of process supplies | Gross value of products | Net value ² added |
|------------|----------------------------------|----------------|-----------|--|---|----------------------------|---------------------------------|
| | | | | | | | |
| | No. | No. | \$ | \$ | \$ | \$ | \$ |
| 1921 | 39 | 1,224 | 1,739,706 | 448,897 | N.A. | 6,316,812 | N.A. |
| 1929 | 32 | 1,149 | 1,532,333 | 407,952 | " | 3,918,316 | " |
| 1931 | 26 | 786 | 1,149,689 | 227,467 | " | 1,925,593 | " |
| 1933 | 14 | 242 | 322,281 | 83,565 | " | 1,071,602 | " |
| 1937 | 25 | 300 | 394,386 | 90,134 | 116,455 | 853,386 | 540,762 |
| 1939 | 43 | 323 | 412,728 | 63,486 | 105,500 | 890,128 | 653,032 |
| 1941 | 14 | 182 | 229,984 | 40,875 | 59,761 | 788,815 | 662,443 |
| 1944 | 11 | 165 | 260,575 | 48,323 | 35,809 | 422,850 | 323,260 |
| 1946 | 11 | 247 | 404,012 | 58,712 | 48,932 | 325,846 | 207,483 |
| 1949 | 18 | 264 | 607,782 | 82,735 | 127,661 | 822,881 | 503,572 |
| 1951 | 20 | 514 | 1,406,783 | 148,661 | 299,084 | 4,539,842 | 3,640,343 |
| 1952 | 19 | 696 | 2,161,894 | 279,709 | 474,083 | 4,770,635 | 3,556,975 |
| 1953 | 13 | 739 | 2,204,274 | 301,297 | 428,963 | 4,623,407 | 3,235,891 |
| 1954 | 15 | 808 | 2,614,266 | 273,024 | 456,390 | 5,294,499 | 4,103,256 |

1. Includes lessees shipping from dumps.

2. Gross value less the value of fuel, electricity, process supplies, freight and treatment charges.

TABLE 35. Summary¹ of Operations of Silver-Cobalt Mines and Mills, 1952-1954

| | 1952 | 1953 | 1954 |
|--|---------|---------|---------|
| Ore mined | 179,534 | | |
| Ore salvaged from surface ² | 22,395 | 268,837 | 297,038 |
| Ore and tailings treated (milled) ³ | 343,400 | 391,262 | 326,790 |
| Concentrates produced | 16,088 | 8,205 | 10,415 |

1. Partly estimated as data are unobtainable from some small shippers.

2. Complete data not available.

3. Does not include crude ore shipped.

TABLE 36. Mine and Mill Shipments of Canadian Silver-Cobalt Ores and Concentrates, 1953 and 1954

| | Gross weight | Metal content | | | |
|---|-----------------|------------------|------------------|----------------|----------------|
| | | Silver | Cobalt | Nickel | Copper |
| 1953 | Tons | Ounces | Pounds | Pounds | Pounds |
| To Canadian smelters and to the government stockpile at Deloro, Ontario | 8,270 | 3,420,204 | 1,217,314 | 468,074 | 123,256 |
| To foreign plants | 223 | 6,941 | 51,324 | 18,430 | 3,766 |
| Total | 8,493 | 3,427,145 | 1,268,638 | 486,504 | 127,022 |
| 1954 | | | | | |
| To Canadian smelters and to the government stockpile at Deloro, Ontario | 11,083 | 4,358,999 | 1,458,033 | 441,539 | 227,362 |
| To foreign plants | 66 | 50,083 | 9,700 | — | — |
| Total | 11,149 | 4,409,082 | 1,467,733 | 441,539 | 227,362 |

TABLE 37. Employees and Earnings in the Silver-Cobalt Mining Industry, 1950-1954

| Year | Administrative | | Workmen | | Total employees | Man-hours worked | Earnings | | Total earnings |
|------------|----------------|--------|---------|--------|-----------------|------------------|----------------|-----------|----------------|
| | Male | Female | Male | Female | | | Administrative | Workmen | |
| Number | | | | | | | | | |
| 1950 | 44 | 3 | 314 | 3 | 364 | 745,691 | 123,269 | 760,002 | 883,281 |
| 1951 | 64 | 4 | 441 | 5 | 514 | 1,221,781 | 228,621 | 1,178,162 | 1,406,783 |
| 1952 | 71 | 5 | 613 | 7 | 696 | 1,605,890 | 242,036 | 1,919,858 | 2,161,894 |
| 1953 | 81 | 9 | 644 | 5 | 739 | 1,554,897 | 286,506 | 1,918,128 | 2,204,274 |
| 1954 | 113 | 15 | 677 | 3 | 808 | 1,772,748 | 363,338 | 2,250,928 | 2,614,266 |

TABLE 38. Number of Workmen on Payroll at End of Month in the Silver-Cobalt Mining Industry, 1953 and 1954

| Month | 1953 | | | | | 1954 | | | | | Total |
|---------------------------|-----------|--------|------|-------|---------|-----------|------|-------|-----|-----|-------|
| | Mine | | Mill | Total | Mine | | Mill | Total | | | |
| | Surface | | | | Surface | | | | | | |
| | Male | Female | Male | Male | Male | Female | Male | Male | | | |
| January | 139 | 6 | 384 | 141 | 670 | 158 | 3 | 429 | 69 | 659 | |
| February | 128 | 5 | 374 | 133 | 640 | 159 | 3 | 390 | 61 | 613 | |
| March | 128 | 4 | 364 | 134 | 630 | 154 | 3 | 414 | 51 | 622 | |
| April | 122 | 4 | 349 | 117 | 592 | 156 | 3 | 403 | 52 | 614 | |
| May | 127 | 4 | 358 | 129 | 618 | 145 | 3 | 427 | 109 | 684 | |
| June | 146 | 4 | 342 | 144 | 636 | 121 | 3 | 440 | 112 | 676 | |
| July | 149 | 5 | 349 | 147 | 650 | 128 | 3 | 460 | 121 | 712 | |
| August | 160 | 5 | 356 | 151 | 672 | 137 | 3 | 466 | 120 | 726 | |
| September | 153 | 5 | 380 | 145 | 683 | 131 | 3 | 445 | 123 | 702 | |
| October | 151 | 5 | 387 | 140 | 683 | 127 | 3 | 444 | 119 | 692 | |
| November | 172 | 5 | 373 | 130 | 680 | 124 | 3 | 445 | 120 | 692 | |
| December | 170 | 5 | 382 | 112 | 669 | 106 | 3 | 416 | 111 | 636 | |
| Average | 147 | 5 | 362 | 135 | 739 | 136 | 3 | 431 | 110 | 680 | |
| Man-hours of labour | 1,351,791 | | | | | 1,586,619 | | | | | |

TABLE 39. Specified Miscellaneous Expenditures by the Silver-Cobalt Mining Industry, 1951-1954

| - | 1951 | 1952 | 1953 | 1954 |
|---|---------|-----------|-----------|-----------|
| | \$ | \$ | \$ | \$ |
| Workmen's compensation | 36,427 | 56,086 | 62,277 | 73,837 |
| Silicosis assessment | 21,654 | 40,383 | 46,267 | 49,564 |
| Unemployment insurance | 11,780 | 15,629 | 17,275 | 17,680 |
| Aggregate cost of all supplies purchased | 809,689 | 1,018,663 | 1,220,658 | 1,500,103 |
| Aggregate cost of plant and equipment purchased | 251,594 | 800,173 | 240,376 | 349,594 |
| Cost of buildings, machinery and equipment erected or installed during the year | 352,561 | 688,286 | 229,912 | 447,022 |

Cobalt

Ores from the cobalt area were treated by Deloro Smelting and Refining Co. Ltd., which produced metallic cobalt and cobalt compounds at Deloro, Ontario. Silver-cobalt ores were treated at the Cobalt Chemical Division of Quebec Metallurgical Industries Limited. At Port Colborne the International Nickel Company of Canada began

production of electrolytic cobalt in addition to the production of cobalt oxide from the nickel-copper ores of the Sudbury area. Cobalt is recovered from the nickel-copper matte shipped to Norway by the Falconbridge Nickel Mines Ltd. It is expected that cobalt will be recovered from the nickel-copper ores from Lynn Lake, Manitoba.

Arsenic

Data on arsenious oxide formerly included in this bulletin are now given in the report on the Miscellaneous Non-metal Mining Industry.

TABLE 40. Production of Cobalt from Canadian Ores, 1945-1954

| Year | Quantity | Value | Year | Quantity | Value |
|-------------------------|-----------|-----------|-----------|-----------|-----------|
| | Pounds | \$ | | Pounds | \$ |
| 1945 | 109,123 | 90,026 | 1950..... | 583,806 | 964,003 |
| 1946 | 73,900 | 70,215 | 1951..... | 951,607 | 1,999,612 |
| 1947 | 572,673 | 875,644 | 1952..... | 1,421,923 | 3,226,903 |
| 1948 ¹ | 1,544,852 | 2,029,178 | 1953..... | 1,602,545 | 4,013,077 |
| 1949 | 619,065 | 952,469 | 1954..... | 2,252,965 | 5,912,997 |

1. Includes shipments from stockpiled ores which were mined in earlier years.

TABLE 41. Production of Cobalt from Canadian Ores, Imports and Exports, 1953 and 1954

| | 1953 | | 1954 | |
|---|-----------|-----------|-----------|-----------|
| | Quantity | \$ | Quantity | \$ |
| | Pounds | | Pounds | |
| Production: (In terms of metallic cobalt and cobalt in oxides and salts sold, and in ores exported) | 1,602,545 | 4,013,077 | 2,252,965 | 5,912,997 |
| Imports: | | | | |
| Cobalt ore | 4,288,000 | 628,251 | 10,400 | 1,321 |
| Oxide of cobalt | 28,500 | 47,833 | 6,935 | 14,395 |
| Exports: | | | | |
| Cobalt contained in ore | 37,100 | 60,418 | 3,300 | 5,693 |
| Cobalt, metallic | 769,369 | 2,427,907 | 1,139,039 | 3,778,413 |
| Cobalt alloys | 11,874 | 59,038 | 4,926 | 22,302 |
| Cobalt oxides and cobalt salts | 932,499 | 1,900,399 | 836,205 | 1,454,648 |

TABLE 42. World Production of Cobalt, 1950-1954

(From the Annual Report of the American Bureau of Metal Statistics)

| Country | 1950 | 1951 | 1952 | 1953 | 1954 |
|--------------------------------------|------------|------------|------------|------------|------------|
| | Pounds | | | | |
| Canada ¹ | 583,806 | 951,607 | 1,421,923 | 1,602,545 | 2,181,900 |
| Northern Rhodesia ² | 1,473,900 | 1,568,972 | 1,037,120 | 1,032,640 | 940,800 |
| Belgian Congo ² | 11,349,281 | 12,599,289 | 15,432,200 | 18,249,679 | 18,979,401 |
| French Morocco ³ | 930,300 | 1,596,130 | 2,200,191 | 1,327,169 | 1,622,586 |
| United States ³ | 809,328 | 902,629 | 1,363,251 | 1,258,924 | 1,990,677 |

1. Metal recovered from smelter products plus cobalt contained in cobalt residues exported.

2. Cobalt content of alloys.

3. Content of ore.

Principal Operators in the Silver-Lead-Zinc Mining Industry, 1954

| Name of operator | Head office address | Location of mine |
|--|--|----------------------|
| Newfoundland: | | |
| Buchans Mining Co. Ltd. | Water St., St. John's | Buchans |
| Independent Mining Corp. Ltd. | 15 Toronto St., Toronto, Ontario | Corner Brook |
| Nova Scotia: | | |
| Dawmac Mining and Oils Ltd. | 1519 Pine Ave. W., Montreal, Quebec | Cobequid |
| Mina-Nova Mines Ltd. | 217 Bay St., Toronto, Ontario | Boisdale Hills |
| Mindanair Metals Corp. Ltd. | 50 King St. W., Toronto, Ontario | Stirling |
| Minda-Scotia Mines Ltd. | 217 Bay St., Toronto, Ontario | Middle Stewiacke |
| New Brunswick: | | |
| American Metal Co. Ltd. | 25 Adelaide St. W., Toronto, Ontario | Newcastle |
| Anuwon Uranium Mines Ltd. | 85 Richmond St. W., Toronto, Ontario | Restigouche Co. |
| Astrabrun Mines Ltd. | 44 King St. W., Toronto, Ontario | Nepisiquit River |
| Attlin-Ruffner Mines Ltd. | 302 Bay St., Toronto, Ontario | Bathurst |
| Bagamac Mines Ltd. | Oak Ridges, Ontario | Eathurst |
| Bruns-Mines Ltd. | 44 King St., Toronto, Ontario | Little River |
| Brunhurst Mines Ltd. | 100 Adelaide St. W., Toronto, Ontario | Bathurst |
| Brunswick Mining and Smelting Corp. Ltd. | Box 260, Bathurst | Gloucester Co. |
| Celta Development and Mining Co. Ltd. | 465 St. John St., Montreal, Quebec | Gloucester Co. |
| Chesterville Mines Ltd. | 25 Adelaide St. W., Toronto, Ontario | Gloucester Co. |
| Confederation Mining Corp. | 132 St. James St. W., Montreal, Quebec | Bathurst |
| Consolidated Harpers Malartic Gold Mines Ltd. | 330 Bay St., Toronto, Ontario | Eathurst |
| Conwest Exploration Co. Ltd. | Spencerville, Ontario | Eathurst |
| Coulee Lead and Zinc Mines Ltd. | 67 Yonge St., Toronto, Ontario | Bathurst |
| Cyprus Exploration Corp. Ltd. | 80 Richmond St. W., Toronto, Ontario | Bathurst |
| Glenconna Mining Co. Ltd. | 132 St. James St. W., Montreal, Quebec | Point Roche |
| God's Lake Gold Mines Ltd. | 389 Marn St., Winnipeg, Manitoba | Eathurst |
| Headway Red Lake Gold Mines Ltd. | 67 Yonge St., Toronto, Ontario | Bathurst |
| Headvue Mines Ltd. | 67 Yonge St., Toronto, Ontario | Bathurst |
| Joburke Gold Mines Ltd. | 357 Bay St., Toronto, Ontario | Bathurst |
| Kayrand Mining and Development Co. Ltd. | 215 St. James St. W., Montreal, Quebec | Sunbury |
| Kerromac Mining Co. Ltd. | 132 St. James St. W., Montreal, Quebec | Bathurst |
| Keyboycon Mines Ltd. | 330 Bay St., Toronto, Ontario | Eathurst |
| Keymet Mines Ltd. | 330 Bay St., Toronto, Ontario | Petit Rocher Nord |
| Lauson Holdings Limited | 330 Bay St., Toronto, Ontario | Gloucester |
| New Calumet Mines Ltd. | 25 King St. W., Toronto, Ontario | Restigouche |
| New Larder "U" Island Mines Ltd. | 330 Bay St., Toronto, Ontario | Bathurst |
| Nudulama Mines Ltd. | 330 Bay St., Toronto, Ontario | Bathurst |
| Nipiron Mines Ltd. | 302 Bay St., Toronto, Ontario | Bathurst |
| O'Brien, M.S., Ltd. | 900 Victoria Bldg., Ottawa, Ontario | Beresford |
| Quebec Smelting and Refining Ltd. | 215 St. James St. W., Montreal, Quebec | Blissville |
| Roche Long Lac Gold Mines Ltd. | 7 King St. W., Toronto, Ontario | Bathurst |
| Tiblemont Goldfields Ltd. | 44 King St. W., Toronto, Ontario | Bathurst |
| Timmins, N.A., (1938) Ltd. | 1010 Canada Cement Bldg., Montreal, Quebec | Northumberland |
| Titanic Mine Holdings Ltd. | 215 St. James St. W., Montreal, Quebec | Gloucester |
| Quebec: | | |
| Absam Mines Ltd. | 465 St. John St., Montreal | Barraute |
| Anacon Lead Mines Limited | 330 Bay St., Toronto, Ontario | Montauban Les Mines |
| Ascot Metals Corporation Ltd. | P.O. Box 492, Sherbrooke | Moulton Hill |
| Barvue Mines Ltd. | 330 Bay St., Toronto, Ontario | Barraute Twp. |
| Belfort Mines Ltd. | 5 St. James St. E., Montreal | Barraute Twp. |
| Chatelet Mines Ltd. | McWatters | Carpentier Twp. |
| Consolidated Candego Mines Ltd. | 1434 Ste. Catherine St. W., Montreal | Marsoui, Gaspe North |
| Golden Manitou Mines Ltd. | 330 Bay St., Toronto, Ontario | Bourlamaque Twp. |
| Grandines Mines Ltd. | 330 Bay St., Toronto, Ontario | Portneuf |
| Lachance Mines Ltd. | 161 Notre Dame St. S., Thetford Mines | Thetford Mines |
| MacDonald Mines Ltd. | 1434 Ste. Catherine St. W., Montreal | Dufresnoy Twp. |
| New Calumet Mines Ltd. | 355 St. James St., Montreal | Calumet |
| New Inesco Mines Ltd. | 355 St. James St., Montreal | Dufresnoy Twp. |
| New Norzone Mines Ltd. | 25 Adelaide St. W., Toronto, Ontario | Rolette |
| Philippe, Ito | 62 de l'Évêché, Rimouski | St-Fabien |
| St. Roberts Metals Corp. | 132, ouest rue St-Jacques, Montreal | Risborough Twp. |
| Suffield Metals Corporation Ltd. | P.O. Box 492, Sherbrooke | Ascot |
| United Montauban Mines Ltd. | 330 Bay St., Toronto, Ontario | Montauban Les Mines |
| Vendome Mines Ltd. | 5 St. James St. E., Montreal | Piedmont |

Principal Operators in the Silver-Lead-Zinc Mining Industry, 1954 — Continued

| Name of operator | Head office address | Location of mine |
|---|--|--------------------|
| Ontario: | | |
| Consolidated Sudbury Basin Mines Ltd. | 25 King St. W., Toronto | Errington |
| Jardun Mines Ltd. | 649 Albert St. E., Sault Ste. Marie | Jarvis Twp. |
| McCombe Mining and Exploration Ltd. | 330 University Ave., Toronto | Kenora |
| MacKeller Bay Mines Ltd. | 22 Toronto St., Toronto | Thunder Bay |
| Saratoga Exploration Co. Ltd. | 22 Toronto St., Toronto | Schreiber |
| British Columbia: | | |
| American Metal Co. Ltd. | 25 Adelaide St. W., Toronto, Ontario | Hope |
| American Zinc, Lead Smelting Co. | 927 Old National Bank, Spokane, Wash., U.S.A. | Nelson |
| Atlin-Ruffner Mines (B.C.) Ltd. | 302 Bay St., Toronto, Ontario | Atlin |
| Base Metals Mining Corp. Ltd. | 62 Richmond St., Toronto, Ontario | Golden, Kaslo |
| B.C. Metal Mines Ltd. | 614 W. Pender St., Vancouver | Lardeau |
| Beatrice Mining Co. Ltd. | 744 W. Hastings St., Vancouver | Revelstoke |
| Berens River Mines Ltd. | 173 Portage Ave., Winnipeg, Manitoba | Fort Steele |
| Burgess and Burgess | Ymir | Ainsworth |
| Carnoose Mines Ltd. | 357 Bay St., Toronto, Ontario | Kamloops |
| Cassiar Consolidated Mines Ltd. | 850 W. Hastings, Vancouver | Stewart |
| Canadian Exploration Limited | Royal Bank Bldg., Vancouver | Salmo |
| Carnegie Mines of B.C. Ltd. | 1126 Sherbrooke St. W., Montreal, Quebec | Slocan |
| Cooper, J.A. | Ainsworth | Ainsworth |
| Cody-Reco Mines Ltd. | 11 King St. W., Toronto, Ontario | Slocan |
| Consolidated Mining and Smelting Co. of Canada Ltd., The | Trail | Kimberley, Riondel |
| Deer Horn Mines Ltd. | 44 King St. W., Toronto, Ontario | Burns Lake |
| Dumas, F.J. | Ainsworth | Ainsworth |
| Pairview Mining Co. Ltd. | 626 Pender St. W., Vancouver | Osoyoos |
| P.C.L. Mines Ltd. | Louis Creek | Kamloops |
| Giant Mascot Mines Ltd. | 908 Royal Bank Bldg., Vancouver | Spillimachien |
| Hayes, D.I. | Spokane, Wash., U.S.A. | Nelson |
| Highland-Bell Limited | 844 West Hastings St., Vancouver | Greenwood |
| Isaacs and Pittman | Box 3651, Kaslo | Slocan |
| Jardine, J.A. | Kaslo | Kaslo |
| Jackson Basin Mining Co. Ltd. | 525 Seymour St., Vancouver | Retallack |
| Kelowna Mines Headley Ltd. | Hedley | Sandon |
| Kootenay Belle Gold Mines Ltd. | 916 Stock Exchange Bldg., Vancouver | Slocan, Ainsworth |
| Kootenay Exploration Ltd. | 425 Baker St., Nelson | Kinbasket Lake |
| Kootenay Base Metals Ltd. | 525 Seymour St., Vancouver | Fort Steele |
| Laib, K.K., A. Johnson and H. Hawkins.... | Bayonne | Nelson |
| Luning, S.A. | 311 Douglas Bldg., Seattle, Wash., U.S.A. | Slocan |
| Magnuson Mines Ltd. | 629 Spokane St., Trail | Fruitvale |
| MacDonald and Laib | Bayonne | Nelson |
| McCready, G.E. | 525 Seymour St., Vancouver | Ainsworth |
| McVicar Mining Co. Ltd. | 475 Howe St., Vancouver | Squamish |
| Mills, Pengelly and Cooper | Silverton | Slocan |
| McCreary and Gibbs | Box 375, New Denver | Slocan |
| Mollie Mac Mines Ltd. | 850 W. Hastings, Vancouver | Revelstoke |
| New Jersey Zinc Explorations Ltd. | 525 Seymour St., Vancouver | Nelson |
| New Arlington Mines Ltd. | Box 387, Nelson | Nelson |
| Noranda Exploration Co. Ltd. | Noranda, Quebec | Alberni |
| Northwestern Explorations Ltd. | 25 King St. W., Toronto, Ontario | Fort Steele |
| Northwestern Holdings Ltd. | 413 Birks Bldg., Vancouver | Hope |
| Paycheck Mining and Development Co. Ltd. | 302 Baker St., Nelson | Lightning Peak |
| Pacific Mining Services Ltd. | 844 W. Hastings St., Vancouver | Nelson |
| Petersen, E.H. | Sandon | Slocan |
| Pioneer Gold Mines of B.C. Ltd. | 525 Seymour St., Vancouver | Ainsworth |
| Reeves MacDonald Mines Ltd. | 413 Granville St., Vancouver | Nelson |
| Renata Group | Box 353, Castlegar | Trail Creek |
| Scranton Mines Ltd. | 1519 Marine Bldg., Vancouver | Ainsworth |
| Sheep Creek Gold Mines Ltd. | 413 Granville St., Vancouver | Slocan |
| Silbak Premier Mines Ltd. | 718 Granville St., Vancouver | Skeena |
| Sileurian Chieftain Mining Co. | 615 Pender St. West, Vancouver | Garden Bay |
| Sil-Van Consolidated Mining & Milling Ltd. | 602 West Hastings St., Vancouver | Omineca |
| Silver Ridge Mining Co. Ltd. | 373 Baker St., Nelson | Slocan |
| Silver Standard Mines Ltd. | 602 West Hastings St., Vancouver | Omineca |
| Silver Tip Gold Mines Ltd. | 210 Pemberton Bldg., Victoria | Portland Canal |
| Skeena Silver Mines Ltd. | 850 West Hastings St., Vancouver | Skeena Crossing |
| Sunshine Lardeau Mines Ltd. | 525 West Pender St., Vancouver | Revelstoke |
| Torbit Silver Mines Ltd. | 44 King St. W., Toronto 1, Ontario | Portland Canal |
| Tulsequah Mines Ltd. | Trail | Tulsequah |



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MINERAL STATISTICS

Principal Operators in the Silver-Lead-Zinc Mining Industry, 1954 — Concluded

| Name of operator | Head office address | Location of mine |
|--|---|------------------|
| British Columbia — concluded: | | |
| Utica Mines (1937) Ltd. | 413 Granville St., Vancouver | Ainsworth |
| Van Roi Mines (1947) Ltd. | Silverton | Slocan |
| Violamac Mines (B.C.) Ltd. | 67 Yonge St., Toronto, Ontario | Slocan |
| Vancouver Island Base Metals Ltd. | 850 W. Hastings St., Vancouver | Duncan |
| Vigilante Mine | Ainsworth | Ainsworth |
| Wanke, E.A., and C. Johnson | Box 61, Greenwood | Greenwood |
| Western Exploration Co. Ltd. | Silverton | Slocan |
| Western Mines Ltd. | 1768 E. Hastings St., Vancouver | Ainsworth |
| Yale Lead and Zinc Mines Ltd. | 330 Bay St., Toronto, Ontario | Ainsworth |
| Yankee Dundee Mines Ltd. | 918 Rogers Bldg., Vancouver | Nelson |
| Northwest Territories: | | |
| Pine Point Mines Ltd. | Yellow Knife | Slave Lake |
| Yukon: | | |
| Bellekeno Mines Ltd. | 25 Adelaide St., Toronto, Ontario | Mayo |
| MacKeno Mines Ltd. | 100 Adelaide St. W., Toronto, Ontario | Mayo |
| Silden Mines Ltd. | Keno Hill | Keno Hill |
| United Keno Hill Mines Ltd. | 85 Richmond St. W., Toronto, Ontario | Mayo |
| Yukeno Mines Ltd. | 100 Adelaide St. W., Toronto, Ontario | Mayo |

List of Operators in the Silver-Cobalt Mining Industry, 1954

| Name of operator | Head office address | Location of mine |
|--|---|------------------|
| Quebec: | | |
| Juno Metals Corp. | 4235 Iberville St., Montreal | Taschereau |
| Quebec Cobalt and Exploration Ltd. | 88 Metcalfe St., Ottawa, Ontario | Basin of Pekans |
| Touton Gold and Base Metals Co. Ltd. | Fabre Station | Fabre Twp. |
| Ontario: | | |
| Big Agaunico Mines Ltd. | Box 99, Haileybury | Bucke Twp. |
| Castle-Trethewey Mines Ltd. | 25 King St. West, Toronto | O'Brien |
| Cobalt Consolidated Mining Corp. Ltd. | 100 Adelaide St. W., Toronto | Coleman Twp. |
| Cotley Mines Ltd. | Drawer 369, Haileybury | Elk Lake |
| Cordon Cobalt Mines Ltd. | 129 Adelaide St. W., Toronto | Coleman Twp. |
| Dean, J.C. | Box 616, Cobalt | Coleman Twp. |
| Glenrock Gold Mines Ltd. | 80 King St. W., Toronto | Palmer Twp. |
| Harrison-Hibbert Mines Ltd. | 145 Yonge St., Toronto | Bucke Twp. |
| Mayfair Mines Ltd. | 331 Bay St., Toronto | Coleman Twp. |
| New Morrison Mines Ltd. | Cornwall | O'Brien |
| McAllister, R.C. | Box 283, Cobalt | Coleman Twp. |
| Mensilvo Mines Ltd. | 73 King St. W., Toronto | Coleman Twp. |
| Nipissing Mining Co. Ltd., The | 302 Bay St., Toronto | Cobalt |
| Nipissing-O'Irien Mines Ltd. | 25 King St. W., Toronto | Coleman Twp. |
| Morgan Silver Cross Mines Ltd. | 377 St. James St., Montreal, Quebec | Coleman Twp. |
| Roy Silver Mines Ltd. | 357 Bay St., Toronto | Farr Twp. |
| Shag Silver Mines Ltd. | Cobalt | Coleman Twp. |
| Silver Miller Mines Ltd. | 357 Bay St. W., Toronto | Coleman Twp. |
| Siscoe Metals of Ontario Ltd. | Cornwall | Nicol Twp. |
| Tiara Mines Ltd. | 100 Adelaide St. W., Toronto | Elk Lake |
| United Cobalt Mines Ltd. | 145 Yonge St., Toronto | Coleman Twp. |

Note. In addition to the names listed, there were some small shippers.