# Minister of Mines

PROVINCE OF BRITISH COLUMBIA

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# ANNUAL REPORT

For the Year Ended 31st December

1958

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in right of the Province of British Columbia.
1959

**BRITISH COLUMBIA DEPARTMENT OF MINES**

VICTORIA, B.C.

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HON. W. K. KIERNAN, *Minister.*

P. J. MULCAHY, *Deputy Minister.*

J. W. PECK, *Chief Inspector of Mines.*

S. METCALFE, *Chief Analyst and Assayer.*

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J. D. LINEHAM, *Chief, Petroleum and Natural Gas Conservation Branch.*

*To His Honour* FRANK MACKENZIE ROSS, C.M.G., M.C., LL.D.,
*Lieutenant-Governor of the Province of British Columbia.*

MAY IT PLEASE YOUR HONOUR:

The Annual Report of the Mining Industry of the Province for the year 1958 is herewith respectfully submitted.

W. K. KIERNAN,
*Minister of Mines.*

*Minister of Mines' Office,*
*May, 1959.*

John G. Biggs died on January 23rd, 1958, in his eighty-second year. He was born in 1877 in County Durham, England. He came to Canada in 1905, at the age of 28, and settled first at Wellington on Vancouver Island, where he found employment with Canadian Collieries (Dunsmuir) Limited. Shortly afterwards he moved to Cumberland, where he was employed by the same company until 1919, when he joined the Department of Mines as Inspector of Mines. He was stationed at Merritt from 1919 until 1928, when he was transferred to Princeton. He remained there until his retirement in 1941.

Harry E. Miard died on December 21st, 1958, in New Westminster. He was born in Paris, France, in 1879, emigrating to Canada in 1897. His association with coal-mining in British Columbia began in 1901 at Coal Creek. In 1914 he left the position of overman at Coal Creek to return to France as a soldier of the Republic. In 1919, shortly after returning to Coal Creek, he joined the staff of the Inspection Branch of the Department of Mines at Fernie. His duties as Inspector of Mines and as a member of the Board of Examiners took him to many of the mining camps of the Province. He retired at Fernie in 1946. After his retirement he did consulting work for The Consolidated Mining and Smelting Company of Canada, Limited, and The Crow's Nest Pass Coal Company Limited. He held a life membership in the Canadian Institute of Mining and Metallurgy.

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# ANNUAL REPORT OF THE MINISTER OF MINES, 1958

## Introduction

A Report of the Minister of Mines of the Province of British Columbia has been published each year since 1874.

The Annual Report records the salient facts in the progress of the mineral industry, also much detail about individual operations, including those undertaken in the search for, exploration of, and development of mineral deposits, as well as the actual winning of material from mineral deposits.

The Annual Report of the Minister of Mines now contains introductory sections dealing with Statistics and Departmental Work, followed by sections dealing with Lode Metals; Placer; Structural Materials and Industrial Minerals; Petroleum and Natural Gas; Inspection of Lode Mines, Placer Mines, and Quarries; Coal; and Inspection of Electrical Equipment and Installations at Mines and Quarries, each with its own table of contents. A table listing the properties described, in geographic groupings, precedes the index.

An introductory review of the mineral industry and notes at the first of several of the main sections deal generally with the industry or its principal subdivisions. Notes in the various sections deal briefly with exploration or production operations during the year or describe a property in more complete detail, outlining the history of past work and the geological setting as well as describing the workings and the mineral deposits exposed in them. Some notes deal with areas rather than with a single property.

The work of the branches of the Department is outlined briefly in the section on Departmental Work. This section is followed by notes dealing briefly with the work of other British Columbia or Federal Government services of particular interest to the mineral industry of British Columbia. Information concerning mine operations and some of the activities of the Inspection Branch of the Department of Mines is contained in the section on Inspection of Lode Mines, Placer Mines, and Quarries, early in the section on Coal and in the section on Inspection of Electrical Equipment and Installations at Mines and Quarries.

The section on Statistics begins with an outline of current and past practice in arriving at quantities and calculating the value of the various products.

# Review of the Mineral Industry, 1958

Production in 1958, the centennial year, brought the accumulated value of the mineral output of British Columbia well past the 4-billion-dollar mark. The statistics of mineral production for 1858 show only coal valued at a few thousand dollars and placer gold valued at $705,000. For 1958, thirty-eight items are listed—fifteen under metals, seven under industrial minerals, thirteen under structural materials, and three under fuels. Their combined value is $146,875,081, placer gold and coal combined contributing slightly more than 4 per cent of the total.

Lead contributed 23.6 per cent and zinc 29.4 per cent of the value of 1958 mineral output. Fourteen other products each contributed from 1 to 6 per cent. It is noteworthy that asbestos contributed 5.2 per cent of the total value, being greater than gold, silver, and copper, which ranged from 4.6 to 2 per cent of the total value. Although still a relatively small item, natural-gas output contributed 2.6 per cent of the 1958 total value.

The part of total value contributed by each group of mineral products in 1958 was: Principal metals, 63.8 per cent; other metals, 7.2 per cent; industrial minerals, 8.0 per cent; structural materials, 13.6 per cent; fuels, 7.4 per cent. The details of prices, quantities of minerals produced, and values are found in tables on pages A 13 to A 48.

The value of mineral output for 1958 was materially less than that of recent years because of reduced prices for copper, lead, and zinc, and reduced output of gold, silver, copper, coal, and several other products. Increases were recorded for iron ore, petroleum, and natural gas. Mine closures in 1957 and the closing of six mines in 1958 account for the reduction in quantity of gold, silver, copper, tungsten, and coal. The values for the "principal metals" and the "other metals" groups were much below the 1953–57 average and the 1957 figures; consequently the percentages contributed by metals were also reduced. Industrial minerals and structural materials have been increasing in value, and their 1958 values, although less than those of 1957, exceeded the 1953–57 averages. The 1958 value for fuel exceeded the five-year average, increases in natural gas and petroleum more than offsetting the decline in coal output.

The quantity of lead exceeded the average of the preceding five years by about 2 per cent, and that of zinc exceeded the five-year average by 6 per cent, but the combined value of the two metals was 12.6 million dollars below the five-year average. Copper output was reduced sharply compared with recent years. Although there were considerable changes in the output of individual gold mines, their combined output in 1958 was approximately the same as in 1957. However, in comparison with recent years, little gold was won from ores yielding one or more of the metals copper, lead, and zinc as the main product or as principal products. In 1957 such ores yielded about a sixth of the total gold. Silver output was reduced similarly, although at several mines silver output increased with lead output. The value of the "principal metals" group declined more than $18,000,000 from the 1957 figure. Commercial production of nickel was recorded for the first time; production was started in January and suspended in August. Tungsten production was suspended in August. Iron-ore production was materially greater than in 1957, one producer having operated throughout the year and the other for about nine months. Texada Mines Limited, recovering a copper-gold concentrate as a by-product in concentrating iron ore, and Cowichan Copper, milling ore for the first time, contributed more than half the copper output.

In the "structural materials" field a substantial increase in cement-making capacity was achieved when the plant of Lafarge Cement of North America Ltd. on Lulu Island began operating in January, but the Provincial output for the year was somewhat less than in 1957.

Production of coal was much below the 1957 output, but oil production increased by a half and the 1958 output of natural gas was about eight times that of 1957.

The number of lode-mineral claims recorded in 1958, a measure of exploration activity, was 13, 459, compared with 12,110 in 1957. Lode-mine exploration increasingly is carried on by large companies doing geological, geophysical, and geochemical work, stripping with heavy equipment, diamond drilling, and often meeting transportation problems by using fixed-wing aircraft or helicopters. These procedures contrast with the traditional ones that were responsible for most lode discoveries in the past. Except for the Cassiar property, the new mines of the post-war period are old discoveries which determined and intelligent effort and increased prices have made profitable sources of mineral wealth.

Interest has been shown in a wide range of minerals, including asbestos, barite, gypsum, limestone, magnesite, and silica, in addition to the metals that have been the main contributors of mineral wealth. Exploration in the Merritt-Highland Valley area indicates large reserves of copper, with substantial quantities of good milling grade and very large quantities of low-grade material. Copper mineralization on Racing River and Toad River in the northeastern part of the Province received preliminary exploration. Further work was done on the Boss Mountain molybdenum property, and low-grade molybdenum-bearing material at Glacier Gulch received preliminary testing.

Exploration for oil and gas was carried on actively mainly in northeastern British Columbia, where the area of interest has broadened, as indicated by a considerable enlargement of the area held under permit. Interest was not confined to northeastern British Columbia. More than 2,700,000 acres of land on Graham Island and off the east coast of the Island was taken under permit, and near the end of 1958, 12,700,000 acres in the Skeena Mountains, and a further 445,000 acres lying to the southeast, were taken under permit. Five wells between 1,800 and 6,000 feet in depth were drilled and abandoned along the east coast of Graham Island.

More than forty drilling rigs were operated in 1958, and 484,287 feet of drilling was done on 112 wells, of which, at the end of the year, one was suspended and twenty were drilling, fifty-one had been abandoned, seventeen had been completed as oil wells, and twenty-three as gas wells. Two of the oil-well completions and nine gas-well completions were wildcat wells. These additions and some revisions brought the number of oil wells to thirty-nine and gas wells to 148. Most of the wells drilled, including sixty wildcat wells and all wells successfully competed, are in northeastern British Columbia.

The West Coast Transmission Company pipe-line was operated for the full year. Gas production from sixty-nine wells amounted to 64,051,785,000 cubic feet, and oil production from twenty-eight wells amounted to 512,359 barrels. At Taylor, on the Peace River, the McMahon gas scrubbing plant and adjoining refinery and sulphur recovery plant produce dry sweet gas for transmission, having recovered liquid condensate and sulphur. Refining the condensate yields propane, butane, finished motor and aviation fuels, kerosene, and diesel oil.

Revenue to the Government from petroleum and natural gas amounted to $9,472,200.74, including fees, rentals, and miscellaneous, $4,326,288.54; tender bonuses, $4,510,123.14; and royalties on gas, oil, and processed products, $635,809.06.

The average number employed through 1958 in placer, lode, coal, industrial-minerals and structural-material mining was 11,201. Major expenditures by those branches of the industry included: Salaries and wages, $45,035,287; fuel and electricity, $7,922,163; process supplies (inclusive of explosives, chemicals, drill-steel, lubricants, etc.), $13,215,371; Federal taxes, $6,062,698; Provincial taxes, $1,847,466; municipal and other taxes, $1,925,952; levies for workmen's compensation (including silicosis), unemployment insurance, and other items, $1,782,744. Dividends amounted to $14,966,123. The lode-mining industry spent $27,614,725 in freight and treatment charges on ores and concentrates.

The recorded expenditures of the petroleum and natural-gas industry amounted to $39,980,479, of which $31,507,890 was for exploration and included $14,897,919 for exploratory drilling. The expenditures recorded included for salaries and wages, $3,898,271; for fuel and electricity, $158,876; and for process supplies, $1,837,665. The total number reported employed on December 31st, 1958, was 846.

# Statistics

The statistics of the mineral industry are collected and compiled and the statistical tables for this Report are prepared by the Bureau of Economics and Statistics, Department of Industrial Development, Trade, and Commerce.

In the 1951 Report, extensive rearrangements of tables and of their order were made. The tables in the present Report closely parallel those presented in Reports for years preceding 1951, but additional details have been incorporated, and the present order is considered to make more apparent the relationship between summary tables and the tables giving the details summarized.

In the 1958 Report, adjustments have been made to bring lead and zinc production figures into line with the best information available. The changes are reflected in Tables I, II, III, VI, VIIA, VIIB, VIIIA, VIIIB, and in the gross-value figure in Table XIV. The gross-value figures have also been corrected to include early production of iron, mercury, and tungsten so that Table XIV now records the tonnage from all lode-mining operations year by year beginning with 1901 and also records the gross value of the principal metals; however, it does not record the value of by-product metals antimony, bismuth, cadmium, indium, and tin, contributing a minor part of value of the output of any mine.

## METHOD OF COMPUTING PRODUCTION

The tables of statistics recording the mineral production of the Province for each year are compiled from certified returns made by the operators, augmented by some data obtained from the Royal Canadian Mint and from the operators of customs smelters. The value of each mineral product, in Canadian funds, is calculated at the average price for the year (*see* p. A 13). The quantities of metals are net after making deductions for losses in smelting and refining.

### METALS

Prior to 1925 the average prices for gold and copper are true average prices, but, as a means of correcting for losses in smelting and refining, the prices of other metals were taken at the following percentages of the year's average price for the metal: Silver, 95 per cent; lead, 90 per cent; and zinc, 85 per cent. For 1925 and subsequent years the value has been calculated using the true average price and the net metal contents, in accordance with the procedures adopted by the Dominion Bureau of Statistics and the co-operating Provincial Departments of Mines.

Beginning with the Annual Report for 1948, production figures for individual lode-mining operations are the assay contents of the products shipped (ore, concentrates, or bullion), no deductions being made for losses in smelting and refining. In previous Annual Reports the production figures given for individual properties are net, after deductions for smelting and refining losses.

#### *Placer Gold*

The data on placer-gold production were very largely obtained from the Gold Commissioners until 1925. The value of placer gold in dollars is now obtained from returns received annually from the operators. At the old standard price, $20.67 per ounce of

fine gold, $17 was regarded as a close approximation of the average value per ounce of crude placer gold produced in British Columbia. Dividing the production reported in dollars by 17 gave the equivalent in crude ounces. The average value $17 per ounce is equivalent to a fineness of 822½. Beginning with 1932 the average value per crude ounce has been based on the same fineness but has recognized the varying price of gold. The average price per ounce of crude placer gold for the year is listed on page A 13.

### *Lode Metals, Gross and Net Contents*

The gross contents are the gold and silver contents of bullion and for ores and concentrates the total assay contents, obtained by multiplying the assay by the weight. The quantities for gold, silver, copper, lead, and zinc in Table XV and in "Notes on Metal Mines" are gross.

Calculations of the value of production are based on the total assay content for gold and on net content for the other principal metals. These are: In lead ores and concentrates and zinc concentrates, for silver 98 per cent, lead 95 per cent, and zinc 85 per cent of the total assay content; and in copper concentrates, 95 per cent of the silver and the total assay content of copper less 10 pounds per ton of concentrates. Quantities for silver, lead, zinc, and copper in Tables I to VIII, inclusive, are net.

### *Average Metal Prices*

In the interests of uniformity the Statistical Bureaux of the Provinces and the Dominion Bureau of Statistics use the same average metal prices in valuing mineral production. Up to and including the year 1939 the prices used in evaluating metal and mineral production were:—

Gold and silver: The average United States price for the year, as quoted in the Engineering and Mining Journal, converted into Canadian funds at the average exchange rate.

Copper, lead, and zinc: For lead and zinc, the average London Metal Market price for the year converted into Canadian funds at the average exchange rate; for copper, until 1932 the New York price for copper was used, thereafter the average London Metal Market price was used.

Suspension of trading on the London Metal Exchange in September, 1939, and the controls of metals during the war years necessitated changes from the procedures which had been followed.

The method of arriving at the price for gold continued unchanged, but the prices for the metals controlled were those set by the Canadian Metals Controller. In 1945 the controls were largely removed from sales but not from prices. Control of metal prices ended on June 6th, 1947. For 1945 and subsequent years the prices are those computed by the Dominion Bureau of Statistics, using information supplied by the principal Canadian refiners of silver and the base metals.

In the period 1945–47 the prices received for silver, lead, and zinc sold for use in Canada were substantially less than the prices received for these metals exported to the United States. The prices for silver in 1945 and 1946 and for copper, lead, and zinc in 1946 and 1947 are weighted averages, taking into consideration sales in Canada at the ceiling prices and sales abroad at New York prices converted into Canadian funds.

Prices are now arrived at by the methods as given in the footnotes to table of average prices on page A 13.

## FUEL

### *Coal*

In 1926 a change was made in computing coal and coke statistics. The practice in former years had been to list as coke production only the coke made in bee-hive ovens,

the coal used in making it not being listed; coke made in by-product ovens was not listed as coke, but the coal used in making this coke was credited as coal production. The result was that both the coal and the coke production figures were incomplete. Starting with the 1926 Annual Report, the standard practice of the Bureau of Statistics, Ottawa, was adopted. This consists of crediting all coal produced, including that used in making coke, as primary mine production. Coke-making is considered a manufacturing industry. As the data are of interest to the mining industry, Table X is included in the Report to show the total coke produced in the Province, together with by-products, and the values given by the producers. The pre-1926 data have now been reworked and brought into conformity with current practice. Table IXA lists the full mine output (gross) produced and its net value, and these figures are incorporated in Table I, in the total mine production for the Province. Table X gives the complete data for coke, gas, and by-products manufactured for the period 1895 to 1925, and for each year subsequent to 1925.

Up to and including the year 1947, production was recorded in long tons (2,240 pounds). Beginning in 1948, production is given in short tons (2,000 pounds). The quantity of coal produced in the preceding years has been recalculated in short tons.

The average price for coal, listed year by year (*see* p. A 13), is the total value divided by the quantity. Up to and including 1945, the quantity is the gross mine output; for 1946 and subsequent years, the quantity is the quantity sold and used. For 1946 and subsequent years, the value (Tables I, III, VIIA, IXA, IXB, and IXC) is the amount realized from sales of coal, at colliery loading points, plus the colliery valuation of coal used under companies' boilers and in making coke. For 1946 and subsequent years the quantity sold and used is shown in Table IXC. " Use " includes coal used under company stationary and locomotive boilers, and used in making coke. Washery loss and changes in stocks, year by year, are shown in the table " Collieries of British Columbia, Production and Distribution by Collieries and by Districts," page 135 of this Report.

### *Natural Gas*

Commercial production of natural gas began in 1954. The production shown in Tables I, III, VIIA, and VIIIA is the total dry and residue gas sold. The figures are compiled from the monthly disposition report and Crown royalty statement filed with the Department of Mines by the producer. The quantity is reported as thousands of cubic feet at standard conditions (14.4 pounds per square inch pressure, 60° F. temperature).

### *Petroleum*

Commercial production of petroleum began in 1956. The figures shown in Tables I, III, VIIA, and VIIIA are compiled from the monthly disposition report and Crown royalty statement filed with the Department of Mines by the producer. The quantity is reported in barrels (35 imperial gallons=1 barrel).

## AVERAGE PRICES USED IN VALUING PROVINCIAL PRODUCTION OF GOLD, SILVER, COPPER, LEAD, ZINC, AND COAL

| Year | Gold,[1] Crude, Oz. | Gold, Fine, Oz. | Silver, Fine, Oz. | Copper, Lb. | Lead, Lb. | Zinc, Lb. | Coal, Short Ton |
|---|---|---|---|---|---|---|---|
| | $ | $ | Cents | Cents | Cents | Cents | $ |
| 1901 | 17.00 | 20.67 | 56.002 N.Y. | 16.11 N.Y. | 2.577 N.Y. | ..... | 2.679 |
| 1902 | ..... | ..... | 49.55 ,, | 11.70 ,, | 3.66 ,, | ..... | ..... |
| 1903 | ..... | ..... | 50.78 ,, | 13.24 ,, | 3.81 ,, | ..... | ..... |
| 1904 | ..... | ..... | 53.36 ,, | 12.82 ,, | 3.88 ,, | ..... | ..... |
| 1905 | ..... | ..... | 51.33 ,, | 15.59 ,, | 4.24 ,, | ..... | ..... |
| 1906 | ..... | ..... | 63.45 ,, | 19.28 ,, | 4.81 ,, | ..... | ..... |
| 1907 | ..... | ..... | 62.06 ,, | 20.00 ,, | 4.80 ,, | ..... | 3.125 |
| 1908 | ..... | ..... | 50.22 ,, | 13.20 ,, | 3.78 ,, | ..... | ..... |
| 1909 | ..... | ..... | 48.93 ,, | 12.98 ,, | 3.85 ,, | ..... | ..... |
| 1910 | ..... | ..... | 50.812 ,, | 12.738 ,, | 4.00 ,, | 4.60 E. St. L. | ..... |
| 1911 | ..... | ..... | 50.64 ,, | 12.38 ,, | 3.98 ,, | 4.90 ,, | ..... |
| 1912 | ..... | ..... | 57.79 ,, | 16.341 ,, | 4.024 ,, | 5.90 ,, | ..... |
| 1913 | ..... | ..... | 56.80 ,, | 15.27 ,, | 3.93 ,, | 4.80 ,, | ..... |
| 1914 | ..... | ..... | 52.10 ,, | 13.60 ,, | 3.50 ,, | 4.40 ,, | ..... |
| 1915 | ..... | ..... | 47.20 ,, | 17.28 ,, | 4.17 ,, | 11.25 ,, | ..... |
| 1916 | ..... | ..... | 62.38 ,, | 27.202 ,, | 6.172 ,, | 10.88 ,, | ..... |
| 1917 | ..... | ..... | 77.35 ,, | 27.18 ,, | 7.91 ,, | 7.566 ,, | ..... |
| 1918 | ..... | ..... | 91.93 ,, | 24.63 ,, | 6.67 ,, | 6.94 ,, | 4.464 |
| 1919 | ..... | ..... | 105.57 ,, | 18.70 ,, | 5.19 ,, | 6.24 ,, | ..... |
| 1920 | ..... | ..... | 95.80 ,, | 17.45 ,, | 7.16 ,, | 6.52 ,, | ..... |
| 1921 | ..... | ..... | 59.52 ,, | 12.50 ,, | 4.09 ,, | 3.95 ,, | ..... |
| 1922 | ..... | ..... | 64.14 ,, | 13.38 ,, | 5.16 ,, | 4.86 ,, | ..... |
| 1923 | ..... | ..... | 61.63 ,, | 14.42 ,, | 6.54 ,, | 5.62 ,, | ..... |
| 1924 | ..... | ..... | 63.442 ,, | 13.02 ,, | 7.287 ,, | 5.39 ,, | ..... |
| 1925 | ..... | ..... | 69.065 ,, | 14.042 ,, | 7.848 Lond. | 7.892 Lond. | ..... |
| 1926 | ..... | ..... | 62.107 ,, | 13.795 ,, | 6.751 ,, | 7.409 ,, | ..... |
| 1927 | ..... | ..... | 56.37 ,, | 12.92 ,, | 5.256 ,, | 6.194 ,, | ..... |
| 1928 | ..... | ..... | 58.176 ,, | 14.570 ,, | 4.575 ,, | 5.493 ,, | ..... |
| 1929 | ..... | ..... | 52.993 ,, | 18.107 ,, | 5.050 ,, | 5.385 ,, | ..... |
| 1930 | ..... | ..... | 38.154 ,, | 12.982 ,, | 3.927 ,, | 3.599 ,, | ..... |
| 1931 | ..... | ..... | 28.700 ,, | 8.116 ,, | 2.710 ,, | 2.554 ,, | 4.018 |
| 1932 | 19.30 | 23.47 | 31.671 ,, | 6.380 Lond. | 2.113 ,, | 2.405 ,, | 3.795 |
| 1933 | 23.02 | 28.60 | 37.832 ,, | 7.454 ,, | 2.391 ,, | 3.210 ,, | ..... |
| 1934 | 28.87 | 34.50 | 47.461 ,, | 7.419 ,, | 2.436 ,, | 3.044 ,, | ..... |
| 1935 | 28.94 | 35.19 | 64.790 ,, | 7.795 ,, | 3.133 ,, | 3.099 ,, | ..... |
| 1936 | 28.81 | 35.03 | 45.127 ,, | 9.477 ,, | 3.913 ,, | 3.315 ,, | ..... |
| 1937 | 28.77 | 34.99 | 44.881 ,, | 13.078 ,, | 5.110 ,, | 4.902 ,, | ..... |
| 1938 | 28.93 | 35.18 | 43.477 ,, | 9.972 ,, | 3.344 ,, | 3.073 ,, | ..... |
| 1939 | 29.72 | 36.14 | 40.488 ,, | 10.092 ,, | 3.169 ,, | 3.069 ,, | ..... |
| *1940* | *31.68* | *38.50* | *38.249* ,, | *10.086* ,, | *3.362* ,, | *3.411* ,, | ..... |
| 1941 | 31.66 | 38.50 | 38.261 ,, | 10.086 ,, | 3.362 ,, | 3.411 ,, | ..... |
| 1942 | 31.66 | 38.50 | 41.166 ,, | 10.086 ,, | 3.362 ,, | 3.411 ,, | ..... |
| 1943 | 31.66 | 38.50 | 45.254 ,, | 11.75 ,, | 3.754 ,, | 4.000 ,, | ..... |
| 1944 | 31.66 | 38.50 | 43.000 ,, | 12.000 ,, | 4.500 ,, | 4.300 ,, | ..... |
| 1945 | 31.66 | 38.50 | 47.000 ,, | 12.550 ,, | 5.000 ,, | 6.440 ,, | ..... |
| 1946 | 30.22 | 36.75 | 83.650 ,, | 12.80 ,, | 6.750 ,, | 7.810 ,, | 4.68 |
| 1947 | 28.78 | 35.00 | 72.000 ,, | 20.39 ,, | 13.670 ,, | 11.230 ,, | 5.12 |
| 1948 | 28.78 | 35.00 | 75.000 Mont. | 22.35 U.S. | 18.040 ,, | 13.930 ,, | 6.09 |
| 1949 | 29.60 | 36.00 | 74.250 U.S. | 19.973 ,, | 15.800 U.S. | 13.247 U.S. | 6.51 |
| 1950 | 31.29 | 38.05 | 80.635 ,, | 23.428 ,, | 14.454 ,, | 15.075 ,, | 6.43 |
| 1951 | 30.30 | 36.85 | 94.55 ,, | 27.70 ,, | 18.4 ,, | 19.9 ,, | 6.46 |
| 1952 | 28.18 | 34.27 | 83.157 ,, | 31.079 ,, | 16.121 ,, | 15.874 ,, | 6.94 |
| 1953 | 28.31 | 34.42 | 83.774 ,, | 30.333 ,, | 13.265 ,, | 10.675 ,, | 6.88 |
| 1954 | 27.52 | 34.07 | 82.982 ,, | 29.112 ,, | 13.680 ,, | 10.417 ,, | 7.00 |
| 1955 | 28.39 | 34.52 | 87.851 ,, | 38.276 ,, | 14.926 ,, | 12.127 ,, | 6.74 |
| 1956 | 28.32 | 34.44 | 89.373 ,, | 39.787 ,, | 15.756 ,, | 13.278 ,, | 6.59 |
| 1957 | 27.59 | 33.55 | 87.057 ,, | 26.031 ,, | 14.051 ,, | 11.175 ,, | 6.76 |
| **1958** | **27.94** | **33.98** | **86.448** ,, | **23.419** ,, | **11.755** ,, | **10.009** ,, | **7.45** |

[1] Unrefined placer gold, average price per ounce, is taken as $17 divided by $20.67 times the price of an ounce of fine gold.

Prices for fine gold are the Canadian Mint buying prices. Prices for other metals are those of the markets indicated, converted into Canadian funds. The abbreviations are: Mont.=Montreal; N.Y.=New York; Lond.=London; E. St. L. =*East St. Louis; and U.S.=United States.*

Prior to 1925 the prices for gold and copper are true average prices, but the prices of other metals were taken at the following percentages of the year's average price for the metal: Silver, 95 per cent; lead, 90 per cent; and zinc, 85 per cent.

For coal *see* last paragraph under "Fuel," page A 12.

The bases for the prices listed are discussed in detail on pages A 11 and A 12.

## TABLE I.—TOTAL MINERAL PRODUCTION FOR ALL YEARS UP TO AND INCLUDING 1958

| | Total Quantity | Total Value | Quantity, 1958 | Value, 1958 |
|---|---|---|---|---|
| Gold—placer, crude, oz. | 5,205,946 | $96,113,030 | 5,650 | $157,871 |
| „ lode, fine, oz. | 15,330,565 | 441,792,116 | 194,354 | 6,604,149 |
| Silver, oz. | 410,144,046 | 246,148,046 | 7,040,416 | 6,086,299 |
| Copper, lb. | 2,929,310,734 | 479,655,119 | 12,658,649 | 2,964,529 |
| Lead, lb. | 12,577,660,683 | 911,051,022 | 294,573,159 | 34,627,075 |
| Zinc, lb. | 10,259,550,396 | 816,745,894 | 432,002,790 | 43,234,839 |
| Miscellaneous metals[1] | ... | 140,475,311 | ... | 10,575,795 |
| Industrial minerals[2] | ... | 88,054,493 | ... | 11,763,473 |
| Structural materials[3] | ... | 268,696,444 | ... | 19,999,576 |
| Coal[4], tons | 141,382,685 | 546,146,500 | 796,413 | 5,937,860 |
| Natural gas, M s.c.f. | 72,744,107 | 4,326,924 | 64,051,785 | 3,915,239 |
| Petroleum, crude[5], bbls. | 1,002,340 | 2,071,418 | 512,359 | 1,008,376 |
| Totals | ... | $4,041,276,317 | ... | $146,875,081 |

[1] For individual miscellaneous metals, *see* Tables III and VIIIc, pages A 15 and A 28.
[2] For individual industrial minerals, including sulphur, *see* Tables III and VIIId, pages A 15 and A 30.
[3] For individual structural materials, *see* Tables III and VIIIe, pages A 15 and A 32.
[4] Total quantity is *gross* mine output; it includes material discarded in picking and washing. The quantity shown for 1958 is that sold and used (*see also* Table IXc.)
[5] Includes 582 barrels produced for test purposes in 1955, no value assigned.

## TABLE II.—PRODUCTION FOR EACH YEAR FROM 1836 TO 1958, INCLUSIVE

| | | | |
|---|---|---|---|
| 1836–95 (incl.) | $95,355,010 | 1928 | $65,372,583 |
| 1896 | 7,507,956 | 1929 | 68,791,020 |
| 1897 | 10,455,268 | 1930 | 55,769,578 |
| 1898 | 10,906,861 | 1931 | 35,247,837 |
| 1899 | 12,429,707 | 1932 | 28,803,214 |
| 1900 | 16,344,751 | 1933 | 32,652,542 |
| 1901 | 19,671,572 | 1934 | 42,481,319 |
| 1902 | 17,486,550 | 1935 | 48,886,303 |
| 1903 | 17,495,954 | 1936 | 54,179,442 |
| 1904 | 18,977,359 | 1937 | 74,475,902 |
| 1905 | 22,600,525 | 1938 | 64,485,551 |
| 1906 | 24,997,646 | 1939 | 65,707,398 |
| 1907 | 25,928,660 | 1940 | 75,121,424 |
| 1908 | 23,950,573 | 1941 | 77,514,446 |
| 1909 | 24,443,025 | 1942 | 76,699,878 |
| 1910 | 26,377,066 | 1943 | 67,204,417 |
| 1911 | 23,499,072 | 1944 | 54,740,844 |
| 1912 | 32,440,800 | 1945 | 62,070,548 |
| 1913 | 30,296,398 | 1946 | 72,453,745 |
| 1914 | 26,388,825 | 1947 | 112,582,204 |
| 1915 | 29,447,508 | 1948 | 145,517,874 |
| 1916 | 42,290,462 | 1949 | 132,956,254 |
| 1917 | 37,010,392 | 1950 | 139,837,689 |
| 1918 | 41,782,474 | 1951 | 176,330,205 |
| 1919 | 33,296,313 | 1952 | 171,309,429 |
| 1920 | 35,543,084 | 1953 | 153,193,544 |
| 1921 | 28,066,641 | 1954 | 153,383,860 |
| 1922 | 35,162,843 | 1955 | 174,710,606 |
| 1923 | 41,304,320 | 1956 | 190,084,302 |
| 1924 | 48,704,604 | 1957 | 172,264,617 |
| 1925 | 61,492,242 | 1958 | 146,875,081 |
| 1926 | 67,188,842 | | |
| 1927 | 60,729,358 | Total | $4,041,276,317 |

NOTE.—For revisions to lead and zinc production *see* footnote 3, Table VI.

## TABLE III.—QUANTITY AND VALUE OF MINERAL PRODUCTS FOR YEARS 1949 TO 1958

| Description | 1949 | | 1950 | | 1951 | | 1952 | | 1953 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value |
| ***Principal Metals*** | | $ | | $ | | $ | | $ | | $ |
| Gold—placer, crude ..... oz. | 17,886 | 529,524 | 19,134 | 598,717 | 23,691 | 717,911 | 17,554 | 494,756 | 14,245 | 403,230 |
| ,, lode, fine ..... oz. | 288,396 | 10,382,256 | 283,983 | 10,805,553 | 261,274 | 9,627,947 | 251,393 | 8,615,238 | 253,553 | 8,727,294 |
| Silver ..... oz. | 7,636,053 | 5,669,769 | 9,507,225 | 7,666,151 | 8,215,884 | 7,768,118 | 8,796,720 | 7,315,088 | 8,376,953 | 7,017,709 |
| Copper ..... lb. | 54,856,808 | 10,956,550 | 42,212,133 | 9,889,458 | 43,249,658 | 11,980,155 | 42,005,512 | 13,054,893 | 49,021,013 | 14,869,544 |
| Lead ..... lb. | 365,378,899 | 41,929,866 | 284,024,522 | 41,052,905 | 273,456,604 | 50,316,015 | 284,949,396 | 45,936,692 | 297,634,712 | 39,481,244 |
| Zinc ..... lb. | 288,188,620 | 38,176,346 | 290,344,227 | 43,769,392 | 337,511,324 | 67,164,754 | 372,871,717 | 59,189,656 | 382,300,862 | 40,810,618 |
| Totals ..... | | 107,644,311 | | 113,782,176 | | 147,574,900 | | 134,606,323 | | 111,309,639 |
| ***Miscellaneous Metals*** | | | | | | | | | | |
| Antimony ..... lb. | 158,288 | 61,020 | 643,540 | 216,229 | 1,310,836 | 622,647 | 2,333,239 | 1,028,025 | 1,551,043 | 570,474 |
| Bismuth ..... lb. | 102,913 | 210,972 | 162,616 | 369,138 | 191,471 | 451,872 | 142,246 | 312,941 | 71,298 | 157,569 |
| Cadmium ..... lb. | 665,449 | 1,364,170 | 650,540 | 1,535,274 | 1,164,933 | 3,122,021 | 726,172 | 1,561,270 | 787,158 | 1,550,701 |
| Indium ..... oz. | 689 | 1,550 | 4,952 | 12,132 | 582 | 1,368 | 404 | 889 | 6,752 | 14,922 |
| Iron ore concentrates ..... tons | 5,472 | 27,579 | ..... | ..... | 113,535 | 790,000 | 900,481 | 5,474,924 | 991,248 | 6,763,105 |
| Platinum ..... oz. | 99 | 7,468 | 111 | 9,239 | 22 | 2,085 | 2 | 176 | ..... | ..... |
| Tin ..... lb. | 619,117 | 633,047 | 796,403 | 828,259 | 346,718 | 495,807 | 212,113 | 250,293 | 1,092,228 | 581,746 |
| Tungsten ($WO_3$) ..... lb. | ..... | ..... | 281,160 | 281,160 | ..... | ..... | 1,434,640 | 4,565,024 | 2,168,977 | 5,950,323 |
| Totals ..... | | 2,305,806 | | 3,251,431 | | 5,485,800 | | 13,193,542 | | 15,588,840 |
| ***Industrial Minerals*** | | | | | | | | | | |
| Asbestos ..... tons | ..... | ..... | ..... | ..... | ..... | ..... | 20 | 23,000 | 3,102 | 988,716 |
| Barite ..... tons | 1,314 | 13,145 | 1,440 | 17,284 | 1,248 | 16,224 | 848 | 13,408 | 3,560 | 52,845 |
| Diatomite ..... tons | 36 | 963 | 4 | 108 | 8 | 223 | 12 | 240 | ..... | ..... |
| Flux (quartz, limestone) ..... tons | 108,531 | 213,773 | 144,325 | 268,411 | 144,235 | 292,100 | 55,588 | 141,478 | 37,358 | 110,698 |
| Granules (quartz, limestone, granite) ..... tons | 5,941 | 79,661 | 7,886 | 104,590 | 5,727 | 73,767 | 1,610 | 21,026 | 4,620 | 59,321 |
| Gypsum and products ..... tons | 98,977 | 616,490 | 92,882 | 620,108 | 124,729 | 263,072 | 91,112 | 235,453 | 172,665 | 387,655 |
| Iron oxides ..... tons | 2,752 | 23,301 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Mica ..... lb. | 578,000 | 5,675 | 456,000 | 5,533 | 606,000 | 7,462 | 314,000 | 3,001 | 604,000 | 11,338 |
| Perlite ..... tons | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 1,112 | 11,120 |
| Sodium carbonate ..... tons | 47 | 517 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Sulphur ..... tons | 160,435 | 1,546,798 | 143,343 | 1,421,806 | 194,874 | 1,840,992 | 182,607 | 1,745,258 | 151,954 | 1,590,055 |
| Totals ..... | | 2,500,323 | | 2,437,840 | | 2,493,840 | | 2,182,864 | | 3,211,748 |
| ***Structural Materials*** | | | | | | | | | | |
| Brick—common ..... No. | 3,220,000 | 95,075 | 3,980,500 | 117,770 | 1,353,000 | 41,820 | 830,815 | 28,248 | 1,382,883 | 51,381 |
| ,, face, paving, sewer ..... No. | 509,560 | 24,793 | 974,380 | 52,823 | 3,127,888 | 153,575 | 2,566,540 | 121,254 | 4,307,894 | 226,459 |
| ,, firebrick, blocks ..... | ..... | 135,391 | ..... | 282,962 | ..... | 380,742 | ..... | 435,681 | ..... | 426,783 |
| Clays ..... tons | 6,500 | 22,339 | 6,706 | 32,264 | 14,786 | 60,255 | 11,483 | 51,797 | 5,226 | 31,990 |
| Structural tile, hollow blocks ..... | ..... | 145,512 | ..... | 191,016 | ..... | 171,481 | ..... | 60,273 | ..... | 123,469 |
| Drain-tile, sewer-pipe, flue-linings ..... | ..... | 265,098 | ..... | 428,418 | ..... | 410,206 | ..... | 468,110 | ..... | 627,097 |
| Pottery—glazed or unglazed ..... | ..... | 5,176 | ..... | 5,860 | ..... | 4,695 | ..... | 6,536 | ..... | 30,012 |
| Other clay products ..... | ..... | 9,676 | ..... | 11,335 | ..... | 10,393 | ..... | 11,296 | ..... | 19,267 |
| Cement ..... | ..... | 3,209,425 | ..... | 3,088,296 | ..... | 3,311,439 | ..... | 3,603,273 | ..... | 5,071,260 |
| Lime and limestone ..... tons | 179,400 | 1,295,087 | 221,454 | 1,133,776 | 241,723 | 1,251,327 | 321,710 | 1,552,772 | 338,005 | 1,357,958 |
| Rubble, riprap, crushed rock ..... tons | 1,112,272 | 916,841 | 1,164,049 | 990,257 | 972,178 | 1,145,072 | 739,504 | 982,792 | 770,415 | 1,122,516 |
| Sand and gravel ..... | ..... | 3,967,132 | ..... | 3,723,487 | ..... | 3,355,693 | ..... | 3,839,965 | ..... | 4,388,594 |
| Stone ..... tons | 2,287 | 44,345 | 26,758 | 188,675 | 4,837 | 309,350 | 122,308 | 434,964 | 2,611 | 78,252 |
| Totals ..... | | 9,955,890 | | 10,246,939 | | 10,606,048 | | 11,596,961 | | 13,555,038 |
| ***Fuel*** | | | | | | | | | | |
| Coal[1] ..... tons | 1,621,268 | 10,549,924 | 1,574,006 | 10,119,303 | 1,573,572 | 10,169,617 | 1,402,347 | 9,729,739 | 1,384,138 | 9,528,279 |
| *Provincial totals* ..... | | 132,956,254 | | 139,837,689 | | 176,330,205 | | 171,309,429 | | 153,193,544 |

[1] The quantity of coal is that sold and used.

TABLE III.—QUANTITY AND VALUE OF MINERAL PRODUCTS FOR YEARS 1949 TO 1958—*Continued*

| Description | 1954 | | 1955 | | 1956 | | 1957 | | 1958 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value |
| ***Principal Metals*** | | $ | | $ | | $ | | $ | | $ |
| Gold—placer, crude ..... oz. | 8,684 | 238,967 | 7,666 | 217,614 | 3,865 | 109,450 | 2,936 | 80,990 | 5,650 | 157,871 |
| ,, lode, fine ..... oz. | 258,388 | 8,803,279 | 242,477 | 8,370,306 | 191,743 | 6,603,628 | 222,506 | 7,465,076 | 194,354 | 6,604,149 |
| Silver ..... oz. | 9,825,153 | 8,153,108 | 7,902,145 | 6,942,113 | 8,404,600 | 7,511,443 | 8,129,971 | 7,077,708 | 7,040,416 | 6,086,299 |
| Copper ..... lb. | 50,150,087 | 14,599,693 | 44,328,031 | 16,932,549 | 43,360,575 | 17,251,872 | 29,318,494 | 7,631,897 | 12,658,649 | 2,964,529 |
| Lead ..... lb. | 332,474,456 | 45,482,505 | 302,567,640 | 45,161,245 | 283,718,073 | 44,702,619 | 281,603,346 | 39,568,086 | 294,573,159 | 34,627,075 |
| Zinc ..... lb. | 334,124,560 | 34,805,755 | 429,198,565 | 52,048,909 | 443,853,004 | 58,934,801 | 449,448,607 | 50,225,881 | 432,002,790 | 43,234,839 |
| Totals ..... | | 112,083,307 | | 129,672,736 | | 135,113,813 | | 112,049,638 | | 93,674,762 |
| ***Miscellaneous Metals*** | | | | | | | | | | |
| Antimony ..... lb. | 1,302,333 | 382,104 | 2,021,721 | 667,776 | 2,140,432 | 768,843 | 1,360,731 | 577,344 | 858,633 | 284,208 |
| Bismuth ..... lb. | 225,351 | 493,519 | 160,767 | 356,903 | 156,753 | 346,424 | 145,634 | 314,569 | 154,034 | 308,068 |
| Cadmium ..... lb. | 680,734 | 1,123,211 | 1,593,591 | 2,677,233 | 1,937,927 | 3,236,338 | 1,946,397 | 3,172,627 | 1,425,108 | 2,166,164 |
| Indium ..... oz. | 477 | 1,281 | 104,774 | 232,389 | 363,192 | 795,390 | 384,360 | 693,770 | 75,434 | 117,677 |
| Iron ore concentrates ..... tons | 535,746 | 3,733,891 | 610,930 | 3,228,756 | 369,955 | 2,190,847 | 357,342 | 2,200,637 | 630,271 | 4,193,442 |
| Mercury ..... lb. | ..... | ..... | 75 | 250 | ..... | ..... | ..... | ..... | ..... | ..... |
| Nickel ..... lb. | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 1,408,490 | 996,507 |
| Platinum ..... oz. | 4 | 408 | ..... | ..... | ..... | ..... | ..... | ..... | 4 | 260 |
| Tin ..... lb. | 587,528 | 280,437 | 391,228 | 311,613 | 756,934 | 637,792 | 709,102 | 555,936 | 795,496 | 625,260 |
| Tungsten ($WO_3$) ..... lb. | 2,206,443 | 5,851,558 | 1,914,000 | 5,460,967 | 2,264,775 | 6,351,376 | 1,921,483 | 5,240,479 | 690,976 | 1,884,209 |
| Totals ..... | | 11,866,409 | | 12,935,887 | | 14,327,010 | | 12,755,362 | | 10,575,795 |
| ***Industrial Minerals*** | | | | | | | | | | |
| Asbestos ..... tons | 8,599 | 2,920,751 | 17,187 | 4,265,971 | 20,356 | 6,620,060 | 31,714 | 9,245,800 | 30,078 | 8,203,384 |
| Barite ..... tons | 5,056 | 115,337 | 9,465 | 238,825 | 11,436 | 287,626 | 20,072 | 433,200 | 16,144 | 341,700 |
| Diatomite ..... tons | ..... | ..... | 14 | 280 | 40 | 800 | 120 | 2,400 | 27 | 540 |
| Flux (quartz, limestone) ..... tons | 39,897 | 40,804 | 111,759 | 208,198 | 176,311 | 392,429 | 137,433 | 442,204 | 90,635 | 311,630[1] |
| Granules (quartz, limestone, granite) ..... tons | 4,541 | 65,507 | 6,355 | 73,858 | 13,220 | 173,214 | 17,295 | 221,864 | 22,674 | 284,330 |
| Gypsum and products ..... tons | 175,480 | 421,734 | 149,719 | 383,934 | 72,973 | 391,919 | 66,499 | 142,751 | 70,498 | 211,494 |
| Mica ..... lb. | 284,000 | 5,326 | 505,300 | 2,861 | 200,000 | 1,100 | 180,000 | 1,200 | ..... | ..... |
| Sulphur ..... tons | 219,999 | 2,308,422 | 216,520 | 2,624,171 | 212,885 | 2,523,190 | 226,550 | 2,872,332 | 211,300 | 2,410,395 |
| Totals ..... | | 5,877,881 | | 7,798,098 | | 10,390,338 | | 13,361,751 | | 11,763,473 |
| ***Structural Materials*** | | | | | | | | | | |
| Brick—common ..... No. | 1,289,911 | 35,550 | 4,853,940 | 232,139 | 2,248,447 | 75,767 | 663,828 | 24,345 | 427,550 | 15,125 |
| ,, face, paving, sewer ..... No. | 5,651,262 | 316,676 | 3,901,866 | 248,913 | 6,913,682 | 485,176 | 4,660,231 | 345,081 | 4,871,562 | 344,133 |
| ,, firebrick, blocks ..... No. | ..... | 372,528 | ..... | 578,578 | ..... | 600,753 | ..... | 658,873 | ..... | 405,485 |
| Clays ..... tons | 6,609 | 36,425 | 8,033 | 46,757 | 7,985 | 47,101 | 3,849 | 29,495 | 4,105 | 12,579 |
| Structural tile, hollow blocks ..... tons | ..... | 122,903 | ..... | 114,460 | ..... | 129,257 | ..... | 200,216 | ..... | 122,877 |
| Drain-tile, sewer-pipe, flue-linings ..... | ..... | 753,297 | ..... | 801,019 | ..... | 696,385 | ..... | 697,611 | ..... | 639,173 |
| Pottery—glazed or unglazed ..... | ..... | 31,081 | ..... | 38,035 | ..... | 38,385 | ..... | 47,612 | ..... | 68,387 |
| Other clay products ..... | ..... | 32,697 | ..... | 55,514 | ..... | 69,659 | ..... | 38,868 | ..... | 32,416 |
| Cement ..... | ..... | 4,935,298 | ..... | 5,474,875 | ..... | 6,339,071 | ..... | 7,078,108 | ..... | 6,755,619 |
| Lime and limestone ..... tons | 317,976 | 1,555,002 | 318,152 | 1,711,348 | 396,012 | 1,220,792 | 334,303 | 1,494,578 | 269,747 | 997,819 |
| Rubble, riprap, crushed rock ..... tons | 920,707 | 1,253,856 | 890,613 | 962,272 | 2,028,143 | 2,210,315 | 2,364,301 | 4,272,768 | 1,866,950 | 2,098,952 |
| Sand and gravel ..... tons | ..... | 4,850,469 | ..... | 4,886,890 | ..... | 8,535,348 | ..... | 10,503,274 | ..... | 8,442,676 |
| Stone ..... tons | 3,055 | 99,392 | 26,079 | 148,454 | 35,266 | 139,150 | 2,403 | 236,110 | 2,141 | 64,335 |
| Totals ..... | | 14,395,174 | | 15,299,254 | | 20,587,159 | | 25,626,939 | | 19,999,576 |
| ***Fuels*** | | | | | | | | | | |
| Coal[2] ..... tons | 1,308,284 | 9,154,544 | 1,332,874 | 8,986,501 | 1,417,209 | 9,346,518 | 1,085,657 | 7,340,339 | 796,413 | 5,937,860 |
| Natural gas ..... M s.c.f. | 60,883 | 6,545 | 168,651 | 18,130 | 187,846 | 20,143 | 8,274,942 | 366,867 | 64,051,785 | 3,915,239 |
| Petroleum, crude[3] ..... bbls. | ..... | ..... | ..... | ..... | 148,454 | 299,321 | 340,945 | 763,721 | 512,359 | 1,008,376 |
| Totals ..... | | 9,161,089 | | 9,004,631 | | 9,665,982 | | 8,470,927 | | 10,861,475 |
| *Provincial totals* ..... | | 153,383,860 | | 174,710,606 | | 190,084,302 | | 172,264,617 | | 146,875,081 |

[1] Includes 32 tons of fluorspar mined in 1958.

[2] The quantity of coal is that sold and used.

[3] For test purposes, 582 barrels were produced in 1955, no commercial value assigned.

TABLE IV.—MINERAL PRODUCTION VALUE, 1895–1958

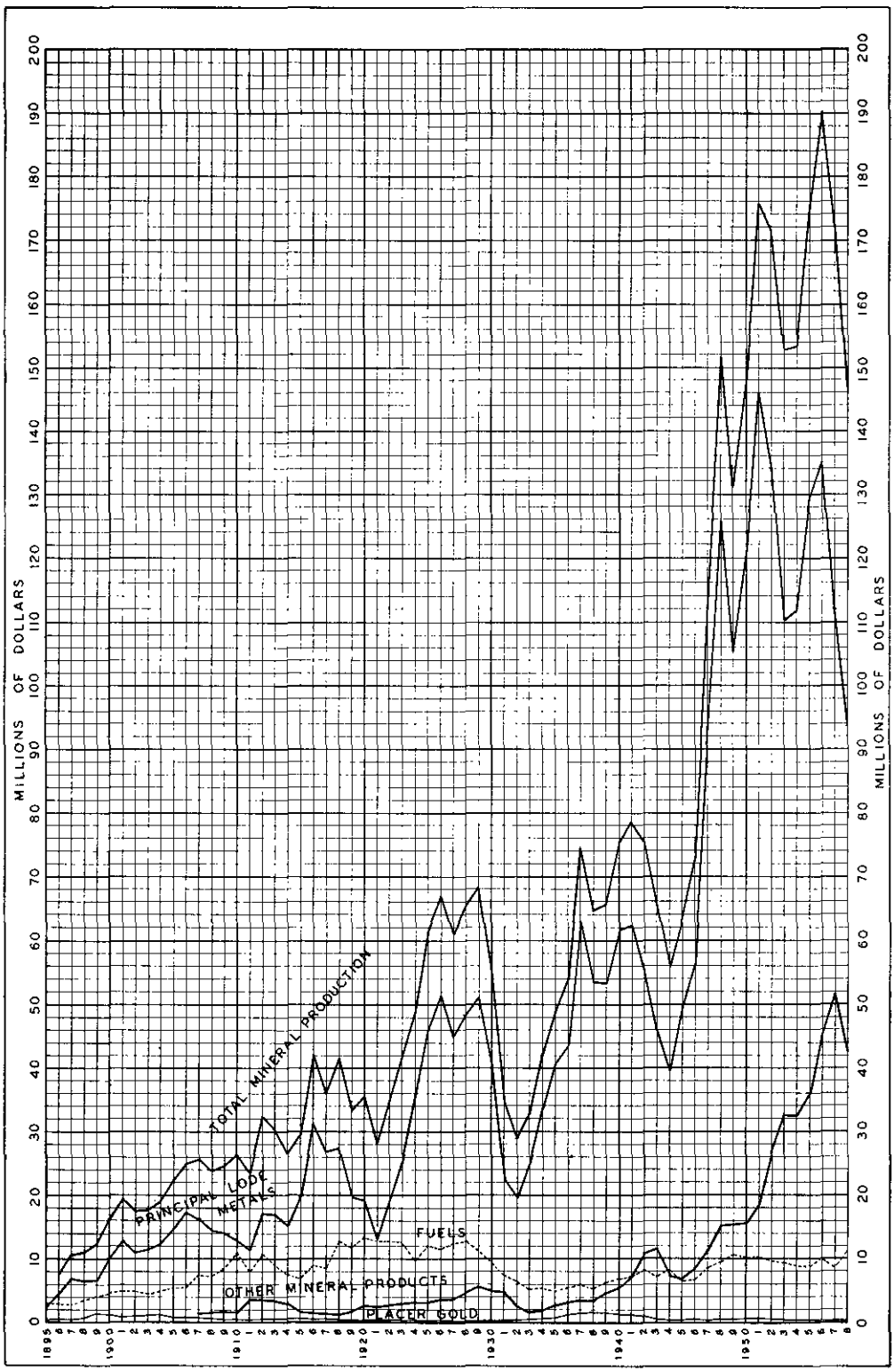
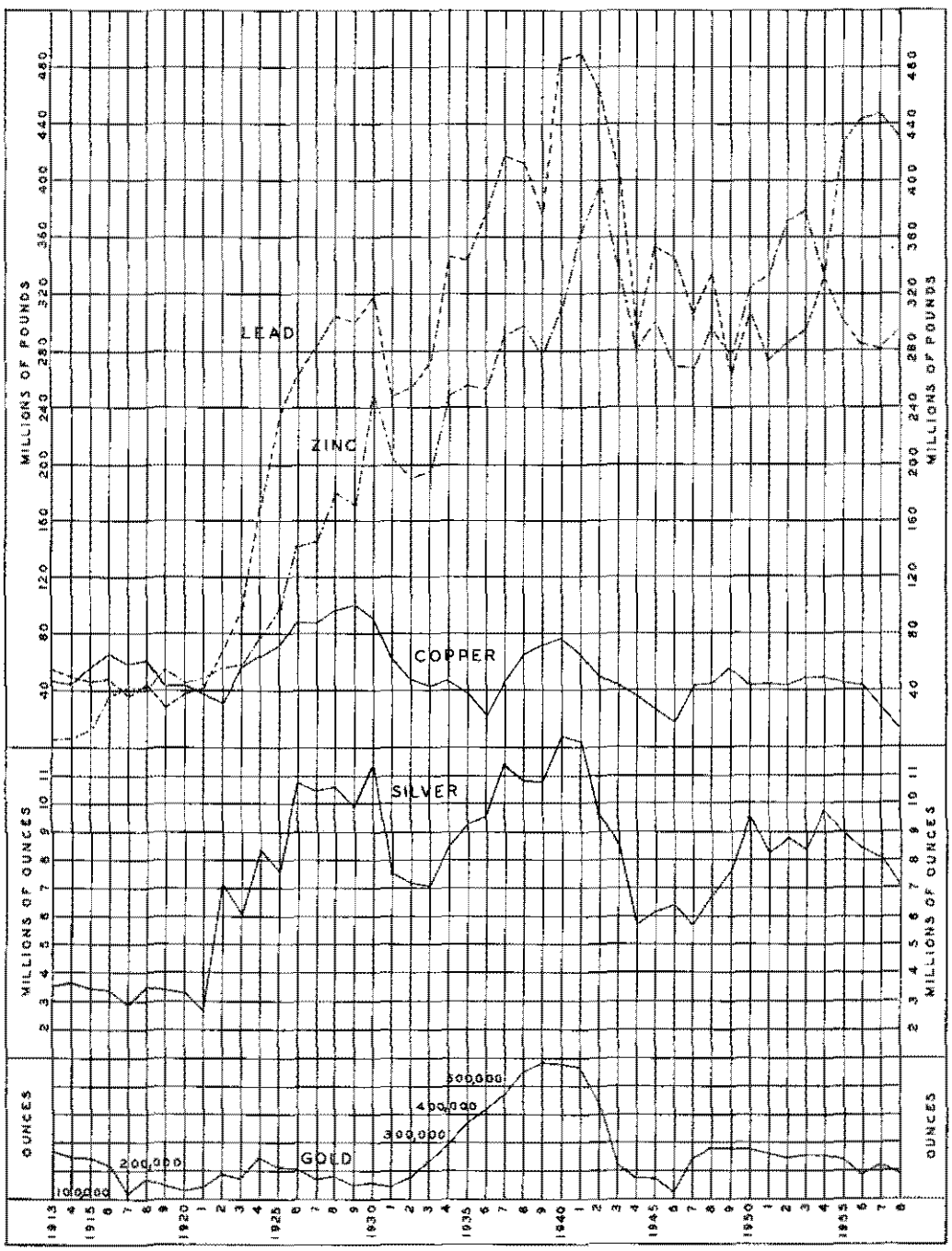


TABLE V.—PRINCIPAL LODE-METALS PRODUCTION, 1913–58



## TABLE VI.—PRODUCTION OF PRINCIPAL METALS, 1858–1958

| Year | Placer Gold | | Gold | | Silver | | Copper | | Lead[3] | | Zinc[3] [4] | | Total Value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Quantity[1] | Value | Quantity[2] | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | |
| | Oz. | $ | Oz. | $ | Oz. | $ | Lb. | $ | Lb. | $ | Lb. | $ | $ |
| 1858–86, incl. | 3,105,775 | 52,798,364 | | | | | | | | | | | 52,798,364 |
| 1887 | 40,810 | 693,709 | | | 17,690 | 17,331 | | | 204,800 | 9,216 | | | 720,256 |
| 1888 | 36,280 | 616,731 | | | 79,780 | 75,000 | | | 674,500 | 29,813 | | | 721,544 |
| 1889 | 34,640 | 588,923 | | | 53,192 | 47,873 | | | 165,100 | 6,498 | | | 643,294 |
| 1890 | 29,080 | 494,436 | | | 70,427 | 73,948 | | | | | | | 568,384 |
| 1891 | 25,280 | 429,811 | | | 4,500 | 4,000 | | | | | | | 433,811 |
| 1892 | 23,500 | 399,526 | | | 77,160 | 66,935 | | | 808,420 | 33,064 | | | 499,525 |
| 1893 | 20,950 | 356,131 | 1,170 | 23,404 | 227,000 | 195,000 | | | 2,135,023 | 78,996 | | | 653,531 |
| 1894 | 23,850 | 405,516 | 6,252 | 125,014 | 746,379 | 470,219 | 324,680 | 16,234 | 5,662,523 | 169,875 | | | 1,186,858 |
| 1895 | 28,330 | 481,683 | 39,270 | 785,400 | 1,496,522 | 977,229 | 952,840 | 47,642 | 16,475,464 | 532,255 | | | 2,824,209 |
| 1896 | 32,000 | 544,026 | 62,259 | 1,244,180 | 3,135,343 | 2,100,689 | 3,818,556 | 190,926 | 24,199,977 | 721,384 | | | 4,801,205 |
| 1897 | 30,210 | 513,520 | 106,141 | 2,122,820 | 5,472,971 | 3,272,836 | 5,325,180 | 266,258 | 38,841,135 | 1,390,517 | | | 7,565,951 |
| 1898 | 37,840 | 643,346 | 110,061 | 2,201,217 | 4,292,401 | 2,375,841 | 7,271,678 | 874,781 | 31,693,559 | 1,077,581 | | | 7,172,766 |
| 1899 | 79,110 | 1,344,900 | 138,315 | 2,857,573 | 2,939,413 | 1,663,708 | 7,722,591 | 1,351,453 | 21,862,436 | 878,870 | | | 8,096,504 |
| 1900 | 75,220 | 1,278,724 | 167,153 | 3,453,381 | 3,958,175 | 2,309,200 | 9,997,080 | 1,615,289 | 63,358,621 | 2,691,887 | | | 11,348,481 |
| 1901 | 57,060 | 970,100 | 210,384 | 4,348,605 | 4,396,447 | 2,462,008 | 27,603,746 | 4,446,963 | 51,582,906 | 2,010,260 | | | 14,237,936 |
| 1902 | 63,130 | 1,073,140 | 236,491 | 4,888,269 | 3,917,917 | 1,941,328 | 29,636,057 | 3,446,673 | 22,536,381 | 824,832 | | | 12,174,242 |
| 1903 | 62,380 | 1,060,420 | 232,831 | 4,812,616 | 2,996,204 | 1,521,472 | 34,359,921 | 4,547,535 | 18,089,283 | 689,744 | | | 12,631,787 |
| 1904 | 65,610 | 1,115,300 | 222,042 | 4,589,608 | 3,222,481 | 1,719,516 | 35,710,128 | 4,578,037 | 36,646,244 | 1,421,874 | | | 13,424,335 |
| 1905 | 57,020 | 969,300 | 238,660 | 4,933,102 | 3,439,417 | 1,971,818 | 37,692,251 | 5,876,222 | 56,580,703 | 2,399,022 | | 139,200 | 16,288,664 |
| 1906 | 55,790 | 948,400 | 224,027 | 4,630,639 | 2,990,262 | 1,897,320 | 42,990,488 | 8,288,565 | 52,408,217 | 2,667,578 | | 17,100 | 18,449,602 |
| 1907 | 48,710 | 828,000 | 196,179 | 4,055,020 | 2,745,448 | 1,703,825 | 40,832,720 | 8,166,544 | 47,738,703 | 2,291,458 | | 46,100 | 17,090,947 |
| 1908 | 38,060 | 647,000 | 255,582 | 5,282,880 | 2,631,389 | 1,321,483 | 47,274,614 | 6,240,249 | 43,195,733 | 1,632,799 | | 99,296 | 15,223,707 |
| 1909 | 28,060 | 477,000 | 238,224 | 4,924,090 | 2,532,742 | 1,239,270 | 45,597,245 | 5,918,522 | 44,396,346 | 1,709,259 | 8,500,000 | 400,000 | 14,668,141 |
| 1910 | 31,760 | 540,000 | 267,701 | 5,533,380 | 2,450,241 | 1,245,016 | 38,243,934 | 4,871,512 | 34,658,746 | 1,386,350 | 4,184,192 | 192,473 | 13,768,731 |
| 1911 | 25,060 | 426,000 | 228,617 | 4,725,513 | 1,892,364 | 958,293 | 36,927,656 | 4,571,644 | 26,872,397 | 1,069,521 | 2,634,544 | 129,092 | 11,880,063 |
| 1912 | 32,680 | 555,500 | 257,496 | 5,322,442 | 3,132,108 | 1,810,045 | 51,456,537 | 8,408,513 | 44,871,454 | 1,805,627 | 5,358,280 | 316,139 | 18,218,266 |
| 1913 | 30,000 | 510,000 | 272,254 | 5,627,490 | 3,465,856 | 1,968,606 | 46,460,305 | 7,094,489 | 55,364,677 | 2,175,832 | 6,758,768 | 324,421 | 17,700,838 |
| 1914 | 33,240 | 565,000 | 247,170 | 5,109,004 | 3,602,180 | 1,876,736 | 45,009,699 | 6,121,319 | 50,625,048 | 1,771,877 | 7,866,467 | 346,125 | 15,790,061 |
| 1915 | 45,290 | 770,000 | 250,021 | 5,167,934 | 3,366,506 | 1,588,991 | 56,918,405 | 9,835,500 | 46,503,590 | 1,939,200 | 12,982,440 | 1,460,524 | 20,762,149 |
| 1916 | 34,150 | 580,500 | 221,932 | 4,587,334 | 3,301,923 | 2,059,739 | 65,379,364 | 17,784,494 | 48,727,516 | 3,007,462 | 37,168,980 | 4,043,985 | 32,063,514 |
| 1917 | 29,180 | 496,000 | 114,523 | 2,367,190 | 2,929,216 | 2,265,749 | 59,007,565 | 16,038,256 | 37,307,465 | 2,951,020 | 41,848,513 | 3,166,259 | 27,284,474 |
| 1918 | 18,820 | 320,000 | 164,674 | 3,403,812 | 3,498,172 | 3,215,870 | 61,483,754 | 15,143,449 | 43,899,661 | 2,928,107 | 41,772,916 | 2,899,040 | 27,910,278 |
| 1919 | 16,850 | 286,500 | 152,426 | 3,150,645 | 3,403,119 | 3,592,673 | 42,459,339 | 7,939,896 | 29,475,968 | 1,526,855 | 56,737,651 | 3,540,429 | 20,036,998 |
| 1920 | 13,040 | 221,600 | 120,048 | 2,481,392 | 3,377,849 | 3,235,980 | 44,887,676 | 7,832,899 | 39,331,218 | 2,816,115 | 47,208,268 | 3,077,979 | 19,665,965 |
| 1921 | 13,720 | 233,200 | 135,663 | 2,804,154 | 2,673,389 | 1,591,201 | 39,036,993 | 4,879,624 | 41,402,288 | 1,693,354 | 49,419,372 | 1,952,065 | 13,153,598 |
| 1922 | 21,690 | 368,800 | 197,856 | 4,089,684 | 7,101,311 | 4,554,781 | 32,359,896 | 4,329,754 | 67,447,985 | 3,480,316 | 57,146,548 | 2,777,322 | 19,600,657 |
| 1923 | 24,710 | 420,000 | 179,245 | 3,704,994 | 6,032,986 | 3,718,129 | 57,720,290 | 8,323,266 | 96,663,152 | 6,321,770 | 58,343,462 | 3,278,903 | 25,767,062 |

## TABLE VI.—PRODUCTION OF PRINCIPAL METALS, 1858–1958—*Continued*

| Year | Placer Gold | | Gold | | Silver | | Copper | | Lead[3] | | Zinc[3 4] | | Total Value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Quantity[1] | Value | Quantity[2] | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | |
| | Oz. | $ | Oz. | $ | Oz. | $ | Lb. | $ | Lb. | $ | Lb. | $ | $ |
| 1924 | 24,750 | 420,750 | 247,716 | 5,120,535 | 8,341,768 | 5,292,184 | 64,845,393 | 8,442,870 | 170,384,481 | 12,415,917 | 79,130,970 | 4,266,741 | 35,958,997 |
| 1925 | 16,476 | 280,092 | 209,719 | 4,335,269 | 7,654,844 | 5,286,818 | 72,306,432 | 10,153,269 | 237,899,199 | 18,670,329 | 98,257,099 | 7,754,450 | 46,480,227 |
| 1926 | 20,912 | 355,503 | 201,427 | 4,163,859 | 10,748,556 | 6,675,606 | 89,339,768 | 12,324,421 | 263,023,937 | 17,757,535 | 142,876,947 | 10,586,610 | 51,863,534 |
| 1927 | 9,191 | 156,247 | 178,001 | 3,679,601 | 10,470,185 | 5,902,043 | 89,202,871 | 11,525,011 | 282,996,423 | 14,874,292 | 145,225,443 | 8,996,135 | 45,133,329 |
| 1928 | 8,284 | 143,208 | 188,087 | 3,888,097 | 10,627,167 | 6,182,461 | 97,908,316 | 14,265,242 | 305,140,792 | 13,961,412 | 181,763,147 | 9,984,613 | 48,425,033 |
| 1929 | 6,983 | 118,711 | 145,387 | 3,005,411 | 9,960,172 | 5,278,194 | 102,793,669 | 18,612,850 | 307,999,153 | 15,555,189 | 172,096,841 | 9,268,792 | 51,839,147 |
| 1930 | 8,955 | 152,235 | 160,853 | 3,325,126 | 11,328,263 | 4,322,185 | 92,362,240 | 11,990,466 | 321,803,725 | 12,638,198 | 250,479,310 | 9,017,005 | 41,445,215 |
| 1931 | 17,176 | 291,992 | 146,133 | 3,020,837 | 7,550,331 | 2,254,979 | 64,134,746 | 5,365,690 | 261,902,236 | 7,097,812 | 202,071,702 | 5,160,911 | 23,192,221 |
| 1932 | 20,400 | 395,542 | 181,651 | 4,263,349 | 7,150,655 | 2,264,729 | 50,608,036 | 3,228,892 | 252,007,574 | 5,326,432 | 192,120,091 | 4,621,641 | 20,100,585 |
| 1933 | 23,928 | 562,787 | 223,589 | 6,394,645 | 7,021,754 | 2,656,526 | 43,149,460 | 3,216,701 | 271,689,217 | 6,497,719 | 195,963,751 | 6,291,416 | 25,619,794 |
| 1934 | 25,181 | 714,431 | 297,216 | 10,253,952 | 8,613,977 | 4,088,280 | 49,651,733 | 3,683,662 | 347,366,967 | 8,461,859 | 249,152,403 | 7,584,199 | 34,786,383 |
| 1935 | 30,929 | 895,058 | 365,343 | 12,856,419 | 9,269,944 | 6,005,996 | 39,428,208 | 3,073,428 | 344,268,444 | 10,785,930 | 256,239,446 | 7,940,860 | 41,557,691 |
| 1936 | 43,389 | 1,249,940 | 404,578 | 14,172,367 | 9,547,124 | 4,308,330 | 21,671,711 | 2,053,828 | 377,971,618 | 14,790,029 | 254,581,393 | 8,439,373 | 45,013,867 |
| 1937 | 54,153 | 1,558,245 | 460,781 | 16,122,727 | 11,308,685 | 5,075,451 | 46,057,584 | 6,023,411 | 419,118,371 | 21,416,949 | 291,192,278 | 14,274,245 | 64,471,028 |
| 1938 | 57,759 | 1,671,015 | 557,522 | 19,613,624 | 10,861,578 | 4,722,288 | 65,769,906 | 6,558,575 | 412,979,182 | 13,810,024 | 298,497,295 | 9,172,822 | 55,548,348 |
| 1939 | 49,746 | 1,478,492 | 587,336 | 21,226,957 | 10,821,393 | 4,381,365 | 73,254,679 | 7,392,862 | 378,743,763 | 12,002,390 | 278,409,102 | 8,544,375 | 55,026,441 |
| 1940 | 39,067 | 1,236,928 | 583,416 | 22,461,516 | 12,327,944 | 4,715,315 | 77,980,223 | 7,865,085 | 466,849,112 | 15,695,467 | 312,020,671 | 10,643,025 | 62,617,336 |
| 1941 | 43,775 | 1,385,962 | 571,026 | 21,984,501 | 12,175,700 | 4,658,545 | 66,435,583 | 6,700,693 | 456,840,454 | 15,358,976 | 367,869,579 | 12,548,031 | 62,636,708 |
| 1942 | 32,904 | 1,041,772 | 444,518 | 17,113,943 | 9,677,881 | 4,080,775 | 50,097,716 | 5,052,856 | 507,199,704 | 17,052,054 | 387,236,469 | 13,208,636 | 57,550,036 |
| 1943 | 14,600 | 462,270 | 224,403 | 8,639,516 | 8,526,310 | 3,858,496 | 42,307,510 | 4,971,132 | 439,155,635 | 16,485,902 | 336,150,455 | 13,446,018 | 47,863,334 |
| 1944 | 11,433 | 361,977 | 186,632 | 7,185,332 | 5,705,334 | 2,453,293 | 36,300,589 | 4,356,070 | 292,922,888 | 13,181,530 | 278,063,373 | 11,956,725 | 39,494,927 |
| 1945 | 12,589 | 398,591 | 175,373 | 6,751,860 | 6,157,307 | 2,893,934 | 25,852,366 | 3,244,472 | 336,976,468 | 16,848,823 | 294,791,635 | 18,984,581 | 49,122,261 |
| 1946 | 15,729 | 475,361 | 117,612 | 4,322,241 | 6,365,761 | 5,324,959 | 17,500,538 | 2,240,070 | 345,862,680 | 23,345,731 | 274,269,956 | 21,420,484 | 57,128,846 |
| 1947 | 6,969 | 200,585 | 243,282 | 8,514,870 | 5,707,691 | 4,109,538 | 41,783,921 | 8,519,741 | 313,733,089 | 42,887,313 | 253,006,168 | 28,412,593 | 92,644,640 |
| 1948 | 20,332 | 585,200 | 286,230 | 10,018,050 | 6,718,122 | 5,038,592 | 43,025,388 | 9,616,174 | 320,037,525 | 57,734,770 | 270,310,195 | 37,654,210 | 120,646,996 |
| 1949 | 17,886 | 529,524 | 288,396 | 10,382,256 | 7,636,053 | 5,669,769 | 54,856,808 | 10,956,550 | 265,378,899 | 41,929,866 | 288,188,620 | 38,176,346 | 107,644,311 |
| 1950 | 19,134 | 598,717 | 283,983 | 10,805,553 | 9,507,225 | 7,666,151 | 42,212,133 | 9,889,458 | 284,024,522 | 41,052,905 | 290,344,227 | 43,769,392 | 113,782,176 |
| 1951 | 23,691 | 717,911 | 261,274 | 9,627,947 | 8,215,884 | 7,768,118 | 43,249,658 | 11,980,155 | 273,456,604 | 50,316,015 | 337,511,324 | 67,164,754 | 147,574,900 |
| 1952 | 17,554 | 494,756 | 251,393 | 8,615,238 | 8,796,720 | 7,315,088 | 42,005,512 | 13,054,893 | 284,949,396 | 45,936,692 | 372,871,717 | 59,189,656 | 134,606,323 |
| 1953 | 14,245 | 403,230 | 253,553 | 8,727,294 | 8,376,953 | 7,017,709 | 49,021,013 | 14,869,544 | 297,634,712 | 39,481,244 | 382,300,862 | 40,810,618 | 111,309,639 |
| 1954 | 8,684 | 238,967 | 258,388 | 8,803,279 | 9,825,153 | 8,153,108 | 50,150,087 | 14,599,693 | 332,474,456 | 45,482,505 | 334,124,560 | 34,805,755 | 112,083,307 |
| 1955 | 7,666 | 217,614 | 242,477 | 8,370,306 | 7,902,145 | 6,942,113 | 44,238,031 | 16,932,549 | 302,567,640 | 45,161,245 | 429,198,565 | 52,048,909 | 129,672,736 |
| 1956 | 3,865 | 109,450 | 191,743 | 6,603,628 | 8,404,600 | 7,511,443 | 43,360,575 | 17,251,872 | 283,718,073 | 44,702,619 | 443,853,004 | 58,934,801 | 135,113,813 |
| 1957 | 2,936 | 80,990 | 222,506 | 7,465,076 | 8,129,971 | 7,077,708 | 29,318,494 | 7,631,897 | 281,603,346 | 39,568,086 | 449,448,607 | 50,225,881 | 112,049,638 |
| 1958 | 5,650 | 157,871 | 194,354 | 6,604,149 | 7,040,416 | 6,086,299 | 12,658,649 | 2,964,529 | 294,573,159 | 34,627,075 | 432,002,790 | 43,234,839 | 93,674,762 |
| Totals | 5,205,946 | 96,113,030 | 15,330,565 | 441,792,116 | 410,144,046 | 246,148,046 | 2,929,310,734 | 479,655,119 | 12,577,660,683 | 911,051,022 | 10,259,550,396 | 816,745,894 | 2,991,505,227 |

[1] Ounces of crude gold.

[2] Ounces of fine gold.

[3] Revisions have been made in 1958 to some yearly totals for lead and zinc to bring them into agreement with the best records of recoveries of lead and zinc from slags treated at the Trail smelter.

[4] For 1905–08, inclusive, records show shipments of a combined total of 18,847 tons of zinc ore and zinc concentrates of unstated zinc content.

## TABLE VIIa.—PRODUCTION, 1957 AND 1958, BY MINING DIVISIONS—SUMMARY

| Division | Year | Placer Gold | | Principal Lode Metals | Miscellaneous Metals | Industrial Minerals | Structural Materials | Fuels | | | | | | Division Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Coal | | Petroleum | | Natural Gas | | |
| | | Quantity[1] | Value | | | | | Quantity | Value | Quantity | Value | Quantity | Value | |
| | | Oz. | $ | $ | $ | $ | $ | Tons | $ | Bbls. | $ | M S.C.F. | $ | $ |
| Alberni | 1957 | ..... | ..... | 410 | ..... | ..... | 171,477 | ..... | ..... | ..... | ..... | ..... | ..... | 171,887 |
| | **1958** | **3** | **84** | **1,144** | ..... | ..... | **54,594** | ..... | ..... | ..... | ..... | ..... | ..... | **55,822** |
| Atlin | 1957 | 1,300 | 35,861 | 4,832,486 | 104,160 | ..... | 23,034 | ..... | ..... | ..... | ..... | ..... | ..... | 4,995,541 |
| | **1958** | **985** | **26,994** | ..... | ..... | ..... | **26,102** | ..... | ..... | ..... | ..... | ..... | ..... | **53,066** |
| Cariboo | 1957 | 1,360 | 37,516 | 1,304,316 | ..... | 3,600 | 396,333 | ..... | ..... | ..... | ..... | ..... | ..... | 1,741,765 |
| | **1958** | **4,189** | **117,048** | **950,953** | ..... | **540** | **536,095** | ..... | ..... | ..... | ..... | ..... | ..... | **1,604,636** |
| Clinton | 1957 | 21 | 579 | ..... | ..... | ..... | 14,500 | ..... | ..... | ..... | ..... | ..... | ..... | 15,079 |
| | **1958** | **9** | **251** | ..... | ..... | ..... | **15,483** | ..... | ..... | ..... | ..... | ..... | ..... | **15,734** |
| Fort Steele | 1957 | 2 | 55 | 48,577,717 | 555,936 | 842,580 | 594,873 | 895,118 | 5,310,835 | ..... | ..... | ..... | ..... | 55,881,996 |
| | **1958** | **20** | **559** | **48,889,971** | **625,450** | **663,861** | **153,770** | **633,557** | **4,241,619** | ..... | ..... | ..... | ..... | **54,575,230** |
| Golden | 1957 | ..... | ..... | 2,478,986 | 19,930 | 575,951 | 153,515 | ..... | ..... | ..... | ..... | ..... | ..... | 3,228,382 |
| | **1958** | ..... | ..... | **2,431,487** | **82,814** | **553,194** | **133,262** | ..... | ..... | ..... | ..... | ..... | ..... | **3,200,757** |
| Greenwood | 1957 | ..... | ..... | 1,115,868 | 5,307 | 23,126 | 12,100 | ..... | ..... | ..... | ..... | ..... | ..... | 1,156,401 |
| | **1958** | **5** | **140** | ***936,360*** | **6,553** | ..... | ***12,400*** | ..... | ..... | ..... | ..... | ..... | ..... | **955,453** |
| Kamloops | 1957 | 7 | 193 | ..... | ..... | ..... | 1,636,953 | ..... | ..... | ..... | ..... | ..... | ..... | 1,637,146 |
| | **1958** | **7** | **195** | ..... | ..... | ..... | **1,205,153** | ..... | ..... | ..... | ..... | ..... | ..... | **1,205,348** |
| Liard | 1957 | 6 | 165 | ..... | ..... | 9,245,800 | 241,980 | 2,758 | 28,421 | 340,945 | 763,721 | 8,274,942 | 366,867 | 10,646,954 |
| | **1958** | ..... | ..... | ..... | ..... | **8,203,384** | **206,174** | **3,194** | **28,738** | **512,359** | **1,008,376** | **64,051,785** | **3,915,239** | **13,361,911** |
| Lillooet | 1957 | 58 | 1,600 | 4,900,877 | ..... | ..... | 59,920 | ..... | ..... | ..... | ..... | ..... | ..... | 4,962,397 |
| | **1958** | **72** | **2,012** | **5,102,133** | ..... | ..... | **155,898** | ..... | ..... | ..... | ..... | ..... | ..... | **5,260,043** |
| Nanaimo | 1957 | ..... | ..... | ..... | 2,200,637 | 20,337 | 1,786,533 | 164,013 | 1,849,306 | ..... | ..... | ..... | ..... | 5,856,813 |
| | **1958**[2] | ..... | ..... | **416,810** | **4,193,442** | **23,806** | **995,759** | **154,296** | **1,615,490** | ..... | ..... | ..... | ..... | **7,245,307** |
| Nelson | 1957 | 65 | 1,793 | 12,455,726 | 6,015,573 | ..... | 95,760 | ..... | ..... | ..... | ..... | ..... | ..... | 18,568,852 |
| | **1958** | **2** | **56** | **11,598,949** | **2,609,068** | ..... | ***83,535*** | ..... | ..... | ..... | ..... | ..... | ..... | **14,291,608** |
| New Westminster | 1957 | 52 | 1,434 | ..... | ..... | 129,419 | 6,933,381 | ..... | ..... | ..... | ..... | ..... | ..... | 7,064,234 |
| | **1958** | **14** | **391** | **160,916** | **996,507** | **143,945** | **4,175,832** | ..... | ..... | ..... | ..... | ..... | ..... | **5,477,591** |
| Nicola | 1957 | ..... | ..... | ..... | ..... | ..... | 20,523 | 1,081 | 11,615 | ..... | ..... | ..... | ..... | 32,138 |
| | **1958** | **4** | **112** | ..... | ..... | ..... | **62,670** | **543** | **5,919** | ..... | ..... | ..... | ..... | **68,589** |
| Omineca | 1957 | 37 | 1,021 | 1,543,272 | 36,929 | ..... | 648,068 | 4,991 | 47,414 | ..... | ..... | ..... | ..... | 2,276,704 |
| | **1958** | **71** | **1,984** | **327,290** | **17,839** | ..... | **587,292** | **4,677** | **44,972** | ..... | ..... | ..... | ..... | **929,377** |
| Osoyoos | 1957 | ..... | ..... | 79,573 | ..... | 479,866 | 11,370 | ..... | ..... | ..... | ..... | ..... | ..... | 570,809 |
| | **1958** | ..... | ..... | **301,666** | ..... | **428,209** | **603** | ..... | ..... | ..... | ..... | ..... | ..... | **730,478** |
| Revelstoke | 1957 | 1 | 28 | 1,351,326 | 33,555 | ..... | 54,185 | ..... | ..... | ..... | ..... | ..... | ..... | 1,439,094 |
| | **1958** | ..... | ..... | **546,082** | ..... | ..... | **78,757** | ..... | ..... | ..... | ..... | ..... | ..... | **624,839** |
| Similkameen | 1957 | 27 | 745 | 1,932,983 | ..... | ..... | 118,250 | 17,696 | 92,748 | ..... | ..... | ..... | ..... | 2,144,726 |
| | **1958** | **30** | **838** | **16,845** | **260** | ..... | **82,950** | **146** | **1,122** | ..... | ..... | ..... | ..... | **102,015** |
| Skeena | 1957 | ..... | ..... | 1,669,039 | 4,742 | ..... | 1,390,868 | ..... | ..... | ..... | ..... | ..... | ..... | 3,064,649 |
| | **1958** | ..... | ..... | **1,311,276** | ..... | ..... | **278,797** | ..... | ..... | ..... | ..... | ..... | ..... | **1,590,073** |
| Slocan | 1957 | ..... | ..... | 9,997,915 | 219,198 | ..... | 58,574 | ..... | ..... | ..... | ..... | ..... | ..... | 10,275,687 |
| | **1958** | **2** | **56** | **8,055,865** | **183,395** | ..... | **60,967** | ..... | ..... | ..... | ..... | ..... | ..... | **8,300,283** |
| Trail Creek | 1957 | ..... | ..... | 97,745 | ..... | ..... | 132,808 | ..... | ..... | ..... | ..... | ..... | ..... | 230,553 |
| | **1958** | ..... | ..... | **22,662** | ..... | ..... | **127,461** | ..... | ..... | ..... | ..... | ..... | ..... | **150,123** |
| Vancouver | 1957 | ..... | ..... | ***6,386,323*** | 48,051 | 353,352 | 2,782,322 | ..... | ..... | ..... | ..... | ..... | ..... | 9,570,048 |
| | **1958** | ..... | ..... | **1,355,525** | **19,783** | **75,501** | **4,614,786** | ..... | ..... | ..... | ..... | ..... | ..... | **6,065,595** |
| Vernon | 1957 | ..... | ..... | ..... | ..... | ..... | 192,406 | ..... | ..... | ..... | ..... | ..... | ..... | 192,406 |
| | **1958** | **257** | **7,181** | ..... | ..... | ..... | **224,249** | ..... | ..... | ..... | ..... | ..... | ..... | **231,430** |
| Victoria | 1957 | ..... | ..... | 252,784 | ..... | ..... | 8,097,206 | ..... | ..... | ..... | ..... | ..... | ..... | 8,349,990 |
| | **1958** | ..... | ..... | **1,023,801** | ..... | ..... | **6,176,987** | ..... | ..... | ..... | ..... | ..... | ..... | **7,200,788** |
| Not assigned | 1957 | ..... | ..... | 12,991,302 | 3,511,344 | 1,687,720 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 18,190,366 |
| | **1958** | ..... | ..... | **10,067,156** | **1,840,684** | **1,671,033** | ..... | ..... | ..... | ..... | ..... | ..... | ..... | **13,578,873** |
| Totals | 1957 | 2,936 | 80,990 | 111,968,648 | 12,755,362 | 13,361,751 | 25,626,939 | 1,085,657 | 7,340,339 | 340,945 | 763,721 | 8,274,942 | 366,867 | 172,264,617 |
| | **1958** | **5,650** | **157,871** | **93,516,891** | **10,575,795** | **11,763,473** | **19,999,576** | **796,413** | **5,937,860** | **512,359** | **1,008,376** | **64,051,785** | **3,915,239** | **146,875,081** |

[1] Crude gold.

[2] Nanaimo 1958 figures for gold, silver, copper, and total value include 1957 production as follows: Gold, 261 oz.; silver, 9,011 oz.; copper, 640,555 lb.; total value, $141,133.

## TABLE VIIB.—PRODUCTION, 1957 AND 1958, BY MINING DIVISIONS—PRINCIPAL LODE METALS

| Division | Year | Lode Gold | | Silver | | Copper | | Lead | | Zinc | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value |
| | | Oz. | $ | Oz. | $ | Lb. | $ | Lb. | $ | Lb. | $ |
| Alberni | 1957 | 12 | 403 | 8 | 7 | | | | | | |
| | **1958** | **33** | **1,121** | **27** | **23** | | | | | | |
| Atlin | 1957 | 15,426 | 517,542 | 584,969 | 509,257 | 3,870,199 | 1,007,451 | 4,857,885 | 682,581 | 18,932,040 | 2,115,655 |
| | **1958** | | | | | | | | | | |
| Cariboo | 1957 | 38,759 | 1,300,364 | 4,540 | 3,952 | | | | | | |
| | **1958** | **27,892** | **947,770** | **3,682** | **3,183** | | | | | | |
| Clinton | 1957 | | | | | | | | | | |
| | **1958** | | | | | | | | | | |
| Fort Steele | 1957 | 279 | 9,360 | 2,491,430 | 2,168,964 | | | 164,060,122 | 23,052,088 | 208,924,430 | 23,347,305 |
| | **1958** | **314** | **10,670** | **3,041,368** | **2,629,202** | | | **195,172,210** | **22,942,493** | **232,889,745** | **23,307,606** |
| Golden | 1957 | 5 | 168 | 106,383 | 92,614 | 72,354 | 18,834 | 6,909,862 | 970,905 | 12,496,334 | 1,396,465 |
| | **1958** | **60** | **2,039** | **138,194** | **119,466** | **151,688** | **35,524** | **6,134,534** | **721,115** | **15,521,013** | **1,553,343** |
| Greenwood | 1957 | 2,207 | 74,045 | 711,983 | 619,831 | 1,140,562 | 296,900 | 468,703 | 65,857 | 530,066 | 59,235 |
| | **1958** | **496** | **16,854** | **884,971** | **765,040** | | | **692,605** | **81,416** | **729,917** | **73,050** |
| Kamloops | 1957 | | | | | | | | | | |
| | **1958** | | | | | | | | | | |
| Liard | 1957 | | | | | | | | | | |
| | **1958** | | | | | | | | | | |
| Lillooet | 1957 | 145,289 | 4,874,446 | 30,360 | 26,431 | | | | | | |
| | **1958** | **149,347** | **5,074,811** | **31,596** | **27,314** | | | **50** | **6** | **15** | **2** |
| Nanaimo | 1957 | | | | | | | | | | |
| | **1958**[2] | **1,564** | **53,145** | **19,523** | **16,877** | **1,480,797** | **348,788** | | | | |
| Nelson | 1957 | 118 | 3,959 | 127,667 | 111,143 | 32,909 | 8,567 | 24,488,582 | 3,440,891 | 79,563,010 | 8,891,166 |
| | **1958** | **105** | **3,568** | **151,680** | **131,124** | | | **31,368,216** | **3,687,334** | **77,707,063** | **7,776,923** |
| New Westminster | 1957 | | | | | | | | | | |
| | **1958** | **33** | **1,121** | **504** | **436** | **680,470** | **159,359** | | | | |
| Nicola | 1957 | | | | | | | | | | |
| | **1958** | | | | | | | | | | |
| Omineca | 1957 | 1,131 | 37,945 | 795,172 | 692,253 | 44,868 | 11,680 | 3,767,228 | 529,333 | 2,434,551 | 272,061 |
| | **1958** | **273** | **9,277** | **178,855** | **154,617** | **17,605** | **4,123** | **534,394** | **62,818** | **963,780** | **96,455** |
| Osoyoos | 1957 | 2,367 | 79,413 | 184 | 160 | | | | | | |
| | **1958** | **8,762** | **297,733** | **4,370** | **3,778** | | | **718** | **84** | **714** | **71** |
| Revelstoke | 1957 | 2,210 | 74,145 | 275,617 | 239,944 | 43,699 | 11,375 | 3,909,848 | 549,373 | 4,263,885 | 476,489 |
| | **1958** | **1,136** | **38,601** | **141,017** | **121,906** | | | **1,813,785** | **213,210** | **1,722,268** | **172,365** |
| Similkameen | 1957 | 2,616 | 87,767 | 35,524 | 30,926 | 6,969,729 | 1,814,290 | | | | |
| | **1958** | **441** | **14,985** | **146** | **126** | **7,403** | **1,734** | | | | |
| Skeena | 1957 | 357 | 11,977 | 1,650,598 | 1,436,961 | | | 1,499,780 | 210,734 | 83,819 | 9,367 |
| | **1958** | **250** | **8,495** | **1,310,282** | **1,132,713** | | | **1,439,596** | **169,225** | **8,423** | **843** |
| Slocan | 1957 | 443 | 14,863 | 1,097,841 | 955,747 | | | 37,145,715 | 5,219,344 | 34,075,711 | 3,807,961 |
| | **1958** | **241** | **8,189** | **922,308** | **797,317** | | | **36,058,520** | **4,238,679** | **30,092,729** | **3,011,680** |
| Trail Creek | 1957 | 1,089 | 36,536 | 1,389 | 1,209 | 230,223 | 59,929 | 369 | 52 | 170 | 19 |
| | **1958** | **649** | **22,053** | **225** | **194** | | | **2,809** | **330** | **848** | **85** |
| Vancouver | 1957 | 10,005 | 335,668 | 94,614 | 82,368 | 14,448,884 | 3,761,189 | 2,005,673 | 281,817 | 17,228,467 | 1,925,281 |
| | **1958** | **2,585** | **87,838** | **18,406** | **15,912** | **4,016,258** | **940,567** | **85,842** | **10,091** | **3,008,766** | **301,117** |
| Vernon | 1957 | | | | | | | | | | |
| | **1958** | | | | | | | | | | |
| Victoria | 1957 | | | 4,532 | 3,945 | 955,933 | 248,839 | | | | |
| | **1958** | | | **23,328** | **20,167** | **4,285,555** | **1,003,634** | | | | |
| Not assigned[1] | 1957 | 193 | 6,475 | 117,160 | 101,996 | 1,509,134 | 392,843 | 32,489,579 | 4,565,111 | 70,916,124 | 7,924,877 |
| | **1958** | **173** | **5,879** | **169,934** | **146,904** | **2,018,873** | **472,800** | **21,269,880** | **2,500,274** | **69,357,509** | **6,941,299** |
| Totals | 1957 | 222,506 | 7,465,076 | 8,129,971 | 7,077,708 | 29,318,494 | 7,631,897 | 281,603,346 | 39,568,086 | 449,448,607 | 50,225,881 |
| | **1958** | **194,354** | **6,604,149** | **7,040,416** | **6,086,299** | **12,658,649** | **2,964,529** | **294,573,159** | **34,627,075** | **432,002,790** | **43,234,839** |

[1] Gold, silver, copper, and some lead "not assigned" were recovered at the Tacoma smelter from dross shipped from the Trail smelter. The zinc and most of the lead were recovered at the Trail smelter by fuming current and reclaimed slag. [2] *See* footnote 2 of Table VIIA.

## TABLE VIIc.—PRODUCTION, 1957 AND 1958, BY MINING DIVISIONS—MISCELLANEOUS METALS

| Division | Year | Antimony[1] | | Bismuth | | Cadmium[2] | | Indium | | Iron Ore | | Nickel | | Tin | | Tungsten ($WO_3$) | | Division Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | |
| | | Lb. | $ | Lb. | $ | Lb. | $ | Oz. | $ | Tons | $ | Lb. | $ | Lb. | $ | Lb. | $ | $ |
| Atlin | 1957 | | | | | 63,902 | 104,160 | | | | | | | | | | | 104,160 |
| | **1958** | | | | | | | | | | | | | | | | | |
| Fort Steele | 1957 | | | | | | | | | | | | | 709,102 | 555,936 | | | 555,936 |
| | **1958** | | | | | **125** | **190** | | | | | | | **795,496** | **625,260** | | | **625,450** |
| Golden | 1957 | | | | | 12,227 | 19,930 | | | | | | | | | | | 19,930 |
| | **1958** | | | | | **54,483** | **82,814** | | | | | | | | | | | **82,814** |
| Greenwood | 1957 | | | | | 3,256 | 5,307 | | | | | | | | | | | 5,307 |
| | **1958** | | | | | **4,311** | **6,553** | | | | | | | | | | | **6,553** |
| Lillooet | 1957 | | | | | | | | | | | | | | | | | |
| | **1958** | | | | | | | | | | | | | | | | | |
| Nanaimo | 1957 | | | | | | | | | 357,342 | 2,200,637 | | | | | | | 2,200,637 |
| | **1958** | | | | | | | | | **630,271** | **4,193,442** | | | | | | | **4,193,442** |
| Nelson | 1957 | | | | | 469,116 | 783,424 | | | | | | | | | 1,921,483 | 5,240,479 | 6,015,573 |
| | **1958** | | | | | **476,881** | **724,859** | | | | | | | | | **690,976** | **1,884,209** | **2,609,068** |
| New Westminster | 1957 | | | | | | | | | | | | | | | | | |
| | **1958** | | | | | | | | | | | **1,408,490** | **996,507** | | | | | **996,507** |
| Omineca | 1957 | | | | | 22,656 | 36,929 | | | | | | | | | | | 36,929 |
| | **1958** | | | | | **11,736** | **17,839** | | | | | | | | | | | **17,839** |
| Revelstoke | 1957 | | | | | 20,586 | 33,555 | | | | | | | | | | | 33,555 |
| | **1958** | | | | | | | | | | | | | | | | | |
| Similkameen | 1957 | | | | | | | | | | | | | | | | | |
| | **1958** | | | | | | | | | | | | | | | | | [4]**260** |
| Skeena | 1957 | | | | | 2,909 | 4,742 | | | | | | | | | | | 4,742 |
| | **1958** | | | | | | | | | | | | | | | | | |
| Slocan | 1957 | | | | | 134,477 | 219,198 | | | | | | | | | | | 219,198 |
| | **1958** | | | | | **120,655** | **183,395** | | | | | | | | | | | **183,395** |
| Vancouver | 1957 | | | | | 29,479 | 48,051 | | | | | | | | | | | 48,051 |
| | **1958** | | | | | **13,015** | **19,783** | | | | | | | | | | | **19,783** |
| Not assigned [1] [2] [3] | 1957 | 1,360,731 | 577,344 | 145,634 | 314,569 | 1,181,387 | 1,925,661 | 384,360 | 693,770 | | | | | | | | | 3,511,344 |
| | **1958** | **858,633** | **284,208** | **154,034** | **308,068** | **743,902** | **1,130,731** | **75,434** | **117,677** | | | | | | | | | **1,840,684** |
| Totals | 1957 | 1,360,731 | 577,344 | 145,634 | 314,569 | 1,946,397 | 3,172,627 | 384,360 | 693,770 | 357,342 | 2,200,637 | | | 709,102 | 555,936 | 1,921,483 | 5,240,479 | 12,755,362 |
| | **1958** | **858,633** | **284,208** | **154,034** | **308,068** | **1,425,108** | **2,166,164** | **75,434** | **117,677** | **630,271** | **4,193,442** | **1,408,490** | **996,507** | **795,496** | **625,260** | **690,976** | **1,884,209** | **10,575,795** |

[1] Antimony assigned to individual mining divisions is the reported content of concentrates exported to foreign smelters. Antimony "not assigned" is the antimony content of antimonial lead or of other antimony products recovered at the Trail smelter.

[2] Cadmium assigned to individual mining divisions is the reported content of customs shipments to the Trail smelter and to foreign smelters. Cadmium "not assigned" is the remainder of the reported estimated recovery at the Trail smelter from British Columbia concentrates.

[3] Bismuth and indium recovered at the Trail smelter are not assigned to mining divisions and may include some metal from sources outside British Columbia.

[4] Includes 4 ounces of platinum valued at $260.

## TABLE VIID.—PRODUCTION, 1957 AND 1958, BY MINING DIVISIONS—INDUSTRIAL MINERALS

| Division | Year | Asbestos | | Barite | | Diatomite | | Fluxes (Limestone and Quartz) | | Granules (Quartz, Limestone, and Granite) | | Gypsum and Products | | Mica | | Sulphur | | Division Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | |
| | | Tons | $ | Tons | $ | Tons | $ | Tons | $ | Tons | $ | Tons | $ | Lb. | $ | Tons | $ | $ |
| Cariboo | 1957 | | | | | 120 | 2,400 | | | | | | | 180,000[1] | 1,200[1] | | | 3,600 |
| | **1958** | | | | | **27** | **540** | | | | | | | | | | | **540** |
| Fort Steele | 1957 | | | | | | | | | | | | | | | 36,401 | 842,580 | 842,580 |
| | **1958** | | | | | | | | | | | | | | | **38,845** | **663,861** | **663,861** |
| Golden | 1957 | | | 20,072 | 433,200 | | | | | | | 66,499 | 142,751 | | | | | 575,951 |
| | **1958** | | | **16,144** | **341,700** | | | | | | | **70,498** | **211,494** | | | | | **553,194** |
| Greenwood | 1957 | | | | | | | 23,126 | 23,126 | | | | | | | | | 23,126 |
| | **1958** | | | | | | | | | | | | | | | | | |
| Liard | 1957 | 31,714 | 9,245,800[2] | | | | | | | | | | | | | | | 9,245,800 |
| | **1958** | **30,078** | **8,203,384**[2] | | | | | | | | | | | | | | | **8,203,384** |
| Nanaimo | 1957 | | | | | | | 18,606 | 20,337 | | | | | | | | | 20,337 |
| | **1958** | | | | | | | **23,457** | **23,806** | | | | | | | | | **23,806** |
| New Westminster | 1957 | | | | | | | | | 10,495 | 129,419 | | | | | | | 129,419 |
| | **1958** | | | | | | | | | **11,623** | **143,945** | | | | | | | **143,945** |
| Osoyoos | 1957 | | | | | | | 95,701 | 398,741 | 6,130 | 81,125 | | | | | | | 479,866 |
| | **1958** | | | | | | | **67,178** | **287,824**[3] | **11,051** | **140,385** | | | | | | | **428,209** |
| Vancouver | 1957 | | | | | | | | | 670 | 11,320 | | | | | 21,377 | 342,032 | 353,352 |
| | **1958** | | | | | | | | | | | | | | | **5,965** | **75,501** | **75,501** |
| Not assigned | 1957 | | | | | | | | | | | | | | | 168,772 | 1,687,720 | 1,687,720 |
| | **1958** | | | | | | | | | | | | | | | **166,490**[4] | **1,671,033** | **1,671,033** |
| Totals | 1957 | 31,714 | 9,245,800 | 20,072 | 433,200 | 120 | 2,400 | 137,433 | 442,204 | 17,295 | 221,864 | 66,499 | 142,751 | 180,000 | 1,200 | 226,550 | 2,872,332 | 13,361,751 |
| | **1958** | **30,078** | **8,203,384** | **16,144** | **341,700** | **27** | **540** | **90,635** | **311,630** | **22,674** | **284,330** | **70,498** | **211,494** | | | **211,300** | **2,410,395** | **11,763,473** |

[1] Estimated.
[2] Does not include value of containers.
[3] Includes 32 tons of fluorspar, worth $1,386.
[4] Includes approximately 1,500 tons of elemental sulphur, worth $20,813.

## TABLE VIIE.—PRODUCTION, 1957 AND 1958, BY MINING DIVISIONS—STRUCTURAL MATERIALS

| Division | Year | Cement | Lime and Limestone | Building-stone | Rubble, Riprap, and Crushed Rock | Sand and Gravel | Brick (Common) | Face, Paving, and Sewer Brick | Fire-bricks, Blocks | Clays | Structural Tile (Hollow Blocks), Roof-tile, Floor-tile | Drain-tile and Sewer-pipe | Pottery (Glazed or Unglazed) | Other Clay Products | Division Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | $ | $ | $ | $ | $ | $ | $ | $ | $ | $ | $ | $ | $ | $ |
| Alberni | 1957 | ..... | ..... | ..... | 5,142 | 166,335 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 171,477 |
| | **1958** | ..... | ..... | ..... | **6,802** | **47,792** | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | **54,594** |
| Atlin | 1957 | ..... | ..... | ..... | 1,092 | 21,942 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 23,034 |
| | **1958** | ..... | ..... | ..... | **2,948** | **23,154** | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | **26,102** |
| Cariboo | 1957 | ..... | ..... | ..... | 720 | 395,613 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 396,333 |
| | **1958** | ..... | ..... | ..... | **165,326** | **370,769** | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | **536,095** |
| Clinton | 1957 | ..... | ..... | ..... | ..... | 14,500 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 14,500 |
| | **1958** | ..... | ..... | ..... | ..... | **15,483** | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | **15,483** |
| Fort Steele | 1957 | ..... | ..... | ..... | 437,348 | 157,525 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 594,873 |
| | **1958** | ..... | ..... | ..... | **28,155** | **125,615** | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | **153,770** |
| Golden | 1957 | ..... | ..... | ..... | 500 | 153,015 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 153,515 |
| | **1958** | ..... | ..... | ..... | **1,825** | **131,437** | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | **133,262** |
| Greenwood | 1957 | ..... | ..... | ..... | 7,100 | 5,000 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 12,100 |
| | **1958** | ..... | ..... | ..... | **7,400** | **5,000** | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | **12,400** |
| Kamloops | 1957 | ..... | ..... | ..... | 1,186,908 | 450,045 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 1,636,953 |
| | **1958** | ..... | ..... | ..... | **822,714** | **382,439** | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | **1,205,153** |
| Liard | 1957 | ..... | ..... | ..... | 2,166 | 239,814 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 241,980 |
| | **1958** | ..... | ..... | ..... | **85** | **206,089** | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | **206,174** |
| Lillooet | 1957 | ..... | ..... | ..... | 5,000 | 54,920 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 59,920 |
| | **1958** | ..... | ..... | ..... | **8,250** | **147,648** | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | **155,898** |
| Nanaimo | 1957 | ..... | 1,306,434 | 189,195 | 4,845 | 286,059 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 1,786,533 |
| | **1958** | ..... | **849,702** | ..... | **5,013** | **141,044** | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | **995,759** |
| Nelson | 1957 | ..... | ..... | ..... | 835 | 94,925 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 95,760 |
| | **1958** | ..... | ..... | ..... | **28,972** | **56,563** | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | **85,535** |
| New Westminster | 1957 | ..... | 132,144 | ..... | 2,366,125 | 2,630,953 | 14,581 | 309,307 | 595,003 | 29,495 | 154,769 | 637,084 | 35,000 | 28,920 | 6,933,381 |
| | **1958** | ..... | **109,667** | ..... | **541,426** | **2,112,365** | **13,625** | **291,607** | **360,835** | **12,579** | **76,292** | **573,453** | **60,725** | **23,258** | **4,175,832** |
| Nicola | 1957 | ..... | ..... | ..... | ..... | 20,523 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 20,523 |
| | **1958** | ..... | ..... | ..... | **3,000** | **59,670** | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | **62,670** |
| Omineca | 1957 | ..... | ..... | ..... | 150,484 | 497,584 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 648,068 |
| | **1958** | ..... | ..... | ..... | **162,367** | **374,925** | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | **537,292** |
| Osoyoos | 1957 | ..... | ..... | ..... | 10,000 | 1,370 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 11,370 |
| | **1958** | ..... | ..... | ..... | ..... | **603** | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | **603** |
| Revelstoke | 1957 | ..... | ..... | ..... | ..... | 54,185 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 54,185 |
| | **1958** | ..... | ..... | ..... | **23,395** | **55,362** | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | **78,757** |
| Similkameen | 1957 | ..... | ..... | ..... | 25,000 | 93,250 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 118,250 |
| | **1958** | ..... | ..... | ..... | ..... | **82,950** | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | **82,950** |
| Skeena | 1957 | ..... | 44,400 | ..... | 32,345 | 1,314,123 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 1,390,868 |
| | **1958** | ..... | **25,900** | ..... | **97,871** | **155,026** | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | **278,797** |
| Slocan | 1957 | ..... | ..... | ..... | ..... | 58,574 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 58,574 |
| | **1958** | ..... | ..... | ..... | ..... | **60,967** | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | **60,967** |
| Trail Creek | 1957 | ..... | ..... | 1,650 | 12,000 | 119,158 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 132,808 |
| | **1958** | ..... | ..... | **3,500** | **12,500** | **111,461** | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | **127,461** |
| Vancouver | 1957 | ..... | ..... | 45,265 | 14,367 | 2,615,045 | 8,236 | 35,774 | 53,687 | ..... | ..... | ..... | ..... | 9,948 | 2,782,322 |
| | **1958** | **1,560,000** | ..... | **60,835** | **155,967** | **2,741,294** | ..... | **52,526** | **35,006** | ..... | ..... | ..... | ..... | **9,158** | **4,614,786** |
| Vernon | 1957 | ..... | ..... | ..... | 5,000 | 187,406 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 192,406 |
| | **1958** | ..... | ..... | ..... | **3,780** | **220,469** | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | **224,249** |
| Victoria | 1957 | 7,078,108 | 11,600 | ..... | 5,791 | 871,410 | 1,528 | ..... | 10,183 | ..... | 45,447 | 60,527 | 12,612 | ..... | 8,097,206 |
| | **1958** | **5,195,619** | **12,550** | ..... | **23,156** | **814,551** | **1,500** | ..... | **9,644** | ..... | **46,585** | **65,720** | **7,662** | ..... | **6,176,987** |
| Totals | 1957 | 7,078,108 | 1,494,578 | 236,110 | 4,272,768 | 10,503,274 | 24,345 | 345,081 | 658,873 | 29,495 | 200,216 | 697,611 | 47,612 | 38,868 | 25,626,939 |
| | **1958** | **6,755,619** | **997,819** | **64,335** | **2,098,952** | **8,442,676** | **15,125** | **344,133** | **405,485** | **12,579** | **122,877** | **639,173** | **68,387** | **32,416** | **19,999,576** |

## TABLE VIIIA.—PRODUCTION TO DATE BY MINING DIVISIONS—SUMMARY

| Division | Placer Gold[1] | | Principal Lode Metals | Miscellaneous Metals | Industrial Minerals | Structural Materials | Fuels | | | | | | Division Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Coal | | Petroleum[2] | | Natural Gas | | |
| | Quantity | Value | | | | | Quantity | Value | Quantity | Value | Quantity | Value | |
| | Oz. | $ | $ | $ | $ | $ | Tons | $ | Bbls. | $ | M S.C.F. | $ | $ |
| Alberni | 1,613 | 33,136 | 11,658,636 | | 9,398 | 944,904 | | | | | | | 12,646,074 |
| Atlin | 729,122 | 17,197,198 | 37,482,188 | 387,814 | 20,325 | 214,122 | | | | | | | 55,301,647 |
| Cariboo | 2,594,321 | 53,705,745 | 37,641,149 | 23,730 | 163,220 | 3,478,688 | 290 | 1,100 | | | | | 95,013,632 |
| Clinton | 10,093 | 240,834 | 847,454 | 900 | 162,867 | 110,928 | | | | | | | 1,362,983 |
| Fort Steele | 20,445 | 465,922 | 1,437,747,113 | 8,839,536 | 3,381,482 | 4,183,581 | 53,415,431 | 216,499,468 | | | | | 1,671,117,102 |
| Golden | 469 | 11,268 | 35,514,559 | 364,687 | 2,856,256 | 1,308,563 | | | | | | | 40,055,333 |
| Greenwood | 5,056 | 115,136 | 115,626,046 | 54,946 | 2,323,897 | 739,841 | | | | | | | 118,859,866 |
| Kamloops | 27,526 | 602,789 | 3,044,836 | 65,678 | 6,528,308 | 7,051,096 | 14,995 | 59,765 | | | | | 17,352,472 |
| Liard | 50,082 | 1,245,186 | 6,312 | 79 | 32,267,682 | 1,149,209 | 89,837 | 606,290 | 1,002,340 | 2,071,418 | 72,744,107 | 4,326,924 | 41,673,100 |
| Lillooet | 91,723 | 1,888,849 | 113,312,084 | 48,350 | 5,129 | 1,080,616 | | | | | | | 116,335,028 |
| Nanaimo | 866 | 19,300 | 6,297,743 | 28,752,522 | 687,010 | 28,498,462 | 79,867,359 | 295,835,663 | | | | | 360,090,700 |
| Nelson | 3,575 | 88,705 | 139,021,684 | 37,293,219 | 64,126 | 2,576,972 | | | | | | | 179,044,706 |
| New Westminster | 11,545 | 241,845 | 288,150 | 1,084,231 | 445,245 | 55,095,306 | | | | | | | 57,154,777 |
| Nicola | 234 | 4,764 | 571,128 | | 9,610 | 401,781 | 2,928,915 | 11,071,191 | | | | | 12,058,474 |
| Omineca | 52,439 | 1,388,539 | 17,276,774 | 15,329,133 | 11,460 | 2,604,253 | 411,757 | 2,535,143 | | | | | 39,145,302 |
| Osoyoos | 190 | 4,142 | 50,446,121 | 1,020 | 2,637,076 | 971,997 | 1,122 | 5,008 | | | | | 54,065,364 |
| Revelstoke | 7,574 | 164,251 | 10,775,731 | 159,853 | | 1,170,423 | | | | | | | 12,270,258 |
| Similkameen | 12,136 | 287,876 | 120,020,611 | 128,661 | 18,558 | 2,175,342 | 4,652,979 | 19,532,872 | | | | | 142,163,920 |
| Skeena | 4,603 | 105,569 | 208,963,667 | 274,317 | 1,240,215 | 6,481,541 | | | | | | | 217,065,309 |
| Slocan | 364 | 9,342 | 165,686,544 | 1,265,274 | | 715,555 | | | | | | | 167,676,715 |
| Trail Creek | 848 | 24,176 | 82,703,415 | 35,564 | | 1,561,354 | | | | | | | 84,324,509 |
| Vancouver | 182 | 5,306 | 194,052,953 | 535,028 | 5,942,484 | 33,378,675 | | | | | | | 233,914,446 |
| Vernon | 2,651 | 70,769 | 188,310 | | 3,978 | 2,197,004 | | | | | | | 2,460,061 |
| Victoria | 628 | 15,680 | 6,616,865 | 24,508 | 190,451 | 99,341,980 | | | | | | | 106,189,484 |
| Not assigned[3] | 1,577,661 | 18,176,703 | 99,061,823 | 45,806,261 | 29,258,318 | 11,264,251 | | | | | | | 203,567,356 |
| Totals | 5,205,946 | 96,113,030 | 2,894,851,896 | 140,475,311 | 88,227,095 | 268,696,444 | 141,382,685 | 546,146,500 | 1,002,340 | 2,071,418 | 72,744,107 | 4,326,924 | 4,040,908,618 |

[1] Quantity of placer gold is given in ounces of crude gold. The year of first recorded production for the major placer-producing mining divisions was: Atlin, 1898; Cariboo, 1858; Lillooet, 1874; Quesnel, 1858.

[2] Includes 582 barrels produced for test purposes in 1955, no value assigned.

[3] *Re* "not assigned," *see* footnotes under Tables VIIIB and VIIIc.

NOTE.—Full details for placer gold are given in this table. The columns headed "Principal Lode Metals," "Miscellaneous Metals," "Industrial Minerals," and "Structural Materials" give the total value only, details being set forth in Tables VIIIB, VIIIc, VIIID, and VIIIE. The quantity of coal is gross output; *see* footnotes to Tables IXA, IXB, and IXc.

## TABLE VIIIB.—PRODUCTION TO DATE BY MINING DIVISIONS—PRINCIPAL LODE METALS

| Division | Lode Gold | | Silver | | Copper | | Lead[1] | | Zinc[1] | | Division Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | |
| | Oz. | $ | Oz. | $ | Lb. | $ | Lb. | $ | Lb. | $ | $ |
| Alberni | 300,136 | 11,233,123 | 161,254 | 77,522 | 2,290,699 | 343,518 | 112,894 | 4,473 | ..... | ..... | 11,658,636 |
| Atlin | 344,163 | 12,125,578 | 3,375,330 | 2,893,940 | 24,777,597 | 8,160,266 | 23,765,211 | 3,437,907 | 91,067,749 | 10,864,497 | 37,482,188 |
| Cariboo | 1,043,637 | 37,561,963 | 117,771 | 74,523 | 2,352 | 920 | 24,560 | 3,724 | 505 | 19 | 37,641,149 |
| Clinton | 23,390 | 827,328 | 31,564 | 14,214 | 57,548 | 5,905 | 193 | 7 | ..... | ..... | 847,454 |
| Fort Steele | 4,239 | 115,267 | 194,306,280 | 108,484,179 | 28,592 | 6,193 | 10,815,325,736 | 757,945,950 | 7,734,969,871 | 570,895,524 | 1,437,747,113 |
| Golden | 165 | 4,710 | 2,761,673 | 1,998,139 | 779,693 | 253,709 | 196,227,874 | 18,116,430 | 202,060,413 | 15,141,571 | 35,514,559 |
| Greenwood | 1,136,115 | 24,473,744 | 31,120,844 | 18,305,985 | 442,394,706 | 70,810,683 | 14,019,289 | 1,043,830 | 14,707,236 | 991,804 | 115,626,046 |
| Kamloops | 47,868 | 1,608,328 | 304,512 | 181,984 | 6,411,583 | 1,179,668 | 538,097 | 45,030 | 438,023 | 29,826 | 3,044,836 |
| Liard | 114 | 4,120 | 540 | 446 | 56 | 22 | 10,102 | 1,724 | ..... | ..... | 6,312 |
| Lillooet | 3,231,133 | 112,832,497 | 793,402 | 476,996 | 400 | 41 | 62,513 | 2,548 | 15 | 2 | 113,312,084 |
| Nanaimo | 85,573 | 1,973,143 | 589,848 | 353,158 | 23,616,232 | 3,971,442 | ..... | ..... | ..... | ..... | 6,297,743 |
| Nelson | 1,328,892 | 41,555,120 | 7,765,745 | 4,607,993 | 14,798,370 | 1,682,270 | 233,592,849 | 28,304,889 | 501,982,548 | 62,871,412 | 139,021,684 |
| New Westminster | 4,449 | 113,528 | 13,884 | 6,616 | 708,637 | 166,406 | 28,425 | 1,119 | 12,755 | 481 | 288,150 |
| Nicola | 8,525 | 234,914 | 267,419 | 126,588 | 555,712 | 108,513 | 2,235,428 | 90,516 | 320,683 | 10,597 | 571,128 |
| Omineca | 25,038 | 772,610 | 9,518,667 | 7,558,863 | 6,750,202 | 1,545,334 | 27,697,350 | 3,516,230 | 31,357,063 | 3,883,737 | 17,276,774 |
| Osoyoos | 1,630,723 | 49,652,895 | 588,768 | 387,403 | 2,783,966 | 399,900 | 125,982 | 5,454 | 7,773 | 469 | 50,446,121 |
| Revelstoke | 36,742 | 1,068,988 | 4,104,635 | 2,763,861 | 153,740 | 51,037 | 36,250,885 | 3,843,129 | 25,087,535 | 3,048,716 | 10,775,731 |
| Similkameen | 183,456 | 6,308,351 | 4,218,739 | 2,581,651 | 601,110,859 | 111,113,285 | 382,544 | 13,360 | 72,275 | 3,964 | 120,020,611 |
| Skeena | 2,393,205 | 60,231,837 | 67,514,033 | 42,910,342 | 687,106,270 | 98,025,648 | 58,893,974 | 5,307,636 | 16,798,460 | 2,488,204 | 208,963,667 |
| Slocan | 15,435 | 443,239 | 68,876,641 | 43,832,242 | 229,696 | 43,512 | 804,037,434 | 63,767,246 | 611,014,309 | 57,600,305 | 165,686,544 |
| Trail Creek | 2,949,445 | 62,577,502 | 3,620,966 | 2,066,235 | 121,141,623 | 18,034,726 | 132,723 | 10,650 | 119,048 | 14,302 | 82,703,415 |
| Vancouver | 439,932 | 14,008,395 | 4,731,781 | 2,868,101 | 922,305,508 | 150,146,772 | 17,820,294 | 1,791,557 | 194,287,477 | 25,238,128 | 194,052,953 |
| Vernon | 5,223 | 176,048 | 12,823 | 8,084 | 654 | 100 | 24,914 | 2,932 | 10,816 | 1,146 | 188,310 |
| Victoria | 37,663 | 812,730 | 838,926 | 473,470 | 28,476,845 | 5,026,894 | 210,097 | 19,848 | 3,568,709 | 283,923 | 6,616,865 |
| Not assigned[2] | 55,204 | 1,069,683 | 4,508,001 | 3,095,511 | 42,824,194 | 8,578,355 | 321,622,907 | 22,953,075 | 831,606,894 | 63,365,199 | 99,061,823 |
| Totals | 15,330,465 | 441,785,641 | 410,144,046 | 246,148,046 | 2,929,305,734 | 479,655,119 | 12,553,142,365 | 910,229,264 | 10,259,489,937 | 816,733,826 | 2,894,851,896 |

[1] *See* footnote 3 to Table VI.

[2] Includes zinc and lead recovered at the Trail smelter from current and reclaimed slags and also metals recovered at the Tacoma smelter from dross shipped by the Trail smelter.

## TABLE VIIIc.—PRODUCTION TO DATE BY MINING DIVISIONS—MISCELLANEOUS METALS

| Division | Antimony | | Bismuth | | Cadmium | | Chromite | | Cobalt | | Indium | | Iron Ore | | Magnesium | | Manganese | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value |
| | Lb. | $ | Lb. | $ | Lb. | $ | Tons | $ | Lb. | $ | Oz. | $ | Tons | $ | Lb. | $ | Tons | $ |
| Atlin | | | | | 233,875 | 387,454 | | | | | | | | | | | | |
| Cariboo | | | | | | | 126 | 900 | | | | | | | | | | |
| Clinton | | | | | 2,543 | 5,345 | | | | | | | | | | | | |
| Fort Steele | | | | | 161,805 | 261,597 | | | | | | | | | 204,632 | 88,184 | | |
| Golden | 40,062 | 14,906 | | | 14,584 | 23,551 | 670 | 31,395 | | | | | | | | | | |
| Greenwood | | | | | | | | | | | | | 17,109 | 59,883 | | | | |
| Kamloops | | | | | | | | | | | | | | | | | | |
| Liard | | | | | | | | | | | | | | | | | | |
| Lillooet | 13,466 | 4,321 | | | | | | | | | | | | | | | | |
| Nanaimo | | | | | | | | | | | | | 4,565,426 | 28,752,522 | | | | |
| Nelson | | | | | 1,975,206 | 3,275,144 | | | | | | | | | | | | |
| New Westminster | | | | | | | | | | | | | | | | | | |
| Omineca | 104,489 | 15,217 | | | 127,417 | 213,533 | | | 1,730 | 420 | | | | | | | | |
| Osoyoos | | | | | | | | | | | | | | | | | 16[1] | |
| Revelstoke | 9,394 | 3,455 | | | 88,092 | 150,711 | | | | | | | | | | | | |
| Similkameen | | | | | | | | | | | | | | | | | | |
| Skeena | | | | | 123,258 | 253,577 | | | | | | | 1,200 | 6,000 | | | | |
| Slocan | 31,865 | 8,133 | | | 722,700 | 1,248,981 | | | | | | | | | | | 541 | 8,160 |
| Trail Creek | | | | | | | | | | | | | 550 | 1,925 | | | | |
| Vancouver | | | | | 256,968 | 535,028 | | | | | | | | | | | | |
| Victoria | | | | | | | | | | | | | | | | | 1,167 | 24,508 |
| Not assigned[2 3 4] | 35,920,159 | 8,879,374 | 4,732,134 | 7,807,222 | 19,477,627 | 27,242,410 | | | | | 942,087 | 1,877,255 | | | | | | |
| Totals | 36,119,435 | 8,925,406 | 4,732,134 | 7,807,222 | 23,184,075 | 33,597,331 | 796 | 32,295 | 1,730 | 420 | 942,087 | 1,877,255 | 4,584,087 | 28,820,330 | 204,632 | 88,184 | 1,724 | 32,668 |

[1] Estimated manganese content of about 40 tons of ore shipped for testing purposes by Olalla Mines Ltd. in 1956.

[2] Antimony assigned to individual mining divisions is the reported content of concentrates exported to foreign smelters. Antimony "not assigned" is the antimony content of antimonial lead or of other antimony products recovered at the Trail smelter.

[3] Cadmium assigned to individual mining divisions is the reported content of custom shipments to the Trail smelter and to foreign smelters. Cadmium "not assigned" is the remainder of the reported estimated recovery at the Trail smelter from British Columbia concentrates.

[4] Bismuth and indium recovered at the Trail smelter are not assigned to mining divisions and may include some metal from sources outside British Columbia.

Year of first recorded production: Antimony, 1907; bismuth, 1929; chromite, 1918; indium, 1942; iron ore, 1885; magnesium, 1941; manganese, 1918.

TABLE VIIIc.—PRODUCTION TO DATE BY MINING DIVISIONS—MISCELLANEOUS METALS—*Continued*

| Division | Mercury | | Molybdenite | | Nickel | | Palladium | | Platinum | | Selenium | | Tin | | Tungsten ($WO_3$) | | Division Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | |
| | Lb. | $ | Lb. | $ | Lb. | $ | Oz. | $ | Oz. | $ | Lb. | $ | Lb. | $ | Lb. | $ | $ |
| Atlin | | | | | | | | | | | | | | | 273 | 360 | 387,814 |
| Cariboo | | | | | | | | | 59 | 2,299 | | | | | 27,698 | 21,431 | 23,730 |
| Clinton | | | | | | | | | | | | | | | | | 900 |
| Fort Steele | | | | | | | | | | | | | 11,330,022 | 8,834,191 | | | 8,839,536 |
| Golden | | | | | | | | | | | | | | | | | 364,687 |
| Greenwood | | | | | | | | | | | | | | | | | 54,946 |
| Kamloops | 10,987 | 5,795 | | | | | | | | | | | | | | | 65,678 |
| Liard | | | | | | | | | 2 | 79 | | | | | | | 79 |
| Lillooet | 1,783 | 3,555 | 2,448 | 2,440 | | | | | 3 | 113 | | | | | 32,353 | 37,921 | 48,350 |
| Nanaimo | | | | | | | | | | | | | | | | | 28,752,522 |
| Nelson | | | 25,058 | 18,378 | | | | | | | | | | | 13,774,219 | 33,999,697 | 37,293,219 |
| New Westminster | | | | | 1,689,943 | 1,084,231 | | | | | | | | | | | 1,084,231 |
| Omineca | 4,150,892 | 10,400,259 | 1,600 | 1,840 | | | | | 3 | 154 | | | | | 2,210,892 | 4,697,710 | 15,329,133 |
| Osoyoos | | | 1,020 | 1,020 | | | | | | | | | | | | | 1,020 |
| Revelstoke | | | | | | | | | | | | | | | 7,784 | 5,687 | 159,853 |
| Similkameen | | | | | | | | | 1,280 | 128,661 | | | | | | | 128,661 |
| Skeena | | | 13,022 | 13,020 | | | | | | | 731 | 1,389 | | | 366 | 331 | 274,317 |
| Slocan | | | | | | | | | | | | | | | | | 1,265,274 |
| Trail Creek | | | | | | | 749 | 30,462 | 53 | 3,177 | | | | | | | 35,564 |
| Vancouver | | | | | | | | | | | | | | | | | 535,028 |
| Victoria | | | | | | | | | | | | | | | | | 24,508 |
| Not assigned | | | | | | | | | | | | | | | | | 45,806,261 |
| Totals | 4,163,662 | 10,409,609 | 43,148 | 36,698 | 1,689,943 | 1,084,231 | 749 | 30,462 | 1,400 | 134,483 | 731 | 1,389 | 11,330,022 | 8,834,191 | 16,053,585 | 38,763,137 | 140,475,311 |

Year of first recorded production: Mercury, 1895; molybdenite, 1914; nickel, 1936; palladium, 1928; platinum, 1887; selenium, 1931; tin, 1941; tungsten, 1937.

## TABLE VIIId.—PRODUCTION TO DATE BY MINING DIVISIONS—INDUSTRIAL MINERALS

| Division | Arsenious Oxide | | Asbestos | | Barite | | Bentonite | | Diatomite | | Fluorspar | | Flux (Quartz and Limestone) | | Granules (Quartz, Limestone, and Granite) | | Gypsum and Gypsite | | Hydromagnesite | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value |
| | Lb. | $ | Tons | $ | Tons | $ | Tons | $ | Tons | $ | Tons | $ | Tons | $ | Tons | $ | Tons | $ | Tons | $ |
| Alberni | | | | | | | | | | | | | | | | | | | 1,450 | 20,325 |
| Atlin | | | | | | | | | 1,570 | 35,035 | | | | | 48 | 168 | | | | |
| Cariboo | | | | | | | | | | | | | | | | | 983 | 6,676 | 803 | 7,211 |
| Clinton | | | | | 8 | 80 | | | | | | | | | | | 112,827 | 298,824 | | |
| Fort Steele | | | | | 125,415 | 1,718,406 | | | | | | | | | | | 371,840 | 1,136,584 | | |
| Golden | | | | | | | | | | | 40,165 | 783,578 | 1,790,502 | 1,540,319 | | | | | | |
| Greenwood | | | | | | | | | | | | | | | | | 1,246,918 | 6,323,178 | | |
| Kamloops | | | 111,055 | 32,267,682 | | | | | | | | | | | | | | | | |
| Liard | | | | | | | | | | | | | | | | | | | | |
| Lillooet | | | | | | | | | | | | | 640,647 | 687,010 | | | | | | |
| Nanaimo | | | | | | | | | | | | | 7,601 | 8,174 | 2 | 51 | | | | |
| Nelson | | | | | | | | | | | | | | | 37,381 | 445,245 | | | | |
| New Westminster | | | | | | | | | | | | | | | | | 2,297 | 9,610 | | |
| Nicola | 16,997 | 340 | | | | | | | | | | | | | | | | | | |
| Omineca | 22,002,423 | 272,861 | | | | | | | | | 32 | 1,386 | 413,527 | 1,946,429 | 28,704 | 369,162 | | | | |
| Osoyoos | | | | | | | 791 | 16,858 | | | | | | | | | 250 | 1,700 | | |
| Similkameen | | | | | | | | | | | | | 601,019 | 1,050,722 | | | | | | |
| Skeena | | | | | | | | | | | | | | | 29,538 | 422,645 | | | | |
| Vancouver | | | | | | | | | | | | | | | | | | | | |
| Vernon | | | | | | | | | | | | | | | | | | | | |
| Victoria | | | | | | | | | | | | | 50 | 760 | 9,702 | 159,471 | | | | |
| Totals | 22,019,420 | 273,201 | 111,055 | 32,267,682 | 125,423 | 1,718,486 | 791 | 16,858 | 1,570 | 35,035[1] | 40,197 | 784,964 | 3,453,379 | 5,233,414 | 105,375 | 1,396,742 | 1,735,115 | 7,776,572 | 2,253 | 27,536 |

[1] Includes 30 tons of volcanic ash, worth $300.

Year of first recorded production: Arsenious oxide, 1917; asbestos, 1952; barite, 1940; bentonite, 1926; diatomite, 1928; fluorspar, 1918; flux, 1911; granules, 1930; gypsum and gypsite, 1911; hydromagnesite, 1904.

## TABLE VIIID.—PRODUCTION TO DATE BY MINING DIVISIONS—INDUSTRIAL MINERALS—*Continued*

| Division | Iron Oxide and Ochre | | Magnesium Sulphate | | Mica | | Natro-alunite | | Perlite | | Phosphate Rock | | Sodium Carbonate | | Sulphur | | Talc | | Division Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | |
| | Tons | $ | Tons | $ | Lb. | $ | Tons | $ | Tons | $ | Tons | $ | Tons | $ | Tons | $ | Tons | $ | $ |
| Alberni | | | | | | | 522 | 9,398 | | | | | | | | | | | 9,398 |
| Atlin | | | | | 9,643,800 | 128,017 | | | | | | | | | | | | | 20,325 |
| Cariboo | | | 1,923 | 39,085 | | | | | | | | | 9,524 | 109,895 | | | | | 163,220[1] |
| Clinton | | | | | | | | | | | 3,842 | 16,894 | | | 168,236[2] | 3,065,684 | | | 162,867 |
| Fort Steele | 27 | 920 | | | | | | | | | | | | | | | 5 | 346 | 3,381,482 |
| Golden | | | | | | | | | | | | | | | | | | | 2,856,256 |
| Greenwood | | | 8,742 | 193,967 | 424,700 | 2,075 | | | | | | | 968 | 9,088 | | | | | 2,323,897 |
| Kamloops | | | | | | | | | | | | | | | | | | | 6,528,308 |
| Liard | | | | | | | | | | | | | | | | | | | 32,267,682 |
| Lillooet | | | | | | | | | | | | | | | | | 296 | 5,129 | 5,129 |
| Nanaimo | | | | | | | | | | | | | | | | | | | 687,010 |
| Nelson | 7,292 | 55,901 | | | | | | | | | | | | | | | | | 64,126 |
| New Westminster | | | | | | | | | | | | | | | | | | | 445,245 |
| Nicola | | | | | | | | | | | | | | | | | | | 9,610 |
| Omineca | | | | | | | | | 1,112 | 11,120 | | | | | | | | | 11,460 |
| Osoyoos | | | 3,229 | 21,300 | 1,588,800 | 25,938 | | | | | | | | | | | | | 2,637,076 |
| Similkameen | | | | | | | | | | | | | | | | | | | 18,558 |
| Skeena | | | | | 634,250 | 10,815 | | | | | | | | | 41,624 | 178,678 | | | 1,240,215 |
| Vancouver | 10,669 | 97,389 | | | | | | | | | | | | | 593,516 | 5,422,450 | | | 5,942,484 |
| Vernon | | | | | 160,500 | 3,978 | | | | | | | | | | | | | 3,978 |
| Victoria | 120 | 840 | | | | | | | | | | | | | | | 1,504 | 29,380 | 190,451 |
| Not assigned | | | | | | | | | | | | | | | 2,940,188 | 29,258,318 | | | 29,258,318 |
| Totals | 18,108 | 155,050 | 13,894 | 254,352 | 12,452,050 | 170,823 | 522 | 9,398 | 1,112 | 11,120 | 3,842 | 16,894 | 10,492 | 118,983 | 3,743,564 | 37,925,130 | 1,805 | 34,855 | 88,227,095 |

[1] Includes 30 tons of volcanic ash, worth $300.

[2] Recovery in 1953 and subsequent years.

Year of first recorded production: Iron oxide and ochre, 1918; magnesium sulphate, 1915; mica, 1932; natro-alunite, 1912; perlite, 1953; phosphate rock, 1927; sodium carbonate, 1921; sulphur, 1916; talc, 1916.

## TABLE VIIIE.—PRODUCTION TO DATE BY MINING DIVISIONS—STRUCTURAL MATERIALS

| Division | Cement | Lime and Limestone | Building-stone | Rubble, Riprap, and Crushed Rock | Sand and Gravel | Brick (Common) | Face, Paving, and Sewer Brick | Fire-bricks, Blocks | Clays | Structural Tile (Hollow Blocks), Roof-tile, Floor-tile | Drain-tile and Sewer-pipe | Pottery (Glazed or Unglazed) | Other Clay Products | Division Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $ | $ | $ | $ | $ | $ | $ | $ | $ | $ | $ | $ | $ | $ |
| Alberni | ——— | ——— | ——— | 51,867 | 893,037 | ——— | ——— | ——— | ——— | ——— | ——— | ——— | ——— | 944,904 |
| Atlin | ——— | 1,108 | ——— | 68,391 | 144,623 | ——— | ——— | ——— | ——— | ——— | ——— | ——— | ——— | 214,122 |
| Cariboo | ——— | 7,500 | ——— | 487,575 | 2,952,536 | 1,193 | 184 | 4,651 | 15,807 | ——— | ——— | ——— | 9,242 | 3,478,688 |
| Clinton | ——— | ——— | ——— | 1,606 | 109,322 | ——— | ——— | ——— | ——— | ——— | ——— | ——— | ——— | 110,928 |
| Fort Steele | ——— | 5,350 | 71,941 | 924,822 | 3,173,668 | 7,800 | ——— | ——— | ——— | ——— | ——— | ——— | ——— | 4,183,581 |
| Golden | ——— | 1,000 | 24,000 | 86,506 | 1,197,057 | ——— | ——— | ——— | ——— | ——— | ——— | ——— | ——— | 1,308,563 |
| Greenwood | ——— | 102,442 | 30,500 | 143,540 | 342,076 | 114,361 | ——— | ——— | 6,922 | ——— | ——— | ——— | ——— | 739,841 |
| Kamloops | ——— | 12,000 | 18,000 | 3,616,910 | 3,331,807 | 72,379 | ——— | ——— | ——— | ——— | ——— | ——— | ——— | 7,051,096 |
| Liard | ——— | ——— | ——— | 26,310 | 1,122,899 | ——— | ——— | ——— | ——— | ——— | ——— | ——— | ——— | 1,149,209 |
| Lillooet | ——— | 100 | 2,000 | 289,361 | 789,155 | ——— | ——— | ——— | ——— | ——— | ——— | ——— | ——— | 1,080,616 |
| Nanaimo | ——— | 22,213,273 | 3,184,532 | 62,740 | 1,858,925 | 1,104,295 | 38,939 | ——— | 35,758 | ——— | ——— | ——— | ——— | 28,498,462 |
| Nelson | ——— | 34,543 | 356,679 | 283,666 | 1,880,110 | 19,110 | 2,864 | ——— | ——— | ——— | ——— | ——— | ——— | 2,576,972 |
| New Westminster | ——— | 883,104 | ——— | 7,745,088 | 18,374,536 | 1,416,337 | 3,982,450 | 9,841,559 | 795,363 | 2,545,578 | 9,056,189 | 197,233 | 257,869 | 55,095,306 |
| Nicola | ——— | ——— | 8,000 | 77,061 | 316,720 | ——— | ——— | ——— | ——— | ——— | ——— | ——— | ——— | 401,781 |
| Omineca | ——— | 3,077 | ——— | 543,215 | 2,052,687 | 5,274 | ——— | ——— | ——— | ——— | ——— | ——— | ——— | 2,604,253 |
| Osoyoos | ——— | 32,070 | 14,850 | 145,557 | 779,520 | ——— | ——— | ——— | ——— | ——— | ——— | ——— | ——— | 971,997 |
| Revelstoke | ——— | 1,000 | 5,575 | 313,773 | 850,075 | ——— | ——— | ——— | ——— | ——— | ——— | ——— | ——— | 1,170,423 |
| Similkameen | 10,500 | 11,571 | 24,000 | 509,044 | 1,606,872 | ——— | ——— | ——— | 1,363 | ——— | ——— | ——— | 11,992 | 2,175,342 |
| Skeena | ——— | 1,302,244 | 144,000 | 1,108,241 | 3,913,807 | ——— | ——— | ——— | 4,925 | ——— | ——— | ——— | 8,324 | 6,481,541 |
| Slocan | ——— | 1,000 | 115,143 | 70,014 | 529,398 | ——— | ——— | ——— | ——— | ——— | ——— | ——— | ——— | 715,555 |
| Trail Creek | ——— | 28,000 | 50,050 | 202,042 | 1,281,262 | ——— | ——— | ——— | ——— | ——— | ——— | ——— | ——— | 1,561,354 |
| Vancouver | 1,895,718 | 40,885 | 3,756,726 | 7,549,564 | 19,146,612 | 132,194 | 175,636 | 520,702 | 17,633 | ——— | ——— | 54,701 | 88,304 | 33,378,675 |
| Vernon | ——— | 46,499 | 81,052 | 178,389 | 1,729,810 | 131,467 | 6,202 | 1,011 | 5 | 18,224 | 4,325 | ——— | 20 | 2,197,004 |
| Victoria | 84,173,064 | 752,747 | ——— | 439,192 | 10,463,400 | 1,806,487 | 23,052 | 28,833 | ——— | 691,995 | 824,502 | 127,705 | 11,003 | 99,341,980 |
| Not assigned | ——— | 315,498 | 505,018 | 282,455 | ——— | ——— | ——— | ——— | ——— | ——— | ——— | ——— | ——— | 11,264,251[1] |
| Totals | 86,079,282 | 25,795,011 | 8,392,066 | 25,206,929 | 78,839,914 | 4,810,897 | 4,229,327 | 10,396,756 | 877,776 | 3,255,797 | 9,885,016 | 379,639 | 386,754 | 268,696,444[2] |

[1] Structural materials that so far cannot be assigned to mining divisions include the three items shown, an amount of $3,150,828 for clay products, and a further $7,010,452 that cannot be allotted to a particular class of material.

[2] Includes items noted in footnote 1.

## TABLE IXA.—QUANTITY (GROSS[1]) AND VALUE OF COAL PER YEAR TO DATE

| Year | Tons (2,000 Lb.) | Value | Year | Tons (2,000 Lb.) | Value |
|---|---|---|---|---|---|
| 1836–59 | 41,871 | $149,548 | 1910 | 3,515,944 | $11,108,335 |
| 1860 | 15,956 | 56,988 | 1911 | 2,573,444 | 8,071,747 |
| 1861 | 15,427 | 55,096 | 1912 | 3,388,795 | 10,786,812 |
| 1862 | 20,292 | 72,472 | 1913 | 2,879,251 | 9,197,460 |
| 1863 | 23,906 | 85,380 | 1914 | 2,426,399 | 7,745,847 |
| 1864 | 32,068 | 115,528 | 1915 | 2,209,290 | 7,114,178 |
| 1865 | 36,757 | 131,276 | 1916 | 2,783,849 | 8,900,675 |
| 1866 | 28,129 | 100,460 | 1917 | 2,686,561 | 8,484,343 |
| 1867 | 34,988 | 124,956 | 1918 | 2,888,170 | 12,833,994 |
| 1868 | 49,286 | 176,020 | 1919 | 2,698,022 | 11,975,671 |
| 1869 | 40,098 | 143,208 | 1920 | 3,020,387 | 13,450,169 |
| 1870 | 33,424 | 119,372 | 1921 | 2,877,995 | 12,836,013 |
| 1871 | 55,458[2] | 164,612 | 1922 | 2,890,625 | 12,880,060 |
| 1872 | 55,458[2] | 164,612 | 1923 | 2,848,146 | 12,678,548 |
| 1873 | 55,459[2] | 164,612 | 1924 | 2,226,037 | 9,911,935 |
| 1874 | 91,334 | 244,641 | 1925 | 2,737,607 | 12,168,905 |
| 1875 | 123,362 | 330,435 | 1926 | 2,609,640 | 11,650,180 |
| 1876 | 155,895 | 417,576 | 1927 | 2,748,286 | 12,269,135 |
| 1877 | 172,540 | 462,156 | 1928 | 2,829,906 | 12,633,510 |
| 1878 | 191,348 | 522,538 | 1929 | 2,521,402 | 11,256,260 |
| 1879 | 270,257 | 723,903 | 1930 | 2,113,586 | 9,435,650 |
| 1880 | 299,708 | 802,785 | 1931 | 1,912,501 | 7,684,155 |
| 1881 | 255,760 | 685,171 | 1932 | 1,719,172 | 6,523,644 |
| 1882 | 315,997 | 846,417 | 1933 | 1,416,516 | 5,375,171 |
| 1883 | 238,895 | 639,897 | 1934 | 1,508,741 | 5,725,133 |
| 1884 | 441,358 | 1,182,210 | 1935 | 1,330,524 | 5,048,864 |
| 1885 | 409,468 | 1,096,788 | 1936 | 1,508,048 | 5,722,502 |
| 1886 | 365,832 | 979,908 | 1937 | 1,618,051 | 6,139,920 |
| 1887 | 462,964 | 1,240,080 | 1938 | 1,466,559 | 5,565,069 |
| 1888 | 548,017 | 1,467,903 | 1939 | 1,655,217 | 6,280,956 |
| 1889 | 649,411 | 1,739,490 | 1940 | 1,867,966 | 7,088,265 |
| 1890 | 759,518 | 2,034,420 | 1941 | 2,018,635 | 7,660,000 |
| 1891 | 1,152,590 | 3,087,291 | 1942 | 2,170,737 | 8,237,172 |
| 1892 | 925,495 | 2,479,005 | 1943 | 2,040,253 | 7,742,030 |
| 1893 | 1,095,690 | 2,934,882 | 1944 | 2,165,676 | 8,217,966 |
| 1894 | 1,134,509 | 3,038,859 | 1945 | 1,700,914 | 6,454,360 |
| 1895 | 1,052,412 | 2,824,687 | 1946 | 1,639,277 | 6,732,470 |
| 1896 | 1,002,268 | 2,693,961 | 1947 | 1,923,573 | 8,680,440 |
| 1897 | 999,372 | 2,734,522 | 1948 | 1,809,018 | 9,765,395 |
| 1898 | 1,263,272 | 3,582,595 | 1949 | 1,917,296 | 10,549,924 |
| 1899 | 1,435,314 | 4,126,803 | 1950 | 1,756,667 | 10,119,303 |
| 1900 | 1,781,000 | 4,744,530 | 1951 | 1,824,384 | 10,169,617 |
| 1901 | 1,894,544 | 5,016,398 | 1952 | 1,650,619 | 9,729,739 |
| 1902 | 1,838,621 | 4,832,257 | 1953 | 1,576,105 | 9,528,279 |
| 1903 | 1,624,742 | 4,332,297 | 1954 | 1,447,608 | 9,154,544 |
| 1904 | 1,887,981 | 4,953,024 | 1955 | 1,484,066 | 8,986,501 |
| 1905 | 2,044,931 | 5,511,861 | 1956 | 1,589,398 | 9,346,518 |
| 1906 | 2,126,965 | 5,548,044 | 1957 | 1,221,766 | 7,340,339 |
| 1907 | 2,485,961 | 7,637,713 | 1958 | 882,962 | 5,937,860 |
| 1908 | 2,362,514 | 7,356,866 | | | |
| 1909 | 2,688,672 | 8,574,884 | Totals | 141,382,685 | $546,146,500 |

## TABLE IXB.—COAL PRODUCTION (GROSS[1]) BY DISTRICTS AND MINING DIVISIONS

| District and Mining Division | Total to Date | | | 1957 | | 1958 | |
|---|---|---|---|---|---|---|---|
| | Period | Quantity | Value | Quantity | Value | Quantity | Value |
| *Vancouver Island District* | | Tons | $ | Tons | $ | Tons | $ |
| Nanaimo Mining Division | 1836–1958 | 79,867,359 | 295,835,663 | 200,205 | 1,849,306 | 182,304 | 1,615,490 |
| *Nicola-Princeton District* | | | | | | | |
| Kamloops Mining Division | 1893–1945 | 14,995 | 59,765 | | | | |
| Nicola Mining Division | 1907–1958 | 2,928,915 | 11,071,191 | 1,081 | 11,615 | 543 | 5,919 |
| Osoyoos Mining Division | 1926–1927 | 1,122 | 5,008 | | | | |
| Similkameen Mining Division | 1909–1958 | 4,652,979 | 19,532,872 | 17,696 | 92,748 | 146 | 1,122 |
| District totals | 1893–1958 | 7,598,011 | 30,668,836 | 18,777 | 104,363 | 689 | 7,041 |
| *Northern District* | | | | | | | |
| Cariboo Mining Division | 1942–1944 | 290 | 1,100 | | | | |
| Liard Mining Division | 1923–1958 | 89,837 | 606,290 | 3,158 | 28,421 | 3,094 | 28,738 |
| Omineca Mining Division | 1918–1958 | 411,757 | 2,535,143 | 4,991 | 47,414 | 5,233 | 44,972 |
| District totals | 1918–1958 | 501,884 | 3,142,533 | 8,149 | 75,835 | 8,327 | 73,710 |
| *East Kootenay District* | | | | | | | |
| Fort Steele Mining Division | 1898–1958 | 53,415,431 | 216,499,468 | 994,635 | 5,310,835 | 691,642 | 4,241,619 |
| Provincial totals | 1836–1958 | 141,382,685 | 546,146,500 | 1,221,766 | 7,340,339 | 882,962 | 5,937,860 |

[1] Gross mine output, including washery loss and coal used in making coke (*see* Table X and discussion under "Fuel," page A 12).

[2] A combined total for 1871, 1872, and 1873 has previously been noted in Annual Reports and the above breakdown is estimated.

## TABLE IXc.—QUANTITY[1] AND VALUE OF COAL SOLD AND USED,[2] 1948–58

| Year | District and Mining Division | Total Sales[2]* | Used under Companies' Boilers[2]† | Used in Making Coke[2]‡ | Total Sold and Used[2] | | District Totals, 1958 | |
|---|---|---|---|---|---|---|---|---|
| | | Tons | Tons | Tons | Tons | $ | Tons | $ |
| | **Vancouver Island** | ..... | ..... | ..... | ..... | ..... | **154,298** | **1,615,490** |
| 1948 | Nanaimo | 365,328 | 2,801 | ..... | 368,129 | 3,219,868 | | |
| 1949 | " | 451,074 | 3,925 | ..... | 454,999 | 4,055,572 | | |
| 1950 | " | 472,690 | 4,329 | ..... | 477,019 | 4,060,337 | | |
| 1951 | " | 391,687 | 3,425 | ..... | 395,112 | 3,486,615 | | |
| 1952 | " | 267,346 | 2,986 | ..... | 270,332 | 2,749,206 | | |
| 1953 | " | 204,931 | 1,798 | ..... | 206,729 | 2,059,828 | | |
| 1954 | " | 181,534 | 536 | ..... | 182,070 | 2,029,099 | | |
| 1955 | " | 173,861 | 465 | ..... | 174,326 | 1,769,682 | | |
| 1956 | " | 172,140 | 389 | ..... | 172,529 | 1,629,168 | | |
| 1957 | " | 163,574 | 439 | ..... | 164,013 | 1,849,306 | | |
| **1958** | " | **153,892** | **404** | ..... | **154,296** | **1,615,490** | | |
| | **Nicola-Princeton** | ..... | ..... | ..... | ..... | ..... | **689** | **7,041** |
| 1948 | Nicola | 1,777 | ..... | ..... | 1,777 | 15,281 | | |
| 1949 | " | 1,672 | ..... | ..... | 1,672 | 14,809 | | |
| 1950 | " | 1,125 | ..... | ..... | 1,125 | 9,926 | | |
| 1951 | " | 899 | ..... | ..... | 899 | 8,640 | | |
| 1952 | " | 1,139 | ..... | ..... | 1,139 | 11,493 | | |
| 1953 | " | 1,040 | ..... | ..... | 1,040 | 10,400 | | |
| 1954 | " | 1,256 | ..... | ..... | 1,256 | 12,769 | | |
| 1955 | " | 1,259 | ..... | ..... | 1,259 | 12,904 | | |
| 1956 | " | 1,170 | ..... | ..... | 1,170 | 12,092 | | |
| 1957 | " | 1,081 | ..... | ..... | 1,081 | 11,615 | | |
| **1958** | " | **543** | ..... | ..... | **543** | **5,919** | | |
| 1948 | Similkameen | 49,859 | ..... | ..... | 49,859 | 299,387 | | |
| 1949 | " | 49,906 | ..... | ..... | 49,906 | 298,293 | | |
| 1950 | " | 16,784 | ..... | ..... | 16,784 | 87,483 | | |
| 1951 | " | 3,941 | ..... | ..... | 3,941 | 28,094 | | |
| 1952 | " | 6,306 | ..... | ..... | 6,306 | 48,760 | | |
| 1953 | " | 7,047 | ..... | ..... | 7,047 | 51,012 | | |
| 1954 | " | 29,713 | ..... | ..... | 29,713 | 138,080 | | |
| 1955 | " | 73,475 | ..... | ..... | 73,475 | 379,511 | | |
| 1956 | " | 72,102 | ..... | ..... | 72,102 | 366,820 | | |
| 1957 | " | 17,696 | ..... | ..... | 17,696 | 92,748 | | |
| **1958** | " | **146** | ..... | ..... | **146** | **1,122** | | |
| | **Northern** | ..... | ..... | ..... | ..... | ..... | **7,871** | **73,710** |
| 1948 | Liard | 8,570 | 60 | ..... | 8,630 | 52,721 | | |
| 1949 | " | 12,364 | ..... | ..... | 12,364 | 76,697 | | |
| 1950 | " | 12,250 | ..... | ..... | 12,250 | 82,258 | | |
| 1951 | " | 3,199 | ..... | ..... | 3,199 | 26,095 | | |
| 1952 | " | 3,854 | ..... | ..... | 3,854 | 42,606 | | |
| 1953 | " | 4,815 | 20 | ..... | 4,835 | 50,895 | | |
| 1954 | " | 4,359 | ..... | ..... | 4,359 | 33,079 | | |
| 1955 | " | 3,650 | ..... | ..... | 3,650 | 32,850 | | |
| 1956 | " | 4,642 | ..... | ..... | 4,642 | 38,211 | | |
| 1957 | " | 2,758 | ..... | ..... | 2,758 | 28,421 | | |
| **1958** | " | **3,194** | ..... | ..... | **3,194** | **28,738** | | |
| 1948 | Omineca | 10,920 | 66 | ..... | 10,986 | 85,981 | | |
| 1949 | " | 11,468 | 63 | ..... | 11,531 | 92,865 | | |
| 1950 | " | 13,037 | 62 | ..... | 13,099 | 104,790 | | |
| 1951 | " | 27,904 | ..... | ..... | 27,904 | 206,799 | | |
| 1952 | " | 37,270 | ..... | ..... | 37,270 | 285,732 | | |
| 1953 | " | 42,079 | ..... | ..... | 42,079 | 324,986 | | |
| 1954 | " | 36,572 | ..... | ..... | 36,572 | 292,862 | | |
| 1955 | " | 30,015 | ..... | ..... | 30,015 | 227,010 | | |
| 1956 | " | 8,553 | ..... | ..... | 8,553 | 71,234 | | |
| 1957 | " | 4,991 | ..... | ..... | 4,991 | 47,414 | | |
| **1958** | " | **4,677** | ..... | ..... | **4,677** | **44,972** | | |
| | **East Kootenay** | ..... | ..... | ..... | ..... | ..... | **633,557** | **4,241,619** |
| 1948 | Fort Steele | 990,530 | 20,227 | 154,342 | 1,165,099 | 6,092,157 | | |
| 1949 | " | 842,979 | 19,025 | 228,792 | 1,090,796 | 6,011,688 | | |
| 1950 | " | 825,315 | 15,196 | 213,218 | 1,053,729 | 5,774,509 | | |
| 1951 | " | 889,669 | 15,977 | 236,871 | 1,142,517 | 6,413,374 | | |
| 1952 | " | 822,071 | 15,813 | 245,528 | 1,083,412 | 6,591,942 | | |
| 1953 | " | 878,865 | 12,729 | 230,814 | 1,122,408 | 7,031,158 | | |
| 1954 | " | 820,081 | 15,310 | 218,923 | 1,054,314 | 6,648,655 | | |
| 1955 | " | 803,125 | 16,560 | 230,464 | 1,050,149 | 6,564,544 | | |
| 1956 | " | 890,100 | 19,518 | 248,595 | 1,158,213 | 7,228,993 | | |
| 1957 | " | 677,534 | 17,830 | 199,754 | 895,118 | 5,310,835 | | |
| **1958** | " | **401,875** | **7,274** | **224,408** | **633,557** | **4,241,619** | | |
| 1948 | **Provincial totals** | 1,426,984 | 23,154 | 154,342 | 1,604,480 | 9,765,395 | | |
| 1949 | " | 1,369,463 | 23,013 | 228,792 | 1,621,268 | 10,549,924 | | |
| 1950 | " | 1,341,201 | 19,587 | 213,218 | 1,574,006 | 10,119,303 | | |
| 1951 | " | 1,317,299 | 19,402 | 236,871 | 1,573,572 | 10,169,617 | | |
| 1952 | " | 1,137,986 | 18,799 | 245,528 | 1,402,313 | 9,729,739 | | |
| 1953 | " | 1,138,777 | 14,547 | 230,814 | 1,384,138 | 9,528,279 | | |
| 1954 | " | 1,073,515 | 15,846 | 218,923 | 1,308,284 | 9,154,544 | | |
| 1955 | " | 1,085,885 | 17,025 | 230,464 | 1,332,874 | 8,986,501 | | |
| 1956 | " | 1,148,707 | 19,907 | 248,595 | 1,417,209 | 9,346,518 | | |
| 1957 | " | 867,634 | 18,269 | 199,754 | 1,085,657 | 7,340,339 | | |
| **1958** | " | **564,327** | **7,678** | **224,408** | **796,413** | **5,937,860** | **796,413** | **5,937,860** |

[1] For differences between gross mine output and coal sold refer to table "Production and Distribution by Collieries and by Districts" in section headed "Coal" or "Coal-mining" in Annual Reports of the Minister of Mines.

[2] The totals "sold and used" include:—

* Sales to retail and wholesale dealers, industrial users, and company employees.

† Coal used in company boilers, including steam locomotives.

‡ Coal used in making coke.

*See also* discussion under "Fuel," page A 12.

## TABLE X.—COKE AND BY-PRODUCTS PRODUCTION FOR YEARS 1895 TO 1925 AND 1926 TO 1958

| Year | Coal Used in Making Coke | | Coke Made in Bee-hive Ovens | | Coke Made in By-product Ovens | | Coke Made in Gas Plants | | Total Coke Made | | Gas Sold and Used | Tar Produced | Other By-products[1] | Total Production Value of Coke Industry |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | | | | |
| | Tons | $ | Tons | $ | Tons | $ | Tons | $ | Tons | $ | $ | $ | $ | $ |
| 1895–1925 | 7,955,795 | 25,673,600 | 4,920,457 | 25,673,600 | ..... | ..... | ..... | ..... | 4,920,457 | 25,673,600 | ..... | ..... | ..... | 25,673,600 |
| 1926 | 299,839 | 1,338,565 | 105,227 | 795,841 | 42,209 | 244,469 | 42,468 | 221,600 | 189,904 | 1,261,910 | 1,009,613 | 50,035 | 45,772 | 2,367,330 |
| 1927 | 269,482 | 1,290,760 | 95,281 | 595,504 | 35,900 | 327,215 | 39,464 | 178,682 | 170,645 | 1,101,401 | 1,222,379 | 44,402 | 18,080 | 2,386,262 |
| 1928 | 210,207 | 940,668 | 68,734 | 429,590 | 32,322 | 263,781 | 41,711 | 187,882 | 142,767 | 881,253 | 1,313,407 | 45,313 | 14,036 | 2,254,009 |
| 1929 | 226,363 | 950,243 | 75,426 | 574,279 | 33,339 | 308,867 | 46,573 | 214,732 | 155,338 | 1,097,878 | 1,461,445 | 61,084 | 39,203 | 2,659,610 |
| 1930 | 225,325 | 1,002,684 | 73,708 | 558,801 | 31,904 | 298,004 | 45,751 | 232,917 | 151,363 | 1,089,722 | 1,547,092 | 65,770 | 11,935 | 2,714,519 |
| 1931 | 211,334 | 924,279 | 73,248 | 548,550 | 27,717 | 236,537 | 41,836 | 210,470 | 142,801 | 995,557 | 1,541,454 | 66,506 | 32,603 | 2,636,120 |
| 1932 | 151,750 | 710,432 | 33,090 | 247,615 | 25,436 | 217,221 | 44,645 | 237,174 | 103,171 | 702,010 | 1,589,656 | 54,771 | 14,109 | 2,360,546 |
| 1933 | 107,400 | 554,152 | 6,097 | 44,813 | 24,263 | 213,750 | 34,156 | 214,454 | 64,516 | 473,017 | 1,473,433 | 45,610 | 3,666 | 1,995,726 |
| 1934 | 141,384 | 571,167 | 24,840 | 154,105 | 23,512 | 213,653 | 51,184 | 198,217 | 99,536 | 565,975 | 1,439,287 | 43,939 | 4,756 | 2,053,957 |
| 1935 | 127,776 | 494,492 | 27,066 | 160,565 | 14,911 | 109,684 | 46,111 | 160,694 | 88,088 | 430,943 | 1,430,057 | 44,876 | 3,081 | 1,908,957 |
| 1936 | 125,810 | 436,595 | 34,009 | 191,843 | ..... | ..... | 48,859 | 138,787 | 82,868 | 330,630 | 1,422,783 | 38,872 | ..... | 1,792,285 |
| 1937 | 166,124 | 570,250 | 48,393 | 277,726 | ..... | ..... | 59,141 | 330,821 | 107,534 | 608,547 | 1,746,047 | 46,698 | ..... | 2,401,292 |
| 1938 | 176,877 | 623,649 | 54,602 | 315,294 | ..... | ..... | 58,643 | 345,790 | 113,245 | 661,084 | 1,770,839 | 44,324 | ..... | 2,476,247 |
| 1939 | 171,242 | 569,945 | 50,153 | 286,491 | 7,196 | 37,015 | 55,395 | 325,435 | 112,744 | 648,941 | 1,768,977 | 44,108 | ..... | 2,462,026 |
| 1940 | 184,160 | 577,706 | 37,845 | 220,211 | 29,124 | 151,931 | 60,726 | 303,421 | 127,695 | 675,563 | 1,810,083 | 54,379 | 3,060 | 2,543,085 |
| 1941 | 235,809 | 717,584 | 64,707 | 392,473 | 86,656 | 467,440 | 8,378 | 43,758 | 159,741 | 903,671 | 1,925,270 | 63,569 | 1,716 | 2,894,226 |
| 1942 | 255,862 | 866,795 | 66,824 | 439,464 | 96,428 | 608,521 | 6,528 | 54,387 | 169,780 | 1,102,292 | 2,165,888 | 86,113 | 22,028 | 3,376,321 |
| 1943 | 260,334 | 983,910 | 42,766 | 291,843 | 43,895 | 274,402 | 93,714 | 647,482 | 180,375 | 1,213,727 | 2,453,592 | 96,249 | 18,321 | 3,781,889 |
| 1944 | 212,883 | 1,439,891 | 36,966 | 301,201 | 47,401 | 347,245 | 88,430 | 565,393 | 172,797 | 1,213,839 | 2,562,610 | 56,476 | 19,046 | 3,851,971 |
| 1945 | 230,868 | 1,211,584 | 13,464 | 117,369 | 59,098 | 434,876 | 91,682 | 577,479 | 164,244 | 1,129,724 | 2,721,690 | 83,828 | 20,756 | 3,955,998 |
| 1946 | 251,954 | 1,441,415 | 20,542 | 178,556 | 53,525 | 423,025 | 101,094 | 648,297 | 175,161 | 1,249,878 | 3,079,009 | 88,947 | 53,097 | 4,470,931 |
| 1947 | 284,049 | 1,682,602 | 44,517 | 427,330 | 59,638 | 531,114 | 91,755 | 579,635 | 195,910 | 1,538,079 | 3,390,713 | 124,885 | 25,780 | 5,079,457 |
| 1948 | 235,297 | 1,440,415 | 47,461 | 559,735 | 57,112 | 630,390 | 57,678 | 455,096 | 162,251 | 1,645,221 | 4,520,886 | 153,130 | 19,489 | 6,338,726 |
| 1949 | 323,899 | 1,979,138 | 66,407 | 690,045 | 89,268 | 1,018,288 | 67,449 | 496,933 | 223,124 | 2,205,266 | 4,148,124 | 194,728 | 27,406 | 6,575,524 |
| 1950 | 333,955 | 2,027,470 | 23,703 | 269,728 | 127,477 | 997,200 | 92,704 | 686,871 | 243,884 | 1,953,799 | 4,298,161 | 277,138 | 27,944 | 6,557,042 |
| 1951 | 332,416 | 1,949,117 | 32,598 | 387,796 | 138,051 | 1,552,764 | 72,215 | 571,161 | 242,864 | 2,511,721 | 4,263,754 | 277,786 | 22,132 | 7,075,393 |
| 1952 | 323,922 | 1,972,918 | 35,110 | 440,756 | 142,156 | 1,729,924 | 64,906 | 525,384 | 242,172 | 2,696,064 | 4,625,747 | 252,070 | 25,639 | 7,599,520 |
| 1953 | 310,431 | 2,005,551 | ..... | ..... | 177,790 | 2,090,147 | 60,407 | 525,411 | 238,197 | 2,615,558 | 4,857,116 | 238,771 | 21,046 | 7,732,491 |
| 1954 | 302,052 | 2,052,641 | ..... | ..... | 168,982 | 2,032,902 | 67,108 | 566,660 | 236,090 | 2,599,562 | 5,113,334 | 226,824 | 20,586 | 7,960,306 |
| 1955 | 314,994 | 2,122,303 | ..... | ..... | 177,031 | 2,180,516 | 70,387 | 594,482 | 247,418 | 2,774,998 | 5,407,842 | 292,984 | 18,369 | 8,494,193 |
| 1956 | 328,805 | 2,277,402 | ..... | ..... | 180,263 | 2,270,167 | 78,185 | 738,292 | 258,448 | 3,008,459 | 5,145,851 | 287,437 | 20,961 | 8,462,708 |
| 1957 | 199,654 | 1,284,833 | ..... | ..... | 153,493 | 2,005,570 | ..... | ..... | 153,493 | 2,005,570 | 14,600 | 121,849 | ..... | 2,142,019 |
| 1958 | 224,158 | 1,420,328 | ..... | ..... | 173,920 | 2,253,102 | ..... | ..... | 173,920 | 2,253,102 | 14,600 | 97,803 | ..... | 2,365,505 |
| Totals | 15,712,210 | 64,105,084 | 6,223,241 | 35,571,124 | 2,360,017 | 24,469,720 | 1,829,283 | 11,777,717 | 10,411,638 | 71,818,561 | 83,255,339 | 3,771,274 | 554,617 | 159,399,791 |

[1] "Other by-products" total includes ammonium sulphate, $52,492; ammonia liquor, $103,850; light oils, $16,571; motor fuel, $7,009; naphthalene, $4,077; creosote, $34; benzol (thinning), $312; solvent naphtha, $644; cinders, $344,682; pitch, $5,131; sulphuric acid, $6,658; tar-paint, $2,330; and miscellaneous, $10,827.

## TABLE XI.—DIVIDENDS PAID BY MINING COMPANIES, 1897–1958

*Dividends Paid during 1957 and 1958*

| | 1957 | 1958 |
|---|---|---|
| Bralorne Mines Ltd | $374,100 | $374,100 |
| Canadian Collieries Resources Ltd. | 176,666 | |
| Cassiar Asbestos Corporation Ltd. | | 760,000 |
| Consolidated Mining and Smelting Co. of Canada, Ltd. | 22,113,425 | 13,104,257 |
| Crow's Nest Pass Coal Co. Ltd | 372,708 | 372,708 |
| Highland-Bell Ltd. | 78,293 | 78,293 |
| Pioneer Gold Mines of B. C. Ltd. | 218,968 | |
| Reeves MacDonald Mines Ltd. | 292,250 | 292,250 |
| Others | 621,010 | 14,515 |
| Totals | $24,247,420 | $14,996,123 |

*Dividends Paid Yearly, 1917 to 1958, Inclusive*

| Year | Amount Paid | Year | Amount Paid |
|---|---|---|---|
| 1917 | $3,269,494 | 1939 | $11,865,698 |
| 1918 | 2,704,469 | 1940 | 14,595,530 |
| 1919 | 2,494,283 | 1941 | 16,598,110 |
| 1920 | 1,870,296 | 1942 | 13,627,104 |
| 1921 | 736,629 | 1943 | 11,860,159 |
| 1922 | 3,174,756 | 1944 | 11,367,732 |
| 1923 | 2,983,570 | 1945 | 10,487,395 |
| 1924 | 2,977,276 | 1946 | 15,566,047 |
| 1925 | 5,853,419 | 1947 | 27,940,213 |
| 1926 | 8,011,137 | 1948 | 37,672,319 |
| 1927 | 8,816,681 | 1949 | 33,651,096 |
| 1928 | 9,572,536 | 1950 | 34,399,330 |
| 1929 | 11,263,118 | 1951 | 40,921,238 |
| 1930 | 10,543,500 | 1952 | 32,603,956 |
| 1931 | 4,650,857 | 1953 | 22,323,089 |
| 1932 | 2,786,958 | 1954 | 25,368,262 |
| 1933 | 2,471,735 | 1955 | 35,071,583 |
| 1934 | 4,745,905 | 1956 | 36,262,682 |
| 1935 | 7,386,070 | 1957 | 24,247,420 |
| 1936 | 10,513,705 | 1958 | 14,996,123 |
| 1937 | 15,085,293 | | |
| 1938 | 12,068,875 | Total | $605,405,648 |

TABLE XI.—DIVIDENDS PAID BY MINING COMPANIES, 1897–1958—*Continued*

*Lode-gold Mines*[1]

| Company or Mine | Locality | Class | Amount Paid |
|---|---|---|---|
| Arlington | Erie | Gold | $94,872 |
| Athabasca | Nelson | Gold | 25,000 |
| Bayonne | Tye Siding | Gold | 25,000 |
| Bralorne Mines Ltd. | Bridge River | Gold | 17,760,125 |
| Belmont-Surf Inlet | Princess Royal Island | Gold | 1,437,500 |
| Cariboo Gold Quartz Mining Co. Ltd. | Wells | Gold | 1,679,976 |
| Cariboo-McKinney Con. M. & M. Co. | Camp McKinney | Gold | 565,588 |
| Canadian Pacific Exploration (Porto Rico) | Nelson | Gold | 37,500 |
| Centre Star | Rossland | Gold-copper | 472,255 |
| Fairview Amalgamated | Oliver | Gold | 5,254 |
| Fern Gold Mining & Milling Co. Ltd. | Nelson | Gold | 9,375 |
| Gold Belt Mining Co. Ltd. | Sheep Creek | Gold | 668,595[2] |
| Goodenough (leasers) | Ymir | Gold | 13,731 |
| Hedley Mascot Gold Mines Ltd. | Hedley | Gold | 1,290,553 |
| Island Mountain Mines Ltd. | Wells | Gold | 2,491,236[2] |
| I.X.L. | Rossland | Gold | 134,025 |
| Jewel Denero | Greenwood | Gold | 11,751 |
| Kelowna Exploration Co. Ltd. (Nickel Plate) | Hedley | Gold | 2,040,000 |
| Kelowna Mines Hedley Ltd. | Hedley | Gold | 780,000[3] |
| Kootenay Belle Gold Mines Ltd. | Sheep Creek | Gold | 357,856 |
| Le Roi Mining Co. | Rossland | Gold-copper | 1,475,000 |
| Le Roi No. 2 Ltd. | Rossland | Gold-copper | 1,574,640 |
| Lorne (later Bralorne) | Bridge River | Gold | 20,450 |
| Motherlode | Sheep Creek | Gold | 163,500 |
| Mount Zeballos Gold Mines Ltd. | Zeballos | Gold | 165,000 |
| Nickel Plate (Hedley Gold Mining Co. Ltd.) | Hedley | Gold | 3,423,191 |
| Pioneer Gold Mines of B.C. Ltd. | Bridge River | Gold | 10,048,914 |
| Poorman | Nelson | Gold | 25,000 |
| Premier Gold Mining Co. Ltd. | Premier | Gold | 18,858,075[4] |
| Privateer Mine Ltd. | Zeballos | Gold | 1,914,183 |
| Queen (prior to Sheep Creek Gold Mines Ltd.) | Sheep Creek | Gold | 98,674 |
| Relief Arlington Mines Ltd. (Second Relief) | Erie | Gold | 308,000[2] |
| Reno Gold Mines Ltd. | Sheep Creek | Gold | 1,433,640[2] |
| Sheep Creek Gold Mines Ltd.[6] | Sheep Creek | Gold | 3,609,375[5] |
| Silbak Premier Mines Ltd. | Premier | Gold | 2,425,000[4] |
| Spud Valley Gold Mines Ltd. | Zeballos | Gold | 168,000 |
| Sunset No. 2 | Rossland | Gold-copper | 115,007 |
| Surf Inlet Consolidated Gold Mines Ltd. | Surf Inlet | Gold | 120,279 |
| War Eagle | Rossland | Gold-copper | 1,245,250 |
| Ymir Gold | Ymir | Gold | 300,000 |
| Ymir Yankee Girl | Ymir | Gold | 415,002[2] |
| Miscellaneous mines | | Gold | 108,623 |
| Total, lode-gold mines | | | $77,674,997 |

[1] The gold-copper properties of Rossland are included in this table.
[2] Includes "return of capital" and "liquidating" payments.
[3] Former Kelowna Exploration Company Limited; changed in January, 1951.
[4] Up to and including 1936, dividends paid by Premier Gold Mining Company Limited were derived from operations of the company in British Columbia. Subsequent dividends paid by Premier Gold Mining Company Limited have been derived from the operations of subsidiary companies in British Columbia and elsewhere and are not included in the figure given. In 1936, Silbak Premier, a subsidiary of Premier Gold Mining Company, took over the former gold operations of that company in British Columbia. Dividends paid by Silbak Premier are given above.
[5] In several years, preceding 1953, company revenue has included profits from operations of the Lucky Jim zinc-lead mine.
[6] Since March, 1956, company name is Sheep Creek Mines Ltd.

## TABLE XI.—DIVIDENDS PAID BY MINING COMPANIES, 1897–1958—*Continued*

### *Silver-Lead-Zinc Mines*

| Company or Mine | Locality | Class | Amount Paid |
|---|---|---|---|
| Antoine | Rambler | Silver-lead-zinc | $10,000 |
| Base Metals Mining Corporation Ltd. (Monarch and Kicking Horse) | Field | Silver lead-zinc | 586,143[1] |
| Beaverdell-Wellington | Beaverdell | Silver-lead-zinc | 97,200 |
| Beaver Silver Mines Ltd. | Greenwood | Silver-lead-zinc | 48,000 |
| Bell | Beaverdell | Silver-lead-zinc | 388,297 |
| Bosun (Rosebery-Surprise) | New Denver | Silver-lead-zinc | 25,000 |
| Canadian Exploration Ltd. | Salmo | Silver-lead-zinc | 11,175,400 |
| Capella | New Denver | Silver lead-zinc | 5,500 |
| Consolidated Mining and Smelting Co. of Canada, Ltd. | Trail | Silver-lead-zinc | 468,796,379[2] |
| Couverapee | Field | Silver-lead-zinc | 5,203 |
| Duthie Mines Ltd. | Smithers | Silver-lead-zinc | 50,000 |
| Florence Silver | Ainsworth | Silver-lead-zinc | 35,393 |
| Giant Mascot Mines Ltd. | Spillimacheen | Silver-lead-zinc | 179,263 |
| Goodenough | Cody | Silver-lead-zinc | 45,668 |
| H.B. Mining Co. | Hall Creek | Silver-lead-zinc | 8,904 |
| Highland Lass Ltd. | Beaverdell | Silver-lead-zinc | 132,464 |
| Highland-Bell Ltd. | Beaverdell | Silver-lead-zinc | 1,554,611 |
| Horn Silver | Similkameen | Silver lead-zinc | 6,000 |
| Idaho-Alamo | Sandon | Silver-lead-zinc | 400,000 |
| Iron Mountain (Emerald) | Salmo | Silver-lead-zinc | 20,000 |
| Jackson | Retallack | Silver lead-zinc | 20,000 |
| Last Chance | Three Forks | Silver-lead-zinc | 213,000 |
| Lone Bachelor | Sandon | Silver-lead-zinc | 50,000 |
| Lucky Jim | Three Forks | Silver-lead-zinc | 80,000 |
| Mercury | Sandon | Silver-lead-zinc | 6,000 |
| Meteor | Slocan City | Silver-lead-zinc | 10,257 |
| Monitor and Ajax | Three Forks | Silver lead-zinc | 70,500 |
| Mountain Con. | Cody | Silver-lead-zinc | 71,387 |
| McAllister | Three Forks | Silver lead-zinc | 45,088 |
| Noble Five | Cody | Silver-lead-zinc | 72,859 |
| North Star | Kimberley | Silver-lead-zinc | 497,901 |
| No. One | Sandon | Silver lead-zinc | 6,754 |
| Ottawa | Slocan City | Silver lead-zinc | 110,429 |
| Payne | Sandon | Silver lead-zinc | 1,438,000 |
| Providence | Greenwood | Silver-lead-zinc | 142,238[3] |
| Queen Bess | Alamo | Silver lead-zinc | 25,000 |
| Rambler-Cariboo | Rambler | Silver-lead-zinc | 467,250 |
| Reeves MacDonald Mines Ltd. | Remac | Silver lead-zinc | 2,338,000 |
| Reco | Cody | Silver lead-zinc | 334,992 |
| Ruth Mines Ltd. | Sandon | Silver-lead-zinc | 125,490 |
| St. Eugene | Moyie | Silver-lead-zinc | 566,000 |
| Sheep Creek Mines Ltd. | Invermere | Silver-lead-zinc | 93,750 |
| Silversmith and Slocan Star[4] | Sandon | Silver-lead-zinc | 1,267,600 |
| Silver Standard Mines Ltd. | Hazelton | Silver-lead-zinc | 1,715,333 |
| Spokane-Trinket | Ainsworth | Silver-lead-zinc | 10,365 |
| Standard Silver Lead | Silverton | Silver-lead-zinc | 2,734,688 |
| Sunset and Trade Dollar | Retallack | Silver-lead-zinc | 88,000 |
| Sunshine Lardeau Mines Ltd. | Beaton | Silver-lead-zinc | 164,000 |
| Torbrit Silver Mines Ltd. | Alice Arm | Silver-lead-zinc | 390,000 |
| Utica | Kaslo | Silver-lead-zinc | 64,000 |
| Violamac Mines (B.C.) Ltd. | New Denver | Silver-lead-zinc | 850,000 |
| Wallace Mines Ltd. (Sally) | Beaverdell | Silver-lead-zinc | 135,000 |
| Washington | Rambler Station | Silver-lead-zinc | 20,000 |
| Western Exploration Co. Ltd. | Silverton | Silver-lead-zinc | 30,867 |
| Whitewater | Retallack | Silver-lead-zinc | 592,515 |
| Yale Lead and Zinc Mines Ltd. | Ainsworth | Silver-lead-zinc | 278,620 |
| Miscellaneous mines | | | 70,239 |
| Total, silver-lead-zinc mines | | | $498,765,637 |

[1] Includes $466,143 " return of capital " distribution prior to 1949.
[2] Earnings of several company mines, and customs smelter at Trail.
[3] Includes $10,504 paid in 1944 but not included in the yearly figure.
[4] These two properties were amalgamated as Silversmith Mines Limited in August, 1939.

TABLE XI.—DIVIDENDS PAID BY MINING COMPANIES, 1897–1958—*Continued*

*Copper Mines*

| Company or Mine | Locality | Class | Amount Paid |
|---|---|---|---|
| Britannia M. & S. Co.[1] | Britannia Beach | Copper | $18,803,772 |
| Canada Copper Corporation | Greenwood | Copper | 615,399 |
| Cornell | Texada Island | Copper | 8,500 |
| Granby Cons. M.S. & P. Co.[2] | Copper Mountain | Copper | 29,873,226 |
| Marble Bay | Texada Island | Copper | 175,000 |
| Hall Mines | Nelson | Copper | 233,280 |
| Miscellaneous mines | | Copper | 261,470 |
| Total, copper mines | | | $49,970,647 |

[1] The Britannia Mining and Smelting Co. Limited, a wholly owned subsidiary of the Howe Sound Company (Maine), paid the dividends shown to its parent company. On June 30th, 1958, consolidation between the Howe Sound Company (Maine) and Haile Mines Inc. became effective, bringing into existence Howe Sound Company (Delaware). The Britannia mine became a division of the new Howe Sound Company, and in August Britannia Mining and Smelting Co. was liquidated voluntarily.

[2] The Granby Consolidated Mining Smelting and Power Company dividends commenced in 1904 and cover all company activities in British Columbia to date. The figure includes all dividends, capital distributions, and interim liquidating payments, the latter being $4,500,000, paid, in 1936, prior to reorganization.

*Coal Mines*

| Company or Mine | Locality | Class | Amount Paid |
|---|---|---|---|
| Wellington Collieries Ltd. | Nanaimo | Coal | $16,000,000 |
| Bulkley Valley Collieries Ltd. | Telkwa | Coal | 24,000 |
| Crow's Nest Pass Coal Co. Ltd. | Fernie | Coal | 16,719,198 |
| Canadian Collieries Resources Ltd. | Nanaimo | Coal | 828,271 |
| Total, coal mines | | | $33,571,469 |

*Aggregate of All Classes*

| | |
|---|---|
| Lode-gold mining | $77,674,997 |
| Silver-lead-zinc mining and smelting | 498,765,637 |
| Copper-mining | 49,970,647 |
| Coal-mining | 33,571,469 |
| Miscellaneous, structural, and placer gold | 7,675,670 |
| Total | $667,658,420 |

NOTE.—The term "miscellaneous" noted in each class of dividend covers all payments of $5,000 and under, together with payments made by companies or individuals requesting that the item be not disclosed.

In compiling the foregoing table of dividends paid, the Department wishes to acknowledge the kind assistance given by companies, individuals, and trade journals in giving information on the subject.

## TABLE XII.—PRINCIPAL ITEMS OF EXPENDITURE, REPORTED FOR OPERATIONS OF ALL CLASSES

| Class | Salaries and Wages | Fuel and Electricity | Process Supplies |
|---|---|---|---|
| Lode-mining | $32,284,917 | $4,485,205 | $10,553,781 |
| Placer-mining | 9,887 | 554 | 2,100 |
| Fuels—coal, coke and gas plants, petroleum and natural gas | 7,592,307 | 623,826 | 2,414,734 |
| Miscellaneous metals and industrial minerals | 4,276,071 | 851,638 | 934,417 |
| Structural materials industry | 4,770,378 | 2,119,766 | 1,148,004 |
| **Totals, 1958** | **$48,933,560** | **$8,080,989** | **$15,053,036** |
| Totals, 1957 | 56,469,056 | 8,937,567 | 24,257,177 |
| 1956 | 57,266,026 | 9,762,777 | 22,036,839 |
| 1955 | 51,890,246 | 9,144,034 | 21,131,572 |
| 1954 | 48,702,746 | 7,128,669 | 19,654,724 |
| 1953 | 55,543,490 | 8,668,099 | 20,979,411 |
| 1952 | 62,256,631 | 8,557,845 | 27,024,500 |
| 1951 | 52,607,171 | 7,283,051 | 24,724,101 |
| 1950 | 42,738,035 | 6,775,998 | 17,500,663 |
| 1949 | 41,023,786 | 7,206,637 | 17,884,408 |
| 1948 | 38,813,506 | 6,139,470 | 11,532,121 |
| 1947 | 32,160,338 | 5,319,470 | 13,068,948 |
| 1946 | 26,190,200 | 5,427,458 | 8,367,705 |
| 1945 | 22,620,975 | 7,239,726 | 5,756,628 |
| 1944 | 23,131,874 | 5,788,671 | 6,138,084 |
| 1943 | 26,051,467 | 7,432,585 | 6,572,317 |
| 1942 | 26,913,160 | 7,066,109 | 6,863,398 |
| 1941 | 26,050,491 | 3,776,747 | 7,260,441 |
| 1940 | 23,391,330 | 3,474,721 | 6,962,162 |
| 1939 | 22,357,035 | 3,266,000 | 6,714,347 |
| 1938 | 22,765,711 | 3,396,106 | 6,544,500 |
| 1937 | 21,349,690 | 3,066,311 | 6,845,330 |
| 1936 | 17,887,619 | 2,724,144 | 4,434,501 |
| 1935 | 16,753,367 | 2,619,639 | 4,552,730 |
| Grand totals, 1935–58 | $863,807,510 | $148,282,527 | $311,859,643 |

NOTE.—"Process Supplies" include explosives, chemicals, drill-steel, lubricants, etc.

## TABLE XIII.—AVERAGE NUMBER EMPLOYED IN THE MINING INDUSTRY, 1901–58

| Year | Placer-mining | Lode-mining | | | In Concentrators | In Smelters | Coal-mining | | | Structural Materials | | Miscellaneous | Total[1] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Under | Above | Total | | | Under | Above | Total | Quarries and Pits | Plants | | |
| 1901 | ..... | 2,736 | 1,212 | 3,948 | ..... | ..... | 3,041 | 931 | 3,974 | ..... | ..... | ..... | 7,922 |
| 1902 | ..... | 2,219 | 1,126 | 3,345 | ..... | ..... | 3,101 | 910 | 4,011 | ..... | ..... | ..... | 7,356 |
| 1903 | ..... | 1,662 | 1,088 | 2,750 | ..... | ..... | 3,137 | 1,127 | 4,264 | ..... | ..... | ..... | 7,014 |
| 1904 | ..... | 2,143 | 1,163 | 3,306 | ..... | ..... | 3,278 | 1,175 | 4,453 | ..... | ..... | ..... | 7,759 |
| 1905 | ..... | 2,470 | 1,240 | 3,710 | ..... | ..... | 3,127 | 1,280 | 4,407 | ..... | ..... | ..... | 8,117 |
| 1906 | ..... | 2,680 | 1,303 | 3,983 | ..... | ..... | 3,415 | 1,390 | 4,805 | ..... | ..... | ..... | 8,788 |
| 1907 | ..... | 2,704 | 1,239 | 3,943 | ..... | ..... | 2,862 | 907 | 3,769 | ..... | ..... | ..... | 7,712 |
| 1908 | ..... | 2,567 | 1,127 | 3,694 | ..... | ..... | 4,432 | 1,641 | 6,073 | ..... | ..... | ..... | 9,767 |
| 1909 | ..... | 2,184 | 1,070 | 3,254 | ..... | ..... | 4,713 | 1,705 | 6,418 | ..... | ..... | ..... | 9,672 |
| 1910 | ..... | 2,472 | 1,237 | 3,709 | ..... | ..... | 5,903 | 1,855 | 7,758 | ..... | ..... | ..... | 11,467 |
| 1911 | ..... | 2,435 | 1,159 | 3,594 | ..... | ..... | 5,212 | 1,661 | 6,873 | ..... | ..... | ..... | 10,467 |
| 1912 | ..... | 2,472 | 1,364 | 3,837 | ..... | ..... | 5,275 | 1,855 | 7,130 | ..... | ..... | ..... | 10,967 |
| 1913 | ..... | 2,773 | 1,505 | 4,278 | ..... | ..... | 4,950 | 1,721 | 6,671 | ..... | ..... | ..... | 10,949 |
| 1914 | ..... | 2,741 | 1,433 | 4,174 | ..... | ..... | 4,267 | 1,465 | 5,732 | ..... | ..... | ..... | 9,906 |
| 1915 | ..... | 2,709 | 1,435 | 4,144 | ..... | ..... | 3,708 | 1,283 | 4,991 | ..... | ..... | ..... | 9,135 |
| 1916 | ..... | 3,357 | 2,036 | 5,393 | ..... | ..... | 3,694 | 1,366 | 5,060 | ..... | ..... | ..... | 10,453 |
| 1917 | ..... | 3,290 | 2,198 | 5,488 | ..... | ..... | 3,760 | 1,410 | 5,170 | ..... | ..... | ..... | 10,658 |
| 1918 | ..... | 2,626 | 1,764 | 4,390 | ..... | ..... | 3,658 | 1,769 | 5,247 | ..... | ..... | ..... | 9,637 |
| 1919 | ..... | 2,513 | 1,746 | 4,259 | ..... | ..... | 4,143 | 1,821 | 5,966 | ..... | ..... | ..... | 10,225 |
| 1920 | ..... | 2,074 | 1,605 | 3,679 | ..... | ..... | 4,191 | 2,158 | 6,349 | ..... | ..... | ..... | 10,028 |
| 1921 | ..... | 1,355 | 975 | 2,330 | ..... | ..... | 4,722 | 2,163 | 6,885 | ..... | ..... | ..... | 9,215 |
| 1922 | ..... | 1,510 | 1,239 | 2,749 | ..... | ..... | 4,712 | 1,932 | 6,644 | ..... | ..... | ..... | 9,393 |
| 1923 | ..... | 2,102 | 1,516 | 3,618 | ..... | ..... | 4,342 | 1,807 | 6,149 | ..... | ..... | ..... | 9,767 |
| 1924 | ..... | 2,353 | 1,680 | 4,033 | ..... | ..... | 3,894 | 1,524 | 5,418 | ..... | ..... | ..... | 9,451 |
| 1925 | ..... | 2,298 | 2,840 | 5,138 | ..... | ..... | 3,828 | 1,615 | 5,443 | ..... | ..... | ..... | 10,581 |
| 1926 | 299 | 2,606 | 1,735 | 4,341 | 808 | 2,461 | 3,757 | 1,565 | 5,322 | 493 | 324 | 124 | 14,172 |
| 1927 | 415 | 2,671 | 1,916 | 4,587 | 854 | 2,842 | 3,646 | 1,579 | 5,225 | 647 | 138 | 122 | 14,830 |
| 1928 | 355 | 2,707 | 2,469 | 5,176 | 911 | 2,748 | 3,814 | 1,520 | 5,334 | 412 | 368 | 120 | 15,424 |
| 1929 | 341 | 2,926 | 2,052 | 4,978 | 966 | 2,948 | 3,675 | 1,353 | 5,028 | 492 | 544 | 268 | 15,565 |
| 1930 | 425 | 2,316 | 1,260 | 3,576 | 832 | 3,197 | 3,389 | 1,256 | 4,645 | 843 | 344 | 170 | 14,032 |
| 1931 | 685 | 1,463 | 834 | 2,297 | 581 | 3,157 | 2,957 | 1,125 | 4,082 | 460 | 526 | 380 | 12,171 |
| 1932 | 874 | 1,355 | 900 | 2,255 | 542 | 2,036 | 2,628 | 980 | 3,608 | 536 | 329 | 344 | 10,524 |
| 1933 | 1,134 | 1,786 | 1,335 | 3,121 | 531 | 2,436 | 2,241 | 853 | 3,094 | 376 | 269 | 408 | 11,369 |
| 1934 | 1,122 | 2,706 | 1,729 | 4,525 | 631 | 2,890 | 2,050 | 843 | 2,893 | 377 | 187 | 360 | 12,985 |
| 1935 | 1,291 | 2,749 | 1,497 | 4,237 | 907 | 2,771 | 2,145 | 826 | 2,971 | 536 | 270 | 754 | 13,737 |
| 1936 | 1,124 | 2,959 | 1,840 | 4,799 | 720 | 2,678 | 2,015 | 799 | 2,814 | 931 | 288 | 825 | 14,179 |
| 1937 | 1,371 | 3,603 | 1,818 | 5,421 | 1,168 | 3,027 | 2,286 | 867 | 3,153 | 724 | 327 | 938 | 16,129 |
| 1938 | 1,303 | 3,849 | 2,266 | 6,115 | 919 | 3,158 | 2,088 | 874 | 2,962 | 900 | 295 | 369 | 16,021 |
| 1939 | 1,252 | 3,905 | 2,050 | 5,955 | 996 | 3,187 | 2,167 | 809 | 2,976 | 652 | 311 | 561 | 15,880 |
| 1940 | 1,004 | 3,923 | 2,104 | 6,027 | 1,048 | 2,944 | 2,175 | 699 | 2,874 | 827 | 334 | 647 | 15,705 |
| 1941 | 939 | 3,901 | 1,823 | 5,724 | 1,025 | 3,072 | 2,229 | 494 | 2,723 | 766 | 418 | 422 | 15,084 |
| 1942 | 489 | 2,920 | 1,504 | 4,424 | 960 | 3,555 | 1,892 | 468 | 2,360 | 842 | 378 | 262 | 13,270 |
| 1943 | 212 | 2,394 | 1,699 | 4,093 | 891 | 2,835 | 2,240 | 611 | 2,851 | 673 | 326 | 567 | 12,448 |
| 1944 | 255 | 1,896 | 1,825 | 3,721 | 849 | 2,981 | 2,150 | 689 | 2,839 | 690 | 351 | 628 | 12,314 |
| 1945 | 209 | 1,933 | 1,750 | 3,683 | 822 | 2,834 | 1,927 | 503 | 2,430 | 921 | 335 | 586 | 11,820 |
| 1946 | 347 | 1,918 | 1,817 | 3,735 | 872 | 2,813 | 1,773 | 532 | 2,305 | 827 | 555 | 679 | 11,933 |
| 1947 | 360 | 3,024 | 2,238 | 5,262 | 966 | 3,461 | 1,694 | 731 | 2,425 | 977 | 585 | 869 | 14,899 |
| 1948 | 348 | 3,143 | 2,429 | 5,572 | 1,126 | 3,884 | 1,594 | 872 | 2,466 | 1,591 | 656 | 754 | 16,397 |
| 1949 | 303 | 3,034 | 2,724 | 5,758 | 1,203 | 3,763 | 1,761 | 545 | 2,306 | 2,120 | 542 | 626 | 16,621 |
| 1950 | 327 | 3,399 | 2,415 | 5,814 | 1,259 | 3,759 | 1,745 | 516 | 2,261 | 1,916 | 616 | 660 | 16,612 |
| 1951 | 295 | 3,785 | 3,695 | 7,480 | 1,307 | 4,044 | 1,462 | 463 | 1,925 | 1,783 | 628 | 491 | 17,863 |
| 1952 | 280 | 4,171 | 3,923 | 8,094 | 1,516 | 4,120 | 1,280 | 401 | 1,681 | 1,530 | 557 | 529 | 18,257 |
| 1953 | 132 | 3,145 | 2,589 | 5,734 | 1,371 | 3,991 | 1,154 | 396 | 1,550 | 1,909 | 559 | 634 | 15,790 |
| 1954 | 199 | 2,844 | 2,520 | 5,164 | 1,129 | 3,119 | 1,076 | 358 | 1,434 | 1,861 | 638 | 584 | 14,128 |
| 1955 | 103 | 2,564 | 2,553 | 5,117 | 1,091 | 3,304 | 1,100 | 378 | 1,478 | 1,846 | 641 | 722 | 14,102 |
| 1956 | 105 | 2,637 | 2,827 | 5,464 | 1,043 | 3,339 | 988 | 398 | 1,386 | 1,598 | 770 | 854 | 14,539 |
| 1957 | 67 | 2,393 | 2,447 | 4,840 | 838 | 3,328 | 1,020 | 360 | 1,380 | 1,705 | 625 | 474 | 13,257 |
| 1958 | 75 | 1,919 | 1,809 | 3,728 | 625 | 3,081 | 828 | 260 | 1,088 | 1,483 | 677 | 446 | 11,201 |

[1] The average number employed in the industry is the sum of the averages for individual companies. The average for each company is obtained by taking the sum of the numbers employed each month and dividing by 12, regardless of the number of months worked.

## TABLE XIV.—LODE-METAL MINES—TONNAGE, NUMBER OF MINES, NET AND GROSS VALUE OF PRINCIPAL METALS,[4] 1901–58

| Year | Tonnage[1] | Number of Shipping Mines | Number of Mines Shipping over 100 Tons | Gross Value as Reported by Shipper[2] | Freight and Treatment[2] | Net Value to Shipper[3] | Gross Value of Lode Metals Produced[4] |
|---|---|---|---|---|---|---|---|
| 1901 | 926,162 | 119 | 78 | ..... | ..... | ..... | $13,287,947 |
| 1902 | 1,009,016 | 124 | 75 | ..... | ..... | ..... | 11,136,162 |
| 1903 | 1,288,466 | 125 | 74 | ..... | ..... | ..... | 11,579,382 |
| 1904 | 1,461,609 | 142 | 76 | ..... | ..... | ..... | 12,309,035 |
| 1905 | 1,706,679 | 146 | 79 | ..... | ..... | ..... | 15,180,164 |
| 1906 | 1,963,872 | 154 | 77 | ..... | ..... | ..... | 17,484,102 |
| 1907 | 1,805,614 | 147 | 72 | ..... | ..... | ..... | 16,222,097 |
| 1908 | 2,083,606 | 108 | 59 | ..... | ..... | ..... | 14,477,411 |
| 1909 | 2,057,713 | 89 | 52 | ..... | ..... | ..... | 14,191,141 |
| 1910 | 2,216,428 | 83 | 50 | ..... | ..... | ..... | 13,228,731 |
| 1911 | 1,770,755 | 80 | 45 | ..... | ..... | ..... | 11,454,063 |
| 1912 | 2,688,532 | 86 | 51 | ..... | ..... | ..... | 17,662,766 |
| 1913 | 2,663,809 | 110 | 58 | ..... | ..... | ..... | 17,190,838 |
| 1914 | 2,175,971 | 98 | 56 | ..... | ..... | ..... | 15,225,061 |
| 1915 | 2,720,669 | 132 | 59 | ..... | ..... | ..... | 19,992,149 |
| 1916 | 3,229,942 | 169 | 81 | ..... | ..... | ..... | 31,483,014 |
| 1917 | 2,797,368 | 193 | 87 | ..... | ..... | ..... | 26,788,474 |
| 1918 | 2,912,516 | 175 | 80 | ..... | ..... | ..... | 27,595,278 |
| 1919 | 2,146,920 | 144 | 74 | ..... | ..... | ..... | 19,756,648 |
| 1920 | 2,215,445 | 121 | 60 | ..... | ..... | ..... | 19,451,725 |
| 1921 | 1,586,428 | 80 | 35 | ..... | ..... | ..... | 12,925,448 |
| 1922 | 1,592,163 | 98 | 33 | ..... | ..... | ..... | 19,228,257 |
| 1923 | 2,447,672 | 77 | 28 | ..... | ..... | ..... | 25,348,399 |
| 1924 | 3,413,912 | 86 | 37 | ..... | ..... | ..... | 35,538,247 |
| 1925 | 3,849,269 | 102 | 40 | ..... | ..... | ..... | 46,200,135 |
| 1926 | 4,775,327 | 138 | 55 | ..... | ..... | $38,558,613 | 51,508,081 |
| 1927 | 5,416,411 | 132 | 52 | ..... | ..... | 27,750,364 | 44,977,082 |
| 1928 | 6,241,672 | 110 | 49 | ..... | ..... | 29,070,075 | 48,281,825 |
| 1929 | 6,977,903 | 106 | 48 | ..... | ..... | 34,713,887 | 51,720,436 |
| 1930 | 6,804,276 | 68 | 32 | ..... | ..... | 21,977,688 | 41,292,980 |
| 1931 | 5,549,622 | 44 | 22 | ..... | ..... | 10,513,931 | 22,900,229 |
| 1932 | 4,354,904 | 75 | 29 | ..... | ..... | 7,075,393 | 19,705,043 |
| 1933 | 4,063,775 | 109 | 47 | ..... | ..... | 13,976,358 | 25,057,007 |
| 1934 | 5,141,744 | 145 | 69 | ..... | ..... | 20,243,278 | 34,071,955 |
| 1935 | 4,927,204 | 177 | 72 | ..... | ..... | 25,407,914 | 40,662,633 |
| 1936 | 4,381,173 | 168 | 70 | ..... | ..... | 30,051,207 | 43,813,898 |
| 1937 | 6,145,244 | 185 | 113 | $48,617,920 | $4,663,843 | 43,954,077 | 62,950,536 |
| 1938 | 7,377,117 | 211 | 92 | 40,222,237 | 4,943,754 | 35,278,483 | 53,878,093 |
| 1939 | 7,212,171 | 217 | 99 | 45,133,788 | 4,416,919 | 40,716,869 | 53,554,092 |
| 1940 | 7,949,736 | 216 | 92 | 50,004,909 | 6,334,611 | 43,670,298 | 61,735,604 |
| 1941 | 8,007,937 | 200 | 96 | 52,354,870 | 5,673,048 | 46,681,822 | 62,607,882 |
| 1942 | 6,894,844 | 126 | 76 | 50,494,041 | 5,294,637 | 45,199,404 | 59,694,192 |
| 1943 | 5,786,864 | 48 | 32 | 37,234,070 | 3,940,367 | 33,293,703 | 52,651,868 |
| 1944 | 4,879,851 | 51 | 31 | 29,327,114 | 2,877,706 | 26,449,408 | 39,369,738 |
| 1945 | 4,377,722 | 36 | 27 | 34,154,917 | 2,771,292 | 31,383,625 | 48,724,001 |
| 1946 | 3,705,594 | 50 | 32 | 48,920,971 | 2,904,130 | 46,016,841 | 56,653,485 |
| 1947 | 5,011,271 | 75 | 33 | 81,033,093 | 4,722,010 | 76,311,087 | 93,124,847 |
| 1948 | 5,762,321 | 97 | 51 | 118,713,859 | 18,585,183 | 100,128,727 | 121,696,891 |
| 1949 | 6,125,460 | 118 | 54 | 99,426,678 | 19,613,185 | 79,814,604 | 107,775,413 |
| 1950 | 6,802,482 | 112 | 58 | 108,864,792 | 22,113,431 | 86,751,361 | 113,464,619 |
| 1951 | 6,972,400 | 119 | 64 | 142,590,427 | 25,096,743 | 117,493,684 | 147,646,989 |
| 1952 | 9,174,617 | 95 | 58 | 140,070,389 | 30,444,575 | 106,601,451 | 144,151,515 |
| 1953 | 9,660,281 | 80 | 48 | 94,555,069 | 27,815,152 | 66,739,892 | 123,619,837 |
| 1954 | 8,513,865 | 63 | 40 | 106,223,833 | 29,135,673 | 77,088,160 | 120,829,789 |
| 1955 | 9,126,902 | 53 | 34 | 119,039,285 | 30,696,044 | 88,343,241 | 138,145,095 |
| 1956 | 8,827,037 | 70 | 40 | 125,043,590 | 31,933,681 | 93,110,262 | 143,546,586 |
| 1957 | 7,282,436 | 59 | 40 | 95,644,930 | 30,273,900 | 65,370,185 | 119,409,764 |
| **1958** | **6,402,198** | **47** | **28** | **83,023,111** | **28,068,396** | **54,955,069** | **100,591,049** |

[1] Includes ores of iron, mercury, nickel, tungsten, and silica (flux).

[2] Data not collected before 1937.

[3] Previous to 1937 the shipper reported "Net Value at Shipping Point," no indication being given as to how the net value was computed. From 1937 on, the shipper has reported "Gross Value," from which deduction of freight and treatment gives "Net Value."

[4] Gross value calculated by valuing gold, silver, copper, lead, zinc, mercury (1938–44, 1955), and nickel (1936–37, 1958) at yearly average prices, and iron (1901–03, 1907, 1918–23, 1928, 1948–58) and tungsten (1939–45, 1947–58) at values given by operators.

## TABLE XV.—LODE-METAL PRODUCTION IN 1958

| Property or Operator | Location of Mine | Owner or Agent | Ore Shipped or Treated | Product Shipped | Gross Metal Contents | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Gold | Silver | Copper | Lead | Zinc | Cadmium |
| **NORTHERN BRITISH COLUMBIA** | | | | | | | | | | |
| *Atlin Mining Division* | | | Tons | | Oz. | Oz. | Lb. | Lb. | Lb. | Lb. |
| *Nil* | | | | | | | | | | |
| *Liard Mining Division* | | | | | | | | | | |
| *Nil* | | | | | | | | | | |
| **CENTRAL BRITISH COLUMBIA** | | | | | | | | | | |
| *Cariboo Mining Division* | | | | | | | | | | |
| Cariboo Gold Quartz and Aurum | Wells | The Cariboo Gold Quartz Mining Co. Ltd., Vancouver | 66,880 | Bullion | 27,892 | 3,682 | | | | |
| *Clinton Mining Division* | | | | | | | | | | |
| *Nil* | | | | | | | | | | |
| *Omineca Mining Division* | | | | | | | | | | |
| Cronin Babine | Smithers | New Cronin Babine Mines Ltd., Vancouver | 123 | Crude ore, 123 tons; lead concentrates, 9 tons | 6 | 6,169 | | 70,481 | 68,143 | |
| Silver Standard | Hazelton | Silver Standard Mines Ltd., Vancouver | 5,044 | Lead concentrates, 543 tons; zinc concentrates, 970 tons | 267 | 178,347 | 17,837 | 492,040 | 1,065,717 | 16,766 |
| **COAST AND ISLANDS** | | | | | | | | | | |
| *Alberni Mining Division* | | | | | | | | | | |
| Buccaneer and Musketeer | Tofino | Bedwell River Gold Mines Ltd., Vancouver | 100[1] | Concentrates, 5 tons | 33 | 29 | 31 | 470 | | |
| *Nanaimo Mining Division* | | | | | | | | | | |
| Merry Widow No. 5 and Kingfisher | Benson Lake | Empire Development Co. Ltd., Vancouver | 572,404 | Iron-ore concentrates, 272,495 tons | | | | | | |
| Prescott, Paxton, Yellow Kid, Yellow Jacket | Texada Island | Texada Mines Ltd., Vancouver | 709,731 | Iron-ore concentrates, 357,776 tons; copper concentrates, 3,338 tons | 948 | 11,035 | 873,639 | | | |

[1] Estimate.

## TABLE XV.—LODE-METAL PRODUCTION IN 1958—*Continued*

| Property or Operator | Location of Mine | Owner or Agent | Ore Shipped or Treated | Product Shipped | Gross Metal Contents | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Gold | Silver | Copper | Lead | Zinc | Cadmium |
| *New Westminster Mining Division* | | | Tons | | Oz. | Oz. | Lb. | Lb. | Lb. | Lb. |
| Pride of Emory | Choate | Western Nickel Ltd., Vancouver | 131,133 | Nickel concentrates, 7,598 tons containing 1,776,183 lb. nickel; copper concentrates, 729 tons | | | 744,657 | | | |
| *Skeena Mining Division* | | | | | | | | | | |
| Silbak Premier | Premier | Silbak Premier Mines Ltd., Vancouver | | Salvage—concentrates, 100 tons | 250 | 1,032 | | 8,515 | 9,910 | |
| Toric | Kitsault River | Torbrit Silver Mines Ltd., Toronto | 135,892 | Silver-lead concentrates, 1,872 tons; silver bullion | | 1,331,088 | | 1,506,849 | | |
| *Vancouver Mining Division* | | | | | | | | | | |
| Britannia | Britannia Beach | Britannia Mining & Smelting Co. Ltd., Britannia Beach (placed in voluntary liquidation, August 8, 1958) | 66,863 | Copper concentrates and precipitates, 6,882 tons; zinc concentrates, 3,048 tons; iron pyrite concentrates, 12,042 tons | 2,585 | 19,302 | 4,485,078 | 171,685 | 3,496,446 | 18,593 |
| *Victoria Mining Division* | | | | | | | | | | |
| Blue Grouse | Cowichan Lake | Cowichan Copper Co. Ltd., Lake Cowichan | 96,029 | Copper concentrates, 7,778 tons | | 25,608 | 4,363,335 | | | |
| SOUTH CENTRAL BRITISH COLUMBIA | | | | | | | | | | |
| *Greenwood Mining Division* | | | | | | | | | | |
| Highland-Bell | Beaverdell | Highland-Bell Ltd., Vancouver | 18,729 | Lead concentrates, 1,698 tons; zinc concentrates, 637 tons; jig concentrates, 217 tons | 487 | 900,669 | | 728,142 | 858,071 | 6,158 |
| Providence | Greenwood | S. J. and J. S. Kleman, Greenwood | 13 | Crude ore | 8 | 2,363 | | 916 | 655 | |
| *Kamloops Mining Division* | | | | | | | | | | |
| *Nil* | | | | | | | | | | |
| *Lillooet Mining Division* | | | | | | | | | | |
| Bralorne | Bridge River | Bralorne Mines Ltd., Vancouver | 146,358 | Bullion; gold concentrates, 3,009 tons | 99,489 | 21,119 | | | | |
| Elizabeth Group | Yalakom River | W. H. White, Vancouver | 9 | Crude ore | 5 | 5 | | 53 | 18 | |
| Pioneer | Bridge River | Pioneer Gold Mines of B.C. Ltd., Vancouver | 105,442 | Bullion | 49,853 | 10,799 | | | | |
| *Nicola Mining Division* | | | | | | | | | | |
| *Nil* | | | | | | | | | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| *Osoyoos Mining Division* | | | | | | | | | | |
| Fairview | Oliver | Consolidated Mining & Smelting Co. of Canada, Ltd., Trail | 35,708 | Silica flux | | | | | | |
| French | Hedley | French Mines Ltd., Vancouver | 13,820 | Bullion | 8,607 | 657 | | | | |
| Horn Silver | Keremeos | Canada Radium Corporation Ltd., Toronto | 54 | Siliceous ore | 15 | 3,684 | | 718 | 714 | |
| Nickel Plate | Hedley | W. B. Graham, Hedley, lessee, from Kelowna Mines Hedley Ltd. | | Salvage—concentrates, 16 tons | 140 | 31 | 131 | | | |
| *Similkameen Mining Division* | | | | | | | | | | |
| Copper Mountain | Copper Mountain | Granby Cons. M.S. & P. Co. Ltd., Copper Mountain | | Mill clean-up, 108 tons | 441 | 154 | 8,483 | | | |
| *Vernon Mining Division* | | | | | | | | | | |
| *Nil* | | | | | | | | | | |
| SOUTHEASTERN BRITISH COLUMBIA | | | | | | | | | | |
| *Fort Steele Mining Division* | | | | | | | | | | |
| Estella | Wasa | United Estella Ltd., Vancouver | | Lead concentrates, 29 tons; zinc concentrates, 57 tons clean-up | | 486 | | 31,032 | 66,900 | 179 |
| Sullivan | Kimberley | Consolidated Mining & Smelting Co. of Canada, Ltd., Trail | 2,443,884 | Lead concentrates, 121,198 tons; zinc concentrates, 285,936 tons; tin concentrates, 610 tons | 314 | 3,102,951 | 428,600 | 205,413,400 | 273,913,600 | |
| *Golden Mining Division* | | | | | | | | | | |
| L.T. | Invermere | E. L. Tegart, Invermere | 4 | Crude ore (dump) | | 177 | | 3,913 | 185 | |
| Mineral King and Paradise | Toby Creek | Sheep Creek Mines Ltd., Nelson | 192,426 | Lead concentrates, 5,225 tons; zinc concentrates, 16,115 tons | | 98,966 | 178,456 | 6,452,482 | 18,104,313 | 77,834 |
| Ptarmigan | Horsethief Creek | Selkirk Ptarmigan Mines Ltd., Edgewater | 181 | Crude ore | 60 | 41,871 | | 1,010 | 1,580 | |
| *Nelson Mining Division* | | | | | | | | | | |
| Arlington | Erie | G. D. Fox and R. W. Linn, Trail | 30 | Mill clean-up; crude ore and siliceous ore, 29 tons | 22 | 63 | | 1,258 | 1,408 | |
| Emerald-Feeney-Dodger | Salmo | Canadian Exploration Ltd., Vancouver | 64,114 | Tungsten concentrates, 34,549 units $WO_3$ | | | | | | |
| Gold Belt | Salmo | A. Endersby, Fruitvale | 217 | Siliceous ore | 30 | 104 | | 693 | 434 | |
| H.B. | Salmo | Consolidated Mining & Smelting Co. of Canada, Ltd., Trail | 458,213 | Lead concentrates, 5,892 tons; zinc concentrates, 36,162 tons | | 83,024 | | 8,308,920 | 40,764,400 | 353,206 |
| Jersey | Salmo | Canadian Exploration Ltd., Vancouver | 383,458 | Lead concentrates, 10,296 tons; zinc concentrates, 18,488 tons | | 47,772 | | 16,541,417 | 22,102,831 | 172,115 |
| Kootenay Belle | Salmo | M. Arishenkoff, Shoreacres | 15 | Crude ore | 1 | 36 | | 290 | 29 | |
| Nugget | Salmo | A. Endersby, Sr., and A. Endersby, Jr., Fruitvale | 154 | Siliceous ore | 38 | 57 | | 363 | 464 | |
| Reeves MacDonald | Remac | Reeves MacDonald Mines Ltd., Vancouver | 417,076 | Lead concentrates, 5,168 tons; zinc concentrates, 25,901 tons | | 23,520 | | 7,973,619 | 28,220,124 | 155,937 |
| Silver King | Nelson | A. Burgess, Ymir | 18 | Crude ore | 1 | 194 | | 2,187 | 1,578 | |
| Sun group | Nelson | W. Rozan and R. Gautier, Nelson | 6 | Crude ore | 13 | 4 | | 25 | 25 | |

## TABLE XV.—LODE-METAL PRODUCTION IN 1958—*Continued*

| Property or Operator | Location of Mine | Owner or Agent | Ore Shipped or Treated | Product Shipped | Gross Metal Contents | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Gold | Silver | Copper | Lead | Zinc | Cadmium |
| *Revelstoke Mining Division* | | | Tons | | Oz. | Oz. | Lb. | Lb. | Lb. | Lb. |
| Spider, Eclipse | Camborne | Sunshine Lardeau Mines Ltd., Vancouver | 11,889 | Lead concentrates, 1,256 tons; zinc concentrates, 1,544 tons; crude ore, 470 tons | 1,136 | 143,894 | | 1,909,247 | 2,016,995 | |
| *Slocan Mining Division* | | | | | | | | | | |
| Black Diamond | Ainsworth | G. Hobbs and J. Hawes, Ainsworth | 3 | Crude ore | | 253 | | 3,506 | 648 | |
| Bluebell | Riondel | Consolidated Mining & Smelting Co. of Canada, Ltd., Trail | 255,859 | Lead concentrates, 18,759 tons; zinc concentrates, 31,344 tons | | 363,156 | 320,757 | 27,545,899 | 31,792,649 | 149,421 |
| Caledonia | Blaylock | Caledonia Mines Ltd., Kaslo | 157 | Lead concentrates, 14 tons; zinc concentrates, 8 tons; crude ore, 5 tons | 1 | 2,010 | | 24,970 | 12,476 | 40 |
| Fisher Maiden | Silverton | F. Mills and F. Dewis, Silverton | 216 | Crude ore | | 2,373 | | 9,169 | 28,795 | 203 |
| Highlander | Ainsworth | Yale Lead & Zinc Mines Ltd., Ainsworth | 51,460 | Lead concentrates, 3,996 tons; zinc concentrates, stockpiled, 995 tons | 21 | 88,847 | | 6,052,922 | 170,343 | |
| Laura M. | Ainsworth | M. B. Sirak, Ainsworth | 1,074 | Lead concentrates, 108 tons; zinc concentrates, 36 tons; crude ore, 124 tons | | 3,782 | | 272,867 | 6,219 | 167 |
| Little Phil | Ainsworth | T. Lane, Ainsworth | 13 | Crude ore | | 288 | | 10,447 | 1,398 | |
| Lucky Jim | Zincton | Lucky Four Leasers, New Denver | 658 | Lead concentrates, 28 tons; zinc concentrates, 53 tons; crude ore 7 tons | 1 | 2,851 | | 43,643 | 64,054 | 374 |
| McAllister | Silverton | M. Tarnowski and E. De Rosa, Silverton | 2 | Crude ore from dump | | 225 | | 57 | 25 | |
| Noonday-Curley | Silverton | K. Millar, Silverton | 88 | Lead concentrates, 6 tons; zinc concentrates, 12 tons; crude ore, 4 tons | | 670 | | 9,099 | 14,993 | 529 |
| Ottawa | Slocan | Yukon Western Mining & Prospecting Co. Ltd., Edmonton | 28 | Crude ore | 1 | 4,200 | | 342 | 204 | |
| Silversmith, Ruth Hope, Slocan Star | Sandon | Lessees from Carnegie Mining Corporation, Sandon | 640 | Lead concentrates, 26 tons; zinc concentrates, 70 tons; crude ore, 109 tons | 5 | 16,478 | | 157,614 | 99,770 | 553 |
| Silver Mountain | Sandon | Silver Mountain Mines Ltd., Sandon | 10 | Crude ore | | 736 | | 11,903 | 393 | |
| Spokane | Ainsworth | T. Lane, Ainsworth | 3 | Crude ore | | 22 | | 2,130 | 826 | |
| Mammoth, Monarch | Silverton | Western Exploration Co. Ltd., Silverton, and lessees | 13,326 | Lead concentrates, 1,041 tons; zinc concentrates, 1,232 tons | 41 | 204,675 | | 1,423,405 | 1,471,671 | 11,220 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Utica | Kaslo Creek | J. A. Cooper, Kaslo; Lajo Mines Ltd., Vancouver | 150 | Lead concentrates, 71 tons; zinc concentrates, 63 tons | 1 | 10,435 | ..... | 30,218 | 92,176 | 396 |
| Van Roi, Hewitt | Silverton | Slocan Van Roi Mines Ltd. and lessees | 364 | Lead concentrates, 31 tons; zinc concentrates, 50 tons; crude ore, 15 tons | 2 | 9,940 | ..... | 51,895 | 63,659 | 457 |
| Victor | Sandon | Violamac Mines Ltd., New Denver | 9,037 | Lead concentrates, 1,409 tons; zinc concentrates, 1,147 tons; crude ore, 177 tons | 165 | 217,489 | ..... | 2,264,970 | 1,433,740 | 8,891 |
| Westmont | Silverton | Chexdeco Mining Ltd., Silverton; Silver King Mining Co. Ltd., Silverton | 445 | Lead concentrates, 17 tons; zinc concentrates, 11 tons; crude ore, 218 tons | 4 | 13,215 | ..... | 41,283 | 61,283 | 113 |
| *Trail Creek Mining Division* | | | | | | | | | | |
| W.D. | Trail | E. Wells and F. Donelly, Trail | 1,140 | Crude ore | 649 | 230 | ..... | 2,957 | 997 | ..... |

## TABLE XVI.—LODE-METAL MINES EMPLOYING AN AVERAGE OF TEN OR MORE MEN DURING 1958[1]

| Name of Mine or Operator | Days Operating | | Tons | | Average Number Employed | |
|---|---|---|---|---|---|---|
| | Mine | Mill | Mined | Milled | Mine | Mill |
| *Shipping Mines* | | | | | | |
| Cariboo Gold Quartz Mining Co. Ltd. | 280 | 365 | 66,880 | 66,880 | 175 | 13 |
| Silver Standard Mines Ltd. | 105 | 89 | 5,044 | 5,044 | 24 | 5 |
| Torbrit Silver Mines Ltd. | 365 | 365 | 135,892 | 135,892 | 98 | 22 |
| Britannia Mining and Smelting Co. Ltd. | 66 | 57 | 66,863 | 66,863 | 107 | 5 |
| Highland-Bell Ltd. | 259 | 259 | 18,729 | 18,729 | 34 | 6 |
| Bralorne Mines Ltd. | 365 | 365 | 146,358 | 146,358 | 358 | 27 |
| Pioneer Gold Mines of B.C. Ltd. | 365 | 365 | 105,442 | 105,442 | 235 | 18 |
| French Mines Ltd. | 284 | 364 | 13,820 | 13,820 | 14 | 8 |
| Copper Mountain (Granby Cons. M.S. & P. Co. Ltd.) | ..... | ..... | ([3]) | ([3]) | 46[2] | ..... |
| Bluebell (Cons. M. & S. Co. of Canada, Ltd.) | 253 | 348 | 255,859 | 255,859 | 268 | 19 |
| Highlander (Yale Lead & Zinc Mines Ltd.) | 250 | 250 | 51,460 | 51,460 | 36 | 8 |
| Western Exploration Co. Ltd. | ([3]) | ([3]) | 13,326 | 13,326 | 2 | 7 |
| Victor (Violamac Mines Ltd.) | 365 | ..... | 9,037 | ..... | 21 | ..... |
| H.B. (Cons. M. & S. Co. of Canada, Ltd.) | 365 | 365 | 458,213 | 458,213 | 106 | 13 |
| Jersey (Canadian Exploration Ltd.) | 365 | 365 | 383,458 | 383,458 | 118 | 11 |
| Emerald-Feeney-Dodger (Canadian Exploration Ltd.) | 204 | 212 | 64,114 | 64,114 | 82 | 8 |
| Reeves MacDonald Mines Ltd. | 252 | 352 | 417,076 | 417,076 | 103 | 25 |
| Sullivan (Cons. M. & S. Co. of Canada, Ltd. | 254 | 254 | 2,443,884 | 2,443,884 | 1,123 | 333 |
| Mineral King (Sheep Creek Mines Ltd.) | 307 | 358 | 192,426 | 192,426 | 83 | 11 |
| Spider (Sunshine Lardeau Mines Ltd.) | 101 | 135 | 11,889 | 11,419 | 20 | 5 |
| Blue Grouse (Cowichan Copper Co. Ltd.) | 253 | 268 | 96,029 | 96,029 | 89 | 12 |
| Western Nickel Mines Ltd. | 213 | 213 | 131,133 | 131,133 | 125 | 19 |
| Empire Development Co. Ltd. | 266 | 266 | 572,404 | 572,404 | ([3]) | ([3]) |
| Texada Mines Ltd. | 266 | 366 | 715,182 | 709,731 | 112 | 34 |
| *Non-shipping Mines* | | | | | | |
| Ecstall Mining Co. Ltd. | ..... | ..... | ..... | ..... | 10 | ..... |
| Noranda Exploration Co. Ltd. | ..... | ..... | ..... | ..... | 19 | ..... |
| Granduc Mines Ltd. | ..... | ..... | ..... | ..... | 21 | ..... |
| Northwestern Explorations Ltd. | ..... | ..... | ..... | ..... | 25 | ..... |
| Phoenix Copper Co. Ltd. | ..... | ..... | ..... | ..... | 12 | ..... |
| Rexspar Uranium & Metals Mining Co. Ltd. | ..... | ..... | ..... | ..... | 10 | ..... |
| Sunro (Cons. M. & S. Co. of Canada, Ltd.) | ..... | ..... | ..... | ..... | 14 | ..... |
| Birkett Creek Mine Operators Ltd. | ..... | ..... | ..... | ..... | 18 | ..... |
| Britannia Mine Division (Howe Sound Company) | ..... | ..... | ..... | ..... | 31 | ..... |

[1] The average number employed includes wage-earners and salaried employees. The average is obtained by adding the monthly figures and dividing by 12, irrespective of the number of months worked.

[2] One hundred and eight tons of clean-up material shipped to Tacoma smelter, and employment represents all clean-up operations, including salvage of equipment and machinery.

[3] Not available.

# Departmental Work

## DEPUTY MINISTER

John Fortune Walker, who had been Deputy Minister of Mines for twenty-two years, retired on September 30th, 1958. He was born in Binbrook, Ont., on September 17th, 1893, and is a veteran of World War I, a graduate of the University of British Columbia in geological engineering, and a Ph.D. from Princeton University in geology. He had served as an officer of the Geological Survey of Canada for ten years, working in various areas in British Columbia, when he left that service to become Provincial Mineralogist in the British Columbia Department of Mines in 1934 and continued in that position until he was appointed Deputy Minister in 1937.

Patrick Joseph Mulcahy, who had been in the service of the Government of British Columbia for thirty-nine years, was appointed Deputy Minister of Mines, effective October 1st, 1958. He was born in Victoria in 1901. He entered the service of the Government of British Columbia in the Department of the Attorney-General in 1919, and transferred to the Department of Mines in 1924. Since then he has served continuously in Victoria, except when he was Mining Recorder at Barkerville in 1931 and at Hope in 1932 and set up the central records office in Vancouver in 1942. Until his appointment as Deputy Minister he had been Chief Gold Commissioner since 1942 and Chief Petroleum and Natural Gas Commissioner since 1952.

## ADMINISTRATION BRANCH

The Administration Branch is responsible for the administration of the Provincial laws regarding the acquisition of rights to mineral and to coal, petroleum and natural gas, and deals with other departments of the Provincial service for the Department or for any branch.

Upon the retirement of John F. Walker, P. J. Mulcahy was appointed to the position of Deputy Minister. K. B. Blakey, who had been acting in the capacity of Deputy Chief Gold Commissioner and Deputy Chief Commissioner, Petroleum and Natural Gas, was appointed as Chief Gold Commissioner and Chief Commissioner, Petroleum and Natural Gas. R. H. McCrimmon and R. E. Moss were appointed to the positions of Deputy Chief Gold Commissioner and Deputy Chief Commissioner, Petroleum and Natural Gas, respectively, effective October 1st, 1958.

Gold Commissioners, Mining Recorders, and Sub-Mining Recorders, whose duties are laid down in the " Mineral Act " and the " Placer-mining Act," administer these Acts and other Acts relating to mining. Mining Recorders, in addition to their own functions, may also exercise the powers conferred upon Gold Commissioners with regard to mineral claims within the mining division for which they have been appointed. Similar duties may be performed by Mining Recorders with regard to placer claims but not in respect of placer-mining leases. Recording of location and of work upon a mineral claim as required by the " Mineral Act " and upon a placer claim or a placer-mining lease as required by the " Placer-mining Act " must be made at the office of the Mining Recorder for the mining division in which the claim or lease is located. Information concerning claims and leases and concerning the ownership and standing of claims and leases in any mining division may be obtained from the Mining Recorder for the mining division in which the property is situated or from the Department's offices at Victoria, and Room 104, 739 West Hastings Street, Vancouver. Officials in the offices of the Gold Commissioner at Victoria and the Gold Commissioner at Vancouver act as Sub-Mining Recorders for all mining divisions. Sub-Mining Recorders, who act as forwarding

agents, are appointed at various places throughout the Province. They are authorized to accept documents and fees, and forward them to the office of the Mining Recorder for the correct mining division. Officials and their offices in various parts of the Province are listed in the table on page A 50.

## Central Records Offices (Victoria and Vancouver)

The transcripts of all recordings made in Mining Recorders' offices throughout the Province are sent to the office of the Chief Gold Commissioner in Victoria twice each month, and include the names of lessees of reverted Crown-granted mineral claims. These records and maps showing the approximate positions of mineral claims held by record and of placer-mining leases may be consulted by the public during office hours at Victoria and at the office of the Gold Commissioner at Vancouver, Room 104, 739 West Hastings Street. The maps conform in geographical detail, size, and number to the reference and mineral reference maps issued by the Legal Surveys Branch of the Department of Lands and Forests, and the approximate positions of mineral claims held by record and of placer-mining leases are plotted from details supplied by the locators. Provision has been made to supply the general public, on request to the office of the Chief Gold Commissioner, with copies of the maps. The charge for these maps is $1 plus 5 per cent tax for each sheet.

List of Gold Commissioners and Mining Recorders in the Province

| Mining Division | Location of Office | Gold Commissioner | Mining Recorder |
|---|---|---|---|
| Alberni | Alberni | T. G. O'Neill | T. G. O'Neill. |
| Atlin | Atlin | L. P. Lean | L. P. Lean. |
| Cariboo | Quesnel | F. E. P. Hughes | F. E. P. Hughes. |
| Clinton | Clinton | W. E. McLean | W. E. McLean. |
| Fort Steele | Cranbrook | E. L. Hedley | E. L. Hedley. |
| Golden | Golden | R. E. Manson | R. E. Manson. |
| Greenwood | Grand Forks | R. Macgregor | R. Macgregor. |
| Kamloops | Kamloops | D. Dalgleish | D. Dalgleish. |
| Liard | Victoria | R. H. McCrimmon. | |
| Lillooet | Lillooet | E. B. Offin | E. B. Offin. |
| Nanaimo | Nanaimo | W. H. Cochrane | W. H. Cochrane. |
| Nelson | Nelson | K. D. McRae | K. D. McRae. |
| New Westminster | New Westminster | J. F. McDonald | G. C. Kimberley. |
| Nicola | Merritt | T. S. Dobson | T. S. Dobson. |
| Omineca | Smithers | G. H. Beley | G. H. Beley. |
| Osoyoos | Penticton | T. S. Dalby | T. S. Dalby. |
| Revelstoke | Revelstoke | W. T. McGruder | W. T. McGruder. |
| Similkameen | Princeton | B. Kennelly | B. Kennelly. |
| Skeena | Prince Rupert | T. H. W. Harding | T. H. W. Harding. |
| Slocan | Kaslo | | F. R. Carmichael. |
| Trail Creek | Rossland | W. L. Draper | W. L. Draper. |
| Vancouver | Vancouver | J. Egdell | Miss S. Hyham (Deputy). |
| Vernon | Vernon | G. F. Forbes | G. F. Forbes. |
| Victoria | Victoria | R. H. McCrimmon | E. J. Bowles. |

## Gold Commissioners' and Mining Recorders' Office Statistics, 1958

| Mining Division | Free Miners' Certificates | | | | Lode-mining | | | | | | Placer-mining | | | | | Revenue | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Individual | Company | Special | Provisional (Placer) | Mineral Claims Recorded | Certificates of Work | Cash in Lieu | Certificates of Improvements | Bills of Sale, etc. | Leases | Placer Claims Recorded | Placer Leases Granted | Certificates of Work, Placer Leases | Cash in Lieu | Bills of Sale, etc. | Free Miners' Certificates | Mining Receipts | Total |
| Alberni | 74 | 2 | 4 | — | 163 | 312 | $300.00 | — | 23 | 4 | — | 2 | 6 | — | — | $524.50 | $2,347.75 | $2,872.25 |
| Atlin | 161 | 2 | 1 | — | 127 | 5 | 1,000.00 | — | 17 | — | 8 | 37 | 34 | $1,750.00 | 21 | 1,293.00 | 7,813.00 | 9,106.00 |
| Cariboo | 974 | 13 | 7 | — | 502 | 355 | 6,100.00 | — | 57 | 4 | 4 | 154 | 288 | 3,250.00 | 116 | 4,802.25 | 24,495.75 | 29,298.00 |
| Clinton | 40 | — | 1 | — | 128 | 155 | 1,800.00 | — | 35 | — | — | 3 | 6 | — | 4 | 190.25 | 3,271.25 | 3,461.50 |
| Fort Steele | 239 | 4 | 5 | — | 227 | 621 | 1,600.00 | — | 35 | 2 | — | 20 | 57 | — | 21 | 1,453.75 | 6,306.75 | 7,760.50 |
| Golden | 113 | 5 | — | 1 | 243 | 190 | 2,700.00 | 32 | 22 | — | — | 9 | 1 | — | — | 928.00 | 6,446.25 | 7,374.25 |
| Greenwood | 138 | 1 | 1 | — | 373 | 330 | 900.00 | — | 57 | 8 | — | 5 | 10 | — | — | 675.50 | 4,646.45 | 5,321.95 |
| Kamloops | 423 | 6 | 14 | 3 | 2,928 | 1,964 | 1,100.00 | 9 | 470 | 10 | — | 13 | 5 | — | 1 | 2,404.25 | 11,183.00 | 13,587.25 |
| Liard | 289 | — | 7 | — | 592 | 767 | 2,300.00 | 9 | 141 | — | — | 9 | 17 | — | — | 1,375.50 | 11,645.00 | 13,020.50 |
| Lillooet | 158 | 2 | 1 | — | 219 | 279 | 500.00 | 7 | 11 | 5 | — | 4 | 34 | 250.00 | 5 | 894.25 | 3,879.00 | 4,773.25 |
| Nanaimo | 124 | 3 | — | — | 150 | 287 | 4,700.00 | — | 35 | 7 | — | 1 | — | — | 2 | 743.00 | 6,394.00 | 7,137.00 |
| Nelson | 310 | 8 | 7 | 4 | 260 | 324 | 300.00 | 22 | 18 | 12 | 6 | — | 4 | — | 1 | 2,256.25 | 3,106.75 | 5,363.00 |
| New Westminster | 376 | 3 | 8 | 17 | 451 | 117 | 10,200.00 | — | 215 | 2 | 3 | 6 | 13 | — | 1 | 1,931.25 | 13,035.00 | 14,966.25 |
| Nicola | 309 | — | 2 | — | 4,494 | 1,122 | 100.00 | — | 516 | 1 | — | — | 1 | — | — | 989.00 | 17,424.76 | 18,413.76 |
| Omineca | 315 | 3 | 2 | — | 401 | 796 | 2,100.00 | — | 119 | 4 | 2 | 17 | 40 | 5,450.00 | 14 | 1,532.00 | 13,423.10 | 14,955.10 |
| Osoyoos | 160 | 1 | 6 | — | 249 | 163 | 1,600.00 | 3 | 31 | 6 | — | — | — | — | — | 808.25 | 3,199.95 | 4,008.20 |
| Revelstoke | 131 | 1 | 6 | — | 147 | 343 | 6,800.00 | — | 36 | 2 | — | 16 | 17 | 375.00 | 36 | 638.75 | 10,746.25 | 11,385.00 |
| Similkameen | 156 | 3 | 4 | 3 | 565 | 182 | 4,800.00 | — | 151 | 7 | 2 | 8 | 36 | — | 11 | 978.25 | 8,583.50 | 9,561.75 |
| Skeena | 239 | 4 | 1 | — | 128 | 358 | 3,500.00 | — | 53 | 19 | — | 1 | — | — | — | 1,317.25 | 7,091.75 | 8,409.00 |
| Slocan | 165 | 5 | 4 | — | 196 | 728 | 2,100.00 | — | 42 | 6 | — | 4 | — | — | — | 1,329.75 | 5,331.25 | 6,661.00 |
| Trail Creek | 104 | 3 | 2 | — | 16 | 55 | — | — | 3 | 1 | — | — | — | — | — | 712.50 | 241.75 | 954.25 |
| Vancouver | 1,792 | 186 | 46 | — | 390 | 117 | 1,400.00 | 1 | 29 | 3 | 3 | — | 1 | — | — | 24,267.25 | 3,382.37 | 27,649.62 |
| Vernon | 228 | 1 | 4 | 10 | 160 | 35 | 100.00 | — | 23 | 1 | 11 | 7 | 10 | — | 3 | 1,139.00 | 1,186.25 | 2,325.25 |
| Victoria | 325 | 22 | — | — | 350 | 452 | 200.00 | — | 36 | 2 | — | — | 18 | — | — | 3,474.50 | 3,300.25 | 6,774.75 |
| Totals for Province 1958 | 7,343 | 278 | 133 | 38 | 13,459 | 10,057 | $56,200.00 | 83 | 2,175 | 106 | 39 | 316 | 598 | $11,075.00 | 236 | $56,658.25 | $178,481.13 | $235,139.38 |
| Totals for Province, 1957 | 7,641 | 289 | 162 | 37 | 12,110 | 13,781 | $53,100.00 | 108 | 2,820 | 165 | 21 | 180 | 690 | $10,075.00 | 162 | $62,651.75 | $158,362.90 | $221,014.65 |

## Coal, Petroleum, and Natural Gas

The Administration Branch is responsible for the administration of the "Petroleum and Natural Gas Act" and for the "Coal Act." Information concerning applications for permits and leases issued under the "Petroleum and Natural Gas Act" and concerning the ownership and standing of them may be obtained upon application to the office of the Chief Commissioner, Department of Mines, Victoria, B.C. Similar information may be obtained respecting licences and leases issued under the "Coal Act." Maps showing the locations of permits and leases under the "Petroleum and Natural Gas Act" are available, and copies may be obtained upon application to the office of the Department of Mines, Victoria, B.C. Monthly reports listing additions and revisions to permit-location maps and listing changes in title to permits, licences, and leases and related matters are available from the office of the Chief Commissioner upon application and payment of the required fee.

*Petroleum and Natural-gas Statistics, 1958*

| | |
|---|---|
| Permits— | |
| Issued | 87 |
| In good standing | 442 |
| Assigned | 122 |
| Natural-gas licences—Issued | 12 |
| Drilling reservations—Issued | 4 |
| Leases— | |
| Issued | 539 |
| In good standing | 842 |
| Assigned | 73 |

*Petroleum and Natural-gas Revenue, 1958*

| | | |
|---|---|---|
| Permits— | | |
| Fees | $146,250.00 | |
| Rental | 3,135,141.48 | |
| Penalties and cash in lieu of work | 26,590.47 | |
| | | $3,307,981.95 |
| Drilling reservations— | | |
| Fees | $750.00 | |
| Rental | 4,146.80 | |
| | | 4,896.80 |
| Licences— | | |
| Fees | $400.00 | |
| Rental | 9,757.29 | |
| | | 10,157.29 |
| Leases— | | |
| Fees | $13,125.00 | |
| Rental | 977,257.50 | |
| | | 990,382.50 |
| Tender bonus | | 4,510,123.14 |
| Royalties— | | |
| Gas | $433,545.81 | |
| Oil | 140,158.48 | |
| Processed products | 62,104.77 | |
| | | 635,809.06 |

| | |
|---|---|
| Operators' licences | $10,520.00 |
| Assignment fees | 1,800.00 |
| Miscellaneous | 550.00 |
| | $9,472,220.74 |

*Coal Revenue, 1958*

| | | |
|---|---|---|
| Licences— | | |
| Fees | $450.00 | |
| Rental | 3,669.50 | |
| | | $4,119.50 |
| Leases— | | |
| Fees | $400.00 | |
| Rental | 535.95 | |
| Cash in lieu of work | 400.00 | |
| | | 1,335.95 |
| | | $5,455.45 |

### Mining Laws and Laws Related to the Mineral Industry

Synopses of mining laws and of laws related to mining, and the titles of the various Acts and the prices charged for each are available on application.

## ANALYTICAL AND ASSAY BRANCH

By S. W. Metcalfe, Chief Analyst and Assayer

### Rock Samples

During 1958 the chemical laboratory in Victoria issued reports on 3,929 samples from prospectors* and Departmental engineers. A laboratory examination of a prospector's sample generally consists of the following: (1) A spectrographic analysis to determine if any base metals are present in interesting percentages; (2) assays for precious metals and for base metals shown by the spectrographic analysis to be present in interesting percentages. The degree of radioactivity is measured on all samples submitted by prospectors and Departmental engineers; these radiometric assays are not listed in the table below.

The laboratory reports were distributed in the following manner among prospectors who were not grantees, prospectors who were grantees under the "Prospectors' Grubstake Act," and Departmental engineers:—

| | Samples | Spectrographic Analyses | Assays |
|---|---|---|---|
| Prospectors (not grantees) | 973 | 26 | 2,692 |
| Prospectors (grantees) | 275 | 1 | 660 |
| Departmental engineers | 213 | 27 | 577 |
| Totals | 1,461 | 54 | 3,929 |

Mineralogical specimens submitted for identification and rocks for classification are examined by the Mineralogical Branch of the Department.

* A reasonable number of samples are assayed, without charge, for a prospector who makes application for free assays and who satisfies the Chief Analyst that prospecting is his principal occupation during the summer months. A form for use in applying for free assays may be obtained from the office of any Mining Recorder.

### Coal, Petroleum, and Gas Samples

Forty-three samples were analysed. Of these, fourteen were samples of formation water from wells being drilled for oil and gas in the Province; seventeen were samples of coal for proximate analysis and calorific value; two were waters tested for oil seepage; three were natural gases; and seven were samples of condensates from oil and gas wells in the Province.

### Police and Coroners' Exhibits

Ninety-one cases of a chemical-legal nature were completed for the Attorney-General's Department. Twenty-eight cases involved analyses for poisons generally. Eighteen were for alcohol in blood and body fluids, and six were for carbon monoxide and alcohol in blood. Six cases involved narcotics, and six cases analyses of animal organs for poison. Eleven cases were analyses for liquor under the " Government Liquor Act " and the " Indian Act." In four cases, analyses were made in connection with charges of murder. In addition, there were four analyses of gasoline for colouring matter added in accordance with the regulations in the " Coloured Gasoline Tax Act." The remaining cases involved drugs and food for suspected poisoning, possession of explosives, breaking and entering, and wilful damage. On ten occasions, evidence was presented in Court.

Analytical work of this nature was discontinued by the laboratory at the end of the year.

### Miscellaneous Samples

For the Purchasing Commission, specification tests were made on eight samples of anti-freeze, and two blankets were examined.

For the Taxation Branch of the Department of Finance, two gasolines and one gasoline marker dyestuff were examined.

For the Department of Agriculture, four marls were analysed for lime and magnesia, one soil was examined for boron, two samples of hay and two of soil were analysed for molybdenum, and two samples of gypsum were examined.

For the Department of Highways, one water sample was examined.

For the British Columbia Power Commission, two partly decomposed wooden pegs from power-poles were examined for nitrates.

For the Department of Mining and Metallurgy at the University of British Columbia, one sand was analysed for titanium and iron, and one sample of sponge iron for total iron and free iron.

For the Royal Canadian Mounted Police, sixteen samples consisting of placer gold and gravel were assayed for their gold contents. Evidence was given in Court.

For residents of the Province, two water samples were examined.

### Examinations for Assayers

Provincial Government examinations for certificates of competency and licence to practise assaying in British Columbia were held at Victoria in April and May, and at Trail in December. In April and May, two candidates were examined and both passed. In December, ten candidates were examined; three passed, three were granted supplementals, and four failed.

## INSPECTION BRANCH

### Organization and Staff

*Inspectors and Resident Engineers*

J. W. Peck, Chief Inspector.....Victoria
Robert B. Bonar, Deputy Chief Inspector of Mines.....Victoria
L. Wardman, Senior Electrical Inspector of Mines.....Victoria

E. R. Hughes, Senior Inspector of Mines.....Victoria
Robert B. King, Inspector and Resident Engineer.....Vancouver
A. R. C. James, Inspector and Resident Engineer.....Vancouver
J. E. Merrett, Inspector and Resident Engineer.....Nelson
D. R. Morgan, Inspector and Resident Engineer.....Fernie
David Smith, Inspector and Resident Engineer.....Prince Rupert

The Inspectors are stationed at the places listed and inspect coal mines, metalliferous mines, and quarries in their respective districts. They also examine prospects, mining properties, and roads and trails.

E. R. Hughes supervised the Department's roads and trails programme and prospectors' grub-stakes.

*Instructors, Mine-rescue Stations*

Arthur Williams.....Cumberland Station
T. H. Robertson.....Princeton Station
Joseph J. Haile.....Fernie Station
W. H. Childress.....Nelson Station

*Staff Changes*

H. C. Hughes, Chief Inspector of Mines, retired on January 31st, 1958, after twenty years of service with the Department. He joined the staff on January 15th, 1938, as Inspector of Mines at Nelson.

J. W. Peck, Inspector and Resident Engineer at Nelson, was appointed Chief Inspector of Mines on February 15th, 1958.

*Board of Examiners for Coal-mine Officials*

Robert B. Bonar, Chairman and Secretary.....Victoria
A. R. C. James, Member.....Vancouver
D. R. Morgan, Member.....Fernie

R. B. Bonar, A. R. C. James, D. R. Morgan, and the mine-rescue instructors for the district in which an examination is being held form the Board for granting certificates of competency to coal-miners.

An Inspector is empowered to grant provisional certificates to coal-miners for a period not exceeding sixty days between regular examinations.

## MINERALOGICAL BRANCH

Field work by officers of the Mineralogical Branch includes geological mapping and examination of mineral deposits, and studies related to ground-water and engineering geology. The results are published partly in the Annual Report of the Minister of Mines and partly in a series of bulletins. The Mineralogical Branch supplies information regarding mineral deposits and the mineral industry, in response to inquiries received in great number. The activities of the Branch also include identification of rock and mineral specimens submitted directly by prospectors and others, or through the Analytical Branch.

### Professional Staff

On December 31st, 1958, the professional staff included the following engineers classified as geologists or mineral engineers: H. Sargent, Chief of the Mineralogical Branch; M. S. Hedley, S. S. Holland, J. W. McCammon, N. D. McKechnie, G. E. P. Eastwood, J. T. Fyles, A. Sutherland Brown, J. M. Carr, H. W. Nasmith, A. F. Shepherd, and J. E. Hughes. H. W. Nasmith resigned at the end of December. J. E. Hughes was granted leave in October to continue postgraduate studies at McGill University.

Technical editing of the Annual Report of the Minister of Mines and of other publications was directed by M. S. Hedley. Copy for printing was prepared by and under the direction of the editor for English, which post was occupied until August by Mrs. C. C. Savage and from October by Mrs. Rosalyn J. Moir. Messrs. Hedley and Holland assisted in directing and supervising field work. Most of the other members of the professional staff are assigned to mapping the geology of selected areas and of mineral deposits. Mr. McCammon is responsible for studies of industrial minerals and structural materials and Mr. Shepherd for records and library.

## Field Work

Systematic field work was done by nine members of the permanent staff, and by one geologist retained for the field season. They were assisted by thirteen temporary field assistants.

A. Sutherland Brown began the geological mapping of Moresby Island in the Queen Charlotte Group.

J. M. Carr continued geological mapping in the Highland Valley area, including detailed mapping of workings at several properties, and made a preliminary study of a small area that contains the Craigmont property northwest of Merritt.

J. T. Fyles devoted the first part of the field season to reconnaissance mapping along the Columbia River from a point near Donald to Nagle Creek near Mica Creek in the western side of the Big Bend.

J. T. Fyles devoted the latter part of the field season and G. E. P. Eastwood devoted most of the season to finalizing mapping in the part of the Lardeau area between the head of Gainer Creek and the heads of Trout and Beaton Creeks.

J. E. Hughes completed field studies along the John Hart Highway between the West Pine bridge and Commotion Creek.

S. S. Holland examined operating mines and prospects in Bridge River and Wells areas, the area between Prince George and Smithers, the North Thompson River, and the Revelstoke area, and devoted two weeks to problems of engineering geology on the Fraser and Peace Rivers.

J. W. McCammon made studies of industrial-mineral occurrences, including limestone in the Cache Creek and Merritt areas, silica at Sicamous, Oliver, and Golden, barite in the Columbia-Windermere Valley, and pegmatites in part of the North Thompson area. He also assisted in setting up a geological display in " Nature House " at Manning Park.

N. D. McKechnie examined properties on Vancouver Island, near Hope, and near Merritt, and began a study of ultrabasic rocks in the Kamloops-Princeton-Grand Forks area.

H. W. Nasmith made a ground-water study in the Bulkley Valley and a preliminary investigation in the Prince George area. His work in the field of engineering geology included a study of water seepage at the Whatshan Dam, landslides at Golden and Prince Rupert, seepage pressures at a highway tunnel near Yale, a study of bridge foundations near Quesnel, and studies of Pleistocene sediments near Peachland and Naramata and on the Big Bend of the Columbia River.

H. P. Trettin was employed for the field season to complete mapping begun in 1957 of the area along the Fraser River from Lillooet to Big Bar ferry. This work was under the general direction of Professor K. C. McTaggart, retained as consultant.

## PETROLEUM AND NATURAL GAS BRANCH

### Staff

J. D. Lineham, Chief of the Petroleum and Natural Gas Branch ..... Victoria
R. R. McLeod, Senior Petroleum Engineer and Chairman of the Board of Arbitration ..... Victoria
A. N. Lucie-Smith, Senior Petroleum Engineer and Chairman of the Conservation Committee ..... Victoria
W. L. Ingram, Petroleum Engineer ..... Victoria
K. C. Gilbart, Petroleum Engineer ..... Victoria
S. S. Cosburn, Mineral Engineer (Geology) ..... Victoria
D. L. Griffin, Mineral Engineer (Geology) ..... Victoria
T. A. Mackenzie, Engineering Assistant ..... Victoria
P. K. Huus, Engineering Assistant ..... Victoria
G. E. Blue, Petroleum Engineer ..... Dawson Creek
R. N. Thompson, Petroleum Engineer ..... Dawson Creek
H. B. Fulton, Assistant Geologist ..... Dawson Creek
H. A. Sharp, Engineering Assistant ..... Dawson Creek
E. N. Jernslet, Field Survey Assistant ..... Dawson Creek

The following are in charge of certain sections within the Branch: R. R. McLeod, reservoir engineering; A. N. Lucie-Smith, reserves; W. L. Ingram, development engineering; S. S. Cosburn, geology; T. A. Mackenzie, well information and statistics; G. E. Blue, field office.

### Staff Changes

H. A. Sharp joined the field staff as an engineering assistant on March 31st and R. N. Thompson as a petroleum engineer on May 1st.

D. L. Griffin joined headquarters staff as a geologist on June 11th.

W. L. Ingram was transferred to Victoria from Dawson Creek on July 28th, and E. N. Jernslet was transferred from Victoria to the field staff on November 24th.

The Petroleum and Natural Gas Branch is responsible for the administration of the "Regulation Governing the Drilling of Wells and the Production and Conservation of Oil and Natural Gas" made pursuant to the "Petroleum and Natural Gas Act, 1954."

The regulation provides for the use of efficient and safe practices in the drilling, completion, and abandonment of wells; for the orderly development of fields discovered within the Province; and for the conservation and prevention of waste of oil and natural gas within the reservoir and during production operations.

The Branch, in addition to continuous field inspection of drilling and producing operations, makes studies relative to conservation.

### Board of Arbitration

Chairman: R. R. McLeod, engineer. Members: A. W. Hobbs, solicitor; S. G. Preston, agrologist.

The Board of Arbitration, responsible to the Minister of Mines, held hearings in 1958 at Fort St. John and Pouce Coupe.

Seventeen applications, concerning right of entry came before the Board. Of these, one application was not processed because the operator did not effect entry; three were settled by private agreement; one was adjourned at the request of the land-owner; one was settled by a Board award order with the agreement and consent of both parties; six were settled by award orders of the Board; and five award orders were pending at the end of the year.

R. R. McLeod, of the Department of Mines, was, at his request, replaced as Chairman of the Board on November 28th by A. W. Hobbs, of the Department of the Attorney-General. Mr. McLeod remained as a member of the Board.

### Conservation Committee

Chairman: A. N. Lucie-Smith, engineer. Members: N. D. McKechnie, geologist; M. H. A. Glover, economist.

During 1958 the Conservation Committee considered two major matters which had been referred to it by the Minister:—

(1) Whether production of gas from the Buick Creek sandstone at West Buick Creek should be allowed while there was apparently an accumulation of commercial oil in the same horizon down dip on the northeast flank; and

(2) Whether the allowable production of a gas well may, in certain instances, be increased over the limit in force of 25 per cent of its open-flow potential by the application of the so-called "Alberta formula."

With regard to the first problem, conditional permission had been given on November 13th, 1957, to start producing gas from the crestal wells at West Buick Creek so that static bottom hole pressures could be taken continually in the oil wells, which had been shut in for that purpose. Gas production commenced on November 30th, 1957, and, with the co-operation of the operator, Pacific Petroleums Ltd., it was established at the beginning of March, 1958, that there was definite communication between the oil wells on the northeast flank and the gas wells on the crest of the structure; also, by this time, a well on the upper part of the southwest flank had started producing some oil with the gas and condensate. The Minister, acting on the advice of the Committee, ordered, on May 29th, all Buick Creek sandstone gas wells in the West Buick Creek field to be shut in, pending further information which might become available from further drilling. A well subsequently drilled between two of the oil wells on the northeast flank showed the formation to lack porosity, and by this time the production of the oil wells, which had been put back on the pump after the gas wells had been shut in, had declined considerably, both of which facts cast some doubt as to the extent of the oil accumulation. In view of this the operator was allowed to reopen the gas wells on September 5th on condition that two additional wells were drilled on the southwest flank at locations to be selected by the Committee to investigate the reservoir conditions there. The results of this additional drilling showed that the oil probably occurs in small patches around the perimeter of the structure with impermeable areas between, and that the reserve would probably be negligible compared with that of the gas. The Committee recommended that West Buick Creek, as far as the Buick Creek sandstone was concerned, should be produced as a gasfield and not an oilfield.

With regard to the second matter, the Committee recommended that the 25-per-cent rule should continue to apply to all gas wells, as there was still insufficient reservoir data available to allow the application of a formula, and no formula had yet been unreservedly accepted by any regulatory body.

## GRUB-STAKING PROSPECTORS

Under authority of the "Prospectors' Grub-stake Act" the Department of Mines has provided grub-stakes each year since 1943 to a limited number of applicants able to qualify. An amendment to the Act in 1958 authorized an increase in the maximum allowable grub-stake to $400, with an additional amount up to $300 for travelling expenses.

To qualify at the present time the Department requires that the applicant shall be a physically fit male British subject, holder of a valid free miner's certificate, who has

been resident in the Province during the year preceding his application for a grub-stake, or who has been honourably discharged from Her Majesty's services, who is between the ages of 18 and 70, and who can identify common rocks and minerals.

It is required that in order to obtain the maximum grub-stake, he agree to spend at least sixty days actually prospecting in the area of his choice in British Columbia considered favourably by officers of the Department of Mines. If he prospects a lesser time, the grant will be reduced proportionately. In the past, rebates have been recovered from grantees to whom payments have exceeded the proper amount for the time and effort devoted to prospecting.

The grantee must not accept pay from any other source for services rendered during the period credited to the grub-stake. At the end of the season he shall provide the Department with a diary and maps outlining his activities while working under the grub-stake. Any discoveries made, staked, and recorded are exclusively his own property.

Statistical information covering the grub-stake programme since its inception is given in the following table:—

GRUB-STAKE STATISTICS

| Field Season | Approximate Expenditure | Men Grub-staked | Samples and Specimens Received at Department Laboratory | Mineral Claims Recorded |
|---|---|---|---|---|
| 1943 | $18,500 | 90 | 773 | 87 |
| 1944 | 27,215 | 105 | 606 | 135 |
| 1945 | 27,310 | 84 | 448 | 181 |
| 1946 | 35,200 | 95 | 419 | 162 |
| 1947 | 36,230 | 91 | 469 | 142 |
| 1948 | 35,975 | 92 | 443 | 138 |
| 1949 | 31,175 | 98 | 567 | 103 |
| 1950 | 26,800 | 78 | 226 | 95 |
| 1951 | 19,385 | 63 | 255 | 137 |
| 1952 | 19,083 | 50 | 251 | 95 |
| 1953 | 17,850 | 41 | 201 | 141 |
| 1954 | 19,989 | 48 | 336 | 123 |
| 1955 | 21,169 | 47 | 288 | 183 |
| 1956 | 20,270 | 47 | 163 | 217 |
| 1957 | 22,000 | 46 | 174 | 101 |
| 1958 | 24,850 | 47 | 287 | 211 |

Samples and specimens received from grub-staked prospectors are spectrographed, assayed, and tested for radioactivity. Mineralogical identifications are made on request.

Of the forty-seven grantees in 1958, twenty-four were given grants for the first time and eight of these proved unsatisfactory. Two grantees who had received previous grub-stakes were also struck from the list for unsatisfactory work. Five grantees, who for various reasons were unable to fulfil the terms and conditions of the grant, received only partial payment. Grub-staked prospectors worked in seventeen out of the twenty-four mining divisions.

D. H. Rae again gave able service in interviewing applicants and supervising grantees in the field. The following notes have been largely compiled from Mr. Rae's own observations while in the field and from information provided in the diaries of the grantees.

*Atlin Mining Division.*—Some work was done near Ash Mountain west of Tuya Lake, where the surface was found to be heavily drift covered. Some of this work extended into the Liard Mining Division. On both sides of Edasp Lake, outcrops of granite were encountered. Nothing of interest was reported in the Tuya and Stikine Ranges. Some small pegmatite dykes were found along the westerly contact of the Cassiar Batholith. More work will be done here. Work was also done in the Eaglehead Lake area, where barren quartz veins were found in limestone intruded by granodiorite. A large exposure of serpentine was found, but no asbestos was observed. South of the lake narrow stringers of asbestos were found in a peridotite zone.

*Cariboo Mining Division.*—West of Kleena Kleene some prospecting was done in the vicinity of Perkins Peak. In a wide exposure of argillite some rusty sulphides were found in cracks and fissures, along with some green and blue copper stain. Samples taken failed to show commercial values. About 20 miles southwest of McLeod Lake some prospecting was done but nothing of interest was reported.

*Clinton Mining Division.*—Some work was done in several areas between Tatla and Tatlayoko Lakes. A diorite-greenstone contact was prospected between Potato and Skinner Mountains. Nothing of interest was found. Some work was also done around the headwaters of Churn Creek. Nothing important was found. At the headwaters of Ruby, Bear, and Garnet Creeks more work was done. Scattered exposures of diorite showing considerable feldspar and hornblende and several large outcrops of serpentine were reported.

*Golden Mining Division.*—Work was continued in the Brewer Creek-Dutch Creek areas west of Canal Flats. At Thorald Creek narrow quartz veins cutting altered sedimentary rocks were prospected and sampled but no values were found. Nothing of interest was reported from work done in the Ben Abel Lake area.

*Kamloops Mining Division.*—Considerable work was done in the area between Lakeview and Eagle Creeks and some valuable gold-bearing quartz was found. Several heavily oxidized outcrops were investigated and found to be worth further prospecting. On Shuswap Lake some prospecting was done close to both Blind and Eagle Bays. The exposed rock is mainly andesite, chlorite schist, and limestone showing some scattered pyrite, but having no economic value. Some work was also done between Blind Bay, White Lake, Charcoal Creek, Blanc Creek, and around Pement and Wallensteen Lakes, but nothing of interest was reported.

*Liard Mining Division.*—Some work was done around Tuchodi Lakes and in the Tetsa River valley, where some copper float was found. Prospecting was carried on as far as 5 miles north and northeast of Tuya Lake, and in the Mount McGavin area. Considerable lava, coarse granodiorite, mica schist, and serpentine was encountered, but nothing of economic importance was reported. Some more work was also done near the headwaters of Blue River, near Jennings Lakes, and near Tootsee Lake. In the Rosella Creek area, outcrops of limestone, schist, and barite were investigated, and at Poorman Lake some green copper stain was found, and fine colours of gold panned in a small creek. Nothing of geological importance was found in ground explored at the head of Moody Creek, near Snow Creek, or on the Horseranch Range of mountains. The ground between McDonald Creek and Racing River received some further attention. This area is all the more interesting since Magnum mines started work in the district. Adjacent to the Tetsa Range, quartz, hematite, and magnetite along with small amounts of copper were found, although nothing proved to be of commercial importance. At Nine Mile Creek northeast of Telegraph Creek some inconclusive work was done, and from a base camp established near Adsit Lake a large area was prospected, and some basic rocks, narrow dykes, and granitic rocks were noted.

*Lillooet Mining Division.*—Some prospecting was done in the Bridge River area, extending from Pearson Pond to Spruce Lake, and continuing on to Cardtable Mountain. Some attention was paid to an exposure of limestone and altered sediments, but nothing of importance was reported.

*Nanaimo Mining Division.*—Prospecting was continued in the Menzies Bay area north of Campbell River. Small outcrops of copper-bearing quartz were explored, but nothing of commercial value was reported. Inconclusive work was carried on around Wolf Mountain, Bonell Creek, and the old O.K. mine. Several samples were turned in containing good values in gold.

*Nelson Mining Division.*—At the south end of Kootenay Lake, prospecting was continued northwest of the old Bayonne mine, up the west fork of Goat River, and at the

headwaters of Cameron Creek. Interesting geological conditions were reported, but nothing of importance was found.

*New Westminster Mining Division.*—In the high, logged-off area adjacent to the northeast side of Weaver Lake numerous narrow mineralized veins containing copper, lead, and zinc minerals were found scattered through the exposed granite. These were thoroughly prospected, but no continuity or increase in width was found to exist. Several good exposures of copper ore were prospected on Agassiz Mountain, and further work is warranted in this area. Near the Alexandra Bridge in the Fraser Canyon an exposure of micaceous schist showing scattered mineralization of molybdenite received some attention. The values were too low to be of importance. A small amount of work was done several miles west of the Fraser River between Spuzzum and Clear Creeks. The area is very rugged, and no mineralization of interest was reported. East of Boston Bar, on the Anderson River, some inconclusive work was done. Exposures of slate, diorite, limestone, and serpentine were reported. Between Harrison Lake and the head of Spuzzum Creek much scattered molybdenite was found, but there was not enough concentration to make the area interesting.

*Nicola Mining Division.*—Some good work was done over an extensive area extending from Juliet westerly to the headwaters of Anderson River. Narrow pegmatites, gneissic granite, and considerable faulting were observed in the Murray Lake area. A feldspathetic dyke containing pyrites and some manganese minerals was observed near Alexander Lake, and at the headwaters of Anderson River many fine-grained andesitic and rhyolitic dykes were reported. No important mineral occurrences were found, but excellent prospecting was done. Some work was done on rusty outcrops between Stump and Napier Lakes, near Brookmere, east of Aspen Grove, and at the north end of Mamit Lake. Nothing of interest was reported.

*Omineca Mining Division.*—A great deal of prospecting was done in this mining division. In the Fraser Lake area, outcrops of granite and volcanics were prospected, and a small deposit of kaolin was reported to have been discovered. Some time was spent in the Dog Creek valley near Germansen Lake, in the Tarnezell Creek area, at the north end of Trembleur Lake, and adjacent to the portage on Stuart Lake, but nothing of interest was reported. At the end of the northwesterly arm of Stuart Lake some cinnabar float was found. Several narrow veins containing manganese were uncovered on McKelvey Island and on the adjacent mainland, but these were not of commercial value. On the north shore of Pinchi Lake, east of the old Pinchi Lake mercury mine, a large heavily faulted zone was given considerable attention. Some work was also done on and adjacent to the south shore, near the centre of Trembleur Lake.

Several other areas around Manson Creek and Old Hogem received considerable attention. These included Jackfish Creek, Twenty Mile Creek at the road crossing, Osilinka River to Steele Creek, Groundhog Creek valley, Wolverine Lake area, headwaters of Granite Creek, and southeast end of Manson Lakes. Some interesting float was found, and several areas showing interesting geological conditions were mapped for further attention. Some prospecting was done in the Cheztainya Lake and Humphrey Lake areas, which are mainly underlain by altered conglomerates with some surface exposures of volcanics and granite. Nothing of interest was found in the whole area.

From a base camp on the north side of Nation Lake, 6 miles from Nation River outlet, an extensive area was prospected. This work was finally concentrated on an exposure of low-grade copper mineralization close to the lake. Assays of samples taken here were not commercial. Some work was also done near the centre of the south shore of Tchentlo Lake, where outcrops of agglomerate, argillite, and serpentine were reported.

From the north end of Uslika Lake, extending northwesterly for 20 miles, a great deal of prospecting was done, and several new discoveries of copper mineralization were explored.

*Similkameen Mining Division.*—East of the Hope–Princeton Highway, in the Friday Creek area, a great deal of work was done prospecting successfully around some old workings. Narrow but high-grade exposures of bornite occur over a large area. More work will be done here. Some work was also done in the Railroad Creek valley and in the Coquihalla River area, including the valleys of Divide and Podunk Creeks, and much of the Sowaqua River valley. Rhyolite, argillite, iron-stained schist, some granodiorite, and dark-coloured serpentine were observed, and some stringers of brittle fibre asbestos up to 2 inches long were found in the serpentine. More work is warranted in this area.

*Skeena Mining Division.*—Some attention was paid to areas close to Diana Lake, Prudhomme Lake, and Rainbow Lake, where considerable magnetite was found. At Diana Lake some float carrying high values in silver and lead was picked up, but nothing was found in place. Sims Harbour on Porcher Island was investigated, and some narrow veins containing pyrite and chalcopyrite were found in granite but proved to be non-commercial. Close to Claxton some work was done along a granite-sedimentary contact, where a quartz vein containing iron pyrites was uncovered. On Kumealon Inlet a large area underlain by a pure variety of limestone was prospected extensively, and this is being investigated for use in the pulp industry.

Some work was also done on the Queen Charlotte Islands (Lyell Island), where the source of placer gold in a stream was under investigation. On Pitt Island one man continued his 1957 prospecting and turned in an excellent report of his findings over a large area. The area reported on included Elbow Point area, McCauley Island, Mink Trap Bay, Curtis Inlet, Union Passage, and Fin Island. This area shows a large variation in the nature of the underlying rock, viz.: Quartz-diorite, granodiorite, coarse limestone, biotite schist, gabbro, basalt, and monzonite. Nothing of commercial interest was reported.

Some work was also done around Alice Arm, Roundy Creek, Larcom Island, head of Hastings Arm, Donahue Creek, Lime Creek, and the south end of Porcher Island. Nothing of interest was reported.

*Slocan Mining Division.*—Work was continued in the vicinity of Burton, including Shannon Creek, Wilson Creek, Rodd Creek, Cariboo Creek, Bonanza Creek, Mosquito Creek, Rossland Creek, Scalping Knife Mountain, and Snow Creek. Some small showings of molybdenite in granite were reported from the Snow Creek area. Nothing of further interest was found.

*Vancouver Mining Division.*—Some work was done on the Toba River 8 miles from the head of Toba Inlet. Several high assays were obtained from float material, but no definite geological information is available. On Redonda Island further prospecting was done in the vicinity of a discovery of molybdenite made last year. Small exposures were found to be of commercial value, but no continuity was maintained in the deposit. In the steep mountainous country behind Woodfibre a great deal of work was done in trying to trace the Britannia shear zone. No important zones were found.

*Victoria Mining Division.*—Some work was done around Brow Creek, near Port Renfrew, and Harris Creek. The result of this work was inconclusive.

## MUSEUMS

The Department has a large exhibit of mineral rock specimens in the Douglas Building, Victoria; collections are also displayed in the joint office in Vancouver and in the offices of the Inspectors of Mines in Nelson and Prince Rupert.

Specimens from the collection in Victoria, accumulated in a period of more than sixty years, are displayed in cases on the fourth floor of the Douglas Building. The collection includes specimens from many of the mines and prospects in the Province, and also specimens of type rocks and special minerals from British Columbia and elsewhere.

British Columbia material includes specimens collected by officers of the Department of Mines and specimens donated by property-owners. The collection also includes type specimens purchased from distributors. Other valued specimens or groups of specimens have been donated or loaned to the museum.

## ROCK AND MINERAL SPECIMENS

Information regarding collections of specimens of rocks and minerals available to prospectors and schools in British Columbia may be obtained from the Chief of the Mineralogical Branch.

## PUBLICATIONS

Annual Reports of the Minister of Mines, bulletins, and other publications of the Department, with prices charged for them, are listed in the Department of Mines List of Publications available from the Chief of the Mineralogical Branch.

Publications may be obtained from the offices of the Department in Victoria and elsewhere in the Province. They are also available for reference use in the Department's library (Mineralogical Branch) at Victoria, in the joint office in Vancouver, and in the offices of the Inspectors of Mines in Nelson and Prince Rupert, as well as in public libraries.

## MAPS SHOWING MINERAL CLAIMS, PLACER CLAIMS, AND PLACER-MINING LEASES

From the details supplied by the locators, the approximate positions of mineral claims held by record and of placer-mining leases are shown on maps that may be inspected in the central records offices of the Department of Mines in Victoria and in Vancouver. Copies of these maps may be obtained on request. The boundaries of surveyed claims and leases are shown on the reference maps and other maps of the British Columbia Department of Lands and Forests.

## JOINT OFFICES OF THE BRITISH COLUMBIA DEPARTMENT OF MINES AND THE DEPARTMENT OF MINES AND TECHNICAL SURVEYS, CANADA.

The Provincial Department's Inspector and Resident Engineer, the Gold Commissioner and Mining Recorder for the Vancouver Mining Division, and the officers of the Federal Geological Survey occupy one suite of offices. All official information relating to mining is now available to the public in the one suite of offices in Vancouver.

The services offered to the public include technical information on mining, the identification of mineral specimens, distribution of Federal and Provincial mining publications, a reference library, a display of rocks and minerals, and a central records office.

# Topographic Mapping and Air Photography

A satisfactory year of accomplishment in surveys and mapping was had by the Surveys and Mapping Branch of the British Columbia Department of Lands and Forests, and by the Departments of Mines and Technical Surveys and of National Defence of the Canadian Government.

The British Columbia Government surveys for the final demarcation of the northern boundary of the Province were successfully concluded in 1958.

The Legal Surveys Division of the Surveys and Mapping Branch is responsible for cadastral surveys of all Crown lands in the Province and issued 608 sets of instructions for surveys spread over the populated area. Notable amongst these is an area of 4,170 acres in the Peace River district from Hudson Hope east to the Beatton River road. Forty-nine and one-half miles were surveyed for rights-of-way for new highways in the vicinity of Yahk to Kingsgate, West Summerland to Peachland, Burns Lake, Allison Lake, and Arras to Dawson Creek. In the course of such surveys, 251 old lot corners were replaced by permanent monuments.

The Air Division of the Surveys and Mapping Branch, experiencing ideal flying weather during the season, covered 20,000 square miles with narrow-angle 1-inch-to-20-chains scale vertical photography for the British Columbia Forest Service, and an additional 2,500 lineal miles of various types of photography for other Government branches. These record operations added 26,000 photographs to the Air Photo Library, bringing the total number of air photographs (Federal and Provincial) now on file at Victoria to 453,553.

The Interim Mapping Section of the Air Division completed approximately 30,000 square miles of 1-inch-to-40-chains scale mapping showing planimetry, watershed boundaries, and cadastral surveys, bringing the total area of the Province covered by this series to 224,000 square miles.

In the 1958 programme of operations the Topographic Division of the Surveys and Mapping Branch nearly doubled its 1957 programme by completing field control for twenty standard National Topographic map-sheets covering 7,600 square miles located in the following areas: Mabel Lake, Clinton, Tatlayoko, Taseko and Chilco Lakes, and an area east of Bella Coola.

Control was established for 1,315 square miles by sixty-one multiplex extensions for 1-inch-to-500-feet mapping with 10-foot contours in the vicinity of Vernon, and forty-eight extensions for 1-inch-to-1,000-feet mapping with 20-foot contours in the Chemainus and Nanaimo River areas.

The Multiplex Section of the Topographic Division completed eleven projects covering 3,042 square miles.

Map compilation and reproduction by the Geographic Division of the Surveys and Mapping Branch resulted in the publishing of thirteen maps, seven of which are new editions. Prominently featured during the year was the much requested two-sheet wall map of the Province—No. 1A—scale 1:1,000,000 (approximately 1 inch to 16 miles). Other new editions included four of the popular National Topographic series at 1-inch-to-2-miles scale, i.e., 82 E/NE—Upper Kettle River, 92 G/SE—Langley, 92 I/NW—Ashcroft, and 92 I/SW—Lytton, also two regional maps, i.e., 2C—Northerly Vancouver Island—scale 1 inch to 4 miles and 3H—Tête Jaune—scale 1 inch to 3 miles.

The Canadian Government Departments of Mines and Technical Surveys and of National Defence at Ottawa, working in close co-operation with Provincial agencies during 1958, completed the field work for sixty-two half-sheets of the National Topographic 1:50,000 series in the Province.

The 1958 Annual Report of the Deputy Minister of Lands contains key maps indicating coverage by air photographs and by topographic, interim, and lithographed maps. Further information concerning these and the corresponding Federal mapping may be obtained from the Director, Surveys and Mapping Branch, Department of Lands and Forests, Victoria.

# Department of Mines and Technical Surveys

The Canadian Government Department of Mines and Technical Surveys, created by an Act of Parliament introduced in November, 1949, took over most of the branches and functions related to mining of the former Department of Mines and Resources. The Mines Branch, Geological Survey of Canada, and Surveys and Mapping Branch are the three branches of the Department of the most direct interest to the mining industry. Brief reference to the work of the Surveys and Mapping Branch in British Columbia is made in the preceding note headed "Topographic Mapping and Air Photography." A note on the Geological Survey of Canada follows this paragraph and is followed by a note on the Mines Branch.

## GEOLOGICAL SURVEY OF CANADA

By an arrangement made at the time the Province of British Columbia entered Confederation, geological investigations and mapping in the Province are carried on by the Geological Survey of Canada. Several geological parties are in the field each year. Many excellent reports and maps covering areas of British Columbia have been issued by the Geological Survey of Canada, and they have made available a great amount of information that has been of much benefit to the mining and prospecting activities in British Columbia.

A branch office of the Geological Survey of Canada is maintained in Vancouver. Maps and reports on British Columbia can be obtained there. J. E. Armstrong is in charge of this office.

### Field Work by Geological Survey of Canada in British Columbia, 1958

H. H. Bostock began the geological mapping of Squamish (92 G, W. ½) map-area.

H. Frebold studied Jurassic fauna and stratigraphy in the Tyaughton Lake area and south of Nelson.

J. G. Fyles completed the field study and mapping of the surficial deposits on the east coast of Vancouver Island between Cumberland and Campbell River (lowland parts of 92 F/10, 11, 13, and 14 and K/3 and 4).

H. Gabrielse conducted stratigraphic studies and geological reconnaissance of Kechika (94 L) and Rabbit River (94 M) map-areas.

H. W. Little began the revision of geological mapping in the Kettle River West Half (82 E, W. ½) map-area.

D. C. McGregor collected flora from Lower Cretaceous and adjacent strata in the foothills of Alberta and British Columbia.

B. R. Pelletier and W. B. Brady began and completed field work in the Tetsa River (94 K/9) map-area.

R. A. Price began geological mapping of the Fernie East Half (82 G, E. ½) map-area. This map-area extends into Alberta.

J. E. Reesor continued his study of granitic rocks, making detailed field studies within the Burton (82 F/13) and Passmore (82 F/12) map-areas.

E. F. Roots completed field work required to fill in gaps from Operation Stikine within Bowser Lake (104 A), Spatsizi (104 H), and Dease Lake (104 J) map-areas.

J. G. Souther completed similar work in Iskut River (104 B) map-area and in addition made a geological reconnaissance of Sumdum (104 F) map-area and the southern half of Tulsequah (104 K) map-area.

D. F. Stott completed stratigraphic studies of Cretaceous strata in the foothills of Alberta and British Columbia.

H. W. Tipper completed all but the northeast corner of Quesnel (93 B) map-area.

### Publications of the Geological Survey

A total of fifteen publications of the Geological Survey of Canada relating to British Columbia was received by the British Columbia Department of Mines in 1958. A list of the fifteen publications will be supplied on request.

## MINES BRANCH

The Mines Branch has branches dealing with mineral resources, mineral dressing and process metallurgy, physical metallurgy, radioactivity, and fuels and explosives. A total of six publications of the Mines Branch pertaining to British Columbia were received in 1958 by the British Columbia Department of Mines. A list of these publications will be supplied on request. They included tabular pamphlets dealing with coal mines, gold mines, stone quarries, petroleum refineries, and milling plants in Canada.

# Lode Metals

CONTENTS

## GENERAL REVIEW

With the exception of gold, the prices of all principal metals were down in 1958 compared with 1957. The average Canadian price of gold was $33.98 per ounce, 43 cents more than the twenty-four-year low reached in 1957. The price of silver declined only six-tenths of a cent per ounce. The New York price of copper dipped below 20 cents per pound early in March but climbed slowly to 26.975 cents at the end of the year. The average Canadian price for the year was the lowest since 1949. The average price for lead, below 12 cents per pound, was the lowest since 1946. The 10 cents average price for zinc was also the lowest since 1946 and was practically half the record high of 1951. The imposition in October of quotas on the amounts of lead and zinc imported into the United States had little effect on the quantity of those metals produced in 1958. The price of tungstic oxide reached a low of $8.50 per short ton unit, although it was between $12 and $13 at the start and end of 1958.

Gold, silver, copper, lead, and zinc produced at British Columbia lode mines in 1958 had a gross value of $93,516,891. Miscellaneous metals, including iron ore, tungsten, tin, and minor metals recovered at the Trail smelter, had a gross value of $10,539,795. The total quantity of ore mined at all lode mines amounted to 6,402,198 tons and came from forty-seven mines, of which twenty-eight produced 100 tons or more. The average number employed in the lode-mining industry in 1958, including mines, concentrators, and smelters, was 7,434.

In 1958 twenty-five mills were operated, fifteen of them throughout the year. Two mills, that of Western Nickel Limited near Hope and that of Cowichan Copper Co. Ltd. at Cowichan Lake, produced for the first time. The Musketeer mill at Bedwell Sound reopened. Eight mills closed, four because of exhaustion of the orebodies which supplied them and four because of various economic reasons. Three Slocan mills accepted custom ore.

The Trail smelter recorded custom receipts of 3,238 tons of crude ore (including 1,225 tons of siliceous ore), 9,240 tons of lead concentrates, and 4,514 tons of zinc concentrates. Totals of approximately 26,000 tons of lead concentrates (including about 2,300 tons from the Sullivan mine) and approximately 65,000 tons of zinc concentrates were shipped out of the country for smelting. Most copper concentrates, and dross from the Trail smelter, were shipped to the Tacoma smelter; copper concentrates from Cowichan Lake were shipped to Japan. Concentrated iron ore was shipped to Japan. Tungsten concentrates were sold to the United States Government under contract; concentrates produced after expiration of the contract were stockpiled at the Emerald mine. Nickel concentrates were shipped to the refinery at Fort Saskatchewan.

The production of gold decreased somewhat in comparison with the 1957 figure. This was largely due to the cessation of production from Tulsequah in 1957 and the closing of Britannia early in 1958. The deep development at Bralorne continued, with no diminution in gold content of the 77 vein. New interest was shown in gold by the reopening of the Musketeer mine and by investigational work at Tranquil Inlet and Camp McKinney.

The production of silver remained essentially unchanged, although the sources of silver were materially reduced with the closing of the Silver Standard and Spider mines in May. Production capacity of the Slocan Mining Division was also reduced. Highland-Bell, on the other hand, produced more silver than in any year since 1941.

The Britannia mine closed after fifty-three years of continuous operation, during the course of which it milled 44 million tons and produced 940 million pounds of copper in concentrates. The company had proposed to cease operations in December, 1957, owing to the low price of copper, but a direct subsidy payment by the Canadian and Provincial Governments enabled the mine to operate on a reduced scale until March 12th, 1958, when production ceased. The price of copper subsequently rose, however, and the

owners of the property, after a complete reorganization, were making plans at the end of 1958 to reopen the mine. After the closing of Britannia the only producing copper mine was that of Cowichan Copper Co. Ltd. Copper was a by-product of the milling of iron, nickel, and lead-zinc ores, and of the refining of copper matte from Trail.

Although the current position of copper was not satisfactory, the future was brighter. Interest in the region Kamloops-Ashcroft-Merritt-Princeton was shown by large and small exploration companies. American Smelting and Refining Company Ltd. dropped out of the Highland Valley camp owing to pressure of business elsewhere, but Bethlehem Copper Corporation Ltd. continued exploration on its own property and started an adit at an elevation of 4,600 feet. The adit had reached the Jersey zone at the end of 1958. The Craigmont property near Merritt was also brought to the stage of underground development, and at the end of the year the 3500 adit reached the ore zone which had been outlined by surface diamond drilling.

The chief producers of lead and zinc, apart from the Sullivan, continued to produce in the face of prices that made most operations little more than marginal. These were the H.B., Jersey, Reeves MacDonald, Bluebell, and Mineral King. Three mines closed because their orebodies were exhausted—the Silver Standard and Spider in May and the Highlander in December. There was some reduction in output from the Slocan. The Sullivan mine produced approximately 2,444,000 tons or 9,600 tons per day of operation.

The Emerald tungsten mine closed on July 31st upon exhaustion of the developed orebodies, shortly after termination of its contract with the United States Government. Further development at the current market price of tungstic oxide is not considered. The Emerald tungsten ore zone was discovered in 1941, and the property was bought by the Canadian Government and developed as a wartime measure in 1942. The property (including the Jersey and the old Emerald lead-zinc mines) was purchased by its present owners in 1947 and mined for tungsten until January, 1949. Early in 1951 the Canadian Government bought back two blocks of ground covering the known Emerald tungsten orebodies and the partly developed Dodger tungsten showings, and a mill was constructed at Government expense. In October, 1952, all Government holdings were bought back by the company. The Emerald mine and the closely related Dodger and Feeney mines have produced 13,739,939 pounds of tungstic oxide in concentrates, valued at $33,900,311, gross.

The Western Nickel mine came into production in January, 1958, and operated for half a year. It closed at the end of July because of modification and partial cancellation of European sales contracts.

Molybdenite was of more interest in British Columbia than in years past. American Metal Climax, Inc., at the Boss Mountain property outlined an ore zone that appears to be assured of future production. The same company was actively engaged elsewhere, especially at Glacier Gulch near Smithers. The Glacier Gulch showing is low in grade, but whether or not it will some day be mined the occurrence indicates the possibility that a major molybdenite zone may occur in non-granitic rock.

Exploration activity was at a fair level, considering the state of the market. Work was done mostly by the larger companies, some of which maintained large technical field staffs at considerable expense. Copper was the metal most sought after, partly because its future seemed bright, and also because there was promise of making important discoveries in the southern Interior. Exploration in the north was about normal, although development at the Granduc was halted for an indefinite period. Preliminary work was done on copper showings on Racing and Toad Rivers, near the north end of the Rocky Mountains, on the south side of the Alaska Highway.

Other metals were sought after to a lesser extent than copper. One of the few promising developments in lead and zinc was on Duncan Lake, where surface diamond

drilling showed interesting results. The search for silver, lead, and zinc was somewhat less than desirable in view of the several mine closures.

For some years the Department of Mines has accepted under the " Mineral Act " and the " Placer-mining Act " geological, geophysical, and geochemical reports for credit on assessment requirements. These reports have been available for examination at the office of the Mining Recorder for the appropriate mining division, and at the office of the Chief of the Mineralogical Branch, Department of Mines, Victoria. In all, 244 reports have been accepted since January 17th, 1947. A list of the reports, to date, appears at the end of the Lode Metals section, pages 61 to 75.

# NOTES ON METAL MINES

## TELEGRAPH CREEK*

*Molybdenum*

**Balsom Group (Conwest Exploration Company Limited)**

(57° 132° N.E.) This property is on the headwaters of Barrington River. The showings consist of pyrite, pyrrhotite, and molybdenite in a brecciated zone in a dioritic stock which intrudes Triassic sedimentary and volcanic rocks. American Metal Climax, Inc., optioned twenty-two claims from Conwest Exploration Company and located eight more; work commenced June 17th and finished July 30th. A trail was built from Telegraph Creek to the property, a distance of 60 miles; 275 feet of rock trenching and 2,500 feet of surface stripping was done; geological mapping was done on the claims and seventy-six samples were taken in sampling the mineralized zone. Access to the property was by aeroplane and by pack-horse. Geologist in charge at the property was P. O. Hackey. An average crew of five men was employed.

## UNUK RIVER*

*Copper*

**Granduc (Granduc Mines, Limited)**

(56° 130° S.E.) Company office, Room 507, 1111 West Georgia Street, Vancouver 5; L. T. Postle, president. The property is on the south fork of the Leduc glacier, 25 miles northwest of Stewart at an elevation of 4,500 feet. Work to date has indicated a mass of copper-bearing rock of major size.

On March 15th, 1958, all operations ceased, and at present there are no indications of an early resumption of work. Surface installations at the mine were completely dismantled, and machinery was weather-proofed and stored in the 3250 level.

On the surface 3,251 feet of ice-drilling was done on the Leduc glacier. A further 8,943 feet of diamond drilling was done underground. On the 2625 level 477 feet of drifting was done. A small raise 69 feet long was driven.

Work was carried out until the cessation of operations, an average crew of fifty-two men being employed.

## PORTLAND CANAL*

*Gold-Silver-Lead-Zinc*

**Silbak Premier Mines Limited**

(56° 130° S.E.) Company office, 572 Howe Street, Vancouver. A. E. Bryant, president; Henry L. Hill and Associates, consulting engineers. During the summer of 1958 mill clean-up work carried out by a crew of four men produced 99.6 tons of concentrates averaging 2.5 ounces gold per ton. There was no indication that operations would be resumed in the near future.

## ALICE ARM*

*Silver*

**Toric (Torbrit Silver Mines Limited)**

(55° 129° N.W.) Registered office, 309 Royal Bank Building, Vancouver; executive office, 44 King Street West, Toronto; mine office, Alice Arm. R. W. Burton, manager; H. Bapty, mine superintendent; G. K. Sutherland, mill superintendent. Capital: 3,000,000 shares, $1 par value. The Torbrit mine camp and mill are on the west bank of the Kitsault River, 17 miles by road from Alice Arm.

Production: Ore milled, 135,892 tons. Total concentrates produced amounted to 1,872 tons containing 1,090,846 ounces of silver and 1,506,849 pounds of lead. In

* By David Smith.

addition, the total bullion produced was 240,242 fine ounces. The source of the ore milled in 1958 was as follows: 34 per cent from the winze below the 813 level; 28 per cent from the 813 level; 17 per cent from the 916 level; and 21 per cent from the 1018 level.

A summary of mining operations follows:—

| Ore broken— | Tons |
|---|---|
| Stoping | 100,170 |
| Stope raises and stope drifts | 4,261 |
| Development | 2,691 |
| Total | 107,122 |

| Waste broken— | Tons |
|---|---|
| Level development | 615 |
| Stope raises and stope drifts | 937 |
| Raises | 438 |
| Total | 1,990 |

| Development in linear feet— | Ft. |
|---|---|
| Drifts and crosscuts | 304 |
| Raises | 233 |
| Stope drifts | 383 |
| Stope raises | 1,328 |
| Total | 2,248 |
| Underground diamond drilling | 6,011 |
| Longhole drilling with tungsten carbide bits | 33,971 |

No safety officer is employed, but a mine safety committee carries out regular monthly inspections of the mine and mill and holds monthly meetings. Sixteen compensable accidents occurred, as follows: Mine, 9 accidents; mill, 3 accidents; surface, 3 accidents; and kitchen, 1 accident.

On the surface no new construction was undertaken. The access trail to the hydro plant was put in excellent shape; all bridges were repaired or entirely replaced.

An adit was driven at 1,025 feet elevation from the west bank of the Kitsault River to investigate further the vein intersections found in the course of surface diamond drilling on the North Star claim. Total footage in the adit was 1,115 feet, and from the adit 4,403 feet of diamond drilling was done to explore further vein-matter which was found in driving the adit.

On the Tiger claim (Lot 3614), some trenching was done to trace the extension of a vein outcrop. Later, 667 feet of diamond drilling was done from surface sites.

## ECSTALL RIVER*

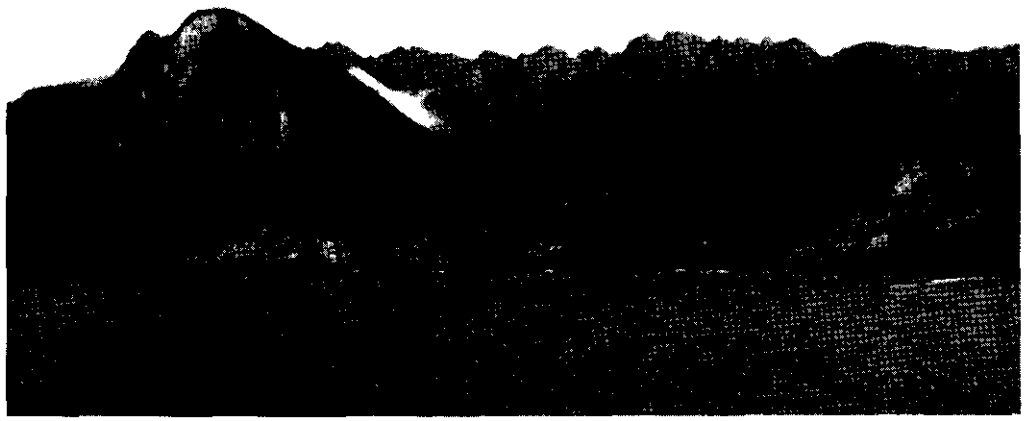
***Pyrite-Zinc-Copper***

**Ecstall (Ecstall Mining Company Limited)**

(53° 129° N.W.) Company office, 355 Burrard Street, Vancouver. R. D. Mollison, New York, president; W. R. Bacon, director and manager of British Columbia operations. This property consists of twenty-one Crown-granted claims which extend across the Ecstall River at a point 30 miles above its confluence with the Skeena River. It is 45 miles southeast of Prince Rupert. Work on the property was confined to a few days' geophysical work for the purpose of checking two electromagnetic anomalies obtained during the 1957 survey.

[Reference: *Minister of Mines, B.C.,* Ann. Rept., 1952, pp. 81–84.]

* By David Smith.



Entrance to Pocket Inlet, west coast of Moresby Island.

Pillow lava lying above limestone, Louise Island, Queen Charlotte Islands.

**Packsack (Texas Gulf Sulphur Company)**

(53° 129° N.E.) Executive office, 75 East Forty-fifth Street, New York. C. O. Stephens, New York, president. This property consists of sixteen claims, two rows of eight claims extending northward from the big bend of the Ecstall River. It is 7 air miles south 25 degrees east of the Ecstall property. In 1957 a crew working under the direction of W. R. Bacon discovered massive sulphide showings on the east slope of what is now known locally as Prospect Hill. The showings are at a general elevation of 800 feet above sea-level and 650 feet above the valley floor.

There are two showings. They occur in the shallow beds of two tiny intermittent streams. The southern showing occurs in the northeastern corner of the Packsack No. 2 claim, and the northern showing, 550 feet north of the southern, straddles the location-line between the Gunnysack Nos. 1 and 2 claims.

The showings appear to be replicas of those occurring in Red Gulch Creek on the Ecstall property. In other words they consist largely of massive pyrite containing minor amounts of sphalerite and chalcopyrite. In addition, however, minor coatings of secondary chalcocite have been observed in a few places.

As on the Ecstall property, the showings occur in sericite schist, the favourable band of which is more than 100 feet wide at the southern showing. The band strikes northward and dips very steeply eastward.

The surface expression of the favourable band is a topographic depression, and extensive trenching with hand-tools is not practical. An electromagnetic survey was undertaken in 1958 to outline the extent of mineralization. The results of this survey indicate a minimum length of 2,000 feet for the mineralized zone and a probable maximum width of the order of 50 feet. The property was not visited.

## HAZELTON*

***Silver-Lead-Zinc-Cadmium***

**Silver Standard (Silver Standard Mines Limited)**

(55° 127° S.W.) Head office, 609, 602 West Hastings Street, Vancouver; mine office, Hazelton. R. R. Wilson, president; H. B. Gilleland, manager; A. C. Ritchie, general superintendent; G. E. Apps, mine superintendent. The property is on Glen Mountain, 5½ miles north of Hazelton. All underground work ceased on May 15th. No ore remains in the stopes and there are no more known ore-shoots on the veins. All surface break-throughs of stopes and raises have been caved and backfilled. To the end of production, May 15th, 1958, the mine worked 105 days with 2,537 man shifts underground, 800 man shifts in the mill, and 957 man shifts on the surface.

A summary of the work done in 1958 was as follows:—

*Mine*

| Development— | Ft. |
|---|---|
| Drifting and crosscutting | 35 |
| Subdrifting | 70 |
| Raising | 230 |
| Total | 335 |

| Diamond drilling— | Ft. |
|---|---|
| Surface | *Nil* |
| Underground | 193 |
| Total | 193 |

* By David Smith.

*Mine*—Continued

| Stoping— | Tons |
|---|---|
| No. 11 cross-vein | 5,320 |
| No. 10 cross-vein | 1,157 |
| Ore-passes | 36 |
| Total | 6,513 |

| Ore to mill— | Tons |
|---|---|
| Stopes | 6,513 |
| Development | 74 |
| Total | 6,587 |

*Mill*

| | Tons |
|---|---|
| Ore from mine | 6,587 |
| Sorted as waste | 1,543 |
| Tons milled | 5,044 |

All mining was on No. 11 and No. 10 cross-veins. The 1511-1100 D block at the south end of the No. 11 cross-vein ore-shoot was developed and stoped to supply approximately one-third of the 1958 production. The balance of the ore was mined from remnants of the orebodies, pillars, and small faulted vein segments. Eight diamond-drill holes totalling 193 feet were drilled to test the veins in the vicinity of the workings.

Milling was continuous from January 27th to April 17th and was intermittent to May 13th. A total of 6,587 tons of ore was drawn from the mine. Of this, 1,543 tons was hand-sorted and discarded as waste while the remaining 5,044 tons was treated by differential flotation. The indicated recovery was 93.7 per cent. There were no major alterations to the mill flow sheet and no major breakdowns.

All surface units were completely dismantled and placed in storage at the Sil-Van mine. Except for the hoist, all underground installations and equipment were dismantled and are now in storage at the Sil-Van mine.

## SMITHERS

### *Silver-Lead-Zinc*

**Lorraine***

(54° 126° N.W.) This property is on the eastern slope of Hyland Mountain at an elevation of 5,000 feet. Work on the property was confined to opening up the upper tunnel in preparation for stoping to surface. A truck-road 4 miles in length was built joining the Cronin mine road 2 miles below the present Cronin mill-site. Work was under the direction of D. A. Campbell, engineer. A crew of three men was employed.

### *Molybdenum*

**Glacier Gulch† (American Metal Climax, Inc.)**

(54° 127° N.E.) The occurrence of molybdenite in rocks directly below the toe of the glacier at the head of Glacier Gulch on the east side of Hudson Bay Mountain has been known locally for some time, even though no published record exists. Four claims were located on the molybdenite showing in May and June, 1956, by W. D. Yorke-Hardy, E. E. Malkow, Hunter H. Simpson, and R. C. McFarland, of Smithers. These men located twenty-six more claims around the head of Glacier Gulch in July, 1957, and in December, 1957, title to all claims was transferred by bill of sale

* By David Smith.
† By Stuart S. Holland.

to Climax Molybdenum (B.C.) Ltd., now American Metal Climax, Inc. The company located an additional twenty-five claims around the initial locations.

American Metal Climax, Inc., was actively engaged during the summer of 1958 in investigating the occurrences of molybdenite at and around the toe of the glacier at the head of Glacier Gulch. A trail from the head of the Glacier Gulch road was built up hill to a tent camp established within 200 feet of the toe of the glacier.

Over the past ten years or more the glacier has been receding rapidly and an extensive area has recently been exposed to view. This area of rock, immediately east of the ice front, is smoothed by ice erosion, and is almost devoid of drift and boulder cover. The bedrock of Hazelton formation tuffs, flows, and agglomerates is perfectly exposed to view. The rocks are cut by a few feldspar porphyry dykes high up along the northern edge of the glacier and by several shear zones along which there has been some carbonate alteration. The volcanics, regardless of type, are crossed by a system of northwesterly striking and northeasterly dipping joint-planes. The joint-planes, whose spacing may range from 1 foot to 10 or 15 feet, are mineralized predominantly by molybdenite. Some pyrite, chalcopyrite, and sphalerite have been observed in very minor amounts. The molybdenite ranges in thickness from a mere film to veinlets of about three-eighths of an inch maximum thickness. The rock between the mineralized joint-planes appears to be devoid of mineralization.

Bedrock and its contained mineralization is well displayed in an area 2,000 feet wide by 1,000 feet deep. The company was primarily engaged in sampling this area. A grid had been laid out and bulk samples were taken at 100- by 200-foot intervals. Although three sets of samples were taken over the area, uniform results had not been obtained. Eleven diamond-drill holes totalling 6,320 feet were drilled.

Exploration has shown that there is a very large surface area of molybdenite mineralization beyond the area sampled and that the mineralization appears to have a vertical range of several thousand feet. There is some indication that the more intensely hornfelsed rocks carry a slightly higher molybdenite content. The accurate determination of grade is the critical factor in assessing the worth of the property.

Work was under the direction of J. W. Bryant. A geological survey of the property was made by Professor W. W. Moorhouse, of the University of Toronto.

## OMINECA*

***Mercury***

**AMY Group** (55° 125° N.E.) This property consists of ten claims—AMY Nos. 1 to 10 held by record—and is situated on Silver Creek 6 miles south of the Omineca River. The mineral showings are cinnabar impregnations in Permian rocks along the Pinchi fault zone. An average crew of three men was employed. Work included the removal of some 14,500 yards of overburden by hydraulicking and with a bulldozer. The access road was put into shape for truck transportation. Geological mapping was done. The project was a joint effort by Noranda Exploration Company, Limited, Canex Aerial Exploration Ltd., and Bralorne Mines Limited under the supervision of E. Bronlund.

***Copper***

**Jane Group** (56° 125° S.W.) This property consists of seventeen claims—Jane Nos. 1 to 17—held by record, and is situated on Croydon Creek 9 miles west of Aiken Lake. The mineral showings are shear zones in diorite and pyroxenite carrying values in copper and gold. An average crew of eight men was employed. Work accomplished included 9 miles of trail, 35,000 feet of line cutting, 1,537 feet of diamond drilling in seven holes, and geological mapping. E. Bronlund was engineer in charge for Noranda Exploration Company, Limited, Canex Aerial Exploration Ltd., and Bralorne Mines Limited.

* By David Smith.

Glacier at the head of Glacier Gulch, Hudson Bay Mountain.

Packing to the Glacier Gulch molybdenite showings.

*Lead-Silver*

**Silver Tip Group (Canex Aerial Exploration Ltd.)**

(59° 130° N.W.) The Silver Tip claims are about 4 miles northeast of Tootsee Lake and 17 miles by road south of Mile-post 701 on the Alaska Highway. A total of thirty-two claims are held by record by the owners, A. Zborovsky and associates. Conwest previously optioned the claims and did the following work: 1,950 feet of drifting and raising, 650 feet of underground diamond drilling in six holes, 1,908 feet of surface drilling in eleven holes, and some surface trenching. The option was dropped and Canex took up the option. A crew of ten was employed. Work commenced August, 1958, and ended in November. Three holes were drilled from the adit with a total footage of 3,296 feet. Approximately 10 miles of new tractor-road was constructed and improvements were made to the existing road.

## ALASKA HIGHWAY*

*Copper*

**Magnum Copper (Magnum Copper Limited N.P.L.)**

(58° 125° N.E.) Company office, 700 Burrard Building, 1030 West Georgia Street, Vancouver. D. J. McDonald, president; A. Allan, field superintendent. The property is on the headwaters of Delano Creek, a tributary of the Racing River. A total of sixty-eight claims are held, partly by record, partly by option agreement from W. Lembke and A. Larson, Mile 408, Alaska Highway. The showings consist of closely spaced lenses of quartz within a northeasterly trending shear zone. The quartz lenses are more or less abundantly mineralized with chalcopyrite. Surface sampling by the company reportedly indicates a length of 1,050 feet, 7.0 feet wide, averaging 7 per cent copper. Sporadic low values in gold and silver are associated with the copper mineralization. The zone is persistent on strike and drilling shows it to extend at least 700 feet in vertical depth. Work on the property commenced July 28th and was discontinued on September 25th. The average crew consisted of twelve men. A length of 3,485 feet of AX core drilling was done in six deep holes. To obtain samples, 440 feet of EX core drilling was done in twenty-two shallow holes. Considerable trenching and open-cutting was done. Some work was done to improve the existing Racing River trail and in new construction on Delano Creek. The camp was supplied by pack-train and all heavy equipment was moved in by an S-55 helicopter. There was no permanent construction at the camp. All drilling equipment and supplies have been stored on the ground and a continuation of the drilling programme is planned for 1959. The property was not visited.

*Copper*

**Toad River (Fort Reliance Minerals Limited)**

(58° 125° N.W.) Company office, 25 King Street West, Toronto. J. B. Streit, president; A. D. Wilmot, exploration manager. The property is on the Toad River, 18 miles south of Mile 442 on the Alaska Highway. A total of thirty claims are held—nineteen by location, eight by option agreement from H. Kvikstad, and three by option agreement from G. L. Johnson. The showings consist of a strong north-south trending shear zone with an average width of 8 feet that cuts through thin-bedded argillite and shale having a northerly strike and dipping to the west at 20 degrees. The copper mineralization occurs in narrow quartz-calcite stringers. Surface sampling by the company was concentrated within a length of 800 feet and reportedly indicated a length of 660 feet with an average width of 9.7 feet and a grade of 5.7 per cent copper. Diamond drilling commenced on September 17th and was continued until October 26th. Ten AX holes were drilled with a total length of 1,452 feet. All drilling equipment and supplies were placed in storage on the property. There was no permanent construction in 1958. The property was not visited.

* By David Smith.

## CARIBOO*

### WELLS-BARKERVILLE (53° 121° S.W.)

*Gold*

**Aurum and Cariboo Gold Quartz (The Cariboo Gold Quartz Mining Company Limited)**

Company office, 1007 Royal Bank Building, Vancouver. W. B. Burnett, president. M. Guiguet, manager; R. E. C. Richards and J. W. Wylie, superintendents; J. I. Stone, mill superintendent. The Cariboo Gold Quartz and Aurum mines operated by this company are adjacent to the town of Wells, which is 51 miles by road from Quesnel on the Pacific Great Eastern Railway. The mine has two sections—the Quartz, which is the Cariboo Gold Quartz mine, and the Aurum, which was formerly the Island Mountain mine.

The ore deposits in the Quartz mine are in very irregular quartz veins; those in the Aurum mine are in tabular sulphide replacement bodies and in irregular quartz veins. Mining and development work was confined to the No. 1, Tailings, Rainbow, East, Mosquito, and Aurum zones.

The development footage in all sections of the two mines was as follows:—

| Zone | Drifts and Crosscuts | Raises | Subdrifts | Diamond Drilling |
|---|---|---|---|---|
| | Ft. | Ft. | Ft. | Ft. |
| No. 1 | 301 | ..... | ..... | 250 |
| Tailings | 57 | 122 | 151 | 1,505 |
| Rainbow | ..... | 52 | ..... | ..... |
| Aurum E | 717 | 326 | 769 | 4,904 |
| Aurum W | 237 | 54 | ..... | 1,770 |
| East Fault | 802 | 171 | ..... | 2,358 |
| Mosquito | 1,366 | ..... | ..... | 1,237 |
| Totals | 3,480 | 725 | 920 | 12,024 |

Irregular quartz orebodies are mined by a cut-and-fill method. Replacement orebodies are developed by inclined drifting and are mined by slashing the ore on a retreating system. Ore was produced as follows:—

| | Tons |
|---|---|
| Cut-and-fill mining | 46,982 |
| Retreating system | 17,363 |
| Development ore | 3,235 |
| Total | 67,580 |

The Quartz mine is ventilated by a Sheldon fan that delivers 20,000 cubic feet per minute and is driven by a 25-horsepower electric motor. The Aurum mine is ventilated by a Sturtevant fan that delivers 15,000 cubic feet per minute and is powered by a 15-horsepower electric motor.

Ore from both mines is milled in the Cariboo Gold Quartz mill. Gold is recovered by cyanidation.

An active safety programme was maintained at the mine. At the end of the year, the Provincial Department of Labour presented the mine with a Centennial award. This award was for a low accident rate of 12.2 accidents per million man-hours.

Production: Ore mined, 67,580 tons; ore milled, 66,880 tons. Recovery: Gold, 27,892 oz.; silver, 3,682 oz.

* By R. B. King.

## LAC LA HACHE*

### TAKOMKANE MOUNTAIN (52° 120° S.W.)

***Molybdenum***

**Boss Mountain (American Metal Climax, Inc.)**

Company office, 61 Broadway, New York, N.Y.; British Columbia office, 718 Granville Street, Vancouver. The American Metal Company and the Climax Molybdenum Company joined to form American Metal Climax, Inc., at the end of 1957. This new company continued work on the property. The property consists of eleven Crown-granted claims, Lots 11116 to 11126, inclusive, and seventy-four claims held by record, all of which are optioned from H. H. Huestis and associates. The property is on the east side of Takomkane (Big Timothy) Mountain at the headwaters of Molybdenite Creek. It is served entirely by aircraft from Williams Lake, landings being made on a small lake near the head of Boss Creek at the southern foot of Takomkane Mountain. From this lake a pack-trail leads over the mountain and down to the camp near the showings.

Exploration work during 1958 consisted of road and trail work, geophysical mapping, and diamond drilling. A total of 9,090 feet of diamond drilling was completed to test the extension of two mineralized showings.

## LILLOOET†

### BLUE CREEK (51° 122° S.W.)

***Gold***

**Elizabeth**

The Elizabeth group of four Crown-granted claims is north of Blue Creek, a tributary of Yalakom River. It is owned by Elizabeth U. White, of Vancouver, and T. W. Illidge, of Bralorne. Access to the property is by 48 miles of road from Lillooet.

In 1958, 9 tons of ore was shipped to the smelter at Trail.

### GUN CREEK (50° 122° N.W.)

***Cobalt-Gold-Uranium***

**Northern Gem Mining Corporation Ltd.**

Company office, 510 West Hastings Street, Vancouver. A. R. Allen, president; Isaac Shulman, managing director; H. R. Shuttleworth, superintendent. This property, consisting of eight Crown-granted and twenty-six recorded mineral claims, is on Roxey Creek near its headwaters. Roxey Creek flows into Gun Creek, which is a tributary of the Bridge River. The mine camp, elevation 5,500 feet, is 3 miles from Gun Creek and 12 miles from the Bridge River road. The mine road branches from the Bridge River road nearly 2 miles east of Minto.

During the year four men were employed doing assessment work.

### BRIDGE RIVER (50° 122° N.W.)

***Gold***

**Bralorne Mines Limited‡**

Company office, 355 Burrard Street, Vancouver; mine office, Bralorne. F. R. Joubin, president; M. M. O'Brien, vice-president and managing director; C. M. Manning, general superintendent; J. S. Thomson, mine superintendent; C. D. Musser, mill superintendent. Capital: 1,250,000 shares, no par value.

* By R. B. King.
† By R. B. King, except as noted.
‡ By Stuart S. Holland and R. B. King.

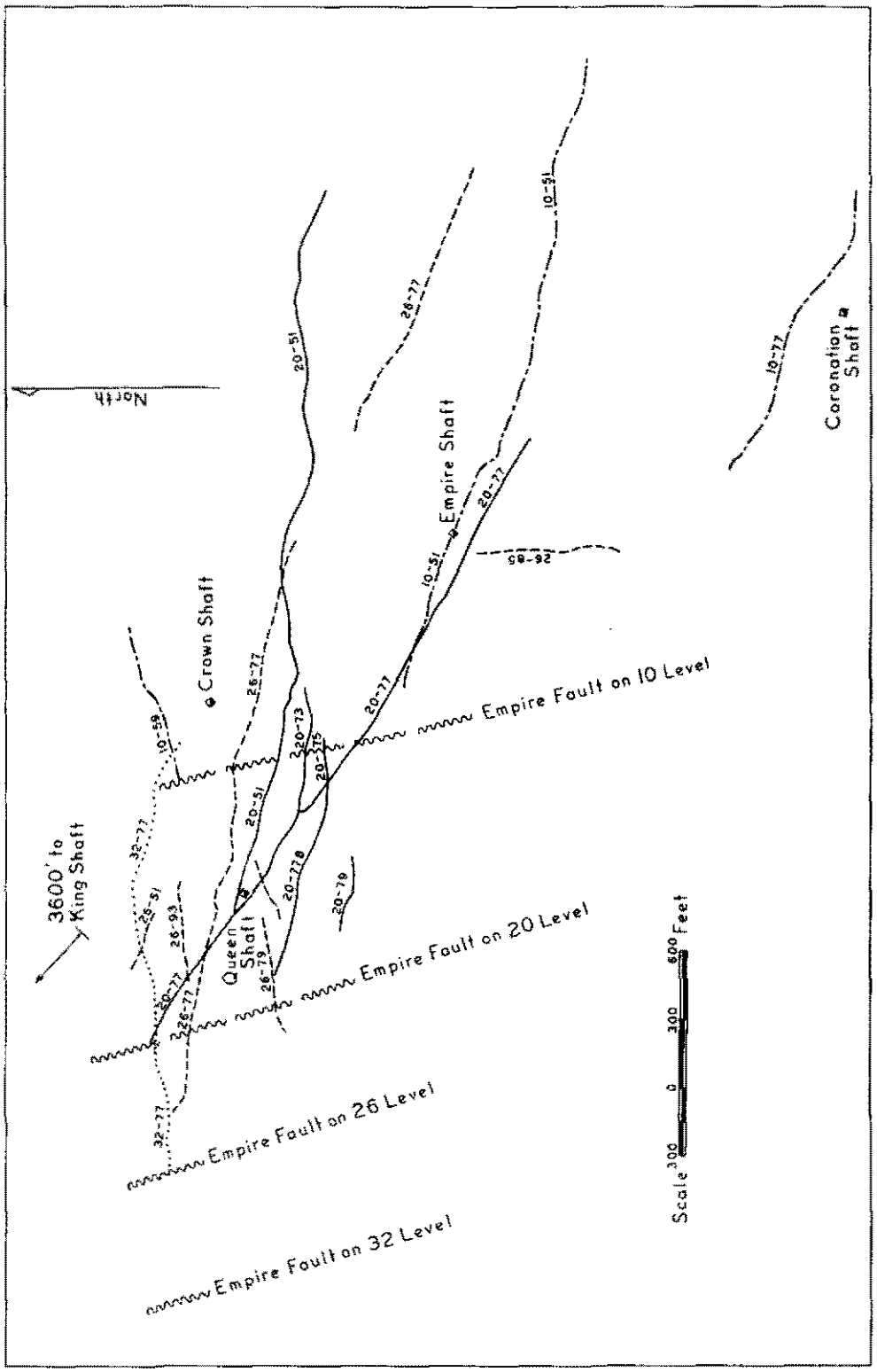



Figure 1. Bralorne Mines Limited—part of vein system.

The Bralorne mine is on Cadwallader Creek, a tributary of the Bridge River. It is reached by 51 miles of road from Shalalth or 75 miles of road from Lillooet, both stations on the Pacific Great Eastern Railway.

The company holds about a hundred claims extending along the east side of Cadwallader Creek for about 3 miles upstream from its junction with the Hurley River.

### *Workings*

The underground workings at Bralorne are extensive and have a total length of about 48.5 miles. The mine comprises four main sections, named from west to east the King, Queen, Crown, and Empire. Figure 1 shows the Queen, Crown, and Empire sections as well as the original Coronation shaft; the King section lies about 4,000 feet west of the Queen shaft.

The King section lies west of the Empire fault. It includes most of the original Lorne workings and in the early 1930's, prior to development of the Empire section, was the principal section of the mine. Mining finally ceased in the King section in 1940, though latterly there has been some exploration on No. 20 level in that section and from the crosscut extending northerly into Taylor Bridge River ground.

The Queen section lies east of the Empire fault. It is named from the Queen shaft, which is in the footwall of the 77 vein and has been sunk from No. 26 level to No. 36 level, a distance of about 1,500 feet.

The Crown section, named from the Crown shaft, lies in the footwall of the Empire fault east of the Queen section. The Crown shaft was sunk from No. 8 level to No. 26 level.

The Empire section, southeast of the Crown, is named from the Empire shaft sunk from No. 3 to No. 26 level. The Empire shaft was originally connected to the King section by a long crosscut on No. 8 level, which constitutes the main haulage level of the mine. In addition, the Crown and Empire shafts are connected on all levels between No. 8 and No. 26.

The Coronation shaft, lying southeast of the Empire, was sunk to No. 10 level and is one of the original mine workings.

Ore from below No. 26 level is hoisted in the Queen shaft to No. 26 level and then is trammed to the Crown shaft and hoisted to No. 8 level, the main haulage level of the mine, whence it is hauled to the mill.

Over the years gold production has come principally from the King, Shaft, North, and " C " veins in the King section, the 53 and 55 veins on the hangingwall side of the Empire fault, and the 51, 73, 75, 77, 79, 81, and 93 veins on the footwall side of the Empire fault. The total gold production of the mine from 1900 to 1958 is 1,933,095 ounces of gold from 3,930,195 tons of ore.

### *Vein System*

The King vein system is separate from and unrelated to the veins in the Crown and Empire sections. It is described in Geological Survey of Canada Memoir 213, pages 80 to 87. Bralorne veins on the footwall side of the Empire fault are quartz-filled fractures predominantly of two directions (*see* Fig. 1): (1) Northwesterly trending fractures, generally striking from north 60 to 75 degrees west and dipping to the northeast, are occupied by important veins such as the 77 and 51, both of which have been explored for strike lengths of several thousand feet; (2) easterly trending fractures striking north 75 to 85 degrees east and dipping steeply northward are occupied by the 73, 75, 79, and 93 veins; this direction is also followed by short lengths of vein, even along dominantly northwesterly fractures. The 85 vein has a northerly strike, a direction of rare occurrence in the mine.

The northwesterly striking veins occupy shear fractures, which in effect are reverse faults in which the hangingwall side has moved up and to the northwest. The easterly striking veins and vein segments occupy tension fractures along which there has been little movement.

*Fault*

The Empire fault is a northwesterly striking and southwesterly dipping reverse fault which on the hangingwall side offsets the veins to the north. Above No. 26 level the western ends of the 51 and 77 veins were cut by it and a considerable amount of ore was mined from the faulted portions which are named the 53 and 55 veins on the hangingwall side of the fault. Drifting on the west end of the 77 vein below No. 26 level has not reached the downward extension of the Empire fault zone.

*Recent Development*

The Queen shaft was sunk in the footwall of the 77 vein below No. 26 level to develop the 77, 79, and 93 veins at depth. The shaft extends to the 36 level, 881 feet below sea-level. Crosscutting to the 77 vein has been completed on all levels down to No. 33 and the vein drifted out on these levels. Drifts on the vein have been extremely successful in developing ore. Annual reports of the company have published the following dimensions of ore on the four lowest levels:—

| Level | Length of Ore | Average Width | Assay |
|---|---|---|---|
| | Ft. | Ft. | Oz. Gold per Ton |
| 30 | 1,081 | 6.3 | 1.09 |
| 31 | 964 | 7.1 | 1.20 |
| 32 | 1,009 | 7.27 | 1.15 |
| 33 | 1,127 | 8.1 | 0.99 |

In the course of mining it has been found that veins commonly may veer from a northwesterly trending shear fracture to an easterly trending tension fracture. This characteristic is shown in Figure 1 by the 51 vein on No. 20 level. Similarly it has been found that below No. 28 level the western end of the 77 vein has veered from a strike of north 75 degrees west to one of north 75 degrees east; it is taking the course of the 93 vein and in actuality may be occupying the 93 vein fracture.

Over the past five years the amount of gold produced from the 77 vein has increased from 49 per cent of the mine total in 1954 to 94 per cent in 1958. In view of the increased importance of the vein it is significant that on the deeper levels much of the ore is in the western end of the vein, where it follows the 93 vein direction.

*Current Development*

In 1958 the Queen shaft was sunk 251 feet and Nos. 34, 35, and 36 levels were established. Loading-pockets, transfer-raises, and pumping-stations were completed.

Development work comprised: 3,388 feet of drifting, 3,064 feet of crosscutting, 713 feet of raising, and 13,100 feet of diamond drilling. This development work was mainly in the Queen shaft section to explore the 77, 79, 85, 93, and 103 veins.

Ore is mined principally by cut-and-fill and shrinkage stoping. The tonnage of ore mined was as follows:—

| | Tons |
|---|---|
| Cut and fill | 92,556 |
| Shrinkage | 56,764 |
| Development | 9,402 |
| Raising | 1,795 |
| Total | 160,517 |

Pioneer Gold Mines of B.C. Limited, mill on edge of Cadwallader Creek.

Bralorne Mines Limited, mill and part of camp.

The mine is ventilated mechanically by fans circulating about 75,000 cubic feet a minute through the mine workings. Air is brought from surface to No. 25 level, where it is passed through a water-cooling plant. Fans distribute the cooled air through the working and exhaust the vitiated air. In 1958, 987 feet of ventilation raise was driven and a total of 1,550 feet of raise was slashed to 12 feet in diameter.

Through the combined efforts of all employees the number of days lost due to accidents decreased by 30 per cent from the 1957 average. Supervisors' course, safety discussions, first-aid and mine-rescue classes were held during the year.

In the mill, ore is treated by amalgamation, blanket concentration, and flotation. A sulphide concentrate made by flotation is shipped to the Tacoma smelter. Production: Ore milled, 146,358 tons. Recovery: Gold, 99,489 oz.; silver, 21,119 oz.

**Pioneer Gold Mines of B.C. Limited***

Company office, 525 Seymour Street, Vancouver; mine office, Pioneer Mine. Hon. F. M. Ross, president; W. B. Montgomery, general manager; H. D. M. Jager, general superintendent; T. Bevister, mill superintendent. The property is on Cadwallader Creek, a tributary of Bridge River, and is about 78 miles by road from Lillooet on the Pacific Great Eastern Railway.

Production from Pioneer has come mainly from two veins—the Main vein and the 27 vein which since 1948 has contributed the bulk of production. The Main vein strikes northwestward and dips steeply northward and occupies a reverse fault comparable to those occupied by the 51 and 77 veins at Bralorne. The 27 was a blind vein and does not extend far above No. 16 level. The vein lies on the hangingwall side of the Main vein, strikes about north 20 degrees east, and dips about 55 degrees to the northwest. The 27 vein occupies a complex fracture system comprising northeasterly striking shear elements and northerly striking tension elements. Flatter dipping splits in the footwall of the 27 vein occupying tensional fractures contribute to the complexity of the vein system.

The mine is worked from No. 2 and No. 3 shafts and an inclined three-compartment winze, designated No. 5 shaft. No. 5 shaft services No. 26 to No. 29 levels.

In 1958 an intensive effort was made to find ore in the 27 and other veins. Development work was done to explore the 27, 40, 89, and 92 veins. Details are as follows:—

| Level | Drifting | Crosscutting | Raising |
|---|---|---|---|
| | Ft. | Ft. | Ft. |
| 0 | 146.5 | 17.0 | 147.0 |
| 20 | 31.5 | ..... | 648.3 |
| 25 | 1,183.0 | 665.5 | ..... |
| 26 | ..... | ..... | 197.0 |
| 27 | 53.0 | ..... | ..... |
| 28 | 83.5 | ..... | 505.5 |
| 29 | 67.0 | 93.0 | 132.0 |
| Totals | 1,564.5 | 775.5 | 1,630.0 |

Diamond drilling totalling 17,594 feet was completed. Of this, 15,507 feet was done underground and 2,087 feet was drilled from surface.

Ore is mined by shrinkage, and by cut-and-fill stoping methods. The stopes are filled with sands from mill tailings. During the year 105,273 tons of ore was broken underground.

The mine is ventilated by a 48-inch-diameter Jeffrey Aerodyne fan which delivers 70,000 cubic feet of air per minute from surface down a ventilation raise to No. 5 shaft and from there down to 29 level. Air is circulated through the mine workings and is upcast through No. 2 and No. 3 shafts.

* By Stuart S. Holland and R. B. King.

In the mill the ore is treated by cyanidation. In 1958, 105,442 tons of ore was milled, from which 49,651 ounces of gold was produced; an additional 202 ounces was recovered from slag shipped to the Tacoma smelter.

## PUKAIST CREEK*

*Copper*

**Louis (New Hamil Silver-Lead Mines Ltd.)** (50° 121° N.W.) Company office, 204, 569 Howe Street, Vancouver. R. A. Brossard, president. This company controls a total of fifty recorded claims in the lower section of Pukaist Creek about 3 miles from its confluence with the Thompson River. The area is largely underlain by rocks of the Guichon batholith. Geophysical surveys were carried out in the summer months and about 800 feet of diamond drilling was done. The work was under the supervision of A. R. Allen.

## HIGHLAND VALLEY†

*Copper*

**Krain Copper Ltd.** (50° 121° N.E.) Company office, 1004, 850 West Hastings Street, Vancouver. D. F. Farris, president. This company holds ninety-three claims and fractions east of the north peak of Forge Mountain, in the Krain, D.W., and R.K. groups. Northwestern Explorations, Limited, dropped its option on this property at the end of 1958.

Work in 1958 by Northwestern Explorations was supervised by D. A. Barr. It included one diamond-drill hole 633 feet long, which intersected the southeast part of the mineralized zone on the Krain Copper claim. This zone, which is oxidized at the northwest end, is now known to extend 1,200 feet with an average width of 200 feet; the deepest drill intersection on it is between 400 and 500 feet below the surface. Other work in 1958 consisted of 2,000 feet of bulldozer trenching, mainly on the R.K. group, as well as electrical, magnetometer, geochemical, and geological surveys. One mile of road was built, and 2½ miles of telephone-line installed. A shower-house was constructed. An average crew of twelve men was employed from June to October.

**Trojan Consolidated Mines Ltd.** (50° 120° N.W.) Company office, 809, 837 West Hastings Street, Vancouver. George L. Conn, president. This company holds about 100 claims and fractions north and east of the south peak of Forge Mountain. Work in 1958 was restricted to geological and geophysical surveys. These were directed by W. H. White and F. J. Hemsworth. An average crew of five men was employed for three months. In addition, a watchman was kept on the property throughout the year. Newmont Mining Corporation of Canada Limited optioned the property at the end of 1958.

**Bethlehem Copper Corporation Ltd.** (50° 120° S.W.) Company office, 814, 402 West Pender Street, Vancouver. H. H. Huestis, president; R. E. Hamilton, mine manager. This company holds 112 claims and fractions immediately east of Quiltanton (Divide) Lake. According to estimates published by Bethlehem Copper Corporation in May, surface drilling done by American Smelting and Refining Company since 1955 indicates 50 million tons of material grading 0.65 per cent copper in the Jersey zone and 9.5 million tons grading 0.95 per cent copper in the East Jersey zone. The Iona zone contains an additional large tonnage whose grade is more uncertain. In 1958 American Smelting and Refining Company Ltd. did 6,752 feet of diamond drilling, mainly in the East Jersey zone, and about 1,660 feet of rotary test-hole drilling. The work was supervised by C. J. Coveney. The option on the property was dropped in May.

* By A. R. C. James.
† By J. M. Carr.

Bethlehem Copper resumed operations in May. A contract for tunnelling was given to Intermountain Construction Ltd. The camp on the south side of Divide Lake was re-established and by the end of the year was equipped with power, water-supply, new cook-house, and dry. A portal-site was cleared 2,600 feet west of Jersey Lake at 4,600 feet elevation. A machine-shop and power-house were erected, together with an office building, assay office, and sampling plant. The 4600 level adit was begun in July and is directed due east. At the end of 1958 it was 2,840 feet long and had reached the fringe of the Jersey zone. The adit is 7 by 7 feet finished size and is about one-third timbered. The tunnel penetrates younger quartz-diorite for 1,640 feet, then older quartz-diorite for 970 feet followed by dacite porphyry and breccia. Dykes of quartz-diorite porphyry were intersected at 880 and 2,150 feet, respectively.

Thirty-two men were employed at the end of the year, including ten employed by Bethlehem Copper.

**Beaver** (50° 121° N.E.) This group of thirty-three claims and fractions adjoins the northwest boundary of the Bethlehem property and is held jointly by Farwest Mining Limited (previously named Farwest Tungsten Copper Mines Limited) and Beaver Lodge Uranium Mines Limited (office of both companies, 1075 Melville Street, Vancouver). Part of the group was optioned by American Smelting and Refining Company Ltd. until the end of 1958.

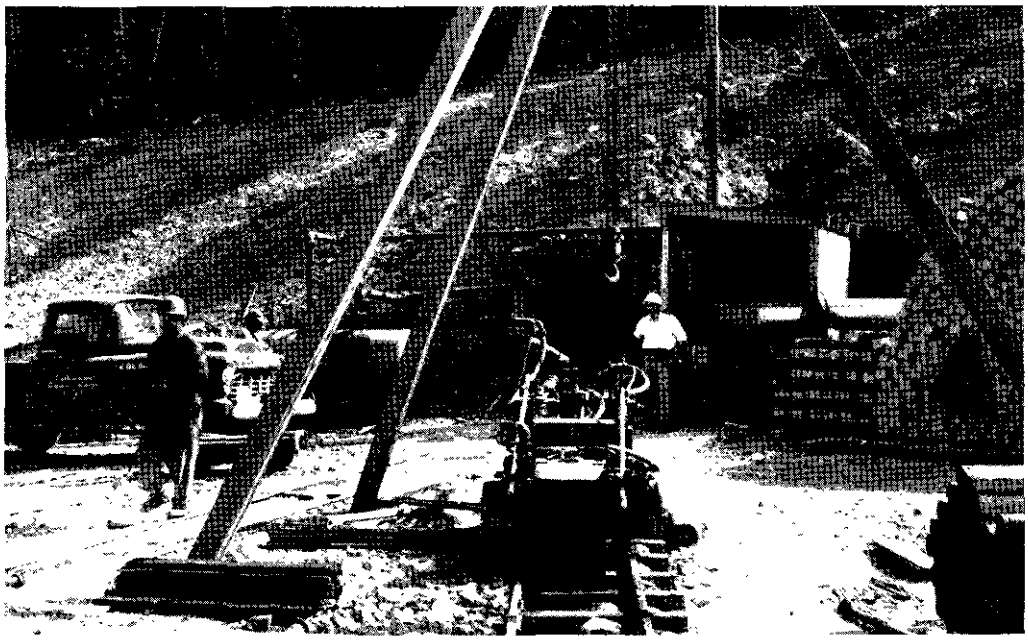
In 1958 American Smelting and Refining drilled three short rotary test-holes. Work by Farwest consisted of prospecting and of soil sampling at 200-foot intervals on lines spaced at 400 feet over the entire group. In addition, reconnaissance electrical surveys were carried out over selected lines. The work was done by two men under the direction of W. M. Sirola, chief geologist.

**Lodge** (50° 120° N.W.) This group adjoins the Beaver group and the north boundary of the Bethlehem property. It comprises thirty-six claims and fractions which are held by Northlodge Copper Mines Limited (company office, 1075 Melville Street, Vancouver). The property was optioned by American Smelting and Refining Company until the end of 1958 and three short rotary test-holes were drilled. Work by Northlodge consisted of geochemical and geophysical prospecting by two men from June to August.

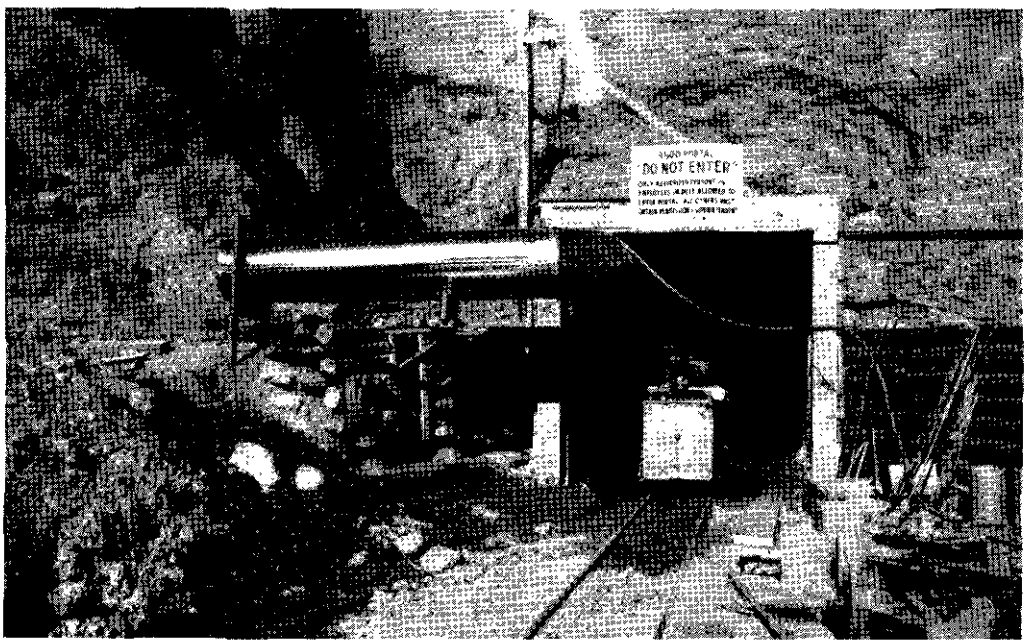
**Outrider** (50° 120° S.W.) This group of forty-four claims and fractions adjoins the east boundary of the Bethlehem property and is held by Farwest Mining Limited. In 1958 Northwestern Explorations, Limited, did electrical and geochemical surveys and geological mapping over parts of the group.

**Hat** (50° 120° S.W.) This group of eight claims adjoins the east boundary of the Outrider group and is held by Northlodge Copper Mines Limited. American Smelting and Refining Company dropped its option in August, whereupon Northwestern Explorations, Limited, did electrical and geochemical surveys and geological mapping.

**Bob, Star, Cow, and B.X.** (50° 120° N.W.) These groups are immediately north and east of Bose Lake and adjoin the Lodge and Outrider groups. The Bob and Star groups comprise fifty-four claims and fractions which are held by Torwest Resources Ltd. (company office, 1001, 837 West Hastings Street, Vancouver). The Cow and B.X. groups comprise twenty-eight claims and fractions which are held by B.X. Mining Company Limited (company office, 1500, 355 Burrard Street, Vancouver). In 1958 the groups were optioned by Noranda Exploration Company, Limited. Camp was established at Bose Lake and an average of nine men was employed from July to September under the supervision of O. W. Nichols.



Bethlehem Copper Corporation Ltd., 4600 level adit portal, August, 1958.




Birkett Creek Mine Operators Ltd., Craigmont 3500 level adit portal, August, 1958.

Work consisted of an electromagnetic survey of the property together with geological mapping. Some bulldozer trenching was done on an old showing on the B.X. group. Five miles of road was constructed. The options were dropped at the end of the summer.

**Bethsaida Copper Mines Limited.**—(50° 121° S.E.) Company office, 303, 1075 Melville Street, Vancouver. D. F. Farris, president. This company holds fifty claims west of Divide Lake. Northwestern Explorations, Limited, dropped its option and no work was done on this property in 1958.

**Jericho Mines Limited**

(50° 120° S.W.) Company office, 204, 717 West Pender Street, Vancouver. James R. Murray, president. This company holds about fifty-six claims and fractions south of Witches Brook about 7 miles east of Divide Lake. Until late in the year the property included more than 1,000 claims and was optioned by Anson Mines Limited, which is a subsidiary of Phelps Dodge Corporation of Canada, Limited (Vancouver office, 904, 1030 West Georgia Street). In 1958 work by Anson Mines Limited was supervised by M. G. Mooney and included six diamond-drill holes totalling 1,470 feet, together with magnetometer surveys of parts of the property. Three holes were drilled south and west of Pimainus Lake. The other three holes were drilled east of and adjacent to Witches Brook.

Jericho Mines discovered a small high-grade copper showing about 1 mile west of Billy Lake. This showing is reached by a road constructed for about 8 miles from the camp near Witches Brook. At the end of the year five men were employed under the supervision of W. E. McArthur.

## PIMAINUS LAKE*

***Copper***

**Northwestern Explorations, Limited**

(50° 121° S.E.) Company office, 1111, 1030 West Georgia Street, Vancouver. J. A. Gower, manager. This company holds a large number of claims along the west margin of the Guichon Creek batholith south of Pimainus Lake. The claims comprise the P.E.H., B.J., Eye, and Sku groups. Work in 1958 was supervised by J. J. Brummer and C. S. Ney, and consisted of prospecting, geological mapping, magnetic surveying, and geochemical surveying. The existing road to Pimainus Lake from Highland Valley was improved and a small amount of hand-trenching was done on the Eye group. On the average sixteen men were employed from May to October on these groups and on others held by Northwestern Explorations in the Guichon Creek and Merritt areas.

## GUICHON CREEK*

***Copper***

**Northwestern Explorations, Limited**

(50° 120° N.W.) Company office, 1111, 1030 West Georgia Street, Vancouver. J. A. Gower, manager. This company holds a large number of claims along the east margin of the Guichon Creek batholith south of Witches Brook and west of Guichon Creek. The claims constitute the J.B. group. Work in 1958 was supervised by J. J. Brummer and C. S. Ney, and consisted of prospecting, geological mapping, magnetic surveying, and geochemical surveying. Two and one-half miles of road was constructed.

## MERRITT†

***Copper***

The discovery of the Craigmont orebody in 1957 led to vigorous exploration of the surrounding area in 1958. The Craigmont mine is on the east slope of Promontory Hills

* By J. M. Carr.
† By J. M. Carr, except as noted.

about 10 miles northwest of Merritt. The orebody is close to the south margin of the Guichon Creek batholith and is a skarn deposit in stratified rocks of the Nicola series. Equivalent rocks which outcrop at Lookout Point, some 2½ miles west-southwest of the orebody, include limestones, tuffaceous limestones, limy tuffs, vitric and lithic tuffs, and greywackes. At Lookout Point these rocks possess moderate to steep dips and strike generally east-northeast, toward Craigmont. In addition to the Guichon Creek batholith, which extends north for a distance of some 40 miles, plutonic rocks underlie parts of the area southeast of Lookout Point and east of Guichon Creek, respectively, and may be extensions or satellites of the batholith. Volcanic rocks of the Kingsvale group cover parts of the area south and southwest of the Craigmont ore zone. In the most westerly holes which have been drilled in the ore zone, Kingsville rocks overlie weathered and altered Nicola rocks and are believed to be later than the mineralization.

Elevations range from 2,000 feet at Nicola River and Guichon Creek to 5,688 feet at Lookout Point. The climate is semi-arid, and many of the creeks have a seasonal flow. Access to the various properties is by dirt roads either from Craigmont mine, from the Merritt–Spences Bridge Highway, or from the road between Lower Nicola and the Aberdeen mine. The Canadian Pacific Railway branch line and a gas pipe-line both pass through Merritt.

[References: *Geol. Surv., Canada,* Mem. 249 (Nicola Map-area), 1948; *Minister of Mines, B.C.,* Ann. Rept., 1957, p. 28.]

**Craigmont (Birkett Creek Mine Operators Ltd.)**

(50° 120° S.W.) Head office, 700, 1030 West Georgia Street, Vancouver. R. G. Duthie, superintendent, Merritt; C. C. Rennie, resident geologist. This private company was formed in July, 1958. It is controlled by Canadian Exploration Limited together with Noranda Exploration Company, Limited, and Peerless Oil and Gas Company. Craigmont Mines Limited is a non-voting participant. The company controls 157 claims and fractions owned by Craigmont Mines Limited, of which fourteen have been legally surveyed. The Craigmont orebody is on Merrell Nos. 7 and 8 claims and McLeod Nos. 5 and 6 claims, and is south of the north fork of Birkett Creek at surface elevations between 3,800 and 4,200 feet.

In 1958 Canadian Exploration Limited directed exploration up to July, when responsibility passed to Birkett Creek Mine Operators Ltd. From November, 1957, to December, 1958, twenty-two holes totalling 15,404 feet were diamond drilled from surface. Of these, sixteen encountered mineralization. From December, 1957, to May, 1958, twenty-five rotary drill-holes totalling 1,392 feet were made in preparation for diamond drilling. Approximately 2,000 feet of bulldozer stripping was done in five separate areas and about 10 miles of roads were constructed. A new road 4.2 miles long with a 5-per-cent grade was built from the Aberdeen road to the portal-site, and the Aberdeen road was widened and improved. Magnetometer surveys were made on sixty-two claims and fractions and some geological mapping was done.

Underground work started in July, 1958, and by the end of the year a complete plant was installed. It included dry-house, temporary offices, warehouse, core-house, combined shops and power plant, and water system with water-tank. Equipment included one Ingersoll-Rand 500-c.f.m. compressor, two LeRoi 500-c.f.m. compressors, one D 1300 75-kw. Caterpiller diesel generator set, and a D 1300 59-kw. Caterpillar diesel standby generator. An adit was directed north 70 degrees west from a portal-site on the north fork of Birkett Creek at 3,516 feet elevation, and at the end of the year was 1,066 feet long. The first 700 feet is fully timbered and measures 9 by 9 feet, finished size. The remaining length is half timbered and measures 9 feet high by 8 feet wide, finished size. An Ingersoll-Rand ABJ three-boom jumbo is used. Granby-type cars are hauled by a Mancha 6-ton diesel locomotive and a Ruth 3-ton diesel standby locomotive.

In 1958 the number of men employed on the property varied from fifteen to thirty-five, including drillers on contract. At the end of the year a total of twenty-eight men were employed. Underground work was on a three-shift basis, and all employees lived in Merritt.

The orebody is in an area devoid of outcrops. It has been exposed by recent trenching near hole No. 7, where it underlies about 6 feet of glacial drift. The nearest rock outcrops are about 1,000 feet north of the orebody, and are of altered and slightly mineralized quartz-diorite. The contact between the Guichon Creek batholith and the Nicola series possibly follows the north fork of Birkett Creek and apparently passes through a copper showing more than 1 mile to the east, on the former Eric claim. The orebody was found by drilling a strong positive magnetic anomaly. As shown by surface drilling, the mineralized zone strikes about north 80 degrees east and dips steeply south in the upper portions. At greater depths there is some indication of dip reversal. Mineralization is apparently continuous for a length of 1,750 feet across widths up to 200 feet. Its full extent both laterally and in depth is not yet determined. Probable ore reserves between 13 and 14 million tons grading about 1.8 per cent copper and 17 per cent iron were estimated in November, 1958, by both the consultants and the operators.

The following description is based on examination of the core from holes Nos. 7, 13, 15, 19, and 21, together with information provided by the resident geologist. Wallrocks are greywacke and quartzofeldspathic tuff on the north, and andesite, quartzofeldspathic tuff, and mixed tuffs on the south in the western portion; a diorite dyke forms the south wall in the eastern portion. The ore zone consists of limy rocks altered to skarn and other rocks so heavily mineralized that their original lithology is uncertain. Actinolite, garnet, epidote, quartz, calcite, and chlorite constitute the gangue, together with pink orthoclase feldspar which in places is very abundant. Tourmaline was identified in thin section. Mineralization consists of magnetite, specular hematite, or both, with masses, irregular veinlets, and disseminations of chalcopyrite. Some of the hematite is distinctly magnetic. Bornite is rare and pyrite is only locally abundant in the ore zone. Oxidation is slight.

The adit on the 3500 level penetrated 326 feet of glacial till, 300 feet of weathered dark tuffs, and then diorite with small amounts of sulphide. The easterly extension of the mineralized zone was intersected early in 1959.

**P.C.M., Cap, and Domino**

(50° 120° S.W.) These groups are held by I. Schulman, Vancouver. They consist of sixty-five claims on the south slopes of Promontory Hills at elevations which average 3,000 feet. From March to August, 1958, the property was optioned by Centennial Mines Ltd. (company office, 700 Burrard Street, Vancouver), which did work that included geological mapping and dip-needle and magnetometer surveys of the entire property. In this period, up to six men were employed under the direction of T. S. Smith and J. C. Foweraker, successively. From August the property was optioned jointly by Centennial Mines Ltd. and Magnum Copper Limited. Additional geophysical and geological work was then done on the Domino group before work ceased in December. Several small magnetic anomalies attributed to magnetite in andesite were discovered on the property.

**Hank**

(50° 120° S.W.) This group adjoins the P.C.M., Cap, and Domino groups and is held by I. Schulman, Vancouver. It consists of thirty-six claims at elevations between 4,000 and 4,500 feet. In September, 1958, the group was optioned jointly by Centennial Mines Ltd. and Magnum Copper Limited. Following geological mapping and geophysical work, attention was concentrated on an intense magnetic anomaly on the Hank No. 30 claim. Three bulldozer trenches were made, of which one exposed a small amount of chalcopyrite, and three diamond-drill holes were put down which totalled 1,746 feet. No mineralization

is reported to have been intersected other than above-average amounts of finely disseminated magnetite. A detailed spontaneous polarization survey was made over the anomaly. In addition to the above work, a dip-needle survey was completed of twenty-one claims, 2½ miles of road was built, and a core-house constructed. From four to eight men were employed under the supervision of J. C. Foweraker. Work ceased in December and the option was dropped shortly after.

Prior to the option, W. Taylor and associates did a large amount of bulldozer stripping on the Hank No. 1 claim, approximately one-half mile south of the anomaly.

**Noranda Exploration Company, Limited**

British Columbia office, 202, 2256 West Twelfth Avenue, Vancouver. B. O. Brynelsen, manager. In 1958 this company held by location or option a large number of claims in the Merritt area in four separate properties. A field office was established in Merritt and a large crew was employed under the supervision of M. M. Menzies and other geologists. All options were subsequently dropped.

(*a*) *Merritt Property.*—(50° 120° S.W.) Work was chiefly concentrated on this property, which adjoins the south and southeast boundaries of the Craigmont property. It consists of 135 claims and fractions held by Noranda. Up to fifteen men were employed from early January to August, 1958. Work consisted of line-cutting and surveying, followed by electromagnetic, magnetometer, dip-needle, and geological surveying. Five holes totalling 1,689 feet were diamond drilled to test some of the anomalies found. Some road building was done.

(*b*) *Tyner Lake Property.*—(50° 120° S.W.) This surrounds Tyner Lake at the north end of the Craigmont property and consists of 114 claims held by W. Rand. Work done by Noranda Exploration Company consisted of surveying, geological mapping, and electromagnetic surveying the whole property. Over 5 miles of road was constructed between the Aberdeen road and an existing road at Farr Lake. A camp was established at Tyner Lake and seven men were employed from June to August, 1958, under the suprevision of S. G. Bruce.

(*c*) *Farr Lake Property.*—(50° 120° S.W.) This is near the west boundary of the Tyner Lake property and consists of fifty-four claims held by Midnight Consolidated Mines Ltd. The property was optioned by Noranda in 1957. Work done in 1958 consisted of the geological mapping of part of the property and extension of the road from Tyner Lake to join the road from Farr Lake to Dot.

(*d*) *Gordon Creek Property.*—(50° 121° S.E.) This is 4 miles east of Dot railway station. It consists of forty-seven claims making up part of the W.P. group, which is held by Highland Valley Mining Corporation Ltd. In 1958 work by Noranda Exploration Company consisted of surveying, geological mapping, and electromagnetic surveying of the entire property. Some bulldozer trenching was done and existing roads were improved. An electromagnetic anomaly that was trenched was reported to be due to a thin coal-bed. Camp was established on the property and an average crew of six men was employed from May to July under the supervision of D. Carson.

**Northwestern Explorations, Limited**

(50° 120° S.W.) Company office, 1111, 1030 West Georgia Street, Vancouver. J. A. Gower, manager. This company holds the C.J.S. and J.S.S. groups. The C.J.S. group adjoins the east boundary at the W.P. group and the west boundary of the Craigmont property. The J.S.S. group is near Jesse Creek, 4 miles north of Merritt. Work in 1958 was supervised by J. J. Brummer and C. S. Ney and consisted of prospecting, geological mapping, magnetic surveying, and geochemical surveying. On the C.J.S. group 2½ miles of road was constructed.

**P. L. (New Hamil Silver-Lead Mines Ltd.)***

(50° 120° S.W.) Company office, 204, 569 Howe Street, Vancouver. R. A. Brossard, president. This company controls a group of forty-eight recorded claims on the north side of the Merritt–Spences Bridge Highway, about 3 miles west of Lower Nicola. A magnetometer survey was carried out and about 700 feet of diamond drilling was done. Four men were employed. A. R. Allen supervised the work.

*Lead-Zinc*

**Gem (New Jersey Zinc Explorations Company (Canada) Ltd.)***

(50° 120° S.W.) This property, comprising two recorded claims, is 5 miles south-southeast of Merritt, and about one-half mile south of the summit of Iron Mountain. It is a part restaking of the old Leadville or Comstock of B.C. property. Showings of lead-zinc mineralization were discovered in 1927 and development work was done from 1927 to 1930, and again in 1947 when the property was known as the Lucky Todd mine. An inclined shaft was sunk 100 feet on a quartz-barite-galena vein, at which point the vein is stated to have been displaced by a fault. A total of 36 tons of ore was shipped in 1947.

The present company diamond drilled one hole 87 feet horizontally from a point 120 feet northeast of the shaft. Work was commenced on October 27th and finished on November 5th. Two men were employed.

[References: *Minister of Mines, B.C.,* Ann. Repts.,'1928, p. 224; 1929, p. 245. *Geol. Surv., Canada,* Mem. 249, p. 81.]

## ASPEN GROVE*

*Copper*

**Alscope Explorations Limited**

(49° 120° N.W.) Company office, 902, 718 Granville Street, Vancouver. N. Martini, president, Passaic, N.J., U.S.A., V. M. Petroskey, secretary, Vancouver. Capital: 10,000,000 shares, no par value. This company controls thirty-two claims in the Kentucky Lake area. A magnetometer survey was begun in the latter part of the year, but was later suspended due to heavy snow conditions.

## SWAKUM MOUNTAIN*

*Copper*

**Torwest Resources Limited**

(50° 120° S.W.) Company office, 400, 837 West Hastings Street, Vancouver. W. E. Garnett, president; W. H. Taylor, resident manager. This company controls fourteen Crown-granted and 146 recorded claims situated mainly on the north and east sides of Swakum Mountain, 9 miles north of Nicola. Access is by road from Nicola up the valleys of Clapperton and Shuta Creeks. The claims include a number of old properties such as the Thelma, Alameda, Last Chance, and Gold Gozzan. Mineralization in this area was discovered in 1916 and intermittent work has been done since that time; small test shipments of gold, copper, lead, and zinc ores have been made. During the Second World War the Last Chance group was investigated and diamond drilled as a possible source of scheelite. The claims are entirely underlain by rocks of the Nicola group comprising greenstones interbedded with limestone. Mineral deposits include veins, disseminations, and replacements carrying lead, zinc, and copper minerals.

* By A. R. C. James.

## MEADOW CREEK*

*Copper*

**Vanex (Vanex Minerals Limited)**

(50° 120° S.W.) Company office, 902, 718 Granville Street, Vancouver. N. Martini, president, Passaic, N.J., U.S.A.; W. M. Petroskey, secretary, Vancouver. Capital: 5,000,000 shares, 50 cents par value. The company holds 120 claims by record in the Meadow Creek area, 25 miles due north of Merritt. Also the company has entered into a development agreement with Dunmore Mines Ltd. on an additional fifty-one claims which adjoin the Vanex holdings to the south. The property is accessible by road from Merritt via Mamit Lake, or from Kamloops. The entire area is underlain by rocks of the Nicola group. Copper mineralization on the Dunmore Mines Ltd. property has been known for many years and some exploration work has been done in this locality in recent years.

The present company commenced operations in June. A magnetometer survey was carried out and it is reported that this indicated an anomaly in the area north of Homfray Lake. A small camp was established on the property, and diamond drilling commenced at the beginning of October was still in progress at the end of the year. A crew of eleven men was employed under the supervision of S. B. McBeath.

## KAMLOOPS*

*Copper*

**D. M. (Cadamet Mines Limited)†**

(50° 120° N.W.) Company office, 1116, 85 Richmond Street West, Toronto. T. J. Day, president. This company (formerly named Graham Bousquet Gold Mines Limited) holds 117 claims which lie mainly south of the Trans-Canada Highway about 11 miles west of Kamloops. The property consists of the D.M. group and the Afton group, on which the old Pothook copper prospect is situated.

In 1958 the property was optioned by Noranda Exploration Company, Limited, which dropped the option late in the year. Work by Noranda was directed by A. D. K. Burton and included geological mapping together with electromagnetic and self-potential surveying. Several bulldozer trenches were made and 800 feet of diamond drilling (BX core) was done.

**Makaoo Development Company Limited**

(50° 120° N.E.) Company office, 919, 736 Granville Street, Vancouver. L. G. Wood, president; W. I. Nelson, manager. This company holds five Crown-granted claims and seventy-two recorded claims in the vicinity of Coal Hill, about 3 miles southwest of Kamloops. This and other properties occurring in the eastern part of the Iron Mask batholith were fully described in the 1956 Annual Report, pages 47 to 69.

In 1958 a total of 220 feet of surface trenching was done and 66 feet of diamond drilling. Self-potential geophysical work was done over an area of about twenty acres.

**Fat Chance (New Jersey Zinc Exploration Company (Canada) Limited)**

(50° 120° N.E.) Vancouver office, 905, 525 Seymour Street, Vancouver. This company holds twenty-one recorded claims about 1½ miles west of Knutsford. Geological mapping and geophysical surveys were carried out over parts of the property. These claims have no important surface showings but they lie within the geologically favourable area of the Iron Mask batholith.

* By A. R. C. James, except as noted.
† By J. M. Carr.

## BIRCH ISLAND*

***Fluorite-Celestite-Uranium***

**Rexspar Uranium & Metals Mining Company Limited**

(51° 119° N.W.) Head office, 550 Sherbrooke Street, Montreal; mine office, Birch Island. Philip Joseph, president, Montreal; John W. Scott, manager, Birch Island. Capital: 6,500,000 shares, $1 par value. The Rexspar property is in the Red Ridge area, 2 to 3 miles south of Birch Island on the Canadian National Railway, 81 miles by rail or 90 miles by road north of Kamloops. The property comprises 124 claims and fractions, of which forty claims and fractions are held by Crown grant, seventy-three claims and fractions by record, and eleven claims and fractions by lease from Deer Horn Mines Limited. A brief history and description of the property was given in the Annual Report for 1957.

In 1958 no further exploration of the Rexspar orebodies was carried out. It is reported that negotiations on the major financing necessary to bring the property into production were still unconcluded at the end of 1958, but in the meantime the work begun in 1957 in preparation for the construction of an aerial tram-line and mill was continued. In the main plant area 1,000 feet of spur track was laid, loading-platforms and storage sheds were built by the track, the grinding-plant foundations were poured, and other building areas were stripped of topsoil and rough graded. A gravel pit near the plant-site was worked and 800 cubic yards of aggregate stocked. The aerial tram-line right-of-way was widened from 35 to 70 feet throughout the 900-foot length, all intermediate tower-sites were graded and access roads built to them, and the upper tram-terminal site was stripped and rough graded. On the property itself the B zone open-pit area was cleared of trees and stumps and prepared for stripping. At the mine camp a small tunnel and raise system totalling 120 feet was driven in the mine camp area to tap springs for a permanent camp water-supply.

In addition to the Rexspar property, the company holds thirty-two claims by option agreement and thirty-seven claims by record on Foghorn Mountain a few miles to the south. In 1958 a 7-mile jeep-road was made from the Rexspar camp to this property. Geiger and scintillometer surveys were carried out over a wide area, following up earlier indications of radioactivity, and this work was followed by some trenching on the best showings. It is reported by the company that the showings found were small and sporadic though of high grade. Geophysical surveys, including self-potential, electromagnetic, and soil-testing surveys, were carried out in an area of old lead-zinc showings, and some bull-dozer trenching was done on anamolies found. The company reports that the results of this work were rather discouraging but that some possibilities remain to be investigated.

[References: *Minister of Mines, B.C.,* Ann. Repts., 1957, pp. 31–32; 1954, pp. 108–111.]

## SIMILKAMEEN RIVER*

***Copper***

**Ilk (Phelps Dodge Corporation of Canada, Ltd.)**

(49° 120° S.W.) Company office, 904, 1030 West Georgia Street, Vancouver. W. A. Hutchison, general manager, Toronto; D. C. Malcolm, resident geologist, Vancouver. The sixteen claims and fractions comprising this property were optioned from Len and Irvine Ashley in October, 1958. It is the old Wheeler property in the vicinity of Friday Creek, on the west side of the Similkameen River, about 10 miles south of Princeton. Access is by means of a 3-mile road leaving the Hope–Princeton Highway at a point approximately 5 miles south of Whipsaw Creek. The area is on the margin of the Copper Mountain stock and the presence of copper mineralization has been known for many years but prospecting has been difficult due to lack of outcrops.

* By A. R. C. James.

The company commenced dip-needle and geochemical surveys and 1,600 feet of bulldozer trenching was done. Overburden was more than 40 feet thick in places. Three men were employed under the supervision of M. G. Mooney.

[References: *Minister of Mines, B.C.,* Ann. Rept., 1929, p. 277. *Geol. Surv., Canada,* Mem. 243 (1947), p. 89.]

## HEDLEY*

***Gold***

**French (French Mines Ltd.)**

(49° 120° S.E.) Company office, 314, 718 Granville Street, Vancouver; mine office, Hedley. W. B. Burnett, president; J. S. Biggs, mine superintendent. The French mine is on the Oregon mineral claim, about 8 miles by road from Hedley and 1½ miles east of the Hedley–Nickel Plate road at an elevation of 3,900 feet. The property includes three Crown-granted and thirteen recorded claims.

The orebody consists of gold-bearing skarn ranging up to 12 feet thick with many minor folds and faults. It is in general rather flat lying and irregular and has been mined for a distance of about 620 feet along the strike and from 40 to 80 feet in width. The main part of the orebody is flat lying at the 3,920-foot level, but the eastern section dips from 25 to 45 degrees northeast to the 3,785-foot level and a section in the central part of the orebody dips steeply northwest to the 3,835-foot level. Recent mining and development seems to indicate that the eastern section of the ore-bearing ground has a general northeasterly dip into the mountain. The orebody is cut by a number of faults, including the flat-lying Cariboo fault which strikes northeastward and at present forms the eastern limit of the orebody. So far no extension has been found east of this fault in spite of considerable exploration work carried out during the year.

The showings were originally discovered in the early years of the century, but mineralization at the surface was mainly copper and the grade was low. Intermittent development work was done from 1905 to 1917. In 1949 Kelowna Mines Hedley Limited obtained control of the property. From 1950 to 1955 a total of 32,463 tons of ore was mined. In 1956 a controlling interest in the property was acquired by The Cariboo Gold Quartz Mining Company Limited, and a new company, French Mines Ltd., was formed. Production under the present company began in August, 1957.

The mine is developed from three adit levels—the 3,920-foot (Kelowna) level, the 3,835-foot (Granby) level, and the 3,785-foot (Cariboo) level. In 1958 mining and development was carried out on all three levels, but mainly in the east section of the mine between the 3,920 and 3,785 levels. The ore is mined in open stopes and is transported by slusher to ore-passes. The following is a summary of work done in 1958:—

| | | |
|---|---|---|
| Drifting | ft. | 356 |
| Raising | ft. | 332 |
| Diamond drilling, surface (1 hole) | ft. | 147 |
| Diamond drilling, underground (32 holes) | ft. | 2,530 |
| Ore milled | tons | 13,820 |
| Gold recovered | oz. | 8,607 |

The ore is transported by truck from the mine to the crushing plant and 50-ton cyanide mill which is situated in the Similkameen Valley just south of Hedley. A crew of twenty men is employed in all operations. There were no compensable accidents during the year.

* By A. R. C. James.

## KEREMEOS*

***Gold-Silver***

**Horn Silver (Canada Radium Corporation Limited)** (49° 119° S.W.) Company office, 1024, 85 Richmond Street West, Toronto 1, Ont.; mine office, Keremeos. W. L. Hodgson, president, Scarborough, Ont.; H. Parliament, resident engineer, Keremeos. Capital: 7,500,000 shares, no par value. This company controls the old Horn Silver property, comprising the Horn Silver and Silver Bell Crown-granted claims and seven recorded claims. The property is on the east slope of Richter Mountain, 16 miles south of Keremeos and 4 miles north of the International Boundary. Access is by road from Keremeos to a point near the foot of Richter Mountain, from where a short side road leads to the ore-loading platform at 1,300 feet elevation. The adit portals at 2,622 feet elevation are reached by a steep jeep-trail 1 mile long.

The property was first developed in the early years of the century. Further development and production took place from 1915 to 1933 when a total of 5,824 tons of ore was mined, yielding 667 ounces of gold and 245,406 ounces of silver. The mine has been developed from two adits—an east adit at 2,622 feet elevation and a west adit at 2,615 feet elevation. When the present company resumed development in 1958, there were approximately 2,200 feet of open underground workings.

The orebodies consist of flat-lying veins in a hornblende-syenite intrusive of Mesozoic age which intrudes Palæozoic quartzites and greenstones. The veins strike approximately east and dip as much as 30 degrees south. They range in width from a few inches up to 6 feet, and are much disturbed by faulting. The vein material consists in some places of hard banded quartz, and in others of soft crumbly quartz and gouge. The silver-bearing minerals include native silver, argentite, and cerargyrite. Other minerals include rather sparse pyrite, galena, sphalerite, and minor grey copper. Gold values occur in places where pyrite is the predominant mineral.

The company began work at the end of April and continued to the end of the year. The following is a summary of work done:—

| | Ft. |
|---|---|
| Surface stripping | 1,868 |
| Drifting | 415 |
| Raising | 130 |
| Diamond drilling (underground) | 1,721 |

A total of 54 tons of ore was shipped to the Trail and Tacoma smelters, yielding 15 ounces of gold and 3,684 ounces of silver. A tool-house, dry, and 100-ton ore-bin were built, a jeep and tractor road 1 mile long was built from the ore-loading platform to the main east adit, and a trail was made from the west adit on the Horn Silver claim to the Silver Bell No. 5 claim. An average crew of eight men was employed.

[Reference: *Minister of Mines, B.C.*, Ann. Rept., 1928, p. 258.]

## FAIRVIEW CAMP*

***Silica-Gold***

**Fairview (The Consolidated Mining and Smelting Company of Canada, Limited)** (49° 119° S.W.) Head office, Trail; mine office, P.O. Box 337, Oliver. G. S. Ogilvie, property superintendent. This mine is about 5 miles west of Oliver at an elevation of 3,080 feet. Quartz is mined and shipped to Trail for use as flux in the smelter. The quartz contains a small amount of gold and other metals. The property comprises thirty-six Crown-granted claims, some of which were originally located in the late nineties of the last century. After many years of inactivity the property was revived in 1933 by Fairview Amalga-

* By A. R. C. James.

mated Gold Mines Limited, and some production took place from 1933 to 1939. The mine remained inactive until 1946 when the present company commenced operations.

The orebody is a quartz vein ranging in width up to about 25 feet, striking northwestward and ranging in dip from 30 to 50 degrees northeast. In the present working areas there are many small faults, and as the ground is difficult to hold in shrinkage stope mining large pillars are left for support. The mine is at present worked from two adit levels, both of which have been driven several thousand feet along the strike of the vein. No. 6 level is the lowest adit and the haulage level, near the portal of which are the dry-house, blacksmith-shop, ore-bin, and compressor-house. No. 3 level is the top level and stoping is at present being done above it.

Ore mined in 1958 was from the 305-GH and the 305-J stopes. The 305-GH stope was mined out by the middle of the year. By the end of the year the 305-J stope was also mined out as a result of the vein being cut off by a fault striking southwestward across the stope area.

Meanwhile No. 3 level was driven through the fault, and, finding the vein again, was driven a further 188 feet on the vein. Box holes and chutes were made in preparation for a new stope. A raise was driven parallel to the north side of the fault to link up with the surface raise, thus providing return ventilation for the new stope. Operations were continuous throughout the year, and 35,708 tons of quartz was shipped. A crew of ten men was employed at the end of the year. Six compensable accidents occurred during the year.

## CAMP McKINNEY*

***Gold***

**Cariboo-Amelia (H & W Mining Company Limited)** (49° 119° S.E.) Company office, 626 West Pender Street, Vancouver. R. W. Hunstone, president; C. H. McLellan, superintendent. This private company hold the following Crown-granted claims under option from W. E. McArthur, of Greenwood: Cariboo, Amelia, Emma, Alice, Maple Leaf, Sawtooth, Okanagan, and Wiarton. The property includes the old Cariboo-Amelia mine, the principal producer of Camp McKinney. This mine was in production from 1894 to 1903; 123,457 tons of ore was milled and 69,581 ounces of gold was produced. The camp has been inactive since the early years of the century, although attempts at revival have been made during the past fifty years. The property is about 9 miles north of the International Boundary and 6 miles north of Bridesville on the Trans-Provincial Highway. A branch road leaving the highway at Rock Creek canyon, 3 miles east of Bridesville, passes through the camp in a little more than 6 miles. The property is at an elevation of 4,400 feet on the lower southeastern slopes of Baldy Mountain.

The claims are underlain by a finely banded sedimentary series, the commonest rock types being quartzites and greenstones. Production has come almost entirely from the Cariboo vein, a quartz-filled fissure ranging up to 10 feet wide, striking westward and dipping vertically or steeply southward. The vein has been traced underground for a distance of 1,800 feet and to a depth of 530 feet. The mine was developed from a vertical shaft 360 feet deep to No. 4 level, and by a winze on the vein 200 feet to No. 6 level. At the eastern limit of the mine workings the vein is cut off by a northerly striking fault which dips westward at a low angle. Recent attempts to revive the property have been directed toward finding the extension of the vein beyond this fault. In 1939 Pioneer Gold Mines of B.C. Ltd. unwatered the mine and diamond drilled eleven holes on the eastern extension of the vein, eight from surface and three underground. More recently W. E. McArthur drilled several holes from surface. The present exploration programme is directed to finding the vein beyond the boundary fault on No. 5 level.

* By A. R. C. James.

The present company began work on October 16th, 1958. A power-house and shop buildings were erected, and a 40-horsepower, electrically driven, 11-stage, Byron Jackson deepwell pump was installed at the old main shaft. The shaft was unwatered to No. 3 level at 260 feet from the surface. The last 100 feet of the shaft was found to be full of muck and had to be cleared. Then the unwatering was completed to No. 5 level at 480 feet from the surface. Work was still in progress at the end of the year. A crew of fifteen men was employed.

[Reference: Hedley, M. S.: Geology of Camp McKinney and of the Cariboo-Amelia Mine, *B.C. Dept. of Mines,* Bull. 6.]

## ROCK CREEK*

### *Chromium*

**Belchrome (Belair Mining Corporation Ltd.)**

(49° 119° S.E.) Company office, 536 Howe Street, Vancouver. W. P. Watson, president, Vancouver. This private company controls about fifty claims in an area 2 miles northeast of Baldy Mountain and 3 miles north of Camp McKinney. Chromite showings occur on the Bridon group of claims. A description of the property was given in the 1957 Annual Report. In 1958 a magnetometer survey was carried on from May 1st to September 31st. Two men were employed under the supervision of John Tregilges.

[Reference: *Minister of Mines, B.C.,* Ann. Rept., 1957, pp. 35–36.]

**Sammy (Belair Mining Corporation Ltd.)**

(49° 119° S.E.) This property consists of the Belchrome Nos. 1 to 8 claims. It is not to be confused with the Belchrome property described in the previous note, but is a relocation of a low-grade chromite showing 2.7 miles north of Rock Creek and 500 feet west of the Rock Creek–Kelowna road. The showing is on the edge of the Westkettle River valley at the foot of a north-trending ridge; it has been known for many years but little previous work has been done.

The area of the showings is underlain by serpentinized peridotite which is intrusive into the surrounding altered volcanic and sedimentary rocks. Approximately 3,000 square feet of stripping was done in the early months of the year by B. A. Fenwick-Wilson, and five trenches totalling 150 feet long were excavated. Later four X-ray diamond-drill holes were drilled totalling 689 feet. The series of trenches disclosed segregated chromite in talcose, serpentinized rock. The segregations range from disseminated grains of chromite to relatively high-grade lumps up to about 8 inches in diameter, and occur over a width of from 10 to 23 feet as measured in the trenches. The serpentine trends northeastward and has been exposed in the trenches intermittently over a length of about 100 feet. Beyond these limits the ground is covered with overburden.

The best width of the higher-grade material was 8 feet in the southwesterly trench. The drill logs suggest that the surface showings of chromite are not continuous at depth, but they indicate further segregations of chromite up to 30 feet thick about 100 feet below the surface. A chip sample taken across 9 feet of the better-grade material in the southwest trench assayed: Chromic oxide, 8.87 per cent. A sample selected from high-grade lumps assayed: Chromic oxide, 27.80 per cent.

* By A. R. C. James.

## BEAVERDELL*

***Silver-Lead-Zinc-Cadmium***

**Highland-Bell (Highland-Bell Limited)**

(49° 119° S.E.) Company office, 604, 789 West Pender Street, Vancouver; mine office, Beaverdell. K. J. Springer, president, Toronto; O. S. Perry, manager; J. de Yaeger, mine superintendent; A. D. Coggan, mill superintendent. The mine is at Beaverdell, 32 miles north of Rock Creek. The property consists of thirty Crown-granted claims and six claims held by record. The mine consists of two sections—the upper and lower workings. Both sections are in the same ore zone, but are separated by a major fault known as the East Terminal fault, which dips 65 degrees to the east and has a vertical displacement of 800 feet. The No. 4 adit, at 3,974 feet elevation on Wallace Mountain, is the main haulage level for the upper mine. Access to the lower mine is by the 2900 adit level, which was completed in July, 1955. The portal of this adit is 1½ miles northeasterly from the office at Beaverdell.

In 1958 stope development was continued in the lower mine, and two-thirds of the production was from stopes mined from the 2900 and 3000 levels. Exploration was directed to finding the faulted extension of the ore zone beyond the 2905 fault on the southwest side of the workings. By August indications of the extension were found and development was proceeding in this area at the year end.

In the upper mine the salvaging of pillars and ore remnants from Nos. 7, 8, 9, and 10 levels continued throughout the year, and approximately one-third of the total production was from these operations.

A ventilation and emergency exit raise was begun in August to connect the upper and lower mines across the East Terminal fault. The raise is being driven from the 3000 level in the lower mine to No. 10 level in the upper mine, a total distance of 770 feet. At the end of 1958, 345 feet of the raise was completed. Ore was intersected in the raise at 138 feet from the 3000 level, and the presence of mineable reserves has since been confirmed by diamond drilling.

The following is a summary of mining operations in 1958:—

| | | |
|---|---|---|
| Drifting | ft. | 646 |
| Crosscutting | ft. | 256 |
| Raising | ft. | 603 |
| Diamond drilling | ft. | 6,926 |
| Ore mined | tons | 19,083 |

Construction work in 1958 included the building of a new concrete-block powder magazine near the 2900 level portal and the installation of a heavier transmission-line between mine and mill.

The ore from both mines is trucked to the mill, which is adjacent to a spur of the Canadian Pacific Railway at Beaverdell. The mill operated continuously throughout the year.

At the end of the year a crew of forty-two men was employed, of whom twenty-six were underground. There were four compensable accidents reported during the year. It is gratifying to report that in 1958, for the first time in the history of the Highland-Bell mine, a mine-rescue team was entered in the competition organized by the Central B.C. Mine Safety Association at Hope. Although a novice team, it won third place in the competition.

* By A. R. C. James.

***Silver-Lead-Zinc***

**Bounty Fraction (Sheritt Lee Mines Ltd.)**

(49° 119° S.E.) Company office, 530, 470 Granville Street, Vancouver. K. E. Wickstrom, president. This company controls a group of six Crown-granted claims and fractions on Wallace Mountain. The property is about a mile south of the original Highland-Bell property and is 5 miles by road from Beaverdell. The showings were discovered early in the century and intermittent development work has been done in the past fifty years and small shipments made. The present company began work on July 2nd. Parts of the old workings on the Bounty fraction were cleaned out and retimbered. A raise was driven 30 feet to surface, and a winze was sunk 25 feet. Toward the end of the year a new adit was started about 25 feet vertically below the old adit. Approximately 1,000 feet of diamond drilling was done. A bunk-house, compressor-house, and ore-bin were erected. A crew of four men was employed under the supervision of K. E. Wickstrom.

## PHOENIX*

***Copper-Gold-Silver***

**Phoenix Copper Company Limited**

(49° 118° S.W.) Company office, 1111 West Georgia Street, Vancouver; mine office, Davis Block, Grand Forks. L. T. Postle, president, Vancouver; J. H. Parliament, manager, Grand Forks. Capital: 3,000,000 shares, no par value. Phoenix Copper Company Limited is a wholly owned subsidiary of The Granby Consolidated Mining Smelting and Power Company Limited and controls thirty-six claims in the Phoenix area. Twenty-eight of these are Crown-granted and eight are held by record. The Granby company resumed work on this property in 1955 after an interval of thirty-six years. The renewal of interest was stimulated by the then prevailing high price of copper and the possibility of cheap open-pit mining. Throughout the subsequent period of decline and partial recovery of copper prices, work has proceeded on a reduced scale with the object of preparing the property so that it may be put into production at short notice as soon as economic conditions are favourable.

In 1958 installation of machinery and equipment for the crushing plant and 750-ton mill was continued, and the transfer-house and conveyor-ways were partially built. The tailings dams were partially finished and 7,000 feet of concrete tailings line was installed.

Mining was confined to the removal of waste rock and overburden from the Snowshoe area in preparation for open-pit mining; a total of 90,240 tons of waste was removed. A small amount of ore, totalling 5,030 tons, was sorted out during mining and stockpiled near the concentrator. The main roads from the pit to the mill were improved and widened. Some rehabilitation was done in the old Victoria shaft, the main source of water for the camp. A limited amount of geological mapping was also done.

A total crew of twenty-three men was employed at the year end. No compensable accidents were reported.

## TRAIL†

***Gold***

**W.D.**

(49° 117° S.W.) This prospect is on the west side of the Columbia River, 3 miles south of Trail, and is owned and operated by E. Wells and F. Donelly, of Trail. It was at one time known as the Casino Red Cap. Mining was continued on a small quartz fissure vein at the base of a rock bluff immediately above the uppermost river bench between Casino Creek and Trail. Two drifts, each 200 feet long and 25 feet apart in elevation, were driven in a southerly direction on the vertical vein. A stope 150 feet long and 6 feet wide was mined between the levels. A small amount of crosscutting was done, both westerly and north-

* By A. R. C. James.
† By J. E. Merrett.

erly, on the bottom level. The mine plant consisted of a portable compressor and an ore-bin. Work was done intermittently and the ore obtained was trucked to the Trail smelter.

Production: Ore shipped, 1,140 tons. Gross content: Gold, 649 oz.; silver, 230 oz.

## NELSON*

### *Gold-Tungsten*

**Venango (Venango Gold Mines Limited)** (49° 117° S.E.) Company office, 459 Baker Street, Nelson. D. H. Norcross, president. This company owns four Crown-granted mineral claims, one-half mile south of the Blewett road and immediately west of Eagle Creek. The property adjoins that held by the former Kenville Gold Mines Limited. A small amount of surface stripping and 650 feet of diamond drilling were done to prospect the extension of a quartz vein and in an attempt to locate the source of molybdenite float found on the property.

### *Silver-Copper-Lead*

**Silver King** (49° 117° S.E.) This old mine is under lease from The Consolidated Mining and Smelting Company of Canada, Limited, by A. Burgess, of Ymir. The lower or Dandy adit at 5,500 feet elevation is reached by 9 miles of rough road southwest of Nelson. This adit extends about 2,400 feet to the old Silver King vertical shaft. Approximately 18 tons of ore was mined from a small lens on the surface near the portal of the Dandy adit and was shipped to the Trail smelter. A further 25 tons of lower-grade ore was produced from 12 feet of raising and some stoping at a point 800 feet within the Dandy portal. This ore was not shipped. A bulldozer was used to strip a 100-foot-long trench on the Dandy vein, 800 feet southeast of and at a higher elevation than the Dandy portal. This work disclosed some lead ore with a high copper content. Further exploration was prevented by the onset of winter.

Production: Ore shipped, 18 tons. Gross content: Gold, 0.6 oz.; silver, 194 oz.; copper, 2,187 lb.; lead, 1,578 lb.

## YMIR*

### *Gold-Silver-Lead-Zinc*

**Goodenough, Ymir (Americonda Mines Limited).**—(49° 117° S.E.) Company office, 117 West Broadway, Waukesha, Wisconsin; mine office, Ymir. This company holds under option the Goodenough and Ymir mines on Ymir Creek, 6 miles by road northeast of Ymir. One man was employed intermittently retimbering in the No. 2 adit of the Goodenough mine.

### *Gold-Silver*

**Tamarac.**—(49° 117° S.E.) George Powell and Austin K. Greenway, of Lillooet, reopened by bulldozer the 1½-mile section of road extending northwestward from the Goodenough to the Tamarac mine.

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* By J. E. Merrett.

## SALMO*

### Erie Creek (49° 117° S.E.)

***Gold-Silver-Lead-Zinc***

**Arlington (New Arlington Mines Limited)**

Company office, 609 Baker Street, Nelson. J. A. Russell, Edmonton, president. Capital: 3,500,000 shares, $1 par value. This company owns the Arlington mine on Rest Creek, 7 miles by road from Salmo. A 125-ton mill on site was operated before 1954, treating dump material. G. D. Fox and R. W. Linn, of Trail, working under a lease arrangement, did a small amount of drifting on the 400 level immediately below a stoped area. Thirty tons of ore, including 1.46 tons of mill clean-up concentrates, was trucked to the Trail smelter.

### Sheep Creek (49° 117° S.E.)

***Gold***

**Nugget**

This mine, which was formerly part of the Reno holdings in the Sheep Creek area, is owned and operated by A. Endersby, of Fruitvale. Mining was continued in the Nugget upper workings, which are 6 miles by road up Fawn Creek from the Sheep Creek road. Additional stoping was done on No. 4 level of the Calhoun vein, about 1,100 feet from the portal. The back of the stope was raised to a height of 50 feet by shrinkage methods on a nearly vertical quartz vein which ranges in width from 2 to 6 feet. The ore was sorted and trucked to the Trail smelter.

Ventilation is by natural circulation of air up through the old lower workings, and compressed air for drilling is supplied through 2 miles of pipe by a water-driven compressor in the Reno mill building on the north bank of Sheep Creek.

### Iron Mountain (49° 117° S.E.)

***Lead-Zinc-Tungsten***

**Emerald, Jersey, Dodger, Feeney (Canadian Exploration Limited)**

Head office, 700 Burrard Building, Vancouver; mine office, Salmo. G. A. Gordon, general manager; J. D. Little, assistant general manager; C. M. McGowan, plant superintendent; R. G. Weber, mine superintendent; H. A. Steane, general mill superintendent; R. J. MacLeod, superintendent, tungsten concentrator; E. A. Erickson, superintendent, lead-zinc concentrator. This company is a wholly owned subsidiary of Placer Development Limited. The Emerald, Feeney, Dodger, and Jersey mines, the tungsten concentrator, and the main camp are located on the summit between Sheep Creek and Lost Creek. The property is reached by two roads which leave the Nelson–Nelway Highway 4 and 5½ miles respectively south of Salmo. The lead-zinc concentrator is on the Nelson–Nelway Highway and is served from the mine by a series of underground conveyors. The average number of employees was 223, a decrease of 117 from the average for 1957. The following report, prepared by the management, is a synopsis of the 1958 operations:—

"*Emerald.*—All tungsten ore produced in 1958 was mined in the Emerald. Mining of ore remnants above 3800 level, the lowest adit, was completed by both open-pitting and underground mining. The Emerald orebody below 3800 level was developed by a three-compartment, 32-degree inclined shaft. All ore developed by this shaft from the 2730 level to 3800 level was mined by July 31st, the date on which the mine closed.

"*Feeney.*—This tungsten mine, 800 feet north of the northern end of the Emerald workings, has been idle since 1955 and is considered about mined out.

"*Dodger.*—Mining of tungsten ore was completed in 1957.

* By J. E. Merrett.

"*Invincible.*—No work has been done in this area since October, 1957.

"*Tungsten Concentrator.*—The milling rate decreased from 12,000 tons per month in January and February to 8,000 tons per month thereafter. As of July 31st the milling of tungsten ore ceased, but clean-up operations in the concentrator continued through August and September.

"*Jersey.*—Operation of the Jersey lead-zinc mine continued at an approximate rate of 32,000 tons per month. Because of the thinner, more steeply dipping nature of the E, F, and G orebodies, increasingly more ore was mined by conventional mining methods, i.e., open-stope mining using jacklegs and slushers. Mining of ore remnants in the track area of the south end accounted for some 30 per cent of the lead-zinc ore production. At the end of 1958 production from trackless mining methods accounted for approximately 50 per cent of the monthly production. It is expected that this amount will decrease as the development of thinner ore bands continues. Trackless haulage will continue to provide the main method of ore transportation.

"*Lead-Zinc Concentrator.*—The milling rate averaged 32,000 tons per month. The grade of the ore was approximately 4.2 per cent zinc and 2.3 per cent lead. Tailings were impounded in the tailings pond situated near the Salmo River. The concentrates were shipped to Kellogg, Idaho."

***Lead-Zinc-Tungsten***

**Tungsten King**

This property, comprising eighteen Crown-granted mineral claims and fractions, is adjoined on the north by the Emerald and Jersey holdings of Canadian Exploration Limited, and on the south by the Truman holdings of American Zinc, Lead and Smelting Company. Access is by way of 2 miles of road up Lost Creek from the Salmo–Nelway Highway, or by 1 mile of road from the new Creston–Salmo Highway. The property is owned by E. and R. O. Oscarson, of Spokane, Wash., and L. R. Clubine, of Salmo.

At a point approximately 1 mile south-southwest of the Jersey open-pit, bulldozing and surface blasting discontinuously over a distance of 800 feet has disclosed several lead-zinc-iron mineralized showings in limestone. Most work was done on the east half, where a little more stripping would provide a continuous section 400 feet long.

BOULDER MILL CREEK (49° 117° S.E.)

***Gold***

**Clubine Comstock**

This property is 4.8 miles north of Salmo on the first north-flowing tributary of Boulder Mill Creek, a tributary of Salmo River. It is owned by L. R. Clubine and under lease to Darrell Fisher and Davis Bonfield, all of Salmo. On the surface the road to the mine and ore-bin was reopened, while underground No. 5 and No. 6 levels were reopened to provide ventilation. Some ore was recovered above No. 5 level at its northwest extremity.

ASPEN CREEK (49° 117° S.E.)

***Silver-Lead-Zinc***

**H.B. (The Consolidated Mining and Smelting Company of Canada, Limited)**

J. C. MacLean, property superintendent; H. G. Barker, mine superintendent; N. Doyle, mill superintendent. The H.B. mine is on the west side of Aspen Creek, with the main camp located on the north side of Sheep Creek, 7 miles by road from Salmo. Zinc-lead replacement orebodies in dolomite have been developed by two adits connected by an interior two-compartment vertical shaft. The hoistroom is on the 3500 level, and the main haulage is the lowest or 2800 level. Long ore-pass systems extend from the 2800 level to the ore zones. Most of the production came from two orebodies above the 3300 level, where mining was done by blast holing to pillar slots above slusher drifts. The orebodies strike north and are roughly

parallel to each other, about 150 feet apart, and have a rake to the south of about 20 degrees. In cross-section they are lenticular, and are nearly vertical. The average width is 50 feet, and the maximum height is 450 feet. Development work over a period of years has outlined the No. 1 or east orebody for a length of 1,400 feet along which mining was done for a length of 1,000 feet. The No. 2 or west orebody was being mined over a length of 600 feet. Additional ore was obtained from two flat-lying ore zones adjacent to, but west of, No. 1 orebody. In 1958 a new haulage crosscut was being driven eastward from the 2800 level to a point where a new ore-pass can be driven to service No. 1 orebody south of the present workings.

The milling rate averaged 38,100 tons per month, the highest in the Nelson district. This was an increase above the rate in 1957. The average number of men employed decreased to 116, of whom fifty were employed underground.

An excellent safety record was achieved—one lost-time accident of five days duration was the only accident recorded.

## NELWAY*

***Silver-Lead-Zinc***

**Reeves MacDonald Mines Limited**

(49° 117° S.E.) Company office, 413 Granville Street, Vancouver; mine office, Remac. W. L. Zeigler, Metaline Falls, Wash., general manager; L. M. Kinney, Metaline Falls, Wash., general superintendent; F. R. Thompson, property superintendent; J. Kozar, mine superintendent; J. S. Steele, mill superintendent. Capital: 3,000,000 shares, $1 par value. This company owns the Reeves MacDonald mine on the Pend d'Oreille River, on the Nelway–Waneta road, 4 miles west of Nelway. Zinc-lead replacement bodies in limestone have been developed from the main haulage or 1900 level. The Reeves orebody, 3,500 feet from the 1900 portal, has furnished most of the ore produced to date and has been almost mined out above the 1900 level, but 24 per cent of the 1958 production came from recovery of ore in the hangingwall and footwall areas marginal to this part of the Reeves orebody. Above the 1900 level the Reeves orebody is developed from an internal 55-degree inclined shaft extending from the 1900 level to the 2650 level.

The lower section of the Reeves orebody is being developed by a 52-degree inclined winze in the footwall of the orebody. Ore was encountered about 200 feet above the bottom or 1100 level, and at this point the winze was steepened to 62 degrees. Crosscuts have been driven to the footwall on the 1100, 1320, 1520, and 1690 levels, and connecting raises have been driven on line from the crosscuts to form a pilot raise for No. 3 shaft. The pilot raise has been enlarged downward to dimensions of 19 by 9 feet and has been shaft timbered to a depth of 295 feet below the 1900 level.

Three other orebodies were being mined in 1958. These were the B.L., O'Donnell, and No. 4 ore zones, respectively, about 1,000, 3,100, and 3,250 feet east of the Reeves orebody. They are believed to be faulted segments of the upper section of the Reeves orebody. The No. 4 zone was discovered recently and is being explored.

Six per cent of the annual tonnage came from primary stoping in the B.L. zone, 50 per cent from primary stoping in the O'Donnell zone (which is now mined out below the 2350 level), and 26 per cent from pillar recovery in the Reeves and O'Donnell zones. In general, ore is removed by blasting to pillar slots above scram drifts.

The mill operated continuously at an average rate of 34,800 tons per month. Millheads averaged 3.85 per cent zinc and 1.24 per cent lead. Concentrates were shipped to smelters in the United States. The number employed averaged 126.

**Red Bird†**

This property comprises sixteen Crown-granted mineral claims and fractions owned by Hecla Mining Company, of Wallace, Idaho. The claims are on the south side of the Pend d'Oreille River adjoin-

* By J. E. Merrett, except as noted.
† By J. T. Fyles.

ing and west of claims of the Reeves MacDonald property. The main showings are between elevations of 2,500 and 3,000 feet on the north slope of a steep valley draining eastward toward the Pend d'Oreille River.

The property is an old one, and little work has been done on it since 1929. Access was formerly by means of a trail from the old bridge across the Pend d'Oreille River about 1½ miles downstream from the Reeves MacDonald mine. In 1957 the Hecla company built about a mile of road from Russian Creek near the International Boundary to the property.

The showings are in zones of oxidized zinc and lead minerals in limestone. Old workings include three adits, now caved, a shaft, and several open-cuts. In 1958 Hecla company, employing six men, did a considerable amount of bulldozer stripping and 427 feet of diamond drilling in two holes. The strippings exposed a number of narrow lenses of rusty gossan carrying secondary zinc and lead minerals. One stripping which deepened an old cut, called the Beerbottle cut, disclosed an oxidized zone extending for 80 feet along one wall of the stripping. The oxidized zones cover a wide area but so far continuity between the lenses and the pattern of their distribution is not apparent.

## NORTH KOOTENAY LAKE*

RIONDEL (49° 116° N.W.)

***Silver-Lead-Zinc***

**Bluebell (The Consolidated Mining and Smelting Company of Canada, Limited)**

Company office, Trail; mine office, Riondel. D. S. Campbell, property superintendent; J. B. Donald, mine superintendent; T. F. Walton, mill superintendent. This property is at Riondel on a small peninsula on the east shore of Kootenay Lake, 6 miles by road north of the ferry landing at Kootenay Bay. The ore deposits are sulphide replacement bodies in a limestone band that crosses the peninsula and dips westward under the lake. The Bluebell ore zone is in the central part, the Comfort near the north, and the Kootenay Chief ore zone is at the south end of the peninsula.

This property has been in operation for many years. The orginal underground development was done from a 35-degree inclined shaft sunk in the vicinity of the Bluebell ore zone. In 1929 an inclined shaft was sunk in the vicinity of the Comfort ore zone, and an adit was driven in the Kootenay Chief area. In 1949 drifts were driven from the 225 level of the Bluebell shaft to connect with the Comfort shaft and to the Kootenay Chief ore zone. At a point approximately 1,000 feet south of the Bluebell 225 level station a raise was driven at an inclination of 35 degrees to connect with a winze extending down to the 75 level of the Kootenay Chief workings. The raises were enlarged to 7 by 20 feet to form a three-compartment shaft known as the No. 1 shaft. This shaft was later extended to a total slope length of 1,876 feet with a bottom elevation of 810 feet, being 740 feet below the surface of Kootenay Lake. In order to simplify delineation, the levels were recently renumbered as follows, the zero level remaining the same: 75 level to No. 1 level, 225 level to No. 2 level, 300 level to No. 2A level, 375 level to No. 3 level, 525 level to No. 5 level, 675 level to No. 6 level, 825 level to No. 8 level.

Mining and development operations were, as in recent years, confined to the Comfort and Kootenay Chief ore zones, with most of the work being done in the latter area. Development work completed in 1958 was as follows: 3,680 feet of drifting, 2,006 feet of crosscutting, 2,917 feet of raising, and 16,782 feet of diamond drilling completed in 250 drill-holes. This work was done for local exploration, in extending 5 level north drift from No. 1 shaft to the Bluebell shaft and north toward the Comfort zone, and in preparation for the sinking of a vertical shaft below No. 8 level in the footwall area behind No. 1 shaft.

* By J. E. Merrett.

A total of 47,262 cubic yards of backfill was placed in empty stopes. This amount was composed of 10,393 cubic yards of gravel and 36,869 cubic yards of deslimed tailings.

In December, 1958, the average amount of water pumped from the mine was 4,660,000 imperial gallons per day (3,236 gallons per minute). The capacity of the pump stations was further increased by the addition of a 300-horsepower 1,000-gallons-per-minute pump to No. 5 level station and three 150-horsepower 1,000-gallons-per-minute pumps to No. 8 level station. To provide power to operate the pumps, electrical services, including a new larger 6,900-volt cable and transformers, were installed on No. 8 level.

The induced ventilation of the mine was maintained at 150,000 cubic feet of air per minute. Some local changes were made in air distribution which resulted in improved ventilation of $CO_2$ contaminated areas. To safeguard mine ventilation in case of a power failure, a 150-kilowatt diesel standby generating unit was installed in the power-house. In addition to this a 375-kva. diesel generating unit has been obtained and will be installed, together with the other standby unit, in an extension to the compressor building.

Mine-rescue and first-aid classes were held in the spring. The mine-rescue team, captained by B. Ramage, was successful in winning the West Kootenay competition, and represented that district in the Provincial competition in Victoria. Among the awards received during the year were both the Dominion and Regional John T. Ryan Safety Trophies for 1957, and also the Award of Merit of the B.C. Safety Council for 1,000,000 man-hours of accident-free operation. There were three lost-time accidents during the year.

The average number of persons employed was 284, of whom 160 were employed underground.

The concentrator treated 255,859 tons of ore, or 701 tons per calendar day. The concentrates were shipped to the Trail smelter.

**Kootenay, Kootenian** (49° 116° N.W.) Thomas Lane, of Ainsworth, holds by location these two mineral claims, situated on the east shore of Kootenay Lake about 2 miles north of the Kootenay Bay ferry landing. The mineral occurrence consists of four parallel narrow quartz veins striking north 36 degrees east and dipping 68 degrees southeast. Occasional transverse quartz stringers connect adjoining veins. The veins are in paragneiss of the Lardeau series that dips flatly under Kootenay Lake. Two very narrow bands of limestone lie within the rocks through which the veins pass.

The main vein is exposed below the lake high-water mark, approximately 1,500 feet south of the main transmission-line. Trenching and open-pits have exposed the vein or fissure more or less continuously for a distance of 250 feet. The vein ranges in width erratically from *nil* to 6 inches, and is mineralized with galena, sphalerite, and pyrite in vuggy quartz. Several years ago The Consolidated Mining and Smelting Company of Canada, Limited, drilled three flat diamond-drill holes on this occurrence, but the results of this drilling were not known to the owner. Four samples taken along the vein at its wider and better-mineralized points assayed as follows:—

| Sample No. | Location | Width | Gold | Silver | Lead | Zinc |
|---|---|---|---|---|---|---|
| | | Ft. | Oz. per Ton | Oz. per Ton | Per Cent | Per Cent |
| 1 | No. 1 cut high-water mark | 0.2 | 0.06 | 4.1 | 5.73 | 6.1 |
| 2 | 45 feet northeast No. 1 | 0.25 | 0.02 | 13.3 | 24.65 | 0.2 |
| 3 | 197 feet northeast No. 1 | 0.1 | 0.01 | 11.2 | 6.44 | 1.4 |
| 4 | 239 feet northeast No. 1 | 0.5 | 0.01 | 0.2 | 0.04 | 1.5 |

## AINSWORTH (49° 116° N.W.)*

*Silver-Lead-Zinc*

**Belle Aire** This recorded claim on Coffee Creek, adjacent to the highway bridge, is owned by Sven Hallgren, who extended the main adit a distance of 50 feet to a total length of 120 feet. The work was done on a quartz vein having an average width of 2 feet and containing small lenses of galena and sphalerite.

**Highlander, etc. (Yale Lead & Zinc Mines Limited)** Company office, 525 Seymour Street, Vancouver; mine office, Ainsworth. H. W. Knight, president; P. E. Olson, mine manager; E. Pickard, mine superintendent, succeeded in September by M. Laughton; C. Anderson, mill superintendent. Capital: 5,000,000 shares, $1 par value. This company controls most of the mineral claims lying between Coffee and Cedar Creeks in the Ainsworth camp. The crushing plant, mill, and main haulage adit are below and the mine plant and Highlander adit are above the Nelson–Kaslo Highway, about three-quarters of a mile south of Ainsworth.

A third of the ore produced was obtained from new development, while the remainder was from salvage of pillars and remnant ore blocks. The production was obtained from the Highlander vein, of which the Banker and Albion ore zones are parts. Three 225-foot-long crosscuts were driven at 420-foot intervals into the hangingwall of the 1900 level commencing at a point 960 feet north of the 1900 level main crosscut. At the end of 1958 diamond drilling was being done from these crosscuts to determine if the ore zone continued below the 1900 level. The mining and removal of ore was completed late in the year, and except for the diamond drilling the operation closed on December 12th.

At the beginning of 1958, fifty-seven men were employed, of whom thirty-four were employed underground. The crew gradually decreased throughout the year, until at the time of closing forty-two men were employed, twenty-two of whom were underground.

The concentrator treated 51,460 tons of ore from the mine. The zinc concentrate produced was stockpiled and the lead concentrate was shipped to the Trail smelter. Custom milling was done on ore from the Kootenay Florence at Ainsworth and the Caledonia at Blaylock.

**Kootenay Florence, Lakeshore (Western Mines Limited)** Company office, 850 West Hastings Street, Vancouver; mine office, Ainsworth. H. M. Wright, president; H. M. Turner, superintendent. Capital: 3,000,000 shares, $1 par value. This company owns a large group of mineral claims lying south of Lendrum Creek and astride Princess Creek. The mine plant and mill are on the Nelson–Kaslo Highway, 2 miles north of Ainsworth.

M. B. Sirak and Lloyd Johnstone, lessees, mined stope pillars and ore remnants along 938 raise, which connects No. 9 and No. 5 levels. The ore was hand-sorted, the high-grade material being trucked to the Trail smelter and the low-grade material to the Yale Lead & Zinc concentrator. Compressed air was supplied initially by a small Pelton-driven compressor, and later by the mine compressor.

On the surface 3,000 feet of truck-road was constructed from the Lakeshore adit southward to the Nicolet workings.

## WOODBURY CREEK*

*Gold-Silver-Lead-Zinc*

**Scranton (Scranton Mines Limited)** (49° 117° N.E.) Company office, 1519 Marine Building, 355 Burrard Street, Vancouver. A. A. Loeb, president; C. J. Bailer, general manager. Capital: 3,000,000 shares, $1 par value. This company owns the Scranton group of claims in Kokanee Glacier Park, astride Pontiac Creek, a northerly flowing tributary of Woodbury Creek. The mine

* By J. E. Merrett.

camp is on Pontiac Creek, at an elevation of 5,600 feet, 11½ miles by road from a point on the Nelson–Kaslo Highway, 8 miles south of Kaslo. The group consists of fourteen claims, including the Granite, Sunrise, Grandview, Scranton, Pontiac, and Tecumsie Crown-granted claims. Two men were employed with a bulldozer reopening the mine road and surface stripping at several points on outcrops of quartz veins in the vicinity of the mine.

## KASLO*

***Copper***

**Logan** (49° 116° N.W.) An excavation, 150 feet long and as much as 40 feet deep, was made in a clay hillside 1½ miles west of Kaslo on the north side of the New Denver road. This work was done in search of an occurrence of chalcopyrite reportedly encountered while sinking a well at this site several years ago. Two diamond-drill holes, each 40 feet in length, were drilled. The work was abandoned when no ore was encountered. The work was done under the direction of J. Hunt, of Kaslo, and J. Murison, of Edmonton.

## PADDY PEAK*

***Silver-Lead-Zinc***

**Utica (Lajo Mines Limited)** (49° 117° N.E.) Company office, 717 West Pender Street, Vancouver; mine office, Kaslo. T. S. Lathrop, New York, president; J. A. Cooper, manager. This company holds a long-term lease on the Utica mine (which had been operated under lease from 1953 to 1956 by J. A. Cooper) from Utica Mines (1937) Limited. The mine is at the head of Twelve Mile Creek, about 15 miles by road from Kaslo. The main level is the No. 7 adit, which is connected by raise to the No. 4 adit. A sublevel, No. 5, has been driven from the raise to develop two parallel veins known as the East and West veins. The ore sections on the nearly vertical veins contain 1 to 6 inches of galena having a high silver content. Stoping was done under contract on both veins above and below No. 5 level, mostly on the East vein. The ore was brought to surface by diesel locomotive on No. 7 level and concentrated in the 50-ton mill. Lead and zinc concentrates were trucked to the Trail smelter. Nine men were employed, but the operation was suspended in mid-April.

## RETALLACK-THREE FORKS*

***Silver-Lead-Zinc***

**Caledonia (Caledonia Mines Limited)** (50° 117° S.E.) Company office, 609 Baker Street, Nelson; mine office, Kaslo. Charles Lind, Kaslo, president and manager. Capital: 100,000 shares, 50 cents par value. This company optioned the Caledonia mine near Blaylock from G. E. McCready, of Kaslo. A raise was commenced at a point 200 feet from No. 2 adit portal to connect with No. 1 level in order to improve ventilation. From this raise, and an adjacent stope, 350 tons of ore was extracted, of which 157 tons was trucked to the Yale Lead & Zinc concentrator. This work was suspended in mid-November and a crew of four men commenced driving a 550-foot crosscut from the side of the Kaslo–New Denver road to intersect the downward projection of the vein from No. 1 and No. 2 levels, 220 feet below No. 2 level.

**Star, Wellington (Blue Star Mines Limited)** (50° 117° S.E.) Company office, 1500 Marine Building, Vancouver; mine office, Retallack. Edward L. Borup, president and manager; T. R. Buckham, superintendent. This company controls the Star group of recorded claims and has a lease on the old Wellington mine near Retallack. The Star claims are 2 miles north of

* By J. E. Merrett.

the Wellington mine, which is owned by New Wellington Mines Limited, and cover the Heba, Pluto Fraction, Oppollo, and Hera cancelled Crown-granted claims. A dry and repair building, and a building to house a portable compressor were constructed near the portal of the 1,000-foot-long Matheson tunnel, 2½ miles by road from Retallack. This crosscut was, where necessary, increased in size and retimbered to its face to permit the passage of a battery locomotive and mucking-machine. Ventilation pipe was installed and the track renewed. It is planned to extend this crosscut to the Wellington ore zone.

**Texas, Cowboy, Fourth of July, etc. (Lucky Edd Mines Limited)** (50° 117° S.E.) Company office, Edmonton, Alta.; mine office, Retallack. P. E. Colthorp, manager; H.E. Singel, superintendent. This company has optioned a group of Crown-granted mineral claims at the headwaters of Robb Creek, a tributary of Kaslo River. A crew of four men with a bulldozer constructed 3½ miles of road from Retallack up Robb Creek toward the property.

**Snap, Lucky Jim** (50° 117° S.E.) The Snap claim and the Lucky Jim mine at Zincton were leased by a group known as the Lucky Four Leasers under the direction of Richard E. Martin, of New Denver. The Snap is owned by J. L. Drumheller, of Spokane, Wash., and the Lucky Jim by Sheep Creek Mines Limited, of Nelson. A crew of three men working from May to November in the Lucky Jim mine did a small amount of raising at a point 216 feet within and 75 feet above No. 3 level portal. In addition, broken ore was salvaged from stopes and ore raises from above No. 1 level down to No. 3 level. A shipment of 7½ tons of ore was made direct to the Trail smelter, and 658 tons of ore was trucked to the Western Exploration mill at Silverton.

**Monitor** (50° 117° S.E.) This property, on the south side of Carpenter Creek at Three Forks, is owned by Slocan Monitor Mines Limited, 640 Pender Street West, Vancouver, and is under lease to C. Uphill, W. Pengelly, and A. Elsmore, of the New Denver area. Fifty-nine tons of ore was mined by underhand stoping and shipped to the Western Exploration mill.

**Lost Atlantis** (50° 117° S.E.) A. S. Wojna, of New Denver, holds this group of recorded claims astride the New Denver–Three Forks Highway just north of the old Alamo mill. R. J. Renn, of Calgary, Alta., dropped an option on the property after a crew of three men did more than 400 feet of crosscutting on the bottom level.

## SANDON*

***Silver-Lead-Zinc***

**Silver Mountain Mines, Ltd.** (49° 117° N.E.) Company address, 406 Canadian Bank of Commerce Building, Calgary; mine office, Sandon. A. C. Weich, president; A. L. Bordula, manager; T. Kleim, superintendent. Capital: 20,000 shares, no par value. This company controls the old Reco property of twenty-six Crown-granted mineral claims and fractions, and holds two recorded mineral claims on the south slope of Reco Mountain. The property adjoins the east boundary of the Cody-Reco holdings. Access to the present workings is by 2 miles of road from Cody to a new adit at 5,300 feet in elevation which has been designated No. 16 adit in relation to the near-by Cody-Reco workings. It is also known as the Ted tunnel. One hundred feet lower, and slightly to the east, is the portal of the second or "A" adit. These adits have been driven in argillite to follow a quartz vein ranging in width from 4 to 16 inches, striking north 5 degrees east and dipping 65 degrees east. In some sections the vein is well mineralized with galena, sphalerite, pyrite, and minor amounts of tetrahedrite.

* By J. E. Merrett.

No. 16 adit was driven a distance of 240 feet with an additional 37 feet of crosscut driven in an easterly direction. The "A" adit was driven a distance of 251 feet. A crew of four men was employed. The ore encountered while drifting was stockpiled and a shipment of 10 tons was made to the Trail smelter. An ore-bin of 50-cubic-yard-capacity, compressor-house, workshop, blacksmith-shop, and a powder magazine were constructed.

**Silversmith, etc. (Carnegie Mining Corporation Limited)**

(49° 117° N.E.) Company office, 416, 25 Adelaide Street West, Toronto; mine office, New Denver. George A. MacMillan, president; J. C. Black manager. Capital: 5,000,000 shares, no par value. In January, 1958, by terms of an agreement with Violamac Mines Limited, Carnegie Mines of British Columbia, Ltd., was reorganized to form Carnegie Mining Corporation Limited. This company owns forty-six Crown-granted and six recorded mineral claims and fractions, property that includes the Silversmith, Slocan Star, Richmond-Eureka, Ruth-Hope, and Slocan King mines on Sandon Creek, south of Sandon. A truck-road extends to all mines from the mill just west of Sandon.

No. 10 adit of the Silversmith was reopened, retimbered where necessary, and ventilated to the face of the 1051 crosscut commenced in 1955. More than 1,300 feet of crosscut was driven in a southerly direction, the face of the crosscut being at the end of 1958 more than a mile from the portal. The crosscut was being directed to explore the downward projection of the Adams lode zone. A crew of eight men was employed on this work.

As in past years a small amount of ore was produced by lessees working in various parts. E. and J. Perepolkin and L. Fried, mining above No. 4 level on the lower part of the Ruth orebody, produced 532 tons of milling and 62 tons of shipping ore having a combined gross content in ore and concentrates of: Silver, 10,510 oz.; lead, 119,683 lb.; zinc, 89,140 lb.; cadmium, 553 lb. E. Singel, J. Lingle, and J. Turner leased the Rabbits Paw section of the Silversmith and shipped 34 tons of ore to the Trail smelter. Gross content: Silver, 4,819 oz.; lead, 23,653 lb.; zinc, 8,850 lb. E. Petersen shipped 3 tons of ore from No. 2 level of the Ruth. Gross content: Silver, 375 oz.; lead, 4,360 lb. A. Maxinuk shipped 4.3 tons of ore from a surface cut on the Slocan Star. Gross content: Silver, 468 oz.; lead, 5,424 lb. J. Zambon and S. Sibilleau shipped 5.5 tons of ore from No. 5 level of the Slocan Star. Gross content: Silver, 306 oz.; lead, 4,494 lb.; zinc, 1,195 lb.

The concentrator, employing a crew of nine men, operated continuously throughout the year, milling the total production of the Victor mine and the above 532 tons from the Ruth orebody.

**Victor (Violamac Mines Limited)**

(49° 117° N.E.) Company office, 416, 25 Adelaide Street West, Toronto; mine office, New Denver. Mrs. Viola MacMillan, president; J. C. Black, manager, western operations. Capital: 5,000,000 shares, $1 par value. This company owns the Victor mine, 2½ miles by road northwest of Sandon, or 2½ miles by road southeast of Three Forks. The nearly vertical Victor vein has been developed by several connecting adits. The vein has a mineralized length of about 2,000 feet and a width ranging from a crack to as much as 6 feet. Most of the 1958 production came from the west end of the vein known as the West Victor orebody. This was obtained principally from close timbered cut-and-fill stopes above both No. 5 and No. 7 levels. Exploration continued on the west end of No. 5 level on a high-grade occurrence of silver-lead ore. No. 11 level was completed in January with a small ore recovery from the development work. Mining was suspended on No. 10 and No. 11 levels at that time. In addition to 177 tons of crude ore shipped directly to the Trail smelter, the mine produced 8,861 tons of ore that was

trucked to Sandon and concentrated in the Carnegie mill. The number of men employed was reduced from forty-seven to nineteen.

**Wonderful (Silver Ridge Mining Company Limited)** (49° 117° N.E.) Company office, 373 Baker Street, Nelson. H. F. Magnuson, Wallace, Idaho, president and acting manager. Capital: 5,000,000 shares, 50 cents par value. This company owns a large group of claims southwest of Sandon. The claims lie between the holdings of Violamac Mines Limited and those of Carnegie Mining Corporation Limited. The drift, commenced in 1956 between the Pearson adit and Tributary Creek, was extended to a total length of 75 feet. The work disclosed a short, foot-wide section of galena in a quartz vein. Two men were employed. At the end of December a profit-sharing working agreement was entered into with Violamac Mines Limited for the development of the property.

## SLOCAN LAKE*

***Silver-Lead-Zinc***

**Mammoth, Standard, Monarch, Enterprise (Western Exploration Company Limited)** (49° 117° N.E.) Company office, 38 South Dearborn Street, Chicago, Ill.; mine office, Silverton. M. P. McCullough, Chicago, president; A. M. Ham, Silverton, managing director; J. M. McDearmid, manager; R. A. Avison, mine superintendent; C. E. Towgood, mill superintendent. Capital: 2,000,000 shares, 50 cents par value. A management contract is held by H. L. Hill and Associates, consulting mining engineers, Vancouver. The company owns the Mammoth, Monarch, and Standard mines near Silverton, and the Enterprise mine on Enterprise Creek, 12½ miles by road south of Silverton. Stope mining was continuous throughout the year, with about equal amounts of ore being produced from the Mammoth and Monarch orebodies. The Mammoth main haulage is the No. 7 adit, which is connected by a 45-degree raise to No. 9 level, 340 feet below. The ore from this area was obtained by square-set stoping between No. 9 and No. 8 levels. On No. 7 level the Monarch orebody was explored by a raise from the Hecla drift to the Monarch adit, 310 feet vertically above. A sublevel was established in 1957 midway between levels from it and an orebody was developed that produced half the 1958 ore supply. All ore was delivered to the mill via the 16,000-foot tram-line, the upper terminal of which is at the portal of No. 7 adit. No. 12 adit, at 4,290 feet elevation, was commenced on the east side of Avison Creek and was driven to intersect the downward projection of the Mammoth orebody. This crosscut, more than 2,500 feet long, for the most part parallels the Buffalo vein. The crosscut intersected the Buffalo vein in two places where considerable sphalerite was seen. In December the face of the crosscut was close to, but west of, the believed favourable zone. Late in December stope mining in the upper levels was suspended because of lack of ore. The concentrator ceased operating at the same time.

The Standard and Enterprise mines remained idle. Custom milling was done on several lots of ore. The crew numbered seventy in January and was reduced to forty-six at the time of closing.

**Bosun (New Santiago Mines Limited)** (49° 117° N.E.) Company office, 511, 850 West Hastings Street, Vancouver. R. Crowe-Swords, president. Capital: 3,000,000 shares, 50 cents par value. The Bosun mine is on the east shore of Slocan Lake, 1½ miles south of New Denver on the Nelson–Nakusp Highway. The main haulage, No. 6 adit, is driven beneath the highway from a site 40 feet above the lake. W. H. McLeod, of Silverton, with the aid of a partner, has operated a lease intermittently since 1956. A small amount of

* By J. E. Merrett.

exploratory raising and diamond drilling was done in the west central section. However, the main work completed was the sinking of a winze 40 feet on the vein in the centre section at the intersection of the main vein and No. 6 level crosscut. A 2-foot vein, mineralized with galena and sphalerite, was exposed on the east wall of the winze. Additional sulphide mineralization was disclosed above a false hangingwall and will be mined with the vein material.

**Van Roi, Hewitt (Slocan Van Roi Mines Limited)**

(49° 117° N.E.) Company office, 532 Burrard Street, Vancouver. Capital, 5,000,000 shares, no par value. This company owns the Van Roi and Hewitt mines, 6½ miles by road southeast of Silverton. Transcontinental Resources Limited has directional control. E. Derosa and M. Tarnowski mined 104 tons of ore under lease between No. 9 and No. 10 levels in the Hewitt mine, and L. Fried and V. Hansen mined 260 tons of ore on No. 4 sublevel in the Van Roi mine. The ore from both mines was trucked to the Western Exploration mill at Silverton. All mining equipment was removed from both mines and stored at the Van Roi mill, 1 mile south of Silverton on the Nelson–Nakusp Highway.

**Noonday**

(49° 117° N.E.) The Noonday mine is on Gold Creek just east of the Galena Farm mine. It was under lease to K. Millar and H. Lyon, of Silverton, who made a shipment of 88 tons of ore to the Western Exploration mill at Silverton. An outcrop of ore was exposed by hydraulicking in the bed of Gold Creek immediately below the lowest portal of the Noonday mine.

**Fisher Maiden**

(49° 117° N.E.) This property of two Crown-granted mineral claims owned by F. Mills, of Silverton, is on Silverton Creek, 8 miles by road from Silverton. No. 3 level on the south vein was reopened, and 206 tons of ore was removed from an old stope above the level and was trucked to the Western Exploration mill at Silverton. The caved portal of No. 3 level of the north vein, approximately 300 feet north of the south vein, was reopened and retimbered for a distance of 60 feet.

**Westmont (Silver King Mines Limited)**

(49° 117° N.E.) Company office, 2, 415 Baker Street, Nelson; mine office, Silverton. Capital: 100,000 shares, $1 par value. B. F. Marasek, president and manager. This company holds under option from J. A. Cullinane, of the Ellis Syndicate of Nelson, nine Crown-granted mineral claims and fractions on the north side of Enterprise Creek, opposite the Enterprise mine. Access is by 5.6 miles of road from the Nelson–Nakusp Highway. The one-half mile of old road between the mine and Enterprise Creek road was reopened, and a 30-foot bridge was constructed over Westmont Creek. A portable ore-bin of 60 tons capacity was constructed near the portal of No. 4 adit. This portal was reopened and retimbered from the surface to the intersection of the main vein, a distance of 200 feet. West of the intersection, caved ground was cleared sufficiently to provide access to the bottom of the old stope area, approximately 1,000 feet west. This work permitted the re-establishment of natural ventilation. At the intersection of the crosscut and main vein a stope has been prepared for mining. Immediately west of this point, a crosscut 35 feet long was driven into the footwall following a narrow silver-bearing quartz vein. East of the intersection, 100 feet of drifting was done on the main vein and 425 tons of ore was removed from a stope above the drift. The stope back was close to the surface. The quartz vein in this stope ranged in width from 6 inches to 2 feet and was well mineralized with galena, sphalerite, tetrahedrite, ruby silver, and native silver. The ore produced was shipped to the Western Exploration mill at Silverton and to the Trail smelter. A crew of three was employed.

## SPRINGER CREEK*

*Silver*

**Ottawa (Yukon Western Mining and Prospecting Company Limited)**

(49° 117° N.E.) Company and mine office, Slocan City. W. A. Ady, Edmonton, manager; C. Thickett, Slocan City, foreman. This company holds an option on the Ottawa mine on Springer Creek, 5 miles by road from Slocan City. Between February and November a crew of four men completed 200 feet of drifting and 65 feet of raising on the east vein on the No. 8 or bottom level. On the west vein on this level 190 feet of raising was completed. One mile of new road was constructed northeast from No. 8 level portal to the Hamilton portal on Little Tim Creek, where 94 feet of crosscutting was done to intersect a quartz vein believed to be the continuation of the Anna vein. Twenty-eight tons of ore was trucked to the Trail smelter.

## NORTH LARDEAU*

*Gold-Silver-Lead-Zinc*

**Spider, Eclipse (Sunshine Lardeau Mines Limited)**

(50° 117° N.W.) Company office, 604, 744 West Hastings Street, Vancouver; mine office, Beaton. J. Drybrough, president; J. A. Pike, managing director; G. G. Sullivan, manager; O. Meurling, mine superintendent; E. Hall, mill superintendent. Capital: 4,000,000 shares, no par value. The mine camp and mill are at the old townsite of Camborne, at the junction of Poole Creek and Incomappleux River, 6 miles by road northeast of Beaton on the northeast arm of Upper Arrow Lake. The mine is on the south side of Poole Creek, 2 to 3 miles by very steep road from Camborne.

No development work was done and production was on a salvage basis. All broken ore below No. 10 level on the Eclipse and No. 4 veins was recovered. Underhand stoping on No. 4 vein indicated a pinching of the orebody. Mining and milling were suspended on May 14th, the mill having produced 1,256 tons of lead concentrate and 1,544 tons of zinc concentrate during 1958. The concentrates were shipped to smelters in the United States.

The road to No. 6 level was reopened and S. Barclay and partner, holding a lease on the workings on this level, made some ore shipments.

Prior to 1952 approximately 400 tons of ore was mined. During the period of operation by the present company, from 1952 to 1958, 140,772 tons of ore was mined, having the following gross content in concentrates and in approximately 4,000 tons of crude ore: Gold, 11,876 oz.; silver, 1,686,805 oz.; copper, 188,161 lb.; lead, 23,793,322 lb.; zinc, 25,301,641 lb.; cadmium, 145,529 lb. Mill recoveries averaged about 91 per cent. Of the foregoing, the Eclipse vein produced about 35,000 tons of ore, the remainder coming from the Spider workings. The ore grades of the two veins were practically the same. On suspension of mining operations a small crew was maintained to examine an adjoining group of claims, owned by Lardeau Mines Exploration Limited, and the Lead Star group, situated about 4 miles westerly and owned by D. A. McIntosh. After some diamond drilling and surface examination the options on these properties were dropped.

**Beatrice (Beatrice Mining Co. Ltd.)**

(50° 117° N.W.) Company office, 404 Pemberton Building, 744 West Hastings Street, Vancouver. W. J. Scorgie, president and managing director. Capital: 50,000 shares, $1 par value. This company owns a group of claims at the head of the east fork of Mohawk Creek. The main workings are on the Beatrice claim and are accessible by 4 miles of tractor-road from the Spider mine road. The tractor-road was reopened but no other work was done.

* By J. E. Merrett.

FERGUSON (50° 117° N.E.)

*Silver-Lead-Zinc*

**Black Warrior, Elsmere (Circle City Mines Limited)**

Company office, Trail. A. Peterson, Trail, manager. These properties, optioned from J. Main, of Ferguson, are at the headwaters of Ferguson Creek, 10 miles by trail from Ferguson. A crew of two men was employed repairing the trail and reopening open-cuts and caved drifts so that examination can be made of these properties.

HALL CREEK (50° 117° N.E.)

*Silver-Lead-Zinc*

**Bannockburn**

J. Gallo, of Howser, owns the Bannockburn group of Crown-granted mineral claims on the south side of the headwaters of Hall Creek, a tributary of Duncan River. The property is reached by 17 miles of road from the Lardeau River road up Healy Creek, over the summit into Hall Creek, and by 4 miles of trail south to the mine workings. The Lardeau River bridge was reconstructed and the road was reopened to Hall Creek. Three miles of pack-horse trail was constructed toward the workings. Some surface stripping was done at various points along a vein mineralized with galena and sphalerite.

**Wagner**

J. Gallo, of Howser, owns the Wagner group of Crown-granted mineral claims on the north side of the headwaters of Hall Creek, a tributary of Duncan River. The property is reached by the same road providing access to the Bannockburn group and by 2 miles of trail north to the mine workings. Some surface stripping was done on a vein exposed by the recession of a glacier.

SOUTH LARDEAU*

*Silver-Lead-Zinc*

**J.G., Rosco, etc. (The Consolidated Mining and Smelting Company of Canada, Limited)**

(50° 116° S.W.) Company office, Trail. This company has a purchase option from J. Gallo and associates, of Howser, on a block of mineral claims extending north from Glacier Creek across a mountain ridge to the north end of the peninsula on the east side of Duncan Lake. A band of limestone, mineralized with galena and sphalerite, has at various times been explored by diamond drilling and trenching over several thousand feet of strike length. There is an adit on the north side of Glacier Creek. Further geological mapping was done in 1958, and a considerable amount of diamond drilling was done on the peninsula.

CRESTON*

*Copper*

**May-Bee**

(49° 116° S.E.) This property, comprising three recorded claims owned by O. Arrowsmith, of Erickson, is on the north side of Arrow Creek, 3 miles west of Kitchener on the Creston–Cranbrook Highway. The claims are astride the south end of the Iron Range Mountain fault, and extend from the north side of Goat River northward up the mountain. The showing is a chalcopyrite-bearing quartz vein ranging in width from 1 to 5 feet. The vein strikes north 36 degrees west and dips vertically, and is in a diorite sill of Purcell age in the Iron Range Mountain fault zone. The upper adit at 3,200 feet elevation was extended 12 feet to a total length of 95 feet. The lower adit at 3,020 feet elevation was extended 15 feet to a total length of 60 feet.

* By J. E. Merrett.

## KIMBERLEY*

*Silver-Lead-Zinc*

**Sullivan (The Consolidated Mining and Smelting Company of Canada, Limited)**

(49° 115° N.W.) Company office, 215 St. James Street West, Montreal; western headquarters, Trail. R. E. Stavert, Montreal, president; R. D. Perry, Trail, vice-president and general manager. Sullivan mine office, Kimberley. J. R. Geigerich, general superintendent; R. M. Porter, mine superintendent; H. J. Chalmers, Chapman Camp, superintendent, Sullivan concentrator. The Sullivan mine is on Mark Creek, 2 miles north of Kimberley, and the concentrator is at Chapman Camp, 2 miles south of Kimberley. The holdings include 678 Crown-granted mineral claims and fractions. The following report, prepared by the management, is a synopsis of the 1958 operations:—

" The Sullivan Mine produced and the Concentrator treated some 2,400,000 tons of ore. Seventy per cent of this was produced from the section Above 3900 Level and thirty per cent from Below 3900 Level.

" Long-hole drilling methods, using diamond and percussion drills with sectional steel, accounted for 95% of the production. The remainder was mined by bench mining methods in open stopes. Three winzes for float filling stopes Below 3900 Level were sunk by drilling a raise pattern through to the stope by diamond drill and blasting in sections from the stope to the level. These winzes were an average of 60 feet in length.

" Development footage was 52,497.5 feet, about ten per cent below 1957. 870,562 cubic yards of fill were placed, made up as follows—175,731 cubic yards gravel; 172,452 cubic yards float fill; 522,379 cubic yards planned cave.

" Primary ventilation of the mine was done by eleven fans, using 1,375 H.P. Volume of air handled was in the order of 1,000,000 c.f.m., or four tons of air for each ton of ore produced.

" Safety programs have been active at both the Mine and the Concentrator. The Mine, with 43 lost-time accidents, had a frequency rate of 22.5 and a severity rate of 1199 compared to 1957 figures of 28.9 and 1594 respectively. The Concentrator, with three lost-time accidents, had a frequency of 3.7 and a severity rate of 221 compared to 1957 figures of 5.7 and 115 respectively. Days lost due to accidents were 2,291 at the Mine and 180 at the Concentrator. The eye protection program at the Mine has been quite successful with a reduction of 22% of eye injuries from 1957.

" One hundred thirty-two new employees attended the induction school at the Mine, bringing the total to 2,137 having received this training. Eighty miners received a two-week course of mining instruction, bringing the total to have received this training to 331. Six employees were trained in Mine-Rescue and received their certificates. Mine-Rescue and First-Aid teams competed in local, East Kootenay, and Provincial competitions.

" The Concentrator operated 254 days during 1958 at an average of close to 9,500 tons per day.

" Employees totalled 1,437 at year-end, with 1,038 at the Mine and 399 at the Concentrator."

## ST. MARY RIVER*

*Lead-Zinc*

**Vulcan (The Consolidated Mining and Smelting Company of Canada, Limited)**

(49° 116° N.E.) This property is 18 miles northwest of Kimberley, west of White Creek, and 6 miles north-northeast of the confluence of White and Dewar Creeks. The property comprises twenty recorded claims owned by The Consolidated Mining and Smelting Company of Canada, Limited, and covers a showing of disseminated lead and zinc in sediments. The claims were located in September, 1957. Eight men were employed for a period of

* By D. R. Morgan.

three months during the summer of 1958. They geologically mapped and prospected the group, completed 7 miles of trail, drilled three diamond-drill holes totalling 85 feet, and did a limited amount of geophysical work. The men were housed in tent camps, and a truck and pack-horses were used for transportation.

## FORT STEELE*

*Silver-Lead-Zinc*

**Fort Steele Gold and Silver Mines Limited**

(49° 115° N.W.) Registered office, 1442 Bay Avenue, Trail; mine office, Box 1720, Cranbrook. D. Shirling, president; C. F. Gorse, manager. The Joy, Rita, and Gertrude claims are owned by C. F. Gorse, and are located between Brewery and Fisher Creeks, on the north side of Wild Horse River. Access is by means of a 5-mile logging-road leading from Fort Steele. A small crew was employed reopening two old shafts, one 20 feet deep and the other 40 feet. Both shafts are on a mineral occurrence of silver, lead, and zinc.

## SKOOKUMCHUCK*

*Tungsten*

**Pico (The Consolidated Mining and Smelting Company of Canada, Limited)**

(49° 116° N.E.) This property comprises fifty-eight claims owned by The Consolidated Mining and Smelting Company of Canada, Limited. It is on Burnt Creek, a tributary of Skookumchuck Creek, approximately 30 miles by logging-road west of Torrent. The claims cover scheelite mineralization associated with garnet, epidote, and minor chalcopyrite in skarn zones within sediments and diorite. The showings were trenched in 1957.

During 1958 a contract company employing five men for a period of six weeks drilled five holes totalling 1,455 feet on the "sediment" showing. Personnel were housed in a tent camp on Burnt Creek.

## CANAL FLATS*

*Silver-Lead-Zinc*

**Key**

(50° 115° S.W.) This property comprises fourteen claims owned by J. W., J. E., and J. C. Blake, of Skookumchuck, and A. M. Blake, of Ta Ta Creek. It is on the south tributary of Doctor Creek, 19 miles by logging-road and 7½ miles by good pack-trail southwest of Canal Flats. The claims cover showings of galena, sphalerite, pyrite, and some tetrahedrite with minor quartz in argillaceous sediments. The Consolidated Mining and Smelting Company of Canada, Limited, optioned the property in 1957 and seven men were employed for a period of two months in 1958. The trail was cleared and two holes were diamond drilled a total of 501 feet. The option was relinquished in October, 1958.

## WINDERMERE*

### Toby Creek (50° 116° S.E.)

*Silver-Lead-Zinc*

**Mineral King (Sheep Creek Mines Limited)**

Company office, 6, 490 Baker Street, Nelson; mine office, Toby Creek. H. E. Doelle, managing director; J. B. Magee, resident manager. This mine is 28 miles by road southwest of Athalmer, on the Toby Creek side of the ridge between Jumbo and Toby Creeks. The mineral deposit is a lead-zinc replacement, with barite, in limestone of the Mount Nelson formation. The mine is operated by the open-stope method and the workings are in four subparallel orebodies known as the "A," "B," "C," and "D" bodies.

* By D. R. Morgan.

During 1958, 192,426 tons of ore was mined and milled, with most of the tonnage coming from above the No. 4 level. Exploration, development, and mining were continued on all levels from No. 2 to No. 6, inclusive, and the finding of a better grade of ore in the lower levels raised the average mill head slightly above that of 1957. The development included 1,728 feet of drifts and crosscuts, 1,783 feet of raises, and 11,570 feet of diamond drilling in a total of 126 holes.

No major installation was made underground during 1958, and there has been very little change in the operation. Preparations were being made to mine barite from the top-level workings at the end of the year, and it is expected there will be production of barite in the near future. This mining will be separated from the remainder of the operations by transporting the barite along No. 3 level and down the surface skipway.

The mine is ventilated by both mechanical and natural ventilation, and approximately 29,000 cubic feet of air per minute is exhausted from the workings. Of this quantity, 18,000 cubic feet per minute is supplied by a 15-horsepower electrically driven Sirocco fan at the portal of the No. 2 level intake airway. Transportation from the mine is by diesel locomotive, and all production is brought to No. 7 level.

New construction work on the surface during 1958 included an extension to the power-house to accommodate a 500-kva. portable diesel generator and a 300-c.f.m. portable diesel compressor. The original 500-ton capacity coarse-ore bin, located near the main haulage portal of the mine, was rebuilt and trestled for lead-zinc ore. A new 100-ton ore-bin was built at the bottom of the surface incline for barite ore.

The average number of men employed was ninety-four, of whom fifty were employed underground.

### Horsethief Creek (50° 116° N.E.)

***Silver-Copper***

**Ptarmigan (The Selkirk Ptarmigan Mines Limited)**

President and manager, Heinz K. F. Seel, Edgewater. This property is at an elevation of 8,600 feet, at the headwaters of Red Line Creek, a tributary of McDonald Creek, which in turn is a tributary of Horsethief Creek. Access is by means of a 29-mile road from the village of Wilmer. A description of the property is included in the 1955 Annual Report.

The property is owned by Mr. Seel, and the present company, which is a private one, was formed in 1958 to continue the operations at the mine. Three men were employed and activities were directed mainly to the No. 3 level, where a small cut-and-fill stope was commenced in 1957. Further ice was removed for a distance of 160 feet at the inner portion of the level, and 34 feet of drifting was done on a new lead of high-grade ore. The total tonnage of ore from the stope and drift was 181 tons, which was shipped by truck to the Trail smelter. Silver assays of the shipments ranged from 210 to 400 ounces per ton. The mine is ventilated by natural means, and a raise was driven from the level to an old incline for a distance of 45 feet to improve the ventilation.

On the surface 2½ miles of the upper portion of the road was relocated to improve the grade, and a small building was put up for storage and heating of water for drilling.

### REVELSTOKE*

***Silver-Lead-Zinc***

**King Fissure, S.B., C.R., and Deby**

(51° 118° S.E.) Twenty-three claims and fractions located in September, 1955, and held by American Standard Mines Limited were under option in 1958 to Bunker Exploration Ltd. The claims cover old lead-zinc occurrences first located many years ago but not mentioned in any geological reports. The company improved the trail into the

* By Stuart S. Holland.

property and established a tent camp at an elevation of about 4,500 feet at the head of Lorenz Creek, a tributary from the south to Copeland Creek. The camp is reached via a truck-road which leaves the Trans-Canada Highway at the railway crossing about 2 miles west of Revelstoke. The truck-road follows the west side of Jordan River for about 10 miles. From there a pack-horse trail continues for another 2 miles to the mouth of Copeland Creek. The trail extends up the north side of Copeland Creek for 3 miles, then crosses to the south side and climbs steeply for 3 miles to the camp-site at the head of Lorenz Creek.

The mineralization is exposed between 6,000 and 7,500 feet elevation on the northern slope of Mount Copeland. The mineralization is well exposed in natural outcrops on moderate and steep slopes for a total length of about 7,500 feet, although part is obscured by lobes of glacial ice.

The area is underlain by a succession of quartzites, micaceous quartzites, schists, and garnetiferous mica schists containing a few marble beds. The rocks strike north 50 degrees west, dip 50 degrees southwest, and are folded into an isoclinal syncline whose axis is essentially horizontal even though local plunges of 5 degrees northwest or southeast are observed. The central part of the syncline is occupied by a band of gneiss which is crossed by several narrow, irregular pegmatite dykes.

The mineralization, which is a fine-grained aggregate of pyrite, pyrrhotite, galena, and sphalerite, seems to replace a single stratigraphic bed. It lies close to a white marble bed that makes an excellent marker horizon and outcrops mainly along the southwest limb of the syncline. On the northwestern end the mineralization can almost be seen to follow down into the synclinal trough and then up on the northeastern limb where it outcrops discontinuously along strike.

The sulphide mineralization ranges from 1 foot to about 8 feet in width and probably averages about 5 feet. Chip sampling done in 1956 for American Standard Mines Limited indicated that the outcropping mineralization along the southwestern limb might assay up to about 10 per cent combined lead and zinc and contain 1 to 2 ounces of silver per ton.

Work during the summer of 1958 was directed solely toward a thorough sampling of the outcropping mineralization. Trenches at 25-foot intervals were blasted across the mineralized bed and a generous-sized bulk sample taken from each locality. Further exploration work by Bunker Exploration Ltd. will be largely contingent upon obtaining encouraging assay results from this sampling.

[References: *Minister of Mines, B.C.,* Ann. Rept., 1956, p. 114; Western Miner, October, 1956, p. 128.]

## SKAGIT RIVER*

### *Copper*

**A.M. (The Consolidated Mining and Smelting Company of Canada, Limited)**

(49° 121° S.E.) The A.M. group, consisting of eight Crown-granted claims, was optioned from Canam Copper Company Ltd. The property is on the western boundary of Manning Park and is about 4 miles by road southerly from Mile 26 on the Hope–Princeton Highway. From 1930, when the showings were discovered, up to the end of 1956 a considerable amount of underground exploration has been carried out, and detailed descriptions of the property have appeared in previous Annual Reports.

From August 12th until November 4th a surface geological mapping programme was carried out under the direction of J. K. Webb. A four-man party prepared a plane-table map of the significant claim area.

[References: *Minister of Mines, B.C.,* Ann. Repts., 1954, pp. 152–159; 1949, pp. 210–213.]

* By A. R. C. James.

A total crew of 156 men was employed in the final month of operation.

[References: *Minister of Mines, B.C.,* Ann. Rept., 1954, pp. 161–163; *Geol. Surv., Canada,* Mem. 190 (1936).]

## HARRISON LAKE*

***Molybdenite***

**Newmont Mining Corporation of Canada Limited** (49° 121° N.W.) Company office, 744 West Hastings Street, Vancouver. J. A. Pike, resident manager. This company optioned the AB group of forty recorded claims. The group is on Clear Creek, a tributary of Big Silver Creek, which flows into the east side of Harrison Lake. Surface trenching, sampling, and geological work were done to outline zones of molybdenite mineralization in the granitic rocks. Five men were employed.

## HOWE SOUND*

***Copper***

**Britannia (Howe Sound Company (Britannia Division))** (49° 123° N.E.) Head office, 500 Fifth Avenue, New York, N.Y.; mine office, Britannia Beach. William M. Weaver, Jr., president; Frederick A. McGonigle, vice-president; D. W. Pringle, general superintendent; L. L. Allen, mine superintendent; P. C. Emery, chief engineer. In December, 1957, Britannia Mining and Smelting Co. Limited proposed to cease operations, but with the assistance of a direct subsidy payment from the Federal Government and the Provincial Government the company continued to operate on a reduced scale until March 12th, 1958, when all operations, except maintenance, ceased. On August 8th Britannia Mining and Smelting Co. Limited was placed in voluntary liquidation and Howe Sound Company became the successor. At the end of the year D. W. Pringle was appointed general superintendent and plans were made to reopen the mine.

The following summary supplied by the management provides detail of the operations in 1958:—

| | No. 8 | Victoria | Total |
|---|---|---|---|
| | Ft. | Ft. | Ft. |
| Drifts | 151 | 188 | 339 |
| Raises | 530 | 262 | 792 |
| Powder-workings | 245 | ..... | 245 |
| Diamond drilling | 1,117 | 549 | 1,666 |

The ore is mined by shrinkage, cut-and-fill, and square-set mining methods. The tonnages produced by each mining method in the two mines was as follows:—

| | No. 8 | Victoria | Total |
|---|---|---|---|
| Development | 396 | 552 | 948 |
| Square-set | 14,863 | ..... | 14,863 |
| Cut-and-fill | 3,597 | 4,856 | 8,453 |
| Shrinkage | 25,494 | 14,238 | 39,732 |
| Totals | 44,350 | 19,646 | 63,996 |

Production: Ore milled, 66,863 tons.

* By R. B. King.

*Zinc-Lead-Copper*

**Gold Coin (Noranda Exploration Company, Limited)** (49° 121° S.E.) British Columbia office, 202, 2256 West Twelfth Avenue, Vancouver. B. O. Brynelsen, manager, Vancouver. This property includes forty-one claims which are held under option agreement with J. Ashenbrenner and F. Lemieux, of Hope. The claims are on Shawatum or Ten Mile Creek, a tributary of the Skagit River, and are approximately 25 miles in a direct line southeast of Hope. Numerous outcrops of sulphide mineralization occur in rocks of the Hozameen series, and have been prospected over a number of years by minor surface workings. In 1950 a few hundred feet of diamond drilling was done on the Gold Coin No. 2 claim to explore the downward extension of the series of narrow veins that outcrop on bluffs to the north of Shawatum Creek and east of Star Group Creek.

The work undertaken by the present company included prospecting, sampling, mapping, and some magnetometer surveying. A crew of four men was employed for two months.

[References: *Minister of Mines, B.C.*, Ann. Repts., 1929, pp. 241, 242; 1938, pp. F 19, F 20.]

## HOPE*

*Nickel-Copper*

**Pride of Emory (Western Nickel Limited)** (49° 121° S.W.) Company office, 1111 West Georgia Street, Vancouver; mine office, Hope. D. W. Pringle, manager; L. R. Archibald, mine superintendent. The property is at the head of Stulkawhits (Texas) Creek, which flows eastward into the Fraser River about 6 miles north of Hope. From a point on the Trans-Canada Highway 10 miles north of Hope, a good gravel road 5.1 miles long leads up Stulkawhits Creek to the mine camp near the 2600 adit portal. A branch road from the camp provides access to the 3550 portal.

A description and history of the property was given in the 1954 Annual Report. The property remained inactive from November, 1954, until April, 1957, when The Granby Consolidated Mining Smelting and Power Company Limited was appointed to conduct the management of the mine. Throughout the latter half of 1957 the property was prepared for production, which began in January, 1958. As a result of economic difficulties, the mine was closed at the end of July.

The orebodies are pipe-like in form and occur in an irregular northerly plunging mass of ultrabasic rocks, approximately 2 square miles in area. They comprise concentrations of sulphides, of which pyrrhotite, pentlandite, and chalcopyrite are the most common, in the ultrabasic rocks. The mine is developed from two adit levels—the 3550 level, with portals on both west and east sides of the mine, and the 2600 level, which is the main haulage level. An ore-pass and an internal inclined shaft join the two levels. The greater part of the ore was mined from stopes above the 3550 level in the Pride of Emory and the Brunswick Nos. 5 and 8 orebodies, but a considerable amount of ore was also mined from an orebody above the 2600 level. Sublevel and shrinkage methods of mining were used. The following is a summary of production and work done:—

| | | |
|---|---|---|
| Drifting | ft. | 1,032 |
| Raising | ft. | 3,373 |
| Diamond drilling | ft. | 5,477 |
| Ore mined | tons | 131,133 |
| Nickel concentrates shipped | tons | 7,598 |
| Copper concentrates shipped | tons | 729 |

* By A. R. C. James.

## TEXADA ISLAND*

***Iron***

**Texada Mines Ltd.** (49° 124° N.W.) Registered office, 626 West Pender Street, Vancouver. A. D. Christensen, San Francisco, president; B. L. Alexander, general manager; J. Kenneth Halley, chief engineer; J. Yuill, mine superintendent; L. D. Smillie, mill superintendent. This property is on the southwest coast of Texada Island, about 3 miles westerly from Gillies Bay, which is nearly 70 air miles northwest of Vancouver airport. The company holds eight Crown-granted and ten recorded mineral claims.

Magnetite is mined in pits from levels which are established at 20-foot intervals. Waste rock is stripped where necessary. Vertical holes are drilled with Gardner-Denver rotary drills and are blasted electrically. The broken ore or waste is loaded by 2½-cubic-yard diesel-driven shovels into 15-cubic-yard-capacity trucks and is transported to specific stockpiles or to the crushing plant.

The development work at the various mines is summarized as follows:—

| Mine | Diamond Drilling (Ft.) | Waste Stripping (Cu. Yd.) |
|---|---|---|
| Prescott | 3,481 | ---------- |
| Yellow Kid | 7,468 | 164,731 |
| Paxton | 5,841 | 446,176 |
| Boulder Nest and others | 1,039 | ---------- |
| Totals | 17,829 | 610,907 |

In the mill a copper concentrate is made by flotation and a magnetite concentrate is made by magnetic separation. The magnetite concentrate is dried in a rotary kiln and conveyed to stockpiles. Magnetite concentrates were shipped to Japan and copper concentrates to Tacoma.

Production: Iron concentrate, 357,776 tons; copper concentrate, 3,338 tons.

## VANCOUVER ISLAND†

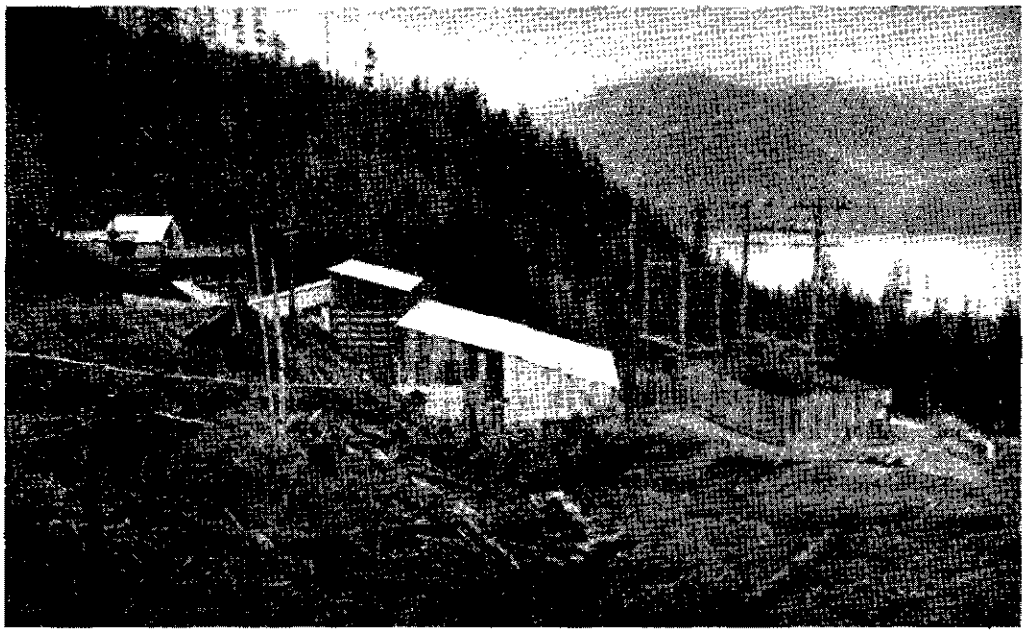
### BENSON (ELK) LAKE (50° 127° S.E.)

***Iron***

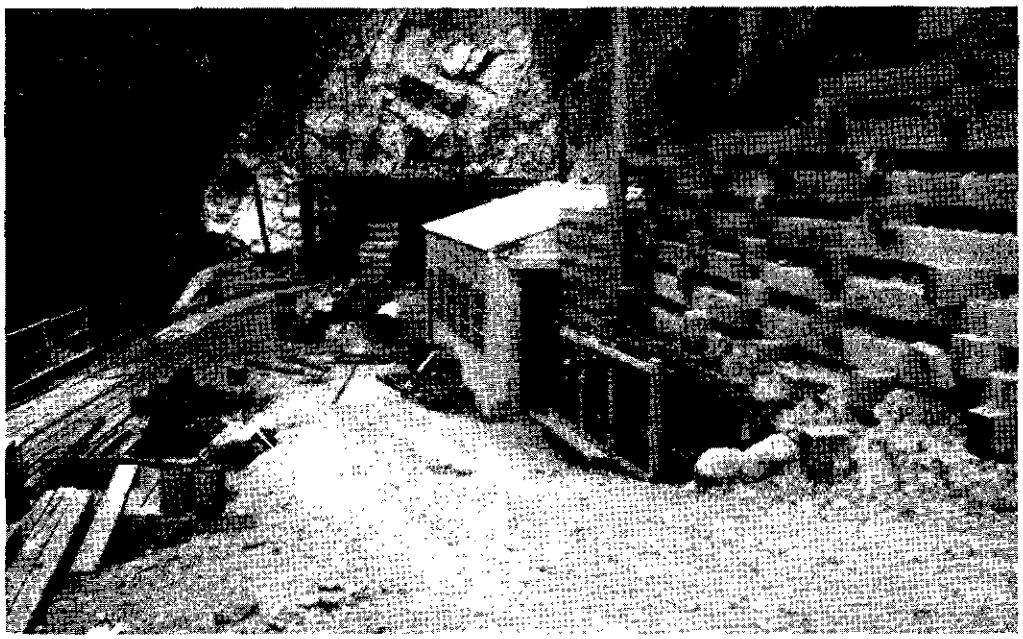
**Empire Development Company Limited** Company office, 736 Granville Street, Vancouver; mine office, Port McNeill. George C. Lipsey, general manager. This property is operated by Mannix Company Limited; company office, 546 Howe Street, Vancouver; A Shaak, project manager. The property is south of Benson and Kathleen Lakes in the Quatsino-Nimpkish area of Vancouver Island. It is reached by a 25-mile road from Port McNeill on Broughton Strait. Magnetite ore is mined from two open pits on the Merry Widow orebody at an elevation of 2,500 feet. Vertical blast-holes are drilled by Gardner-Denver rotary drills. Broken ore is loaded by 2½-cubic-yard diesel-driven shovels onto trucks and hauled about 1 mile to the primary crushing plant. Crushed material is conveyed to a loading-bin at the head of an inclined surface tram. Ore is loaded into 8-ton-capacity skips which operate in counterbalance. The ore is dumped from the skips into a bin and is then conveyed to the concentrator, at an elevation of 800 feet, where it is further crushed and ground to proper size for magnetic separation. The concentrate is trucked to Port McNeill, where it is stockpiled for shipment.

To facilitate the handling of supplies and personnel to the pits a road was constructed from the camp during the year. The mine produced 572,404 tons of ore, yielding 272,495 tons of magnetite concentrate.

* By R. B. King.
† By R. B. Bonar, except as noted.



Cowichan Copper Co. Ltd., mill.



Sunro Mines Limited, adit portal in Jordan River Canyon.

BEDWELL SOUND (49° 125° S.W.)

*Gold*

**Musketeer (Bedwell River Gold Mines Limited)**

Company office, Tofino. S. D. Craig, managing director. This company acquired the Musketeer property from Pioneer Gold Mines Limited, and early in 1958 commenced to reopen the mine. The mill and cook-house had been severely damaged by heavy snowfall, but by July the reconditioning of the mill building and machinery was well in hand. The mine was in fair condition in spite of the long closure. Considerable work was done to improve the road from the head of Bedwell Sound to the mine, a distance of approximately 10 miles.

Near the end of 1958 the property was put into production and an initial shipment of concentrate was sent to the Tacoma smelter.

TRANQUIL INLET (49° 125° S.W.)

*Gold*

**Fandora and Gold Flake (Tofino Gold Mines Ltd.)***

Company office, 408, 402 West Pender Street, Vancouver. F. R. Burton, president; R. H. Seraphim, exploration manager. Moneta Porcupine Mines, Limited, acquired management control of this property in 1957. The property consists of five Crown-granted claims and thirty-one claims held by record. These are on Tranquil Creek about 2 miles from the head of Tranquil Inlet on Vancouver Island, about 115 miles by air west of Vancouver airport. From a beach camp near the mouth of Tranquil Creek, a tractor-road 1¾ miles long follows the general course of the creek to a steep trail leading to the camp-site at an elevation of about 1,500 feet. A tram-line from the end of the road is used to service the camp and 1500 level (Upper Craig adit).

The gold-quartz veins were discovered in the late 1930's, when surface work disclosed the veins in a shear zone adjacent to an andesite dyke. Adits were later driven at 1,900 and 2,100 feet elevations. In 1946 the property was optioned by Privateer Mine, Limited. This company extended the 1900 and 2100 levels and opened levels at 1,700 and 1,500 feet elevations. The property closed in 1947. In 1949 Camac Mining Co. Limited optioned the property and did some underground and surface work. In 1957 Moneta Mines reopened the property and began driving the 1500 level. In 1958, 946 feet of drifting was done and thirty-two cuts were blasted in the north wall of the drift to sample a vein in the hangingwall.

The rocks in the area are altered volcanics, tuffs, and breccias. Fractures, striking north of east to south of east and dipping 60 to 85 degrees to the north, cut the volcanic rocks. In the workings an andesite dyke of varying width follows one of these fractures, striking north 70 degrees west and dipping 75 degrees to the north. This dyke has some narrow, fairly continuous quartz veins in it or near its contacts. The quartz veins split and join with no apparent regularity. The widest section of quartz vein sampled has been 28 inches, the average width being considerably less.

The gangue material of the veins is mainly quartz with some carbonate. The known metallic minerals are pyrite, galena, sphalerite, chalcopyrite, and visible gold. The walls of the veins are for the most part oxidized by circulating ground water.

* By R. B. King.

## Cowichan Lake (48° 124° N.E.)

***Copper***

**Blue Grouse (Cowichan Copper Co. Ltd.)***

Head office, 620 Howe Street, Vancouver; mine office, Lake Cowichan. Oswood G. McDonald, president and general manager; J. R. Billingsley, mine manager; G. G. Sullivan, geologist. The property consists of three Crown-granted mineral claims and sixty claims held by record. It includes two old properties—the Blue Grouse and Sunnyside—and is on the south side of Cowichan Lake about 3 miles by motor-road northwest of Honeymoon Bay.

In 1958 stoping of the G-H orebody (*see* Ann. Rept., 1956, pp. 120–122) continued and stoping of the E zone (*see* Ann. Rept., 1957, p. 71) was begun. Development work was entirely in connection with these stoping operations.

The following summary, provided by the management, shows details of the work done during the year:—

| | Ft. |
|---|---|
| Drifting and crosscutting | 1,115 |
| Raising | 703 |
| Diamond drilling underground | 5,627 |

A total of 96,029 tons was milled, containing an average of 3.196 per cent copper. Concentrates were shipped to Japan from a loading-dock at Hatch Point at the head of Saanich Inlet.

## Jordan River (48° 124° S.E.)

***Copper***

**Sunloch and Gabbro (Sunro Mines Limited)**

Head office, Tadanac; mine office, River Jordan. This property is on the Jordan River about 1 mile upstream from the mouth. The present workings are reached by a branch road, 1 mile long, that leaves the Victoria–Jordan River highway about half a mile east of River Jordan post office. The adit started in 1957 about 100 feet above sea-level was extended 3,456 feet during the year. The adit is straight, with a bearing of about north 35 degrees east and has a total length of 7,805 feet. It was driven to explore further the downward extension of a mineralized shear zone indicated in old surface workings and partly outlined by previous diamond drilling. The zone was penetrated at about 7,500 feet and consists of basalt mineralized with chalcopyrite and minor amounts of pyrrhotite and pyrite.

A drift was started near the point of contact and was driven north 15 degrees west on the strike of the zone for 400 feet. This drift was completed about the end of June. An extensive diamond-drill programme was inaugurated in June from underground stations.

* By N. D. McKechnie.

## REPORTS ON GEOLOGICAL, GEOPHYSICAL, AND GEOCHEMICAL WORK

Reports accepted to the end of 1958 for credit on assessment requirements for properties held under the "Mineral Act" and the "Placer-mining Act" since January 17th, 1947, and reports on geochemical surveys accepted since April 6th, 1951, are shown in the accompanying table. A copy of each report may be examined in the office of the Mining Recorder for the mining division in which the property is. A second copy of each report is filed in the office of the Chief of the Mineralogical Branch, Department of Mines, Victoria.

In the following list the property name is that which appears to be in most common use. It is not feasible to list all the claim names in each property. The author of each report is given and the principal for whom the report was written.

### REPORTS CREDITED FOR ASSESSMENT

| Geographic Position | | Property<br>Owner or Principal<br>Author of Report<br>Date of Submission of Report | Kind of Work | | |
|---|---|---|---|---|---|
| 1° Quadr. | Quarter | | Geological | Geophysical | Geochemical |
| 48° 123° | N.W. | East Sooke Copper<br>A. Stretton, F. Cooke, W. A. Gray, and H. Stretton.<br>P. A. Chubb and A. E. Lehmberg.<br>August 27, 1951. | × | × | — |
| 48° 123° | N.W. | Lucky Strike Group<br>Miss Winnifred McLellan.<br>Victor Dolmage.<br>May 15, 1948. | × | — | — |
| 48° 124° | S.E. | Ann, Don, Jo A-D Claims<br>Rio Canadian Exploration Ltd.<br>L. B. Gatenby.<br>June 3, 1958. | × | × | × |
| 48° 124° | S.E. | Bob A-B, Conrad A-D Groups<br>Rio Canadian Exploration Ltd.<br>L. B. Gatenby.<br>June 3, 1958. | × | × | × |
| 48° 124° | S.E. | Chef and Chef No. 2 Groups<br>Gabbro Copper Mines Limited.<br>M. M. Menzies.<br>March 8, 1956. | — | — | × |
| 48° 124° | N.E. | Cowichan Copper Group<br>Cowichan Copper Co. Ltd.<br>A. C. Skerl.<br>May 25, 1954. | — | × | — |
| 48° 124° | N.E. | Stella 1–4<br>Rosea Copper Mines Ltd.<br>F. J. Hemsworth.<br>April 29, 1957. | — | × | — |
| 49° 115° | S.W. | Barkshanty, Etna, Larson, Glencairn, and Tradedollar Groups<br>St. Eugene Mining Corporation Limited.<br>Alexander Smith.<br>November 24, 1947. | × | — | — |
| 49° 115° | N.W. | Dries and Tonia<br>The Consolidated Mining and Smelting Company of Canada, Limited.<br>P. H. Sevensma.<br>June 11, 1954. | — | × | — |
| 49° 115° | N.W. | Estella Group<br>Estella Mines Ltd.<br>A. R. Allen.<br>May 8, 1952. | × | — | — |
| 49° 115° | N.W. | Fly, Spoon, Hook, and Trout Group<br>The Consolidated Mining and Smelting Company of Canada, Limited.<br>P. H. Sevensma.<br>May 27, 1954. | — | × | — |
| 49° 115° | S.E. | Jason Groups<br>Northwestern Explorations, Limited.<br>W. P. Hammond.<br>September 3, 1954. | × | — | — |

REPORTS CREDITED FOR ASSESSMENT—*Continued*

| Geographic Position | | Property<br>Owner or Principal<br>Author of Report<br>Date of Submission of Report | Kind of Work | | |
|---|---|---|---|---|---|
| 1° Quadr. | Quarter | | Geological | Geophysical | Geochemical |
| 49° 115° | N.W. | Kimberley Claims<br>Conwest Exploration Company Limited.<br>A. A. Brant.<br>February 24, 1948. | — | × | — |
| 49° 115° | S.W. | M.L. Claims (Moyie Lake)<br>St. Eugene Mining Corporation Limited.<br>Alexander Smith.<br>November 24, 1947. | × | — | — |
| 49° 115° | S.W. | M.L. 1–6 Group<br>St. Eugene Mining Corporation Limited.<br>Alexander Smith.<br>November 25, 1948. | — | × | — |
| 49° 115° | S.W. | M.L. 72 Fraction and M.L. 73–75 Claims<br>St. Eugene Mining Corporation Limited.<br>Alexander Smith.<br>September 13, 1951. | — | × | — |
| 49° 115° | S.W. | M.L. 7 and 8 Groups<br>St. Eugene Mining Corporation Limited.<br>Alexander Smith.<br>September 13, 1951. | — | × | — |
| 49° 115° | S.W. | M.L. 7 and 8 Groups<br>St. Eugene Mining Corporation Limited.<br>Alexander Smith.<br>September 11, 1953. | — | — | × |
| 49° 115° | S.E. | Rex, Jason, Intruder Groups<br>Northwestern Explorations, Limited.<br>McPhar Geophysics Limited.<br>September 3, 1954. | — | × | — |
| 49° 115° | S.W. | St. Joseph Group<br>Northwestern Explorations, Limited.<br>C. S. Ney.<br>January 11, 1955. | × | — | — |
| 49° 115° | N.W. | T.P.C. Group<br>Northwestern Explorations, Limited.<br>C. S. Ney.<br>January 27, 1955. | × | × | — |
| 49° 116° | S.E. | Delaware Claims<br>John W. Hill.<br>McPhar Geophysics Limited.<br>April 13, 1955. | — | × | — |
| 49° 116° | N.W. | Fred, Mar, and Nick Groups<br>Highland-Bell Limited.<br>W. H. Mathews.<br>December 11, 1956. | × | — | — |
| 49° 116° | N.W. | Jackpot and Sunshine Groups<br>Arcon Base Metals Limited.<br>W. V. Smitheringale.<br>June 12, 1955. | × | — | — |
| 49° 116° | N.W. | Jim Group<br>The Consolidated Mining and Smelting Company of Canada, Limited.<br>H. L. McCallum.<br>May 13, 1955. | — | × | — |
| 49° 116° | N.E. | Mathew Creek Group<br>Anyox Metals Limited.<br>Alexander Smith.<br>March 9, 1948. | — | × | — |
| 49° 117° | S.E. | Amco Group<br>Amco Exploration, Inc.<br>W. W. Moorhouse.<br>December 5, 1952. | × | — | — |
| 49° 117° | S.E. | Amco 43–47 Fractions<br>Amco Exploration, Inc.<br>W. W. Moorhouse.<br>September 8, 1953. | × | — | — |
| 49° 117° | S.E. | Calcite Group<br>Canadian Exploration Limited.<br>H. Lakes.<br>September 25, 1947. | × | — | — |

REPORTS CREDITED FOR ASSESSMENT—*Continued*

| Geographic Position | | Property<br>Owner or Principal<br>Author of Report<br>Date of Submission of Report | Kind of Work | | |
|---|---|---|---|---|---|
| 1° Quadr. | Quarter | | Geological | Geophysical | Geochemical |
| 49° 117° | S.E. | Caviar, Larch, and Val Groups<br>Diem Mines Limited.<br>P. J. Shenon and R. P. Full.<br>November 7, 1950. | × | — | — |
| 49° 117° | S.W. | Celtic Queen Group<br>Rossland Mines Limited.<br>A. R. Clark and E. H. Lovitt.<br>August 23, 1947. | × | × | — |
| 49° 117° | S.E. | Deer and Double B Groups<br>The Consolidated Mining and Smelting Company of Canada, Limited.<br>W. T. Irvine.<br>December 4, 1951. | × | — | — |
| 49° 117° | S.E. | Falcon and Larch Claims<br>Diem Mines Limited.<br>F. McIntosh Galbraith.<br>September 23, 1952. | — | × | — |
| 49° 117° | S.E. | GPX, Phil, North Wind, and King Mineral Claims<br>Kenville Gold Mines Limited.<br>F. C. Buckland and W. R. Baker.<br>October 19, 1948. | × | — | — |
| 49° 117° | S.E. | Grouse Claims<br>Diem Mines Limited.<br>S. H. Ward and F. McIntosh Galbraith.<br>September 21, 1951. | — | × | — |
| 49° 117° | S.E. | Hal Group and Scott Fraction<br>Canadian Exploration Limited.<br>James Crowe.<br>June 9, 1947. | × | — | — |
| 49° 117° | S.E. | H.B. Nos. 2–7 Mineral Claims<br>The Consolidated Mining and Smelting Company of Canada, Limited.<br>Leonard Telfer.<br>February 15, 1949 | × | — | — |
| 49° 117° | S.E. | Joker and One Shot Groups<br>Canadian Exploration Limited.<br>H. Lakes.<br>October 10, 1947. | × | — | — |
| 49° 117° | S.E. | Last Chance No. 1 Group<br>New Jersey Zinc Exploration Company (Canada) Ltd.<br>E. Livingston and R. C. Macdonald.<br>November 6, 1953. | — | — | × |
| 49° 117° | S.W. | Little Bess Group<br>Rossland Mines Limited.<br>S. G. Bruce.<br>March 22, 1948. | × | × | — |
| 49° 117° | S.W. | May Queen Groups and May Queen Fractions 1, 17, 23, 36, and 38<br>Rossland Mines Limited.<br>A. R. Clark and S. G. Bruce.<br>March 22, 1948. | × | × | — |
| 49° 117° | S.E. | Ore Hill Group<br>Sheep Creek Gold Mines Limited.<br>A. G. Pentland.<br>July 5, 1947. | × | — | — |
| 49° 117° | S.E. | Pactolus Group<br>Arthur St. Clair Brindle.<br>Alexander Smith.<br>November 10, 1947. | × | — | — |
| 49° 117° | S.E. | Ronald Group<br>New Jersey Zinc Exploration Company (Canada) Ltd.<br>E. Livingston and R. C. Macdonald.<br>April 2, 1954. | — | — | × |
| 49° 117° | S.W. | Rossland Claims<br>Valley Mining Company.<br>E. P. Kaiser, R. C. Macdonald, and H. C. Gunning.<br>January 21, 1948. | × | × | — |
| 49° 117° | S.E. | Sunshine No. 2 Mineral Claim<br>Canadian Exploration Limited.<br>James Crowe.<br>August 12, 1947. | × | — | — |

## REPORTS CREDITED FOR ASSESSMENT—*Continued*

| Geographic Position | | Property<br>Owner or Principal<br>Author of Report<br>Date of Submission of Report | Kind of Work | | |
|---|---|---|---|---|---|
| 1° Quadr. | Quarter | | Geological | Geophysical | Geochemical |
| 49° 117° | S.W. | Tiger Fractional Mineral Claim<br>Rossland Mines Limited.<br>S. G. Bruce and W. R. Baker.<br>November 13, 1947. | × | × | — |
| 49° 117° | S.E. | Victory Group<br>Canadian Exploration Limited.<br>James Crowe.<br>August 15, 1947. | × | — | — |
| 49° 118° | S.W. | Attwood Claims<br>Attwood Copper Mines Limited.<br>W. H. White and R. H. Seraphim.<br>March 13, 1952. | × | × | × |
| 49° 118° | S.E. | Bruce Group<br>Noranda Exploration Company, Limited.<br>M. M. Menzies.<br>January 28, 1957. | × | × | — |
| 49° 118° | S.E. | Copper Basin Groups A, B, and C<br>Noranda Exploration Company, Limited.<br>M. M. Menzies.<br>January 28, 1957. | — | × | — |
| 49° 118° | S.E. | Eholt Group<br>Noranda Exploration Company, Limited.<br>M. M. Menzies.<br>February 8, 1957. | × | × | — |
| 49° 118° | S.W. | Eholt Copper Property<br>Noranda Exploration Company, Limited.<br>M. M. Menzies.<br>February 8, 1957. | — | × | — |
| 49° 118° | S.W. | Greenwood Copper<br>Greenwood Copper Corporation Limited.<br>C. W. S. Tremaine.<br>September 24, 1956. | — | × | — |
| 49° 118° | S.W. | Hardscrabble Fraction<br>Attwood Copper Mines Limited.<br>R. H. Seraphim.<br>November 24, 1952. | — | × | — |
| 49° 118° | S.W. | Pat Group<br>N. H. McDiarmid and E. M. Olts.<br>R. E. Renshaw.<br>April 3, 1957. | × | × | — |
| 49° 118° | S.W. | Ren Group<br>Belcor Engineering Limited.<br>F. J. Hemsworth.<br>February 25, 1958. | × | — | — |
| 49° 118° | S.W. | Ren Mineral Claims<br>Belcor Engineering Limited.<br>F. J. Hemsworth.<br>March 20, 1957. | — | × | — |
| 49° 118° | S.W. | Salamet Group<br>Salamet Mines Ltd.<br>E. B. Nicholls.<br>September 26, 1956. | — | × | — |
| 49° 118° | S.W. | South End Group<br>Attwood Copper Mines Limited.<br>R. H. Seraphim.<br>October 24, 1952. | — | × | — |
| 49° 119° | N.W. | Alocin Chrome Groups A and B<br>Noranda Exploration Company, Limited.<br>M. M. Menzies.<br>February 12, 1957. | × | × | — |
| 49° 119° | S.E. | Bellaclava Claims<br>Silver Bounty Mines Limited.<br>G. S. Eldridge.<br>August 25, 1948. | — | × | — |
| 49° 119° | N.W. | Brenda Prospect<br>Northwestern Explorations, Limited.<br>C. S. Ney.<br>October 23, 1957. | × | × | — |

REPORTS CREDITED FOR ASSESSMENT—*Continued*

| Geographic Position | | Property<br>Owner or Principal<br>Author of Report<br>Date of Submission of Report | Kind of Work | | |
|---|---|---|---|---|---|
| 1° Quadr. | Quarter | | Geological | Geophysical | Geochemical |
| 49° 119° | S.E. | Crater Lake Group<br>Highland-Bell Limited.<br>D. F. Kidd.<br>October 11, 1947. | × | — | — |
| 49° 119° | S.E. | Fair Fraction Mineral Claim<br>The Consolidated Mining and Smelting Company of Canada, Limited.<br>C. O. Swanson.<br>July 19, 1947. | × | — | — |
| 49° 119° | S.E. | Idaho and Washington No. 1 Mineral Claims<br>Highland-Bell Limited.<br>D. F. Kidd.<br>October 17, 1947. | × | — | — |
| 49° 120° | N.W. | Bounty Group<br>G. S. Eldridge.<br>D. L. Hings.<br>February 28, 1957. | — | × | — |
| 49° 120° | S.W. | Covellite Group<br>The Granby Consolidated Mining Smelting and Power Company Limited.<br>J. H. Parliament.<br>March 28, 1951. | — | — | × |
| 49° 120° | S.W. | Hope-Summit Group<br>Deerhorn Mines Limited.<br>L. B. Gatenby.<br>December 13, 1956. | × | × | × |
| 49° 120° | N.W. | Independence Group<br>St. Eugene Mining Corporation Limited.<br>Alexander Smith.<br>October 17, 1951. | × | — | — |
| 49° 120° | N.W. | Nor A, B, C Groups<br>Fidelity Uranium Mines Ltd.<br>E. J. Wendeborne.<br>March 18, 1958. | × | — | — |
| 49° 121° | S.W. | USS 1–7<br>James A. Noble.<br>John C. Ruckmick.<br>September 17, 1956. | × | — | — |
| 49° 123° | N.E. | M2, M3, M4, M5, and M2–4 Fractions<br>Giant Mines and Metals Limited.<br>A. R. Allen.<br>July 31, 1947. | × | — | — |
| 49° 124° | N.W. | Clark Claim Groups<br>George S. Clark.<br>D. F. Coulbaugh.<br>May 31, 1956. | — | × | — |
| 49° 124° | N.E. | Lyons, B.R., and L and M Claims<br>Bernard McElroy.<br>Duncan A. McNaughton.<br>March 20, 1947. | × | — | — |
| 49° 125° | S.W. | Mocena Mines Group<br>Mocena Mines Limited.<br>W. I. Nelson.<br>April 1, 1955. | — | × | — |
| 50° 114° | S.W. | Fording River Project<br>Utah Co. of the Americas.<br>L. C. Clark.<br>April 17, 1958. | × | — | — |
| 50° 116° | N.E. | Alpine and O.K. Groups<br>Silver Giant Mines Limited.<br>A. R. Allen.<br>October 7, 1948. | × | — | — |
| 50° 116° | S.W. | Art, Ken, and Don Groups<br>Gibson Girl Mines Limited.<br>F. J. Hemsworth.<br>September 27, 1951. | × | — | — |
| 50° 116° | N.E. | Blue Bell and Silver Bell Groups<br>Silver Giant Mines Limited.<br>A. R. Allen.<br>October 23, 1948. | × | — | — |

REPORTS CREDITED FOR ASSESSMENT—*Continued*

| Geographic Position | | Property<br>Owner or Principal<br>Author of Report<br>Date of Submission of Report | Kind of Work | | |
|---|---|---|---|---|---|
| 1° Quadr. | Quarter | | Geological | Geophysical | Geochemical |
| 50° 116° | N.E. | Erin Group<br>Silver Giant Mines Limited.<br>A. R. Allen.<br>June 11, 1948. | × | — | — |
| 50° 116° | N.E. | Europa, Venus, Mars, etc.<br>Silver Giant Mines Limited.<br>A. R. Allen.<br>June 2, 1947. | × | — | — |
| 50° 116° | S.W. | Rosco Group<br>The Granby Consolidated Mining Smelting and Power Company Limited.<br>W. I. Nelson and L. Adie.<br>January 26, 1953. | × | — | — |
| 50° 116° | N.W. | Warren Creek Mineral Claims<br>Roger Le Beuf.<br>Harvey H. Cohen.<br>July 3, 1957. | × | — | — |
| 50° 117° | S.E. | Snowball Groups<br>New Jersey Zinc Explorations Limited.<br>W. H. Mathews.<br>October 19, 1953. | × | — | — |
| 50° 118° | N.E. | Big Ledge Group<br>The Consolidated Mining and Smelting Company of Canada, Limited.<br>R. G. McEachern.<br>September 25, 1947. | × | × | — |
| 50° 118° | N.E. | Big Ledge Group<br>The Consolidated Mining and Smelting Company of Canada, Limited.<br>D. C. Malcolm and L. Telfer.<br>December 10, 1951. | — | — | × |
| 50° 119° | N.E. | Bird and Brett Mineral Claims<br>William E. Forbes and Associates.<br>A. R. Allen.<br>August 18, 1950. | × | — | — |
| 50° 120° | S.E. | Afton Group<br>Kennco Explorations (Canada) Limited.<br>H. V. Warren.<br>October 1, 1951. | — | — | × |
| 50° 120° | N.E. | Ajax, Neptune, Monte Carlo, Jacko 4 and 9, and Jacko Fractions 6 and 10<br>The Consolidated Mining and Smelting Company of Canada, Limited.<br>J. Richardson and R. G. McEachern.<br>January 21, 1955. | — | × | — |
| 50° 120° | S.W. | A1 1–12, GM 1–8, and GM 9–16 Mineral Claims<br>B.C. Base Metal Developments Ltd.<br>J. E. Betz and W. L. Young.<br>August 22, 1957. | — | × | — |
| 50° 120° | N.W. | Alpha North and Northeast Groups<br>The Cardiff Mining Company Ltd.<br>F. J. Hemsworth.<br>February 7, 1957. | — | × | — |
| 50° 120° | N.W. | Alpha North and Northeast Groups<br>The Cardiff Mining Company Ltd.<br>F. J. Hemsworth.<br>February 7, 1957. | — | — | × |
| 50° 120° | S.W. | Alpha-Scotty Group<br>The Cardiff Mining Company Ltd.<br>F. J. Hemsworth.<br>November 30, 1956. | — | × | — |
| 50° 120° | S.W. | Alpha-Scotty Group<br>The Cardiff Mining Company Ltd.<br>F. J. Hemsworth.<br>November 30, 1956. | — | — | × |
| 50° 120° | S.W. | Bethlehem Copper Property<br>Bethlehem Copper Corporation Ltd.<br>W. H. White, R. M. Thompson, and K. C. McTaggart.<br>October 25, 1955. | × | — | — |
| 50° 120° | S.W. | Bill, Frank, Nord, and Pat Mineral Claims<br>Udd-Ramsay Syndicate.<br>McPhar Geophysics Limited.<br>February 1, 1957. | — | × | — |

## REPORTS CREDITED FOR ASSESSMENT—*Continued*

| Geographic Position | | Property<br>Owner or Principal<br>Author of Report<br>Date of Submission of Report | Kind of Work | | |
|---|---|---|---|---|---|
| 1° Quadr. | Quarter | | Geological | Geophysical | Geochemical |
| 50° 120° | S.W. | Bill, Frank, Nord, and Pat Mineral Claims<br>Udd-Ramsay Syndicate.<br>B. M. Middleton.<br>February 1, 1957. | × | — | — |
| 50° 120° | S.W. | Bill, Frank, Nord, and Pat Mineral Claims<br>Udd-Ramsay Syndicate.<br>McPhar Geophysics Limited.<br>February 1, 1957. | — | — | × |
| 50° 120° | N.E. | Borup Group<br>Meta Uranium Mines Limited.<br>E. B. Nicholls.<br>September 18, 1956. | — | × | — |
| 50° 120° | S.W. | Buck Group<br>Craigmont Mines Limited.<br>C. C. Rennie.<br>April 24, 1958. | — | × | — |
| 50° 120° | S.W. | BX Claims<br>Argyle Securities Limited.<br>J. E. Betz and W. L. Young.<br>April 17, 1957. | — | × | — |
| 50° 120° | S.W. | C.J.S. Group<br>Northwestern Explorations, Limited.<br>C. S. Ney.<br>November 12, 1958. | × | × | × |
| 50° 120° | N.E. | Continental M.B. Groups<br>Graham Bousquet Gold Mines Limited.<br>E. B. Nicholls.<br>November 16, 1956. | — | × | — |
| 50° 120° | S.W. | Copperado Group<br>Western Copperada Mining Corporation.<br>J. E. Betz and W. L. Young.<br>August 5, 1957. | — | × | — |
| 50° 120° | N.E. | DM Group<br>Graham Bousquet Gold Mines Limited.<br>E. B. Nicholls.<br>January 10, 1957. | — | × | — |
| 50° 120° | N.W. | DM and Afton Groups<br>Graham Bousquet Gold Mines Limited and Axel Berglund.<br>H. W. Darling.<br>December 13, 1957. | × | — | × |
| 50° 120° | S.W. | Domino No. 1 Group<br>Centenniai Mines Limited.<br>C. C. Rennie.<br>December 17, 1958. | — | × | — |
| 50° 120° | S.E. | Don and Jean Groups<br>Mutual Mines and Metals Ltd.<br>G. E. Midgley.<br>February 27, 1958. | — | × | — |
| 50° 120° | N.W. | D.W., Krain, and R.K. Groups<br>Northwestern Explorations, Limited.<br>D. A. Barr.<br>August 1, 1958. | — | — | × |
| 50° 120° | N.W. | D.W. and Krain Groups<br>Krain Copper Limited, Farwest Tungsten Mines Limited, Beaver Lodge Uranium Mines Limited.<br>G. E. Apps and W. M. Sirola.<br>April 25, 1957. | — | × | — |
| 50° 120° | S.W. | Farr Lake Property<br>Noranda Exploration Company, Limited.<br>M. M. Menzies.<br>October 31, 1958. | × | — | — |
| 50° 120° | S.W. | FB and Fiddler Claims<br>Anuwon Uranium Mines Limited.<br>J. A. Soles.<br>January 9, 1957. | × | — | — |
| 50° 120° | S.W. | Fiddler Group<br>J. E. Betz and W. L. Young.<br>August 5, 1957. | — | × | — |

REPORTS CREDITED FOR ASSESSMENT—*Continued*

| Geographic Position | | Property<br>Owner or Principal<br>Author of Report<br>Date of Submission of Report | Kind of Work | | |
|---|---|---|---|---|---|
| 1° Quadr. | Quarter | | Geological | Geophysical | Geochemical |
| 50° 120° | N.W. | Fran, Heather, and Giselle Groups<br>Deerhorn Mines Limited.<br>L. B. Gatenby.<br>December 13, 1956. | × | — | × |
| 50° 120° | S.W. | FRM 1–8 Group<br>A. D. Wilmot.<br>November 20, 1957. | × | — | — |
| 50° 120° | S.W. | Hat and Outrider Groups<br>Farwest Tungsten Copper Mines Limited and Beaver Lodge Uranium Mines Limited.<br>G. E. Apps and W. M. Sirola.<br>April 25, 1957. | — | × | — |
| 50° 120° | S.W. | Hat and Outrider Groups<br>Northwestern Explorations, Limited.<br>D. A. Barr.<br>December 30, 1958. | — | × | — |
| 50° 120° | S.W. | Hec North Group<br>Craigmont Mines Limited.<br>C. C. Rennie.<br>June 17, 1958. | — | × | — |
| 50° 120° | S.W. | Hec South Group<br>Craigmont Mines Limited.<br>C. C. Rennie.<br>June 17, 1958. | — | × | — |
| 50° 120° | N.W. | Highland Valley Property<br>Noranda Exploration Company, Limited.<br>M. M. Menzies.<br>December 10, 1958. | × | — | — |
| 50° 120° | N.W. | Highland Valley Property<br>Noranda Exploration Company, Limited.<br>M. M. Menzies.<br>December 10, 1958. | — | × | — |
| 50° 120° | N.E. | Hill Top Group<br>W. C. Ditmars.<br>Victor Dolmage.<br>March 28, 1947. | × | — | — |
| 50° 120° | N.W. | Jan and E.D. Mineral Claims<br>Tri-Side Mining Corporation Limited.<br>C. Riley and A. C. Ogilvy.<br>November 23, 1956. | × | — | × |
| 50° 120° | S.W. | KL 1–6 Groups<br>Rio Canadian Exploration Ltd.<br>L. B. Gatenby.<br>October 2, 1958. | × | × | × |
| 50° 120° | S.W. | KL 7 and 8 Groups<br>Rio Canadian Exploration Ltd.<br>L. B. Gatenby.<br>October 2, 1958. | × | × | × |
| 50° 120° | S.W. | Loe Group<br>Craigmont Mines Limited.<br>C. C. Rennie.<br>February 10, 1958. | — | × | — |
| 50° 120° | N.W. | Lodge Claims<br>Northlodge Copper Mines Limited.<br>McPhar Geophysics.<br>June 22, 1956. | — | — | × |
| 50° 120° | N.W. | Lodge Group<br>Northlodge Copper Mines Limited.<br>G. E. Apps and W. M. Sirola.<br>April 4, 1957. | — | × | — |
| 50° 120° | S.W. | Lucky Jim Group<br>Vanex Minerals Ltd.<br>H. L. Hill.<br>October 29, 1958. | — | × | — |
| 50° 120° | S.W. | Lynn, J, and CS Claims<br>Sheba Copper Mines Limited.<br>C. S. Ney.<br>November 10, 1958. | — | × | × |

REPORTS CREDITED FOR ASSESSMENT—*Continued*

| Geographic Position | | Property<br>Owner or Principal<br>Author of Report<br>Date of Submission of Report | Kind of Work | | |
|---|---|---|---|---|---|
| 1° Quadr. | Quarter | | Geological | Geophysical | Geochemical |
| 50° 120° | S.W. | Mac Group<br>Jackson Mines Limited.<br>D. R. Morgan and J. A. Soles.<br>October 25, 1956. | × | — | — |
| 50° 120° | S.W. | Mer-Pay Group<br>Birkett Creek Mine Operators Ltd.<br>C. C. Rennie.<br>August 12, 1958. | — | × | — |
| 50° 120° | S.W. | Merritt Group<br>Noranda Exploration Company, Limited.<br>M. M. Menzies.<br>November 14, 1958. | — | × | — |
| 50° 120° | S.W. | Merritt Group<br>Noranda Exploration Company, Limited.<br>M. M. Menzies.<br>September 18, 1958. | × | — | — |
| 50° 120° | S.W. | Nicki, Mel, and O'Leary Groups<br>New Delhi Mines Limited.<br>F. J. Hemsworth.<br>November 18, 1958. | — | × | — |
| 50° 120° | S.W. | Ole, Pat, and Rudy Mineral Claims<br>Udd-Ramsay Syndicate.<br>W. O. J. G. Meijer.<br>January 22, 1957. | — | — | × |
| 50° 120° | N.W. | Patrick Group<br>Green Bay Mining and Exploration Company Limited.<br>V. B. Meen.<br>March 27, 1957. | — | — | × |
| 50° 120° | S.W. | P.C.M. and Cap Groups<br>Centennial Mines Limited.<br>C. C. Rennie.<br>December 8, 1958. | × | × | — |
| 50° 120° | S.W. | PEC Group<br>Birkett Creek Mine Operators Ltd.<br>C. C. Rennie.<br>September 29, 1958. | — | × | — |
| 50° 120° | S.W. | PL 1–48 Claims<br>Georgia Leaseholds Limited.<br>A. R. Allen.<br>July 16, 1958. | — | × | — |
| 50° 120° | S.W. | Quartzite Group<br>Birkett Creek Mine Operators Ltd.<br>C. C. Rennie.<br>August 1, 1958. | — | × | — |
| 50° 120° | N.W. | Raha Mineral Claims<br>I. Shulman.<br>A. E. Aho.<br>December 23, 1958. | × | × | × |
| 50° 120° | S.W. | Road and Brown Groups<br>Noranda Exploration Company, Limited.<br>M. M. Menzies.<br>December 4, 1958. | — | × | — |
| 50° 120° | S.W. | Rod Group<br>Deerhorn Mines Limited.<br>L. B. Gatenby.<br>August 10, 1956. | × | — | × |
| 50° 120° | S.W. | Roscoe Lake Property<br>Udd-Ramsay Syndicate.<br>McPhar Geophysics Limited.<br>February 6, 1957. | — | × | × |
| 50° 120° | N.W. | Salmo Prince Groups<br>Salmo Prince Mines Limited.<br>B. I. Nesbitt.<br>May 3, 1957. | — | — | × |
| 50° 120° | S.E. | Stump Lake Group<br>Amaco Development Corporation Limited.<br>W. J. Elliott and J. A. Soles.<br>September 12, 1956. | × | — | — |

## REPORTS CREDITED FOR ASSESSMENT—*Continued*

| Geographic Position | | Property<br>Owner or Principal<br>Author of Report<br>Date of Submission of Report | Kind of Work | | |
|---|---|---|---|---|---|
| 1° Quadr. | Quarter | | Geological | Geophysical | Geochemical |
| 50° 120° | S.W. | Sunshine Nos. 10, 11, 15, and 16<br>Vanex Minerals Ltd.<br>H. L. Hill.<br>November 25, 1958. | — | × | — |
| 50° 120° | N.W. | Trojan Group<br>Trojan Consolidated Mines Ltd.<br>F. J. Hemsworth.<br>November 6, 1958. | — | × | — |
| 50° 120° | S.W. | Witches Brook<br>Phelps Dodge Corporation of Canada, Limited.<br>Franc R. Joubin.<br>February 6, 1957. | — | × | — |
| 50° 121° | S.E. | B.J. Claims<br>Northwestern Explorations, Limited.<br>C. S. Ney.<br>November 26, 1958. | × | × | × |
| 50° 121° | N.E. | Baby's Own Group<br>Ainsworth Base Metals, Limited.<br>F. J. Hemsworth.<br>March 28, 1957. | — | × | — |
| 50° 121° | N.E. | Beaver Group<br>Farwest Tungsten Copper Mines Limited<br>and Beaver Lodge Uranium Mines Limited.<br>G. E. Apps and W. M. Sirola.<br>June 24, 1957. | — | × | — |
| 50° 121° | S.E. | Bethsaida Copper<br>Bethsaida Copper Mines Limited.<br>G. E. Apps and W. M. Sirola.<br>April 4, 1957. | — | × | — |
| 50° 121° | S.E. | Bethsaida Copper<br>Bethsaida Copper Mines Limited.<br>G. E. Apps and W. M. Sirola.<br>April 4, 1957. | — | — | × |
| 50° 121° | S.E. | Bill, Frank, Nord, and Pat Mineral Claims<br>Udd-Ramsay Syndicate.<br>B. M. Middleton.<br>February 1, 1957. | × | — | — |
| 50° 121° | S.E. | Bill, Frank, Nord, and Pat Mineral Claims<br>Udd-Ramsay Syndicate.<br>McPhar Geophysics Limited.<br>February 1, 1957. | — | × | — |
| 50° 121° | S.E. | Bill, Frank, Nord, and Pat Mineral Claims<br>Udd-Ramsay Syndicate.<br>McPhar Geophysics Limited.<br>February 1, 1957. | — | — | × |
| 50° 121° | N.E. | Divide Group<br>Graham Bousquet Gold Mines Limited.<br>H. W. Darling.<br>February 1, 1957. | — | — | × |
| 50° 121° | N.E. | Divide Group<br>Graham Bousquet Gold Mines Limited.<br>E. B. Nicholls.<br>February 1, 1957. | — | × | — |
| 50° 121° | N.E. | Dominion Chromium Property<br>J. W. Oakes.<br>H. L. Banting.<br>July 24, 1948. | — | × | — |
| 50° 121° | N.E. | E.D. and Jan Groups<br>Tri-Side Mining Corporation Limited.<br>C. Riley and A. C. Ogilvy.<br>November 23, 1956. | × | — | × |
| 50° 121° | S.E. | Eye Group<br>Northwestern Explorations, Limited.<br>C. S. Ney.<br>November 26, 1958. | × | × | × |

REPORTS CREDITED FOR ASSESSMENT—*Continued*

| Geographic Position | | Property<br>Owner or Principal<br>Author of Report<br>Date of Submission of Report | Kind of Work | | |
|---|---|---|---|---|---|
| 1° Quadr. | Quarter | | Geological | Geophysical | Geochemical |
| 50° 121° | N.E. | Fairview Group (no map)<br>May Barnes.<br>J. C. Rogers.<br>May 5, 1947. | × | — | — |
| 50° 121° | N.E. | Faith and H. S. Groups<br>The Cardiff Mining Company Ltd.<br>F. J. Hemsworth.<br>February 7, 1957. | — | × | — |
| 50° 121° | N.E. | Faith and H.S. Groups<br>The Cardiff Mining Company Ltd.<br>F. J. Hemsworth.<br>February 7, 1957. | — | — | × |
| 50° 121° | S.E. | Laco Group<br>Laco Mines Limited.<br>C. F. Wegener and F. J. Garbutt.<br>April 8, 1957. | × | — | — |
| 50° 121° | N.E. | Louise Group<br>Graham Bousquet Gold Mines Limited.<br>E. B. Nicholls.<br>January 4, 1957. | — | × | — |
| 50° 121° | S.E. | Ole, Pat, and Rudy Mineral Claims<br>Udd-Ramsay Syndicate.<br>W. O. J. G. Meijer.<br>January 22, 1957. | — | — | × |
| 50° 121° | S.E. | Pimainus Lake<br>Phelps Dodge Corporation of Canada, Limited.<br>Franc R. Joubin.<br>February 6, 1957. | — | × | — |
| 50° 121° | S.E. | Pimainus Lake<br>Udd-Ramsay Syndicate.<br>McPhar Geophysics Limited.<br>February 6, 1957. | — | × | × |
| 50° 121° | N.E. | R.K. 7–30 Mineral Claims<br>Northwestern Explorations, Limited.<br>D. A. Barr.<br>July 30, 1958. | — | × | — |
| 50° 121° | S.E. | Skeena Silver Group<br>Skeena Silver Mines Ltd.<br>C. Rutherford.<br>August 22, 1957. | — | — | × |
| 50° 121° | N.E. | Tofin Property<br>New Hamil Silver-Lead Mines Limited.<br>A. R. Allen.<br>December 3, 1958. | — | × | — |
| 50° 121° | S.E. | Toketic Group<br>New Jersey Zinc Exploration Company (Canada) Ltd.<br>R. C. Macdonald.<br>February 15, 1957. | — | × | × |
| 50° 121° | S.E. | W.P. Group<br>Noranda Exploration Company, Limited.<br>M. M. Menzies.<br>December 4, 1958. | × | — | — |
| 50° 121° | S.E. | W.P. Group<br>Noranda Exploration Company, Limited.<br>M. M. Menzies.<br>December 4, 1958. | — | × | — |
| 50° 121° | S.E. | W.P. Group<br>Highland Valley Mining Corporation Ltd.<br>C. W. S. Tremaine.<br>October 30, 1957. | — | × | — |
| 50° 121° | S.E. | W.P. Group<br>Highland Valley Mining Corporation Ltd.<br>C. W. S. Tremaine.<br>December 13,1957. | — | × | — |
| 50° 122° | N.E. | Chalco<br>Mrs. D. C. Noel.<br>W. H. Patmore.<br>January 4, 1955. | × | — | — |

## REPORTS CREDITED FOR ASSESSMENT—*Continued*

| Geographic Position | | Property<br>Owner or Principal<br>Author of Report<br>Date of Submission of Report | Kind of Work | | |
|---|---|---|---|---|---|
| 1° Quadr. | Quarter | | Geological | Geophysical | Geochemical |
| 50° 126° | S.W. | Mac Group<br>New Jersey Zinc Exploration Company (Canada) Ltd.<br>R. C. Macdonald.<br>December 30, 1958. | — | × | — |
| 50° 126° | S.E. | Magnet Groups No. 2 and No. 1<br>Noranda Exploration Company, Limited.<br>M. M. Menzies and B. O. Brynelsen.<br>February 16, 1954. | × | × | — |
| 50° 127° | N.W. | H.P.H. and Larch Groups<br>Western Mining and Development Syndicate.<br>Hans Lundberg.<br>April 2, 1948. | — | × | — |
| 50° 127° | S.E. | Quatsino Copper-Gold<br>Quatsino Copper-Gold Mines Limited.<br>D. A. Bourne and S. M. Manning.<br>January 15, 1953. | × | — | — |
| 51° 116° | N.W. | King David Group<br>International Germanites Ltd.<br>H. H. Cohen.<br>August 20, 1957. | — | — | × |
| 51° 119° | S.W. | Bel, Pip, and Bet Groups<br>Pioneer Gold Mines of B.C. Limited.<br>F. H. Mylrea.<br>October 14, 1949. | × | — | — |
| 51° 119° | S.W. | Dip, R.D., and Elk Groups<br>Westville Mining Company.<br>D. H. James.<br>October 21, 1949. | × | — | — |
| 51° 119° | S.W. | Johnson Property<br>Kennco Explorations (Canada) Limited.<br>S. H. Ward.<br>April 10, 1952. | — | × | — |
| 51° 119° | S.W. | Johnson Property<br>Kennco Explorations (Canada) Limited.<br>D. A. Barr and J. S. Scott.<br>April 10, 1952. | — | — | × |
| 51° 119° | N.W. | Trophy Mountain Property<br>New Athona Mines Limited.<br>A. G. Hodgson.<br>October 12, 1956. | × | — | — |
| 51° 119° | S.E. | Westville Property<br>Plateau Metals Limited.<br>S. J. Pedley and C. Riley.<br>December 28, 1951. | × | — | — |
| 51° 119° | S.E. | Westville Property<br>Plateau Metals Limited.<br>S. J. Pedley and C. Riley.<br>December 28, 1951. | — | × | — |
| 51° 121° | S.W. | Venus Group<br>New Jersey Zinc Exploration Company (Canada) Ltd.<br>E. Livingston and R. C. Macdonald.<br>March 12, 1958. | — | × | — |
| 52° 122° | N.W. | Jig Mineral Claims<br>Ian Bain.<br>Ian Bain.<br>July 25, 1958. | × | — | — |
| 52° 131° | S.E. | Elva No. 4 Mineral Claim<br>St. Eugene Mining Corporation Limited.<br>C. M. Campbell Jr.<br>November 8, 1957. | — | × | — |
| 52° 131° | S.E. | Ikeda No. 7 Mineral Claim<br>St. Eugene Mining Corporation Limited.<br>C. M. Campbell Jr.<br>November 8, 1957. | — | × | — |
| 52° 131° | S.E. | Magnetite Group<br>St. Eugene Mining Corporation Limited.<br>C. M. Campbell Jr.<br>November 8, 1957. | — | × | — |

REPORTS CREDITED FOR ASSESSMENT—*Continued*

| Geographic Position | | Property<br>Owner or Principal<br>Author of Report<br>Date of Submission of Report | Kind of Work | | |
|---|---|---|---|---|---|
| 1° Quadr. | Quarter | | Geological | Geophysical | Geochemical |
| 53° 121° | S.E. | Antler Creek Placer Leases<br>Horace Fraser.<br>Victor Dolmage.<br>September 7, 1949. | × | — | — |
| 53° 121° | N.W. | Fraser River Copper<br>Mrs. M. Simon.<br>A. C. Skerl.<br>January 7, 1952. | — | × | — |
| 53° 121° | S.W. | Lightning Creek Leases<br>Lightning Creek Gold Alluvials Ltd.<br>P. D. Brown and J. Robertshaw.<br>November 12, 1947. | × | × | — |
| 53° 121° | S.E. | Lower Antler Creek Gold Placers<br>Horace Fraser.<br>Victor Dolmage.<br>September 7, 1949. | × | — | — |
| 53° 127° | S.E. | Harrison Group<br>C. V. and B. R. Harrison and W. Harrison, Jr.<br>Franc R. Joubin.<br>August 21, 1950. | × | — | — |
| 53° 129° | N.E. | Gunnysack Group<br>Ecstall Mining Company Ltd.<br>W. R. Bacon and McPhar Geophysics Limited.<br>September 12, 1958. | — | × | — |
| 53° 129° | N.E. | Packsack Group<br>Ecstall Mining Company Ltd.<br>W. R. Bacon and McPhar Geophysics Limited.<br>September 12, 1958. | — | × | — |
| 54° 126° | S.E. | Copper Island Group<br>Kennco Explorations (Canada) Limited.<br>H. V. Warren.<br>December 18, 1951. | × | — | × |
| 54° 128° | S.W. | Wedeene<br>Quebec Metallurgical Industries Ltd.<br>Alexander Smith.<br>November 25, 1958. | — | × | — |
| 55° 125° | S.E. | Dorothy and Elizabeth Groups<br>Kennco Explorations (Canada) Limited.<br>D. A. Barr and H. V. Warren.<br>June 26, 1952. | — | — | × |
| 55° 125° | N.E. | Pole Group<br>Totem Minerals Limited.<br>Hans Lundberg.<br>September 3, 1958. | × | × | × |
| 55° 127° | S.W. | Ace, Hazelton, Jack, Joe, John, Rib, Star, Sun Groups<br>National Explorations Limited.<br>J. T. Mandy and G. L. Oates.<br>May 31, 1951. | — | × | — |
| 55° 127° | S.W. | Peg Group<br>Silver Standard Mines Limited.<br>W. St. C. Dunn.<br>February 9, 1955. | — | — | × |
| 55° 127° | S.W. | Sultana Group<br>G. Parent and Associates.<br>C. H. Macdonald.<br>September 5, 1953. | × | — | — |
| 55° 129° | S.W. | Barite Group, Hematite Group, James Varden Mineral Claims<br>Torbrit Silver Mines Limited.<br>J. Botelho.<br>July 22, 1947. | × | — | — |
| 55° 129° | N.W. | Gold Drop Group<br>Gold Drop Mines Limited.<br>E. G. Langille.<br>November 4, 1947. | × | — | — |
| 55° 129° | S.W. | L.B. Claims<br>The Consolidated Mining and Smelting Company of Canada, Limited.<br>G. Neely Moore.<br>March 18, 1955. | — | × | — |

REPORTS CREDITED FOR ASSESSMENT—*Continued*

| Geographic Position | | Property<br>Owner or Principal<br>Author of Report<br>Date of Submission of Report | Kind of Work | | |
|---|---|---|---|---|---|
| 1° Quadr. | Quarter | | Geological | Geophysical | Geochemical |
| 55° 129° | S.W. | N.H. Claims<br>The Consolidated Mining and Smelting Company of Canada, Limited.<br>G. Neely Moore.<br>March 18, 1955. | — | × | — |
| 55° 129° | S.W. | Sax Claims<br>The Consolidated Mining and Smelting Company of Canada, Limited.<br>G. Neely Moore.<br>October 7, 1954. | — | × | — |
| 55° 129° | N.E. | Seabee Claims<br>Spes Explorations Limited.<br>R. B. Elver and J. A. Soles.<br>September 24, 1956. | × | — | — |
| 55° 129° | N.W. | Woodland Mineral Claim<br>Northwestern Explorations, Limited.<br>C. S. Ney.<br>June 15, 1956. | — | — | × |
| 56° 124° | S.E. | Davies and Gordon Groups<br>Kennco Explorations (Canada) Limited.<br>D. A. Barr and H. V. Warren.<br>June 26, 1952. | × | — | × |
| 56° 125° | N.E. | Dell Group<br>The Consolidated Mining and Smelting Company of Canada, Limited.<br>R. G. McEachern.<br>February 1, 1957. | — | × | — |
| 56° 125° | N.E. | Gen (1–2) Mineral Claims<br>The Consolidated Mining and Smelting Company of Canada, Limited.<br>R. G. McEachern.<br>February 1, 1957. | — | × | — |
| 56° 125° | N.E. | Gen (6–11) Mineral Claims<br>The Consolidated Mining and Smelting Company of Canada, Limited.<br>L. Telfer.<br>February 1, 1957. | — | — | × |
| 56° 125° | S.W. | Totem Group<br>Totem Minerals Limited.<br>Hans Lundberg.<br>July 23, 1958. | × | × | — |
| 56° 130° | N.W. | Blue-Belle Group<br>Granduc Mines, Limited.<br>J. J. Crowhurst.<br>January 6, 1954. | × | — | — |
| 56° 130° | S.W. | Lehto Group<br>Newmont Exploration Limited.<br>A. H. Lange and P. M. Cannon.<br>December 28, 1956. | — | × | — |
| 56° 130° | N.W. | Marg Group<br>Granduc Mines Limited.<br>J. J. Crowhurst.<br>January 6, 1954. | × | — | — |
| 56° 130° | N.W. | McK Group<br>Granduc Mines Limited.<br>J. J. Crowhurst.<br>February 13, 1954. | × | — | — |
| 56° 130° | S.E. | Vaughn K Group<br>The Granby Consolidated Mining Smelting and Power Company Limited.<br>J. J. Crowhurst.<br>March 23, 1953. | × | — | — |
| 57° 125° | S.W. | Tor Group<br>Totem Minerals Limited.<br>Hans Lundberg.<br>September 3, 1958. | × | × | — |
| 57° 130° | N.W. | Kakiddi, Klastine, Skyline Groups<br>Torbrit Silver Mines Limited.<br>G. R. Kent and R. W. Burton.<br>February 27, 1958. | × | — | — |
| 57° 131° | S.E. | Buy and Hab Mineral Claims<br>Hudson Bay Mining and Smelting Co., Limited.<br>J. A. Haskin.<br>June 12, 1957. | — | × | — |

REPORTS CREDITED FOR ASSESSMENT—*Continued*

| Geographic Position | | Property<br>Owner or Principal<br>Author of Report<br>Date of Submission of Report | Kind of Work | | |
|---|---|---|---|---|---|
| 1° Quadr. | Quarter | | Geological | Geophysical | Geochemical |
| 57° 131° | S.W. | Pan 1–32 Mineral Claims<br>Triana Exploration Limited.<br>L. J. D'Aigle and L. G. White.<br>March 18, 1957. | × | — | — |
| 58° 131° | N.W. | Ace Group<br>Consolidated Northland Mines Limited.<br>A. G. Hodgson.<br>September 25, 1957. | × | — | — |
| 58° 131° | N.W. | N.W. Group<br>Consolidated Northland Mines Limited.<br>A. G. Hodgson.<br>September 25, 1957. | × | — | — |
| 58° 133° | N.E. | Erickson-Ashby Claims<br>The Consolidated Mining and Smelting Company of Canada, Limited.<br>W. T. Irvine.<br>November 12, 1952. | × | — | — |
| 58° 135° | N.W. | Spec Claims<br>The Consolidated Mining and Smelting Company of Canada, Limited.<br>W. T. Irvine.<br>October 15, 1952. | × | — | — |
| 59° 126° | S.E. | Liard Fluorite, Gem<br>Conwest Exploration Company Ltd.<br>J. R. Woodcock and W. V. Smitheringale.<br>December 6, 1954. | × | — | — |
| 59° 129° | S.W. | Blue River, White, and Serpentine<br>Cassiar Yukon Gold Mines Limited.<br>J. S. Koski.<br>October 2, 1953. | × | — | — |
| 59° 129° | S.E. | Dorreen and Par Groups<br>Dorreen Gold Mines Limited.<br>W. N. Plumb and H. L. Hill.<br>August 12, 1953. | × | — | — |
| 59° 129° | S.W. | Low Grade<br>St. Eugene Mining Corporation Limited.<br>James J. McDougall and A. Smith.<br>May 30, 1955. | × | — | — |
| 59° 129° | S.E. | Zinc Groups<br>Yukon Ranges Exploration Limited.<br>D. R. Derry.<br>September 1, 1949. | × | — | — |
| 59° 130° | N.E. | Gem 1–38<br>Hudson Bay Mining and Smelting Co., Limited.<br>J. A. Haskin.<br>September 15, 1949. | × | — | — |
| 59° 133° | N.W. | Heli and Copter Mineral Claims<br>Helicopter Exploration Co. Ltd.<br>D. M. Cannon.<br>May 23, 1951. | × | — | — |
| 59° 133° | N.E. | Trailer Special Placer-mining Lease<br>Northern Resources Ltd.<br>Clyde H. Wilson.<br>June 5, 1946. | — | × | — |
| 59° 136° | N.W. | Maid of Erin Property<br>St. Eugene Mining Corporation Limited.<br>Alexander Smith.<br>April 8, 1949. | × | — | — |

# Placer

## CONTENTS

## ATLIN*

### SPRUCE CREEK (59° 133° N.W.)

**Noland Mines Limited.**—This underground placer mine is at the confluence of Dominion Creek with Spruce Creek and is 12 miles by road from Atlin. During 1958 A. Mattson, of Atlin, reworked old tailings. The property is being kept in good standing.

D. K. Falconer worked alone on a drift on his lease.

Enterprise Placers employed nine men for a short period of operation.

### MCKEE CREEK (59° 133° S.W.)

Three placer-mining leases on McKee Creek, about 10 miles south of Atlin, are owned by Joe and Louis Piccolo and George Watt. A shortage of water restricted operations at this hydraulic.

### BOULDER CREEK (59° 133° S.W.)

Seven placer leases owned by N. Fisher and Ole Olson are under option to W. S. Weber. A crew of five started work in May and finished in October.

### PINE CREEK (59° 133° N.W.)

Fred Giesen and Karl Sieger worked three placer leases near Discovery. Fred Giesen was killed in an unfortunate accident when a run of sand and gravel broke into the drift in which he was working alone.

## OMINECA*

### LORNE CREEK (54° 128° N.E.)

An attempt was made to clean up the creek bed in the gap 1 mile above the junction with the Skeena River. A late flash flood destroyed the work of several months in a matter of hours.

## CARIBOO†

### HIXON CREEK (53° 122° S.W.)

**Hixon Placers Inc.** Company office, 2032 Third Avenue, Seattle, Wash.; mine office, Hixon. H. W. Hargood, president; C. J. Norris, superintendent. This property, consisting of twenty-one placer leases, is 3 miles up Hixon Creek from Hixon P.O. Some hydraulicking was completed in the fall after sufficient rainfall had filled the supply reservoir.

**Government Creek.**—Harry Schmalz had a diesel-operated shovel digging pits on his lease. The gravel was washed through sluice boxes and gold and black sand recovered.

### WILLOW RIVER (53° 121° S.W.)

**Lowhee Creek.**—R. E. MacDougall continued to hydraulic in the Lowhee pit. Four men were employed.

**Downie Creek.**—Nick Bird sank six shafts, each about 20 feet deep on his lease.

**Red Gulch.**—Jack Gunn completed a ditch and sluice box on his lease.

**Rizona Mining Corporation Limited.**—This company, under the supervision of W. M. Hong, hydraulicked some gravel on W. E. North's lease on Kwong Foo Creek and on Hickman's lease on Beaverpass Creek. Water for hydraulicking was pumped to the pits by large diesel-driven pumps. The gravel was washed through sluice boxes and the tailings were stacked by crawler tractor. Four men were employed.

* By D. Smith.
† By R. B. King.

**Kumhila Exploration Co. Ltd.**—Dudley Davis, engineer in charge; Ray Wallace, dredge master. In 1958 this company operated a dredge and washing plant on its lease on Williams Creek. A 4½-cubic-yard dragline, two crawler tractors, and three carry-alls were used to dig a drainage ditch and remove about 40 feet of overburden. After the area was cleared of overburden, a 3½-cubic-yard dragline was used to dig an additional 40-foot depth of gravel to bedrock. This gravel was washed in a floating steel-pontoon washing plant. Production: 185,000 yards of gravel, 2,343 ounces of gold.

**Jack of Clubs Lake.**—R. E. MacDougall drove a short tunnel on his lease on the north shore of this lake.

### Lightning Creek (53° 122° S.E.)

**Lightning Creek.**—W. R. Woodman did some work on his lease just below the first bridge on Swift River Forest road project.

**Mostique Creek.**—Mr. and Mrs. P. J. Macdonald hydraulicked gravel from a bank about 75 feet high.

**Gagen Creek.**—N. Klapatiuk ground-sluiced some gravel from his lease near the mouth of Gagen Creek.

Snoqboo Exploration, a partnership of H. B. Wallace, J. Clarke, W. J. McAuley, *et al.*, tested some ground on a lease originally staked by G. S. Gagen.

**Urquhart Gulch.**—D. H. Wells drove some tunnel through unconsolidated material.

**Grub Gulch.**—Frank Freeman and John Hind sluiced about 2,000 cubic yards of gravel on their lease.

**Oregon Gulch.**—James Williams sank a shaft 10 feet deep and did some drifting on his lease.

### Peters Creek (53° 121° S.W.)

**Bassford Creek.**—Thomas Crawford ground-sluiced a small amount of gravel on his lease.

**Campbell Creek.** — Ed Johnston erected 1,000 feet of pipe-line and did some ground-sluicing on his lease.

### Keithley Creek (52° 121° N.E.)

**Keithley Creek.**—Lee Fournier ground-sluiced on his lease in the Placer Engineers Pit at Four Mile Creek.

Thomas Payne ground-sluiced for a short period on his lease north of Four Mile Creek.

G. A. Goldsmith drove some tunnel through rock to explore remnants of gravel. This lease is about a mile below the junction of Keithley and Little Snowshoe Creeks.

E. Lang, working just below the junction of the Keithley and Little Snowshoe Creeks, drove a tunnel about 75 feet through glacial till to explore some gravel found by churn drilling.

**Nigger Creek.**—Jack Monet did some trail work and assessment work on his lease.

**Rollie Creek.**—Roy MacDonald and partners advanced a rock tunnel about 75 feet to explore a gravel zone located by drilling. This work was started by A. E. Sandberg in 1957.

QUESNEL RIVER (52° 121° N.W.)

**Spanish Creek.**—Mrs. R. A. Dunsire and partners operated a placer lease near the mouth of Spanish Creek. Gravel was mined by a 1½-cubic-yard diesel shovel, loaded, and trucked to sluice boxes at Spanish Creek. About 26,000 cubic yards of gravel were sluiced.

**Lawless Creek.**—Steven Wlad completed some hydraulicking on his lease near Quesnel Forks.

QUESNEL LAKE (52° 121° N.W.)

**Cedar Creek.**—Peter Ogden continued hydraulicking on his lease near Cedar Creek.

## FRASER RIVER*

LILLOOET AREA (50° 121° N.W.)

**Fountainview** The lease is on the Fraser River opposite the Pacific Great Eastern Railway station at Fountain. The property is 13 miles by road from the Lillooet–Bridge River road. The lease was assigned to J. H. McKee. A bulldozer was used to push gravel into a hopper at the top of a washing plant. The gravel then is passed through a trommel which discards all material over three-eighths inch. The gravel then passes to a bank of four Yuba jigs for concentration. Concentrates from these are reconcentrated in smaller jigs and a final black sand and gold concentrate is stored in boxes to be shipped to a recovery plant in Burnaby. Operations ceased at the end of the year.

McGILLIVRAY CREEK (50° 121° N.W.)

Robert Black and T. C. McAlpine did some work on leases on Foster Bar. A shaft was sunk 16 feet on the bar and several small pits were excavated.

KANAKA BAR (50° 121° S.W.)

G. Carlson worked during the winter on his leases at Kanaka Bar. Gravel was scraped from the bar by a hoist-scraper arrangement.

NORTH BEND (49° 121° N.E.)

**The Yukon Consolidated Gold Corporation Limited.**—Company office, 1919 Marine Building, Vancouver. W. A. Arbuckle, president; C. E. McLeod, managing director. This company explored placer leases on the bank of the Fraser about 2 miles south of North Bend. Seven shafts were sunk to test the area for gold. Work ceased in May. Six men were employed.

## BRIDGE RIVER*

**Hurley River.**—(50° 122° N.W.) W. Haylmore and one man did some work on his lease on Hurley River near Gold Bridge.

## SIMILKAMEEN†

TULAMEEN RIVER (49° 120° N.W.)

M. O. Heap moved 2,500 cubic yards of gravel in the course of exploration on his placer lease No. 1317, 4 miles upstream from Princeton.

SIMILKAMEEN RIVER (49° 120° S.W.)

The Burr interests of Princeton removed from 4,000 to 5,000 cubic yards of gravel in exploration work on their placer leases on the Similkameen River near the mouth of Whipsaw Creek.

* By R. B. King.
† By A. R. C. James.

## VERNON*

### Mission Creek (49° 119° N.E.)

Michael Martin hydraulicked a small amount of gravel on his placer claim.

Ervin, Ella, and Robert Wiedemeyer sluiced a total of 1,080 cubic yards of gravel on their three separate claims.

Rex Bruch sluiced 100 cubic yards of gravel on his claim.

### Harris Creek (50° 118° S.W.)

The Schultz brothers, of Lavington, bulldozed 10,000 cubic yards of gravel to uncover the bedrock on P. H. V. Fosbery's placer leases.

### Monashee Creek, South Fork (50° 118° S.E.)

L. R. Callahan hydraulicked 400 cubic yards of gravel on his lease.

### McIntyre Creek (50° 118° S.W.)

F. W. Walter sluiced 150 cubic yards of gravel on his placer lease at the fork of McIntyre Creek and Kettle River.

## SALMO†

### Erie Creek (49° 117° S.E.)

**Erie Creek**

J. P. O'Donnell and J. Stenwall, of Salmo, did a small amount of sluicing on a hitherto unworked point of ground on the east bank of Erie Creek, immediately below its junction with Hooch Creek. Many large boulders and an adverse bedrock grade hampered progress.

## COLUMBIA RIVER†

### Kirbyville Creek (51° 118° N.W.)

**West Columbia Gold Placers Ltd.**—Company office, 2360 Abbott Street, Kelowna. J. H. Buckland, president. This company owns Special Placer Mining Lease No. 462, an area of 3.9 square miles on the west side of the Columbia River at the confluence of Kirbyville Creek and opposite the mouth of Goldstream River. The property is reached by boat from Mile 56 on the Big Bend Highway, north of Revelstoke. Further exploratory test drilling was done in 1958.

### Old Camp Creek (51° 118° N.W.)

**Old Camp Placers**

J. B. Grieve, of Armstrong, holds four placer leases on Old Camp Creek, the first south-flowing tributary of Goldstream River, east of its confluence with the Columbia River. The recent workings are approximately three-quarters of a mile above the Goldstream River. A small dam and 100 feet of sluice boxes were installed. Some bulldozing and a small amount of sluicing was done in a gravel bank on the east bank of the creek.

## LARDEAU†

### Lardeau Creek (50° 117° N.E.)

W. Hladinec and A. Bobicki, of Beaton, own Placer Mining Lease No. 465 at the main falls on Lardeau Creek, 5 miles by road from Ferguson. A short access road leads

* By A. R. C. James.
† By J. E. Merrett.

from the main road to living quarters erected near the falls. A small tunnel 40 feet long was driven to divert the creek around the falls. A well-constructed log dam was erected immediately above the falls and directs the water through the diversion tunnel. A rammed-mud sealing dam was being erected across the creek above the tunnel discharge in order to prevent back seepage. When completed the falls pothole will be pumped out.

## FORT STEELE*

**Boreas Mines Limited**

(49° 115° N.W.) Company office, 525 Seventh Avenue West, Calgary, Alta.; J. E. Treacy, president. This company acquired the property of the Fort Steele Gold and Silver Mines Limited on Wild Horse River in October, 1958. The property is near the mouth of Fisher Creek, a tributary of the river, 5 miles northeast of Fort Steele. Activities since the transfer were confined to exploratory drilling.

## CRANBROOK*

**Nero**

(49° 116° S.W.) The Nero claim is owned by D. J. Oscarson, of Kimberley, and is located at the falls on Moyie River, 17 miles southwest of Cranbrook. The claim was sub-leased to two parties of men during 1958. T. O. Bloomer and partner drove a tunnel (Nero No. 1) 135 feet toward the bed of an old course of the river. They also drove a 35-foot tunnel and 20-foot raise to divert the river and lower the height of water in a pool above the falls.

P. R. Kotush and two partners drove a tunnel (Nero No. 2) for a distance of 165 feet toward the old bed of the river.

* By D. R. Morgan.

# Structural Materials and Industrial Minerals

CONTENTS



## ASBESTOS

**Cassiar Asbestos Corporation Limited***

Mount McDame (59° 129° S.W.). Head office, 1001, 85 Richmond Street West, Toronto; mine office, Cassiar. F. M. Connell, president; J. D. Christian, general manager; N. F. Murray, general superintendent. This property is 86 miles by road southwesterly from Mile 648.8 on the Alaska Highway. It consists of forty-two claims, of which thirty-nine are Crown-granted. The mine is on Mount McDame at an elevation of 6,300 feet. The modern company town of Cassiar and the mill are in the valley of Troutline Creek at an elevation of 3,540 feet.

Ore was mined from the 6170, 6140, and 6110 levels during 1958. The ore, high-grade chrysotile asbestos, occurs in fractures in a serpentine dyke which strikes north 15 degrees west and dips 45 degrees east.

In 1958 mining was carried on from March 12th to October 12th. During that time 361,154 tons of ore and 1,222,134 tons of waste were broken. The aerial tram-line operated from March 24th to September 28th and carried 311,701 tons of ore; a further 40,401 tons of ore was carried by trucks. Underground exploration was carried out on two levels. On the 6000 level a further 980 feet of drifting and some cross-cutting was done. On the 5700 level in the cirque basin an adit 1,417 feet in length was driven.

At an average daily rate of 1,072 tons, the mill processed 359,921 tons of ore to produce the following fibre:—

| | Tons |
|---|---|
| Spinning grades | 5,824 |
| Cement grades | 25,605 |
| Total | 31,429 |

The mill operated for 335 days.

Plant expansion in 1958 included completion of a heavy-duty garage, construction of a 20- by 65-foot addition to the power-house, and completion of a 72- by 120-foot fibre storage shed. Ten privately owned frame dwellings were erected on the townsite. The company assisted in this project by advancing loans to the total cost of the building materials. A trailer park was cleared, and water, electrical, and sewage service were provided for eight trailers.

* By D. Smith.

## BARITE

**Mountain Minerals Limited***

Company office, Meech Building, P.O. Box 273, Lethbridge, Alta.; quarry office, Brisco. R. A. Thrall, managing director; William MacPherson, superintendent. This company operates quarries on barite deposits at Parson and Brisco and a processing plant at Lethbridge. The Parson deposit (51° 116° S.W.) is 5 miles from Parson siding and is reached by means of the Cranbrook Sawmills logging-road. The deposit consists of barite in two parallel, north trending, irregular fissure veins about 300 feet apart. The west vein is exposed for 200 feet and has a maximum width of 30 feet. It was worked by a single quarry. The east vein is exposed for 450 feet and has a maximum width of 35 feet. It was worked by two quarries, the southern one being 75 feet higher than the other.

Recent work at the deposit has consisted chiefly of driving an adit drift south along the east vein from a portal in the upper part of the face of the north quarry. The drift followed the vein for more than 250 feet under the south quarry. A 50-foot raise from the drift reached surface.

During 1958 the company shipped 730 tons of barite from the deposit. The ore was obtained from the excavation of the drift.

The Brisco deposit (50° 116° N.E.) is on ground covered by five Crown-granted mineral claims—the Wamineca, Canyon, Salmon, Carmine, and Northisle—located in a north to south line in the order named. The claims are between Templeton River and Dunbar Creek 2½ miles due west of Brisco. Access is by 4.3 miles of good gravel road from Brisco.

On the property barite is found in a breccia zone in dolomite associated with limestone and quartzite. Outcrops of bedrock are relatively scarce and to date barite has been uncovered in only four scattered locations—one near the north end of the Wamineca mineral claim, one adjoining the Templeton River near the south end of the Canyon mineral claim, one in the north half of the Salmon mineral claim, and the fourth near the centre of the Carmine mineral claim. Overburden in the intervening areas is deep. The rocks appear to be in the steeply dipping east limb of a major syncline and are cut by numerous faults of varying magnitudes.

The main showings and the working quarry are on the Salmon claim. Barite has been exposed across an average width of 25 feet for 780 feet along a northerly striking breccia zone. The west wallrock is highly fractured dark grey to black dolomite with a few scattered lenses or horses of brown quartzite. Mountain leather is abundant as films on fracture surfaces and a few small barite veins are present. The east wallrock is light grey weathering buff to flesh-coloured dolomite. It is brecciated, and near the main barite body contains barite in the matrix. The orebody is brecciated. Much of the barite is white, but the white sections are irregularly shaped and are usually edged or cut by zones of variable width that consist of a fine-grained black matrix enclosing angular fragments of white barite a fraction of an inch to several inches in diameter. The black coloration is due to carbon. Some pyrite is present, and it results in yellow to brown iron staining in parts of the quarry. A 4-foot-diameter mass of thin-bedded black shale unlike any rock seen elsewhere in the claim area was noted in a face near the north end of the quarry.

The barite is mined by what is essentially a single quarry with five benches having a 130-foot vertical range between the floor of the lowest bench, at the north end of the exposure, and the top of the face of the highest bench, at the south end. The barite body pinches and swells erratically both horizontally and vertically. The walls are normally undulating fault surfaces but not of the same fault through the length of the exposure. The barite is apparently cut off by a right-hand fault at the north end of the quarry, and it pinches out to the south.

* By J. W. McCammon and D. R. Morgan.

To explore the deposit at depth an adit was started from the edge of Templeton River 60 feet below and 300 feet north of the north end of the quarry. At the end of August, 1958, the adit was 420 feet long. For the first 70 feet from the portal the adit passes through glacial drift. The rest of the workings are in closely fractured dark dolomite with mountain leather on the fracture surfaces. Except for small amounts in one or two thin shears, no barite was encountered until the last 90 feet of the adit was driven. This section of the adit is roughly parallel to the north end of the quarry and 40 to 60 feet east of it. In the adit a shear striking slightly east of north and containing black barite breccia was met and followed. Two raises—one at the adit face and the other 90 feet back from the face—were driven to the surface following the barite. One raise broke through into the most northerly bench of the quarry and the other broke through into the next bench to the south.

A second adit, 40 feet long, was driven into the south bank of the Templeton River below a small barite showing 600 feet downstream from the main adit. A few feet above the portal of the adit 4 feet of white barite is exposed. Within the adit, however, only a small amount of black barite breccia was found in shears. The rock exposed in the adit is highly fractured dark dolomite with mountain leather. Many shears are visible. Barite is exposed discontinuously on the surface for 140 feet south from this adit. A lens of white barite 70 feet long and 15 feet wide is exposed at water level on the opposite side of the river 100 feet north of the adit portal. This lens is apparently terminated at the north end by a shear. Geological relations indicate this zone of barite is part of the main zone offset by faulting.

About 2,500 feet north of the main quarry, barite has been exposed near the centre of the Wamineca claim. An area 200 feet long and 60 feet wide has been stripped. The barite, white in colour, occurs as irregular masses forming the matrix around brecciated fragments of light-coloured dolomite. Scattered quartzite fragments are included in the breccia.

Stripping near the centre of the Carmine claim 1,800 feet south of the main quarry exposed a small amount of barite. The barite, mixed white with black breccia, forms irregular discontinuous masses in a zone of shearing.

During 1958 the Brisco quarry was operated for nine months. A five-man crew quarried and crushed 10,350 tons of barite and shipped it to Lethbridge. Most of the ore came from the central part of the quarry.

[Reference: *Minister of Mines, B.C.,* Ann. Rept., 1952, pp. 243–248.]

**Silver Giant (Giant Mascot Mines Limited)***

Spillimacheen (50° 116° N.E.). Company office, 908 Royal Bank Building, Vancouver; mine office, Spillimacheen. W. C. Gibson, president. A management contract is held by H. L. Hill and Associates, consulting mining engineers, Vancouver. Clarence Major, property superintendent. This operation is at the Silver Giant property, which prior to its abandonment in June, 1957, was mined for silver, lead, and zinc. Present operations are confined to the recovery of barite from the old tailings dump. The barite is concentrated at the mill, and sold to McPhails Engineering Company, of Tacoma, Wash. This company has erected a drying and bagging plant at the railway siding at Spillimacheen.

Production of barite commenced in August, 1958, but was discontinued in December following a fire which destroyed the drying plant at Spillimacheen. During this period 4,325 tons of barite was produced from the mill by a crew of ten men. It is reported that definite plans have been made to resume milling operations in the future but the date of reopening has not been set.

* By D. R. Morgan.

**Larrabee Mining and Exploration Ltd.***

Invermere (50° 116° S.E.). Company office, 500 Petroleum Building, Calgary, Alta. L. R. Gardener, manager. This Company owns a group of four claims on the south side of Toby Creek adjoining the Bunyan property, 8 miles west of Invermere. Access is by means of a dirt road leading from Invermere. The company engaged a firm of contractors from Calgary to work on the property in 1958. Six men were employed for three months. They stripped approximately 200 feet of overburden and exposed what appears to be a fairly large deposit of barite, ranging from 10 to 25 feet wide. A small face was formed preparatory to quarrying, and a 50-ton-capacity bin was built on the site to facilitate loading operations. Other activities included the construction of 3½ miles of roadway to connect to the Sampson road for trucking purposes, and the building of a loading-ramp at Goldie Creek railway siding, south of Invermere. Approximately 200 feet of diamond drilling was completed. It is reported the property has now been leased to the Barite Company of Canada, but the latter company had not commenced work on the property at the end of 1958.

## BUILDING-STONE

**Kootenay Granite Products Limited†**

Sirdar (49° 116° S.W.). Company office, 1410 Fourth Street S.W., Calgary, Alta.; quarry office, Sirdar. R. Staal, superintendent. This company operates a quarry and processing plant on the Creston–Kootenay Bay Highway, 2 miles north of Sirdar. With the exception of the storage building, the complete plant was revised and reconstructed. The underground quarry workings were filled and a new surface quarry was started immediately north of the 66,000-volt transmission-line of the West Kootenay Power and Light Company Limited. A wide bulldozer scraping channel 150 feet long was excavated through a small granite knoll under the transmission-line to connect the quarry floor with a grizzly and 60-ton storage bin.

Most of the equipment has been installed in the crushing, screening, and bagging areas of the plant, and when completed the flow circuit will be as follows: A 15- by 24-inch Traylor jaw crusher followed by a 3- by 8-foot single-deck Allis-Chalmers shaking screen. The oversized material is conveyed to a 2-foot Symons cone crusher. The product from this crusher, united with the undersized material from the Allis-Chalmers screen, is conveyed to a 3- by 8-foot Dillon double-decked screen placed in closed circuit with the cone crusher. Some products may be removed at this point and the undersized material is conveyed to a 3- by 8-foot Niagara screen employing four screen decks. The sized products are discharged into seven steel storage bins having attachments for a portable bagging and sewing machine at their discharge outlets.

Five sizes of grits will be produced. Their sizes and use are as follows: +10 mesh to −⅛-inch chick, sander, and monumental grit; +⅛-inch to −$\frac{3}{16}$-inch chicken grit; +$\frac{3}{16}$-inch to −¼-inch turkey grit; +¼-inch to −$\frac{5}{16}$-inch roofing and stucco grit; +$\frac{5}{16}$-inch to −½-inch construction grit. Larger-sized material can be produced on demand.

Compressed air was supplied by a Fuller rotary compressor. A large concrete-based, steel-framed, and plyboard-covered building was constructed to house the milling equipment. A crew of nine men was employed in addition to a small construction contracting crew. A trial shipment of four carloads of grit was sent to Calgary for distribution to various prairie points.

**Valley Granite Products Ltd.‡**

Cheam View (49° 121° S.W.). Company office, 410 Mayfair Avenue, Chilliwack; plant, Bridal Falls. Kenneth Jessiman, general manager. The quarry is on the Trans-Canada Highway 11 miles east of Rosedale. Rock is mined by drilling vertical

* By D. R. Morgan.
† By J. E. Merrett.
‡ By R. B. King.

blast-holes with jackhammers. During the year the coarse jaw crusher was moved and a rotary kiln for drying broken rock was installed. This eliminated piling the rock and drying it with open-flame kerosene burners. The plant produces turkey, chicken, and bird grits, stucco dash, sand-blasting materials, and filler for asphalt roofing. Fourteen men were employed.

**Little Mountain Quarry.***—Chilliwack (49° 121° S.W.). This pit is on the north slope of Mount Shannon about 1 mile northeast of Chilliwack. It is operated intermittently by the Chilliwack Dyking District Board. Rock is blasted in the quarry by municipal employees as required for dyke repairs. The broken rock is hauled under contract to the river bank as needed. In 1958 the quarry produced 7,750 tons of rubble.

**Gilley Bros. Limited†**—Pitt River (49° 122° S.W.). Company office, 902 Columbia Street, New Westminster. J. H. Gilley, general manager; James C. Gilley, production supervisor; Francis J. MacDonald, superintendent. Quartz-diorite is quarried to obtain rock for jetties, dykes, and concrete aggregate. The mining method has been changed from a coyote-hole to a benching system. Benches are at 40-foot intervals.

Vertical blast-holes, spaced 14 feet apart, are drilled about 4 feet below the grade-line or berm. Broken rock is loaded by diesel-driven shovels into 12-cubic-yard trucks and is transported to a crushing plant. The crushing plant consists of a 42- by 60-inch jaw crusher which discharges crushed rock over an inclined 6-inch grizzly to a conveyor belt for loading scows. Undersized material (—6-inch) is stockpiled. Hydro-electric power to run the plant is produced on the property. Twenty-five men were employed.

**Indian River Quarries Limited.†**—Granite Falls (49° 122° S.W.). Company office, 1255 West Pender Street, Vancouver; quarry office, Granite Falls. John M. Carnsew, superintendent. During the year some rock which had been broken during previous mining operations was removed from the quarry. Operations were intermittent.

**Vancouver Granite Co. Limited†**—Nelson Island (49° 124° N.E.). Company office, 744 West Hastings Street, Vancouver; quarry, Nelson Island. W. C. Ditmars, president. Rock for building purposes, monuments, jetty rock, and rubble are mined at this quarry. The mining is done by drilling the rock to size, following a mineral lineation pattern, and blasting and wedging for removal. Derricks are used to move the stone to scows, by which it is transported to Vancouver for cutting and finishing. Approximately 2,000 tons of stone was produced during the operating year. Six men were employed.

## SLATE†

**McNab Creek Slate Quarry**—Howe Sound (49° 123° N.E.). Head office, Richmix Clays Limited, 2890 East Twelfth Avenue, Vancouver; quarry, McNab Creek. G. W. Richmond, manager. Slate is quarried for flagstones, roofing granules, and filler. Rock is broken from a 30-foot quarry face by drilling and blasting horizontal holes. Broken slate is hand-loaded into scows. The product is shipped to Vancouver for grading and sizing. The quarry is operated intermittently.

**British Columbia Slate Co. Ltd.**—Jervis Inlet (50° 123° S.W.). Philip Graham, president; J. Ehlers, quarry superintendent. This property is on an Indian reservation west of Deserted Bay on the south side of Princess Royal Reach in Jervis Inlet. Slate is mined by slashing it from the quarry face. Broken slate is hand-sorted, and marketable sizes are split to ½-inch thickness. Some of the stone is trimmed with a diamond saw.

In 1958 approximately 460 tons of slate was produced and shipped to Vancouver.

* By J. W. McCammon.
† By R. B. King.

## CEMENT*

**British Columbia Cement Company Limited.**—Bamberton (48° 123° N.W.). Head office, 540 Burrard Street, Vancouver. Gordon Farrell, president; B. Franklin Cox, vice-president and general manager; R. E. Haskins, general superintendent.

This company operates a cement plant with a rated capacity of 3½ million barrels per year at Bamberton. During 1958 the plant produced 307,650 tons of cement.

**Lafarge Cement of North America Ltd.**—Lulu Island (49° 123° S.E.). This company operates a cement plant on Lulu Island. First production began early in 1958. The plant has a rated capacity of 1½ million barrels per year. Production for 1958 was 99,200 tons.

## CLAY AND SHALE

**Clayburn-Harbison Ltd.†** (49° 122° S.E.) Head office, 850 West Hastings Street, Vancouver; plants, Kilgard and Abbotsford. Gordon Farrell, president; R. M. Hungerford, general manager; G. H. Peterson, manager. In 1956, Canadian Refractories Limited, a subsidiary of Harbison-Walker Refractories Company, purchased a substantial interest in Clayburn-Harbison Ltd. Clayburn-Harbison Ltd. was formerly known as Clayburn Company Limited.

Two plants are operated by this company: One, in which sewer-pipe, flue-linings, and light-weight aggregate is manufactured, is at Kilgard; the other, in which facebrick and refractories are made, is at Abbotsford.

In the Kilgard plant, clay is pre-dried in a 150-foot rotary kiln and stockpiled. The dried clay is mixed with water and grog and extruded through dies to form sewer-pipe and flue-lining. The formed ware is dried and burned in down-draught beehive kilns fired with natural gas.

In the Abbotsford plant, bricks are dry-pressed or extruded through dies, hand set on cars, and passed through a drier. From the drier the bricks pass into a tunnel kiln 300 feet long. Some shale used in the manufacture of refractories is pre-calcined in the rotary kiln at Kilgard. This kiln is also used for the bloating of certain shales.

Clay and shale are mined from three open pits and two mines on Sumas Mountain. A room-and-pillar method of mining is used in the underground mines, and extensive use is made of roof-bolting for ground support. Holes are drilled with tungsten-carbide-tipped augers which are driven by air-operated drills. Stumping powder is used in blasting down the shale. Scrapers operated by 30-horsepower electrically driven hoists are used to move broken shale directly to mine cars. In the open pits, shale is mined in 40-foot benches by drilling and blasting vertical and horizontal holes. Broken shale is hauled to the plants by truck.

Clay and shale mined during 1958 totalled 58,491 tons. Twenty men were employed in the mining operation and 138 were employed in the plant.

**Lafarge Cement of North America Ltd.†** Fort Langley (49° 122° S.E.). This company opened a clay pit about 8 miles east of Fort Langley on River Road. A large electrically powered scraper is used to scrape clay from the deposit to a bin. Clay is fed into large tanks, where it is mixed with water to form a slurry. The slurry is pumped to barges for transportation to the company cement plant on Lulu Island.

**Bear Creek Brick Company.†**—Surrey (49° 122° S.W.). Head office, Victoria Tile & Brick Supply Co. Ltd., Vancouver; plant, Archibald Road, Surrey Municipality. James McBeth, plant manager. During 1958 there was some production of drain-tile from this plant.

* By J. W. McCammon.
† By R. B. King.

**Haney Brick and Tile Ltd.***

Haney (49° 122° S.W.). Company office, 846 Howe Street, Vancouver; plant, Haney. E. G. Baynes, president; J. Hadgkiss, managing director. Plastic clay is mined from a low pit face adjacent to the plant by a ½-cubic-yard gasoline-driven shovel and is transported by truck to a covered air-drying area. The clay is dried in a rotary wood-fired kiln and conveyed to a dry pan for grinding. Brick and tile are formed by a stiff-mud extrusion process and dried in a controlled-temperature drying-room. The products are burned in down-draught beehive kilns. During 1958, 7,500 tons of clay products were produced. Forty men were employed.

**Mainland Clay Products Limited***

Barnet (49° 122° S.W.). Head office, 8699 Angus Drive, Vancouver; plant, Barnet. Surface clay is mined from a pit adjacent to the plant and is transported to a covered air-drying area. Some fireclay is obtained from Kilgard. Bricks are formed and dried in a heated drying building. Common brick, Roman brick, and firebrick are burned in rectangular oil-fired kilns. The production in 1958 was 1,020,391 building bricks. Six men were employed.

**Deeks-McBride Ltd. (Clay Division)†**

Bazan Bay (48° 123° N.E.). K. Bruce, plant manager. This company operates a clay pit and brick and tile plant at Bazan Bay near Sidney, Vancouver Island. Surface clay is mined by scrapers and stockpiled for drying. It is then ground in a dry pan and elevated to a storage hopper. Brick and tile are formed by a stiff-mud extrusion process and dried in a temperature- and humidity-controlled drying-room. An oil-fired shuttle-type kiln and a down-draught beehive kiln are used to burn the ware. Common brick, building-tile, and drain-tile are produced. When the plant is operating, an average crew of nine men is employed.

**Baker Brick & Tile Company Limited.**†—Victoria (48° 123° S.E.). Office and works, 3191 Douglas Street, Victoria. Surface clay is mined near the plant and transported by truck to storage bins. The clay is air-dried, ground, and formed into shapes by the soft-mud extrusion process and then dried with waste heat from the kilns. Down-draught kilns are used to burn the ware.

## GYPSUM

**Western Gypsum Products Limited‡**

Windermere (50° 155° S.W.). Company office, 306 Electric Railway Chambers, Winnipeg 2, Man.; quarry office, Athalmer. A. E. Portman, superintendent. This property is at Windermere Creek, 10 miles by road from Lake Windermere railway station. The gypsum is crushed near the quarry-site and trucked to the railway siding at Athalmer for shipment.

During 1958 a crew of twelve men produced 71,432 tons of gypsum, of which 69,755 tons was shipped from Athalmer. Most of the production was obtained from the No. 1 quarry, which has been in operation for many years. This quarry was abandoned in October, 1958, and the present operations are confined to a new quarry that was started approximately half a mile farther north. Diamond drilling completed during 1958 included eighty-nine holes at Windermere Creek totalling 8,411 feet, forty-four holes at Burnais Draw totalling 4,766 feet, and fourteen holes at Stoddart Creek totalling 1,317 feet.

Road work included the building of 1 mile of roadway from the crusher plant to the new quarry, and the relocation of 2 miles of the roadway below the plant to improve

* By R. B. King.
† By R. B. Bonar.
‡ By D. R. Morgan.

the grade. Approximately 1,500 feet of pipe-line was installed to supply water to the new quarry.

## LIMESTONE

### Limestone Deposits in the Ashcroft-Clinton Area*

Except for small scattered lenses, limestone in the Ashcroft-Clinton area is confined to the Permian Marble Canyon formation of the Cache Creek group. The Marble Canyon formation constitutes a northwest-trending band of limestone that extends for more than 60 miles from a point 2 miles northwest of Martel to north of Jesmond. The band has a maximum width of 8 miles. It is crossed by roads along Oregon Jack Creek, through Marble Canyon between Carquille and Pavilion, and between Clinton and Kelly Lake, and by the Pacific Great Eastern Railway between Clinton and Kelly Lake. The road from Kelly Lake to Jesmond runs parallel to and within a mile of the southwest edge of the Marble Canyon limestone for more than 25 miles northwest from Kelly Lake.

The Marble Canyon formation consists chiefly of medium- to fine-grained crystalline limestone that varies in colour from dark blue-black through creamy to white. Most of it is massive, and well-bedded exposures are uncommon. Stringers, pods, and blebs of chert, some dolomite, and pyrite occur in parts of the formation, but elsewhere the limestone is very pure.

During an examination made in 1958 six samples of the Marble Canyon formation were taken from exposures where the limestone is readily accessible to roads.

Sample No. 1 came from an outcrop 13.1 miles northwest of the Kelly Lake junction on the road to Jesmond. The sample consisted of random chips taken across the base of a steep bluff that forms the end of a small ridge 300 feet northeast of the roadway. The limestone is light-grey, medium- to fine-grained, crystalline rock. Most of it appears quite pure, but some shows small scattered grains of chert on weathered surfaces. Rock of similar appearance forms a 200-foot-high bluff a quarter of a mile northeast of the road along the east bank of a large creek 7.8 miles to the southeast.

The second sample was taken across the face of a small abandoned quarry by a creek one-quarter mile east of the road and railway 5½ miles southwest of Clinton. The limestone is light coloured. A high steep face 200 feet wide has been opened up in the quarry.

Sample No. 3 was made up of random chips taken across 400 feet of limestone exposed in bluffs 400 yards northwest of and 200 feet above the tufa quarry 2½ miles southwest of Clinton. The rock here is variably coloured from light to dark grey. On most weathered surfaces scattered small wart-like protrusions of chert are visible. The remains of a small pot kiln lie on the flat at the base of the bluffs.

There are numerous exposures of limestone along the road from Carquille up Hat Creek and through Marble Canyon to Pavilion. The first outcrop near the road is 10 miles west of Carquille. At this point a bluff which forms the side of a ridge rises abruptly from an open grassy slope 800 feet northwest of the road. Limestone in the bluff is poor-looking, dark blue to black, highly fractured material. Veins of calcite and knobs and patches of chert and dolomite are abundant in it. Sample No. 4 was taken across 150 feet at the base of the bluff. Half a mile farther west this same ridge is crossed by the road and the rock is well exposed to the south.

The road runs beside another limestone bluff 11.6 miles west of Carquille. The rock here is lighter coloured and smoother weathering than at the last point, but it does contain thin criss-crossed stringers of silica. One mile and a half farther west 100 feet of light cream-coloured limestone breccia is exposed. This is next to dark-grey medium-grained crystalline limestone beds that strike 40 degrees west of north and dip 58 degrees to the southwest.

* By J. W. McCammon.

At 13.4 miles the road forks, one branch going south to Upper Hat Creek and the other northwest through Marble Canyon. Just north of the road at the forks is a large bluff of creamy fine-grained limestone. Sample No. 5 was taken across 100 feet at the base of the bluff.

Through the canyon between the forks and Crown Lake the rock is mostly light coloured. Some contains chert nodules and veinlets and dolomite. A clean-looking bluff 2.6 miles northwest of the forks was sampled across 100 feet. This was sample No. 6.

No samples were taken along the Oregon Jack Creek road. Outcrops are plentiful and the rock is very similar to that exposed elsewhere in the Marble Canyon formation. This road is narrow, steep, and in poor condition.

A rounded hummock of limestone half a mile to the west is visible from Highway No. 1, three-quarters of a mile south of the northern cut-off to Ashcroft. The base of the hummock is 600 feet above the highway and the hummock itself is about 250 feet high and 500 feet in diameter. The rock is medium-grained, light-grey to mottled rather uniform-looking limestone. It weathers to a light colour with usually a smooth surface, although in some places small scattered raised lumps of chert and dolomite are visible. Sample No. 7 consisted of chips taken at random across 250 feet on top of the hummock.

About a quarter mile to the southeast similar limestone outcrops in a low knoll 400 feet long and 300 feet wide. Volcanic rocks are exposed in the intervening area. A third limestone knoll about 100 feet in diameter outcrops 600 feet farther to the southeast.

One-quarter mile west of Highway No. 1 directly opposite the south cut-off to Ashcroft at Cornwall Creek, a double-crested hill of limestone projects 350 feet above a flat field. The hill is roughly 1,300 feet long in a north-south direction and 600 feet wide. In the trough of the saddle between the two crests a band of brown weathering cherty argillite is exposed across 150 feet. This band strikes north 55 degrees west and dips 65 degrees northeast. The remainder of the hill consists of rather uniform medium-grained light-grey to mottled limestone. On weathered surfaces scattered streaks of chert, irregular patches of dolomite, and some rusty areas are visible. Sample No. 8 was taken at random across the top of the north crest, and sample No. 9 was taken across 500 feet on the top of the south crest.

Two bodies of limestone are cut by Highway No. 1 north of Martel, 7 miles north of Spences Bridge. The first is a small triangular patch half a mile north of the Martel section house. This body is exposed for 300 feet along the highway and for 300 feet north from the road to its apex 200 feet higher. The limestone is bounded on the west by white cherty quartzite, on the northeast by skarn, and on the south by gravel. Most of the rock is dark grey to black and weathers light. It is veined by numerous small calcite stringers and cut by one dyke. Few impurities are visible on outcrop surfaces. Sample No. 10 consisted of chips taken along 150 feet in the road cut.

The second and much larger limestone body is exposed by a continuous road cut starting one-fifth of a mile north of the outcrop just described and extending northward for four-fifths of a mile. The limestone forms a bare ridge a mile long that trends 25 degrees west of north from the road cut and reaches a maximum elevation of 900 feet above the highway. The limestone continues southeast of the highway to the Thompson River and is exposed in a small showing on the opposite bank. The rock is uniform black fine-grained limestone with a few scattered interbeds of argillite and some porphyry dykes. Faults and fractures are numerous and considerable folding has taken place. Many white calcite veins are present. Sample No. 11 consisted of random chips taken along 1,000 feet at the south end of the road cut.

Northward up the highway the rocks are a heterogeneous mixture containing some limestone, but none of the limestone is in large quantity or pure.

A large cliff of light weathering limestone is visible along the northeast side of Venables Creek starting about 1 mile above the highway.

Along the east bank of the Thompson River between Spatsum and Basque are several small limestone lenses one-quarter to one-half mile east of the railway. All would have to be mined largely by underground methods.

Several limestone lenses outcrop in the small valley southwest of the Canadian Pacific Railway station at Walhachin, 13 miles northeast of Ashcroft. The first one is one-quarter mile from the tracks directly south of the Walhachin road bridge. The lens is about 200 feet long and 50 to 75 feet wide. It consists of dark-grey badly fractured limestone with chert and dolomite inclusions. Sample No. 12 was taken along 200 feet on the side of the lens. A second small limestone mass is exposed around the hillside half a mile to the south and east. Three more lenses 100 to 200 feet in diameter form bare mounds on a bench south across the creek from this last exposure. The largest limestone body, about 800 feet long and 400 feet wide, forms the top of the steep east side of a gully just south of the last-mentioned outcrop.

In the first 10 miles along the Cariboo Highway north of Cache Creek several lenses of limestone outcrop in road cuts and beside the road. All of these are small.

The only serious attempt in recent years to produce lime rock in this entire area was made on a large travertine or tufa deposit on Lot 268, about 2½ miles southwest of Clinton. The Pacific Great Eastern Railway passes through the northwest side of the tufa in a cut 600 feet long and 25 feet deep. The main mass of the deposit is on the slope southeast from the tracks. The tufa forms a mound with a maximum exposed length parallel to the tracks of 850 feet and a width of 500 feet. The deepest exposure is in the railway cut, which does not reach the bottom of the deposit. Most of the rock is pale buff to white porous material containing abundant casts of leaves and twigs but some is fairly massive. Between 1947 and 1953 Clinton Lime Holdings Limited attempted to develop the property. Some diamond drilling was done, the deposit was almost completely stripped, two small quarries were opened up, and a crushing and screening plant was built. A small amount of agricultural lime was shipped. There has apparently been no activity lately. Two samples of the tufa were analysed: Sample No. 13 was taken up the 15-foot-high face of the upper quarry; sample No. 14 was taken up the 10-foot face of the bottom quarry.

*Ashcroft-Clinton Limestone Analyses*

| Sample | Insol. | $R_2O_3$ | $Fe_2O_3$ | MnO | MgO | CaO | $P_2O_5$ | S | Ig. Loss | $H_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.18 | 0.10 | 0.05 | 0.002 | 0.55 | 55.16 | 0.027 | 0.01 | 43.87 | 0.02 |
| 2 | 0.46 | 0.30 | 0.04 | 0.030 | 0.30 | 55.24 | 0.071 | Tr. | 43.57 | 0.03 |
| 3 | 0.34 | 0.08 | 0.03 | 0.025 | 1.15 | 54.35 | 0.022 | Tr. | 44.02 | 0.04 |
| 4 | 1.02 | 0.38 | 0.18 | 0.013 | 0.47 | 54.51 | 0.034 | Tr. | 43.54 | 0.04 |
| 5 | 0.36 | 0.58 | 0.06 | 0.021 | 0.33 | 55.03 | 0.123 | Tr. | 43.58 | 0.03 |
| 6 | 0.08 | 0.16 | 0.02 | 0.009 | 0.27 | 55.53 | 0.071 | *Nil* | 43.81 | 0.02 |
| 7 | 0.20 | 0.30 | 0.03 | 0.005 | 0.32 | 55.34 | 0.079 | *Nil* | 43.79 | 0.03 |
| 8 | 0.46 | 1.58 | 0.04 | 0.006 | 0.27 | 54.77 | 0.368 | Tr. | 42.95 | 0.01 |
| 9 | 0.34 | 0.52 | 0.03 | 0.011 | 0.31 | 55.12 | 0.135 | *Nil* | 43.55 | 0.01 |
| 10 | 2.62 | 0.50 | 0.11 | 0.031 | 0.56 | 53.68 | 0.031 | 0.02 | 42.50 | 0.11 |
| 11 | 1.34 | 0.22 | 0.08 | 0.036 | 0.89 | 54.12 | 0.031 | 0.02 | 43.38 | 0.03 |
| 12 | 3.76 | 1.16 | 0.37 | 0.543 | 0.61 | 52.40 | 0.040 | 0.03 | 42.01 | 0.03 |
| 13 | 0.10 | 0.10 | 0.02 | 0.007 | 0.54 | 54.92 | 0.018 | 0.11 | 44.22 | 0.03 |
| 14 | 0.12 | 0.06 | 0.03 | 0.001 | 0.33 | 55.16 | 0.020 | 0.07 | 44.21 | 0.06 |

[References: *Bureau of Mines, Canada,* Publ. No. 811, 1944, pp. 181–184, 221–225; *Geol. Surv., Canada,* Mem. 262 and map, 1952, pp. 15–22, 111; *Geol. Surv., Canada,* Mem. 118, 1920, pp. 49–51; *Geol. Surv., Canada,* Ann. Rept., New Series, Vol. VII, Rept. B, 1894; *Minister of Mines, B.C.,* Ann. Repts., 1947, p. 218; 1948, p. 189; 1953, p. 191.]

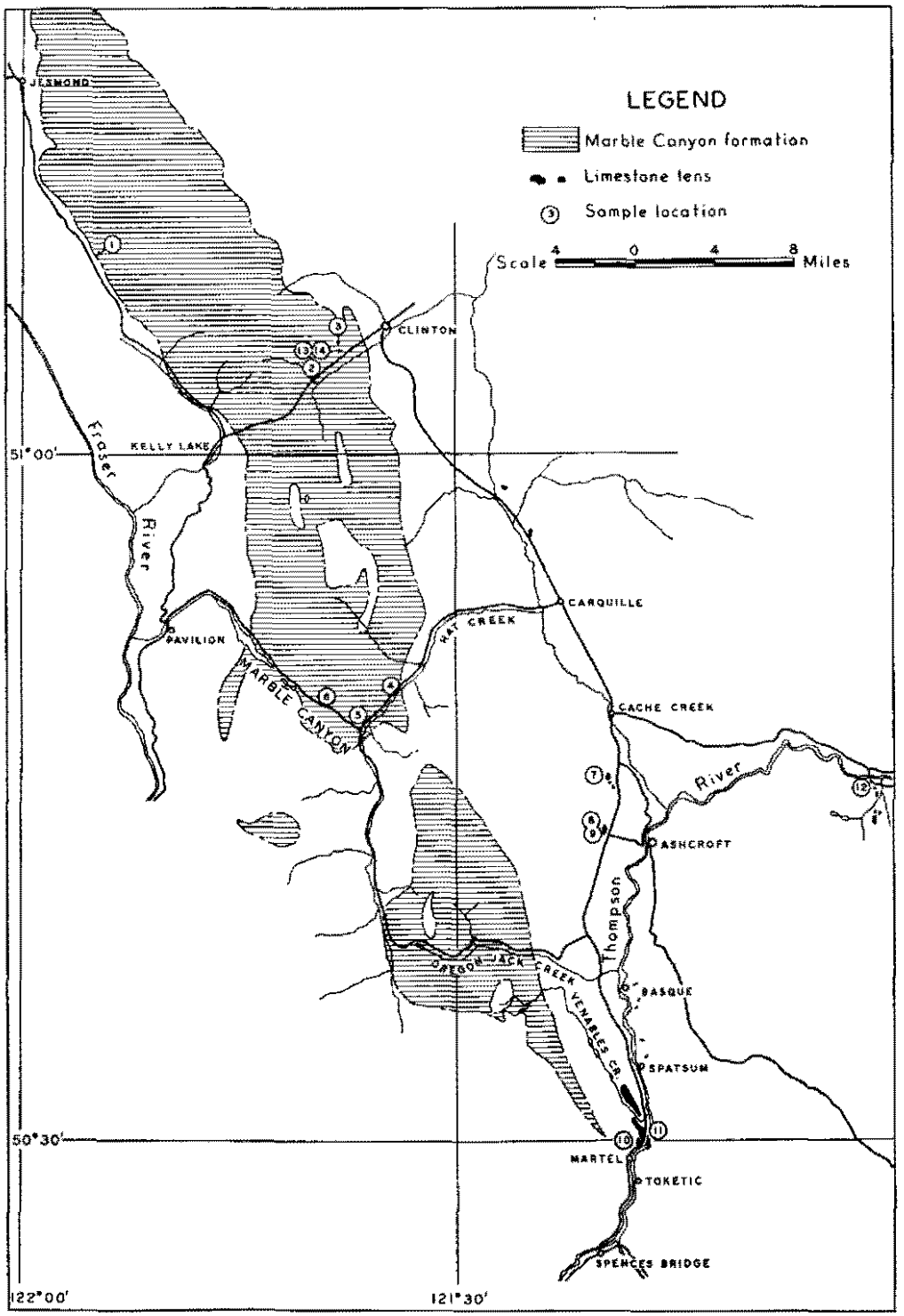



Figure 2. Limestone in the Ashcroft-Clinton area.

## Limestone in the Merritt Area*

In the vicinity of Merritt, limestone occurs in the Triassic Nicola group of rocks. During a reconnaissance made in 1958 no extensive beds of limestone were found. Except for those on Swakum Mountain, the Promontory Hills, and north of Harmon Lake, the deposits seen consisted of insignificant pods and lenses.

The road from Nicola via Clapperton Creek to the mining claims on top of Swakum Mountain passes close to two elongate masses of limestone. The first one is at 5,300 feet elevation by the abandoned workings on the Thelma group. Here a 100-foot-wide band of dark-grey limestone is exposed for 350 feet in a north-south direction. The exposure is covered by overburden at both ends. The rock is massive and contains scattered thin stringers of white calcite, some chert nodules, and vague shapes that may be fossils. Sample No. 1 was taken across 100 feet at the centre of the exposure. The second lens is at 5,600 feet elevation near Swakum peak on the Alameda No. 4 claim about a mile north of the Thelma. The lens averages 150 feet wide and is exposed for one-quarter mile along a line trending north 20 degrees east. The rock is light buff to grey with brown grains of dolomite, white calcite stringers, and some thin shaly interbeds. A shallow pit has been dug on some sparse sulphide mineralization near the centre of the lens. Sample No. 2 was taken across the width of the limestone 100 feet south of the pit. Several other lenses of similar material have been reported in the same general area.

On the hillside 2 miles northeast of Merritt a 50-foot-wide band of limestone extends for 600 feet up the slope. It strikes 10 degrees east of north and dips 70 degrees east. The limestone is light grey in colour and contains considerable silica and dolomite in small irregular grains. The ruins of an old pot kiln lie near the base of the exposure some 500 feet higher than the road. Near the top of the exposure are some old pits and trenches on sparse copper mineralization.

Several limestone lenses are exposed on the south slope of Promontory Hills directly north of Canford. The lowest one found forms the top of a steep bluff 1,100 feet above the highway. Here siliceous dark-grey limestone veined with white calcite is exposed across 70 feet for 200 feet along a strike of north 40 degrees east. Sample No. 3 was taken across the width of the exposure. A second lens was found 300 feet higher up the hill; a third one, 500 feet higher still; and a fourth one, 300 feet above the third. All lenses form bare northeast-trending mounds on flat terraces that break the general slope of the hill. More lenses of a similar type are reported on the crest of the hills.

Cockfield (Mem. 249) reported several limestone lenses on the hills south of Nicola Lake. Only two of these were found. The largest was 2,200 feet above and 1½ miles south of the highway 5 miles east of Nicola. It is readily accessible from ranch and logging roads to the south and west. The limestone forms a rounded ridge extending down an open grassy slope. The exposure is 500 feet long in a north-south direction and 200 feet wide. The rock is dark-grey rough weathering siliceous material. Sample No. 4 consisted of random chips taken across the surface. The other lens seen was very small.

A single insignificant lens of limestone was found in a creek bed southwest of Iron Mountain. Three limestone deposits were seen north of the road that passes Harmon Lake and 5 miles west of Highway No. 5. One forms a prominent white bluff readily visible from the road and about 2,000 feet north of and 350 feet above it. The limestone is light creamy grey. It is exposed across 200 feet for a length of 500 feet in a northerly direction. The second and largest deposit is 2,000 feet northwest of the one just described and 400 feet higher in elevation. This one forms bluffs 100 feet high, has a maximum width of 400 feet, and is exposed for one-quarter mile along a northeast strike. The rock is light creamy grey and weathers light blue grey with a rough surface. The roughness is due to small protruding lumps and grains of dolomite and silica. Sample No. 5 was

* By J. W. McCammon.

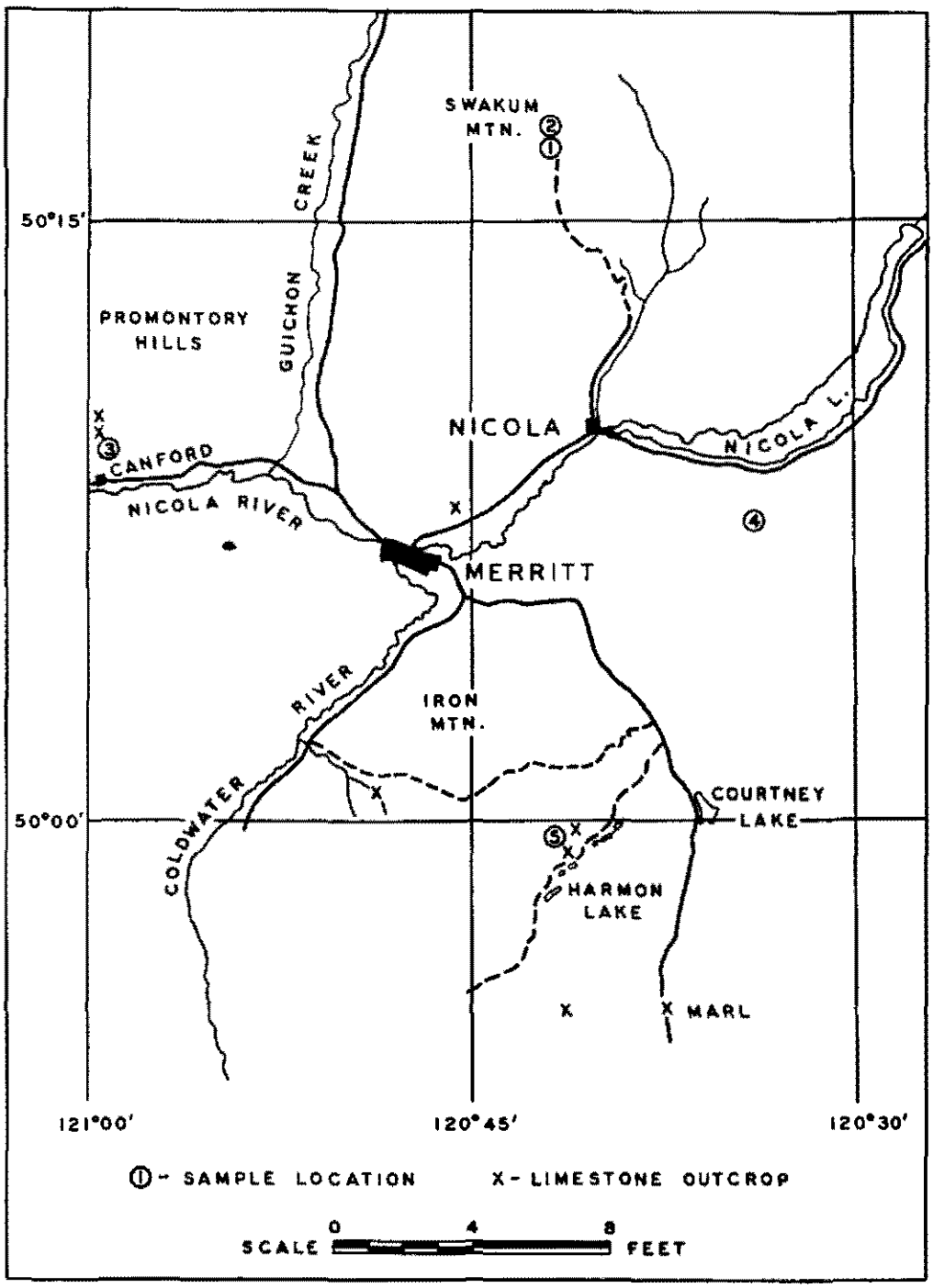



Figure 3. Limestone in the Merritt area.

made up of random chips taken across the lens near its centre. The third deposit is half a mile northeast of the second one. It consists of a lens 300 feet long and 130 feet wide associated with fossiliferous tuff and sandstone. The limestone is dark grey and contains stringers of white calcite with some dolomite and silica.

Marl of undetermined thickness forms a wide zone around the southwest end of a small lake adjacent to the east side of Highway No. 5 about 6 miles south of Courtney Lake. It was too water-saturated to be examined on foot.

A small lens of light-grey limestone was found 2¾ miles west of the marl deposit. It is too small and inaccessible to be of value.

*Merritt Limestone Analyses*

| Sample | Insol. | $R_2O_3$ | $Fe_2O_3$ | MnO | MgO | CaO | $P_2O_5$ | S | Ig. Loss | $H_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 7.08 | 0.46 | 0.28 | 0.07 | 0.44 | 51.22 | 0.026 | 0.03 | 40.80 | 0.04 |
| 2 | 11.16 | 1.08 | 0.67 | 0.047 | 0.63 | 48.00 | 0.056 | 0.02 | 38.99 | 0.03 |
| 3 | 13.32 | 2.84 | 0.92 | 0.107 | 1.06 | 45.92 | 0.042 | 0.04 | 36.85 | 0.08 |
| 4 | 2.62 | 0.28 | 0.20 | 0.015 | 0.46 | 53.67 | 0.038 | 0.01 | 42.80 | 0.04 |
| 5 | 1.92 | 0.26 | 0.12 | 0.023 | 0.23 | 54.40 | 0.026 | Tr. | 43.08 | 0.02 |

[References: *Geol. Surv., Canada,* Mem. 243, 1947; Mem. 249, 1948.]

**Agassiz Lime Quarry.***—Agassiz (49° 121° S.W.). Hiram Cutler, owner. This pit and plant ceased operation in May, 1958, and stockpiled limestone was sold. Limestone produced: 950 tons. Five men were employed.

**Fraser Valley Lime Supplies***

Popkum (49° 121° S.W.). Head office, 905 Edmonds Street, Burnaby. Thomas Mairs, manager; John Isaacs, superintendent. John Isaacs replaced Arthur Isaacs as superintendent in June. Limestone is quarried to produce agricultural limestone and industrial filler. The quarry is being worked in benches nearly 25 feet high. Rock is blasted from the quarry face, loaded onto trucks by a 1-cubic-yard front-end loader, and transported to the crushing plant. About 4,000 tons of limestone was quarried during 1958. Ten men were employed.

**Beale Quarries Division***

Vananda (49° 124° N.W.). Head office, 744 West Hastings Street, Vancouver; quarry office, Vananda. Lafarge Cement of North America Ltd., owner; W. D. Webster, superintendent. Limestone is quarried to produce pulp rock for paper mills, agricultural limestone, crushed limestone, and cement rock. The quarry is worked on levels with faces about 40 feet high. Vertical blast-holes are drilled with a Joy Heavy-weight Champion drill. Broken rock is loaded by a 3-cubic-yard Bucyrus shovel onto Euclid 63T trucks and transported to the crushing plant. This plant is equipped with an Allis-Chalmers 60- by 48-inch primary jaw crusher, an Allis-Chalmers 36- by 48-inch secondary jaw crusher, and a Pennsylvania impactor. Screens and belt-conveyors are installed to accommodate two main sizes of rock—pulp rock from 6 to 12 inches and cement rock which is minus three-quarters of an inch.

Limestone produced: 212,619 tons. Twenty-four men were employed.

**Ideal Cement Company Ltd.***

Vananda (49° 124° N.W.). British Columbia office, 1155 West Georgia Street, Vancouver; quarry office, Vananda. W. S. Beale, manager, Rock Products Division. This company purchased the assets of W. S. Beale (1955) Ltd. and assumed control in February, 1958. The rock quarry is on Lot 25, Texada Island, and is about 2 miles south of Vananda. The crushing plant is at Marble Bay, adjacent to Vananda. During the year a new crushing plant was built which can crush and screen 6,000 tons of limestone per day. Rock is broken from low quarry faces, loaded onto trucks by a ¾-cubic-yard Marion 372 shovel, and is transported to the crushing plant. The plant consists of a Pioneer bar feeder which feeds rock to a fixed grizzly that scalps out all —14-inch

* By R. B. King.

material. Oversized rock is conveyed to a 30- by 42-inch Pioneer jaw crusher. Rock from the grizzly and the crusher is passed over a triple-deck Allis-Chalmers screen which produces four products: 6-inch to 14-inch, 1½-inch to 6-inch, ¾-inch to 1½-inch, and —¾-inch. These sizes are each conveyed to separate stockpiles.

As required, the material is loaded by a belt-conveyor, at the rate of 500 tons an hour, into barges for shipment. Marble Bay has been dredged to provide a suitable harbour for ocean-going barges having a capacity of 5,000 tons. A new dock has been constructed to accommodate and load these barges. Seven men were employed.

**McKay Quarry***

Vananda (49° 124° N.W.). Don McKay, owner. This quarry is on the main road about 2 miles south of Vananda. White limestone is mined and sold for stucco dash and whiting. The white, bleached limestone occurs as irregular masses in a blue-grey limestone. Open-pit mining with low benches allows a selective recovery of the white limestone. Grey limestone is sold for pulp rock and also exported for use in the glass industry.

During 1958, 2,000 tons of white limestone and 15,000 tons of blue-grey limestone were produced. Three men were employed.

**Gypsum Lime and Alabastine, Canada, Limited***

Blubber Bay (49° 124° N.W.). Head office, 50 Maitland Street, Toronto 5, Ont.; British Columbia office, 1105 West Pender Street, Vancouver; quarry office, Blubber Bay; lime plants, Blubber Bay and Vancouver. W. M. Tully, British Columbia area manager; Arthur Pitt, Blubber Bay, plant manager. Limestone is quarried approximately 2 miles from the Blubber Bay plant. The quarry is worked in benches with faces nearly 25 feet high. Horizontal and vertical blast-holes are drilled with wagon drills and Gardner-Denver rotary drills. Broken rock is loaded by diesel-driven shovels onto trucks and hauled to the Blubber Bay plant. There limestone is crushed, sized, and stockpiled for use in lime-burning facilities at Blubber Bay and Vancouver, and also for sale.

Products are crushed stone, including sized rock, spalls, and fines or screenings, quicklime (lump, crushed, and pulverized), and hydrated lime.

Stone is supplied to such industries as pulp and paper, cement, smelting and refining, iron and steel, agriculture, etc.; lime is supplied for building, mining, pulp and paper, chemicals, agriculture, steel, and sugar industries.

The total number of men employed at Blubber Bay in 1958 was forty-five.

**Koeye Limestone Co. Ltd.†**

Koeye River (51° 127° N.W.). P. O. Christensen, president; A. A. Christensen, secretary-treasurer. This company operates a limestone quarry on Koeye River, less than a mile from its mouth on Fitz Hugh Sound, 6 miles south of Namu. The limestone is mined by drilling vertical holes with a small portable drill. Broken rock is hand-loaded into narrow-gauge cars and hand-trammed to a scow-loading ramp. The 1958 production was 7,000 tons, which was shipped to the Crown-Zellerbach pulp plant at Ocean Falls.

**Alaska Pine & Cellulose Limited.†**—Jeune Landing (50° 127° S.W.). Head office, 1111 West Georgia Street, Vancouver. Nils Erickson, quarry superintendent. This quarry is on the east shore of Neroutsos Inlet about 1¼ miles north of Jeune Landing. Limestone is quarried for pulp rock for the Port Alice pulp-mill. In 1958 the quarry produced 11,350 tons of limestone.

**The Granby Consolidated Mining Smelting and Power Company Limited.***—Harbledown Island (50° 126° N.W.). This company drilled a limestone property under lease from R. H. Chestnut. Seventeen holes totalling 308 feet were diamond drilled.

* By R. B. King.
† By J. W. McCammon.

**British Columbia Cement Company Limited.***—Head office, 540 Burrard Street, Vancouver. Gordon Farrell, president; B. Franklin Cox, vice-president and general manager; R. E. Haskins, general superintendent. Limestone is mined at Cobble Hill (48° 123° N.W.) on Vancouver Island. The quarry face is about 80 feet high and churn drills are used to drill vertical blast-holes which have a 26-foot spacing and burden. Broken rock is loaded by diesel-driven shovels into 15- and 30-cubic-yard-capacity trucks and transported over 7 miles of private road to the plant at Bamberton.

In 1958, 445,259 tons of raw material was mined.

## MAGNESITE

**Harbour Natural Resources Limited†**—(49° 115° N.W.). Company office, 811A Seventeenth Avenue S.W., Calgary, Alta.; Reuben Bond, president. A management contract is held by Millar, Hannigan and Associates Limited, consulting mining engineers, Calgary. This property is in Perry Creek valley, between Antwerp and Lisbon Creeks, 9 miles south of Kimberley. Access is by means of a road leading southwest from Wycliffe.

The property is operated under an option obtained in 1958. Activities to the present have been confined to surface stripping and drilling to test the orebody. The removal of approximately 1,400 cubic yards of overburden from the outcrop has exposed the magnesite for a length of 735 feet. Drilling has increased this length to 1,990 feet. Six holes, totalling 1,150 feet, were completed, and these together with the surface stripping indicated a width of 50 feet for the "high grade" magnesite core. In addition, widths of as much as 60 feet in the footwall show disseminated magnesite as blobs and stringers visually estimated at 30 to 50 per cent magnesite.

It is reported a large-scale sample is being prepared for a pilot run, and the result of the test will provide the basis for decision as to the plant design.

## MARL‡

**Cheam Marl Products Ltd.**—Popkum (49° 121° S.W.). Office, Chilliwack. A. M. Davidson, manager. Marl and overlying humus are mined from a post-Glacial deposit which has accumulated on the floor of Cheam Lake. This material, on the north shore of the lake, is as much as 12 feet thick and is dug by dragline and loaded onto trucks. Wet and semi-dry humus and marl are produced for agricultural purposes. Two men were employed.

**Popkum Marl Products Limited**—Popkum (49° 121° S.W.). W. A. Munro, managing director. Marl and humus are mined from a post-Glacial deposit on the east shore of Cheam Lake. Draglines working on heavy wooden-plank roadways are used to dig marl and humus. These products are sold locally. The production in 1958 was 14,360 tons of marl and 6,000 cubic yards of humus. Six men were employed.

## SAND AND GRAVEL§

**Louis Salvador and Son.**‖—Creston (49° 116° S.W.). This Company operates a gravel crushing, screening, and washing plant on Goat River, immediately south of Creston. Approximately 6,000 cubic yards of sand and gravel were produced for the local construction industry in 1958.

* By R. B. Bonar.
† By D. R. Morgan.
‡ By R. B. King.
§ By R. B. King, except as noted.
‖ By J. E. Merrett.

**Merriam and Peskor.***—Wynndel (49° 116° S.W.). F. Merriam, owner. This pit is on the Creston–Kootenay Bay Highway, 4½ miles north of Wynndel. In addition to supplying a small amount of gravel for building construction, gravel was also provided for the Peskor Paving Ltd. plant of Carl Peskor. The tar mixing plant was established at the quarry.

**Scaman's Gravel Pit.***—Wynndel (49° 116° S.W.). George Scaman, Creston, owner. This pit is at the north end of Duck Creek road, 1 mile north of Wynndel. Approximately 2,000 cubic yards of road gravel was excavated from a low bench by a front-end loader.

**Premier Sand and Gravel Company Limited.***—Nelson (49° 117° S.E.). Albert Shrieves, president and manager; D. Norcross, superintendent. This property is located on the east side of the City of Nelson in the vicinity of Anderson Creek. This property was purchased from the former owners and operated in conjunction with Nelson Ready-Mix Concrete Ltd. concrete plant. Gravel is removed by dragline and then crushed and sized.

Production in 1958 was 31,276 cubic yards. Five men were employed.

**Feeney Pit***

(49° 117° S.E.). Associated Enterprises Limited, of Salmo, installed a portable screening plant at this pit, 5 miles south of Salmo on the Salmo–Nelway Highway. Approximately 1,000 cubic yards of ⅝-inch and $\frac{3}{16}$-inch gravel was produced and trucked to the cement-tile manufacturing plant of Valley Concrete Limited located 1 mile west of Salmo.

**Ferraro Gravel Pit***

Trail (49° 117° S.W.). This pit, owned by Korpack Cement Products Company Limited, of Trail, is located between Casino Road and the Columbia River, 2 miles south of Trail. Gravel excavated from low benches is loaded directly into a portable crushing and screening plant. The products are sold to the public, to McGauley Ready-Mix Concrete Company, or shipped to the owner's concrete, cinder, and chimney-block plant in Trail. A crew of three men was employed.

**Abbotsford Gravel Sales Ltd.**—Abbotsford (49° 122° S.E.). This pit is 7 miles west and 6 miles south of Abbotsford. Gravel is mined by shovel and scraper. A plant, adjacent to the pit, crushes, washes, and sizes the gravel. The products are used as aggregate in a ready-mix concrete plant or are sold locally. Four men were employed.

**Dueck's Gravel Pit**

Clearbrooke (49° 122° S.E.). Dueck Building Supplies Ltd., owner. This pit is about 1 mile north of Clearbrooke. Sand and gravel are dug from low gravel faces by an overhead loader and transported to a bucket elevator, by which they are elevated to a crushing, washing, and sizing plant. Pit-run, washed, and sized gravel are produced. A ready-mix plant furnishes concrete for local sales. Seven men were employed.

**Foster's Gravel Pit.**—Aldergrove (49° 122° S.E.). C. N. Foster, owner. This pit is about 3 miles south of Aldergrove. Sand and gravel are mined from low faces by a front-end loader. Pit-run gravel is sold locally. The production in 1958 was 4,084 cubic yards. One man was employed.

**Border Sand and Gravel Company.**—White Rock (49° 122° S.W.). Office and plant, Boundary Road, R.R. 4, White Rock. T. Lapierre, manager. Gravel is dug from low faces by an overhead loader. It is transported for washing and sizing to a plant or is sold as pit-run gravel. Three men were employed.

* By J. E. Merrett.

**Colebrook Sand & Gravel Company Limited**

Cloverdale (49° 122° S.W.). Office and plant, 12311 Fifty-third Avenue, R.R. 1, Cloverdale. F. Bray, president and general manager. Sand and gravel are mined by an overhead loader, loaded onto trucks, and hauled to a semi-portable washing and screening plant. Washed and sized products or pit-run gravel are sold locally. The production in 1958 was 5,293 cubic yards of pit-run and 16,630 cubic yards of washed and sized products. Two men were employed.

**Sunshine Properties Ltd.**

Newton (49° 122° S.W.). Linton's Construction Co. Ltd., operator; Thomas A. Linton, managing director. This pit is about 1 mile south and 3 miles west of Newton on the British Columbia Electric Railway. Gravel is mined from low faces by three diesel-driven shovels. It is either crushed and screened in a portable crusher or is sold as run-of-pit. Production in 1958 was 213,664 cubic yards of run-of-pit and 64,642 cubic yards of crushed material. Six men were employed.

**Corporation of the District of Surrey.**—Cloverdale (49° 122° S.W.). Several gravel pits are operated within the township for the purpose of road maintenance and construction. Gravel is mined by diesel-driven shovels and is transported to crushers by trucks or is used directly as pit-run gravel.

**Corporation of the Township of Langley.**—Murrayville (49° 122° S.W.). Several gravel pits are operated within the township for the purpose of road maintenance and construction. Gravel is mined by diesel-driven shovels and is transported to crushers by trucks or is used directly as pit-run gravel.

**Hornby General Machinery Company.**—Langley Municipality (49° 122° S.W.). Office, Cloverdale; pit, Gobsell Road. Harry Hornby, owner. Run-of-pit gravel is mined by two small diesel shovels from low pit faces. A portion of the production is crushed and sized in a portable plant. The remainder is sold as run-of-pit. Production in 1958 was 20,519 cubic yards. Three men were employed.

**S.U.B. Quarries Ltd.**—Port Mann (49° 122° S.W.). Office, 611 No. 3 Road, Brighouse. Gravel is mined by digging low gravel faces with diesel-driven shovels. Most of the production is supplied as pit-run gravel to a crushing plant and ready-mix plant adjacent to the pit. Five men were employed.

**Trouton Excavating Ltd.**—New Westminster (49° 122° S.W.). Office and plant, 10987 Sandell Road, New Westminster. W. R. Trouton, manager. In 1958 some gravel was mined from the floor of the pit and sold as run-of-pit. Three men were employed.

**Elderkin's Excavating Ltd.**—Port Mann (49° 122° S.W.). Office, Burnaby. Lawrence Elderkin, manager. This company operates a small pit near Port Mann. Gravel is mined by overhead loader or a small shovel and is sold locally as pit-run. One man was employed.

**Barker Construction Co. Ltd.**—Ladner (49° 123° S.E.). C. E. Barker, president; W. H. Greene, manager. This company operates a pit on Boundary Bay Road. Gravel is mined from low faces by diesel-driven shovels and is crushed and screened or sold locally.

**Corporation of the District of Coquitlam.**—Coquitlam (49° 122° S.W.). Several gravel pits are operated within the township for the purpose of road maintenance and construction. Gravel is mined by a small diesel shovel. Gravel is either crushed in a portable crusher or used as pit-run.

**Jack Cewe Blacktop Ltd.** Coquitlam (49° 122° S.W.). Jack Cewe, owner and manager. This pit is about 3 miles north of Coquitlam on Pipe Line Road. The deposit, being part of the Mary Hill outwash, is of a glacio-fluvial origin and represents outwash of sand and medium to coarse gravel with minor interbedded lenses of till.

Gravel is mined from 30-foot faces by a 1-cubic-yard-capacity diesel-driven shovel. It is loaded onto trucks for transportation to local markets as pit-run gravel or is crushed and sized for use by an adjacent asphalt road-materials plant. Nine men were employed.

**Gilley Bros. Limited (Maryhill Division)** Coquitlam (49° 122° S.W.). Company office, 902 Columbia Street, New Westminster. J. H. Gilley, general manager; James C. Gilley, production supervisor; E. Johnston, superintendent. This pit and its plant are on the Fraser River near Coquitlam. Sand and gravel are mined from 30-foot faces by a 2½-cubic-yard disesel-driven shovel and trucked by 12-cubic-yard trucks to a crushing plant. Crushed rock is distributed to two washing plants. Sand, gravel, and crushed products produced from this property are transported by scows to markets. Forty-five men were employed.

**S. and S. Gravel Pit.**—Coquitlam (49° 122° S.W.). N. P. Stromgren and C. B. Scott, owners. This pit is on Pipe Line Road north of Coquitlam. Gravel is mined from low gravel faces by a diesel-driven shovel or an overhead loader and is either crushed in a portable crusher or sold locally as run-of-pit. Four men were employed.

**Scott Bros. Ltd.** Coquitlam (49° 122° S.W.). Company office, Coquitlam. This company operates several small pits near Coquitlam. The Lucas pit on Pipe Line Road, the Jacoby pit on the Coquitlam River about 2 miles north of the Dewdney truck-road, and from several areas along the banks of the Coquitlam River. Gravel is mined by overhead loader onto trucks and sold as pit-run or is crushed and screened. Four men were employed.

**Corporation of the Municipality of Burnaby.** — Burnaby (49° 122° S. W.). S. Thompson, works superintendent. The pit, on Stride Avenue, is operated by E. R. Taylor Construction Co. Ltd. for the Municipality of Burnaby. Gravel is mined by a 1-cubic-yard diesel-driven shovel. It is loaded onto trucks and transported to a portable crusher or is used as run-of-pit gravel.

**Enemark Construction Limited** Indian Arm (49° 122° S.W.). Office, Port Mellon. T. Enemark, president. This pit is on the south half of Lot 1, District Lot 1027, Township 6, Range 7, west of the 7th meridian. It is on the west shore of Indian Arm near Clementine Creek. Coarse gravel and rock is mined from talus slopes and creek bottoms by 1½- and 2½-cubic-yard-capacity diesel-driven shovels. It is then trucked and dumped directly on scows for shipment to local markets. While operating, fourteen men are employed and production is at the rate of 25,000 cubic yards a month.

**Deeks-McBride Ltd.** Company office, 1051 Main Street, Vancouver; George B. McKeen, president; H. W. Rhodes, vice-president, production and development; J. W. Sharpe, general manager. Two gravel pits and crushing plants were operated during 1958 by this company. One pit is near Coquitlam (49° 123° S.E.), and the other is near the mouth of Seymour Creek (49° 123° S.E.). At the Coquitlam pit, gravel is mined with a 1-cubic-yard-capacity electrically operated dragline and is transported by a conveyor belt to a jaw crusher and then to a washing plant. The washed and sized gravel is stored in steel bunkers and is sold locally or used in a ready-mix cement plant. Twelve men were employed.

At the Seymour plant, gravel is mined by a ¾-cubic-yard dragline at the edge of Burrard Inlet. Gravel is transported by conveyors to a washing plant. Crushed, washed, and sized gravel is shipped by scow or truck or is used in a ready-mix plant. Twenty men were employed.

**Highland Sand and Gravel Company Limited**

Lynnmour (49° 123° S.E.). Company office, Lynnmour. W. J. Barrett-Leonard, president and general manager; D. F. Spankie, director. This company operates two plants—one on East Keith Road, Lynnmour, and one at 2962 Lambert Road, Langley Municipality. At the Lynnmour plant, sand, gravel, crushed products, and road materials are produced. Material is mined from low gravel faces by a ¾-cubic-yard diesel-driven shovel and is transported to a crushing, screening, and washing plant. Gravel purchased from local supplies is also prepared in this plant. Eleven men were employed.

At the Langley plant, gravel is mined from low gravel faces by shovel and trucked to a plant, where it is washed, crushed, and sized. Seven men were employed.

During 1958, 163,810 cubic yards of material was handled by these plants, which involved the following products: Crushed rock, 25,892 cubic yards; sand and gravel, 50,321 cubic yards; crushed fills, 77,781 cubic yards; bank-run fill, 29,866 cubic yards.

**Maclynn Gravel Co. Ltd.**—Lynnmour (49° 123° S.E.). Company office, Keith Road, Lynnmour. A. D. MacMillan, owner and operator. Gravel is dug by dragline from the bottom of Lynn Creek. The run-of-pit gravel is sold locally. Three men were employed.

**Capilano Crushing Co. Ltd.**

West Vancouver Municipality (49° 123° S.E.). C. W. Bridge, general manager. This company operated two crushing and washing plants—plant No. 1 at 606 Marine Drive, West Vancouver, and plant No. 2 at 33 East First Avenue, Vancouver. Gravel is mined by dredging the foreshore near the mouth of the Capilano River. Two diesel-driven draglines are used to remove the gravel. One of these loads gravel onto trucks for transport to plant No. 1; the other loads gravel onto scows for transport to plant No. 2. Total 1958 production from both plants was approximately 330,000 cubic yards.

**Routledge Gravel Ltd.**

West Vancouver Municipality (49° 123° S.E.). Office, Capilano Post Office. T. C. Routledge, president. This company operates two pits—No. 1 on the Indian reservation at the lower end of Lower Capilano Road and No. 2 at the mouth of Lynn Creek at the lower end of Brooksbank Avenue, North Vancouver. In both pits, gravel is scraped by a 7-cubic-yard scraper from underwater deposits and is conveyed to crushing, screening, and washing plants. The production in 1958 was 70,000 cubic yards of run-of-pit and 150,000 cubic yards of screened and crushed material. Twenty men were employed.

**Construction Aggregates Ltd.**

Britannia Beach (49° 123° N.E.). Company office, 628 Carnarvon Street, New Westminster. Gravel is mined by scraping material from a high bank into a large hopper. The oversized rock is removed and the finer sizes of gravel are conveyed by an inclined belt to a washing and screening plant. The fine sand is treated in an Aitkens classifier to remove fine deleterious material. The sand and gravel are shipped by scow or railroad to markets. Eight men were employed.

**Hillside Sand & Gravel Limited**

Hillside (49° 123° S.E.). Company office, 1075 Main Street, Vancouver; plant, Hillside. J. E. Buerk, manager; Ray Kehoe, superintendent. This pit is on the west shore of Howe Sound and is accessible by road from Gibsons Landing. Gravel is mined by washing with a constant flow of water cascading over the high pit face. Gravel is

loaded by a ¾-cubic-yard diesel-driven shovel into 15-cubic-yard Euclid trucks and transported to a crushing and washing plant. Washed and sized gravel is loaded onto scows for transportation. The plant was equipped with individual electric motors. These replaced the water-powered drives formerly used in screening, conveying, and washing the gravel.

**Butler Brothers Supplies Ltd.***

Royal Oak (48° 123° S.E.). Office and plant, Keating Cross-road. Gravel is blasted or is dug from gravel faces by diesel-driven shovels and an overhead loader. It is transported to a washing and sizing plant or sold as pit-run. A ready-mix plant furnishes concrete for local sales. In 1958, 156,802 yards of gravel was mined. Six men were employed.

**McIntyre & Harding Gravel Company Limited***

Saanich (48° 123° N.E.). Company office and plant, Royal Oak Post Office, Saanich. Gravel is dug from gravel faces by ½-cubic-yard diesel-driven shovels and is transported by trucks to a chute and grizzly. It is then conveyed to a washing and cleaning plant where sand, gravel, and washed and sized products are produced. A concrete plant for making concrete bricks, building-blocks, and drain-tile is also operated. In 1958, 45,479 cubic yards of gravel was produced. Sixteen men were employed.

**Evans, Coleman & Johnson Bros. Ltd.***

Albert Head (48° 123° S.E.). Company office, 900 Wharf Street, Victoria; plant, Royal Bay. D. E. Smith, manager; B. W. Parker, plant superintendent. Two plants are operated by this company, both of which are in the vicinity of Royal Bay. At plant No. 1, sand and gravel are mined by using a scraper on a slack-line cableway to loosen packed gravel from the high face. Gravel is loaded by a 1¼-cubic-yard shovel into a hopper, where it discharges onto a conveyor belt and is conveyed to the plant. Gravel is crushed, screened, washed, and classified, and the products are shipped by scow to markets.

At plant No. 2, gravel is dug by a diesel-driven shovel from a low face, loaded onto trucks and transported to a washing and cleaning plant.

Sand, gravel, and crushed products are sold locally. The production from both pits was 354,905 cubic yards in 1958. Twenty-two men were employed.

**S. H. Marriott Sand and Gravel***

Courtenay (49° 124° N.W.). Office, Courtenay. S. H. Marriott, manager and operator. This pit is beside the Courtenay–Cumberland road, 2½ miles from Courtenay, and is operated on a lease from Canadian Collieries Resources Limited. Gravel is mined from a high face with a ¾-cubic-yard gasoline-driven mobile loader. The gravel is fed to a small rotary screening plant, where it is sized into two products—under 2 inches and over 2 inches. Three men are normally employed at the quarry.

**A. V. Richardson Ltd.***

Duncan (48° 123° N.W.). Company office, Duncan. This property is owned and operated by Butler Brothers Supplies Ltd. The pit is 4 miles from Duncan on the Lake Cowichan Road. Pit-run gravel and washed and screened sand, gravel, and rock are produced. Gravel is mined by an overhead loading machine and also by scraping. Pit-run gravel that is not used directly as fill or road dressing is washed and sized in an adjoining plant. A ready-mix plant uses the washed products as aggregate in concrete for local sales. During the year 15,500 cubic yards of gravel was produced. Three men were employed.

* By R. B. Bonar.

## SILICA

**Mountain Minerals Limited***

Golden (51° 116° S.W.). Company office, Meech Building, P.O. Box 273, Lethbridge, Alta.; R. A. Thrall, managing director; William MacPherson, superintendent. This company holds two leases on a silica property at Moberly Mountain, 5 miles north of Golden. A crew of four men was employed for intermittent periods during 1958 trenching and drilling along the outcrop. Six open-cuts of various sizes were made, and four diamond-drill holes totalling 500 feet were completed.

**Queen†**

Sheep Creek (49° 117° S.E.). F. Rotter, of Salmo, leased the Queen mine dump near the junction of Sheep and Waldie Creeks from Sheep Creek Mines Limited. The quartzitic dump rock was loaded onto trucks by a front-end loader and trucked to the Trail smelter for use as silica flux.

**Quartzite Point Quarry‡**

Shuswap Lake (50° 119° N.E.). A bed of massive white quartzite outcrops along the beach on the east shore of Shuswap Lake at Quartzite (Marble) Point, about 7 miles north of Sicamous. One small knob of the quartzite is exposed at the edge of the water below two cabins on the point. About 300 feet north of this outcrop the main quartzite exposure is visible. It is about 80 feet wide and can be traced for 500 feet along the shore. The quartzite forms a bed between layers of gneiss striking northward and dipping flatly to the east. There is an old quarry 40 feet long and 15 feet wide near the south end of the main exposure.

The quartzite is milky white and contains few visible impurities. One sample consisting of chips taken across the entire width of the exposure at the quarry contained 97.48 per cent $SiO_2$, 0.59 per cent $Al_2O_3$, and 0.02 per cent Fe.

It is reported that in 1923 a shipment of 100 tons of quartzite was made from this deposit to Trail to make hydrofluosilicic acid.

[References: *Minister of Mines, B.C.*, Ann. Rept., 1923, p. 172; *Mines Branch, Ottawa,* Publ. No. 686, 1928, p. 38.]

**Oliver Silica Quarry§**

Oliver (49° 119° S.W.). Pacific Silica Limited. Registered office, 717 West Pender Street, Vancouver; quarry office, Box 397, Oliver. Ivan A. Hunter, manager. The Oliver silica quarry is on the Gypo mineral claim, owned by The Consolidated Mining and Smelting Company of Canada, Limited, and leased to Pacific Silica Limited. This claim is less than a quarter mile west of Highway No. 97, almost 1 mile north of Oliver.

The Gypo claim has been Crown-granted for many years. Apparently the first interest in it centred on a small vein containing scattered sulphides. In 1926 the Consolidated Mining and Smelting company carried out exploratory work and made a small shipment from the claim. The shipment was of value chiefly because it provided siliceous flux. Between 1941 and 1944 R. C. McKay shipped approximately 800 tons of fine-grained mica for grinding from a lens alongside a large quartz vein on another part of the claim. Later Interior Contracting Company Limited leased the claim from the Consolidated Mining and Smelting company and intermittently quarried small amounts of quartz from the large quartz outcrop. The quartz was used for flux and stucco dash. In July, 1953, Stucco Supply Company, of Vancouver, subleased the quarry from Interior Contracting Company. Stucco Supply Company operated the quarry until April, 1955,

* By D. R. Morgan.
† By J. E. Merrett.
‡ By J. W. McCammon.
§ By J. W. McCammon and A. R. C. James.

when the sublease was taken over by Pacific Silica Limited, originally of Seattle. In 1956 this latter company opened a second quarry and built a separate plant to produce coarse lump silica for the metallurgical industry, meanwhile maintaining production of stucco dash, roofing rock, and other fine-sized products from the original plant and quarry. Operation of the new No. 2 plant and quarry was carried out by Interior Contracting Company under contract. In September, 1957, Pacific Silica took over the entire operation and now runs both plants and both quarries.

The quarries are in a large lens of barren quartz exposed up the front of a bluff that rises at the edge of the valley floor. The lens is vertical, strikes west, is 500 feet long and 200 feet wide, and has a vertical exposed height of 278 feet. To the east the lens plunges under the drift of the valley floor, to the north and south it is enclosed by walls of granite porphyry, and to the west it lenses out abruptly in the granite. Two small quartz outcrops 100 and 200 feet to the west probably are faulted segments of the main mass.

The quartz in the lens is mostly milky white, although some patches are subtranslucent pale bluish grey and other small patches, around scattered clots of pyrite, are rusty. Some parts of the quartz body are highly fractured and others are massive. In the fractured zones parting planes one-thirty-second to one-quarter inch apart are strongly developed. In some places two sets of planes approximately at right angles are present, and in others three sets not at right angles and yielding rhombohedral fragments have formed. In the quarry face flat striated surfaces as large as 10 feet long and 3 feet wide are visible. These are thought to be faces of incompletely formed quartz crystals.

Impurities are scarce in the quartz. A few small patches of pyrite were seen and small amounts of copper sulphide have been reported. Near the centre of the lens a small patch of granular sea-green fluorite was noted. This is reported to be the remnant of a lens from which about 32½ tons of fluorite was shipped to markets in Washington in 1958. A small inclusion of granite was exposed in the north part of the face of the second bench in the quarry.

The rock enclosing the quartz is a coarse-grained granite porphyry containing rectangular feldspar crystals 1 inch long.

The contact between the quartz and granite varies. In some places the contact is faulted or sheared. In other places the contact is gradational from granite through highly quartzose granite to pure quartz within 3 or 4 inches. In still other places a zone 6 inches to as much as 5 feet wide consisting largely of fine flakes of mica lies between the quartz and the granite.

The quartz is cut by several small faults.

Quarrying is carried on by means of three main benches. The lowest bench, the old No. 1 quarry, is at the base of the exposure; the second bench, the old No. 2 quarry, is 135 feet above No. 1; and the third bench is 25 feet above No. 2. The lip of the quarry and top of the bluff is 118 feet above the third bench. Two small sub-benches have been started around the northwest corner between the third bench and the quarry lip.

The quartz is blasted from the quarry face, loaded onto trucks by a diesel-driven shovel, and hauled to the two crushing plants. Selected white rock is treated in No. 1 plant, which is adjacent to No. 1 quarry. Here the rock is crushed to —¼-inch size, screened, and sacked. It is sold as stucco dash, roofing rock, and similar products, chiefly in British Columbia and Alberta. At No. 2 plant, located on a small flat 1,200 feet northwest of the quarries, the crushed rock is separated into four sizes ranging from 5-inch to —¼-inch. This rock is shipped in bulk to metallurgical plants in Washington and Oregon for making ferro-silicon and silicon carbide.

During 1958 the average crew employed, including office staff, was sixteen. Estimated production was 9,745 tons from No. 1 plant, 32,820 tons from No. 2 plant, and 15,000 tons stockpiled. Approximately 200,000 tons of quartz has been mined from this deposit to date.

The analyses of four samples taken across the quarry faces as indicated in Figure 4 are tabulated below:—

| Sample | $SiO_2$ | $Al_2O_3$ | Fe |
|---|---|---|---|
| | Per Cent | Per Cent | Per Cent |
| 1 | 97.40 | 0.70 | 0.03 |
| 2 | 97.48 | 0.75 | 0.04 |
| 3 | 98.12 | 0.86 | 0.03 |
| 4 | 98.78 | 0.61 | 0.02 |

NOTE.—Samples were prepared for analysis by grinding in a porcelain ball mill so some contamination by alumina is represented in the above results.

[References: *Minister of Mines, B.C.,* Ann. Repts., 1953, p. 198; 1955, p. 102; 1956, p. 159.]

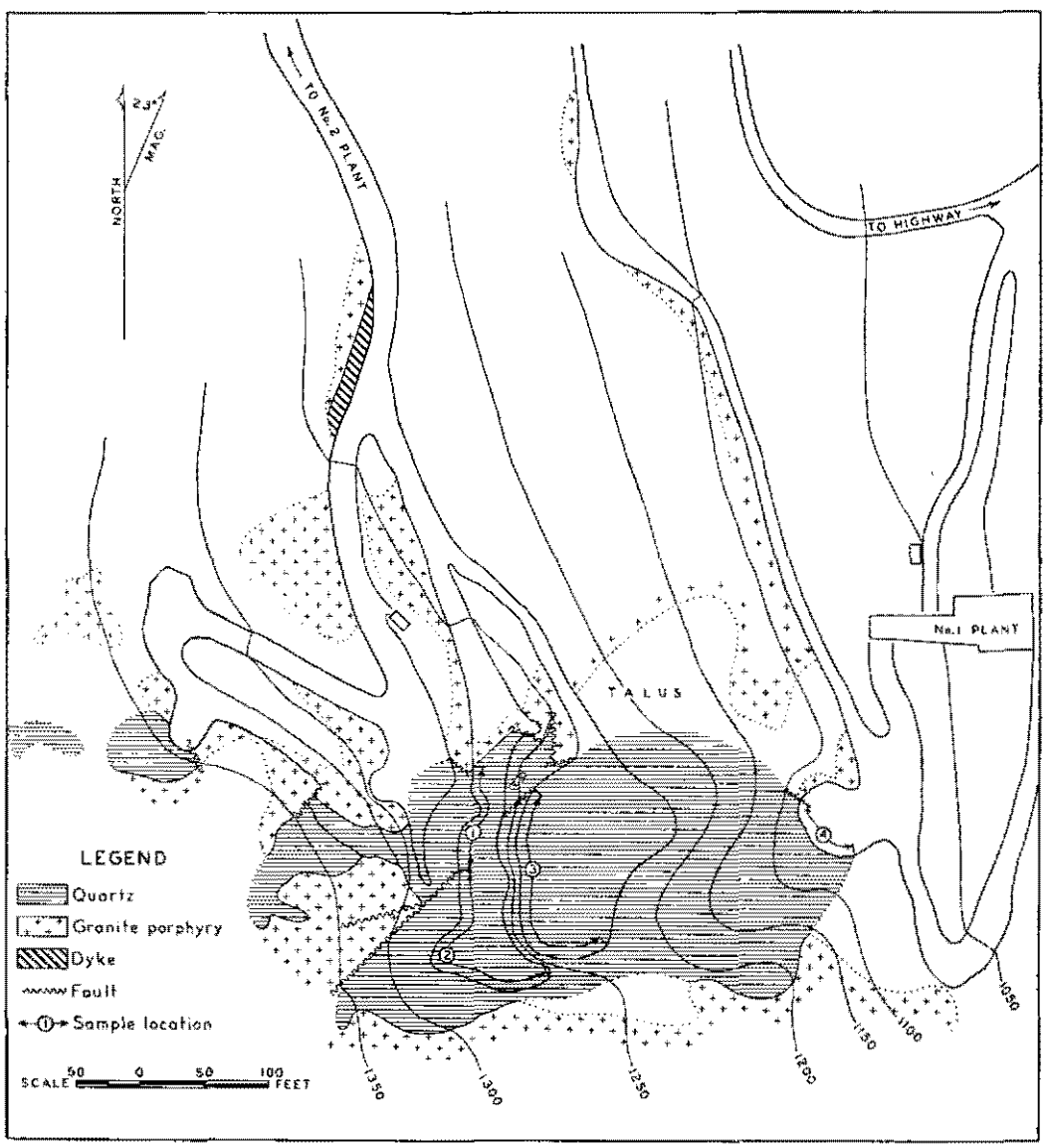



Figure 4. Oliver Silica Quarry.

# Petroleum and Natural Gas

By J. D. Lineham

CONTENTS



## EXPLORATION

Twenty-one seismic parties did work during 1958. Although a few profiles were shot in the Flathead River area south of Fernie and on Graham Island, the most northerly of the Queen Charlotte Islands, most of the surveys were made in northeastern British Columbia and consisted of reflection shooting.

Surface geological mapping and some structure test-drilling programmes in northeastern British Columbia were continued by various oil companies. Geological surveys were made also in other sedimentary basins. Photogeological studies were used extensively to supplement the surveys.

Exploratory drilling was concentrated in northeastern British Columbia, where sixty wildcat wells were operated, of which two were completed as oil discoveries and nine as gas discoveries.

A well suspended in 1957, Union-Hudson's Bay Milligan Creek No. 73-G, was completed as a successful oil discovery in 1958. A new oilfield was discovered in the Beatton River area, north of the Milligan Creek field, when Triad Beatton River No. J-38-b was completed as an oil well in the Triassic Halfway formation. Late in the year a good show of oil in the Lower Cretaceous Bluesky formation was obtained in Triad Beatton River K-39-d well, about 5 miles west of the Triassic discovery. The well was being tested at the end of the year.

The following wells, all discoveries, were completed as gas wells:—

| Well Name | Zone |
|---|---|
| Dome Basco Laprise Creek No. 35-H-94-G-8 | Triassic, Baldonnel formation. |
| Fargo *et al.* Blueberry No. 17 | Mississippian, Rundle group. |
| Gulf States Clarke Lake No. 1A | Devonian, Slave Point formation. |
| Pacific Fort Nelson No. 1 | Mississippian, Rundle group. |
| Pacific Imperial Jedney No. 99-J | Triassic, Halfway formation. |
| Phillips Town 'A' No. 1 | Mississippian, Rundle group. |
| Sinclair Canadian Atlantic No. B-5-1 | Triassic, Baldonnel formation. |
| Sinclair Canadian Atlantic B-13-2 | Triassic, Baldonnel and Halfway formations. |
| Texaco N.F.A. Boundary Lake No. 7 | Permo-Pennsylvanian. |

At the close of 1958, development of the Beatton River and Milligan Creek oil areas was progressing actively while the general search for oil and gas continued, mainly along a trend from the Buick Creek field to the Fort Nelson area.

Wells operated in other parts of the Province were Hercon Key Evans No. 1 in the Vancouver area, Charter *et al.* Saturna No. 1 on Saturna Island, and five wells drilled by Richfield Oil Corporation on Graham Island.

## DEVELOPMENT

Nineteen drilling contractors operated over forty rigs during 1958. The maximum number of rigs active in any month was thirty-two during the month of January.

Of the 112 wells operated, twenty-three were completed as gas wells, seventeen were completed as oil wells, fifty-one were abandoned, one was suspended, and twenty were drilling at the end of the year. In addition, ten approved locations were awaiting rigs. During August ten wells, previously classified as potential gas wells, were abandoned.

A total of 484,287 feet was drilled during the year, with February and July accounting for the greatest and least monthly totals of 76,385 feet and 19,273 feet, respectively. A summary of wells drilled during 1958 is shown in Table I.

Completions made during the year increased the total potential producers to 148 gas wells and thirty-nine oil wells.

Eighteen areas were designated as oil or gas fields, and the descriptions of the Blueberry and of the previously designated Boundary Lake, Pouce Coupe, and Fort St. John fields were amended. Information concerning all fields designated to date is given in Table II. The number of development wells completed within these fields were: Nine oil wells in Boundary Lake, three oil wells in Milligan Creek, three gas wells in Kobes-Townsend, two gas wells each in East Blueberry and Blueberry, and one gas well each in Boundary, Buick Creek, Dawson Creek, Gundy Creek, Halfway, and Fort St. John Southeast.

## RESERVES

A summary of the reserves, together with explanatory notes, is given in Table III.

The gas reserve has not increased as much as anticipated, but this situation is considered merely a temporary one in the development of northeastern British Columbia. On the other hand, the oil reserve has increased substantially, and the time is fast approaching when an oil pipe-line will be justified.

## PRODUCTION

Sixty-nine gas wells produced 64,051,785,000 cubic feet of gas and twenty-eight oil wells produced 512,359 barrels of crude oil during the year. The highest monthly production was in December, when 6,642,643,000 cubic feet of gas and 68,180 barrels of oil were produced.

Westcoast Transmission Company Limited purchased the gas production. The crude oil was delivered to refineries at Dawson Creek and Grande Prairie, Alta.

A summary of the monthly production of gas, oil, and products recovered at the McMahon plant is given in Table IV.

### Gas-gathering System

The gas-gathering system, owned and operated by Westcoast Transmission Company Limited, extends from the plant at Taylor southeast to the Peace River area of northwestern Alberta and northwest along the Alaska Highway, tapping one of the largest

potential gas-producing areas in Canada. The wet, sour gas part of the system supplies the McMahon gas-processing plant. The main part of the system consists of 3.9 miles of 12¾-inch line to the Fort St. John Southeast field and 8 miles of 18-inch line to the Fort St. John field; 38 miles of 26-inch line, 17.8 miles of 20-inch line, 18 miles of 18-inch line, and 11 miles of 12¾-inch line extend to the Highway field just beyond Mile-post 121 on the Alaska Highway.

The laterals, which service the gas-producing areas, consist of 2.9 miles of 4½-inch line to the Red Creek field, 6.4 miles of 8⅝-inch line and an extension of 7.4 miles of 4½-inch line to the Stoddart area and Montney field, 15.7 miles of 20-inch line to the Buick Creek field, 20 miles of 12¾-inch line to the Halfway and Kobes field and an extension of 5.5 miles of 8⅝-inch line to the Townsend wells, 6 miles of 8⅝-inch line to the Blueberry and West Blueberry fields, and 6 miles of 10¾-inch line to the Gundy Creek field.

This gathering system is designed to transport between 300 and 400 millions of cubic feet of raw gas plus several thousand barrels of liquid hydrocarbons per day.

The dry-gas part of the system in British Columbia is located south of the Peace River. It delivers dry gas from two British Columbia fields and from Alberta to the 30-inch main transmission-line near the McMahon plant. The main 26-inch gathering-line extends 37 miles to the British Columbia-Alberta boundary, and from it 8⅝-inch laterals extend 5.45 miles to the Dawson Creek field and 6.7 miles to the Kiskatinaw field.

*Gas Plant and Refinery Installations in the Peace River District*

The McMahon gas scrubbing and refining plant, one of the world's largest of its kind, is at Taylor on the banks of the Peace River about 36 miles northwest of Dawson Creek. The final unit of the plant went into operation in mid-February, 1958. The purpose of the plant is to separate the condensate from the sour, wet natural gas gathered from wells in the area, sweeten and dehydrate the gas, extract recoverable liquid hydrocarbons, and convert them into final products including propane, butane, finished motor and aviation fuels, kerosene, and diesel oil.

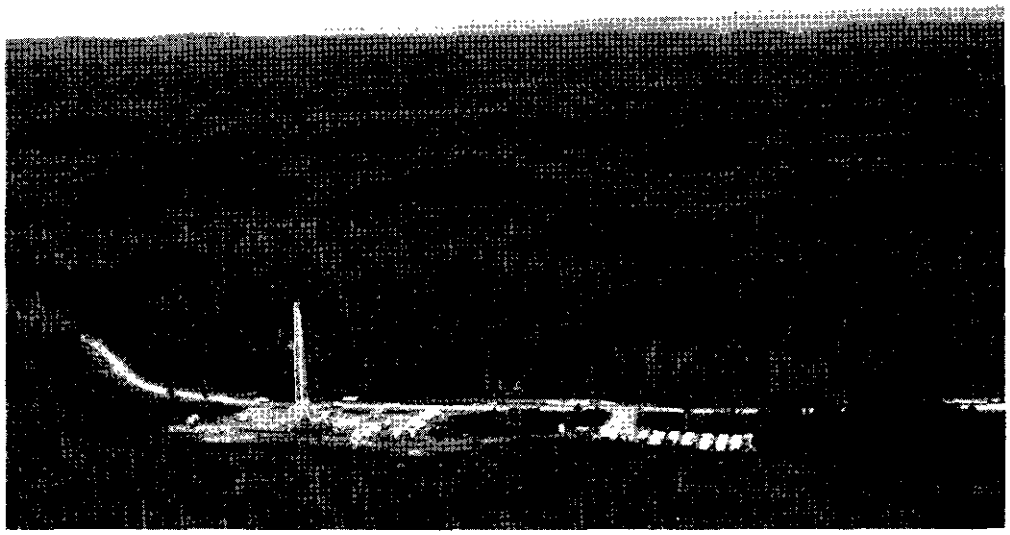
The major processing facilities are: Amine-treating and solid absorbent type dehydration, absorption, and distillation, light ends fractionation, condensate stabilization and fractionation, and hydrogen treating and catalytic reforming.

The scrubbing plant, owned by Westcoast Transmission Company Limited and operated by Pacific Petroleums Ltd., has a capacity sufficient to treat some 345 million cubic feet of raw gas per day to produce 300 million cubic feet of pipe-line gas. The plant capacity can be increased with only minor alteration to produce 400 million cubic feet of pipe-line gas per day.

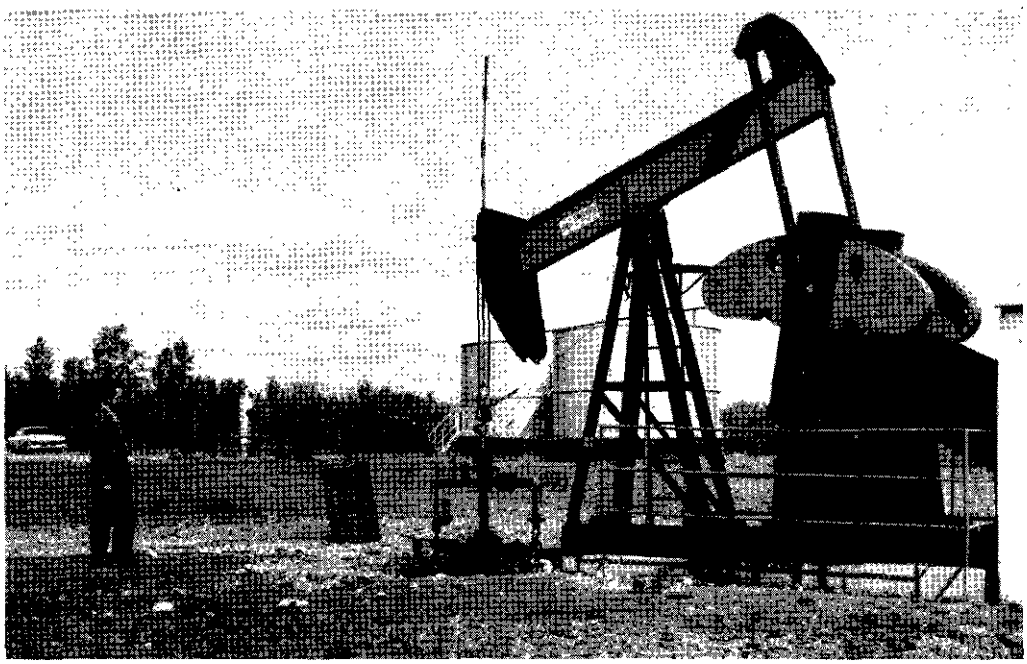
The adjacent refinery, owned jointly by Phillips Petroleum Company, of Bartlesville, Oklahoma, and Pacific Petroleums Ltd., and operated by Pacific Petroleums Ltd., has a capacity of approximately 3,000 barrels per day. The refining plant takes the liquid fractions from the gas scrubbing plant and refines them to make the finished products.

The sulphur recovery plant, with a capacity of 425 tons per day, is owned and operated by Jefferson Lake Petrochemicals of Canada, Ltd., a subsidiary of Jefferson Lake Sulphur Company of the United States.

The refinery at Dawson Creek, owned by Pacific Petroleums Ltd. and Phillips Petroleum Company, has a capacity of approximately 2,500 barrels per day that will be increased to 3,500 barrels per day by the end of 1959. This refinery processes asphaltic crude to supply the local market with asphalt paving for the Alaska Highway.



Richfield Mic-Mac-Homestead Nadu River No. 1 well drilling on Graham Island.



Well head with pump in operation, Fort St. John oilfield.

### Pipe-lines

The initial daily capacity of Westcoast Transmission Company's 650-mile-long 30-inch pipe-line is reported to be 400 million cubic feet of natural gas, with four compressor stations. A maximum capacity of 660 million cubic feet per day can be obtained with the addition of more compressor stations.

Natural gas is distributed in British Columbia chiefly by Inland Natural Gas Co. Ltd. and British Columbia Electric Company Limited. The former company has 360 miles of main transmission-line, branch lines, and distribution systems, extending from Savona to Kamloops, Salmon Arm, Vernon, Kelowna, Penticton, Rossland, Trail, and Nelson. Communities adjacent to the line draw natural gas from it.

Natural gas for export to the United States is delivered at Huntington to Pacific Northwest Pipeline Corporation.

## WELL RECORDS, WELL INFORMATION, AND STATISTICS

### Well Records

The Petroleum and Natural Gas Branch maintains complete records of all exploratory and development wells drilled within the Province. Daily drilling reports on every well drilled are submitted each week by the operator and, on the completion of the well, a formal well-history report, including copies of all logs, drill-stem test results, analyses, and general well information, as well as geological, engineering, and completion summaries are required. The information is condensed and recorded on well cards.

The production of crude oil, natural gas, liquefied petroleum gas products and sulphur is reported monthly by producers and plant operators on forms provided by the Department. The information is recorded on a card system and indexed according to well, pool, and field.

### Well Information

One of the main functions of the Branch is the collection, compilation, and classification of data concerning the exploration, drilling, and production phases of the oil and gas industry in the Province. All non-confidential data are made available at a nominal charge to interested persons, by opening records for examination, by reproduction of records, or by publication. Certain information remains confidential for a specific period of time to afford reasonable protection to the operator.

### Statistics

The Branch publishes monthly the Drilling and Land Report and also the Monthly Oil and Gas Report comprising summaries on drilling and production.

### Field Office

The Department maintains a field staff at Dawson Creek to enforce the regulations under the " Petroleum and Natural Gas Act " in northeastern British Columbia. Inspections are made of all phases of the drilling and production activity, which includes drilling rigs, completed oil and gas wells, tank batteries, gas meters, and abandoned locations. Production tests, sampling procedures, and various pressure tests are also witnessed or carried out by the Department personnel.

### Well Samples

Unless otherwise directed, any operator who drills a well for petroleum or natural gas is required to take a sample of bit cuttings at least every 10 feet of depth.

All material from core samples must be preserved in labelled boxes not more than 36 inches long and must be delivered to the Department when required. Normally all cores from wells drilled in northeastern British Columbia are stored in the Department of Mines core-storage depot in Pouce Coupe. However, since the depot became filled in September, 1957, each operator has been required to provide temporary core storage. Cores taken during 1958 from wells drilled in the Vancouver area, on Saturna Island, and on Graham Island are stored at Victoria.

Samples of all well cuttings are forwarded by the operator to the stratigraphic laboratory in Victoria. A part of each 10-foot sample is washed, dried, and filed in a labelled glass bottle in sequence with other samples from the same well. A complete set of samples from each well is available for examination at Victoria. Two additional sets of samples are bottled and shipped—one to the laboratory of the Geological Survey of Canada at Calgary and one, since January, 1958, to the Petroleum and Natural Gas Branch field office at 1805 One Hundred and Eighth Avenue, Dawson Creek. During 1958, 30,938 samples were washed and bottled in Victoria.

## STATISTICS

### *Table I.—Wells Drilled or Operated, 1958*

| Well Name | Date Spudded | Date Rig Released | Total Depth | 1958 Footage | Status at Dec. 31, 1958 |
|---|---|---|---|---|---|
| *Northeastern British Columbia* | | | | | |
| B.A.-Shell Klua Creek No. 2 | Jan. 19, 1958 | Mar. 7, 1958 | 7,400 | 7,400 | Dry and abandoned. |
| Calvan Trutch Creek No. 1 | Dec. 9, 1958 | ..... | ..... | 3,410 | Drilling. |
| Decalta Boundary Lake No. 14-32 | May 27, 1958 | June 20, 1958 | 4,580 | 4,580 | Triassic (Bdy. L. Zone), oil well. |
| Dome Basco Laprise Creek No. 35-H-94-G-8 | Dec. 26, 1957 | Mar. 9, 1958 | 5,138 | 4,497 | Triassic (Baldonnel), gas well. |
| Dome Prosper Martin Creek No. 1 | Sept. 28, 1958 | Nov. 8, 1958 | 4,697 | 4,697 | Dry and abandoned. |
| Fargo *et al.* Blueberry No. 19 | Dec. 20, 1957 | Feb. 7, 1958 | 4,362 | 1,234 | L. Cretaceous (Cad.-Nik.), gas well. |
| Fargo *et al.* Blueberry No. 21 | Mar. 26, 1958 | May 7, 1958 | 4,400 | 4,400 | L. Cretaceous (Cad.-Nik.) and Triassic (Baldonnel), multi-zone gas well. |
| Fargo *et al.* Blueberry No. 22 | May 12, 1958 | June 22, 1958 | 5,721 | 5,721 | Dry and abandoned. |
| Fargo *et al.* East Blueberry No. 7 | Aug. 24, 1954 | Sept. 19, 1954 | 4,430 | ..... | Dry and abandoned. |
| Fargo *et al.* East Blueberry No. 7 deepened | Apr. 14, 1958 | June 20, 1958 | 6,995 | 2,565 | Triassic (Baldonnel and Halfway), multi-zone gas well. |
| Fargo *et al.* East Blueberry No. 17 | Feb. 9, 1958 | May 26, 1958 | 7,152 | 7,152 | Mississippian (Rundle), gas well. |
| Fargo *et al.* East Blueberry No. 25 | Dec. 12, 1958 | ..... | ..... | 4,082 | Drilling. |
| Fargo *et al.* East Blueberry No. 26 | Dec. 22, 1958 | ..... | ..... | 1,854 | Drilling. |
| Fargo *et al.* Halfway No. 4 | Feb. 16, 1958 | Mar. 22, 1958 | 3,718 | 3,718 | Triassic (Baldonnel), gas well. |
| Fargo *et al.* South Blueberry No. 24 | July 30, 1958 | Dec. 16, 1958 | 6,983 | 6,983 | Dry and abandoned. |
| Fargo *et al.* West Blueberry No. 20 | Jan. 6, 1958 | Feb. 2, 1958 | 4,300 | 4,300 | Dry and abandoned. |
| FPC-Richfield Brenot Creek No. 1 | Nov. 9, 1957 | July 30, 1958 | 7,796 | 7,095 | Dry and abandoned. |
| FPC-Richfield North Daiber No. 1 | Oct. 14, 1958 | ..... | ..... | 5,670 | Drilling. |
| Gulf States Bonnie Creek No. 1 | Dec. 9, 1958 | ..... | ..... | 4,360 | Drilling. |
| (Gulf States) Chuatse Creek No. 1 | Feb. 20, 1958 | Mar. 5, 1958 | 2,306 | 2,306 | Dry and abandoned. |
| (Gulf States) Clarke Lake No. 1 | Dec. 27, 1957 | Jan. 28, 1958 | 2,500 | 1,990 | Dry and abandoned. |
| Gulf States Fort Nelson No. 2 | Mar. 11, 1958 | May 7, 1958 | 7,889 | 7,889 | Dry and abandoned. |
| Gulf States Gundy Creek No. 7 | June 6, 1958 | July 16, 1958 | 5,038 | 5,038 | L. Cretaceous (Cad.-Nik.) and Triassic (Baldonnel), multi-zone gas well. |
| Gulf States-Imperial Clarke Lake No. 1-A | Jan. 31, 1958 | Mar. 27, 1958 | 6,438 | 6,438 | Devonian (Slave Point), gas well. |
| Gulf States-Imperial Clarke Lake No. 2 | Nov. 8, 1958 | ..... | ..... | 6,565 | Drilling. |
| (Gulf States) Kotcho Lake No. 2 | Dec. 20, 1957 | Feb. 12, 1958 | 7,240 | 5,055 | Dry and abandoned. |
| Gulf States Kotcho Lake No. 3 | Dec. 16, 1958 | ..... | ..... | 2,465 | Drilling. |
| Gulf States Petitot River No. 1 | Dec. 30, 1958 | ..... | ..... | 258 | Drilling. |
| Gulf States Poplar Hills No. 1 | Aug. 25, 1958 | Oct. 24, 1958 | 7,291 | 7,291 | Dry and abandoned. |
| Honolulu Imperial Progress No. 7-34 | June 1, 1958 | Sept. 14, 1958 | 8,374 | 8,374 | Dry and abandoned. |
| Hudson's Bay-Union-Imperial Paddy No. 2 | Jan. 17, 1958 | Mar. 18, 1958 | 8,216 | 8,216 | Dry and abandoned. |
| Imperial Calvan Altares 83-A-94-B-8 | Dec. 15, 1958 | ..... | ..... | 3,179 | Drilling. |
| Imperial Pacific Alces East No. 16-31-84-13 | July 15, 1958 | Aug. 6, 1958 | 4,746 | 4,746 | Triassic (Bdy. L. Zone), oil well. |
| Imperial Pacific Boundary No. 6-3-85-14 | June 1, 1958 | June 19, 1958 | 4,024 | 4,024 | Triassic (Bdy. L. Zone), oil well. |
| Imperial Pacific Boundary No. 8-3-85-14 | Aug. 23, 1958 | Sept. 12, 1958 | 4,061 | 4,061 | Triassic (Bdy. L. Zone), oil well. |
| Imperial Pacific Boundary No. 8-10-85-14 | May 12, 1958 | May 30, 1958 | 4,145 | 4,145 | Triassic (Bdy. L. Zone), oil well. |
| Imperial Pacific Boundary No. 14-3-85-14 | June 21, 1958 | July 6, 1958 | 4,021 | 4,021 | Triassic (Bdy. L. Zone), oil well. |
| Imperial Pacific Boundary No. 14-11 | ..... | ..... | ..... | ..... | Location. |

## *Table I.—Wells Drilled or Operated, 1958*—Continued

| Well Name | Date Spudded | Date Rig Released | Total Depth | 1958 Footage | Status at Dec. 31, 1958 |
|---|---|---|---|---|---|
| Imperial Pacific Boundary No. 16-3-85-14 | May 11, 1958 | May 30, 1958 | 4,095 | 4,095 | Triassic (Bdy. L. Zone), oil well. |
| Imperial Pacific Boundary No. 16-11-85-14 | Mar. 28, 1958 | Apr. 26, 1958 | 4,695 | 4,695 | Triassic (Bdy. L. Zone), oil well. |
| Imperial Pacific Boundary East No. 14-7-85-13 | June 2, 1958 | July 7, 1958 | 4,708 | 4,708<br>+1,525 | Triassic (Bdy. L. Zone), oil well.<br>(Crooked hole.) |
| Imperial Pacific Golata No. 8-29-83-15 | June 21, 1957 | Jan. 1, 1958 | 12,287 | ..... | Dry and abandoned. |
| Imperial Pacific Jedney No. 25-H-94-G-1 | Aug. 21, 1958 | Nov. 30, 1958 | 7,225 | 7,225 | Dry and abandoned. |
| Imperial Pacific Windy Creek No. 11-23-81-72 | Aug. 21, 1958 | Nov. 19, 1958 | 5,400 | 5,400 | Dry and abandoned. |
| Imperial Pan American Tattoo No. 26-B-94-0-11 | Jan. 15, 1958 | May 15, 1958 | 7,505 | 7,505 | Dry and abandoned. |
| Pacific Boundary No. 12-10 | Mar. 19, 1958 | June 2, 1958 | 6,913 | 6,913 | Triassic (Halfway), gas well. |
| Pacific Buick Creek No. 14 | ..... | ..... | ..... | ..... | Location. |
| Pacific Buick Creek No. 16 | July 1, 1958 | July 20, 1958 | 3,922 | 3,922 | Dry and abandoned. |
| Pacific Buick Creek No. 17 | Sept. 11, 1958 | Oct. 5, 1958 | 3,711 | 3,711 | Buick Creek Sandstone, gas well. |
| Pacific Buick Creek No. 18 | Oct. 9, 1958 | Nov. 3, 1958 | 3,855 | 3,855 | Dry and abandoned. |
| Pacific Fort Nelson No. 1 | Feb. 1, 1958 | April 21, 1958 | 7,477 | 7,477 | Mississippian (Rundle), gas well. |
| Pacific Fort Nelson No. 2 | Mar. 20, 1958 | April 17, 1958 | 2,998 | 2,998 | Dry and abandoned. |
| Pacific Fort Nelson No. 3 | Nov. 5, 1958 | ..... | ..... | 6,485 | Drilling. |
| Pacific Fort St. John No. 59 | ..... | ..... | ..... | ..... | Location. |
| Pacific Fort St. John No. 70 | ..... | ..... | ..... | ..... | Location. |
| Pacific Fort St. John No. 89 | ..... | ..... | ..... | ..... | Location. |
| Pacific Fort St. John No. 98 | Dec. 4, 1957 | Jan. 17, 1958 | 5,030 | 699 | Triassic (Halfway), gas well. |
| Pacific Imperial Cache Creek No. 1 | Dec. 8, 1957 | Feb. 7, 1958 | 5,564 | 1,352 | Dry and abandoned. |
| Pacific Imperial Highway No. 1 | Jan. 1, 1958 | Apr. 2, 1958 | 7,763 | 7,763 | Dry and abandoned. |
| Pacific Imperial Jedney No. 99-J | Sept. 9, 1958 | Nov. 25, 1958 | 5,375 | 5,375 | Triassic (Halfway), gas well. |
| Pacific Imperial Medana No. 47-G | Nov. 30, 1958 | ..... | ..... | 5,028 | Drilling. |
| Pacific Scurry Dawson Creek No. 4 | Dec. 10, 1957 | Jan. 1, 1958 | 2,935 | ..... | L. Cretaceous (Cadotte), gas well. |
| Pacific Scurry Dawson Creek No. 6 | Jan. 2, 1958 | Jan. 17, 1958 | 2,923 | 2,923 | Dry and abandoned. |
| Pacific Two Rivers No. 99 | May 26, 1958 | June 18, 1958 | 4,139 | 4,139 | Dry and abandoned. |
| Pan American Beaver River No. A-1 | Jan. 21, 1958 | ..... | ..... | 8,519 | Drilling. |
| (Phillips) Beatton "A" No. 1 | Jan. 5, 1958 | Mar. 2, 1958 | 4,040 | 4,040 | Dry and abandoned. |
| (Phillips) Blair "A" No. 1 | Sept. 3, 1957 | Jan. 4, 1958 | 8,700 | ..... | Dry and abandoned. |
| (Phillips) Kobes No.2 | Dec. 6, 1957 | Mar. 14, 1958 | 5,247 | 2,235 | Triassic (Charlie Lake), gas well. |
| (Phillips) Kobes No. 3 | Nov. 23, 1957 | Feb. 23, 1958 | 5,770 | 1,223 | Dry and abandoned. |
| (Phillips) Kobes No. 4 | July 24, 1958 | Nov. 13, 1958 | 5,675 | 5,675 | L. Cretaceous (Cadomin), gas well. |
| (Phillips) Kobes "A" No. 2 | ..... | ..... | ..... | ..... | Location. |
| (Phillips) Kobes "A" No. 4-A | Nov. 8, 1957 | Mar. 1, 1958 | 7,167 | 2,051 | Dry and abandoned. |
| (Phillips) Kobes "B" No. 1 | Mar. 13, 1958 | June 29, 1958 | 7,472 | 7,472 | Triassic (Charlie Lake) and Mississippian (Rundle), multi-zone gas well. |
| (Phillips) Milligan "A" No. 1 | Feb. 15, 1958 | Mar. 9, 1958 | 3,800 | 3,800 | Dry and abandoned. |
| (Phillips) Puggins No. 1 | Jan. 28, 1958 | ..... | ..... | 14,702 | Drilling. |
| (Phillips) Town "A" No. 1 | Dec. 5, 1957 | Mar. 31, 1958 | 7,400 | 3,372 | Mississippian (Rundle), gas well. |
| (Phillips) Town "A" No. 2 | Aug. 30, 1958 | Nov. 13, 1958 | 7,400 | 7,400 | Dry and abandoned. |
| (Phillips) Umbach No. 1 | Nov. 29, 1957 | Jan. 27, 1958 | 6,010 | 1,809 | Dry and abandoned. |
| (Phillips) Umbach No. 2 | Dec. 10, 1958 | ..... | ..... | 4,446 | Drilling. |
| Richfield Decalta-A. P. Con. Big Arrow Creek No. 2 | Feb. 28, 1958 | Mar. 14, 1958 | 3,805 | 3,805 | Dry and abandoned. |

| | | | | | |
|---|---|---|---|---|---|
| Richfield Prespatou Creek No. 1 | Jan. 14, 1957 | Feb. 8, 1958 | 4,761 | ——— | Jurassic-Triassic, gas well. |
| Richfield Prespatou Creek No. 2 | Jan. 23, 1958 | Feb. 19, 1958 | 4,284 | 4,284 | Dry and abandoned. |
| Sinclair Canadian Atlantic Calvan XB18 No. 1 | Oct. 17, 1958 | ..... | ..... | 6,048 | Drilling. |
| Sinclair Canadian Atlantic No. B-5-1 | Feb. 5, 1957 | May 30, 1958 | 8,957 | 2,722 | Triassic (Baldonnel), gas well. |
| Sinclair Canadian Atlantic No. B-8-1 | Jan. 26, 1958 | May 27, 1958 | 10,447 | 10,447 | Dry and abandoned. |
| Sinclair Canadian Atlantic No. B-13-1 | Jan. 1, 1955 | June 26, 1958 | 5,745 | ..... | Dry and abandoned. |
| Sinclair Canadian Atlantic No. B-13-2 | Oct. 23, 1957 | Sept. 17, 1958 | 13,734 | 7,595 | Triassic (Baldonnel and Halfway), multi-zone gas well. |
| Sun Fort St. John No. 8-14 | Oct. 29, 1958 | Dec. 30, 1958 | 6,215 | 6,215 | L. Cretaceous (Gething), oil well. |
| Texaco NFA Boundary Lake No. 6 | Feb. 11, 1957 | Feb. 16, 1958 | 4,192 | ..... | Dry and abandoned. |
| Texaco NFA Boundary Lake No. 7 | Dec. 24, 1957 | Feb. 6, 1958 | 5,346 | 2,920 | Permo-Pennsylvanian, gas well. |
| Texaco NFA Boundary Lake No. 8 | Feb. 12, 1958 | Mar. 24, 1958 | 5,365 | 5,365 | Dry and abandoned. |
| Texaco NFA Boundary Lake No. 9 | Feb. 7, 1958 | Mar. 5, 1958 | 4,328 | 4,328 | Dry and abandoned. |
| Texaco NFA Buick Creek No. 15 | Dec. 19, 1957 | Jan. 17, 1958 | 4,508 | 1,022 | Dry and abandoned. |
| Texaco NFA Nig Creek No. 8 | Feb. 22, 1958 | Mar. 27, 1958 | 4,764 | 4,764 | Dry and abandoned. |
| Texaco NFA Nig Creek No. 9 | Sept. 25, 1958 | Oct. 20, 1958 | 4,562 | 4,562 | Triassic (Baldonnel), gas well. |
| Triad Beatton River J-28-d | ..... | ..... | ..... | ..... | Location. |
| Triad Beatton River No. J-29-d | Nov. 10, 1958 | Dec. 2, 1958 | 3,800 | 3,800 | Triassic (Halfway), oil well. |
| Triad Beatton River J-37-D | ..... | ..... | ..... | ..... | Location. |
| Triad Beatton River No. J-38-b | Jan. 30, 1958 | Mar. 1, 1958 | 4,684 | 4,684 | Triassic (Halfway), oil well. |
| Triad Beatton River No. J-39-d | Dec. 5, 1958 | Dec. 24, 1958 | 3,785 | 3,785 | Triassic (Halfway), oil well. |
| Triad Beatton River K-39-d | Dec. 19, 1958 | ..... | ..... | 3,592 | Drilling. |
| Triad Bush Mountain No. 1 | July 16, 1958 | ..... | ..... | 8,534 | Drilling. |
| Triad Prairie Creek No. 1 | Dec. 18, 1957 | Feb. 6, 1958 | 535 | 241 | Dry and abandoned. |
| Triad Prairie Creek No. 1-A | Nov. 18, 1958 | ..... | ..... | 1,840 | Drilling. |
| Union Aitken Creek No. 3 | Nov. 27, 1958 | ..... | ..... | 4,695 | Drilling. |
| Union–H.B. Milligan Creek No. D-42-G | Dec. 21, 1958 | ..... | ..... | 3,760 | Drilling. |
| Union-H.B. Milligan Creek No. D-53-G | Nov. 12, 1958 | Nov. 29, 1958 | 3,760 | 3,760 | Triassic (Halfway), oil well. |
| Union-H.B. Milligan Creek No. D-54-G | Dec. 1, 1958 | Dec. 18, 1958 | 3,782 | 3,782 | Triassic (Halfway), oil well. |
| Union-Hudson's Bay Doig River 23-D | Feb. 2, 1958 | Mar. 2, 1958 | 5,222 | 5,222 | Dry and abandoned. |
| Union-Hudson's Bay Milligan Creek No. 16-H | Jan. 6, 1958 | Jan. 28, 1958 | 3,939 | 3,939 | Dry and abandoned. |
| Union-Hudson's Bay Milligan Creek No. 73-G | Feb. 27, 1957 | Jan. 4, 1958 | 3,800 | ..... | Triassic (Halfway), oil well. |
| Union-Hudson's Bay Milligan Creek D-62-G | ..... | ..... | ..... | ..... | Location. |
| Union-Hudson's Bay Milligan Creek No. D-64-G | Jan. 31, 1958 | Feb. 21, 1958 | 3,764 | 3,764 | Triassic (Halfway), oil well. |
| Union-Hudson's Bay Milligan Creek No. D-82-G | Feb. 22, 1958 | Mar. 9, 1958 | 3,738 | 3,738 | Dry and abandoned. |
| Union-Hudson's Bay Milligan Creek D-84-G | ..... | ..... | ..... | ..... | Location. |
| Union Richfield Scot Point No. 77-I | Jan. 6, 1958 | Jan. 28, 1958 | 3,829 | 3,829 | Dry and abandoned. |
| *Queen Charlotte Islands* | | | | | |
| Richfield Mic-Mac-Homestead Gold Creek No. 1 | Nov. 25, 1958 | Dec. 7, 1958 | 3,855 | 3,855 | Dry and abandoned. |
| Richfield Mic-Mac-Homestead Masset No. 1 | Aug. 8, 1958 | Aug. 18, 1958 | 1,840 | 1,840 | Dry and abandoned. |
| Richfield Mic-Mac-Homestead Nadu River No. 1 | Oct. 23, 1958 | Nov. 19, 1958 | 4,710 | 4,710 | Dry and abandoned. |
| Richfield Mic-Mac-Homestead Tlell No. 1 | Dec. 11, 1958 | Dec. 18, 1958 | 4,120 | 4,120 | Dry and abandoned. |
| Richfield Mic-Mac-Homestead Tow Hill No. 1 | Sept. 1, 1958 | Oct. 15, 1958 | 6,015 | 6,015 | Dry and abandoned. |
| *Vancouver Area* | | | | | |
| Hercon Key Evans No. 1 | Feb. 12, 1956 | Aug. 29, 1958 | 7,862 | 16 | Suspended. |
| *Victoria Area* | | | | | |
| Charter *et al.* Saturna No. 1 | Oct. 30, 1957 | May 9, 1958 | 3,948 | 2,373 | Dry and abandoned. |

*Table II.—Oil and Gas Fields Designated at December 31st, 1958*

| Field | Date Designated | Date Revised | Pools[1] | General Classification | Field Location | Number of Wells in Field |
|---|---|---|---|---|---|---|
| Blueberry | Feb. 7, 1958 | Dec. 22, 1958 | 4, 6, 10 | Gas and oil | N.T.S. 94-A-12 | 11 |
| East Blueberry | Dec. 22, 1958 | | 6, 8, 10 | Gas | N.T.S. 94-A-13 | 2 |
| West Blueberry | Feb. 7, 1958 | | 4, 6 | Gas | N.T.S. 94-A-12 | 3 |
| Boundary Lake | Oct. 30, 1956 | Feb. 7, 1958 | 7, 8 | Gas and oil | Tp. 85, R. 14 | 22 |
| Buick Creek | Feb. 7, 1958 | | 5, 8 | Gas | N.T.S. 94-A-11 | 4 |
| West Buick Creek | Feb. 7, 1958 | | 2, 5, 6, 8 | Gas and oil | N.T.S. 94-A-14 | 14 |
| Dawson Creek | Feb. 7, 1958 | | 1 | Gas | Tp. 79, R. 15 | 4 |
| Fort St. John | Aug. 22, 1955 | Feb. 7, 1958 | 2, 3, 6, 7, 8, 9 | Gas and oil | Tp. 83, R. 18 | 33 |
| Fort St. John Airport | Feb. 7, 1958 | | 3, 6, 8 | Gas | Tp. 83, R. 17 | 3 |
| Fort St. John Southeast | Feb. 7, 1958 | | 3, 6, 8, 9 | Gas | Tp. 83, R. 17 | 15 |
| Gundy Creek | Feb. 7, 1958 | | 4, 6, 7 | Gas | N.T.S. 94-B-16 | 4 |
| Halfway | Dec. 22, 1958 | | 6, 8 | Gas | Tp. 87, R. 25 | 3 |
| Highway | Feb. 7, 1958 | | 4, 6, 10 | Gas | N.T.S. 94-B-16 | 5 |
| Kiskatinaw | Feb. 7, 1958 | | 11 | Gas | Tp. 81, R. 15 | 1 |
| West Kiskatinaw | Feb. 7, 1958 | | 7 | Gas | Tp. 81, R. 17 | 1 |
| Kobes-Townsend | Feb. 7, 1958 | | 3, 7, 8, 10 | Gas | N.T.S. 94-B-9 | 7 |
| Milligan Creek | Feb. 7, 1958 | | 8 | Oil | N.T.S. 94-H-2 | 4 |
| Montney | Feb. 7, 1958 | | 2, 7, 8, 9 | Gas | Tp. 86, R. 19, 20 | 5 |
| Pouce Coupe | Aug. 22, 1955 | Feb. 7, 1958 | 1 | Gas | Tp. 80, R. 13 | 2 |
| Red Creek | Feb. 7, 1958 | | 8, 9 | Gas | Tp. 85, R. 21 | 2 |
| Sunrise | Feb. 7, 1958 | | 1 | Gas | Tp. 79, R. 16 | 3 |

[1] Pools listed numerically:—

1—Cadotte.
2—Gething.
3—Cadomin.
4—Nikanassin.
5—Buick Creek Sandstone.
6—Triassic (Baldonnel).
7—Triassic (Charlie Lake).
8—Triassic (Halfway).
9—Permo-Pennsylvanian.
10—Mississippian.
11—Devonian.

*Table III.—Proved Reserves of Recoverable Oil, Gas, and Gas By-products at December 31st, 1958*

| | Crude Oil[1] | Raw Gas | Disposable Gas | Gas Liquids | Sulphur |
|---|---|---|---|---|---|
| | Barrels | Million Cu. Ft. | Million Cu. Ft. | Barrels | Short Tons |
| Reserves remaining at end of 1957 | 21,266,800 | 1,735,000 | 1,555,098 | 39,228,350 | 1,494,321 |
| Production during 1958 | 512,359 | 64,052 | 58,040 | 1,543,525[2] | 62,986[2] |
| Adjustments made during 1958[3] | | −228,448 | −202,158 | −5,688,503 | −99,425 |
| Reserves found during 1958 | 20,297,400 | 463,900 | 421,700 | 11,030,200 | 283,763 |
| Reserves remaining at end of 1958 | 41,051,841 | 1,906,400 | 1,716,600 | 43,026,522 | 1,615,673 |

[1] The reserve of crude oil is based on an average recovery factor of 23.2 per cent. Where justified by structural conditions, the proved reserve in some instances is taken as 50 per cent of the probable reserve.

[2] The production of gas liquids and sulphur are the quantities estimated from gas analyses to have been produced with the raw gas, both sweet and sour, and are not the quantities actually extracted.

[3] Reserves are continually under revision as data are provided by additional drilling and production.

*Table IV.—Well Operation and Production Statistics, 1958*

| | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Well Data* | | | | | | | | | | | | | |
| Drilling authorities issued | 14 | 12 | 3 | 2 | 10 | 2 | 4 | 7 | 6 | 5 | 10 | 23 | 98 |
| Wells spudded | 16 | 11 | 5 | | 5 | 5 | 5 | 7 | 5 | 5 | 8 | 13 | 85 |
| Rigs operated | 32 | 31 | 31 | 16 | 15 | 13 | 12 | 13 | 16 | 16 | 22 | 25 | |
| Footage drilled | 66,940 | 76,385 | 48,402 | 23,817 | 27,591 | 30,782 | 19,273 | 21,594 | 33,302 | 28,238 | 36,707 | 70,756 | 484,287 |
| Wells dry and abandoned | 8 | 7 | 12 | 2 | 4 | 3 | 2 | 1 | 1 | 2 | 6 | 3 | 51 |
| Reclassified wells | | | | | | | | 10 | | | | | 10 |
| *Oil Wells* | | | | | | | | | | | | | |
| Completed | 1 | 1 | | 1 | 2 | 2 | 2 | 1 | 1 | | 2 | 4 | 17 |
| Capable of production | 23 | 24 | 24 | 25 | 27 | 29 | 31 | 32 | 33 | 33 | 35 | 39 | 39 |
| Operated | 19 | 19 | 19 | 9 | 20 | 22 | 24 | 26 | 25 | 24 | 25 | 28 | |
| Production (bbl.) | 37,965 | 32,715 | 54,068 | 11,904 | 35,323 | 38,589 | 42,885 | 40,025 | 49,682 | 59,649 | 41,374 | 68,180 | 512,359 |
| Average daily production (bbl.) | 1,266 | 1,091 | 1,806 | 397 | 1,177 | 1,286 | 1,430 | 1,334 | 1,656 | 1,988 | 1,379 | 2,273 | |
| *Gas Wells* | | | | | | | | | | | | | |
| Completed | 2 | 3 | 5 | 1 | 3 | 3 | 1 | | 1 | 2 | 2 | | 23 |
| Capable of production | 137[1] | 140 | 145 | 146 | 149 | 152 | 153 | 143 | 144 | 146 | 148 | 148 | 148 |
| Operated | 43 | 44 | 50 | 49 | 50 | 41 | 41 | 42 | 45 | 67 | 67 | 65 | |
| Production (M s.c.f.) | 5,798,299 | 5,285,924 | 5,864,137 | 5,378,633 | 5,496,514 | 4,455,060 | 4,342,781 | 4,270,836 | 4,481,287 | 5,575,481 | 6,460,190 | 6,642,643 | 64,051,785 |
| Average daily production (M s.c.f.) | 193,277 | 176,197 | 195,471 | 179,288 | 183,271 | 148,502 | 144,759 | 142,361 | 149,376 | 185,849 | 215,340 | 221,421 | |
| *Plant By-products* | | | | | | | | | | | | | |
| Propane (bbl.) | 4,988 | 5,653 | 6,433 | 237 | 5,297 | 3,551 | 6,058 | 3,678 | 6,445 | 9,276 | 6,200 | 11,279 | 69,095 |
| Butane (bbl.) | 2,955 | 1,101 | 498 | 374 | 11,554 | 6,747 | 10,511 | 9,197 | 10,030 | 4,318 | 5,093 | 19,231 | 81,609 |
| Sulphur (short tons) | 5,074 | 5,052 | 5,805 | 5,738 | 5,954 | 5,225 | 5,201 | 4,875 | 4,656 | 4,845 | 4,985 | 5,195 | 62,605 |

[1] Revised total at December 31st, 1957, 135.

# Inspection of Lode Mines, Placer Mines, and Quarries

By J. W. Peck, Chief Inspector of Mines

CONTENTS



## PRODUCTION

The output of metal mines for 1958 was 6,402,198 tons. This tonnage was produced from forty-seven mines, of which twenty-eight produced 100 tons or more.

## FATAL ACCIDENTS

During 1958 there were four fatal accidents connected with mining operations in metal mines and quarries. This was four less than in 1957. There were 3,728 persons employed below and above ground in metal mines, and 625 person employed in concentrators in 1958.

The ratio of fatal accidents per 1,000 persons employed in mines and concentrators was 0.92, as compared with 1.41 in 1957.

Tonnage mined per fatal accident during the last ten-year period was 813,275 tons.

The following table shows the mines at which fatal accidents occurred during 1958, with comparative figures for 1957:—

| Mine | Mining Division | Number of Fatal Accidents | |
|---|---|---|---|
| | | 1958 | 1957 |
| Birkett Creek | Nicola | 1 | .... |
| Britannia | Vancouver | .... | 3 |
| Emerald | Nelson | 1 | .... |
| Pine Creek Placer | Atlin | 1 | .... |
| Texada Mines | Vancouver | 1 | .... |
| Granduc | Skeena | .... | 1 |
| Tulsequah | Atlin | .... | 2 |
| Violamac | Slocan | .... | 1 |
| Western Nickel | Vancouver | .... | 1 |
| Totals | | 4 | 8 |

The following table classifies fatal accidents as to cause and location:—

| Cause | Number | Location |
|---|---|---|
| Fall of ground | 2 | Underground. |
| Struck by rolling rock | 1 | Underground. |
| Drowned | 1 | Surface. |
| Total | 4 | |

A description of all fatal accidents follows.

John Daniel MacDonald, aged 52, Canadian, married, and employed as a miner at Canadian Exploration Limited, Salmo, was killed by a rolling rock in the 3556 scram drift in the Emerald mine on July 27th, 1958, at about 11.35 a.m.

The 3556 scram drift rises to the north for about 150 feet at an angle of about 25 degrees. An open stope, above and to the east, provides the ore for the scram drift. A 10-horsepower air slusher hoist is set up at the south end of the drift, and it moves a 36-inch scraper down the slope to the grizzly in front of the hoist.

There were no witnesses to the accident. MacDonald was operating the slusher at lunch time, and when his partner returned one-half hour later, MacDonald was found slumped over the controls with the motor running. The top of his skull was crushed. A disk-shaped rock weighing about 400 pounds was lying at his side. It is assumed the rock tumbled into the scraping channel and then rolled down the slusher trench, gaining sufficient momentum to continue across the grizzly to strike MacDonald with considerable force.

An inquest was held at Salmo on July 31st and the coroner's jury returned the following verdict:—

" We, the jury, duly sworn and empaneled July 28th, 1958, to enquire into the death of John Daniel MacDonald do find that the deceased John Daniel MacDonald of Salmo, B.C., came to his death from a fractured skull caused by a flying rock received while working underground at the Emerald mine. He died between 11.35 a.m. and 12.05 p.m. July 27th, 1958. We feel that no blame is attached to anyone. We do however feel that the Company management give consideration to placing of guards in front of slusher hoists operating where scraping angle is over 15 degrees."

No previous incidents of rolling rock had been reported for this scraper drift, and thus the hazard had not been foreseen. However, it is apparent some sort of guard might have halted or diverted the rock, and thus the verdict is concurred with. It has also been recommended that for similar set-ups the slusher hoist could be located in an offset or less-exposed position.

Robert Gordon Chisan, aged 26, Canadian, married, and employed as a miner at Birkett Creek Mine Operators Limited, Merritt, was instantly killed by a fall of rock at the face of the 3500 level adit on November 1st, 1958, at 2.05 p.m.

The 3500 level adit is 9 by 9 feet in finished size and had been driven 547 feet from the portal at the time of the accident. For the first 350 to 400 feet the drift was in overburden. At about 400 feet from the portal the drift entered weak rock which was broken by fractures and slips with smooth, slickensided surfaces. The drift was timbered from portal to face with 10- by 10-inch sets comprising posts, sill, and cap-piece. These were normally set about 4 feet apart, but in places were set as close as 1 foot apart. The backs of the sets were lagged with 3- by 10-inch timber. From the last set to the face, spiling was driven. This comprised 10-foot diamond-drill rods which were driven about 4 inches apart into holes drilled in the face.

On the day of the accident Chisan was working with W. Ryder and E. Grams, the latter being the drift leader. On the previous shift the upper portion of the cut had been mucked out and the spiling rods had been driven forward and set in position. At

about noon the men drilled and blasted three short lifters. These were 2-foot holes with one stick of powder in each (very little blasting was required in this ground). Chisan then mucked out the face, loading about ten cars, and having done this he extended the air-duct and water-pipe. Meanwhile, Grams barred down the face and, as stated later, was of the impression that the ground seemed to be getting harder.

The men then set the sill in position, after which they all went out to fetch the timber for the posts and cap-piece. While the men were out fetching timber, Stan Hill, the tunnel foreman, went in and examined the face. He found everything normal at this time. The men then returned to the face and began to erect the set. Grams and Ryder set the post on the right side of the drift and were bracing it while Chisan was cleaning muck off the sill on the left side ready to set the other post. Stan Hill was standing on the right side of the drift supervising the work. Suddenly the men heard a sound of falling rock and when they looked around they saw that a large piece of rock had rolled off the bottom part of the left side of the face and had fallen on Chisan, knocking him to the floor of the drift and trapping him. The rock was originally about 4 by 4 by 1¼ feet, weighing about 600 pounds, but broke into three pieces after it had struck Chisan and fell to the floor of the drift. The men quickly released Chisan, but he was apparently dead. He was brought out of the mine and taken to Merritt hospital, where he was examined by Dr. Hewson and found to be dead. Death was later found to be due to multiple fractures involving the base of the skull with severe brain damage.

The inquest was held on November 10th at the Merritt court-house. The verdict was as follows:—

" We, the jury, find that Robert Gordon Chisan met his death at the Birkett Creek mine at about 2 p.m. on November 1st due to a fall of rock. The cause of death was multiple fractures of the skull. We find that no blame is to be attached to anyone."

The verdict of the inquest is concurred with. The ground was known to be very weak and badly fractured. It was difficult to scale effectively, but most of the broken material was small in size. Every part of the adit had been well timbered throughout, and further safety measures are difficult to suggest other than continual, careful observation and checking of the face. The most dangerous operation is undoubtedly the timbering, as this is the time when men must stand closest to the face. It would appear from the position of Chisan after the accident that he probably was partly turned with his back to the face at the time.

Fred William Giesen, aged 65, Canadian, and working as a self-employed miner in the Pine Creek Placer mine near Atlin, was smothered by a fall of ground at the face of a short adit on November 11th, 1958, at about 3.30 p.m.

The adit in which the accident occurred had been driven 16 feet from the portal. It was a prospect drift and was in unconsolidated material. It was 9 feet wide and timbered, but the timber used was very old and dried out and all 6 inches or less in diameter. No footsills or dividers were installed. On the day of the accident the deceased's partner, Karl Sieger, an inexperienced miner, was working upstream about 500 feet away. He observed Giesen at 3 p.m., but when he visited the adit at 3.40 p.m. he discovered a cave-in near the face and presumed Giesen was buried. Sieger could do little without help, and this was obtained shortly after from Atlin, 6 miles away. The body was recovered from under 3½ feet of gravel and sand. Artificial respiration was given but without success.

Later investigation revealed that a set of timber had broken at the face, permitting a run of loose gravel and sand. From the position of the body it would appear Giesen had tried to escape, but had been struck by the run, rendered unconscious, and, when covered by sand, suffocated.

The accident was due to poor timbering being done, and it would seem that the deceased, although an experienced man, had complete disregard for his own safety.

George Humphrys, aged 63 years, Canadian, married, and employed as master mechanic at Texada Mines Ltd., Vananda, lost his life by drowning on December 9th, 1958, at 12.15 p.m.

At the inquest held in Powell River on December 12th, 1958, the Coroner's jury brought in the following verdict:—

"We, the members of the jury, find that George Humphrys came to his death by drowning as a result of a motor vehicle accident about 2 miles from Gillies Bay, Texada Island, B.C., on the private road of Texada Mines Ltd., on the 9th day of December between 12 noon and 1.00 p.m., with no blame attached to anyone."

The private road of Texada Mines Ltd. extends from the camp to the open-pit iron mine, a distance of 4 miles. About 2 miles from the mine the road curves and crosses a sand and gravel fill about 400 feet long and 20 feet deep. The road is about 25 feet wide. It is usual procedure for the staff to leave the mine at 12 noon in various trucks and motor-vehicles, almost in convoy, and travel to the camp for lunch. On December 9th this procedure was carried out. George Humphrys was the last to leave, but did not show up for lunch. The driver of one of the trucks returning from lunch at about 12.35 p.m. noticed peculiar tracks leading off the road where it crosses the fill. He investigated and found a motor-vehicle lying upside down in 6 feet of accumulated water behind the fill. No one was in the truck and some time elapsed before the body of Humphrys was located by probing from a boat.

The pond was drained, but nothing else was found. The truck involved was in good driving condition. It is thought that Humphrys, being late for lunch, might have been travelling too fast on entering the curve and lost control, to run off the road. There were no skid marks to indicate the brakes had been used.

## FATAL ACCIDENTS AND ACCIDENTS INVOLVING LOSS OF TIME

Four fatal accidents and 139 accidents involving a loss of time of seven days or more were reported to the Department. These were investigated and reported on by the Inspectors of Mines.

The following three tables classify these accidents as to cause, occupation, and as to the parts of the body injured. The fourth table lists all compensable non-fatal accidents over a ten-year period and relates these accidents to the number of persons employed and tons mined.

ACCIDENTS CAUSING DEATH OR INJURY CLASSIFIED AS TO CAUSE

| Cause | Number of Accidents | Percentage of Total |
|---|---|---|
| Blasting | 1 | 0.7 |
| Falls of ground | 22 | 15.4 |
| Falls of material and flying material | 9 | 6.3 |
| Falls from ladders, staging, etc. | 2 | 1.4 |
| Slipping and falling | 36 | 25.1 |
| Lifting and handling material, etc. | 37 | 25.9 |
| Machinery and tools | 17 | 11.9 |
| Run of ore or waste | 3 | 2.1 |
| Burns and shock | 3 | 2.1 |
| Miscellaneous | 13 | 9.1 |
| Totals | 143 | 100.0 |

## Accidents Causing Death or Injury Classified as to the Occupation of Those Injured

| Occupation | Number of Accidents | Percentage of Total |
|---|---|---|
| Underground— | | |
| Barmen | 4 | 2.8 |
| Chutemen | 4 | 2.8 |
| Haulagemen | 12 | 8.4 |
| Miners | 74 | 51.7 |
| Muckers | 8 | 5.6 |
| Timbermen | 9 | 6.3 |
| Repairmen | 6 | 4.2 |
| Trackmen and pipe-fitters | 2 | 1.4 |
| Skip-tenders | 1 | 0.7 |
| Miscellaneous | 9 | 6.3 |
| Supervisors and staff | 4 | 2.8 |
| Surface— | | |
| Shops | 1 | 0.7 |
| Mill | 2 | 1.4 |
| Surface, general | 7 | 4.9 |
| Totals | 143 | 100.0 |

## Accidents Causing Injury Classified as to Parts of the Body Injured

| Location | Number of Accidents | Percentage of Total |
|---|---|---|
| Head and neck | 11 | 7.7 |
| Eyes | 5 | 3.5 |
| Trunk | 10 | 7.0 |
| Back (including shoulders) | 37 | 25.9 |
| Arms (including wrists) | 11 | 7.7 |
| Hands and fingers | 21 | 14.6 |
| Legs and ankles | 28 | 19.6 |
| Feet | 16 | 11.2 |
| Fatal | 4 | 2.8 |
| Totals | 143 | 100.0 |

## Compensable Non-fatal Accidents Related to Tons Mined and Men Employed

| Year | Number of Compensable Accidents | Number of Persons Employed | Frequency per 1,000 Persons | Tons Mined |
|---|---|---|---|---|
| 1949 | 1,161 | 6,961 | 167 | 6,125,460 |
| 1950 | 1,051 | 7,073 | 148 | 6,802,482 |
| 1951 | 1,170 | 8,787 | 133 | 6,972,400 |
| 1952 | 1,345 | 9,610 | 140 | 9,174,617 |
| 1953 | 965 | 7,105 | 136 | 9,660,281 |
| 1954 | 790 | 6,293 | 126 | 8,513,865 |
| 1955 | 756 | 6,208 | 107 | 9,126,902 |
| 1956 | 694 | 6,507 | 122 | 8,827,037 |
| 1957 | 627 | 5,678 | 110 | 7,282,436 |
| 1958 | 485 | 4,353 | 111 | 6,402,198 |

## DANGEROUS OCCURRENCES

Twenty-two dangerous occurrences were reported as required by section 9 of the "Metalliferous Mines Regulation Act" and were investigated by the Inspectors of Mines. This represents an increase of 22 per cent from the eighteen reported for 1957.

Of these occurrences, nine were connected with hoisting, six with explosives, two with electricity, two with subsidence, one with fire, one with gas inflow, and one with rock bump.

On February 24th, 1958, an explosion took place when a miner at the Reeves MacDonald mine apparently drilled into a small amount of explosives not detonated by the previous blast. He was not injured. It was ruled he had not thoroughly examined the face previous to drilling and, as a consequence, his blasting certificate was suspended for a period of three months.

On March 16th, 1958, at the Bluebell mine a short circuit in the ventilating system allowed a dangerous concentration of carbon dioxide gas, which was being released from the rock strata, to accumulate in the main shaft area between No. 8 and No. 6 levels. The ventilating system was revised and the gas was removed before any person suffered from it.

On March, 1958, a fire of unknown origin destroyed a warehouse and its contents at the New Cronin Babine mine.

On April 15th, 1958, the cage-tender at the No. 3 shaft of Pioneer mine was preparing to clean out the east skip, for which operation it was necessary to raise the skip high in the dump. While the hoistman was doing so, the bottom limit switch on the west side came into operation and the power kicked off. Using the backout switch, the hoistman raised the west skip about 4 feet after disengaging the clutch on the east side. The hoistman attempted to re-engage the clutch, but before it was fully engaged he released the brake and the west skip then fell freely past the limit switch, which set the brakes. This stopped the skip after the drum turned about 12 feet beyond the bottom limit, which was sufficient to allow the rope to twist into two tight loops. There was no damage to the skip and, as no one was riding, there was no injuries.

On May 8th, 1958, the surface skips at the Merry Widow mine of Empire Development Company Limited ran away, with resultant damage to the hoisting-rope and other equipment. The hoistman was lowering ore at the time. The hoist, which was powered by a wound rotor induction motor, was held to full speed, when lowering a load, by regenerative braking. However, at the time of the incident the generators were tripped off the line either by reverse current generated by the hoist motor or inadvertently from some other cause. This left the motor without excitation current and, since no power would be produced, the hoist ran away. Unfortunately, the auxiliary automatic brake was inoperative as it had just previously been dismantled for repairs. The operating brakes are applied hydraulically, assisted by weights, but with the power off the weights alone did not apply sufficient pressure to effect a quick stop. The skips reached the end of the run with sufficient speed to shear the cable clamps and this allowed the rope to slide down the incline. It had to be discarded. Adjustments were made to the braking system to prevent a recurrence of this incident.

On May 13th, 1958, the north skip in the inclined No. 5 shaft of Pioneer mine jumped the track when travelling down empty and became wedged in the shaft. Derailment was evidently due to a rock becoming wedged in the bottom guide shoe.

On May 24th, 1958, a large area of the tailings dump at the Mineral King mine collapsed suddenly and slid into Toby Creek. A workman employed on the dump managed to scramble to safety. It is suspected a section of the dump had become undermined by water.

On June 7th, 1958, four electricians were removing a 2,300-volt oil switch in the Jersey mine of Canadian Exploration Limited when the foreman inadvertently closed the main switch from another location. Severe arcing took place, but the workmen were able to leave the working-place without injury. As a result of this incident, changes were made in operational procedure so that it would be necessary for each employee working on equipment powered by electricity to lock the control switch in the open position with his own padlock and each person so doing to remove only his own padlock on completion of the work.

On July 2nd, 1958, a timber-car, which had been hung below the cage in the No. 2 shaft of Pioneer mine, swung loose in the shaft and several shaft timbers were broken when the cage was lowered. The timber-car has retractable guide-shoes which either had not been locked in position or had become disengaged.

On July 7th, 1958, a descending cage in the No. 2 shaft of Pioneer mine was stopped by a shaft timber which had loosened and projected into the cage compartment of the shaft. About 2,000 feet of rope was unwound from the hoist drum before the incident was discovered. Two men were in the cage but neither was injured. The rope was sufficiently damaged to require replacement.

On July 21st, 1958, a miner was trapped by a run of muck from a draw-hole in a slusher drift in the Sullivan mine while he was preparing to bulldoze a hang-up in the draw-hole. He was buried up to his shoulders and on removal was found to have suffered a broken leg. He was alone at the time of the incident, and thus it is fortunate the fuse for the bulldoze had not been ignited.

On July 26th, 1958, a slusherman was preparing to bulldoze seven large rocks in a scram drift in the Reeves MacDonald mine. He was in the process of lighting the third bulldoze when one of the other two ignited charges exploded. Seven to ten sticks of Stopeite were in the charge, but fortunately the slusherman was shielded from the direct line of fire by a large boulder. He suffered a ruptured ear-drum and shock, but was led to safety by a near-by miner before the other charges exploded. It is believed that the premature explosion was caused by a rock rolling down from a draw-point and striking one of the ignited charges.

On August 6th, 1958, a workman at the Cowichan Copper mine suffered a broken leg and a severe gash on the chin when he returned too soon to the scene of a blast. He had lit two shots but returned on hearing one report. The workman did not have a blasting certificate and apparently acted on his own initiative.

On August 8th, 1958, the floor of a section of drift in No. 8 level of the Bluebell mine suddenly heaved up a height of 1 foot. The drift was being driven close to a zone where carbon dioxide gas and water had been released. This area had been cement grouted under high pressure, and it was thought that this pressure had relieved itself through the heaving of the floor of the drift.

On September 8th, 1958, an aluminum angle forming part of the bail of the skip in the No. 3 shaft of Pioneer mine broke while muck was being dumped. The hoistman suspected something was wrong, and thus the defect was discovered before there were more serious consequences.

On October 22nd, 1958, a load of diamond-drill rods 10 feet long became loose while being hoisted in the cage in the No. 2 shaft of Pioneer mine. The rods, standing vertically, had been chained together slightly below the mid-point. Considerable damage was caused to the cage and the shaft timber.

On October 24th, 1958, there was considerable damage to the hoisting-rope and shaft guides of the No. 1 shaft, Cariboo Gold Quartz mine, when the cage became stuck in the cage compartment and the unwinding rope looped into the adjoining skip compartment, to be caught by the ascending skip. The incident occurred during the initial run at the start of a shift, and thus no persons were involved.

On October 28th, 1958, a violent explosion occurred at a blacksmith's forge in the surface car-repair shop at the Sullivan mine while two 1½-inch hollow extension sprags were being heated preparatory to sharpening the points. The sprags were destroyed, and fragments of the sprags were blown through the roof of the building. Fifty panes of glass in windows at various points in the building were also smashed by the blast. Five men were injured, four of whom had minor superficial wounds which did not result in loss of work. An inquiry held at the mine failed to disclose the cause of the explosion, but it is suspected there was some explosive in one of the sprags.

On November 18th, 1958, two men at the French mine received flash burns to their eyes from an electric arc which occurred while they were attempting to close a crusher-motor magnetic starter switch with the door of the control box open and the power on. Instructions have been issued which prohibit the closing of any switch until the door is closed and secured.

On December 4th, 1958, the skip in the No. 2 inclined shaft of Reeves MacDonald mine was derailed during descent. It proceeded in this manner for 50 feet, coming to rest against a divider. The hoistman stopped the hoist when he noticed the motor amperage had decreased. Two men were in the skip but were not injured. The cause of the derailment was not revealed, but guides have been installed to prevent a recurrence of this type of incident.

On December 9th, 1958, two miners employed at the 42-H-5 raise at the Sullivan mine inadvertently ignited a quantity of primacord which had fallen into the raise during blasting operations. Three workmen at the bottom of the raise narrowly escaped injury. The blasting certificates of the two miners were suspended for a month for not taking sufficient precautions.

On December 9th, 1958, a small explosion occurred at the Reeves MacDonald mine when a slusherman struck a rock with a large rock hammer. The workman was struck in the face by rock particles, his safety glasses were broken, and he was knocked down. It is believed that a small amount of explosives had been on the rock and had detonated on being struck.

## PROSECUTIONS

Gold Dot Mining Company Limited was prosecuted at Boston Bar on November 28th, 1958, under General Rule 24 (*a*) of the "Metalliferous Mines Regulation Act" for erecting an unapproved magazine on a road to its mining property west of Kanaka. The company pleaded guilty and was fined $15 and costs.

Sheep Creek Mines Limited was prosecuted by the Fish and Game Branch of the Department of Recreation and Conservation at Kimberley on June 28th, 1958, for allowing mill tailings from the Mineral King mine to pollute Toby Creek (*see* "Dangerous Occurrences"). The company was found guilty and fined $25 and costs.

There were violations of the provisions of the "Metalliferous Mines Regulation Act" in regard to the use of explosives and blasting procedure. Six offenders had their blasting certificates suspended from one to twelve months, according to the type of offence.

## EXPLOSIVES USED IN MINES

The table below shows the quantities of explosives and blasting accessories used in metal mines and quarries in British Columbia in 1954, 1955, 1956, 1957, and 1958:—

| | 1954 Total | 1955 Total | 1956 Total | 1957 Total | 1958 Total | 1958 | |
|---|---|---|---|---|---|---|---|
| | | | | | | Mines | Quarries |
| High explosives (lb.) | 7,652,574 | 8,420,791 | 8,560,000 | 7,103,000 | 5,485,000 | 5,179,000 | 306,000 |
| Blasting-caps | 1,815,250 | 1,982,900 | 2,184,000 | 1,676,000 | 1,244,000 | 1,194,000 | 50,000 |
| Electric blasting-caps | 232,270 | 151,685 | 52,000 | 64,000 | 84,000 | 46,000 | 38,000 |
| Delay electric blasting-caps (short period) | 191,513 | 283,000 | 205,000 | 160,000 | 129,000 | 118,000 | 11,000 |
| Delay electric blasting-caps (sure-fire delays and X107 delays) | 70,300 | 144,875 | 263,000 | 127,000 | 128,000 | 128,000 | |
| Primacord (ft.) | 824,000 | 399,000 | 226,000 | 261,000 | 574,000 | 460,000 | 114,000 |
| B-line detonating fuse (ft.) | | | 2,436,000 | 2,049,000 | 2,197,000 | 2,017,000 | 180,000 |
| Safety fuse (ft.) | 13,429,800 | 17,744,900 | 17,218,000 | 13,367,000 | 11,272,000 | 11,010,000 | 262,000 |
| Ignitercord (ft.) | 206,180 | 418,800 | 498,000 | 639,000 | 469,000 | 464,000 | 5,000 |
| Ignitercord connectors | 160,501 | 371,000 | 563,000 | 750,000 | 610,000 | 604,000 | 6,000 |
| Ammonium nitrate | | | | 5,000 | 190,000 | 160,000 | 30,000 |

A drop of 12.08 per cent in quantity of ore mined for 1958 as compared to that mined in 1957 is mainly responsible for the drop of 23 per cent in high explosives used over the same period. This drop in high explosives was offset somewhat by the large increase in the use of ammonium nitrate, which first made its appearance as a blasting agent in British Columbia in 1957. This compound, when sensitized with fuel-oil, constitutes a powerful explosive. As such the preparation comes under the control of the Chief Inspector of Explosives at Ottawa. Written permission must first be obtained from him before the blasting agent can be mixed or used. Permission must also be obtained from the Chief Inspector of Mines, Victoria, when the blasting agent is used in mines and quarries in British Columbia. Four permits were issued in 1958, bringing the total to six—three to open-pit mines and three to quarries. The main condition of the permits was that the blending of "prilled" ammonium nitrate with fuel oil take place on site as it is being loaded into the bore-hole, or just previous to this. Ammonium nitrate and fuel oil is not a permissible explosive for underground use.

## UNDERGROUND DIESEL EQUIPMENT

There were no significant changes in underground diesel equipment in 1958. Locomotives in use amounted to sixteen, and miscellaneous pieces of equipment, such as trucks, loaders, bulldozers, etc., totalled about thirty. Three of the locomotives were used in coal mines; the remainder of the equipment was used in metal mines.

No unsatisfactory working conditions were reported where this equipment was used. The upper permissible limit of carbon monoxide in diesel exhaust gases was lowered to 0.1 per cent from 0.25 per cent unless laboratory methods of analysis are used. There is a real need of portable equipment for accurate analysis.

## DUST CONTROL AND VENTILATION

Inflows of carbon dioxide gas at Bluebell, high mine-air temperatures in the deep workings at Bralorne, release of sulphur dioxide gas from backfill at Sullivan, dry drilling at an asbestos mine, and dry drilling and crushing at gypsum and limestone quarries were special problems requiring the attention of the mine operators and the Inspectors of Mines. Continuing progress was made in improving ventilation to remove the normal mining contaminants of dust, diesel exhaust fumes, blasting gases, etc.

Dust counts and ventilation surveys were also made by the staff of the Chief Inspector, Silicosis Branch of the Workmen's Compensation Board, and the results of these surveys were made available to the Chief Inspector of Mines. The following information is taken from the report "Summary of Dust Conditions at British Columbia Metalliferous Mines during the Year 1958":—

"1. During the year 1958, sixty-one ventilation and dust control surveys were made at the metalliferous mines of British Columbia. These were made at forty-three mining operations, eighteen of which were inspected for the second time.

"2. The main object of this inspection work is to lower the amount of dust breathed by the workmen as much as possible. It is not known what concentration of silica dust is considered safe to breathe without producing silicosis, as several other factors besides the dust concentration must be taken into consideration. The figure of 300 particles per c.c. of air has been chosen as an objective to work towards. When this figure is attained, it indicates a very great improvement over conditions existing several years ago.

"3. Blasting operations produce dense concentrations of dust but the workmen are generally not subjected to this dust or subjected to it for short periods of time only. Most of the blasting operations can be arranged to occur at the ends of the shifts and allow sufficient time for ventilation to remove the dust from the workings before the following shift goes to work. A certain amount of blasting operations, such as in chutes, may be considered necessary so that the production of ore may not be interfered with but this should be reduced to the very minimum.

"4. Stoper drilling operations underground consistently produce the highest concentrations of dust during the time the men are working. The dust counts used to be 2,000 or more particles per c.c. of air at these operations. Fifty-eight per cent of the surveys made in 1958 gave averages of less than 1,000 particles.

"5. At leyner, jackleg and plugger drilling operations underground the dust concentrations are not as high as at stoper drilling operations. Since most of the surveys gave less than 1,000 particles, it is probably better to adopt the figure of 500 particles for the purpose of comparison. Sixty-one per cent of the surveys gave averages of less than 500 particles per c.c. of air.

"6. The averages for 'All Other Underground Locations' are very satisfactory. Ninety-three per cent of the surveys made during 1958 gave averages of less than 300 particles. The percentages for the past nine years have remained fairly constant, varying between 76 and 93 per cent. This condition is particularly satisfactory when considering the fact that the great majority of the men work in this lower dust concentration.

"7. The dust concentrations in the crushing plants during 1952 were not satisfactory. During 1953 and subsequent years, a special effort was made to control the dust in these plants and satisfactory results have been obtained. Seventy-one per cent of the surveys made in 1958 gave averages of less than 300 particles per c.c. of air.

"8. Eighty-four per cent of the surveys made in assay grinding rooms gave averages of less than 300 particles. This is very satisfactory, as it is the highest percentage that has been obtained during the past nine years.

"9. The percentage of certificates of fitness held by the employers for their workmen who require a medical examination has steadily increased during the past five years. In 1958, certificates in good standing for 97.0 per cent of the workmen who require same were held by the employers. This is a very satisfactory condition as there are numerous difficulties to overcome.

"10. Aluminum powder prophylaxis treatments for the prevention of silicosis were given at six mines during the year. No aluminum therapy treatments were given at the Rehabilitation Clinic of the Workmen's Compensation Board in Vancouver to men who have silicosis.

"11. The main measures for dust prevention, suppression and elimination are receiving good attention at the mines. The more important of these are good ventilation, thorough wetting of the rock before it is handled in any manner, not subjecting the workmen to dust and fumes from blasting operations, using good exhaust systems in crushing plants and assay grinding rooms, etc. Full application of all these measures at all times has not been obtained but the results obtained have been quite satisfactory."

## MINE-RESCUE, SAFETY, AND FIRST AID

During 1958 the mine-rescue stations at Cumberland, Fernie, Nelson, and Princeton were fully maintained and an instructor, qualified in mine-rescue and first aid, was on duty at each station. Each station is equipped with sufficient self-contained oxygen breathing apparatus to maintain at least two mine-rescue teams of six men each should any emergency in near-by mines arise. The equipment consists of McCaa two-hour apparatus and Chemox ¾-hour apparatus, as well as all-service gas-masks, self-rescuers, methane and carbon monoxide detectors, inhalators, and a complete supply of first-aid equipment. Supplies and facilities for charging and servicing all this equipment are maintained.

The station at Cumberland is maintained to serve coal mines in the area. There were no emergency calls for the apparatus during 1958, but two requests for oxygen from the local hospital were promptly complied with. A truck is kept at the station for emergency purposes.

The station at Princeton was converted to a mobile unit in 1957. A large panel truck was equipped with all facilities and thus was able to give service over a wide area. Mine-rescue or first-aid training was given at the Cariboo Gold Quartz, Western Nickel, Highland Bell, Bralorne, and French mines. Fire departments at Merritt, Wells, Oliver, and Princeton were also given help with rescue training. The mobile unit gave ambulance service five times while travelling on the highways. The general public also received first-aid instruction in courses held at Princeton, Hedley, and Merritt.

The mobile mine-rescue unit stationed at Nelson continued to be of great assistance in promoting and giving instruction in mine-rescue and first aid at mines in the East and West Kootenay areas. Mine-rescue courses were held at Bluebell, Reeves MacDonald, and Canadian Exploration mines. Assistance at first-aid classes was given at Riondel, Salmo, New Denver, Kaslo, Remac, and Nelson. Fire departments at Nelson, Salmo, and New Denver were given help in apparatus training.

The mine-rescue station at Fernie is maintained principally to serve the coal mines in the area, but mine-rescue training is also given to personnel of the Sullivan mine at Kimberley. The training of new men for mine-rescue work in coal or metal mines continued in 1958 as well as the maintenance of monthly practices for teams. Assistance was given in the first-aid classes at Fernie. The mine-rescue equipment was made available for a major fire which took place in Fernie.

In addition to the mine-rescue equipment maintained at the Government mine-rescue stations, there are sets of McCaa or Chemox apparatus at the Sullivan, Canadian Exploration, Michel, Bridge River, Cariboo Gold Quartz, H.B., Bluebell, Toric, and Mineral King mines. The district instructor makes periodic checks of this equipment.

A certificate of competency in mine-rescue work is granted to each man who takes the full training course and passes the examination set by the Department of Mines. During 1958, in addition to the regular teams in training, seventy-nine men took the full course and were granted certificates, as follows:—

| Certificate No. | Name | Where Trained | Certificate No. | Name | Where Trained |
|---|---|---|---|---|---|
| 3015[1] | James B. Magee | Salmo. | 3055 | Lyle Joseph Jolie | Riondel. |
| 3016 | John William Robinson | Salmo. | 3056 | Cecil Albert Hedge | Riondel. |
| 3017 | Joseph De Anna | Hope. | 3057 | Horace Alexander Mattock | Riondel. |
| 3018 | Roy Martin | Hope. | 3058 | George Hanschen | Wells. |
| 3019 | Werner Tepel | Hope. | 3059 | Delmer M. Bush | Remac. |
| 3020 | Alex M. Laird | Hope. | 3060 | John M. Parker | Remac. |
| 3021 | Herb Krenbrink | Hope. | 3061 | George Fecyk | Remac. |
| 3022 | Elmer Charette | Hope. | 3062 | Matthew Hurzin | Remac. |
| 3023 | Milton Alexander Mellor | Kimberley. | 3063 | John P. Rozek | Remac. |
| 3024 | George Angus Derry | Kimberley. | 3064 | R. Wayne Ritter | Remac. |
| 3025 | George Bruce Crowe | Kimberley. | 3065 | William R. McDonald | Remac. |
| 3026 | Leslie Melvin Carson | Cranbrook. | 3066 | Ronald L. Turner | Remac. |
| 3027 | Jack Jenkins | Kimberley. | 3067 | Joseph Wandinger | Remac. |
| 3028 | Arthur Phillip King | Kimberley. | 3068 | Edward Howes | Remac. |
| 3029 | Robert William Maddison | Fruitvale. | 3069 | Ronald Charles Kozler | Michel. |
| 3030 | Ernest Grams | Salmo. | 3070 | David Johnson Howe | Michel. |
| 3031 | David Copland Fowler | Riondel. | 3071 | Remo Quarin | Natal. |
| 3032 | David Michael Melenius | Riondel. | 3072 | Henry George Beard | Michel. |
| 3033 | Valentine Hummel | Crawford Bay. | 3073 | Floyd Raymond Miles | Natal. |
| 3034 | Norman George Bonnell | Riondel. | 3074 | Joseph Benjamin R. Walkley | Natal. |
| 3035 | Arnold Leo Spence | Crawford Bay. | 3075 | Jack Louis DeLuca | Natal. |
| 3036 | Henry Peter Bartels | Crawford Bay. | 3076 | Jack Andrew Fontana | Michel. |
| 3037 | Ernest Hugo Kriese | Riondel. | 3077 | Gino Cumbaro | Beaverdell. |
| 3038 | John Nick Chernoff | Riondel. | 3078 | Jock Buckendahl | Beaverdell. |
| 3039 | Ross Mowbray Wakely | Kootenay Bay. | 3079 | Bruno E. Goetting | Beaverdell. |
| 3040 | Paul Szczerba | Riondel. | 3080 | Phillip Lessard | Beaverdell. |
| 3041 | Peter Badyk | Riondel. | 3081 | Arthur A. Gill | Beaverdell. |
| 3042 | Eugene Ernest Fontaine | Riondel. | 3082 | Lorne Morrow | Beaverdell. |
| 3043 | Roy Robert Eddy | Crawford Bay. | 3083 | Floyd Arnold Munter | Beaverdell. |
| 3044 | Adolph Wastrodowski | Kootenay Bay. | 3084 | Arnold R. Zelmer | Beaverdell. |
| 3045 | John Everett Strong | Crawford Bay. | 3085 | Ken Worrall | Beaverdell. |
| 3046 | Patrick Alois Peterson | Balfour. | 3086 | Joseph John Tokios | Beaverdell. |
| 3047 | Gerald Byron Bishop | Riondel. | 3087 | John DeYaeger | Beaverdell. |
| 3048 | Hans Christian Christensen | Riondel. | 3088 | Patrick Ferguson | Beaverdell. |
| 3049 | William Robert Hay | Riondel. | 3089 | Charles Eugene Gobert | Bralorne. |
| 3050 | Ivan Roy Staples | Riondel. | 3090 | Giulio Pierobon | Bralorne. |
| 3051 | Joseph William Gairdner | Crawford Bay. | 3091 | Charles Harry Say | Bralorne. |
| 3052 | Derek Vane Pollard | Riondel. | 3092[2] | Bruce Hawkins | Riondel. |
| 3053 | George Rolick | Riondel. | 3093 | Edward Kruger | Bralorne. |
| 3054 | Hans Kurt Grossman | Riondel. | | | |

[1] Substitute for No. 2530.
[2] Substitute for No. 2771.

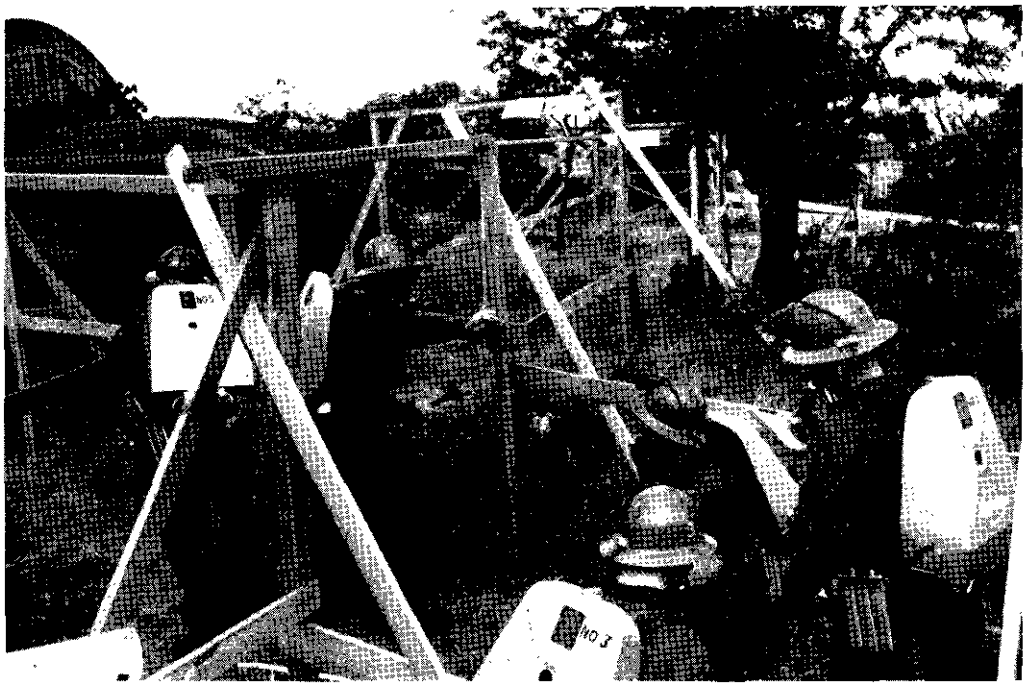
The Mine Safety Associations in different centres of the Province, sponsored by the Department of Mines and aided by company officials, safety supervisors, Inspectors of Mines, and mine-rescue instructors, continued to promote mine-rescue, first-aid, and safety education in their respective districts.

The Vancouver Island Mine Safety Association held its annual competition in Cumberland on May 31st, 1958. Three teams competed—two from the Tsable River mine and a visiting team from the Western Nickel mine. The winning team was from the Tsable River mine and was captained by J. Thomson.

The Central British Columbia Mine Safety Association held its annual competition at Hope on June 7th, 1958. Six teams took part in this competition. They represented Bralorne, Cariboo Gold Quartz, Highland Bell, Pioneer, and Western Nickel mines. The Western Nickel team, captained by A. Wells, took first place.

The West Kootenay Mine Safety Association held its annual competition at Salmo on June 14th, 1958. Six teams took part in this competition—two from the Bluebell mine, one from Canadian Exploration Limited, one from the H.B. mine, and two from the Reeves MacDonald mine. A Bluebell team, captained by B. Ramage, took first place.

The East Kootenay Mine Safety Association held its annual competition at Kimberley on June 21st, 1958. Four teams took part in this competition—two from Kimberley, one from Fernie, and one from Michel. First place was won by the Fernie team, captained by A. Littler.



Provincial mine-rescue competition, Victoria, June 28th, 1958.
Team wearing compressed-oxygen breathing apparatus.

Victoria competition. Team wearing chemically generated oxygen breathing apparatus.

At all meets, competitions were held in first-aid as well as mine-rescue work. In these competitions, events were also held for women and juniors. Representatives from other industries and organizations not necessarily directly connected with mining also participated.

Competitions were also sponsored by mining companies. Two first-aid competitions were held at Bralorne—one in April by Bralorne Mines Limited and one in November by the Bridge River Valley Mine Safety Association. In May The Consolidated Mining and Smelting Company of Canada, Limited, held a mine-rescue competition at Chapman Camp as an elimination contest for entry in the annual competition of the East Kootenay Mine Safety Association.

The third Provincial mine-rescue competition was held at Victoria on June 28th, 1958. The winning teams from the Cumberland, Hope, Salmo, and Kimberley events competed for a trophy and silver trays. The event was won by the Tsable River team, captained by J. Thomson. In conjunction with the competition the Workmen's Compensation Board sponsored the second Provincial first-aid competition. Teams competed which had won local events at Cumberland, Hope, Victoria, Salmo, Kimberley, and Port Mellon. The winning team was from Howe Sound Pulp Division, Canadian Forest Products Ltd., and was captained by C. Mahlman.

## JOHN T. RYAN TROPHY

The John T. Ryan Regional Safety Award for the metal mine with the lowest accident-frequency record for 1958 was won by the H.B. mine of The Consolidated Mining and Smelting Company of Canada, Limited, at Salmo. To win this trophy the H.B. mine completed the year without an accident involving loss of time of over six days. This record also won the Dominion Ryan Trophy, which had only once before been won by a mine in British Columbia. The company's safety organization, officials, and employees deserve high praise for this achievement.

The 1958 regional safety award for coal mines was won by the Tsable River mine of Canadian Collieries Resources Limited, near Cumberland. This is the fourth year in succession that this mine has won the award. The company's safety programme has thus been quite effective.

## BRITISH COLUMBIA MINING ASSOCIATION, SAFETY DIVISION

In 1955 the Mining Association of British Columbia set up a Safety Division with the object of promoting and assisting in establishing and maintaining effective safety programmes at its member mines. These programmes have been quite effective since 1955, as indicated by a decrease in the frequency of all types of accidents. During 1958 this decrease was further accentuated by a decrease in fatalities and the serious maiming type of injuries. Five courses in mine safety and job instruction were given. Visits were made by the safety director to member mines, where meetings were held with supervisors and reports made giving recommendations on practices and conditions found at these mines. Monthly accident statistics were compiled and issued to member mines.

## WEST KOOTENAY MINE SAFETY ASSOCIATION TROPHY

The West Kootenay Mine Safety Association in 1951 donated a safety trophy for annual competition in order to encourage and promote safety in small mines not eligible for the John T. Ryan awards. At first the trophy was restricted to mines in the West Kootenay area, but in 1956 this restriction was removed.

The award is made to the mine having the lowest accident rate and working a total of from 2,500 to 30,000 shifts per year, one-third of these having been worked underground. An accident is taken as one which involves more than three days' loss of time.

In 1958 the award was won by the French mine near Hedley and was presented at a joint meeting of the West Kootenay Mine Safety Association and the Nelson branch of the Canadian Institute of Mining and Metallurgy in Nelson on March 14th, 1959. The French mine completed the year without a single compensable accident. This commendable record had only been achieved once before in the history of the award.

# Coal

By Robert B. Bonar, Deputy Chief Inspector of Mines

CONTENTS



## PRODUCTION

The gross output in short tons of the coal mines of the Province for 1958 was 882,962 tons, a decrease of 338,804 tons or 27.7 per cent from 1957. A total of 138,005 tons came from strip mines at Michel and Tent Mountain.

The Vancouver Island District produced 182,304 tons, a decrease of 17,901 tons or 8.9 per cent from 1957.

The Northern District production was 8,327 tons, an increase of 178 tons or 2.2 per cent over 1957.

The Nicola-Princeton District production was 689 tons, a decrease of 18,088 tons or 96.4 per cent from 1957.

The East Kootenay District production was 691,642 tons, a decrease of 302,993 tons or 30.6 per cent from 1957.

## Output and per Capita Production, 1958

| Colliery and Mine | Gross Output Mined during Year (Tons) | Days Worked | Total Number of Employees | Daily Output per Employee (Tons) | Yearly Output per Employee (Tons) | Number of Employees Underground | Daily Output per Underground Employee (Tons) | Yearly Output per Underground Employee (Tons) |
|---|---|---|---|---|---|---|---|---|
| Tsable River Colliery | 178,366 | 233 | 308 | 2.49 | 579 | 208 | 3.68 | 857 |
| Chambers No. 5 mine | 705 | 131 | 4 | 1.34 | 176 | 3 | 1.79 | 235 |
| Loudon No. 6 mine | 315 | 143 | 2 | 1.10 | 157 | 1 | 2.20 | 315 |
| Lewis mine (Timberlands) | 680 | 145 | 2 | 2.34 | 340 | 2 | 2.34 | 340 |
| Carruthers and Wakelam No. 3 | 428 | 136 | 2 | 1.57 | 214 | 2 | 1.57 | 214 |
| Stronach No. 2 mine | 467 | 124 | 2 | 1.88 | 233 | 2 | 1.88 | 233 |
| Undun mine | 462 | 127 | 2 | 1.82 | 231 | 2 | 1.81 | 231 |
| Extension mine (Brodrick) | 842 | 240 | 3 | 1.17 | 280 | 3 | 1.17 | 280 |
| Big Flame mine | 18 | 15 | 2 | ..... | ..... | 2 | ..... | ..... |
| White mine | 21 | 51 | 2 | ..... | ..... | 2 | ..... | ..... |
| Princeton Blue Flame No. 2 | 132 | 15 | 3 | 2.93 | 44 | 3 | 2.93 | 44 |
| Princeton Blue Flame No. 3 | 14 | 3 | 2 | ..... | ..... | 2 | ..... | ..... |
| Coldwater mine | 543 | 225 | 3 | 0.80 | 181 | 3 | 0.80 | 181 |
| Bulkley Valley Collieries | 5,233 | 115 | 14 | 3.25 | 374 | 10 | 4.55 | 523 |
| Reschke mine | 782 | 105 | 3 | 2.48 | 260 | 2 | 3.72 | 391 |
| Gething mine No. 3 | 2,312 | 180 | 7 | 1.83 | 330 | 6 | 2.14 | 385 |
| Elk River Colliery[1] | 16,235 | 13 | 311 | ..... | ..... | 239 | ..... | ..... |
| Michel Colliery (underground) | 537,402 | 176 | 694 | 4.40 | 774 | 559 | 5.46 | 961 |
| Michel Colliery (strip) | 106,861 | 176 | 16 | ..... | ..... | ..... | ..... | ..... |
| Coleman Collieries (strip) | 31,144 | 45 | 14 | ..... | ..... | ..... | ..... | ..... |

[1] Mine closed January 31st, 1958.

## District Output and per Capita Production, Underground Mines, 1958

| District | Gross Output Mined during Year (Tons) | Total Number of Employees at Producing Collieries | Yearly Output per Employee (Tons) | Number of Men Employed Underground in Producing Collieries | Yearly Output per Underground Employee (Tons) |
|---|---|---|---|---|---|
| Vancouver Island | 182,304 | 308 | 592 | 222 | 821 |
| Nicola-Princeton | 689 | 8 | 86 | 8 | 86 |
| Northern | 8,327 | 24 | 347 | 18 | 462 |
| East Kootenay | 537,402[1] | 694 | 774 | 559 | 961 |
| Whole Province | 728,722 | 1,034 | 705 | 807 | 903 |

[1] Elk River production excluded as mine closed January 31st, 1958.

## Output per Man-shift, Underground Mines, 1949–58

| Year | Man-shifts[1] | Tonnage | Average per Man-shift (Tons) |
|---|---|---|---|
| 1949 | 520,188 | 1,589,131 | 3.05 |
| 1950 | 460,159 | 1,481,813 | 3.22 |
| 1951 | 442,170 | 1,434,974 | 3.24 |
| 1952 | 383,422 | 1,388,732 | 3.62 |
| 1953 | 333,922 | 1,171,932 | 3.51 |
| 1954 | 280,353 | 1,064,023 | 3.79 |
| 1955 | 304,139 | 1,157,813 | 3.86 |
| 1956 | 307,821 | 1,100,434 | 3.57 |
| 1957 | 226,536 | 945,848 | 4.17 |
| 1958 | 204,148 | 728,722 | 3.56 |

[1] Includes both surface and underground workers.

## Collieries of British Columbia, 1958—Production and Distribution, by Collieries and by Districts (in Short Tons)

| Mine | Gross Output | Washery Refuse | Net Output | Used under Companies' Boilers, etc. | Used in Making Coke | Stocks | | | | Sales | | | | Total Coal Sold and Used[1] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | On Hand First of Year | On Hand Last of Year | Added To | Taken From | In Canada | In U.S.A. | Elsewhere | Total Sales | |
| **Vancouver Island District** | | | | | | | | | | | | | | |
| Canadian Collieries Resources Ltd.— | Tons | Tons | Tons | Tons | Tons | Tons | Tons | Tons | Tons | Tons | Tons | Tons | Tons | Tons |
| Tsable River Colliery | 178,366 | 23,822 | 154,544 | 404 | ..... | 20,426 | 24,382 | 3,956 | ..... | 150,184 | ..... | ... | 150,184 | 150,588 |
| Chambers No. 5 mine | 705 | ..... | 705 | ..... | ..... | ..... | ..... | ..... | ..... | 705 | ..... | ..... | 705 | 705 |
| Loudon No. 6 mine | 315 | ..... | 315 | ..... | ..... | ..... | ..... | ..... | ..... | 315 | ..... | ..... | 315 | 315 |
| Lewis mine (Timberlands) | 680 | ..... | 680 | ..... | ..... | ..... | ..... | ..... | ..... | 680 | ..... | ..... | 680 | 680 |
| Carruthers and Wakelam No. 3 | 428 | ..... | 428 | ..... | ..... | ..... | ..... | ..... | ..... | 428 | ..... | ..... | 428 | 428 |
| Stronach mine | 467 | ..... | 467 | ..... | ..... | 110 | 340 | 230 | ..... | 237 | ..... | ..... | 237 | 237 |
| Undun mine | 462 | ..... | 462 | ..... | ..... | ..... | ..... | ..... | ..... | 462 | ..... | ..... | 462 | 462 |
| Extension mine (Brodrick) | 842 | ..... | 842 | ..... | ..... | ..... | ..... | ..... | ..... | 842 | ..... | ..... | 842 | 842 |
| Big Flame mine | 18 | ..... | 18 | ..... | ..... | ..... | ..... | ..... | ..... | 18 | ..... | ..... | 18 | 18 |
| White mine | 21 | ..... | 21 | ..... | ..... | ..... | ..... | ..... | ..... | 21 | ..... | ..... | 21 | 21 |
| Totals, Vancouver Island District | 182,304 | 23,822 | 158,482 | 404 | ..... | 20,536 | 24,722 | 4,186 | ..... | 153,892 | ..... | ..... | 153,892 | 154,296 |
| **Nicola-Princeton District** | | | | | | | | | | | | | | |
| Princeton Blue Flame No. 2 | 132 | ..... | 132 | ..... | ..... | ..... | ..... | ..... | ..... | 132 | ..... | ..... | 132 | 132 |
| Princeton Blue Flame No. 3 | 14 | ..... | 14 | ..... | ..... | ..... | ..... | ..... | ..... | 14 | ..... | ..... | 14 | 14 |
| Coldwater mine | 543 | ..... | 543 | ..... | ..... | ..... | ..... | ..... | ..... | 543 | ..... | ..... | 543 | 543 |
| Totals, Nicola-Princeton District | 689 | ..... | 689 | ..... | ..... | ..... | ..... | ..... | ..... | 689 | ..... | ..... | 689 | 689 |
| **Northern District** | | | | | | | | | | | | | | |
| Bulkley Valley Collieries | 5,233 | ..... | 5,233 | ..... | ..... | 100 | 656 | 556 | ..... | 4,677 | ..... | ..... | 4,677 | 4,677 |
| Reschke mine | 782 | 200 | 582 | ..... | ..... | 300 | ..... | ..... | 300 | 882 | ..... | ..... | 882 | 882 |
| Gething mine No. 3 | 2,312 | ..... | 2,312 | ..... | ..... | ..... | ..... | ..... | ..... | 2,312 | ..... | ..... | 2,312 | 2,312 |
| Totals, Northern District | 8,327 | 200 | 8,127 | ..... | ..... | 400 | 656 | 556 | 300 | 7,871 | ..... | ..... | 7,871 | 7,871 |
| **East Kootenay District** | | | | | | | | | | | | | | |
| Crow's Nest Pass Coal Co. Ltd.— | | | | | | | | | | | | | | |
| Elk River Colliery | 16,235 | 1,537 | 14,698 | 339 | ..... | 563 | ..... | ..... | 563 | 13,002 | 1,920 | ..... | 14,922 | 15,261 |
| Michel Colliery (underground and strip) | 644,263 | 52,285 | 591,978 | 6,935 | 224,408 | 1,673 | 3,972 | 2,299 | ..... | 291,956 | 66,380 | ..... | 358,336 | 589,679 |
| Coleman Collieries (strip) | 31,144 | 2,527 | 28,617 | ..... | ..... | ..... | ..... | ..... | ..... | 28,617 | ..... | ..... | 28,617 | 28,617 |
| Totals, East Kootenay District | 691,642 | 56,349 | 635,293 | 7,274 | 224,408 | 2,236 | 3,972 | 2,299 | 563 | 333,575 | 68,300 | ..... | 401,875 | 633,557 |
| **Coal** | | | | | | | | | | | | | | |
| Grand totals for Province | 882,962 | 80,371 | 802,591 | 7,678 | 224,408 | 23,172 | 29,350 | 7,041 | 863 | 496,027 | 68,300 | ..... | 564,327 | 796,413 |
| **Coke** | | | | | | | | | | | | | | |
| Crow's Nest Pass Coal Co. Ltd.— | | | | | | | | | | | | | | |
| Michel Colliery | 173,919 | ..... | 173,919 | ..... | ..... | 11,076 | 23,754 | 12,678 | ..... | 87,515 | 73,726 | ..... | 161,241 | ..... |

[1] Includes coal used in making coke and coal used under company stationary and locomotive boilers, etc.

## COLLIERIES OF BRITISH COLUMBIA, 1958—MEN EMPLOYED, DISTRIBUTION BY COLLIERIES AND BY DISTRICTS

| Mine | Supervision and Clerical | | | Miners | | | Helpers | | | Labourers | | | Mechanics and Skilled Labour | | | Boys | | | Total Men Employed | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Vancouver Island District** | | | | | | | | | | | | | | | | | | | | | |
| Canadian Collieries Resources Ltd.— | U. | A. | T. | U. | A. | T. | U. | A. | T. | U. | A. | T. | U. | A. | T. | U. | A. | T. | U. | A. | T. |
| Tsable River Colliery | 14 | 12 | 26 | 130 | | 130 | | | | 60 | 36 | 96 | 18 | 38 | 56 | | | | 222 | 86 | 308 |
| Chambers No. 5 mine | 1 | 1 | 2 | 2 | | 2 | | | | | | | | | | | | | 3 | 1 | 4 |
| Loudon No. 6 mine | | 1 | 1 | 1 | | 1 | | | | | | | | | | | | | 1 | 1 | 2 |
| Lewis mine (Timberlands) | | | | 2 | | 2 | | | | | | | | | | | | | 2 | | 2 |
| Carruthers and Wakelam No. 3 | | | | 2 | | 2 | | | | | | | | | | | | | 2 | | 2 |
| Stronach mine | | | | 1 | | 1 | 1 | | 1 | | | | | | | | | | 2 | | 2 |
| Undun mine | | | | 2 | | 2 | | | | | | | | | | | | | 2 | | 2 |
| Extension mine (Brodrick) | | | | 3 | | 3 | | | | | | | | | | | | | 3 | | 3 |
| Big Flame mine | | | | 2 | | 2 | | | | | | | | | | | | | 2 | | 2 |
| White mine | | | | 2 | | 2 | | | | | | | | | | | | | 2 | | 2 |
| Totals, Vancouver Island District | 15 | 14 | 29 | 147 | | 147 | 1 | | 1 | 60 | 36 | 96 | 18 | 38 | 56 | | | | 241 | 88 | 329 |
| **Nicola-Princeton District** | | | | | | | | | | | | | | | | | | | | | |
| Princeton Blue Flame No. 2 | 1 | | 1 | 2 | | 2 | | | | | | | | | | | | | 3 | | 3 |
| Princeton Blue Flame No. 3 | | | | 2 | | 2 | | | | | | | | | | | | | 2 | | 2 |
| Coldwater mine | | | | 3 | | 3 | | | | | | | | | | | | | 3 | | 3 |
| Totals, Nicola-Princeton District | 1 | | 1 | 7 | | 7 | | | | | | | | | | | | | 8 | | 8 |
| **Northern District** | | | | | | | | | | | | | | | | | | | | | |
| Bulkley Valley Collieries | 2 | 1 | 3 | 7 | | 7 | 1 | | 1 | | 1 | 1 | | 2 | 2 | | | | 10 | 4 | 14 |
| Reschke mine | | 1 | 1 | 2 | | 2 | | | | | | | | | | | | | 2 | 1 | 3 |
| Gething mine No. 3 | | | | 5 | | 5 | 1 | | 1 | | 1 | 1 | | | | | | | 6 | 1 | 7 |
| Totals, Northern District | 2 | 2 | 4 | 14 | | 14 | 2 | | 2 | | 2 | 2 | | 2 | 2 | | | | 18 | 6 | 24 |
| **East Kootenay District** | | | | | | | | | | | | | | | | | | | | | |
| Crow's Nest Pass Coal Co. Ltd.— | | | | | | | | | | | | | | | | | | | | | |
| Elk River Colliery[1] | | | | | | | | | | | | | | | | | | | | | |
| Michel Colliery (underground) | 36 | 22 | 58 | 278 | | 278 | 115 | | 115 | 46 | 54 | 100 | 84 | 59 | 143 | | | | 559 | 135 | 694 |
| Michel Colliery (strip) | | 2 | 2 | | | | | | | | | | | 14 | 14 | | | | | 16 | 16 |
| Coleman Collieries (strip) | | 1 | 1 | | | | | | | | | | | 14 | 14 | | | | | 15 | 15 |
| Totals, East Kootenay District | 36 | 25 | 61 | 278 | | 278 | 115 | | 115 | 46 | 54 | 100 | 84 | 87 | 171 | | | | 559 | 166 | 725 |
| **Grand totals for Province** | 54 | 41 | 95 | 446 | | 446 | 118 | | 118 | 106 | 92 | 198 | 102 | 127 | 229 | | | | 826 | 260 | 1,086 |

[1] Elk River Colliery personnel not included; closed down January 31st, 1958.

NOTE.—U.=underground; A.=above ground; T.=totals.

### Coal-preparation Plants

There were no additions or extensive alterations made to existing plants in 1958. For full details of plants *see* 1954 Annual Report.

### Coke-making

Coke is made at only one plant in the Province, that of the Michel Colliery, The Crow's Nest Pass Coal Company Limited, Fernie. There were no alterations or extensions made at this plant during the year. For full details *see* 1954 Annual Report.

### Briquetting

Briquettes are made at only one plant in the Province, that of the Michel Colliery, The Crow's Nest Pass Coal Company Limited, Fernie. There were no alterations or extensions made at this plant during the year. For full details of this plant *see* 1954 Annual Report.

## LABOUR AND EMPLOYMENT

In 1958, 1,086 persons were employed in and about the coal mines of the Province, a decrease of 294 from 1957.

Because of the five-day week in force throughout the Province at the larger mines and the legal holidays, the maximum number of working-days was 241. In the Vancouver Island District the one large mine, the Tsable River mine, worked 233 days. In the East Kootenay District the Michel Colliery worked 176 days.

## COMPETITION FROM COAL PRODUCED OUTSIDE OF BRITISH COLUMBIA

In 1958 the shipment of Alberta coal and briquettes to British Columbia totalled 532,911 and 16,208 tons respectively. The following table shows the amount of Alberta coal brought into British Columbia during the past ten years:—

| Year | Short Tons | Year | Short Tons |
|---|---|---|---|
| 1949 | 891,132 | 1954 | 891,194 |
| 1950 | 873,558 | 1955 | 932,764 |
| 1951 | 898,533 | 1956 | 860,329 |
| 1952 | 1,021,484 | 1957 | 672,527 |
| 1953 | 859,385 | 1958 | 532,911 |

Of the 564,327 tons of British Columbia coal marketed, 228,254 tons was sold for domestic and industrial use in Alberta, Saskatchewan, Manitoba, Ontario, and Yukon Territory; 63,810 tons was sold for railroad use in Canada; 68,300 tons was exported to the United States; and 3,291 tons was sold for ships' bunkers.

The amount sold for domestic and industrial use in the Province was 200,672 tons.

## ACCIDENTS IN AND AROUND COAL MINES

In 1958 there were no fatal accidents, as compared with two in 1957. The number of fatal accidents per 1,000 persons (underground and strip-mine personnel) employed was 0, compared with 1.45 in 1957, 4.39 in 1956, 3.38 in 1955, 0.69 in 1954, 3.22 in 1953, 1.78 in 1952, 3.11 in 1951, 2.21 in 1950, and 0.43 in 1949.

The number of fatal accidents per 1,000,000 gross tons of coal (underground and strip-mine coal) produced in 1958 was 0, compared with 1.63 in 1957.

The following table shows comparative figures for fatal accidents for 1957 and 1958:—

| Company | Colliery | 1958 | 1957 |
|---|---|---|---|
| The Crow's Nest Pass Coal Co. Ltd. | Michel | 0 | 1 |
| The Crow's Nest Pass Coal Co. Ltd. | Elk River | 0 | 1 |
| Totals | | 0 | 2 |

The following two tables classify the fatal accidents in coal mines as to cause and quantity of coal per accident:—

FATAL ACCIDENTS CLASSIFIED AS TO CAUSE

| Cause | 1958 | | 1957 | |
|---|---|---|---|---|
| | Number | Per Cent | Number | Per Cent |
| By falls of roof and coal | .... | .... | 1 | 50.00 |
| Rolling rock or coal | .... | .... | 1 | 50.00 |
| Totals | .... | .... | 2 | 100.00 |

FATAL ACCIDENTS, UNDERGROUND MINES, CLASSIFIED AS TO QUANTITY OF COAL MINED

| Cause | 1958 | | 1957 | |
|---|---|---|---|---|
| | Number of Fatal Accidents | Coal Mined per Fatal Accident | Number of Fatal Accidents | Coal Mined per Fatal Accident |
| By falls of roof and coal | .... | .... | 1 | 945,848 |
| Rolling rock or coal | .... | .... | 1 | 945,848 |
| Totals | .... | .... | 2 | 472,924 |

NOTE.—There were no fatal accidents in strip-mining operations during 1958.

RATIO OF FATAL ACCIDENTS, UNDERGROUND MINES

| District | Accident Death Rate | | | |
|---|---|---|---|---|
| | Per 1,000 Persons Employed | | Per 1,000,000 Tons of Coal Mined | |
| | 1958 | 1957 | 1958 | 1957 |
| Vancouver Island | ..... | ..... | ..... | ..... |
| Nicola-Princeton | ..... | ..... | ..... | ..... |
| East Kootenay | .... | 2.09 | .... | 2.72 |
| Northern | .... | ..... | .... | ..... |
| Province, 1958 | ..... | ..... | ..... | ..... |
| Province, 1957 | .... | 1.50 | ..... | 2.11 |

There were 168 accidents involving loss of seven days or more reported to the Department by the management of the various mines. All these accidents were investigated and reported on by the District Inspectors of Mines.

The following three tables classify the accidents in coal mines in 1958 as to occupation of the men involved, as to cause, and as to injury.

ACCIDENTS CLASSIFIED AS TO OCCUPATION

| Occupation | Number of Accidents | Percentage of Accidents |
|---|---|---|
| Underground— | | |
| Miners | 96 | 57.14 |
| Drillers and facemen | | |
| Haulage and conveyor men | 34 | 20.24 |
| Trackmen and mechanics | 3 | 1.79 |
| Supervisors | 2 | 1.19 |
| Timbermen | 4 | 2.38 |
| Coal-cutters | | |
| Miscellaneous | 2 | 1.19 |
| Surface— | | |
| Shops | 8 | 4.76 |
| Surface | 8 | 4.76 |
| Preparation and coke-ovens | 11 | 6.55 |
| Miscellaneous | | |
| Totals | 168 | 100.00 |

ACCIDENTS CLASSIFIED AS TO CAUSE

| Cause | Number of Accidents | Percentage of Accidents |
|---|---|---|
| Fall of ground | 31 | 18.45 |
| Fall of material and flying material | 11 | 6.55 |
| Lifting and handling equipment and material | 49 | 29.17 |
| Machinery and tools | 33 | 19.64 |
| Slipped and tripped | 28 | 16.67 |
| Falling off staging and platforms | 8 | 4.76 |
| Miscellaneous | 8 | 4.76 |
| Totals | 168 | 100.00 |

ACCIDENTS CLASSIFIED AS TO INJURY

| Injury | Number of Accidents | Percentage of Accidents |
|---|---|---|
| Head and neck | 8 | 4.76 |
| Eyes | 2 | 1.19 |
| Trunk | 33 | 19.64 |
| Back | 28 | 16.67 |
| Arms | 4 | 2.38 |
| Hands and fingers | 40 | 23.81 |
| Legs | 38 | 22.62 |
| Feet | 8 | 4.76 |
| Toes | 7 | 4.17 |
| Totals | 168 | 100.00 |

## EXPLOSIVES

The following table shows the quantity of explosives used in underground coal mines in 1958, together with the number of shots fired, tons of coal produced per pound of explosives used, and the average number of pounds of explosives per shot fired (these

quantities include all the explosives used for breaking coal and rock work in coal mines):—

VANCOUVER ISLAND DISTRICT

| Colliery | Quantity of Explosives Used (Pounds) | Coal Mined (Tons) | Total Number of Shots | Average Tons of Coal per Pound of Explosives Used | Average Pounds of Explosives per Shot Fired |
|---|---|---|---|---|---|
| Tsable River Colliery | 88,550 | 178,366 | 121,225 | 2.01 | 0.73 |
| Chambers No 5 mine | 350 | 705 | 700 | 2.01 | 0.50 |
| Loudon No. 6 mine | 850 | 315 | 800 | 0.37 | 1.06 |
| Lewis mine (Timberlands) | 500 | 680 | 900 | 1.36 | 0.55 |
| Carruthers and Wakelam No. 3 mine | 450 | 428 | 600 | 0.95 | 0.75 |
| Stronach mine | 150 | 467 | 250 | 3.11 | 0.60 |
| Undun mine | 150 | 462 | 300 | 3.08 | 0.50 |
| Extension mine (Brodrick) | 663 | 842 | 396 | 1.27 | 1.67 |
| Big Flame mine | 150 | 18 | 100 | 0.12 | 1.50 |
| White mine | 22 | 21 | 43 | 0.95 | 0.51 |
| Totals for district | 91,835 | 182,304 | 125,314 | 1.98 | 0.73 |

NICOLA-PRINCETON DISTRICT

| | | | | | |
|---|---|---|---|---|---|
| Princeton Blue Flame mine No. 2 | 95 | 132 | 95 | 1.39 | 1.00 |
| Princeton Blue Flame mine No. 3 | 80 | 14 | 100 | 0.17 | 0.80 |
| Coldwater mine | 300 | 543 | 600 | 1.81 | 0.50 |
| Totals for district | 475 | 689 | 795 | 1.45 | 0.59 |

NORTHERN DISTRICT

| | | | | | |
|---|---|---|---|---|---|
| Bulkley Valley Collieries | 4,582 | 5,233 | 5,450 | 1.14 | 0.84 |
| Reschke mine | 500 | 782 | 500 | 1.56 | 1.00 |
| Gething mine | 2,200 | 2,312 | 2,420 | 1.05 | 0.91 |
| Totals for district | 7,282 | 8,327 | 8,370 | 1.14 | 0.86 |

EAST KOOTENAY DISTRICT

| | | | | | |
|---|---|---|---|---|---|
| Elk River Colliery | 620[1] | 16,235 | 765[1] | 26.18 | 0.81 |
| Michel Colliery (underground) | 104,050 | 537,402 | 90,149 | 5.16 | 1.15 |
| Totals for district | 104,670 | 553,637 | 90,914 | 5.28 | 1.15 |

[1] Estimated.

PROVINCE

| | | | | | |
|---|---|---|---|---|---|
| Totals for Province | 204,262 | 744,957 | 225,393 | 3.64 | 0.91 |

QUANTITY OF DIFFERENT EXPLOSIVES USED

| | Lb. |
|---|---|
| Monobel of different grades | 197,262 |
| Permissible rock powder | 7,000 |
| Total | 204,262 |

## MACHINE-MINED COAL

In 1958, mining-machines produced approximately 25,133 tons or 3.45 per cent of the total output from underground mining. A total of 138,005 tons of strip-mined coal was removed by mechanical means.

## SAFETY LAMPS

There were 905 safety lamps in use in the mines of the Province. Of this number, seventy-nine were flame safety and 826 were approved electric lamps, mostly of the Edison type.

### Approved Safety Lamps—Electric and Flame

The following is a list of approved safety lamps, electric and flame:—

The Wolf lamp, flame type.

The Koehler lamp, flame type.

The Edison electric lamp (cap) under Approval No. 18 of the United States Bureau of Mines, and all Edison lamps up to and including Model P, carrying the Approval Certificate No. 26 of the United States Bureau of Mines, Model R-4, Approval No. 29.

The Wheat electric lamp and having Approval No. 20, as issued by the United States Bureau of Mines.

The Wolf electric lamp, No. 830C.

The electric lamp manufactured by the Portable Lamp and Equipment Company, under Approval No. 27 of the United States Bureau of Mines.

M.S.A. single-cell trip lamp, carrying United States Bureau of Mines Approval No. 1009, approved for use on haulage trips in mines.

The Davis M.L. model pneumatic electric lamp.

## ELECTRICITY

Electricity is used for various purposes on the surface and underground at three collieries. A total of 12,247 horsepower was used in and about these mines. Detailed information as to how and where this power was used is given in the report of the Senior Electrical Inspector of Mines.

## INSPECTION COMMITTEES

The provisions of the "Coal-mines Regulation Act," section 65, General Rule 19, require that an inspection committee of workmen shall inspect the mine regularly on behalf of the workmen and make a true report of the conditions found. In all the larger mines of the Province this rule is fully observed, and copies of the report are sent to the Inspectors for the district. The work of these committees is valuable and assists in furthering the interests of safety at the various mines.

## COAL DUST

The danger of accumulations of coal dust on the roadways and in the working-places is fully realized and as a rule the regulations regarding the control of coal dust are adequately carried out. Large quantities of limestone dust are used continually in the larger mines to combat this hazard. It is used in the roadways, working-places, and for the tamping of shots.

Dust samples are taken regularly from roof, sides, and floor of mine roadways and analysed. The reports of the analyses are forwarded to the District Inspector each month.

## DIESEL LOCOMOTIVES

Early in August, 1950, the first diesel underground locomotive to be used in any mine in British Columbia made its trial runs in No. 9 mine, Elk River Colliery, The Crow's Nest Pass Coal Company Limited.

The locomotive is a 15-ton 100-horsepower model and is fully permissible for use in coal mines. Two 75-horsepower diesel locomotives were purchased in 1956 for use in hauling the output from the "A" North mine to the tipple at the Michel Colliery.

## MILLISECOND DELAY DETONATORS

In February, 1951, an amendment to the "Coal-mines Regulation Act" was passed to allow, with the permission of the Chief Inspector of Mines, more than one shot to be fired at a time in any coal mine or district of a mine. For further details *see* 1954 Annual Report.

## DANGEROUS OCCURRENCES

On February 12th, 1958, while drilling to complete a round of holes for brushing at the face of No. 2 level, "A" North mine, Michel Colliery, a miner decided to deepen one of the holes that had been drilled by the cross-shift. As soon as he started to drill an explosion occurred which seriously injured the miner.

Subsequent investigation brought out the fact that one of the cross-shift miners had put one stick of rock-powder into the hole and had not reported the matter.

On November 3rd, 1958, a fire occurred in the No. 2 compressor motor at the Tsable River mine when the closed-circuit rings of the Amortisseur windings burned through in several places and ignited oil and dirt on the stator coils. Damage was confined to the motor.

## BUMPS AND OUTBURSTS

On January 31st, 1958, a severe bump occurred in No. 8 split roadway of No. 12 room, No. 3 Slope district, "B" South mine, Michel Colliery. Two miners working in the place were severely shaken and bruised and approximately 90 feet of the floor was heaved about 2 feet. The large quantity of methane gas which was liberated from the coal affected the whole district, necessitating the withdrawal of all the men.

On December 9th, 1958, a bump occurred on the No. 3 haulage slope, "B" South mine, Michel Colliery, which caused considerable damage to the floor and track of the slope. Approximately 90 feet of track was heaved, and the displacement ranged from 3 feet in the centre to zero at both ends. No damage was caused to the roof or timber support. No one was injured.

On December 19th, 1958, a bump occurred on No. 3 haulage slope, "B" South mine, Michel Colliery, that disturbed several sets of timber supports and caused several small caves. Approximately 50 feet of the roadway was affected. The location of the bump was immediately outby the one that occurred on December 9th, 1958. The floor of the area was only slightly affected and no one was injured.

## PROSECUTIONS

Cecil Gareau, miner, Michel Colliery, was prosecuted on February 14th, 1958, under Rule 112 of The Crow's Nest Pass Coal Company's "Special Rules" for subjecting a fellow workman to danger not necessary in the course of his occupation. He was fined $30 and $5 costs.

## SUPERVISION OF COAL MINES

During 1958 eighteen companies operated twenty-three mines, employing 826 men underground. In the supervision of underground employees there were 3 managers, 8 overmen, 3 shiftbosses, and 53 firebosses, or approximately 1 official for every 12 men.

## BOARD OF EXAMINERS FOR COAL-MINE OFFICIALS

### First-, Second-, and Third-class Certificates and Mine Surveyors' Certificates

The Board of Examiners, formed on July 10th, 1919, consists at present of R. B. Bonar, Deputy Chief Inspector of Mines, chairman and secretary; A. R. C. James, Inspector of Mines, member; and D. R. Morgan, Inspector of Mines, member.

The meetings of the Board are held in the office of the Department of Mines in Victoria. The examinations are held at least once a year and more often if necessary.

All officials, before engaging in multiple blasting with millisecond delay detonators, are required to obtain a permit to do so from the Board of Examiners (Coal-mine Officials). This permit is issued only after the applicant has successfully passed oral and practical examinations in such work.

In addition to the examinations and certificates already specified as coming under the Board of Examiners, the Act provides that every coal-miner shall be the holder of a certificate of competency as such. Examinations are held as circumstances warrant in coal-mining districts, and no certificate is granted where the candidate has failed to satisfy the Board as to his fitness, experience in a coal mine, and a general working knowledge of the English language.

During 1958 there were fourteen candidates for coal-miners' certificates. In addition to the certificates granted above, substitute certificates were issued to those who had lost their original certificates. Permits to act as coal-miners, as provided by the Act, have been granted to younger men by Inspectors in their respective districts. This method allows promising men with less than one year's experience underground to work at the coal face as miners under the guidance of an experienced miner.

The Board of Examiners desires to thank the different coal-mining companies for the use of their premises for holding examinations where necessary.

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# NOTES ON COAL MINES

## VANCOUVER ISLAND INSPECTION DISTRICT

By R. B. Bonar

The gross output of coal from the Vancouver Island Inspection District was 182,304 tons, a decrease of 17,901 tons or 8.9 per cent from the 1957 output. Only one large coal mine, the Tsable River mine, is now in production on the Island. Operations in the once important Nanaimo coalfield are now restricted to nine very small mines, providing employment for no more than twenty-one men. These mines operate in outcrop, pillars, and barriers left during earlier working.

The Island coal-mining industry has suffered a rapid decline in the past few years. Production has declined by as much as 60 per cent since 1951. This condition has resulted from loss of markets due to competition from other fuels, high costs of production, and from the depletion of reserves in the Nanaimo coalfield.

In 1958 there were no accidents classified as serious, although fifty-three minor accidents were reported and investigated. There was one dangerous occurrence reported from the mines of the Island—a fire that occurred in one of the compressor motors at the Tsable River mine. The incident is reported fully under " Dangerous Occurrences."

The annual mine-rescue and first-aid meet organized by the Vancouver Island Mine Safety Association was held at Cumberland on Saturday, May 31st. Two teams from Tsable River mine and a visiting team from the Western Nickel mine participated in

the mine-rescue competition, and a very high standard of performance was maintained. The winning team was the Tsable River team No. 1, captained by John Thomson.

## NANAIMO (49° 123° S.W.)

**Chambers No. 5 Mine, Extension**

R. H. Chambers and associates, operators; R. H. Chambers, manager. This mine is in Section 14, Range 7, in the Douglas district, near Extension. The area was first opened up as a stripping operation in the latter part of 1952 and comprised a small section of the Wellington seam lying close to the surface in the vicinity of the old Vancouver slope workings. By the end of 1954 all available surface coal was depleted, and early in January, 1955, the present slope was started to test the continuity of the the seam underground. Early in 1957 the slope broke into the old Extension workings after being driven well over 600 feet from the portal. The slope pillars and room pillars are now being mined on the retreat.

The coal is mined by picking out the middle band of carbonaceous shale with hand-picks. It is then blasted and hand-loaded into cars which are hauled to the tipple by a gasoline-driven hoist. A small shaker screen sorts the coal into 2-inch, 1- to 2-inch, and under 1-inch sizes.

Total production in 1958 was 705 tons over a working period of 131 days, with a crew of four men. Working conditions were found to be satisfactory in the course of inspections. No accidents were reported.

**Lewis Mine (Timberlands)**

Glyn Lewis, operator and fireboss. This property comprises two small mines operating in the Wellington seam in a small area of outcrop coal that was left when No. 8 mine was abandoned by Canadian Collieries (Dunsmuir) Limited. The seam outcrops on the side of a ridge parallel to and immediately south of the Nanaimo River valley at an elevation of 540 feet above sea-level. The coal measures dip southward at 8 degrees. The two mines are one-third of a mile apart.

The new mine, which commenced production in May, 1951, is in Range 1, Section 2, of the Cranberry district. It operates in an area of coal outcrop about 1 acre in extent, which is bounded on the west by a thrust fault that also formed the western boundary of the old No. 8 mine. The seam is 6 feet thick, including two thin rock bands.

The coal is blasted off the solid and hand-loaded into cars which are hauled to the surface up the slope by a small gasoline-driven hoist. A shaker screen sorts the coal into lump, nut, and pea sizes. Total production in 1958 was 680 tons over a working period of 145 days, with a crew of two men. Working conditions were found to be satisfactory, and no accidents were reported.

**Undun Mine**

J. Unsworth and A. Dunn, operators; A. Dunn, fireboss. This mine, which was brought into production in August, 1954, is three-quarters of a mile northwest of the village of Extension. It operates in the Wellington seam, and the output comes from the mining of pillars and small areas of coal left near the outcrop in the workings of the old Extension No. 6 mine. The Wellington seam is variable in thickness, but the coal is of excellent quality. The measures dip about 10 degrees southwest. The roof is strong conglomerate.

The coal is blasted off the solid and hand-loaded into cars which are hauled via the slope to the surface by a small gasoline-driven hoist. Production in 1958 amounted to 462 tons over a working period of 127 days, with a crew of two men. Working conditions were found to be satisfactory in the course of inspections, and no accidents were reported.

**Big Flame Mine**

Albert Addison, operator. This mine is in Range 5, Section 13, of the Cranberry district. Reopening of this mine, formerly known as the Clifford mine, was commenced early in 1955. During the year only prospecting was done in an attempt to find coal of economical thickness and grade.

**Extension Mine**

H. Brodrick and associates, operators; H. Brodrick, fireboss. This mine is located partly on Lot 6, Douglas district, and on Section 12, Range 1, Cranberry district, and is about 2 miles west of Extension village. The mine was started early in 1957 in outcrop coal near the portal of the No. 2 slope, old Extension colliery.

The coal is blasted off the solid and hand-loaded into cars which are hauled to the surface by a small gasoline-driven hoist. Production in 1958 amounted to 842 tons over a working period of 240 days, with a crew of three men. Working conditions were found to be satisfactory in the course of inspections, and no accidents were reported.

### North Wellington (49° 124° S.E.)

**Loudon No. 6 Mine**

William Loudon and associates, operators; W. Loudon, fireboss. This mine is about 1 mile southeast of Wellington and has been opened up by a flat-dipping slope driven in a small area of outcrop coal in the No. 2 Upper Wellington seam adjacent to the old No. 9 mine workings. The top portion of the seam, varying from 2 to 3 feet and consisting of carbonaceous shale, is blasted off the solid and stowed. The bottom 20 inches to 2 feet of coal is broken up with light shots and hand-loaded into cars which are hauled to the surface by a small gasoline-driven hoist. Production in 1958 amounted to 315 tons over a working period of 143 days, with a crew of two men. Working conditions were found to be satisfactory during the course of inspections, and no accidents were reported.

**Carruthers and Wakelem No. 3 Mine**

R. B. Carruthers and W. Wakelem, operators; R. B. Carruthers, fireboss. This mine, near the Loudon mine, is also in the No. 2 or Upper Wellington seam adjacent to the abandoned workings of the old No. 9 mine. Production in 1958 amounted to 428 tons over a working period of 136 days, with a crew of two men. Working conditions were found to be satisfactory in the course of inspections. No accidents were reported.

**Stronach No. 2 Mine**

Charles Stronach, operator; H. Gilmour, fireboss. This mine is in a section of the No. 2 or Upper Wellington seam adjacent to the old No. 9 mine. All the output comes from the mining of pillars and small areas of coal left in the early workings. Production in 1958 amounted to 467 tons over a period of 124 days, with a crew of two men. Working conditions were found to be satisfactory in the course of inspections. No accidents were reported.

**White Mine**

Joseph White, operator and fireboss. This mine is about 200 feet south of Stronach No. 2 mine and is operated as a prospect in search of pillars of coal thought to have been left during the early working of the old Wellington slope and latterly the Pacific No. 2 mine. These mines operated in the lower Wellington seam, which averages 6 to 8 feet in thickness and is of excellent quality. After considerable difficulty in passing through a gob area, a small pillar of coal was located from which 60 tons of coal was mined before a cave-in closed the area.

During 1958 a roadway was driven through the gob area to explore to the west of the portal. A small pillar of coal was discovered.

## Comox (49° 124° N.W.)

**Canadian Collieries Resources Limited**

Head office, 566 Hornby Street, Vancouver. F. Ronald Graham, chairman of the board; N. R. Whittall, president; E. O. T. Simpson, vice-president, mining; W. W. Johnstone, district superintendent.

*Tsable River Mine.*—S. J. Lawrence, manager; T. Ecclestone, overman; L. Cooper, A. Cullen, and A. Somerville, shiftbosses; W. Bennie, J. Cochrane, M. Frobisher, W. High, L. Hutchinson, C. Lewis, G. Nicholas, J. Thomson, and A. Maxwell, firebosses; S. Gough, surface foreman.

The layout and method of operating this mine are fully described in the 1954 Annual Report. In 1958 production came from the extraction of pillars formed by earlier development in the seam and from development work in the northeast section beyond the second fault system. This latter section, which was penetrated by an inclined rock tunnel near the end of 1955, is being rapidly expanded in spite of difficulties encountered, such as local thinning of the seam and seam faulting.

The haulage slope of No. 1 slope in this section is still being advanced in virgin territory, and the seam at the face of the slope is of normal height and clean. The immediate roof, especially in the lower area of the section, has not improved and consists of thinly bedded sandstone which contains numerous slips and joints and requiries closer timbering than is usual. The rock tunnel started to the rise off No. 10 level parting to connect with the slope workings in this section intersected the coal beyond the fault, but at the end of the year had not been converted to the main haulage incline for the district as was the original intention.

The extraction of pillars in the Nos. 6 Right, 8 Right, and 10 Right sections of the main diagonal slope is proceeding methodically and rapidly.

All the coal, both in development and pillar-extraction areas, is blasted off the solid. Electrical multiple blasting with millisecond delay detonators is used throughout the mine. Totals of 88,550 pounds of Monobel No. 4 and CXL-ite explosives and 121,225 detonators were used during the year.

Total production in 1958 amounted to 178,366 gross tons over a working period of 233 days, with a crew averaging 241 men underground and eighty-eight on the surface. Conditions at the mine were usually found to be satisfactory in the course of inspections.

First-aid arrangements have been maintained at a satisfactory standard. A suitably equipped first-aid room is provided on the surface, and an ambulance is held in readiness for emergencies. Five employees hold industrial first-aid certificates, and twenty-four employees hold other first-aid certificates. Two mine-rescue teams of six men each are maintained, and these attend periodic practices at the Cumberland mine-rescue station.

Forty-six accidents at or in the mine were reported and investigated, none of which were classed as serious. This mine won the Ryan Trophy, emblematic of having the lowest accident record in a British Columbia coal mine, in 1956 and 1957, and has again won the award for 1958. This very excellent record is due to the maintaining of the intensified safety programme put into effect by the management and ably assisted and advised by the director of the Safety Division of the British Columbia Mining Association.

Regular inspections of the mine were made each month by the inspection committee appointed by the workmen, and copies of its reports were forwarded to the office of the District Inspector through the courtesy of the committee.

## NICOLA-PRINCETON INSPECTION DISTRICT

By A. R. C. James

Coal production in 1958 in the Nicola-Princeton district was only 689 tons—an industry which once gave employment to a considerable numbers of men in the district has now almost entirely dwindled away due to lack of markets. Operations were restricted to two very small mines working in pillars and small areas of coal close to the outcrops. The Coldwater mine at Merritt continued to be operated on a small scale and produced coal for local domestic use. The Blue Flame mine near Princeton was closed in January, but the fireboss and another employee reopened an old slope near by and began production in December. Coal from this operation is sold to the Princeton brewery. The Blue Flame property is on a Coal Lease 38, which was again renewed in favour of the Wilson Mining Corporation.

Coal Licences Nos. 32, 69, 70, 71, 125, and 126 covering a total of 2,618 acres near Blakeburn have been renewed in favour of Mullin's Strip Mine Ltd.

Coal Licence No. 11, covering 640 acres near Princeton, has been renewed in favour of E. Hayes and B. Vittoni. Coal Licence No. 17, covering 320 acres near Coalmont, has been renewed in favour of Collins Gulch Collieries Ltd. Coal Licence No. 59, covering 80.9 acres near Grindrod, has been renewed in favour of Edward Pechr. No activity of any importance was reported from any of these properties.

No accidents were reported from either of the coal mines in 1958 nor were there any prosecutions under the "Coal-mines Regulation Act."

### Merritt (50° 120° S.W.)

**Coldwater Coal Mines**

This property, 1 mile south of Merritt, is operated by the owners, S. Gerrard and partners. Fireboss (on permit), S. Gerrard. Activities were again confined to the Coldwater No. 5 mine and consisted of splitting pillars and extracting remnants of coal left between the abandoned workings of the Middlesboro No. 5 mine and the surface, in the area adjacent to and west of the old water-tank and about 250 feet west of the old Middlesboro No. 4 mine. The seam is from 4 to 5 feet thick and includes two partings consisting of 3 inches of bone and 1 inch of hard shale. The coal is blasted from the solid and is hand-loaded into cars which are hauled to the surface by a small gasoline-driven hoist. Total production in 1958 was 543 tons. The crew varied from two to three men. Working conditions were usually found to be satisfactory in the course of inspections. No methane was detected.

### Princeton (49° 120° S.W.)

**Blue Flame Colliery**

Thomas Bryden, fireboss. The mine is about 10 miles by road south of Princeton and about half a mile west of the Hope–Princeton Highway. The old slope was abandoned in January after all available coal had been extracted. In August an old prospect tunnel about one-quarter of a mile east of the old slope, and in the same seam, was reopened. This old tunnel extends 130 feet down dip on the seam and terminates alongside a northeasterly striking fault. The coal seam is from 6 to 7 feet thick, strikes eastward, and dips northward at 16 degrees. During the fall months a tipple was erected at the portal, and equipment was transferred from the previous operation. A gasoline-driven compressor and hoist were erected at the mine. Production began in December, the total production for the year being 132 tons. The coal is crushed to stoker size and is mainly sold to the Princeton brewery. Two men were employed. Working conditions were found to be generally satisfactory and no methane was detected.

## EAST KOOTENAY INSPECTION DISTRICT

By D. R. Morgan

Coal-mining activities in the East Kootenay Inspection District were considerably restricted during 1958 owing to shortage of markets for coal. This resulted in irregular operation, closure of one of the collieries, and a decline in production. Two companies were in operation and produced 691,642 tons of coal, a decrease of 302,993 tons or 30.6 per cent less than was produced in 1957. Most of the production, totalling 660,498 tons, was obtained from the mines of The Crow's Nest Pass Coal Company Limited. This was 223,994 tons or 25.3 per cent less than in 1957. The company operated collieries at Michel and Coal Creek at the commencement of the year, but the Elk River Colliery at Coal Creek was closed in January, and since that time company activities have been confined to the Michel Colliery. The remainder of the production was obtained by Coleman Collieries Limited, which operates a large strip mine on both sides of the interprovincial boundary on Tent Mountain, near Corbin. This company produced 31,144 tons from the British Columbia side in 1958, a decrease of 78,999 tons or 71.7 per cent less than was produced from the same operation in 1957.

The accident record showed an improvement in both frequency and severity rates, and it is very pleasing to report that there were no fatal accidents in the district in 1958. Four serious accidents, each involving a fractured limb, were reported from the Michel Colliery, three of which occurred underground and the other on the surface. This was two serious accidents less than were reported from the colliery in 1957. Minor accidents resulting in the loss of one or more days from work totalled 152, of which 124 occurred underground and twenty-eight on the surface. This number was twenty-four less than in 1957. Five minor accidents were reported from the Elk River Colliery prior to its closure. No accidents were reported from the British Columbia side of the stripping operation on Tent Mountain. Four dangerous occurrences were investigated at Michel Colliery, one of which led to the prosecution of one of the workmen concerned. These incidents are reported more fully in another part of the report under the heading "Dangerous Occurrences."

The thirty-seventh annual competition of the East Kootenay Mine Safety Association was held at Chapman Camp on June 21st, and the various contests were well attended. Four teams representing Fernie, Michel, and Kimberley entered the mine-rescue contest, and the British Columbia Department of Mines shield was won by the Fernie team, captained by Albert Littler. There were 135 entries in the first-aid contests, and the Rotary shield and the British Columbia Department of Mines cup were won by the Sullivan concentrator team, captained by A. Nixon. Winners of both these competitions represented the East Kootenay District at the Provincial competition held at Victoria on June 28th.

**The Crow's Nest Pass Coal Company Limited**

T. G. Ewart, president, Fernie; Thomas Balmer, vice-president, 305 Great Northern Railway Building, Seattle, Wash.; James Littler, general superintendent, Fernie; W. R. Prentice, secretary, Fernie; R. A. Colleaux, treasurer, Fernie. This company owns extensive coal properties in the Crowsnest Pass area and has conducted large-scale coal-mining operations in the district since 1897. Present operations are confined to the Michel Colliery and include both underground and open-cast mining, and are directed from a head office in Fernie. Most of the production is sold on the industrial market and a large amount of the fines is used for coke-making and briquetting. A short description of the operations follows.

MICHEL COLLIERY.—(49° 114° N.W.) William Chapman, manager; Irving Morgan, senior overman; Walter McKay, safety supervisor; William Gregory, afternoon-shift overman.

This colliery is operated at Michel, 24 miles east of Fernie, and is on the Crowsnest Pass branch of the Canadian Pacific Railway. It is a large colliery, comprising five underground mines at Michel and a stripping operation on Baldy Mountain, near Michel. It also includes a modern by-product plant and a briquette plant which are located on the colliery-site. The mines are operated on both sides of the valley and are named according to the seams worked and the direction of development. Four of the mines are on the south side and one on the north side. Those on the south side have been developed from a pair of rock tunnels which have been driven across the synclinal structure of the coal measures, and they are operated on both limbs of the syncline. The remaining mine, "A" North, is being developed from the outcrop of the seam on the north side of the valley. Each of the mines is ventilated by a separate fan. The mines in general are operated by the room-and-pillar system and the pillars are extracted on the retreat. The chief motive power in use underground is compressed air, which is supplied by four electrically driven and two steam-driven compressors on the surface. Two other compressors also supply high-pressure air for operating compressed-air locomotives on some of the main haulage roadways and also the main rock tunnel. The haulage on the levels at the "A" North mine is by diesel and battery locomotives. Electricity is used at some of the mines for operating conveyors and pumps on the main and secondary roadways and is used on a larger scale in the "A" North mine. Coal from all the mines is cleaned and treated for market at a modern preparation plant, a description of which has been given in past reports. A new slimes recovery plant was added to the preparation plant early in 1958 for handling —¼-mm. slimes which formerly were sluiced to settling-ponds and subsequently stockpiled. The slimes are now dewatered and recovered at the plant, a process which has eliminated several conveyors and an elevator.

The underground operations are under the direct supervision of seven overmen and twenty-eight firebosses.

*"A" East Mine.*—Daniel Chester, overman; Frank McVeigh, Harry Sanders, Roger Pasiaud, Albert Littler, Kenneth Kniert, Thomas Taylor, and Louis Sclippa, firebosses.

This mine, in "A" seam, is on the eastern limb of the Michel syncline and all the workings are on the left side of the rock tunnels. The mine has been in operation for many years, and present activities are confined mainly to dip workings which are rapidly retreating back toward the rock tunnels. The mine is worked by the room-and-pillar system.

The seam is of good quality, 10 to 12 feet thick, and dips at an average of 20 degrees in a southwesterly direction. It is friable and gassy. The roof is weak and requires careful attention for its support. Usually the coal in the rooms is mined by compressed-air picks but sometimes is blasted from the solid by the use of millisecond delay detonators. It is loaded by duck-bill conveyors or directly by hand onto the conveyors. The pillars are extracted by the shortwall method, and, as the coal is friable, pneumatic picks are used to advantage and only occasional shots are required. The coal from the pillars is loaded by hand onto shaker-conveyors and transferred to loading points in the rooms or levels by shaker, chain, and belt conveyors. From these loading points the coal is hauled in trips of cars by compressed-air hoists to the main east level, and from there to the surface by compressed-air locomotives via the main rock tunnels.

The mine produced an average of 920 tons per day during 1958 with a crew of 180 men. Most of the production was obtained from the No. 1 and No. 3 Slope districts, and the remainder from a panel of pillars left above the main east level. No. 1 Slope district, the larger operation, is at the outer end of the main level, and has been developed by means of three slopes driven to the base of the Michel syncline. Rooms and pillars have been developed on both limbs of the syncline from this point, but up to the present extraction of pillars has been confined to the inner, or Sparwood, limb of

the syncline. Considerable difficulties have been encountered in this area owing to excessive roof pressures, and a large number of the roadways were abandoned in 1958 because of the high cost of maintenance. Further development in the area was also stopped, and since that time operations have been confined to the extraction of pillars. This decision has restricted the size of the district considerably. No. 3 Slope district has been in operation for many years, and present activity consists of the extraction of pillars left for supporting the slopes. Extraction of the pillars at the lower end of the slopes was completed early in June and since that time operations have been confined to the upper regions. Conditions in general were found to be satisfactory with the exception of breakages of timber supports and restricted clearance on some of the roadways at the lower end of the No. 1 Slope district prior to their abandonment. Difficulty was also experienced on one occasion when the ventilation in this section of the mine was found to be sluggish. This was rectified by driving a new airway between the No. 1 room in the No. 4 Slope section to the No. 1 raise section.

The mine is ventilated by an electrically driven aerodyne fan which delivers 93,000 cubic feet of air per minute to the workings at a 5.8-inch water-gauge.

*"A" West Mine.*—Harry Corrigan, overman; Reginald Taylor, Robert Taylor, James Walsh, John McInnes, Thomas Krall, Roger Girou, Stanley Menduk, Paul Kusnir, Leonard Brett, William Verkerk, and William Cytko, firebosses.

This mine is operated in the same seam and the same limb of the syncline as the "A" East mine, but most of the workings are on the right side of the rock tunnels. It has been developed from a number of inclines which have been driven from the main west level to the outcrop of the seam, and all the present operations are in the upper regions of these inclines. The coal is of good quality, ranging from 12 to 28 feet in thickness and dipping 20 to 35 degrees in a westerly direction. A full description of the general layout of the mine and the method of working is included in the 1957 Annual Report.

The mine is the largest producer at the colliery and during 1958 averaged 1,000 tons per day with a crew of 175 men. Most of the production was obtained from the No. 9 right and No. 4 left belt-road sections, where the coal is 28 feet thick and the pillars are extracted by the caving system. The remainder of the production was obtained from the extraction of pillars alongside the No. 1 entry in the No. 4 right belt-road section. Only the top 12 feet of the seam is extracted in the latter section. Operations in the No. 9 right belt-road section were confined chiefly to pillar extraction, which was accomplished with a great deal of success. A high percentage of the coal was recovered and caving of the roof was controlled without much difficulty. Pillar extraction in this area is now nearing completion. No. 4 left belt-road section is in development stages, and is being prepared ready for the completion of pillar extraction in the No. 9 belt-road section. The main belt-roads have been advanced for 1,000 feet along the strike of the seam, and three pairs of raises have been driven from the belt-roads preparatory to driving rooms for pillar extraction. Some difficulties were encountered in driving the inner pair of rooms due to the presence of faults, and the direction of the rooms had to be changed on the inby side of the fault in order to follow the line of strike. A small amount of pillar extraction had been commenced from these rooms at the end of 1958.

The conditions at the mine in general were found to be satisfactory during the course of inspections and no trace of gas was found in any of the active workings. A close check was maintained on the fire seals in the No. 3 left belt-road section where a gob fire occurred in 1956, and indications were that the first was inactive.

The mine is ventilated by an electrically driven axivane fan which delivers 85,000 cubic feet of air per minute to the mine workings at a 3.5-inch water-gauge. This quantity was found to be sufficient for the requirements of the mine.

*Upper "A" South Mine.*—Vans S. Hulbert, overman; Arnold Webster and James E. Anderson, firebosses.

This is a new operation that was commenced in October, 1956, and is being driven to develop another mine in the "A" seam on the Sparwood limb of the Michel syncline. It is entered on the right side of the rock tunnels, and up to the present comprises only two inclines which are being driven toward the seam for later development of a large area of virgin coal left between the old "A" South mine workings and the outcrop. The two inclines have been driven up the full pitch of the underlying No. 1 seam, and after reaching a distance of 1,200 feet both have been continued as rock raises at a steeper grade to meet the "A" seam. Descriptions of No. 1 seam and the rock raises are included in the 1957 Annual Report.

Most of the activities in 1958 were confined to driving the rock raises and regrading several portions of the two inclines for the installation of track and conveyors. Operations for the greater part of the year were on a single-shift basis and a crew of sixteen men was employed.

The rock raise on No. 1 incline reached the footwall of the "A" seam at the end of November, and indications are that the seam is 26 feet thick at this point. It is intended to continue the roadway at its present grade until it reaches the hangingwall of the seam. The face of No. 2 incline is still in rock but is expected to reach the seam in the near future. Both inclines are now at a point where it will be possible to develop workings at a safe distance from the old "A" South mine workings.

Conditions in general were found to be satisfactory during the course of inspections. Nearly all the equipment is electrically driven and is of the permissible type. The mine is ventilated by the old No. 3 seam fan, which also ventilates the "A" West mine workings and which was found to be sufficient for the requirements of the workings.

*"A" North Mine.*—John Whittaker, overman; Sidney Hughes, Henry Eberts, Thomas Slee, Ronald Saad, and Michael Tymchuk, firebosses.

This mine, in "A" seam, is operated on the north side of the Michel valley, approximately half a mile east of the colliery preparation plant. It has been in operation since 1951, but up to the present activity has been confined to development work. The mine is developed by the room-and-pillar system and is expected to become a large operation. Entry into the mine is provided by four main levels which have been driven from the outcrop and follow the strike of the seam.

The seam is 12 feet thick where normal but is very irregular and faulty. It is of good quality and dips at an angle of 15 to 20 degrees in a southerly direction. The roof is weak. Most of the coal at the working-places is mined with pneumatic picks or is blasted from the solid with millisecond delay detonators. It is loaded by hand onto shaker or chain conveyors and transported to various loading points along the levels, where it is loaded into 10-ton-capacity bottom-dumping cars and taken from the mine by battery or diesel locomotives. The two bottom main levels are more highly mechanized, one being advanced by a new type of continuous miner, which is being tested for the Canadian Ingersoll-Rand Company, and the other by a coal-cutter and mechanical loader. All the production of the mine is brought to the preparation plant by trucks, which are loaded from bins at two of the mine portals.

The production of coal from the mine in 1958 was 360 tons a day with a crew of sixty-seven men. Most of the operations were directed to the lower part of the mine, where the development levels, No. 0 and No. 1, are not sufficiently advanced to serve the remainder of the mine workings. These two levels were advanced 1,200 feet despite a great deal of difficulty encountered due to thinning of the seam in places, and due to the presence of small faults. The faces of the No. 2 and No. 3 levels in the upper part of the mine were idle for most of the year, and activities in this area were directed to the development of a large panel of workings above the levels. The panel, when completed,

will be 800 feet long and 2,000 feet wide. It is entered by two inclines which have been driven across the pitch of the seam. The inclines advanced 1,150 feet during 1958. Conditions in general were found to be satisfactory during the course of inspections. The roadways were kept in good condition, and there was very little sign of subsidence taking place. Most of the equipment at the mine is operated by electricity and is of the permissible type. Compressed air, which is mainly used for operating the pneumatic picks, is supplied by three portable electric compressors located inside the mine on the main intake airway.

The mine is ventilated by an axivane fan which delivers 90,000 cubic feet of air per minute to the workings at a 1.6-inch water-gauge. Small auxiliary fans capable of producing 5,000 cubic feet per minute are used for ventilating the faces of the main levels inby the last cross-cuts, and narrow headings. This volume of air was found to be sufficient to meet the requirements of the mine.

" *B* " *South Mine.*—William Davey, overman; John Krall, Robert Doratty, and Eric Singleton, firebosses.

This mine is operated in the " B " seam, on the western limb of the Michel syncline, and on the left of the rock tunnels. The seam is 5½ feet thick, dips 30 degrees in an easterly direction, and is overlain by a strong sandstone roof. The coal is of excellent quality, friable, and gassy. It is mined with pneumatic picks, and no shot-firing is allowed.

The mine is one of the oldest operations at the colliery and for many years was the major producer. Extensive extraction over a period of years, however, has reduced the size of the operation considerably, and present activities are restricted mainly to a comparatively small area of workings known as the No. 3 Slope district. This district is on the dip side of the main south level, and most of the workings have been developed to the inby side of the old No. 1 Slope district. They are entered by a pair of slopes which have been driven across the pitch of the seam, and most of the workings are on the south side of the slopes. Rooms are driven along the strike of the seam, and the pillars are extracted by a modified shortwall system from between the rooms. All the coal at the working-places is loaded by hand onto shaker and chain conveyors, and transported to a common loading point in the No. 8 room where it is loaded into cars; the cars are hauled to the main south level by compressed-air hoist. All the equipment is operated by compressed air, with the exception of two electric pumps which are used for pumping water from the slopes.

The mine had an average daily output of 420 tons of coal during 1958 with a crew of eighty-five men. Most of the production was obtained from the lower section of the slope district, and the remainder by the extraction of small pillars left from previous workings, scattered at various points in the mine. The coal reserves in the slope district are nearing depletion, and the line of pillar extraction is rapidly converging upon the main haulage slopes. This is causing excessive pressures on the roadside pillars, and considerable difficulties were experienced in 1958 in maintaining sufficient height on the roadways for the conveyors and haulage. Two severe bumps occurred on the main haulage slope above No. 8 room in December (as reported under " Dangerous Occurrences "), and it was decided to abandon the workings below this point.

Conditions in general were found to be fairly good during the course of inspections, with the exception of the restricted clearance just mentioned. Some difficulty was experienced at times in directing a sufficient quantity of air to the faces of the working-places in the lower section of the slope district, but the difficulty was usually overcome by installing small auxiliary fans to boost the ventilation to the faces or by rearranging the brattice partitions.

The mine is ventilated by an axivane fan which delivers 75,000 cubic feet of air per minute to the workings at a 4.3-inch water-gauge. Of this quantity, 46,000 cubic

feet is directed to the slope workings and the remainder to gob areas in the old workings above the main south level.

During 1958, 98,550 pounds of Monobel No. 4, 5,500 pounds of CXL-ite, and 90,149 electric detonators were used at the colliery for coal and rock blasting. Fourteen misfired shots were reported.

Three hundred and twenty-nine tons of limestone dust were used for application on the roadways at the various mines to minimize the coal-dust hazard and for tamping shots. Monthly mine-dust samples were regularly taken at all the mines and analysed. All the samples were above the minimum requirements of incombustible content.

Monthly examinations were made at all the mines by the miners' inspection committees, and a regular meeting was held at the colliery office each month by the pit safety committee. Copies of the findings and recommendations were sent to the office of the District Inspector through the courtesy of the committee members. All the report books kept at the mines in accordance with the "Coal-mines Regulation Act" were examined periodically and found to be in order.

*Baldy Mountain Strip Mines.*—William Chapman, manager; C. M. Matson, foreman.

The coal-stripping operations of The Crow's Nest Pass Coal Company are on Baldy Mountain, 4 miles east of Michel, where a number of thick seams outcrop on the mountainside. The company had two pits in operation during 1958, and both operations were carried out by Mannix Limited, of Calgary, on a contract basis. The pits are known as No. 2 and No. 3, and access is by means of a private roadway leading up the mountain from Natal. Both pits have been in operation for a number of years, and a description is included in past Annual Reports.

The mine produced 106,861 tons of coal in 1958 with a crew of three men in the pit and six truck-drivers to transport the coal to the preparation plant. This was a decline of 42,819 tons from the corresponding figure in 1957. Most of the 1958 production was obtained from No. 3 pit, where a large area of overburden had been previously removed to expose the seam. Operations were confined to loading the coal on a single-shift basis to meet the requirements of the market. No. 2 pit was only operated for a short period during the summer months, the remainder of the coal being reserved pending completion of the No. 3 pit.

The conditions in general were found to be satisfactory during the course of inspections. There were indications at one period that a section of the wall above No. 3 pit was subsiding following extraction of the coal at the northern extremity of the pit, but it appeared to settle later and there was no further movement. A close check was kept on the area and all loose rock was scaled down. No. 3 pit is rapidly nearing depletion and is expected to be abandoned in the near future.

*By-product Plant.*—This plant is adjacent to the preparation plant, and a full description of it is included in the 1954 Annual Report.

During 1958, operations were confined to the Curran-Knowle ovens, and the production of coke was 173,919 tons, an increase of 20,425 tons above the production in 1957. There were no appreciable changes made to the plant during 1958, and the conditions in general were found to be satisfactory during the course of inspections.

*Briquette Plant.*—A description of this plant is included in the 1954 Annual Report, and very little change has been made to the plant since that time. Operations during 1958 were considerably curtailed owing to lack of markets for briquettes, and the plant only worked during intermittent periods. The production was 33,272 tons of briquettes, as compared with 84,436 tons in 1957 and 188,355 tons in 1956. Conditions in general during the course of inspections were found to be satisfactory.

ELK RIVER COLLIERY.—(49° 114° S.W.) James E. Morris, manager. The Crow's Nest Pass Coal Company Limited suspended all mining operations at this colliery at

Coal Creek on January 23rd owing to the lack of markets for the coal. All the equipment and materials were removed from the mines, and the entrances to the mines have been sealed. There were 284 men and officials employed at the colliery at the time of closure; eighty-one of them were transferred to the Michel Colliery.

The colliery had been in operation since 1942. A full description has been given in past Annual Reports. Three mines were in operation at the time of closure.

**Coleman Collieries Limited**

D. B. Young, general manager, Coleman Alta.; John C. Shearer, strip-mine manager. The coal-mining activities of this company in East Kootenay Inspection District are confined to a large stripping operation on the interprovincial boundary on Tent Mountain, near Corbin. Most of the property is in Alberta, but large quantities of coal have been produced from the part in British Columbia during the past eight years. Access to the property is by means of a private road leading to the top of the mountain from the No. 3 highway at Crowsnest Lakes. All the roadways are in Alberta, and all the coal from the strip mines is taken to the company's preparation plant at Coleman, Alta.

Most of the activities in 1958 were confined to the No. 2 pit, where a large deposit of coal over 100 feet thick is in the form of a syncline. Half the pit is in Alberta and the other half in British Columbia. The overburden has been removed during the past three years and the present operations are confined to loading coal. This is done by power-shovels and the coal is transported to the company's preparation plant by 15-ton-capacity trucks. Conditions in general during the course of inspections were found to be satisfactory.

## NORTHERN INSPECTION DISTRICT

By David Smith

The coal mines of the Northern District produced a total of 8,327 tons of coal in 1958, an increase of 178 tons or 2.2 per cent from the 1957 output. The output is sold entirely on the domestic market, which limits all operations to seasonal work only.

No accidents or dangerous occurrences were reported from the coal mines of this district during 1958.

### TELKWA (54° 127° N.E.)

**Bulkley Valley Collieries Limited**

Company office, Telkwa. F. M. Dockrill, president; F. Bond and L. Gething, firebosses. This is a private company mining coal on a royalty basis in a property comprising six Crown-granted lots, Nos. 388 to 392 and No. 401. The property is on Goat Creek, a tributary of the Telkwa River, about 7 miles southeast of Telkwa.

Total production in 1958 was 5,233 tons. The mine was shut down on March 31st and resumed operations September 3rd. An average crew of fourteen men was employed. The main slope has been extended an additional 500 feet and a new section has been opened to the right.

Conditions in the mine were found satisfactory in the course of inspections. No accidents were reported. No methane was detected during inspections.

### PEACE RIVER (56° 122° S.E.)

**King Gething Mines**

Q. F. (King) Gething, operator and fireboss. This property is on Lot 1039, 12 miles by road from Hudson Hope. Mining was confined to the upper level. Total production was 2,312 tons. A crew of three men was employed. Conditions at the working-faces were found to be satisfactory in the course of inspections. No methane was detected. No accidents were reported.

**Reschke Coal Ltd.** Company office, Fort St. John. E. B. Summer, operator and fireboss. This property is at an elevation of 2,600 feet on the steep southern end of a spur of Butler Ridge, 1 mile north of the Peace River. It is 23 miles by road from Hudson Hope. Mining was carried on until the last week in February, when surface run-off due to an early thaw entered the mine and then froze, so handicapping the haulage that operations were suspended for the season. At the time of inspection in September no start had been made on production for the coming season due to lack of markets for domestic coal in the immediate area. Conditions were found to be satisfactory in the course of inspections. No methane was detected. No accidents were reported. Total production was 782 tons.

# Inspection of Electrical Equipment and Installations at Mines, Quarries, and Well Drilling Rigs

By L. Wardman, Electrical Inspector of Mines

## ELECTRIC POWER

In 1958 electric power was used at thirty-six mining companies in operations at twenty-nine lode mines, three placer mines, two non-metallic mineral mines, three collieries, two coal-cleaning plants, and one coking plant. Electric power was also used at eight non-metallic mineral mines for loading, crushing, separating, and conveying materials. Over forty drilling rigs using electric power for lighting and driving motors were used in drilling operations at 112 oil and gas wells. Eighty-nine of these wells were completed.

### LODE-METAL MINES

In 1958 operations at eight metal mines using electric power were terminated either permanently or indefinitely. A mill was built at a reopened mine and wired for electric power. Part of a mill at an inoperative mine was put into service for reclaiming barite from the tailings.

The kva. generating capacity of privately owned plants which were operated in 1958 was as follows:—

| Prime Mover | Generator Kva. Capacity |
|---|---|
| Steam turbines | 11,449 |
| Diesel engines | 12,667 |
| Water-wheels | 1,800 |
| Total | 25,916 |

The electric power produced by these plants was approximately 45,237,588 kilowatt-hours during 1958. The power purchased from public utilities and from the generating division of The Consolidated Mining and Smelting Company of Canada, Limited, amounted to 199,844,072 kilowatt-hours. The total amount of power used in the Province for mining and concentrating purposes was 245,081,660 kilowatt-hours.

Approximately 6,761 horsepower was produced by diesel engines, water-wheels, and gas engines for direct-driven equipment such as compressors. The power was produced as follows:—

| Prime Mover | Horsepower |
|---|---|
| Diesel engines | 4,276 |
| Water-wheels | 1,790 |
| Gasoline engines | 695 |
| Total | 6,761 |

The above figures for generating capacity, kilowatt-hours, and horsepower are very much less than 1957 because of fewer operating mines. For the same reason the connected load shows a considerable reduction in horsepower. A general breakdown of the connected load for those properties which operated in 1958 is as follows:—

| Equipment | Horsepower |
|---|---|
| Hoists | 6,530 |
| Scraper hoists | 5,815 |
| Ventilating fans | 4,289 |
| Pumps | 5,457 |
| Rectifiers and M.G. sets | 8,267 |
| Air compressors | 19,626 |
| Crushing equipment | 7,921 |
| Sink float | 570 |
| Milling and concentrating equipment | 36,542 |
| Workshops | 2,299 |
| Miscellaneous | 10,553 |
| Total | 107,869 |

On surface and underground haulage systems there were in use 131 battery locomotives, 96 trolley locomotives, and 13 diesel locomotives.

### Placer Mines

Electric power was used at three placer mines. The generating capacity was as follows: Diesel-engine-driven generators, 652 kva.

The connected load was as follows:—

| | Horsepower |
|---|---|
| Trommel screens | 90 |
| Jigs | 5 |
| Conveyors | 25 |
| Pumps | 100 |
| Compressors | 15 |
| Miscellaneous | 59 |
| Total | 294 |

### Non-metallic Mines and Quarries

Electric power was used at two non-metallic mines, one non-metallic mill, and eight quarries.

### Coal Mines

Operations at one colliery were terminated in January, 1958, and the use of electric power at one small colliery was discontinued, reducing the number of collieries using electric power to three.

The distribution of electric power was as follows:—

| | Horsepower |
|---|---|
| Surface— | |
| Compressed air | 4,440 |
| Ventilation | 630 |
| Hoisting | 545 |
| Haulage | 15 |
| Coal washing and screening | 2,561 |
| Pumping | 215 |
| Briquetting | 642 |
| Coke production | 1,180 |
| Miscellaneous | 599 |
| Total | 10,827 |

| | Horsepower | |
|---|---|---|
| Underground— | | |
| Ventilation | 40 | |
| Hoisting | 60 | |
| Haulage | 80 | |
| Pumping | 250 | |
| Coal-cutters | 175 | |
| Conveyors | 612 | |
| Compressed air | 200 | |
| Miscellaneous | 3 | |
| Total | | 1,420 |
| Total for surface and underground | | 12,247 |

The closing-down of Elk River Colliery caused a decrease of 3,535 horsepower in the above totals. This decrease would have been greater had not some of the equipment from Elk River Colliery been put into use at Michel Colliery.

Four permissible battery locomotives and three permissible diesel locomotives were in use underground.

### Well Drilling Rigs

Forty-four drilling rigs were operated in 1958. One hundred and twelve wells were operated during the year, and of these eighty-nine were completed.

## ELECTRICAL INSTALLATIONS

### LODE MINES

In 1958 operations at the following enumerated mines were suspended for an indefinite period: Granduc, Emerald Tungsten, Dodger, Highlander, Spider, B.C. Nickel, and Britannia. Operations at the Silver Standard mine were terminated and the equipment was moved off the property.

The Silver Giant mill was reopened to recover barite from the tailings. A mill was built at the Bedwell River Gold mine.

The following is a brief outline of electrical installations which were made at operating mines in 1958.

### Lillooet

*Bridge River (50° 122° N.W.)*

**Bralorne (Bralorne Mines Limited)**

Four 25-horsepower motors driving ventilation fans were installed on the 2600 level at the cooling radiators. An air compressor driven by a 100-horsepower motor was installed at the 800 level shaft station to boost the air pressure by 20 pounds. The 150-kva. transformer station which was at the 200 level Empire shaft station was rebuilt adjacent to the 200 level portal. New switch-gear was installed to replace the old. This station supplies the Empire shaft equipment, the 200 level exhaust fan, the framing-shed motors, and the air-compressor motor at Bradian.

An air compressor driven by a 300-horsepower motor was installed on the surface and a new lamp-house was built at the Bralorne mine portal.

**Pioneer (Pioneer Gold Mines of B.C. Limited)**

A new Woods 19-inch 2-stage ventilation fan driven by a 440-volt 3,450-r.p.m. 11½-horsepower motor was installed on the 29 level to ventilate the 29-16 crosscut. Magnetic proximity shaft-limit switches were installed in No. 2 and No. 3 shafts. These switches have no exposed moving parts and therefore cannot seize up because of dust or corrosion.

The new Pioneer substation was completed early in the year and put into service. The domestic power and lighting distribution system was sold to the British Columbia Electric Company Limited. This sale necessitated several alterations to the Pioneer primary-power distribution-lines.

Two Orelikon fully automatic voltage regulators were installed at the Pioneer No. 1 power plant.

HEDLEY

**French (French Mines Ltd.)** (49° 120° S.E.) A scraper hoist driven by a 10-horsepower motor was installed in the 3916 stope and a pump driven by an 8-horsepower motor was installed in the Cariboo level. A dangerous occurrence took place on November 18th when the mill mechanic and crusherman, while examining a defective crusher-motor magnetic starter, attempted to close it with the door open and the power on. An electric arc occurred which caused flash burns to the eyes of both men. Instructions were issued which prohibit the closing of any switch until the door is closed and secured.

PHOENIX

**Phoenix Copper Company Limited** (49° 118° S.W.) During 1958 construction work was continued on a reduced scale to prepare the Phoenix operation for production at some future date. A 1,500-c.f.m. compressor driven by a 2,200-volt 240-horsepower motor and a 1,000-c.f.m. compressor driven by a 440-volt 150-horsepower motor were installed in the compressor building.

In the crusher building three 2,200-volt crusher motors totalling 500 horsepower and ten 440-volt motors totalling 50 horsepower were installed and the lighting-circuit wiring was completed.

In the mill twenty 440-volt motors totalling 175 horsepower were installed, and the 2,200-volt ball-mill motors were set in place but were not connected. The lighting-circuit wiring was three-quarters completed.

SALMO

**Jersey, Emerald, and Dodger (Canadian Exploration Limited)** (49° 117° S.E.) The tungsten mines were closed in August and all equipment, with the exception of the hoist in the Emerald shaft, was removed. The tungsten mill was left in operating condition. Five substations in the Jersey mine were rebuilt and put in service, and several cables were rerouted and connected to serve substations in the Jersey mine. A 60-horsepower fan and a 50-horsepower fan were relocated. Three new scraper hoists were installed, bringing the total in operation to seventeen.

A 3½-ton Mancha locomotive is being converted for diesel-electric drive. A similar locomotive converted in 1957 has given satisfactory service.

A dangerous occurrence took place in the Dodger 4200 mine on June 7th, as follows:—

The electrical foreman detailed two electricians to disconnect an oil switch in substation 420 while he and two electricians went to substation 47-J-42 to cut off the power and disconnect a transformer. When the transformer was disconnected, the electricians informed the foreman that he could close the switch to return power to the line. This he did, forgetting that in so doing he was energizing the feeder to substation 420. Fortunately, the cables to the oil switch in substation 420 had been disconnected and were lying on the floor with the ends touching. A severe arc occurred but no one was injured. A special rule was written by the management which prohibits working on equipment unless the person working on the equipment has locked the switch controlling the circuit to that equipment in the "open" position.

NORTH KOOTENAY LAKE

*Riondel (49° 116° N.W.)*

**Bluebell (The Consolidated Mining and Smelting Company of Canada, Limited)**

A 2,000-kva. 66,000–6,900-volt 3-phase unit substation was installed in the substation enclosure adjacent to the No. 1 shaft hoist-room. By means of 2,120 feet of 1/0 A.W.G. 3-conductor varnished-cambric lead-covered steel-wire-armoured cable, this unit substation supplies a new substation on No. 8 level. This new substation consists of three 500-kva. single-phase 6,900–575-volt transformers and switch-gear. The power from this system will be used mainly for driving pumps on No. 8 level.

In No. 5 level pumping station No. 1 shaft, one 2-stage 3,600-r.p.m. 1,000-imperial-gallons-per-minute pump driven by a 300-horsepower motor was installed.

In No. 8 level pumping station No. 1 shaft, three 2-stage 1,750-r.p.m. 1,000-imperial-gallons-per-minute pumps driven by 150-horsepower motors and two single-stage 3,500-r.p.m. 300-imperial-gallons-per-minute pumps driven by 50-horsepower motors were installed.

The 2A pump station in the Bluebell shaft was reduced to four 300-imperial-gallons-per-minute pumps driven by 40-horsepower motors.

To provide power for the mine ventilating-fan installation, a diesel-engine-driven 150-kw. continuous-rating 550-volt 3-phase 60-cycle generating unit was installed in the compressor building. Three 75-kva. single-phase 600–7,200-volt transformers were installed to transform the power to line voltage.

SANDON

**Victor (Violamac Mines Limited).**—(49° 117° N.E.) A 125-kva. Caterpillar diesel generating unit was moved from the mill to the compressor-house.

**Silversmith (Carnegie Mines of British Columbia, Ltd.).**—(49° 117° N.E.) An auxiliary vacuum pump driven by a 7½-horsepower motor, a filtrate pump driven by a 5-horsepower motor, and a unit cell driven by a 5-horsepower motor were installed in the mill. The motor-generator battery-charging set was moved from the Ruth to the Carnegie mine.

SLOCAN LAKE

**Western Exploration Company Limited.**—(49° 117° N.E.) The 300-kva. substation for connecting to the British Columbia Power Commission power-lines was completed. A 27.5-kva. substation was built at the portal of the No. 12 Buffalo-Mammoth adit. A 2,300-volt power-line was erected from the Mammoth mine to supply the substation. Battery-charging equipment and a battery locomotive are in use.

KIMBERLEY

**Sullivan (The Consolidated Mining and Smelting Company of Canada, Limited)**

(49° 115° N.W.) In the mine the 75-horsepower sinking-hoist at the No. 1 Pilot shaft was replaced with a 150-horsepower hoist. A 30-horsepower scraper hoist and a 60-horsepower scraper hoist were put in service. At the mill the No. 47 pump 40-horsepower 900-r.p.m. motor was replaced with a 100-horsepower 1,200-r.p.m. motor. The west bank mill-lighting transformers were reconnected from 3-phase 110-volt to 230/115-volt single-phase. The 5-kva. 6,900–230/115-volt transformer at the portal mercury-arc rectifier station was replaced with a 10-kva. 6,900–230/115-volt transformer.

All the welded track on the 3700 haulage has been replaced with track having expansion joints bonded with 4/0 A.W.G. wedge bonds. A 5-kva. 6,900–230/115-volt transformer was installed on the 3700 haulage to supply the track lubricator.

A new service and panel was installed for the X-ray analyser.

VANCOUVER ISLAND

*Benson (Elk) Lake (50° 127° S.E.)*

**Empire Development Company Limited**

A dynamic braking system was installed on the hoist to permit more effective control of the wound-rotor induction motor than was possible with regenerative braking. To ensure that dynamic braking would be available when the power was off, a bank of wet batteries was installed to provide excitation. Previous to the installation of dynamic braking a runaway occurred which ruined the hoisting-cable.

At the time of the incident the generators were tripped off the line inadvertently, either by reverse current from the power generated by the hoist motor or by some other cause. This would leave the motor without excitation current, and since it would then produce no power, the hoist would run uncontrolled until the brakes were applied. Unfortunately, at the time of the incident the automatic brake was dismantled for repairs and stopping of the hoist depended entirely on the operating brakes which are controlled hydraulically and are assisted by weights when applied. When the power was off the weights alone did not apply the brakes with sufficient pressure to effect a quick stop, and the skips reached the ends of the incline with sufficient speed to shear the cable clamps and allow the cable to slide down the incline and become very badly kinked, and was discarded.

*Bedwell River (49° 125° S.W.)*

**David, Jericho, and Laddie Nos. 1, 2, and 3 (Bedwell River Gold Mines Limited)**

This property was opened after being closed for sixteen years. The mill building was rebuilt and some of the old equipment was repaired. New electrical wiring, switch-gear, and motors were installed. Power for the mill is supplied by three Pelton wheels as follows: A 36-inch Pelton wheel drives a 35-kva. 120-volt generator to supply all the electric power required. A 24-inch Pelton wheel drives the ball mill and an 18-inch Pelton wheel drives the primary conveyors and crusher. The remaining equipment is driven by electric motors and is as follows: Crusher to fine-ore bin conveyor, driven by a 5-horsepower motor; classifier, driven by a 5-horsepower motor; four flotation cells and an amalgam barrel, each driven by a 3-horsepower motor; fine-ore feeder, thickener, and vacuum pump, each driven by a 2-horsepower motor; filter and filtrate pump, driven by a 1½-horsepower motor; flotation feed pump and flotation concentrate pump, each driven by a 1-horsepower motor; and filtrate pump, driven by a ½-horsepower motor. In the sample-room a 1-horsepower motor drives the crusher fan and pulverizer.

## PLACER MINES

The Noland mine on Spruce Creek and the Atlin Placers on Wright Creek were not operated in 1958. Hixon Placers on Hixon Creek was operated. Allied Developers commenced an operation on the Fraser River at Fountain, and Kumhila Exploration Co. Ltd. commenced an operation on Williams Creek between Wells and Barkerville.

**Fountain Placers (Allied Developers Ltd.)**

(50° 121° N.W.) The equipment installed at this property consists of a direct-connected 1,200-r.p.m. 75-kw. 60-cycle 240-volt 3-phase Palmer generator driven by an International diesel engine; a trommel screen driven by a 15-horsepower induction motor; and three Yuba jigs, two driven by 2-horsepower motors and the third by a 1-horsepower motor.

**Kumhila Placer (Kumhila Exploration Co. Ltd.)** (53° 121° S.W.) A washing plant, dragline shovel, and boom shovel were installed on the property in 1958. The washing plant is powered by a 200-kva. 480-volt diesel-driven alternator which supplies power to a 75-horsepower trommel-screen motor, a 100-horsepower pump motor, a 25-horsepower stacking-conveyor motor, a 5-horsepower compressor motor, a 5-horsepower cooling-fan motor, and a 3-horsepower winch motor.

On the dragline a diesel engine drives the shovel winch and a 360-kw. 250-volt d.c. generator which supplies power to a 50-horsepower turn-table motor, a 1-horsepower boom motor, and two 5-horsepower compressor motors.

## NON-METALLIC MINES

### McDame

**Cassiar Asbestos Corporation Limited** (59° 120° S.W.) Several changes made in the operation increased the mill load by 38½ horsepower. The mine load was increased by 29½ horsepower. In the power-house were added one VGB 560-horsepower Ruston & Hornsby diesel driving a 438-kva. alternator and one VGB 480-horsepower Ruston & Hornsby diesel driving a 375-kva. alternator. The total generating capacity is now 2,563 kva. The transformer capacity was increased by 238 kva. to accommodate additional loads.

**British Columbia Cement Company Limited.**—(48° 123° N.W.) Operation of the Bamberton quarry was terminated and the electrical shovels were taken out of service.

**Blubber Bay (Gypsum Lime and Alabastine, Canada, Limited).**—(49° 124° N.W.) An overhead 440-volt power-line was built to the quarry to supply a pump motor.

**Coquitlam (Deeks-McBride Ltd.).**—(49° 122° S.W.) A transportable crusher driven by a 440-volt 50-horsepower motor was installed in the pit. It is supplied from a transportable distribution centre. Capacitors were installed in the distribution centre to improve power factor and voltage regulation.

### Sirdar

**Kootenay Granite Products Limited** (49° 116° S.W.) The equipment in the plant was rearranged and the electrical installation was rebuilt as follows: The main service for the plant, consisting of a 400-ampere main switch, 400-ampere gutter, two 200-ampere fused switches, and one 100-ampere fused switch, supplies a 50-horsepower air-compressor motor and two distribution centres, "A" and "B."

"A" distribution centre supplies a 50-horsepower crusher motor, a 30-horsepower crusher motor, a 3-horsepower conveyor motor, a 1-horsepower conveyor motor, a 1½-horsepower screen motor, and a 7½-horsepower fan motor.

"B" distribution centre supplies a 3-horsepower screen motor, a 5-horsepower screen motor, a 2-horsepower conveyor motor, a 1-horsepower conveyor motor, and a 15-horsepower fan motor.

## COAL MINES

### Nanaimo (49° 123° S.W.)

**Union Bay Washery (Canadian Collieries Resources Limited).**—The length of a 440-volt gutter in the washery was increased to accommodate a 50-horsepower combination line starter controlling a 50-horsepower crusher motor. A 2,200-volt static ground fault indicator was installed on the bus at the Union Bay substation.

**Tsable River (Canadian Collieries Resources Limited).**—A dangerous occurrence took place on November 3rd when a fire occurred in the windings of the No. 2 compressor motor in the Tsable River mine compressor-room. Apparently the amortisseur windings overheated and burned through in several places, producing sufficient heat to ignite the oil and dirt on the stator windings. The motor was repaired and returned to service.

EAST KOOTENAY (49° 114° S.W.)

**Elk River Colliery (The Crow's Nest Pass Coal Company Limited).**—Operations were terminated on January 31st and all equipment was dismantled.

**Michel Colliery (The Crow's Nest Pass Coal Company Limited)**

The Elk River Colliery switchboard, consisting of a main oil circuit-breaker and four 600-horsepower starter panels, was installed in the Michel compressor-room. Two 1,500-kva. 6,600–2,300-volt 3-phase transformers were also moved to Michel and installed in the substation at the power-house. Three 300-kva. single-phase transformers were removed. The substation now consists of four 1,500-kva. 3-phase transformers. Two of these transformers supply the air-compressor motors and the other two supply the plant.

A 600-horsepower air compressor from Elk River Colliery was installed in the Michel power-house.

A second 500-kva. transformer was added to the underground system, so that now "A" North mine is supplied separately from the other mines.

# Lode-metal Deposits Referred to in the 1958 Annual Report

The names of the properties are arranged alphabetically within five areas. Each area consists of the mining divisions listed below. The table shows the principal metals produced or indicated in the deposits in 1958:—

*Northern British Columbia.*—Atlin, Liard.

*Central British Columbia.*—Cariboo, Clinton, Omineca.

*Coast and Islands.*—Alberni, Nanaimo, New Westminster, Skeena, Vancouver, Victoria.

*South Central British Columbia.*—Greenwood, Kamloops, Lillooet, Nicola, Osoyoos, Similkameen, Vernon.

*Southeastern British Columbia.*—Fort Steele, Golden, Nelson, Revelstoke, Slocan, Trail Creek.

| Property | Mining Division | Latitude and Longitude | Gold | Silver | Copper | Lead | Zinc | Tungsten | Cadmium | Iron | Manganese | Uranium | Chromium | Tin | Nickel | Molybdenum | Cobalt | Sulphur | Mercury | Page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Northern British Columbia* | | | | | | | | | | | | | | | | | | | | |
| Balsom Group | Liard | 57° 132° N.E. | | | 3 | | | | | | | | | | | 3 | | | | 6 |
| Magnum Group | Liard | 58° 125° N.E. | | | 3 | | | | | | | | | | | | | | | 13 |
| Silver Tip Group | Liard | 59° 130° N.W. | | 3 | | 3 | | | | | | | | | | | | | | 13 |
| Toad River | Liard | 58° 125° N.W. | | | 3 | | | | | | | | | | | | | | | 13 |
| *Central British Columbia* | | | | | | | | | | | | | | | | | | | | |
| AMY | Omineca | 55° 125° N.E. | | | | | | | | | | | | | | | | | 3 | 11 |
| Aurum | Cariboo | 53° 121° S.W. | 1 | 2 | | | | | | | | | | | | | | | | 14 |
| Boss Mountain | Cariboo | 52° 120° S.W. | | | | | | | | | | | | | | 3 | | | | 15 |
| Cariboo Gold Quartz | Cariboo | 53° 121° S.W. | 1 | 2 | | | | | | | | | | | | | | | | 14 |
| Cronin Babine | Omineca | 54° 126° N.W. | 2 | 1 | | 1 | 1 | | | | | | | | | | | | | A43 |
| Glacier Gulch | Omineca | 54° 127° N.E. | | | | | | | | | | | | | | 3 | | | | 10 |
| Jane Group | Omineca | 56° 125° S.W. | | | 3 | | | | | | | | | | | | | | | 11 |
| Lorraine | Omineca | 54° 126° N.W. | | 3 | | 3 | 3 | | | | | | | | | | | | | 10 |
| Silver Standard | Omineca | 55° 127° S.W. | 2 | 1 | 2 | 1 | 1 | | 2 | | | | | | | | | | | 9 |
| *Coast and Islands* | | | | | | | | | | | | | | | | | | | | |
| A.M. | New Westminster | 49° 121° S.E. | | | 3 | | | | | | | | | | | | | | | 54 |
| Blue Grouse | Victoria | 48° 124° N.E. | | 2 | 1 | | | | | | | | | | | | | | | 60 |
| Britannia | Vancouver | 49° 123° N.E. | 2 | 2 | 1 | 2 | 1 | | 2 | | | | | | | | | 2 | | 56 |
| Ecstall | Skeena | 53° 129° N.W. | | | 3 | | 3 | | | | | | | | | | | 3 | | 7 |
| Empire (Merry Widow and Kingfisher) | Nanaimo | 50° 127° S.E. | | | | | | | | | 1 | | | | | | | | | 57 |
| Fandora | Alberni | 49° 125° S.W. | 3 | | | | | | | | | | | | | | | | | 59 |
| Gabbro | Victoria | 48° 124° S.W. | | | 3 | | | | | | | | | | | | | | | 60 |
| Gold Coin | New Westminster | 49° 121° S.E. | | | 3 | 3 | 3 | | | | | | | | | | | | | 55 |
| Gold Flake | Alberni | 49° 125° S.W. | 3 | | | | | | | | | | | | | | | | | 59 |
| Granduc | Skeena | 56° 130° S.E. | | | 3 | | | | | | | | | | | | | | | 6 |
| Musketeer | Alberni | 49° 125° S.W. | 1 | 2 | 2 | 2 | | | | | | | | | | | | | | 59 |
| Newmont | New Westminster | 49° 121° N.W. | | | | | | | | | | | | | | 3 | | | | 56 |
| Packsack | Skeena | 53° 129° N.E. | | | 3 | | 3 | | | | | | | | | | | 3 | | 9 |
| Pride of Emory (Western Nickel) | New Westminster | 49° 121° S.W. | | | 1 | | | | | | | | | | 2 | | | | | 55 |
| Silbak Premier | Skeena | 56° 130° S.E. | 1 | 2 | | 2 | 2 | | | | | | | | | | | | | 6 |
| Sunloch | Victoria | 48° 124° S.E. | | | 3 | | | | | | | | | | | | | | | 60 |
| Texada (Prescott, Paxton, Yellow Kid, Yellow Jacket) | Nanaimo | 49° 124° N.W. | 1 | 1 | 2 | | | | | | | | | | | | | | | 57 |
| Toric | Skeena | 55° 129° N.W. | | 1 | | 1 | | | | | | | | | | | | | | 6 |
| Western Nickel | New Westminster | 49° 121° S.W. | | | 3 | | | | | | | | | | 3 | | | | | 55 |

*Shipping Mines.*—(1) Metal contributed at least 10 per cent of gross value of the shipment. (2) Metal contributed less than 10 per cent of gross value of the shipment. Production for 1958 is listed in Table XV.
*Non-shipping Mines.*—(3) Metal present, indicated by assay or mineralogical determination.

## LODE-METAL DEPOSITS REFERRED TO IN THE 1958 ANNUAL REPORT—*Continued*

| Property | Mining Division | Latitude and Longitude | Gold | Silver | Copper | Lead | Zinc | Tungsten | Cadmium | Iron | Manganese | Uranium | Chromium | Tin | Nickel | Molybdenum | Cobalt | Sulphur | Mercury | Page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *South Central British Columbia* | | | | | | | | | | | | | | | | | | | | |
| Aiscope | Similkameen | 49° 120° N.W. | | | 3 | | | | | | | | | | | | | | | 28 |
| B.X. | Kamloops | 50° 120° N.W. | | | 3 | | | | | | | | | | | | | | | 22 |
| Beaver | Kamloops | 50° 121° N.E. | | | 3 | | | | | | | | | | | | | | | 22 |
| Belchrome | Greenwood | 49° 119° S.E. | | | | | | | | | | | 3 | | | | | | | 34 |
| Bethlehem | Kamloops | 50° 120° S.W. | | | 3 | | | | | | | | | | | | | | | 21 |
| Bethsaida | Kamloops | 50° 121° S.E. | | | 3 | | | | | | | | | | | | | | | 24 |
| Bob | Kamloops | 50° 120° N.W. | | | 3 | | | | | | | | | | | | | | | 22 |
| Bounty Fraction | Greenwood | 49° 119° S.E. | | 3 | | 3 | 3 | | | | | | | | | | | | | 36 |
| Braiorne | Lillooet | 50° 122° N.W. | 1 | 2 | | | | | | | | | | | | | | | | 15 |
| Cap | Nicola | 50° 120° S.W. | | | 3 | | | | | | | | | | | | | | | 26 |
| Caribou Amelia | Greenwood | 49° 119° S.E. | 3 | | | | | | | | | | | | | | | | | 33 |
| Copper Mountain | Similkameen | 49° 120° S.W. | 1 | 2 | 1 | | | | | | | | | | | | | | | A45 |
| Cow | Kamloops | 50° 120° N.W. | | | 3 | | | | | | | | | | | | | | | 22 |
| Craigmont | Nicola | 50° 120° S.W. | | 1 | 3 | | | | | | | | | | | | | | | 25 |
| D.M. | Kamloops | 50° 120° N.W. | | | 3 | | | | | | | | | | | | | | | 29 |
| Domino | Nicola | 50° 120° S.W. | | | 3 | | | | | | | | | | | | | | | 26 |
| Elizabeth | Lillooet | 51° 122° S.W. | 1 | 2 | | 2 | 2 | | | | | | | | | | | | | 15 |
| Fairview | Osoyoos | 49° 119° S.E. | 1 | | | | | | | | | | | | | | | | | 32 |
| Fat Chance | Kamloops | 50° 120° N.E. | | | 3 | | | | | | | | | | | | | | | 29 |
| French | Osoyoos | 49° 120° S.E. | 1 | 2 | | | | | | | | | | | | | | | | 31 |
| Gem | Nicola | 50° 120° S.W. | | | | 3 | 3 | | | | | | | | | | | | | 28 |
| Hank | Nicola | 50° 120° S.W. | | | 3 | | | | | | | | | | | | | | | 26 |
| Hat | Kamloops | 50° 120° S.W. | | | 3 | | | | | | | | | | | | | | | 22 |
| Highland-Bell | Greenwood | 49° 119° S.E. | 2 | 1 | | 2 | 2 | | | 2 | | | | | | | | | | 35 |
| Horn Silver | Osoyoos | 49° 119° S.W. | 1 | 1 | 2 | 2 | | | | | | | | | | | | | | 32 |
| Ilk | Similkameen | 49° 120° S.W. | | | 3 | | | | | | | | | | | | | | | 30 |
| Jericho | Kamloops | 50° 120° S.W. | | | 3 | | | | | | | | | | | | | | | 24 |
| Krain | Kamloops | 50° 121° N.E. | | | 3 | | | | | | | | | | | | | | | 21 |
| Lodge | Kamloops | 50° 120° N.W. | | | 3 | | | | | | | | | | | | | | | 22 |
| Louis | Kamloops | 50° 121° N.W. | | | 3 | | | | | | | | | | | | | | | 21 |
| Makaoo | Kamloops | 50° 120° N.E. | | | 3 | | | | | | | | | | | | | | | 29 |
| Nickel Plate | Osoyoos | 49° 120° S.E. | 1 | 2 | 2 | | | | | | | | | | | | | | | A45 |
| Noranda Exploration | Kamloops | 50° 120° S.W. | | | 3 | | | | | | | | | | | | | | | 27 |
| Northern Gem | Lillooet | 50° 122° N.W. | 3 | | | | | | | | | 3 | | | | | 3 | | | 15 |
| Northwestern Explorations, Guichon Creek | Kamloops | 50° 120° N.W. | | | 3 | | | | | | | | | | | | | | | 24 |
| Northwestern Explorations, Merritt | Kamloops | 50° 120° S.W. | | | 3 | | | | | | | | | | | | | | | 27 |
| Northwestern Explorations, Pimainus Lake | Nicola | 50° 121° S.E. | | | 3 | | | | | | | | | | | | | | | 24 |
| Outrider | Kamloops | 50° 120° S.W. | | | 3 | | | | | | | | | | | | | | | 22 |
| P.C.M. | Nicola | 50° 120° S.W. | | | 3 | | | | | | | | | | | | | | | 26 |
| P.L. | Nicola | 50° 120° S.W. | | | 3 | | | | | | | | | | | | | | | 28 |
| Phoenix | Greenwood | 49° 118° S.W. | 3 | 3 | 3 | | | | | | | | | | | | | | | 36 |
| Pioneer | Lillooet | 50° 122° N.W. | 1 | 2 | | | | | | | | | | | | | | | | 20 |
| Providence | Greenwood | 49° 118° S.W. | 1 | 1 | | 2 | 2 | | | | | | | | | | | | | A44 |
| Rexspar | Kamloops | 51° 119° N.W. | | | | | | | | | | 3 | | | | | | | | 30 |
| Sammy | Greenwood | 49° 119° S.E. | | | | | | | | | | | 3 | | | | | | | 34 |
| Star | Kamloops | 50° 120° N.W. | | | 3 | | | | | | | | | | | | | | | 22 |
| Torwest | Nicola | 50° 120° S.W. | | | 3 | | | | | | | | | | | | | | | 28 |
| Trojan | Kamloops | 50° 120° N.W. | | | 3 | | | | | | | | | | | | | | | 21 |
| Vanex | Nicola | 50° 120° S.W. | | | 3 | | | | | | | | | | | | | | | 29 |
| *Southeastern British Columbia* | | | | | | | | | | | | | | | | | | | | |
| Arlington | Nelson | 49° 117° S.E. | 1 | 2 | | 1 | 1 | | | | | | | | | | | | | 38 |
| Bannockburn | Revelstoke | 50° 117° N.E. | | 3 | | 3 | 3 | | | | | | | | | | | | | 50 |
| Beatrice | Revelstoke | 50° 117° N.W. | | 3 | | 3 | 3 | | | | | | | | | | | | | 49 |
| Belle Aire | Slocan | 49° 116° N.W. | | 3 | | 3 | 3 | | | | | | | | | | | | | 43 |
| Black Diamond | Slocan | 49° 116° N.W. | | 1 | | 1 | 2 | | | | | | | | | | | | | A46 |
| Black Warrior | Revelstoke | 50° 117° N.E. | | 3 | | 3 | 3 | | | | | | | | | | | | | 50 |
| Bluebell | Slocan | 49° 116° N.W. | | 2 | 2 | 1 | 1 | | 2 | | | | | | | | | | | 41 |
| Bosun | Slocan | 49° 117° N.E. | | 3 | | 3 | 3 | | | | | | | | | | | | | 47 |
| C.R. | Revelstoke | 51° 118° S.E. | | 3 | | 3 | 3 | | | | | | | | | | | | | 53 |
| Caledonia | Slocan | 50° 117° S.E. | 2 | 1 | | 1 | 1 | | 2 | | | | | | | | | | | 44 |
| Clubine Comstock | Nelson | 49° 117° S.E. | 3 | | | | | | | | | | | | | | | | | 39 |
| Cowboy | Slocan | 50° 117° S.E. | | 3 | | 3 | 3 | | | | | | | | | | | | | 45 |
| Deby | Revelstoke | 51° 118° S.E. | | 3 | | 3 | 3 | | | | | | | | | | | | | 53 |

LODE-METAL DEPOSITS REFERRED TO IN THE 1958 ANNUAL REPORT—*Continued*

| Property | Mining Division | Latitude and Longitude | Gold | Silver | Copper | Lead | Zinc | Tungsten | Cadmium | Iron | Manganese | Uranium | Chromium | Tin | Nickel | Molybdenum | Cobalt | Sulphur | Mercury | Page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Southeastern British Columbia*—Continued | | | | | | | | | | | | | | | | | | | | |
| Dodger | Nelson | 49° 117° S.E. | | | | | | 1 | | | | | | | | | | | | 38 |
| Eclipse | Revelstoke | 50° 117° N.W. | 2 | 1 | | 1 | 1 | | | | | | | | | | | | | 49 |
| Elsmere | Revelstoke | 50° 117° N.E. | | 3 | | 3 | 3 | | | | | | | | | | | | | 50 |
| Emerald | Nelson | 49° 117° S.E. | | | | | | 1 | | | | | | | | | | | | 38 |
| Estella | Fort Steele | 49° 115° N.W. | | 2 | | 1 | 1 | | 2 | | | | | | | | | | | A45 |
| Feeney | Nelson | 49° 117° S.E. | | | | | | 1 | | | | | | | | | | | | 38 |
| Fisher Maiden | Slocan | 49° 117° N.E. | | 3 | | 3 | 3 | | | | | | | | | | | | | 48 |
| Fort Steele | Fort Steele | 49° 115° N.W. | | 3 | | 3 | 3 | | | | | | | | | | | | | 52 |
| Fourth of July | Slocan | 50° 117° S.E. | | 3 | | 3 | 3 | | | | | | | | | | | | | 45 |
| Gold Belt | Nelson | 49° 117° S.E. | 1 | 2 | | 2 | 2 | | | | | | | | | | | | | A45 |
| Goodenough | Nelson | 49° 117° S.E. | 3 | 3 | | 3 | 3 | | | | | | | | | | | | | 37 |
| H.B. | Nelson | 49° 117° S.E. | | 2 | | 1 | 1 | | 2 | | | | | | | | | | | 39 |
| Hewitt | Slocan | 49° 117° N.E. | 2 | 1 | | 1 | 1 | | 2 | | | | | | | | | | | 48 |
| Highlander | Slocan | 49° 116° N.W. | 2 | 1 | | 1 | 2 | | | | | | | | | | | | | 43 |
| J.G. | Slocan | 50° 116° S.W. | | 3 | | 3 | 3 | | | | | | | | | | | | | 50 |
| Jersey | Nelson | 49° 117° S.E. | | 2 | | 1 | 1 | | 2 | | | | | | | | | | | 38 |
| Key | Golden | 50° 115° S.W. | | 3 | | 3 | 3 | | | | | | | | | | | | | 52 |
| King Fissure | Revelstoke | 51° 118° S.E. | | 3 | | 3 | 3 | | | | | | | | | | | | | 53 |
| Kootenay | Slocan | 49° 116° N.W. | | 3 | | 3 | 3 | | | | | | | | | | | | | 42 |
| Kootenay Belle | Nelson | 49° 117° S.E. | 1 | 1 | | 1 | 2 | | | | | | | | | | | | | A45 |
| Kootenay Florence | Slocan | 49° 116° N.W. | | 3 | | 3 | 3 | | | | | | | | | | | | | 43 |
| Kootenian | Slocan | 49° 116° N.W. | | 3 | | 3 | 3 | | | | | | | | | | | | | 42 |
| L.T. | Slocan | 49° 117° N.E. | | 1 | | 1 | 2 | | | | | | | | | | | | | A45 |
| Lakeshore | Slocan | 49° 116° N.W. | | 3 | | 3 | 3 | | | | | | | | | | | | | 43 |
| Laura M. | Slocan | 49° 116° N.W. | | 2 | | 1 | 2 | | 2 | | | | | | | | | | | A46 |
| Little Phil | Slocan | 49° 116° N.W. | | 1 | | 1 | 2 | | | | | | | | | | | | | A46 |
| Logan | Slocan | 49° 116° N.W. | | | 3 | | | | | | | | | | | | | | | 44 |
| Lost Atlantis | Slocan | 50° 117° S.E. | | 3 | | 3 | 3 | | | | | | | | | | | | | 45 |
| Lucky Jim | Slocan | 50° 117° S.E. | 2 | 1 | | 1 | 1 | | 2 | | | | | | | | | | | 45 |
| McAllister | Slocan | 50° 117° S.E. | | 1 | | 2 | 2 | | | | | | | | | | | | | A46 |
| Mammoth | Slocan | 49° 117° N.E. | 2 | 1 | | 1 | 1 | | 2 | | | | | | | | | | | 47 |
| May-Bee | Nelson | 49° 116° S.E. | | | 3 | | | | | | | | | | | | | | | 50 |
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| Ptarmigan | Golden | 50° 116° N.E. | 2 | 1 | | 2 | 2 | | | | | | | | | | | | | 53 |
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| S.B. | Revelstoke | 51° 118° S.E. | | 3 | | 3 | 3 | | | | | | | | | | | | | 53 |
| Scranton | Slocan | 49° 117° N.E. | 3 | 3 | | 3 | 3 | | | | | | | | | | | | | 43 |
| Silver King | Nelson | 49° 117° S.E. | 2 | 1 | | 1 | 1 | | | | | | | | | | | | | 37 |
| Silver Mountain | Slocan | 49° 117° N.E. | | 1 | | 1 | 2 | | | | | | | | | | | | | 45 |
| Silversmith, etc. | Slocan | 49° 117° N.E. | 2 | 1 | | 1 | 1 | | 2 | | | | | | | | | | | 46 |
| Snap | Slocan | 50° 117° S.E. | | 3 | | 3 | 3 | | | | | | | | | | | | | 45 |
| Spider | Revelstoke | 50° 117° N.W. | 2 | 1 | | 1 | 1 | | | | | | | | | | | | | 49 |
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*Shipping Mines.*—(1) Metal contributed at least 10 per cent of gross value of the shipment. (2) Metal contributed less than 10 per cent of gross value of the shipment. Production for 1958 is listed in Table XV.

*Non-shipping Mines.*—(3) Metal present, indicated by assay or mineralogical determination.

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