# ANNUAL REPORT

OF THE

# MINISTER OF MINES

OF THE PROVINCE OF

# BRITISH COLUMBIA

FOR THE

## YEAR ENDED 31ST DECEMBER

## 1941

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1942.

**BRITISH COLUMBIA DEPARTMENT OF MINES.**

VICTORIA, B.C.

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Hon. HERBERT ANSCOMB, *Minister.*

JOHN F. WALKER, *Deputy Minister.*

JAMES DICKSON, *Chief Inspector of Mines.*

G. CAVE-BROWNE-CAVE, *Chief Analyst and Assayer.*

P. B. FREELAND, *Chief Mining Engineer.*

R. J. STEENSON, *Chief Gold Commissioner.*

*To His Honour Lieut.-Colonel* WILLIAM CULHAM WOODWARD,
*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 1941 is herewith respectfully submitted.

HERBERT ANSCOMB,
*Minister of Mines.*

*Minister of Mines' Office,*
*May, 1942.*

Douglas Lay, Senior Mining Engineer in the Mineralogical Branch, in ill-health and confined to the Royal Jubilee Hospital since early in the year, died, aged 63 years, on November 1st, 1941. Mr. Lay was born in England and came to Canada more than forty years ago. He was, for some time, in charge of the Le Roi No. 2 and other Kootenay mines. During the first world war he managed a large T.N.T. plant in England. On his return to Canada he was appointed resident engineer for the Department at Hazelton, where he was stationed until 1939, when he was transferred to Victoria. His final report, Bulletin No. 11, entitled "Fraser River Tertiary Drainage-history in Relation to Placer-gold Deposits," was published to supplement his earlier work on this subject in Bulletin No. 3.

Mr. Lay was one of the best-known mining engineers in British Columbia.

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John T. Puckey, Instructor, Mine-rescue Station, Fernie, who was in failing health for some time, died on December 19th, 1941, aged 63 years.

Mr. Puckey was born in Wingate, Colley, Durham, England, on May 21st, 1878. He entered the Government service on September 2nd, 1918, as Instructor at the Mine-rescue Station at Fernie. He took a keen interest in first-aid and mine-rescue work, instructing many of the teams in the Crowsnest Pass area during his twenty-three years of service.

# ANNUAL REPORT.

The Annual Report of the Minister of Mines, first published in 1874, has been ever since an annual event of interest to the mining industry. The Report appeared after the appointment of the first Minister of Mines by authority of an Act of the Legislature, passed in the same year. Previously Provincial mining laws had been administered by Gold Commissioners, under the direction of the Provincial Secretary, and for many years subsequently the portfolio for mines was held by the Provincial Secretary.

The Annual Reports of the Minister of Mines originally comprised the reports of the Gold Commissioners; the Inspector of Coal Mines, who was appointed in 1877; and Mining Recorders.

A Bureau of Mines was established by an Act of the Legislature in 1895 and placed under the supervision of the Provincial Mineralogist, whose reports first appeared in 1896. The Annual Report now comprised the reports of the Provincial Mineralogist, the Inspector of Coal Mines, the Gold Commissioners, and Mining Recorders. The report of the Inspector of Metalliferous Mines was added in 1899.

The organized collection of mining statistics was started by the Bureau of Mines in 1895 and continued until 1939, when this work was taken over by the Bureau of Economics and Statistics, Department of Trade and Industry.

The Annual Report continued to appear in this form until 1917, when under the "Mineral Survey and Development Act" a number of Resident Mining Engineers were added to the technical strength of the Department. From 1917 to 1933, inclusive, the Annual Report consisted essentially of the work of the Resident Mining Engineers, and the reports of the Gold Commissioners and Mining Recorders were confined largely to office statistics and finally combined into a statistical table. In 1934 the Annual Report appeared in sections as well as a complete volume, and continued in this form until 1939, when the work of the Department's Mining Engineers, formerly the Resident Mining Engineers, first appeared in bulletin form.

Since 1939 the Annual Reports consist of a brief review of the mining industry, a number of statistical tables regarding production, men employed, dividends paid, etc., a synopsis of the mining laws of the Province, a summary of the work done by the Department, progress notes on all active properties inspected or examined by either the Inspection staff or the officers of the Mineralogical Branch during the course of the year, and the report of the Chief Inspector of Mines and his staff.

The reports of the officers of the Mineralogical Branch are published now in bulletin form. The publication of bulletins by the Department of Mines is not a new innovation, as forty-three bulletins covering a variety of subjects had previously been published between 1896 and 1934, inclusive, as well as a number of separate publications. In the past the bulletins were not numbered consecutively from year to year but only for each year, and most of them were embodied in the Annual Report. Commencing with the present series of bulletins, replacing a large part of the material formerly contained in the Annual Report, the series is being numbered consecutively from year to year, and to date sixteen bulletins have appeared in place of much of the material that ordinarily would have been contained in this report and in the Annual Reports for 1939 and 1940. A list of these bulletins, as well as other publications available for distribution by the Department, will be found at the end of this volume.

## THE MINING INDUSTRY.

The value of mine production in 1941 was $78,479,719, an increase of $2,778,564 over 1940. This figure of $78,479,719 is somewhat below the actual figure because the value of copper is based on the London price, whereas British Columbia copper is sold at the New York price. The increase of $2,778,564 is somewhat less than would appear by comparison with last year's Annual Report because the 1940 returns as published were $348,425 short of the final returns. The London price for copper is used so that value figures in the tables in this Report will correspond closely with Provincial figures as published by the Dominion Bureau of Statistics. The Dominion Bureau uses the London price because most of Canada's copper is sold through London.

Since the outbreak of war the customary summary and the usual tables reviewing and showing detailed mine production have not been given, and cannot be given, as authorities at Ottawa do not consider it in the best interests of the country to divulge certain detailed information. However, the information is being collected and upon conclusion of the war, or in the event of a change in policy, it will be available for publication and so the record eventually will be complete.

## DEPARTMENTAL WORK.

### Mineralogical Branch.

B. T. O'Grady, besides working with the Superintendent of Brokers, carried out investigations in connection with transportation to mining properties throughout the central part of the Province.

J. T. Mandy investigated mining properties along the main line of the Canadian National Railway between Prince Rupert and Burns Lake, in connection with the work of the sampling plant at Prince Rupert. In August, owing to ill-health, he returned to Prince Rupert to continue in charge of the sampling plant.

H. Sargent spent most of the summer season on reconnaissance and prospecting for the source of cinnabar float at the head of Churn Creek and Yalakom River.

M. S. Hedley investigated chromite prospects on Bonaparte River, Cascade, and other points in the southern interior of the Province, as well as a new gold discovery made in the Shulaps Mountains near the head of Yalakom River.

J. S. Stevenson did detailed geological mapping of a small area centring on China Creek, near Alberni, and made a detailed examination of the surface and underground workings at Mount Sicker, near Duncan.

J. M. Cummings continued investigational work in connection with industrial minerals and also the by-product recovery of scheelite from mill tailings and low-grade ore.

R. J. Maconachie was in charge of the Department of Mines experiment to stimulate gold production through the medium of leasing and mining small lode-gold properties in the Nelson area. He also carried out investigational work in connection with transportation facilities in the south-eastern part of the Province.

Stuart S. Holland examined most of the placer operations in the Similkameen, Cariboo, and Omineca Districts.

## SAMPLING PLANT, PRINCE RUPERT.

In 1937 a sampling plant was built on the waterfront at Prince Rupert and put into operation on August 20th. The object in erecting a sampling plant at this point was chiefly for the purpose of stimulating prospecting and development of properties along the Prince Rupert branch of the Canadian National Railway. The sampling plant was erected on the Coast so that full advantage could be taken of special freight rates arranged especially for shipments of ore to the plant.

The sampling plant is, as its name implies, only a sampling plant and not a concentrator. Ores containing sufficient value to ship direct to the smelter are purchased

and assembled at the plant until sufficient tonnage is accumulated to warrant shipment to the smelter. By mixing lots at the plant it is possible also to reduce smelter penalties on individual shipments and so give the prospector the benefit of a mixed lot.

The plant may also be used by those developing properties for the purpose of bulk-sampling.

For the calendar year 1941, twenty-five lots for shipment, eighty-one lots for testing, and twenty-one samples for assaying were received at the plant. These lots aggregated 119 tons. During the year $13,583.93 was paid to shipper.

## GOLD PURCHASING.

Late in 1935 the Department of Finance, co-operating with the Department of Mines, undertook to purchase small lots of placer gold under 2 oz. in weight from the individual placer-miner. The Gold Commissioners throughout the Province are paying a cash price of $29 per ounce for clean placer gold and are purchasing dirty placer gold and amalgam on a deferred-payment basis. Purchases made under this arrangement are as follows:—

| Year. | No. of Lots. | Paid. | Paid per Oz. |
|---|---|---|---|
| 1936 | 1,470 | $50,000 | $28.00 |
| 1937 | 1,657 | 52,250 | 28.00 |
| 1938 | 2,397 | 72,000 | 28.00 |
| 1939 | 2,322 | 60,000 | 29.00 |
| 1940 | 1,336 | 31,600 | 29.00 |
| 1941 | 631 | 16,825 | 29.00 |
| Totals | 9,813 | $282,675 | ..... |

The object of this purchasing scheme is to give the individual miner the best possible price for his gold, and this has been realized in that the total price paid has been almost exactly the same as that received from the Royal Canadian Mint, except for the mint's handling charge of 1 per cent.

The foregoing figures show also that the individual miner benefited at a time when work was scarce and that now he is obtaining more remunerative employment.

## GEOLOGICAL SURVEY OF CANADA.

By an arrangement made at the time the Province of British Columbia entered Confederation, all geological investigations and mapping in the Province were to be carried on by the Geological Survey of Canada; this agreement has been fully adhered to by the Dominion of Canada and has proved of great benefit to the mining industry of the Province. Each year several geological parties are kept in the field and in the aggregate a vast amount of information is made available to the prospector and the mining engineer in the many excellent reports and maps covering British Columbia which have been issued by the Geological Survey of Canada.

For some years a branch office of the Geological Survey has been maintained in Vancouver, where copies of maps and reports on British Columbia can be obtained. The officer in charge of the British Columbia office is W. E. Cockfield, and the address is 305 Federal Building, Vancouver, B.C.

In 1936 a reorganization of several departments in the Federal Government was effected, and the Department of Mines and Resources created. One of the main branches of this Department is that of Mines and Geology, with sub-branches known as the Bureau of Geology and Topography and the Bureau of Mines. The Geological Survey of Canada and the Topographical Survey are now a part of the Bureau of Geology and Topography. During the season of 1941 the Bureau of Geology and Topography had the following officers employed on field-work in British Columbia:—

### Geological Parties.

1. A. H. Lang: Continued geological mapping on the east half of Manson River area.
2. J. E. Armstrong: Made a systematic study of the mercury deposits in the west half of Manson River area; also continued geological mapping of the area.
3. C. S. Lord: Commenced geological mapping of the McConnell Creek area.
4. W. E. Cockfield: Continued mapping of the east half of the Ashcroft area.
5. H. M. A. Rice: Mapped the east half of the Hope area, which adjoins the Ashcroft area on the south.
6. A. F. Buckham: Re-examined the Barkerville gold belt in the Cariboo district.

### Topographical Parties.

A. D. Tuttle and R. J. Parlee mapped the Aiken Lake area in the central portion of the Province to establish controls for later geological work.

## TABLES.

The collection and compilation of mining statistics and the preparation of statistical tables for this report is in charge of the Bureau of Economics and Statistics, Department of Trade and Industry.

## METHOD OF COMPUTING PRODUCTION.

The total mine output of the Province consists of the outputs of metalliferous minerals, coal, structural materials, and miscellaneous metals, minerals, and materials, valued at standard recognized prices in Canadian funds.

In the Annual Report for 1925 some changes were made in the methods used in previous years in computing and valuing the products of the industry, but in order to facilitate comparisons with former years the same general style of tables was adhered to. The methods used in the 1925 Annual Report have been followed in subsequent Annual Reports, with the addition of new tables.

The following notes explain the methods used:—

(1.) From the certified returns of lode mines of ore and concentrate shipments made during the full calendar year by the producers the net recovered metal contents have been determined by deducting from the "assay value content" necessary corrections for smelting and refining losses.

In making comparisons of production figures with previous years, it should be remembered that prior to 1925 in the Annual Reports the total metal production, with the exception of copper, was determined by taking the assay value content of all ores shipped; deductions for slag losses were made by taking varying percentages of the metal prices.

(2.) Gold-placer returns are received from operators giving production in crude ounces recovered; these are converted to fine-gold ounces by dividing the crude-ounce value by the old standard price of gold. The fine-gold content is then valued at the yearly average price of gold, which in 1941 was $38.50 per ounce. On this basis the average crude-gold value per ounce was $31.66 on Provincial placer-gold production.

(3.) The prices used in valuing the different metals are: For gold, the average price for the year; for silver, the average New York metal-market price for the year; for lead, the average London metal-market price for the year; and for zinc, the average London metal-market price for the year. Copper in 1941 is valued at the average London metal-market price. (*See* foot-note to Table I.) Prior to 1932 copper was valued at the average New York price. The change was made because very little copper was being marketed in the United States on account of high tariff charges against importations from foreign countries. The bulk of the lead and zinc production of the Province is sold on the basis of the London prices of these metals and they are therefore used. The New York, St. Louis, and Montreal lead- and zinc-market prices differ materially from the London prices of these metals and are not properly applicable to the valuing of the British Columbia production.

By agreement with the Dominion Bureau of Statistics and the Provincial Statistical Bureaus, the following procedure of taking care of the exchange fluctuations has been agreed upon:—

(*a.*) Silver to be valued at the average New York price, adjusted to Canadian funds at the average exchange rate.

(*b.*) Lead, zinc, and copper to be valued at London prices, adjusted to Canadian funds at the average exchange rate.

(4.) In 1926 a change was made in computing coal and coke statistics. The practice in former years had been to list coal and coke production (in part) as primary mineral production. Only the coke made in bee-hive ovens was so credited; that 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 the coke-production figures were incomplete. Starting with the 1926 Annual Report, the standard practice of the Bureau of Statistics, Ottawa, has been 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 it is, however, of interest to the mining industry, a table included in the report shows the total coke produced in the Province, together with by-products, and the values given by the producers. This valuation of coke is not, of course, included in the total gross mine production of the Province.

From 1918 to 1930 coal production was valued at $5 per long ton. In 1931 the price used was $4.50, and from 1932 on the price used has been $4.25 per long ton. In making comparisons with former years the decline in dollar value is accentuated by this lowered price.

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* Certain detail tables of mine production have been omitted. The numbers of those retained correspond to their number in previous Annual Reports.

## TABLE I.—British Columbia Mine Production, 1940 and 1941.

| | | Quantity, 1940. | Quantity, 1941. | Value, 1940. | Value, 1941. |
|---|---|---|---|---|---|
| **Metallics.** | | | | $ | $ |
| Gold, lode* | oz. | 583,416 | 571,026 | 22,461,516 | 21,984,501 |
| Gold, placer* | oz. | 39,067 | 43,775 | 1,236,928 | 1,385,962 |
| Silver, copper, lead, zinc | | ..... | ..... | 39,498,623 | 40,231,518 |
| Antimony, bismuth, cadmium, magnesium, mercury, platinum, tungsten | | ..... | ..... | 1,714,770 | 3,120,053 |
| Totals | | ..... | ..... | 64,911,837 | 66,722,034 |
| **Fuel.** | | | | | |
| Coal (2,240 lb.) | tons | 1,667,827 | 1,802,353 | 7,088,265 | 7,660,000 |
| **Non-metallics.** | | | | | |
| Barytes, diatomite, mica, and sulphur | | ..... | ..... | 1,002,317 | 1,035,462 |
| Flux—limestone | tons | 69,420 | 82,337 | 31,262 | 50,929 |
| Gypsum products, gypsite | | ..... | ..... | 120,043 | 141,320 |
| Iron oxides, slate and rock granules, talc | tons | 850 | 1,225 | 10,831 | 15,101 |
| Sodium carbonate, magnesium sulphate | tons | 220 | 441 | 1,760 | 9,611 |
| Totals | | ..... | ..... | 1,166,213 | 1,252,423 |
| **Clay Products and other Structural Materials.** | | | | | |
| *Clay Products.* | | | | | |
| Brick— | | | | | |
| Common | No. | 8,655,120 | 7,532,760 | 132,434 | 129,541 |
| Face, paving, sewer brick | No. | 987,161 | 485,816 | 38,328 | 17,645 |
| Firebricks, blocks | | ..... | ..... | 140,727 | 210,911 |
| Fireclay | tons | 609 | 795 | 8,294 | 12,216 |
| Structural tile—hollow blocks | | ..... | ..... | 47,543 | 21,000 |
| Drain-tile, sewer-pipe | No. | 1,119,455 | 1,095,704 | 130,842 | 163,096 |
| Pottery—glazed or unglazed | | ..... | ..... | 11,321 | 11,230 |
| Other clay products; bentonite | | ..... | ..... | 10,094 | 1,308 |
| Totals | | ..... | ..... | 519,583 | 566,947 |
| *Other Structural Materials.* | | | | | |
| Cement, sand, and gravel | | ..... | ..... | 1,413,189 | 1,780,848 |
| Lime and limestone | | 123,461 | 111,858 | 294,682 | 286,006 |
| Stone—building, pulp-stone | tons | 1,559 | 2,228 | 55,347 | 60,310 |
| Rubble, riprap, crushed rock | tons | 287,042 | 192,640 | 252,039 | 151,151 |
| Totals | | ..... | ..... | 2,015,257 | 2,278,315 |
| Total value in Canadian funds | | ..... | ..... | 75,701,155 | 78,479,719 |

Note.—In accordance with the Dominion of Canada "War Measures Act" and Foreign Exchange Control Regulations, it is not possible to set forth Provincial production figures in as detailed a manner as was done heretofore.

Dominion production of copper is evaluated at the average price on the London market and British Columbia production in the above table is likewise so valued, in order that Dominion and Provincial compilations agree. It is to be noted that British Columbia copper is contracted and paid for in U.S. funds, and if such had been used, an appreciable amount could be added to the above Provincial value.

* Canadian funds.

## TABLE II.—Average Metal Prices used in compiling Value of Provincial Production of Gold, Silver, Copper, Lead, and Zinc.

| Year. | Gold, Fine Ounce. | Silver, Fine Ounce. | Copper, Lb. | Lead, Lb. | Zinc, Lb. |
|---|---|---|---|---|---|
| | $ | Cents. | Cents. | Cents. | Cents. |
| 1901 | 20.67 | 56.002 N.Y. | 16.11 N.Y. | 2.577 N.Y. | ..... |
| 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 ,, | ..... |
| 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 ,, |
| 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 ,, |
| 1932 | 23.47 | 31.671 ,, | 6.380 Lond. | 2.113 ,, | 2.405 ,, |
| 1933 | 28.60 | 37.832 ,, | 7.454 ,, | 2.391 ,, | 3.210 ,, |
| 1934 | 34.50 | 47.461 ,, | 7.419 ,, | 2.436 ,, | 3.044 ,, |
| 1935 | 35.19 | 64.790 ,, | 7.795 ,, | 3.133 ,, | 3.099 ,, |
| 1936 | 35.03 | 45.127 ,, | 9.477 ,, | 3.913 ,, | 3.315 ,, |
| 1937 | 34.99 | 44.881 ,, | 13.078 ,, | 5.110 ,, | 4.902 ,, |
| 1938 | 35.18 | 43.477 ,, | 9.972 ,, | 3.344 ,, | 3.073 ,, |
| 1939 | 36.141 | 40.488 ,, | 10.092 ,, | 3.169 ,, | 3.069 ,, |
| 1940 | 38.50 | 38.249 ,, | 10.086 ,, | 3.362 ,, | 3.411 ,, |
| **1941** | **38.50** | **38.261** ,, | **10.086** ,, | **3.362** ,, | **3.411** ,, |
| Average, 1937–41 (inclusive) | 36.662 | 41.071 ,, | 10.663 ,, | 3.669 ,, | 3.573 ,, |

Note.—In making comparisons with average prices used prior to 1925, it should be remembered that deductions were made from the average prices as a means of adjustment between the "assay value content" of ores shipped instead of allowing percentage losses in smelting operations. The price of copper prior to 1925 was taken at "net"; silver, at 95 per cent.; lead, at 90 per cent.; and zinc, at 85 per cent. Subsequent to 1925 (inclusive) prices are true averages, and adjustments are made on the metal content of ores for loss in smelting and refining.

TABLE III.—TOTAL PRODUCTION FOR ALL YEARS UP TO AND INCLUDING 1941.

| | |
|---|---|
| Gold, placer | $90,033,341* |
| Gold, lode | 293,217,485* |
| Silver, copper, lead, zinc | 947,238,461 |
| Coal and coke | 399,107,367 |
| Structural materials | 84,153,674 |
| Miscellaneous minerals, etc. | 24,418,284 |
| Total | $1,838,168,612 |

* Canadian funds.

TABLE IV.—PRODUCTION FOR EACH YEAR FROM 1852 TO 1941 (INCLUSIVE).

| | | | |
|---|---|---|---|
| 1852 to 1895 (inclusive) | $94,547,370 | 1920 | $35,543,084 |
| 1896 | 7,507,956 | 1921 | 28,066,641 |
| 1897 | 10,455,268 | 1922 | 35,162,843 |
| 1898 | 10,906,861 | 1923 | 41,304,320 |
| 1899 | 12,393,131 | 1924 | 48,704,604 |
| 1900 | 16,344,751 | 1925 | 61,492,242 |
| 1901 | 20,086,780 | 1926 | 67,188,842 |
| 1902 | 17,486,550 | 1927 | 60,729,358 |
| 1903 | 17,495,954 | 1928 | 65,372,583 |
| 1904 | 18,977,359 | 1929 | 68,245,443 |
| 1905 | 22,461,325 | 1930 | 55,391,993 |
| 1906 | 24,980,546 | 1931 | 34,883,181 |
| 1907 | 25,882,560 | 1932 | *28,798,406 |
| 1908 | 23,851,277 | 1933 | *32,602,672 |
| 1909 | 24,443,025 | 1934 | *42,305,297 |
| 1910 | 26,377,066 | 1935 | *48,821,239 |
| 1911 | 23,499,072 | 1936 | *54,081,967 |
| 1912 | 32,440,800 | 1937 | *74,475,902 |
| 1913 | 30,296,398 | 1938 | *64,485,551 |
| 1914 | 26,388,825 | 1939 | *65,681,547 |
| 1915 | 29,447,508 | 1940 | *75,701,155 |
| 1916 | 42,290,462 | 1941 | *78,479,719 |
| 1917 | 37,010,392 | | |
| 1918 | 41,782,474 | Total | $1,838,168,612 |
| 1919 | 33,296,313 | | |

* Canadian funds.

TABLE V.—QUANTITIES AND VALUE OF MINE PRODUCTS FOR 1939, 1940, AND 1941.

| Description. | 1939. | | 1940. | | 1941. | |
|---|---|---|---|---|---|---|
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Gold, placer* oz. | 49,746 | $1,478,492 | 39,067 | $1,236,928 | 43,775 | $1,385,962 |
| Gold, lode* oz. | 587,180 | 21,221,272 | 583,416 | 22,461,516 | 571,026 | 21,984,501 |
| Silver oz. | 10,771,585 | 4,361,199 | | | | |
| Copper lb. | 73,254,679 | 7,392,862 | | 39,498,623 | | 40,231,518 |
| Lead lb. | 378,743,763 | 12,002,390 | | | | |
| Zinc lb. | 278,409,102 | 8,544,375 | | | | |
| Coal tons, 2,240 lb. | 1,477,872 | 6,280,956 | 1,667,827 | 7,088,265 | 1,802,353 | 7,660,000 |
| Structural materials | | 1,832,434 | | 2,534,840 | | 2,845,262 |
| Miscellaneous metals and minerals | | 2,567,567 | | 2,880,983 | | 4,372,476 |
| Totals | | $65,681,547 | | $75,701,155 | | $78,479,719 |

* Canadian funds.

## TABLE VI.—Production of Lode Gold, Silver, Copper, Lead, and Zinc.

| Year. | Gold. | | Silver. | | Copper. | | Lead. | | Zinc. | | Total Value. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Oz. | Value. | Oz. | Value. | Pounds. | Value. | Pounds. | Value. | Pounds. | Value. | |
| | | $ | | $ | | $ | | $ | | $ | $ |
| 1887 | ..... | ..... | 17,690 | 17,331 | ..... | ..... | 204,800 | 9,216 | ..... | ..... | 26,547 |
| 1888 | ..... | ..... | 79,780 | 75,000 | ..... | ..... | 674,500 | 29,813 | ..... | ..... | 104,813 |
| 1889 | ..... | ..... | 53,192 | 47,873 | ..... | ..... | 165,100 | 6,498 | ..... | ..... | 54,371 |
| 1890 | ..... | ..... | 70,427 | 73,948 | ..... | ..... | ..... | ..... | ..... | ..... | 73,948 |
| 1891 | ..... | ..... | 4,500 | 4,000 | ..... | ..... | ..... | ..... | ..... | ..... | 4,000 |
| 1892 | ..... | ..... | 77,160 | 66,935 | ..... | ..... | 808,420 | 33,064 | ..... | ..... | 99,999 |
| 1893 | 1,170 | 23,404 | 227,000 | 195,000 | ..... | ..... | 2,135,023 | 78,996 | ..... | ..... | 297,400 |
| 1894 | 6,252 | 125,014 | 746,379 | 470,219 | 324,680 | 16,234 | 5,662,523 | 169,875 | ..... | ..... | 781,342 |
| 1895 | 39,270 | 785,400 | 1,496,522 | 977,229 | 952,840 | 47,642 | 16,475,464 | 532,255 | ..... | ..... | 2,342,526 |
| 1896 | 62,259 | 1,244,180 | 3,135,343 | 2,100,689 | 3,818,556 | 190,926 | 24,199,977 | 721,384 | ..... | ..... | 4,257,179 |
| 1897 | 106,141 | 2,122,820 | 5,472,971 | 3,272,836 | 5,325,180 | 266,258 | 38,841,135 | 1,390,517 | ..... | ..... | 7,052,431 |
| 1898 | 110,061 | 2,201,217 | 4,292,401 | 2,375,841 | 7,271,678 | 874,781 | 31,693,559 | 1,077,581 | ..... | ..... | 6,529,420 |
| 1899 | 138,315 | 2,857,573 | 2,939,413 | 1,663,708 | 7,722,591 | 1,351,453 | 21,862,436 | 878,870 | ..... | ..... | 6,751,604 |
| 1900 | 167,153 | 3,453,381 | 3,958,175 | 2,309,200 | 9,997,080 | 1,615,289 | 63,358,621 | 2,691,887 | ..... | ..... | 10,069,757 |
| 1901 | 210,384 | 4,348,605 | 4,396,447 | 2,462,008 | 27,603,746 | 4,446,963 | 51,582,906 | 2,010,260 | ..... | ..... | 13,267,836 |
| 1902 | 236,491 | 4,888,269 | 3,917,917 | 1,941,328 | 29,636,057 | 3,446,673 | 22,536,381 | 824,832 | ..... | ..... | 11,101,102 |
| 1903 | 232,831 | 4,812,616 | 2,996,204 | 1,521,472 | 34,359,921 | 4,547,535 | 18,089,283 | 689,744 | ..... | ..... | 11,571,367 |
| 1904 | 222,042 | 4,589,608 | 3,222,481 | 1,719,516 | 35,710,128 | 4,578,037 | 36,646,244 | 1,421,874 | ..... | ..... | 12,309,035 |
| 1905 | 238,660 | 4,933,102 | 3,439,417 | 1,971,818 | 37,692,251 | 5,876,222 | 56,580,703 | 2,399,022 | ..... | ..... | 15,180,164 |
| 1906 | 224,027 | 4,630,639 | 2,990,262 | 1,897,320 | 42,990,488 | 8,288,565 | 52,408,217 | 2,667,578 | ..... | ..... | 17,484,102 |
| 1907 | 196,179 | 4,055,020 | 2,745,448 | 1,703,825 | 40,832,720 | 8,166,544 | 47,738,703 | 2,291,458 | ..... | ..... | 16,216,847 |
| 1908 | 255,582 | 5,282,880 | 2,631,389 | 1,321,483 | 47,274,614 | 6,240,249 | 43,195,733 | 1,632,799 | ..... | ..... | 14,477,411 |
| 1909 | 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 | 14,191,141 |
| 1910 | 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 | 13,228,731 |
| 1911 | 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 | 11,454,063 |
| 1912 | 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 | 17,662,766 |
| 1913 | 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 | 17,190,838 |
| 1914 | 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 | 15,225,061 |
| 1915 | 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 | 19,992,149 |
| 1916 | 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 | 31,483,014 |
| 1917 | 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 | 26,788,474 |
| 1918 | 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 | 27,590,278 |
| 1919 | 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 | 19,750,498 |
| 1920 | 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 | 19,444,365 |
| 1921 | 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 | 12,920,398 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1922 | 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 | 19,231,857 |
| 1923 | 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 | 25,347,062 |
| 1924 | 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 | 35,538,247 |
| 1925 | 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 | 46,200,135 |
| 1926 | 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 | 51,508,031 |
| 1927 | 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 | 44,977,082 |
| 1928 | 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 | 48,281,825 |
| 1929 | 145,339 | 3,004,419 | 9,918,800 | 5,256,270 | 101,483,857 | 18,375,682 | 302,346,268 | 15,269,696 | 172,096,841 | 9,268,792 | 51,174,859 |
| 1930 | 160,778 | 3,323,576 | 11,289,171 | 4,307,270 | 90,421,545 | 11,738,525 | 319,199,752 | 12,535,931 | 250,287,306 | 9,010,093 | 40,915,395 |
| 1931 | 146,039 | 3,018,894 | 7,524,320 | 2,247,514 | 63,194,299 | 5,289,363 | 248,783,508 | 6,742,282 | 205,071,247 | 5,237,520 | 22,535,573 |
| 1932 | 181,564 | 4,261,307* | 7,130,838 | 2,258,453 | 49,841,009 | 3,179,956 | 254,488,952 | 5,378,878 | 192,120,091 | 4,621,641 | 19,700,235 |
| 1933 | 223,529 | 6,392,929* | 7,006,406 | 2,650,720 | 42,608,002 | 3,176,341 | 271,606,071 | 6,495,731 | 195,963,751 | 6,291,416 | 25,007,137 |
| 1934 | 297,130 | 10,250,985* | 8,572,916 | 4,068,792 | 48,084,658 | 3,567,401 | 347,366,967 | 8,461,859 | 247,926,844 | 7,546,893 | 33,895,930 |
| 1935 | 365,244 | 12,852,936* | 9,251,544 | 5,994,075 | 38,791,127 | 3,023,768 | 344,268,444 | 10,785,930 | 256,239,446 | 7,940,860 | 40,597,569 |
| 1936 | 404,472 | 14,168,654* | 9,521,015 | 4,296,548 | 20,806,672 | 1,971,848 | 377,971,618 | 14,790,029 | 254,581,393 | 8,439,373 | 43,666,452 |
| 1937 | 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 | 62,912,783 |
| 1938 | 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 | 53,877,333 |
| 1939 | 587,180 | 21,221,272* | 10,771,585 | 4,361,199 | 73,254,679 | 7,392,862 | 378,743,763 | 12,002,390 | 278,409,102 | 8,544,375 | 53,522,098 |
| 1940 | 583,416 | 22,461,516* | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 61,960,139† |
| 1941 | 571,026 | 21,984,501* | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 62,216,019† |
| Totals | 11,403,637 | 293,217,487 | 252,669,858‡ | 137,687,350‡ | 2,108,376,306‡ | 306,055,053‡ | 6,178,738,968‡ | 263,509,372‡ | 3,727,569,601‡ | 159,841,335‡ | 1,240,040,738† |

* Canadian funds. † Includes combined value of silver, copper, lead, and zinc. ‡ Totals subsequent to 1939 not included.

## TABLE VII.—Value of Gold Production to Date.

| Year. | Placer. | Lode. | Total. |
|---|---|---|---|
| 1858–1862 | $9,871,634 | ..... | $9,871,634 |
| 1863–1867 | 16,283,592 | ..... | 16,283,592 |
| 1868–1872 | 9,895,318 | ..... | 9,895,318 |
| 1873–1877 | 9,019,201 | ..... | 9,019,201 |
| 1878–1882 | 5,579,911 | ..... | 5,579,911 |
| 1883–1887 | 3,841,515 | ..... | 3,841,515 |
| 1888–1892 | 2,525,426 | ..... | 2,525,426 |
| 1893 | 356,131 | $23,404 | 379,535 |
| 1894 | 405,516 | 125,014 | 530,530 |
| 1895 | 481,683 | 785,400 | 1,267,083 |
| 1896 | 544,026 | 1,244,180 | 1,788,206 |
| 1897 | 513,520 | 2,122,820 | 2,636,340 |
| 1898 | 643,346 | 2,201,217 | 2,844,563 |
| 1899 | 1,344,900 | 2,857,573 | 4,202,473 |
| 1900 | 1,278,724 | 3,453,381 | 4,732,105 |
| 1901 | 970,100 | 4,348,603 | 5,318,703 |
| 1902 | 1,073,140 | 4,888,269 | 5,961,409 |
| 1903 | 1,060,420 | 4,812,616 | 5,873,036 |
| 1904 | 1,115,300 | 4,589,608 | 5,704,908 |
| 1905 | 969,300 | 4,933,102 | 5,902,402 |
| 1906 | 948,400 | 4,630,639 | 5,579,039 |
| 1907 | 828,000 | 4,055,020 | 4,883,020 |
| 1908 | 647,000 | 5,282,880 | 5,929,880 |
| 1909 | 477,000 | 4,924,090 | 5,401,090 |
| 1910 | 540,000 | 5,533,380 | 6,073,380 |
| 1911 | 426,000 | 4,725,513 | 5,151,513 |
| 1912 | 555,500 | 5,322,442 | 5,877,942 |
| 1913 | 510,000 | 5,627,490 | 6,137,490 |
| 1914 | 565,000 | 5,109,004 | 5,674,004 |
| 1915 | 770,000 | 5,167,934 | 5,937,934 |
| 1916 | 580,500 | 4,587,334 | 5,167,834 |
| 1917 | 496,000 | 2,367,190 | 2,863,190 |
| 1918 | 320,000 | 3,403,812 | 3,723,812 |
| 1919 | 286,500 | 3,150,645 | 3,437,145 |
| 1920 | 221,600 | 2,481,392 | 2,702,992 |
| 1921 | 233,200 | 2,804,154 | 3,037,354 |
| 1922 | 368,800 | 4,089,684 | 4,458,484 |
| 1923 | 420,000 | 3,704,994 | 4,124,994 |
| 1924 | 420,750 | 5,120,535 | 5,541,285 |
| 1925 | 280,092 | 4,335,269 | 4,615,361 |
| 1926 | 355,503 | 4,163,859 | 4,519,362 |
| 1927 | 156,247 | 3,679,601 | 3,835,848 |
| 1928 | 143,208 | 3,888,097 | 4,031,305 |
| 1929 | 118,711 | 3,004,419 | 3,123,130 |
| 1930 | 152,235 | 3,323,576 | 3,475,811 |
| 1931 | 291,992 | 3,018,894 | 3,310,886 |
| 1932 | 395,542 | 4,261,307 | 4,656,849* |
| 1933 | 562,787 | 6,392,929 | 6,955,716* |
| 1934 | 714,431 | 10,250,985 | 10,965,416* |
| 1935 | 895,058 | 12,852,936 | 13,747,994* |
| 1936 | 1,249,940 | 14,168,654 | 15,418,594* |
| 1937 | 1,558,245 | 16,122,727 | 17,680,972* |
| 1938 | 1,671,015 | 19,613,624 | 21,284,639* |
| 1939 | 1,478,492 | 21,221,272 | 22,699,764* |
| 1940 | 1,236,928 | 22,461,516 | 23,698,444* |
| 1941 | 1,385,962 | 21,984,501 | 23,370,463* |
| Totals | $90,033,341 | $293,217,485 | $383,250,826* |

* Canadian funds.

## TABLE XIV.—Coal Production per Year to Date.*

| | Tons. (2,240 lb.) | Value. | | Tons. (2,240 lb.) | Value. |
|---|---|---|---|---|---|
| 1836–1885 | 3,029,011 | $9,468,557 | 1915 | 1,611,129 | $5,638,952 |
| 1886 | 326,636 | 979,908 | 1916 | 2,084,093 | 7,294,325 |
| 1887 | 413,360 | 1,240,080 | 1917 | 2,149,975 | 7,524,913 |
| 1888 | 489,301 | 1,467,903 | 1918 | 2,302,245 | 11,511,225 |
| 1889 | 579,830 | 1,739,490 | 1919 | 2,267,541 | 11,337,705 |
| 1890 | 678,140 | 2,034,420 | 1920 | 2,595,125 | 12,975,625 |
| 1891 | 1,029,097 | 3,087,291 | 1921 | 2,483,995 | 12,419,975 |
| 1892 | 826,335 | 2,479,005 | 1922 | 2,511,843 | 12,559,215 |
| 1893 | 978,294 | 2,934,882 | 1923 | 2,453,223 | 12,266,115 |
| 1894 | 1,012,953 | 3,038,859 | 1924 | 1,939,526 | 9,697,630 |
| 1895 | 939,654 | 2,818,962 | 1925 | 2,328,522 | 11,642,610 |
| 1896 | 896,222 | 2,688,666 | 1926 | 2,330,036 | 11,650,180 |
| 1897 | 882,854 | 2,648,562 | 1927 | 2,453,827 | 12,269,135 |
| 1898 | 1,135,865 | 3,407,595 | 1928 | 2,526,702 | 12,633,510 |
| 1899 | 1,306,324 | 3,918,972 | 1929 | 2,251,252 | 11,256,260 |
| 1900 | 1,439,595 | 4,318,785 | 1930 | 1,887,130 | 9,435,650 |
| 1901 | 1,460,331 | 4,380,993 | 1931 | 1,707,590 | 7,684,155 |
| 1902 | 1,397,394 | 4,192,182 | 1932 | 1,534,975 | 6,523,644 |
| 1903 | 1,168,194 | 3,504,582 | 1933 | 1,264,746 | 5,375,171 |
| 1904 | 1,253,628 | 3,760,884 | 1934 | 1,347,090 | 5,725,133 |
| 1905 | 1,384,312 | 4,152,936 | 1935 | 1,187,968 | 5,048,864 |
| 1906 | 1,517,303 | 4,551,909 | 1936 | 1,346,471 | 5,722,502 |
| 1907 | 1,800,067 | 6,300,235 | 1937 | 1,444,687 | 6,139,920 |
| 1908 | 1,677,849 | 5,872,472 | 1938 | 1,309,428 | 5,565,069 |
| 1909 | 2,006,476 | 7,022,666 | 1939 | 1,477,872 | 6,280,956 |
| 1910 | 2,800,046 | 9,800,161 | 1940 | 1,667,827 | 7,088,265 |
| 1911 | 2,193,062 | 7,675,717 | 1941 | 1,802,353 | 7,660,000 |
| 1912 | 2,628,804 | 9,200,814 | | | |
| 1913 | 2,137,483 | 7,481,190 | Totals | 93,466,558 | $373,433,767 |
| 1914 | 1,810,967 | 6,338,385 | | | |

* For all years to 1925 (inclusive) figures are net coal production and do not include coal made into coke; subsequent figures are entire coal production, including coal made into coke.

## TABLE XV.—Coke Production from Bee-hive Ovens in British Columbia from 1895 to 1925.

| | Tons. (2,240 lb.) | Value. | | Tons. (2,240 lb.) | Value. |
|---|---|---|---|---|---|
| 1895–97 | 19,396 | $96,980 | 1913 | 286,045 | $1,716,270 |
| 1898 (*estimated*) | 35,000 | 175,000 | 1914 | 234,577 | 1,407,462 |
| 1899 | 34,251 | 171,255 | 1915 | 245,871 | 1,475,226 |
| 1900 | 85,149 | 425,745 | 1916 | 267,725 | 1,606,350 |
| 1901 | 127,081 | 635,405 | 1917 | 159,905 | 959,430 |
| 1902 | 128,015 | 640,075 | 1918 | 188,967 | 1,322,769 |
| 1903 | 165,543 | 827,715 | 1919 | 91,138 | 637,966 |
| 1904 | 238,428 | 1,192,140 | 1920 | 67,792 | 474,544 |
| 1905 | 271,785 | 1,358,925 | 1921 | 59,434 | 416,038 |
| 1906 | 199,227 | 996,135 | 1922 | 45,835 | 320,845 |
| 1907 | 222,913 | 1,337,478 | 1923 | 58,919 | 412,433 |
| 1908 | 247,399 | 1,484,394 | 1924 | 30,615 | 214,305 |
| 1909 | 258,703 | 1,552,218 | 1925 | 75,185 | 526,295 |
| 1910 | 218,029 | 1,308,174 | | | |
| 1911 | 66,005 | 396,030 | Totals | 4,393,255 | $25,673,600 |
| 1912 | 264,333 | 1,585,998 | | | |

## TABLE XVI.—Coke and By-products Production of British Columbia, 1940 and 1941.

| Description. | 1940. | | 1941. | |
|---|---|---|---|---|
| | Quantity. | Value. | Quantity. | Value. |
| Coal used in making coke, long tons | 164,429 | $577,706 | 210,544 | $717,584 |
| Coke made in bee-hive ovens, long tons | 33,790 | $220,211 | 57,774 | $392,473 |
| Coke made in by-product ovens, long tons | 26,004 | 151,931 | 77,371 | 467,440 |
| Coke made in gas plants, long tons | 54,220 | 303,421 | 7,480 | 43,758 |
| Total coke made, long tons | 114,014 | $675,563 | 142,625 | $903,671 |
| Gas sold and used | ..... | 1,810,083 | ..... | 1,925,270 |
| Tar produced | ..... | 54,379 | ..... | 63,569 |
| Other by-products | ..... | 3,060 | ..... | 1,716 |
| Total production value of coke industry | ..... | $2,543,085 | ..... | $2,894,226 |

## TABLE XVII.—Dividends paid by Mining Companies, 1897–1941.

*Lode-gold Mines.**

| Company or Mine. | Locality. | Class. | Amount paid. |
|---|---|---|---|
| Arlington | Erie | Gold | $76,567 |
| Athabasca | Nelson | Gold | 25,000 |
| Bralorne | Bridge River | Gold | 8,095,250 |
| Belmont-Surf Inlet | Princess Royal Island | Gold | 1,437,500 |
| Cariboo Gold Quartz | Wells | Gold | 1,386,638 |
| Cariboo-McKinney | Camp McKinney | Gold | 565,588 |
| Canadian Pacific Exploration | Nelson | Gold | 37,500 |
| Centre Star | Rossland | Gold | 472,255 |
| Fairview Amalgamated | Oliver | Gold | 7,922 |
| Fern | Nelson | Gold | 15,000 |
| Goodenough | Ymir | Gold | 13,931 |
| Gold Belt Mining Co., Ltd. | Sheep Creek | Gold | 153,000 |
| Hedley Mascot | Hedley | Gold | 973,574 |
| Island Mountain | Wells | Gold | 767,023 |
| I.X.L. | Rossland | Gold | 134,033 |
| Jewel-Denero | Greenwood | Gold | 11,751 |
| Kelowna Exploration (Nickel Plate) | Hedley | Gold | 870,000 |
| Kootenay Belle | Sheep Creek | Gold | 347,856 |
| Le Roi Mining Co. | Rossland | Gold | 1,475,000 |
| Le Roi No. 2 | Rossland | Gold | 1,574,640 |
| Lorne | Bridge River | Gold | 20,450 |
| Mount Zeballos Gold Mines, Ltd. | Zeballos | Gold | 165,000 |
| Nickel Plate | Hedley | Gold | 3,423,191 |
| Pioneer | Bridge River | Gold | 8,808,868 |
| Poorman | Nelson | Gold | 25,000 |
| Premier | Premier | Gold | 19,658,075 |
| Privateer | Zeballos | Gold | 1,374,285 |
| Queen | Sheep Creek | Gold | 85,000 |
| Relief Arlington Mines, Ltd. (Second Relief) | Erie | Gold | 245,000 |
| Reno | Sheep Creek | Gold | 926,040 |
| Sheep Creek Mines, Ltd. | Sheep Creek | Gold | 1,556,250 |
| Silbak Premier | Premier | Gold | 1,400,000 |
| Spud Valley Gold Mines, Ltd. | Zeballos | Gold | 168,000 |
| Sunset No. 2 | Rossland | Gold | 115,007 |
| Surf Inlet Consolidated Gold Mines, Ltd. | Surf Inlet | Gold | 93,550 |
| War Eagle | Rossland | Gold | 1,245,250 |
| Motherlode | Sheep Creek | Gold | 162,500 |
| Ymir Gold | Ymir | Gold | 300,000 |
| Ymir Yankee Girl | Ymir | Gold | 178,001 |
| Miscellaneous mines | | Gold | 71,743 |
| Total, lode-gold mines | | | $58,461,247 |

* The gold-copper properties of Rossland are included in this table.

TABLE XVII.—DIVIDENDS PAID BY MINING COMPANIES, 1897–1941—*Continued.*

*Silver-lead-zinc Mines.*

| Company or Mine. | Locality. | Class. | Amount paid. |
|---|---|---|---|
| Antoine | Rambler | Silver-lead-zinc | $10,000 |
| Beaverdell-Wellington | Beaverdell | Silver-lead-zinc | 97,200 |
| Bell | Beaverdell | Silver-lead-zinc | 476,297 |
| Bosun (Rosebery-Surprise) | New Denver | Silver-lead-zinc | 27,500 |
| Capella | New Denver | Silver-lead-zinc | 5,500 |
| Consolidated Mining and Smelting Co. of Canada, Ltd. | Trail | Silver-lead-zinc | 101,888,051 |
| Couverapee | Field | Silver-lead-zinc | 5,203 |
| Duthie Mines, Ltd. | Smithers | Silver-lead-zinc | 50,000 |
| Florence Silver | Ainsworth | Silver-lead-zinc | 35,393 |
| 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 | 475,352 |
| 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 | 213,109 |
| 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 | 27,500 |
| 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 | 496,901 |
| No. One | Sandon | Silver-lead-zinc | 6,754 |
| Ottawa | Slocan City | Silver-lead-zinc | 107,928 |
| Payne | Sandon | Silver-lead-zinc | 1,438,000 |
| Providence | Greenwood | Silver-lead-zinc | 98,024 |
| Queen Bess | Alamo | Silver-lead-zinc | 25,000 |
| Rambler-Cariboo | Rambler | Silver-lead-zinc | 575,000 |
| Reco | Cody | Silver-lead-zinc | 332,492 |
| Ruth Mines, Ltd. | Sandon | Silver-lead-zinc | 165,000 |
| St. Eugene | Moyie | Silver-lead-zinc | 566,000 |
| Silversmith* | Sandon | Silver-lead-zinc | 725,000 |
| Slocan Silver | Alamo | Silver-lead-zinc | 11,600 |
| Slocan Star* | Sandon | Silver-lead-zinc | 567,500 |
| Spokane-Trinket | Ainsworth | Silver-lead-zinc | 9,564 |
| Standard Silver Lead | Silverton | Silver-lead-zinc | 2,700,000 |
| Sunset and Trade Dollar | Retallack | Silver-lead-zinc | 88,000 |
| Utica | Kaslo | Silver-lead-zinc | 64,000 |
| Wallace Mines, Ltd. (Sally) | Beaverdell | Silver-lead-zinc | 135,000 |
| Washington | Rambler Station | Silver-lead-zinc | 38,000 |
| Whitewater | Retallack | Silver-lead-zinc | 592,515 |
| Miscellaneous mines | | Silver-lead-zinc | 70,237 |
| Total, silver-lead-zinc mines | | | $113,092,247 |

* These two properties are now amalgamated as Silversmith Mines, Ltd., August, 1939.

TABLE XVII.—DIVIDENDS PAID BY MINING COMPANIES, 1897–1941—*Continued.*

*Copper Mines.*

| Company or Mine. | Locality. | Class. | Amount paid. |
|---|---|---|---|
| Britannia M. & S. Co.* | Britannia Beach | Copper | $11,060,816 |
| Canada Copper Corporation | Greenwood | Copper | 615,399 |
| Cornell | Texada Island | Copper | 8,500 |
| Granby Cons. M.S. & P. Co.† | Copper Mountain | Copper | 8,835,894 |
| Marble Bay | Texada Island | Copper | 175,000 |
| Hall Mines | Nelson | Copper | 233,280 |
| Miscellaneous mines | | Copper | 261,470 |
| Total, copper mines | | | $21,190,359 |

* The Howe Sound Company is the holding company for the *Britannia* mine in British Columbia and other mines in Mexico and the State of Washington. Dividends paid by the Howe Sound Company are therefore derived from all operations, and in the foregoing table the dividends credited to the *Britannia* mine have been paid by the Britannia Mining and Smelting Company, Limited, none being credited subsequent to 1930, until 1939. In making comparison with yearly totals the amounts credited to the Howe Sound Company have been deducted for the years shown, so the total in the annual report concerned will show the higher figure. Dividends paid by Premier Gold Mining Company, Limited, are derived from operations in British Columbia and other countries, and so cannot now be credited to British Columbia. Silbak Premier is a subsidiary of Premier Gold Mining Company, and dividends paid by that company are, of course, included in Provincial totals.

† The amount shown to the credit of the Granby Consolidated Mining, Smelting and Power Company, Limited, does not include the sum of $6,749,996 paid by the company during 1935 and 1936 as a distribution or repayment of capital, subsequent to the closing-down of its operations at Anyox and the company going into voluntary liquidation. Operations ceased at Anyox in August, 1935. The company since that date has revived its business charter and is conducting operations at Allenby, B.C.

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.

*Coal.*

| | |
|---|---|
| Wellington Collieries, Ltd., Nanaimo | $16,000,000 |
| Crow's Nest Pass Coal Co., Ltd., Fernie | 12,681,664 |
| Total | $28,681,664 |

*Miscellaneous and Structural.*

| | |
|---|---|
| Various | $2,173,955 |

*Aggregate of all Classes.*

| | |
|---|---|
| Lode-gold mining | $58,461,247 |
| Silver-lead-zinc mining and smelting | 113,092,247 |
| Copper-mining | 21,190,359 |
| Coal-mining | 28,681,664 |
| Miscellaneous and structural | 2,173,955 |
| Total | $223,599,472 |

TABLE XVII.—DIVIDENDS PAID BY MINING COMPANIES, 1897–1941—*Continued.*

*Dividends paid Yearly, 1919 to 1941, inclusive.*

| Year. | Amount paid. | Year. | Amount paid. |
|---|---|---|---|
| 1919 | $2,494,283 | 1932 | $2,786,958 |
| 1920 | 1,870,296 | 1933 | 2,471,735 |
| 1921 | 736,629 | 1934 | 4,745,905 |
| 1922 | 3,174,756 | 1935 | 7,386,070 |
| 1923 | 2,983,570 | 1936 | 10,513,705 |
| 1924 | 2,977,276 | 1937 | 15,085,293 |
| 1925 | 5,853,419 | 1938 | 12,068,875 |
| 1926 | 8,011,137 | 1939 | 11,865,698 |
| 1927 | 8,816,681 | 1940 | 14,595,530 |
| 1928 | 9,572,536 | 1941 | 16,599,402 |
| 1929 | 11,263,118 | | |
| 1930 | 10,543,500 | Total | $171,067,229 |
| 1931 | 4,650,857 | | |

*Dividends paid during 1940 and 1941.*

| | 1940. | 1941. |
|---|---|---|
| Arlington (R. O. Oscarson) | $4,778 | $4,900 |
| Bralorne Mines, Ltd. | 1,496,400 | 1,496,400 |
| Britannia Mining and Smelting Co., Ltd. | 1,465,638 | 2,835,676 |
| Cariboo Gold Quartz Mines, Ltd. | 319,994 | 319,994 |
| The Consolidated Mining and Smelting Co. of Canada, Ltd. | 7,367,455 | 8,190,823 |
| Crow's Nest Pass Coal Co., Ltd. | 186,354 | 186,354 |
| Gold Belt Mining Co., Ltd. | 102,000 | 51,000 |
| Granby Consolidated Mining, Smelting and Power Co., Ltd. | 360,186 | 270,140 |
| Hedley Mascot Gold Mines, Ltd. | 181,130 | 181,130 |
| Highland Bell, Ltd. | 105,268 | 105,268 |
| Island Mountain Mines, Ltd. | 157,607 | 189,129 |
| Kelowna Exploration (Nickel Plate) | 270,000 | 300,000 |
| Kootenay Belle Gold Mines, Ltd. | 81,024 | 44,016 |
| Mount Zeballos Gold Mines, Ltd. | 110,000 | 55,000 |
| Pioneer Gold Mines of B.C., Ltd. | 700,700 | 700,700 |
| Privateer Mine, Ltd. | 441,734 | 392,653 |
| Relief Arlington Mines, Ltd. | 150,000 | 90,000 |
| Sheep Creek Gold Mines, Ltd. | 356,250 | 300,000 |
| Silbak Premier Mines, Ltd. | 400,000 | 400,000 |
| Spud Valley Gold Mines, Ltd. | 84,000 | 84,000 |
| Surf Inlet Consolidated Gold Mines, Ltd. | 40,093 | 53,457 |
| Ymir Yankee Girl, Ltd. | | 44,500 |
| Others | 214,919 | 304,262 |
| Totals | $14,595,530 | $16,599,402 |

## TABLE XVIII.—CAPITAL EMPLOYED, SALARIES AND WAGES, FUEL AND ELECTRICITY, AND PROCESS SUPPLIES, 1941.

| Class. | Capital employed. | Salaries and Wages. | Fuel and Electricity. | Process Supplies. |
|---|---|---|---|---|
| Lode-mining | $97,285,443 | $19,350,739 | $2,962,854 | $5,221,671 |
| Placer-mining | 2,067,187 | 576,104 | 43,485 | 56,598 |
| Coal-mining | 21,454,552 | 3,952,076 | 227,398 | 841,176 |
| Miscellaneous metals, minerals, and materials | 17,977,530 | 1,374,208 | 344,701 | 1,105,045 |
| Structural materials industry | 2,669,630 | 797,364 | 198,309 | 35,951 |
| **Totals, 1941** | **$141,454,342** | **$26,050,491** | **$3,776,747** | **$7,260,441** |
| Grand totals, 1940 | $139,694,733 | $23,391,330 | $3,474,721 | $6,962,162 |
| Grand totals, 1939 | 135,473,482 | 22,357,035 | 2,066,203 | 6,714,347 |
| Grand totals, 1938 | 153,012,848 | 22,765,711 | 3,396,106 | 6,544,500 |
| Grand totals, 1937 | 145,520,641 | 21,349,690 | 3,066,311 | 6,845,330 |
| Grand totals, 1936 | 142,663,065 | 17,887,619 | 2,724,144 | 4,434,501 |
| Grand totals, 1935 | 143,239,953 | 16,753,367 | 2,619,639 | 4,552,730 |
| Grand totals, 1935–41 | ..... | 150,555,243 | 21,123,871 | 43,314,011 |

NOTE.—The above figures, compiled from returns on the subject made by companies and individuals, illustrate the amount of capital employed in the mining industry, the amount of money distributed in salaries and wages, fuel and electricity, and process supplies (explosives, chemicals, drill steel, lubricants, etc.).

Capital employed includes: Present cash value of the land (excluding minerals); present value of buildings, fixtures, machinery, tools, and other equipment; inventory value of materials on hand, ore in process, fuel and miscellaneous supplies on hand; inventory value of finished products on hand; operating capital (cash, bills and accounts receivable, prepaid expenses, etc.).

## TABLE XIX.—TONNAGE, NUMBER OF MINES, NET AND GROSS VALUE OF LODE MINERALS, 1901–1941.

| Year. | Tonnage. | No. of Shipping-mines. | No. of Mines shipping over 100 Tons. | Net Value to Shipper of Lode Minerals produced. | Gross Value of Lode Minerals produced. |
|---|---|---|---|---|---|
| 1901 | 920,416 | 119 | 78 | ..... | $14,100,282 |
| 1902 | 998,999 | 124 | 75 | ..... | 11,581,153 |
| 1903 | 1,286,176 | 125 | 74 | ..... | 12,103,237 |
| 1904 | 1,461,609 | 142 | 76 | ..... | 12,909,035 |
| 1905 | 1,706,679 | 146 | 79 | ..... | 15,980,164 |
| 1906 | 1,963,872 | 154 | 77 | ..... | 18,484,102 |
| 1907 | 1,804,114 | 147 | 72 | ..... | 17,316,847 |
| 1908 | 2,083,606 | 108 | 59 | ..... | 15,847,411 |
| 1909 | 2,057,713 | 89 | 52 | ..... | 15,451,141 |
| 1910 | 2,216,428 | 83 | 50 | ..... | 14,728,731 |
| 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 | 2,690,110 | 132 | 59 | ..... | 19,992,149 |
| 1916 | 3,188,865 | 169 | 81 | ..... | 31,483,014 |
| 1917 | 2,761,579 | 193 | 87 | ..... | 26,788,474 |
| 1918 | 2,892,849 | 175 | 80 | ..... | 27,590,278 |
| 1919 | 2,112,975 | 144 | 74 | ..... | 19,750,498 |
| 1920 | 2,178,187 | 121 | 60 | ..... | 19,444,365 |
| 1921 | 1,562,645 | 80 | 35 | ..... | 12,920,398 |
| 1922 | 1,573,186 | 98 | 33 | ..... | 19,227,857 |
| 1923 | 2,421,839 | 77 | 28 | ..... | 25,347,092 |
| 1924 | 3,397,105 | 86 | 37 | ..... | 35,538,247 |
| 1925 | 3,849,269 | 102 | 40 | ..... | 46,200,135 |
| 1926 | 4,775,073 | 138 | 55 | $38,558,613 | 51,508,031 |
| 1927 | 5,416,021 | 132 | 52 | 27,750,364 | 44,977,082 |
| 1928 | 6,241,310 | 110 | 49 | 29,070,075 | 48,281,825 |
| 1929 | 6,977,681 | 106 | 48 | 34,713,887 | 51,174,859 |
| 1930 | 6,803,846 | 68 | 32 | 21,977,688 | 40,915,395 |
| 1931 | 5,549,103 | 44 | 22 | 9,513,931 | 22,535,573 |
| 1932 | 4,340,158 | 75 | 29 | 7,075,393 | 19,700,235 |
| 1933 | 4,030,778 | 109 | 47 | 13,976,368 | 25,007,137 |
| 1934 | 5,087,334 | 145 | 69 | 20,243,278 | 33,895,930 |
| 1935 | 4,916,149 | 177 | 72 | 25,407,914 | 40,597,569 |
| 1936 | 4,456,521 | 168 | 70 | 29,975,608 | 43,666,452 |
| 1937 | 6,145,254 | 185 | 113 | 44,762,860 | 62,912,783 |
| 1938 | 7,377,091 | 211 | 92 | 35,759,022 | 53,877,333 |
| 1939 | 7,210,676 | 217 | 99 | 40,711,287 | 53,522,098 |
| 1940 | 8,026,639 | 216 | 92 | 43,550,732 | 62,848,642 |
| **1941** | **7,956,284** | **200** | **96** | **46,686,076** | **62,216,019** |

## TABLE XX.—Men employed in the Mining Industry of British Columbia, 1901–1941.

| Year. | Placer-mining. | Lode-mining. | | | In Concentrators. | In Smelters. | Coal-mining. | | | Structural Materials. | | Miscellaneous. | Total. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 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 | ..... | ..... | 4,145 | 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 | 688 | 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 | 2,796 | 1,729 | 4,525 | 631 | 2,890 | 2,050 | 843 | 2,893 | 377 | 187 | 360 | 12,985 |
| 1935 | 1,291 | 2,740 | 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 | 15,890 |
| 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** | **413** | **422** | **15,084*** |

* The average number of wage-earners was obtained by adding the monthly figures for individual companies and dividing by 12 irrespective of the number of months worked, the average number of wage-earners in the industry is the sum of these individual averages.

TABLE XXI.—METALLIFEROUS MINES SHIPPING IN 1941.

| Mine or Group. | Location of Mine. | Mining Division. | Owner or Agent. | Process. | Character of Ore. |
|---|---|---|---|---|---|
| Polaris-Taku | Taku River (Tulsequah) | Atlin | Polaris-Taku Mining Co., Ltd., Tulsequah | Flotation | Gold. |
| Big Missouri | Stewart (Salmon Arm) | Portland Canal | Buena Vista Mining Co., Ltd., Trail | Flotation ; cyanidation | Gold. |
| Dunwell | Stewart (Glacier Creek) | Portland Canal | J. D. Rochfort and A. Bugnello, Stewart | | Gold, silver, copper. |
| Esperanza | Alice Arm | Portland Canal | H. Tyler, Alice Arm | | Silver, gold, copper, lead, zinc. |
| Gold Bar | Terrace | Portland Canal | Axel Erickson, Terrace | | Gold, silver. |
| Oral M. | Stewart | Portland Canal | J. Haahti, Stewart | | Silver, gold, copper. |
| Rainier Group | Stewart | Portland Canal | E. Love, Stewart | | Silver, copper, lead, zinc. |
| Red Cliffe | Stewart | Portland Canal | J. Rennie, Stewart | | Gold, silver, copper, lead, zinc. |
| Silbak Premier | Stewart | Portland Canal | Silbak Premier Mines, Ltd., Premier | Flotation | Gold, silver, lead. |
| Tide Lake Gold | Stewart | Portland Canal | Bank of Montreal, Stewart | | Gold, silver, copper, zinc. |
| I.X.L. | Porcher Island | Skeena | J. S. Brodie, Porcher Island | | Gold, silver, copper. |
| Surf Inlet | Surf Inlet | Skeena | Surf Inlet Cons. Gold Mines, Ltd., Vancouver | Table concentration ; flotation | Gold, silver, copper. |
| Cariboo Gold | Wells | Cariboo | Cariboo Gold Quartz Mining Co., Ltd., Vancouver | Cyanidation | Gold, silver. |
| Island Mountain | Wells | Cariboo | Island Mountain Mines, Ltd., Wells | Cyanidation | Gold, silver. |
| Black Bull | Copper River | Omineca | Wm. Hagen, Copper River | | Gold, silver. |
| Duthie | Hudson Bay Mountain | Omineca | A. W. Kelly and J. J. Herman, Smithers | | Silver, gold, lead, zinc. |
| Golden Eagle | Topley | Omineca | Heenan & Kylling, and Conlon & Williams, and R. Williams, Topley | | Silver, gold, lead. |
| Hazelton View | Rocher Déboulé Mountain | Omineca | J. T. Lee and A. S. Barker, Hazelton | | Gold. |
| Hunter Basin | Telkwa | Omineca | Conwest Exploration Co., Ltd., Vancouver | | Gold, silver, copper. |
| Mamie | Hudson Bay Mountain | Omineca | J. J. Herman, Smithers | | Gold, silver, copper, zinc. |
| Silver Cup | Topley | Omineca | Mathew Sam, Topley | | Silver, lead, zinc. |
| Allied (Homestake) | Squaam Bay | Kamloops | Allied Mining & Development Co., Barriere | | Silver, gold, lead, zinc. |
| Riverside | Kamloops | Kamloops | Gordon F. Dickson, Kamloops | | Gold, silver. |
| Windpass | Dunn Lake | Kamloops | Windpass Gold Mining Co., Ltd., Vancouver | Flotation | Gold, silver, copper. |
| Consolidated Nicola | Stump Lake | Nicola | Cons. Nicola Gold Fields, Ltd., Vancouver | Flotation | Gold, silver, lead, zinc. |
| Kalamalka | Lavington | Vernon | S. M. Penny, Vernon | | Gold, silver. |
| Skookum | Vernon | Vernon | Levasseur & Rowe, Nelson | | Silver, gold. |
| Amandy | Jewel Lake | Greenwood | W. E. McArthur, Greenwood | | Gold, silver. |
| Bay | Greenwood | Greenwood | R. Forshaw, Greenwood | | Gold, silver. |
| Bounty | Beaverdell | Greenwood | O. Houlind, Beaverdell | | Silver, lead, zinc. |
| Cariboo | Camp McKinney | Greenwood | G. S. Boug *et al.*, Greenwood | | Gold, silver, lead, zinc. |
| Crescent | Jewel Lake | Greenwood | John Pazur *et al.*, Greenwood | | Gold, silver, lead, zinc. |
| Dentonia | Greenwood | Greenwood | Dentonia Leasing Syndicate and A. H. Upton, Greenwood | | Gold, silver. |
| Gold Drop | Jewel Lake | Greenwood | Gold Drop Lessors, Greenwood | | Gold, silver. |

| | | | | | |
|---|---|---|---|---|---|
| Goldfinch | Greenwood | Greenwood | E. Larsen *et al.*, Greenwood | | Gold, silver, lead, zinc. |
| Golden Crown | Phoenix | Greenwood | W. E. McArthur & Son, Greenwood | | Gold, silver, copper. |
| Golden Eagle | Greenwood | Greenwood | A. F. Crowe, Grand Forks | | Silver, gold, copper. |
| Granby | Phoenix | Greenwood | W. E. McArthur, Greenwood | Concentration | Gold, silver, copper. |
| Highland Bell | Greenwood | Greenwood | Highland Bell, Ltd., Creston | | Silver, gold, lead, zinc. |
| Highland Chief | Beaverdell | Greenwood | Highland Chief, Ltd., Kelowna | | Silver, lead, zinc. |
| Homestake | Beaverdell | Greenwood | Homestake Syndicate, Grand Forks | | Gold, silver, lead, zinc. |
| Humming Bird | Greenwood | Greenwood | C. A. Anderson, Grand Forks | | Gold, silver, zinc. |
| Jewel | Jewel Lake | Greenwood | Jewel Leasing Syndicate, Greenwood | | Gold, silver. |
| Klondyke | Bridesville | Greenwood | S. Berglund, Rossland | | Silver, gold. |
| Lakeside | Greenwood | Greenwood | N. Boris, West Grand Forks | | Silver, gold. |
| Lakeside | Greenwood | Greenwood | J. S. and S. J. Kleman, West Grand Forks | | Gold, silver. |
| Number Seven | Boundary Falls | Greenwood | W. E. McArthur *et al.*, Greenwood | | Gold, silver, lead, zinc. |
| Providence | Greenwood | Greenwood | Providence Mine Syndicate, Greenwood | | Silver, gold, lead, zinc. |
| Rosemont | Beaverdell | Greenwood | Highland Bell, Ltd., Creston | | Gold, silver. |
| Sally | Beaverdell | Greenwood | Leasers from Sally Mines, Ltd., Penticton | | Silver, gold, lead, zinc. |
| Union | Granby River | Greenwood | W. E. McArthur, Greenwood | | Gold, silver. |
| Wellington | Beaverdell | Greenwood | A. J. Morrison, Greenwood | | Silver, gold, lead, zinc. |
| Wiarton | Camp McKinney | Greenwood | Highland Bell, Ltd., Creston | | Gold, silver, lead, zinc. |
| Yankee Boy | Grand Forks | Greenwood | W. Schwarz, J. S. and S. J. Kleman, *et al.*, Grand Forks | | Gold, silver. |
| Divine | Oliver | Osoyoos | W. Bousfield, Oliver | | Silver, gold. |
| Empire | Oliver | Osoyoos | Cluff, Ewers & Smither, Oliver | | Gold, silver. |
| Gold Standard | Oro Fino Mountain | Osoyoos | A. Whitehead and D. Dollemore, Princeton | | Gold, silver. |
| Grandoro | Oliver | Osoyoos | J. P. Wukelick, Penticton | | Gold, silver. |
| Grandview | Oliver | Osoyoos | W. R. Trombley, Greenwood | | Gold, silver, copper. |
| Gypo | Oliver | Osoyoos | R. C. McKay, Oliver | | Gold, silver. |
| Hedley Mascot | Hedley | Osoyoos | Hedley Mascot Mines, Ltd., Vancouver | Flotation | Gold, silver, copper. |
| K.C.M. | Penticton | Osoyoos | Kleman Bros. and A. Kabatoff, Penticton | | Gold, silver. |
| Morning Star | Osoyoos | Osoyoos | O. Carlson and R. McKay, Oliver | | Gold, silver. |
| Nickel Plate | Hedley | Osoyoos | Kelowna Exploration Co., Ltd., Hedley | Cyanidation : flotation | Gold, silver, copper. |
| Osoyoos | Osoyoos | Osoyoos | J. W. Boothe and D. Dollemore, Oliver | | Gold, silver. |
| Silver King | Oliver | Osoyoos | L. T. Levasseur and Richard Rowe, Nelson | | Gold, silver. |
| Sunnyside | Penticton | Osoyoos | E. C. Rice and T. J. Kohlman, Penticton | | Gold, silver. |
| B.C. Gold Group | Tulameen | Osoyoos | Rabbitt Bros., Tulameen | | Gold, silver. |
| Copper Mountain | Allenby | Similkameen | Granby Cons. M.S. and Power Co., Vancouver | Flotation | Copper, gold, silver. |
| Caledonia | Blaylock | Ainsworth | G. E. McCready, Kaslo | | Silver, lead, zinc. |
| Highland Surprise | Retallack | Ainsworth | Highland Surprise Gold Mines, Ltd., Vancouver | | Gold, silver, lead, zinc. |
| Revenue | Zwicky | Ainsworth | O. Kahle and E. Garrett, Kaslo | | Silver, lead, zinc. |
| Whitewater | Whitewater | Ainsworth | C. J. Garrett, Retallack | | Silver, gold, zinc, lead. |
| Sullivan | Kimberley | Fort Steele | Consolidated Mining and Smelting Co. of Canada, Ltd., Trail | Flotation | Silver, lead, zinc. |
| Monarch and Kicking Horse | Field | Golden | Base Metal Mining Corporation, Ltd., Toronto | Table concentration ; flotation | Silver, lead, zinc. |

TABLE XXI.—METALLIFEROUS MINES SHIPPING IN 1941—*Continued.*

| Mine or Group. | Location of Mine. | Mining Division. | Owner or Agent. | Process. | Character of Ore. |
|---|---|---|---|---|---|
| Meridian | Camborne | Lardeau | Cory Menhenick, Camborne | | Gold, silver. |
| Silver Bell | Trout Lake | Lardeau | W. Scorgie, Trout Lake | | Silver, lead, zinc. |
| Silver Cup | Ferguson | Lardeau | Malone, Larsen & Broomfield, Ferguson | | Silver, gold, lead, zinc. |
| Spider | Camborne | Lardeau | O. Osing and O. Jorgensen, Rossland | | Silver, gold, lead, zinc. |
| Winslow | Trout Lake | Lardeau | Le Roi Gold Mining Syndicate, Penticton | | Gold, silver. |
| Alpine | Nelson | Nelson | Alpine Gold, Ltd., Nelson | Concentration | Gold, silver, lead, zinc. |
| Arizona | Ymir | Nelson | Geo. Johnsen and N. Morris, Nelson | | Gold, silver. |
| Arlington | Erie Creek | Nelson | R. O. Oscarson, Erie; and Department of Mines, Victoria | | Gold, silver, lead, zinc. |
| Athabasca | Nelson | Nelson | Noble Five Mines, Ltd., Nelson | | Gold, silver, lead, zinc. |
| Baltic | Ymir | Nelson | H. Erickson, Hall Creek | | Gold, silver. |
| Bayonne | Tye | Nelson | Bayonne Consolidated Mines, Ltd., Vancouver | Cyanidation | Gold, silver, lead, zinc. |
| Bear | Hall Creek | Nelson | A. Carlson and J. Berquist, Hall | | Gold, silver. |
| Black Cock | Ymir | Nelson | The Black Cock Mine, Ymir | | Gold, silver, lead, zinc. |
| California | Nelson | Nelson | B.C. Department of Mines, Victoria; L. and R. Bobier, and H. Brenner, Nelson | | Gold, silver, lead, zinc. |
| Canadian Boy | Ymir | Nelson | J. Turk, Ymir | | Gold, silver, lead, zinc. |
| Catherine | Cottonwood Lake | Nelson | L. and R. Bobier, Nelson | | Gold, silver, lead, zinc. |
| Centre Star | Ymir | Nelson | O. Anderson and Associates, Ymir | | Gold, silver, lead, zinc. |
| Clubine Comstock | Boulder Creek | Nelson | L. R. Clubine, Salmo | | Gold, silver. |
| Daylight | Nelson | Nelson | Peter Rolich, Nelson | | Gold, silver. |
| Euphrates | Hall Creek | Nelson | Gold, Silver, Tungsten Mining and Milling Co., Hall | Flotation | Gold, silver, lead, zinc. |
| Fern and Fern No. 2 | Hall Creek | Nelson | J. Logan *et al.*, Nelson | | Gold, silver. |
| Goodenough | Ymir | Nelson | Goodenough Leasing Syndicate, Ymir | | Gold, silver, lead, zinc. |
| Gold Belt | Sheep Creek | Nelson | Gold Belt Mining Co., Ltd., Vancouver | Cyanidation | Gold, silver. |
| Granite-Poorman | Taghum | Nelson | Livingstone Mining Co., Ltd., Blewett | Amalgamation; cyanidation | Gold, silver. |
| Harriet | Erie | Nelson | S. A. Curwen, Ymir | | Gold, silver. |
| Howard | Ymir | Nelson | S. A. Curwen, Ymir | | Gold, silver, lead, zinc. |
| Humming Bird | Nelson | Nelson | L. E. Porter *et al.*, Nelson | | Gold, silver, lead, zinc. |
| Jessie Victoria | Nelson | Nelson | J. A. Ferguson, Nelson | | Gold, silver. |
| Keystone | Erie | Nelson | Slocan Silver Mines, Ltd., Nelson | | Gold, silver, lead, zinc. |
| Kootenay Belle | Sheep Creek | Nelson | Kootenay Belle Gold Mines, Ltd., Vancouver | Cyanidation | Gold, silver. |
| Lone Silver | Salmo | Nelson | R. Sapples, Salmo; L. and R. Bobier, Nelson | | Gold, silver, lead, zinc. |
| Nevada | Nelson | Nelson | D. H. Norcross, Nelson | | Gold, silver. |
| Nugget-Motherlode | Salmo | Nelson | A. Endersby, Sr. and Jr., Sheep Creek | | Gold, silver. |
| Porto Rico | Porto Rico | Nelson | H. Errington, J. Flagel, *et al.*, Ymir | | Gold, silver. |
| Reliance | Beaverdale Creek | Nelson | G. H. Grimwood, Nelson | | Gold, silver. |
| Relief-Arlington | Erie | Nelson | Relief-Arlington Mines, Ltd., Erie | Amalgamation; flotation | Gold, silver. |
| Reno | Sheep Creek | Nelson | Reno Gold Mines, Ltd., Vancouver | Cyanidation | Gold, silver. |
| Sheep Creek | Sheep Creek | Nelson | Sheep Creek Mines, Ltd., Vancouver | Cyanidation | Gold, silver. |
| Silver Tip | Blewett | Nelson | O. L. D'Area and W. Pereopolkin, Blewett | | Gold, silver. |

| | | | | | |
|---|---|---|---|---|---|
| Spokane | Tye | Nelson | K. K. and R. M. Laib, Bayonne | | Gold, silver, lead, zinc. |
| Venus-Juno | Nelson | Nelson | Mrs. A. and Miss T. Heddle, Nelson | | Gold, silver. |
| Wilcox | Ymir | Nelson | B. Golac, Nelson | | Gold, silver. |
| Yankee Girl | Ymir | Nelson | Ymir-Yankee Girl Gold Mines, Ltd., Ymir | Cyanidation ; flotation | Gold, silver, lead, zinc. |
| Ymir | Ymir | Nelson | Leasers, Ymir | | Gold, silver, lead, zinc. |
| Bell | Springer Creek | Slocan | R. E. McMillan, Slocan City | | Silver, gold. |
| Bosun | New Denver | Slocan | C. J. Campbell, Vancouver | | Silver, lead, zinc. |
| Chapleau | Lemon Creek | Slocan | B.C. Department of Mines, Victoria | | Gold, silver. |
| Enterprise | Slocan City | Slocan | S. N. Ross, Nelson | | Silver, gold, lead, zinc. |
| Evening Star | Slocan City | Slocan | W. D. Smith and M. Ansaldo, Slocan City | | Silver, gold. |
| Hewitt | Silverton | Slocan | H. V. Dewis, Silverton | | Silver, lead, zinc. |
| Howard Fraction | Slocan City | Slocan | F. T. Harbour and Associates | | Silver, gold. |
| Lucky Jim | Zincton | Slocan | Zincton Mines, Ltd., Sheep Creek | Table concentrates ; flotation | Zinc. |
| Marmion and Maryland | Slocan City | Slocan | Hans Lyngoy, Rossland | | Silver, gold. |
| Monitor | Three Forks | Slocan | S. Sibileau *et al.*, Sandon | | Silver, gold, lead, zinc. |
| McAllister | Three Forks | Slocan | Geo. Allen, New Denver | | Silver, lead. |
| Ottawa | Springer Creek | Slocan | Wm. Hicks and Associates, Slocan | | Silver, gold. |
| Ruth-Hope | Sandon | Slocan | Leasers from Ruth-Hope Mining Co., Ltd. | | Silver, gold, lead, zinc. |
| Speculator | Springer Creek | Slocan | H. M. Parker, Trail | | Silver, lead, zinc. |
| Standard | Silverton | Slocan | Western Exploration Co., Ltd., Silverton | Table concentration ; flotation | Silver, zinc, lead. |
| Victor | Sandon | Slocan | Leased by E. Doney & Son, Sandon | | Silver, lead, zinc. |
| I.X.L. | Rossland | Trail Creek | Leasing Syndicate of I.X.L. | | Gold, silver. |
| Jumbo | Rossland | Trail Creek | M. Michaely, Rossland | | Gold, silver. |
| Midnight | Rossland | Trail Creek | Midnight Mines, Ltd., Rossland | Amalgamation ; jig ; flotation | Gold, silver. |
| Phoenix | Rossland | Trail Creek | S. Berglund, Rossland | | Gold, silver. |
| Velvet Gold | Rossland | Trail Creek | Velvet Gold Leasers, Rossland | | Gold, silver, copper. |
| Rossland Properties | Rossland | Trail Creek | Leased from Consolidated Mining & Smelting Co. of Canada, Ltd., Trail | | Gold, silver, copper. |
| Thistle | Alberni | Alberni | Leased from United Prospectors, Ltd., Victoria | | Gold, silver, copper. |
| W.W.W. | Franklin River | Alberni | K. J. Robinson, Vancouver | | Gold, silver, lead. |
| Big Boy | Herbert Arm | Clayoquot | R. A. Pitre, Victoria | | Gold, silver. |
| Buccaneer | Bedwell River | Clayoquot | Buccaneer Mines, Ltd., Vancouver | Amalgamation ; flotation | Gold, silver. |
| C.D. (Rey Oro) | Zeballos | Clayoquot | C.D. Mining Co., Ltd., Vancouver | Concentration | Gold, silver. |
| Central Zeballos | Zeballos | Clayoquot | c/o Reno Gold Mines, Ltd., Vancouver | Amalgamation ; flotation | Gold, silver. |
| Homeward | Zeballos | Clayoquot | Homeward Mines, Ltd. | Amalgamation ; flotation | Gold, silver. |
| Mount Zeballos | Zeballos | Clayoquot | Mount Zeballos Gold Mines, Ltd., Vancouver | Amalgamation ; flotation | Gold, silver. |
| Privateer | Zeballos | Clayoquot | Privateer Mine, Ltd., Vancouver | Amalgamation ; cyanidation | Gold, silver. |
| Spud Valley | Zeballos | Clayoquot | Spud Valley Gold Mines, Ltd., Vancouver | Amalgamation ; flotation | Gold, silver. |
| White Star | Zeballos | Clayoquot | White Star Mine, Ltd., Vancouver | | Gold, silver, lead. |
| Taylor Windfall | Taseko Lake | Clinton | Leased from Taylor Windfall Gold Mining Co., Vancouver | | Gold, silver. |
| Bralorne | Bridge River | Lillooet | Bralorne Mines, Ltd., Vancouver | Amalgamation ; flotation | Gold, silver. |
| Pioneer | Bridge River | Lillooet | Pioneer Gold Mines of B.C., Ltd., Vancouver | Cyanidation | Gold, silver. |

TABLE XXI.—METALLIFEROUS MINES SHIPPING IN 1941—*Continued.*

| Mine or Group. | Location of Mine. | Mining Division. | Owner or Agent. | Process. | Character of Ore. |
|---|---|---|---|---|---|
| Burton | Thurlow | Nanaimo | R. W. Burton, Shoal Bay | | Gold, silver. |
| Geiler Group | Quadra Island | Nanaimo | T. Noble, Quathiaski Cove | | Gold, silver. |
| Dawson | Hope | New Westminster | F. Kuhnke, c/o Dawson Cons. Mines, Ltd., Vancouver | | Gold, silver, copper. |
| Invermay | Hope | New Westminster | Skagit River Development Co., Ltd., Vancouver | | Silver, gold, lead, zinc. |
| Star | Hope | New Westminster | L. A. Morin, Vancouver | | Gold, silver, copper. |
| Britannia | Britannia Beach | Vancouver | Britannia Mining & Smelting Co., Ltd., Britannia Beach | Flotation | Copper, gold, silver. |
| Silta | Seymour Inlet | Vancouver | R. C. McCorkell, Vancouver | | Gold, silver. |

# SYNOPSIS OF MINING LAWS OF BRITISH COLUMBIA.

## Mineral Act and Placer-mining Act.

The mining laws of British Columbia are very liberal in their nature and compare favourably with those of any other part of the world. The terms under which both lode and placer claims and placer leaseholds are held are such that a prospector is greatly encouraged in his work, and the titles, especially for mineral claims and placer-mining leaseholds, are perfect. The fees required to be paid are as small as possible, consistent with a proper administration of the mining industry, and are generally lower than those commonly imposed elsewhere. Provision is also made for the formation of mining partnerships practically without expense, and a party of miners is enabled to take advantage of these sections of the Acts so that such miners may work their claims jointly.

Placer-mining leases are granted for a period of twenty years and are approximately 80 acres in size. On a lode claim of 51 acres the expenditure of $500 is required to obtain a Crown grant, and surface rights are obtainable at a small figure, in no case exceeding $5 per acre.

The following synopsis of the mining laws will be found sufficient to enable the miner or intending investor to obtain a general knowledge of their scope and requirements; for particulars, however, the reader is referred to the Acts relating to mining, which may be obtained from the Department of Mines or the King's Printer, Victoria, B.C.

## Free Miners' Certificates.

Any person over the age of 18, and any joint-stock company, may obtain a free miner's certificate on payment of the required fee.

The fee to an individual for a free miner's certificate is $5 for one year. To a joint-stock company having a capital of $100,000, or less, the fee for a year is $50; if capitalized beyond this, the fee is $100. If the company has no stated capitalization, the fee is $100.

The free miners' certificates run from date of issue and expire on the 31st day of May next after its date, or some subsequent 31st day of May (that is to say, a certificate may be taken out a year or more in advance if desired). Certificates may be obtained for any part of a year, terminating on May 31st, for a proportionately less fee.

The possession of this certificate entitles the holder to enter upon all lands of the Crown, and upon any other lands on which the right to so enter is not specially reserved, for the purpose of prospecting for minerals, locating claims, and mining.

A free miner can hold, by location, during any period of twelve months, eight mineral claims within a radius of 10 miles, and may acquire others by purchase. Under the "Placer-mining Act," a free miner may locate, in any period of twelve consecutive months, one placer claim or leasehold in his own name and one placer claim or leasehold for each of three free miners for whom he acts as agent, on any separate creek, river-bed, bar or dry diggings. Other placer claims or leaseholds may be acquired by purchase.

In the event of a free miner allowing his certificate to lapse, his mining property (if not Crown-granted) reverts to the Crown (subject to the conditions set out in the next succeeding paragraph), but where other free miners are interested as partners or co-owners the interest of the defaulter becomes vested in the continuing co-owners or partners *pro rata*, according to their interests.

Six months' extension of time within which to revive title in mining property which has been forfeited through the lapse of a free miner's certificate is allowed. This privilege is given only if the holder of the property obtains a special free miner's certificate within six months after the 31st of May on which his ordinary certificate lapsed. The fee for this special certificate in the case of a person is $15 and in that of a company $300.

It is not necessary for a shareholder, as such, in an incorporated mining company to be the holder of a free miner's certificate.

## Mineral Claims.

Mineral claims are located and held under the provisions of the "Mineral Act."

A mineral claim is a piece of land not exceeding in area fifty-one and sixty-five one-hundredths acres. The angles must be right angles unless the boundaries, or one of them, are the same as those of a previously recorded claim.

No special privileges are allowed for the discovery of new mineral claims or districts.

A mineral claim is located by erecting two "legal posts," which are stakes having a height of not less than 4 feet above ground and squared 4 inches at least on each face for not less than a foot from the top. A tree-stump so cut and squared also constitutes a legal post. A cairn of stones not less than 4 feet in height and not less than 1 foot in diameter 4 feet above the ground may also be used as a legal post. Upon each of these posts must be written the name of the claim, the name of the locator, and the date of location. On No. 1 post, in addition, the following must be written: "Initial post. Direction of Post No. 2 [*giving approximate compass-bearing*] ——— feet of this claim lie on the right and ——— feet on the left of the line from No. 1 to No. 2 posts." Numbered metal identification tags must be attached to both posts at the time of staking.

The location-line between Nos. 1 and 2 posts must be distinctly marked—in a timbered locality by blazing trees and cutting underbrush, and in bare country by monuments of earth or rock not less than 2 feet in diameter at the base, and at least 2 feet high—so that the line can be distinctly seen.

Mineral claims must be recorded in the Mining Recorder's office for the mining division in which they are situate within fifteen days from the date of location, one day extra being allowed for each 10 miles of distance from the recording office after the first 10 miles. If a claim is not recorded in time it is deemed abandoned and open for relocation, but if the original locator wishes to relocate he can only do so by permission of the Gold Commissioner of the district and upon the payment of a fee of $10. This applies also to a claim abandoned for any reason whatever.

Mineral claims are, until the Crown grant is issued, held practically on a yearly lease, a condition of which is that during such year assessment-work be performed on the same to the value of at least $100, or a payment of such sum be made to the Mining Recorder. Such assessments must be recorded before the expiration of the year, or the claim is deemed abandoned. If, however, the required assessment-work has been performed within the year, but not recorded within that time, a free miner may, within thirty days thereafter, record such assessment-work upon payment of an additional fee of $10. The actual cost of the survey of a mineral claim, to an amount not exceeding $100, may also be recorded as assessment-work. If, during any year, work is done to a greater extent than the required $100, any further sum of $100—but not less—may be recorded and counted as further assessments; such excess work must be recorded during the year in which it is performed. All work done on a mineral claim between the time of its location and recording may be counted as work done during the first period of one year from the recording. As soon as assessment-work to the extent of $500 is recorded and a survey made of the claim, the owner of a mineral claim is entitled to a Crown grant on payment of a fee of $25, and giving the necessary notices required by the Act. Liberal provisions are also made in the Act for obtaining mill-sites and other facilities in the way of workings and drains for the better working of claims.

## Placer Claims.

Placer-mining is governed by the "Placer-mining Act," and by the interpretation clause its scope is defined as "the mining of any natural stratum or bed of earth, gravel, or cement mined for gold or other precious minerals or stones." Placer claims are of four classes, as follows:—

"'Creek diggings': any mine in the bed of any stream or ravine:

"'Bar diggings': any mine between high- and low-water marks on a river, lake, or other large body of water:

"'Dry diggings': any mine over which water never extends:

"'Precious-stone diggings': any deposit of precious stones, whether in veins, beds, or gravel deposits."

The following provisions as to extent of the various classes of claims are made by the Act:—

"In 'creek diggings' a claim shall be two hundred and fifty feet long, measured in the direction of the general course of the stream, and shall extend in width one thousand feet, measured from the general course of the stream five hundred feet on either side of the centre thereof:

"In 'bar diggings' a claim shall be:—

"(*a.*) A piece of land not exceeding two hundred and fifty feet square on any bar which is covered at high water; or

"(*b.*) A strip of land two hundred and fifty feet long at high-water mark, and in width extending from high-water mark to extreme low-water mark.

"In 'dry diggings' a claim shall be two hundred and fifty feet square."

The following provision is made for new discoveries of placer-mining ground:—

"If any free miner, or party of free miners, discovers a new locality for the prosecution of placer-mining and such discovery be established to the satisfaction of the Gold Commissioner, placer claims of the following sizes shall be allowed to such discoverers, namely:—

"To one discoverer, one claim..... 600 feet in length;

"To a party of two discoverers, two claims amounting together to..... 1,000 feet in length;

"And to each member of a party beyond two in number, a claim of the ordinary size only.

"The width of such claims shall be the same as ordinary placer claims of the same class: Provided that where a discovery claim has been established in any locality no further discovery shall be allowed within five miles therefrom, measured along the watercourses."

Every placer claim shall be as nearly as possible rectangular in form, and marked by four legal posts at the corners thereof, firmly fixed in the ground. On each of such posts shall be written the name of the locator, the number and date of issue of his free miner's certificate, the date of the location, and the name given to the claim. In timbered localities boundary-lines of a placer claim shall be blazed so that the posts can be distinctly seen, underbrush cut, and the locator shall also erect legal posts not more than 125 feet apart on all boundary-lines. In localities where there is no timber or underbrush, monuments of earth and rock, not less than 2 feet high and 2 feet in diameter at base, may be erected in lieu of the last-mentioned legal posts, but not in the case of the four legal posts marking the corners of the claim.

A placer claim must be recorded in the office of the Mining Recorder for the mining division within which the same is situate, within fifteen days after the location thereof, if located within 10 miles of the office of the Mining Recorder by the most direct means of travel. One additional day shall be allowed for every 10 miles additional or fraction thereof. The number of days shall be counted inclusive of the days upon which such location was made, but exclusive of the day of application for record. The application for such record shall be under oath and in the form set out in the Schedule to the Act. A claim which shall not have been recorded within the prescribed period shall be deemed to have been abandoned.

To hold a placer claim for more than one year it must be rerecorded before the expiration of the record or rerecord.

A placer claim must be worked by the owner, or some one on his behalf, continuously, as far as practicable, during working-hours. If work is discontinued for a period of seven days, except during the close season, lay-over, leave of absence, sickness, or for some other reason to the satisfaction of the Gold Commissioner, the claim is deemed abandoned.

Lay-overs are declared by the Gold Commissioner upon proof being given to him that the supply of water is insufficient to work the claim. Under similar circumstances he has also the power to declare a close season, by notice in writing and published in

the Gazette, for all or any claims in his district. Tunnel and drain licences are also granted by him on the person applying giving security for any damage that may arise. Grants of right-of-way for the construction of tunnels or drains across other claims are also granted on payment of a fee of $25, the owner of the claims crossed having the right for tolls, etc., on the tunnel or drain which may be constructed. These tolls, however, are, so far as the amount goes, under the discretion of the Gold Commissioner.

## Co-owners and Partnerships.

In both the "Mineral" and "Placer-mining" Acts provision is made for the formation of mining partnerships, both of a general and limited liability character. These are extensively taken advantage of and have proved very satisfactory in their working. Should a co-owner fail or refuse to contribute his proportion of the expenditure required as assessment-work on a claim he may be "advertised out," and his interest in the claim shall become vested in his co-owners who have made the required expenditure, *pro rata* according to their former interests.

It should not be forgotten that if any co-owner permits his free miner's certificate to lapse, the title of his associates is not prejudiced, but his interest reverts to the remaining co-owners; provided that said co-owner has not taken advantage of the six months' period of grace allowed for the taking-out of a special free miner's certificate, thus reviving the title to his interest.

## Placer-mining Leases.

Leases of unoccupied Crown lands approximately 80 acres in extent may be granted by the Gold Commissioner of the district after location has been made by staking along a "location-line" not more than one-half a mile (2,640 feet) in length. In this line one bend, or change of direction, is permitted. Where a straight line is followed two posts only are necessary—namely, an "initial post" and a "final post." Where there is a change of direction a legal post must be placed to mark the point of the said change. The leasehold is allowed a width not in excess of one-quarter mile (1,320 feet), and the locator, both on his "initial post" and in his notice of intention to apply, which is posted at the office of the Mining Recorder, is required to state how many feet are included in the location to the right and how many feet to the left of the location-line.

That section of the Act dealing with the staking of placer-mining leases follows:—

"105. (1.) For the purpose of locating a placer leasehold, a line to be known as the 'location-line' shall be marked on the ground by placing a legal post at each end, one post to be known as the 'Initial Post' and the other as the 'Final Post.' The direction of the location-line may change at not more than one point throughout its length, and an intermediate legal post shall be placed at the point at which the direction changes. The total length of the location-line, following its change of direction (if any), shall not exceed two thousand six hundred and forty feet.

"(2.) Upon the initial post and the final post shall be written the words 'Initial Post' and 'Final Post' respectively, together with the name of the locator and the date of the location. On the initial post shall also be written the approximate compass-bearing of the final post, and a statement of the number of feet of the leasehold lying on the right and on the left of the location-line, as viewed from the initial post, not exceeding in the aggregate a width of thirteen hundred and twenty feet, thus: 'Direction of Final Post, . feet of this claim lie on the right and feet on the left of the location-line.' In addition to the foregoing, where there is a change of direction in the location-line as marked on the ground, the number '1' shall be written on the initial post; the number '2' shall be written on the intermediate post; and the number '3' shall be written on the final post. There also shall be affixed to the initial post a notice to the following effect, namely: 'Application will be made under the "Placer-mining Act" for a lease of the ground within this location.'

"(3.) The location-line shall at the time of location be marked between the legal posts throughout its length so that it can be distinctly seen; in a timbered locality, by blazing trees and cutting underbrush, and in a locality where there is neither timber

nor underbrush, by placing legal posts or monuments of earth or stones not less than two feet high and not less than two feet in diameter at the base, so that the location-line can be distinctly seen.

"(4.) Where, from the nature or shape of the surface of the ground, it is impracticable to mark the location-line of a leasehold as provided by this section, the leasehold may be located by placing legal posts as witness-posts, as near as possible to the location-line, and writing on each witness-post the distance and compass-bearing of some designated point on the location-line from the witness-post; and the distances and compass-bearing so written on the witness-posts shall be set out in the application for the lease and in any lease granted thereon.

"(5.) The locator shall, within thirty days after the date of the location, post a notice in Form I in the office of the Mining Recorder, which notice shall set out:—

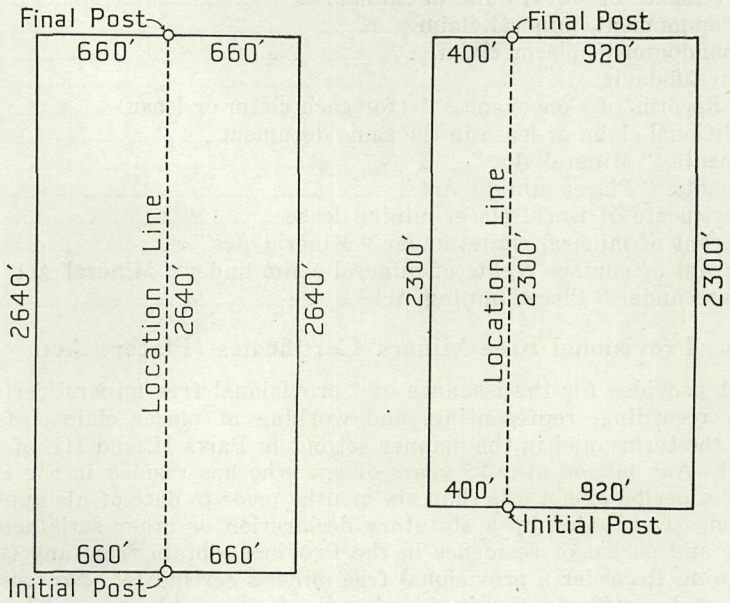
"(*a.*) The name of the intending applicant or each applicant if more than one, and the numbers of their free miners' certificates:

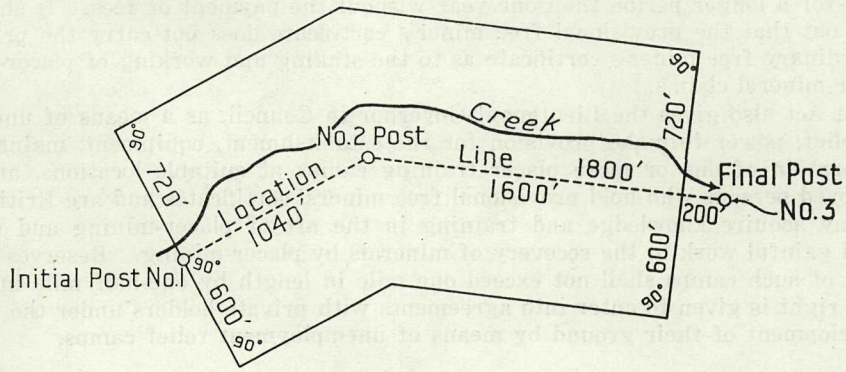
"(*b.*) The date of the location:

"(*c.*) The number of feet lying to the right and left of the location-line, and the approximate area or size of the ground.

EXAMPLES OF VARIOUS METHODS OF LAYING OUT PLACER LEASEHOLDS.

*Showing Areas secured with Location-lines of Various Lengths.*



The words written on the initial post and final post shall be set out in full in the notice; and as accurate a description as possible of the ground to be acquired shall be given, having special reference to any prior locations it may join, and the general locality of the ground to be acquired."

Another provision is that there must be affixed to the "initial post" and to the "final post" a numbered metal identification tag furnished by the Mining Recorder with each free miner's certificate issued. These tags must be attached to the posts or placed in a container within a cairn, at the time of location.

The annual rental on a placer-mining lease is $30, and the amount to be expended annually on development-work is $250.

Authority also has been given for the granting of special placer-mining leases in locations other than has been defined.

For more detailed information the reader is referred to the complete "Placer-mining Act," which may be obtained from the King's Printer, Victoria, B.C.

### Table of Fees, Mineral Act and Placer-mining Act.

| | |
|---|---|
| Individual free miner's certificate, annual fee | $5.00 |
| Company free miner's certificate (capital $100,000 or less), annual fee | 50.00 |
| Company free miner's certificate (capital over $100,000), annual fee | 100.00 |
| Recording mineral claim | 2.50 |
| Recording certificate of work, mineral claim | 2.50 |
| Recording abandonment, mineral claim | 10.00 |
| Recording abandonment, placer claim | 2.50 |
| Recording any affidavit | 2.50 |
| Records in "Records of Conveyances" (for each claim or lease) | 2.00 |
| For each additional claim or lease in the same document | .50 |
| Filing documents, "Mineral Act" | .25 |
| Filing documents, "Placer-mining Act" | 1.00 |
| Recording certificate of work, placer-mining lease | 2.50 |
| For Crown grant of mineral rights under "Mineral Act" | 25.00 |
| For Crown grant of surface rights of mineral claim under "Mineral Act" | 10.00 |
| For every lease under "Placer-mining Act" | 5.00 |

### Provisional Free Miners' Certificates (Placer) Act.

This Act provides for the issuance of "provisional free miners' certificates" for the locating, recording, representing, and working of placer claims of a size, and according to the terms, and in the manner set out in Parts II. and III. of the "Placer-mining Act." Any person over 18 years of age who has resided in the Province continuously for a period of not less than six months prior to date of his application may, on application accompanied by a statutory declaration or other satisfactory evidence as to his age and period of residence in the Province, obtain from any Gold Commissioner or Mining Recorder a provisional free miner's certificate. No fees are payable in respect of such certificate, and it abolishes the fees payable in respect of the recording or rerecording of placer claims, but no record or rerecord of a claim shall be granted for a longer period than one year without the payment of fees. It should be pointed out that the provisional free miner's certificate does not carry the privileges of an ordinary free miner's certificate as to the staking and working of placer-mining leases or mineral claims.

The Act also gives the Lieutenant-Governor in Council, as a means of unemployment relief, power to make provision for the establishment, equipment, maintenance, and operation of one or more placer training camps at suitable locations, at which unemployed persons who hold provisional free miners' certificates and are British subjects may acquire knowledge and training in the art of placer-mining and may be afforded gainful work in the recovery of minerals by placer-mining. Reserves for the location of such camps shall not exceed one mile in length by one-half mile in width, and the right is given to enter into agreements with private holders under the Act for the development of their ground by means of unemployment relief camps.

## Department of Mines Act.

The "Department of Mines Act" empowers the Minister of Mines to organize the Department or to reorganize it from time to time to meet changing conditions in the mining industry. It provides for examination and certification of assayers; for the conducting of short courses of lectures in practical geology and mineralogy; and for the purchase of ore from the Provincial sampling plants. The said Act also provides for the expenditure of public moneys for the construction, reconstruction, or repair of trails, roads, and bridges to facilitate the exploration of the mineral resources of any mining district, or in the operation and development of any mining property.

## Iron and Steel Bounties Act.

The Lieutenant-Governor in Council may enter into an agreement with any person whereby the Crown will pay to that person, out of the Consolidated Revenue Fund, bounties on pig-iron and steel shapes when manufactured within the Province, as follows:—

(*a.*) In respect of pig-iron manufactured from ore, on the proportion produced from ore mined in the Province, a bounty not to exceed three dollars per ton of two thousand pounds:

(*b.*) In respect of pig-iron manufactured from ore, on the proportion produced from ore mined outside the Province, a bounty not to exceed one dollar and fifty cents per ton of two thousand pounds:

(*c.*) In respect of steel shapes of commercial utility manufactured in the Province, a bounty not to exceed one dollar per ton of two thousand pounds.

Bounty, as on pig-iron under this Act, may be paid upon the molten iron from ore which in the electric furnace, Bessemer or other furnace, enters into the manufacture of steel by the process employed in such furnace; the weight of such iron to be ascertained from the weight of the steel so manufactured.

Bounty on steel shapes under this Act shall be paid only upon such steel shapes as are manufactured in a rolling-mill having a rated productive capacity per annum of at least twenty thousand tons of two thousand pounds per ton. The total amount of bounties paid under clauses (*a*) and (*b*) is limited to $200,000 in any one year or $2,000,000 in the aggregate; and the total amount of bounties paid under clause (*c*) is limited to $20,000 in any one year or $200,000 in the aggregate.

## Metalliferous Mines Regulation Act.

This Act is designed to provide for the safe working of mines by practical regulations which govern the main phases of mining, such as hoisting installations, ropes, shaft and cage equipment, mine examination, transportation systems, electrical installations, use of explosives, approaching abandoned workings, and the connection of adjacent mines.

Shaft-hoists are required to be equipped with overwind devices and approved braking systems, and all hoistmen in charge must have an annual medical examination and certificate testifying their fitness to perform this work. Hoisting-ropes where men are hoisted must have a static factor of safety of at least 10 for depths of 1,000 feet, with an allowable decrease of one for each 500 feet additional depth with a minimum factor of safety of 6. The working-life of a hoisting-rope when men are hoisted or lowered is limited to two years.

Cages must be provided with safety-catches, properly designed covers, and safety-gates where men are hoisted. Safety-catches must be tested at stated intervals.

The manager of the mine or some qualified person appointed by him must make a daily examination of all places in the mine where persons are at work and report the conditions found in regard to safety in a book kept at the mine for that purpose.

All persons handling or using explosives must hold a certificate of competency for blasting. This certificate is issued by the district Inspector of Mines to miners

who show by an oral examination that they are qualified to use explosives safely. This certificate may be cancelled for cause.

Where the workings of any mine are approaching any abandoned workings, whether belonging to that mine or to an adjacent mine, the manager of the present workings shall report the circumstance to the Inspector of Mines if the abandoned workings cannot be examined before the live workings are closer than 300 feet to the abandoned workings, and no work shall be done within this distance until a definite method of approach has been submitted to and approved by the Inspector.

Where it is considered necessary, the Minister of Mines may order a connection to be made and maintained between adjacent mines, and determine the conditions under which such a connection must be maintained.

All electrical installations must comply with the requirements of the "Electrical Energy Inspection Act" of British Columbia.

In addition to the Act and General Rules applicable to all mines, each mine which employs fifty or more men must have a code of Special Rules covering the details of operation at that mine. These Special Rules are drafted by the mining company and its employees and, when approved by the Minister of Mines, have the full force of law.

The Inspectors of Mines in the different districts have discretionary authority on a number of points that may arise in the course of mining operations.

## Coal-mines Regulation Act.

This Act, like the "Metalliferous Mines Regulation Act," is designed to provide for the safe working of mines by practical regulations. It is, however, broader in scope than the "Metalliferous Mines Regulation Act" in that it provides for the examination and licensing of coal-mine officials and miners.

## Explosives.

Under the provisions of Dominion Order in Council No. 2903, issued July 4th, 1940, no person or company may own or purchase explosives, except under a special permit prescribed and issued under this order. Each purchase of explosives requires a separate permit, except in the case of mining and quarrying operations, in which cases the Provincial Inspector of Mines has authority to issue the explosives purchase permit for one calendar year.

Only the owner of an explosives factory or a licensed magazine may sell explosives, but an exemption is made in the case of any mining company to the extent that such a company may be permitted, on applying for the necessary authority, to resell small quantities of explosives to properly qualified prospectors in their district.

## SUMMARY OF ACTS SPECIALLY RELATING TO MINING.

*(The complete Acts may be obtained from the King's Printer, Victoria, B.C.)*

### Mining Licences under the Coal and Petroleum Act.

Any person desiring to prospect for coal, petroleum, or natural gas upon any unsurveyed unreserved lands in which these resources are held by the Crown may acquire a licence to do so over a rectangular block of land not exceeding 640 acres, of which the boundaries shall run due north and south and east and west, and no side shall exceed 80 chains (1 mile) in length. Before entering into possession of the said lands he shall place at the corner of such block a legal stake, or initial post, and shall inscribe thereon his name and the angle represented by such post, thus: "A. B.'s N.E. corner," or as the case may be, and shall post in a conspicuous place upon the said land, and also in the Government office of the land recording district, notice of his intention to apply, as well as publishing the same in the B.C. Gazette and local newspaper once each week for four consecutive weeks. If the area applied for is surveyed no staking is required, but the same procedure with regard to advertising notice of intention to apply is necessary.

The application for said licence shall be in writing, in duplicate, and shall contain the best written description possible, with a diagram of the land sought to be acquired, and shall be accompanied with a fee of $100. The application shall be made to the Commissioner of Lands for the district, within sixty days from date of first publication in B.C. Gazette, and by him forwarded to the Minister of Lands, who will grant such licence—provided no reasons arise to the contrary—for a period not to exceed one year, and at the expiration of the first year an extension of such licence may be granted for a second or third year at a fee of $100.

Where coal is discovered during the existence of licence or within thirty days after expiration, the land held under licence, having been surveyed and licence conditions fulfilled, may be leased for five years at rental of 15 cents an acre, subject to renewals for five successive periods of three years each, renewal fee being $100 for each lease, in addition to annual rental.

Lessees, on showing continuous work has been done and reasonable expenditure made for development, may, after carrying out the provisions of the lease, purchase at $20 per acre where surface is available, or $15 per acre for under-surface rights where surface is not available. Lands under the sea may be purchased at $15 per acre. Provided also that, in addition to the rental or purchase price, there shall be paid to the Government as a royalty 2½ cents a barrel (35 imperial gallons) of crude petroleum raised or gotten from such land. (*See* chapter 175, R.S.B.C. 1936.)

### Taxation Act.

(Reverted Crown-granted Mineral Claims.)

A preliminary note is essential to the understanding of this Act. As the law has stood, a Crown-granted mineral claim on which taxes were in arrears for a number of years was offered for sale by the Government at a *tax* sale, with arrears of taxes plus interest and charges and Crown-grant fees as an upset price. If no sale was made the property remained in the hands of the Assessor until desired by some one, when it could only be purchased by tender. It was not open to location under the "Mineral Act" and a prospector had no protection, and to relieve the situation an amending Act was passed.

Under the amended Act such reverted Crown-granted mineral claim may be obtained by any person under a lease for one year upon payment of $25, and a renewal of such lease may be granted upon payment of further $25 for a further period of one year, but no longer. During the period of such lease the lessee has the right to enter, prospect, and mine on such mineral claim, save for coal, petroleum, and natural gas, and during such time the lessee has the option to purchase such Crown-granted mineral claim upon payment of all taxes, costs, and interest which remained due and unpaid on such claim on the date of its forfeiture to the Crown, together with an amount equal

to all taxes and interest which, except for its forfeiture to the Crown, would have been payable in respect thereof from the date of the lease to the date of application for a Crown grant. If, however, the lessee establishes to the satisfaction of the Gold Commissioner that he has expended upon the claim in mining-development work a sum of not less than $200 a year during the continuance of the lease, then the payment of the sum in respect of taxes and penalties from the date of the lease to the date of application for a Crown grant shall not be required. There is also payable a Crown-grant fee of $25. Provision also is made for the grouping of adjoining claims, not exceeding eight in number, and the performing on one of such claims mining-development work for all of the claims.

A person may obtain a lease, or interest in a lease, of eight such claims in the same mining division.

Such leases are not transferable and are subject to the rights any person may already hold to any portion of the surface of such Crown-granted mineral claim.

### Taxation of Mines.

Crown-granted mineral claims are subject to a tax of 25 cents per acre. The tax becomes due on April 1st in each year, and if unpaid on the following June 30th is deemed to be delinquent.

All mines, other than coal, are subject to an output tax (payable quarterly) of 2 per cent. on gross value of mineral, less cost of transportation from mine to reduction-works and the cost of treating same at reduction-works or on the mining premises.

Any such mine, not realizing on ore shipments a market value of $5,000 in any one year, is entitled to a refund of the output tax paid.

Coal is subject to a tax of 10 cents per ton of 2,240 lb., except coal shipped to coke-ovens within the Province. Tax payable monthly.

Coke is subject to a tax of 10 cents per ton of 2,240 lb., except in respect of coke produced from coal upon which this tax has already been paid. Tax payable monthly.

Coal land from which coal is being mined (Class A) is taxed at 1 per cent. upon the assessed value, in addition to any other tax.

Unworked coal land, known as "Coal Land, Class B," is subject to a tax of 2 per cent. upon the assessed value.

For further particulars *see* the "Taxation Act," also the "Public Schools Act," which are obtainable from the King's Printer, Victoria, B.C.

The Federal Government now collects the income tax for all Provincial Governments.

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## CHEMICAL LABORATORY.

BY

G. CAVE-BROWNE-CAVE.

During the year 1941 the staff of the Department of Mines Chemical Laboratory performed 4,023 assays for precious and base metals in ores. Of these, 2,742 were for *bona-fide* prospectors and for departmental engineers, and 1,281 were for the Department's sampling plant at Prince Rupert. A sharp increase in the number of assays for strategic metals was noted.

Proximate analyses and B.T.U. determinations were made on 111 coal samples. Of these, eighty-two were for the Department and twenty-nine were for the Department of Public Works.

As part of the free service offered to *bona-fide* prospectors, 202 mineral specimens were examined, qualitative tests made and the minerals identified.

During the year 1941, 580.038 oz. of placer gold were received from the Gold Commissioners, who are purchasing amounts up to 2 oz. to aid the prospectors in disposing of their placer gold.

For the Attorney-General's Department twenty-four examinations of a chemico-legal nature were undertaken. Eight of these were toxicological analyses. The rest were of a widely varied nature, involving the examination of such samples as particles of glass, paint chips, textile fibres, beer, rectified spirits, and rubbing-alcohol.

Analyses of eight water samples for mineral contents, three soils, and three samples of rectified spirits for ethyl alcohol completed the analytical work by the staff.

No fees were charged for work done for other Government Departments, but had such fees been charged they would have amounted to the following:—

| | |
|---|---|
| Attorney-General's Department | $519.00 |
| Department of Public Works | 298.00 |
| Department of Agriculture | 24.00 |
| Liquor Control Board | 9.00 |
| Miscellaneous | 25.00 |
| | $875.00 |

Provincial Government examinations for certificates of competency and licence to practise assaying in British Columbia, were held in May and December. Four candidates sat for the examinations, of whom three were granted licences to practise assaying in this Province.

During the summer of 1941 the interior of the Laboratory was thoroughly redesigned and modernized. These alterations resulted in a sharp increase in the efficiency and speed with which the staff could work. But the most notable step taken in this modernization plan was the installation in December of an excellent and modern grating spectrograph, and all the spectrographic accessories necessary for the performance of precise and accurate spectro-chemical analyses. The first major research project to be undertaken with this equipment is a Province-wide survey of thousands of ore samples in the hope of discovering hitherto unreported strategic metals.

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## DEPARTMENT OF MINES SAMPLING PLANT, PRINCE RUPERT, B.C.

BY

JOSEPH T. MANDY.

The function, objective, and operation of the sampling plant at Prince Rupert are described in the Annual Report of the Minister of Mines for the years 1938 and 1939.

During 1941 the activity of the plant was well sustained and many prospectors, lessees, and small operators developing properties over a wide field, extending to the west coast of Vancouver Island, took advantage of its utility throughout the year.

During the year $13,583.93 was paid by the plant to shippers.

The details of these shipments can be analysed by scrutiny of the following tabulations.

It is of interest to note that since the inception of this service in August, 1937, and up to December 31st, 1941, the sampling plant has handled a total of 670 shipments for which $45,791.47 has been paid to shippers. During the same period thirty-six shipments have been made by the plant to the smelters, for which $45,817.15 has been received. This sums up to the remarkably small difference of only $25.68, or 0.056 per cent. between the value of the purchase of the ore by the plant and the value of its sale to the smelters.

The following is a synopsis of the operating details of the plant for the year 1941 from January 1st to December 31st:—

| Class of Shipments. | No. of Shipments. | No. of Different Properties. | Weight of Shipments. |
|---|---|---|---|
| | | | Dry Tons. |
| Tonnage lots | 25 | 14 | 100.2770 |
| Bulk test lots | 81 | 36 | 19.0208 |
| Assay lots | 21 | 10 | 0.0266 |
| Totals | 127 | 47 | 119.3244 |

## SHIPMENTS FROM SAMPLING PLANT TO SMELTERS.

| | |
|---|---|
| Number of shipments to smelters (Lots 26–36 OSP/PR) | 11 |
| Dry tons paid for by smelters | 139.84* |
| Paid out by plant on Ore Purchasing Account | $13,583.93 |
| Received from smelters | $13,737.32 |

* Difference between this figure and the total weight of shipments received during the year (119.3244 dry tons) is accounted for by carry-over at the end of 1940 and end of 1941.

The details of the tonnage, bulk test lots, and assay lots, with relative assay and analysis results, follow.

## SAMPLING PLANT.

### *Tonnage Lots.*

| Lot No. | Property. | Shipper. | Locality. | Dry Tons. | Au | Ag | Cu | Pb | Zn | As | Sb | Fe | S | $SiO_2$ | Others. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Oz. per Ton. | Oz. per Ton. | Per Cent. | Per Cent. | Per Cent. | Per Cent. | Per Cent. | Per Cent. | Per Cent. | Per Cent. | Per Cent. |
| 495 | Black Bull | Hagen, W. | Copper River | 1.9515 | 1.84 | 3.30 | 0.10 | ..... | ..... | ..... | ..... | 19.30 | 16.80 | 56.80 | |
| 529 | Black Bull | Hagen, W. | Copper River | 5.9595 | 1.46 | 2.60 | 0.10 | ..... | ..... | ..... | ..... | 15.00 | 13.00 | 67.10 | |
| 556 | Black Bull | Hagen, W. | Copper River | 0.4050 | 1.55 | 3.10 | ..... | ..... | ..... | ..... | ..... | 15.70 | 15.10 | 64.80 | |
| 600 | Black Bull | Hagen, W. | Copper River | 0.7305 | 3.70 | 6.72 | 0.40 | ..... | ..... | 0.10 | ..... | 31.10 | 31.40 | 36.40 | |
| 514, 524 | Dunwell | Rochfort & Bugnello | Stewart | 9.4065 | 0.88 | 16.42 | 0.23 | 2.30 | 6.70 | 1.60 | ..... | ..... | ..... | ..... | |
| 610 | Esperanza Mines, Ltd. | Tyler, H. | Alice Arm | 2.3055 | 0.37 | 132.68 | 0.40 | 2.50 | 5.90 | 0.30 | 0.70 | 5.30 | 4.80 | 62.70 | |
| 611 | Esperanza Mines, Ltd. | Tyler, H. | Alice Arm | 0.7595 | 0.10 | 61.00 | 0.20 | *Nil* | 0.80 | 0.40 | 1.00 | 6.60 | 5.60 | 50.90 | |
| 612 | Esperanza Mines, Ltd. | Tyler, H. | Alice Arm | 0.4630 | 0.385 | 187.00 | 0.20 | *Nil* | 2.00 | 1.50 | 1.60 | 16.20 | 15.90 | 35.00 | |
| 618 | Esperanza Mines, Ltd. | Tyler, H. | Alice Arm | 2.8385 | 0.15 | 176.00 | 0.40 | 2.30 | 3.00 | 0.40 | 0.50 | 5.30 | 7.20 | 73.10 | |
| 553 | Glacier Gulch | Banta, W. | Smithers | 0.2210 | 4.01 | 1.00 | ..... | ..... | ..... | ..... | ..... | 3.60 | 0.50 | 53.30 | Bi, 3.70 |
| 554 | Gold Bar | Erickson, A. | Terrace | 1.9425 | 3.05 | 3.30 | 0.60 | ..... | ..... | 0.05 | 0.50 | 5.10 | 2.60 | 86.80 | |
| 499 | Golden Eagle | Heenan, D., and Kylling, L. | Topley | 0.8865 | 0.14 | 179.00 | 0.80 | 18.10 | 13.80 | ..... | ..... | 8.30 | 14.60 | 35.80 | |
| 500 | Hazelton View | Lee, Jack T. | Hazelton | 7.2665 | 2.02 | 0.20 | *Nil* | *Nil* | 0.60 | 6.10 | *Nil* | 11.40 | 0.50 | 52.50 | Co, 1.40 |
| 582 | Hazelton View | Barker, A. S. | Hazelton | 3.4065 | 3.92 | 0.30 | *Nil* | *Nil* | 4.40 | 33.30 | 0.20 | 22.60 | 3.80 | 19.90 | |
| 575 | Mamie | Herman, J. J. | Smithers | 14.3740 | 0.97 | 4.10 | 0.90 | *Nil* | 11.20 | 16.60 | *Nil* | 20.30 | 19.20 | 21.70 | |
| 506 | Nicholson Creek Mining Co. | Adams, W. R. | Usk | 0.4925 | *Nil* | *Nil* | *Nil* | *Nil* | *Nil* | *Nil* | *Nil* | ..... | ..... | ..... | |
| 526, 543 | Oral M. | Haahti, J. | Stewart | 8.3125 | 0.82 | 4.78 | 11.84 | ..... | 0.40 | 0.73 | Trace | ..... | ..... | ..... | |
| 525 | Rainier group | Love, E. | Stewart | 1.3090 | 0.07 | 92.10 | 0.10 | 6.10 | 3.30 | 0.10 | Trace | 7.50 | 4.80 | 43.00 | |
| 528 | Red Cliffe mine | Rennie, J. | Stewart | 10.9320 | 0.26 | 2.20 | 9.30 | *Nil* | 0.10 | 0.50 | *Nil* | 26.90 | 24.30 | 32.20 | |
| 571 | Red Cliffe mine | Rennie, J. | Stewart | 21.3420 | 1.914 | 1.44 | 1.50 | 1.80 | 5.30 | 0.04 | 0.10 | 24.10 | 26.20 | 30.30 | |
| 574 | Tide Lake Gold mines | Bank of Montreal | Stewart | 1.9140 | 56.42 | 97.68 | 0.09 | ..... | 23.30 | 0.57 | ..... | 3.80 | ..... | 25.40 | |
| 590 | Tide Lake Gold mines | Bank of Montreal | Stewart | 1.4315 | 49.85 | 97.05 | 0.10 | ..... | 22.09 | ..... | ..... | ..... | ..... | ..... | |
| 544 | Tillicum claim | Goodspeed, J. A. | Port Hardy | 1.6270 | 1.94 | 4.30 | 0.30 | 5.00 | 5.20 | Trace | 0.10 | 26.20 | 18.50 | 39.50 | |

### *Test Lots.*

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 603-T | Belvedere group | Stiglbauer, H. | Tofino | 0.0490 | 0.78 | 2.94 | 0.20 | *Nil* | *Nil* | *Nil* | *Nil* | 6.40 | 0.80 | 73.20 | Te, 0.01 |
| 547-T | B.C. Dot No. 1 | Clore, A. | Copper River | 0.0472 | 1.90 | 14.70 | ..... | ..... | ..... | ..... | ..... | 15.80 | 13.40 | 66.40 | |
| 515-T | Black Bull | Hagen, W. | Kleanza Mountain | 0.0547 | 11.78 | 8.50 | 0.20 | ..... | ..... | ..... | ..... | 15.80 | 15.30 | 65.10 | |
| 581-T | Black Bull | Hagen, W. | Kleanza Mountain | 0.0659 | 3.48 | 6.10 | 0.20 | ..... | ..... | ..... | ..... | 40.60 | 41.80 | 15.80 | |
| 566-T | Black Sand Cons. | Halden, A. J. | Queen Charlotte Islands | 0.0007 | Total Au, 0.032 oz.; total Pt, 0.513 oz.; total insol., 0.018 oz. | | | | | | | | | ..... | |
| 601-T | Black Sand Cons. | Erickson, A. | Terrace | 0.0461 | *Nil* | *Nil* | ..... | ..... | ..... | ..... | ..... | 63.40 | ..... | 12.40 | Pt, *nil*; $WO_3$, *nil* |

## SAMPLING PLANT—*Continued.*

### *Test Lots*—Continued.

| Lot No. | Property. | Shipper. | Locality. | Dry Tons. | Au | Ag | Cu | Pb | Zn | As | Sb | Fe | S | $SiO_2$ | Others. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Oz. per Ton. | Oz. per Ton. | Per Cent. | Per Cent. | Per Cent. | Per Cent. | Per Cent. | Per Cent. | Per Cent. | Per Cent. | Per Cent. |
| 541-T | Blue Jacket | Nicholson, M. B. | Masset | 0.0078 | 0.33 | 0.04 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | Pt, 0.02 |
| 542-T | Blue Jacket | Nicholson, M. B. | Masset | 0.0023 | 0.29 | 0.03 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | Pt, 0.025 |
| 568-T | Boulder claim | Jones, J. H. | Porcher Island | 0.7950 | 2.02 | 1.80 | Trace | ..... | ..... | ..... | ..... | 16.10 | 6.60 | 72.10 | |
| 580-T | British Lion mines | Smith, A. H. | Alice Arm | 0.0075 | 0.36 | 1.40 | 1.70 | 0.20 | 0.70 | *Nil* | *Nil* | 18.70 | 14.70 | 48.10 | |
| 507-T | Broken Wing group | Gibson, E. S. | Haney | 0.1194 | 0.40 | 1.20 | Trace | *Nil* | *Nil* | *Nil* | *Nil* | 10.60 | 9.20 | 69.20 | |
| 508-T | Broken Wing group | Gibson, E. S. | Haney | 0.1189 | 1.24 | 3.80 | 0.40 | *Nil* | *Nil* | *Nil* | *Nil* | 7.00 | 2.80 | 87.10 | |
| 561-T | Canadian Girl | Stephens, M. M. | Pitt Island | 0.4855 | 0.48 | 0.40 | *Nil* | ..... | ..... | ..... | ..... | 7.20 | 6.00 | 72.40 | |
| 562-T | Canadian Girl | Stephens, M. M. | Pitt Island | 0.0189 | 0.62 | 0.40 | *Nil* | ..... | ..... | ..... | ..... | 6.60 | 4.50 | 81.20 | |
| 563-T | Canadian Girl | Stephens, M. M. | Pitt Island | 0.0114 | 0.81 | 0.50 | *Nil* | ..... | ..... | ..... | ..... | 9.60 | 8.90 | 75.70 | |
| 564-T | Canadian Girl | Stephens, M. M. | Pitt Island | 0.0030 | 0.88 | 0.40 | *Nil* | ..... | ..... | ..... | ..... | 23.10 | 20.50 | 38.40 | |
| 565-T | Canadian Girl | Stephens, M. M. | Pitt Island | 0.0070 | 0.02 | 0.15 | *Nil* | ..... | ..... | ..... | ..... | 1.80 | 0.20 | 96.90 | |
| 551-T | Dundee group | Duncan, W. S. | Telkwa | 0.1258 | Trace | 1.40 | 4.90 | *Nil* | *Nil* | *Nil* | *Nil* | 12.10 | 4.70 | 60.80 | |
| 552-T | Dundee group | Duncan, W. S. | Telkwa | 0.0219 | Trace | 0.30 | 4.60 | *Nil* | *Nil* | *Nil* | *Nil* | 9.40 | 1.10 | 56.70 | |
| 501-T | Duthie mine | McEwen, J. L. | Smithers | 0.1109 | 0.14 | 73.60 | 0.20 | 40.50 | 8.50 | 2.20 | 0.30 | 10.20 | 16.90 | 13.20 | |
| 502-T | Duthie mine | McEwen, J. L. | Smithers | 0.1169 | 0.35 | 43.00 | 0.30 | 28.50 | 7.10 | 4.10 | 0.20 | 15.80 | 20.20 | 15.70 | |
| 613-T | Eclipse group | Thomson, A. B. | Kyuquot Sound | 0.1075 | 4.145 | 0.20 | *Nil* | 0.60 | *Nil* | *Nil* | *Nil* | 17.80 | 5.00 | 40.40 | Te, 0.03 |
| 617-T | Esperanza mines | Tyler, H. | Alice Arm | 0.0013 | 0.08 | 441.10 | 0.80 | 5.90 | 4.10 | 0.30 | 1.30 | ..... | ..... | 66.00 | W, *nil* |
| 615-T | Free Gold M.C. | Kwoczek, A. L. | Clayoquot Sound | 0.4880 | 6.84 | 2.00 | 0.20 | *Nil* | 0.80 | ..... | ..... | 7.70 | 0.80 | 88.80 | Te, *nil* |
| 557-T | Glacier Gulch | Banta, W. | Smithers | 0.1840 | 4.38 | 2.20 | ..... | ..... | ..... | ..... | ..... | 4.30 | 0.50 | 52.60 | |
| 558-T | Glacier Gulch | Banta, W. | Smithers | 0.0616 | 5.87 | 3.40 | ..... | ..... | ..... | ..... | ..... | 5.20 | 0.60 | 50.50 | |
| 616-T | Globe claim | Kenney, E. T. | Terrace | 0.0220 | 1.84 | 0.80 | 0.50 | ..... | ..... | ..... | ..... | 16.40 | 10.20 | 59.50 | Te, 0.02 |
| 602-T | Gold Bar | Erickson, A. | Kitsumgallum Lake | 1.5455 | 2.54 | 6.59 | 0.80 | ..... | ..... | *Nil* | 0.40 | 5.90 | 4.10 | 85.90 | |
| 559-T | Golden Eagle | Heenan, D. | Topley | 0.3255 | 0.13 | 171.20 | 1.30 | 13.70 | 11.50 | Trace | 0.50 | 6.50 | 12.70 | 45.60 | |
| 588-T | Golden Eagle | Conlon & Williams | Topley | 0.1630 | 0.07 | 138.00 | 0.40 | 13.30 | 7.30 | 0.10 | 0.60 | 7.10 | 9.20 | 45.60 | |
| 589-T | Golden Eagle | Conlon & Williams | Topley | 0.7460 | 0.08 | 150.40 | 0.40 | 13.40 | 6.10 | 0.10 | 0.60 | 6.90 | 9.60 | 54.00 | |
| 619-T | Golden Eagle | Williams, R. | Topley | 0.9680 | 0.10 | 180.90 | 0.90 | 16.20 | 10.10 | 0.10 | 0.80 | 6.70 | 12.00 | 46.60 | |
| 620-T | Golden Eagle | Williams, R. | Topley | 0.6985 | 0.09 | 86.70 | 0.70 | 3.80 | 12.90 | 0.10 | 0.30 | 7.10 | 10.90 | 52.20 | |
| 591-T | Gold Leaf | Flynn, J. | Anyox | 0.0010 | 0.49 | 4.70 | *Nil* | 0.70 | 0.50 | 0.06 | ..... | ..... | ..... | 88.70 | |
| 592-T | Gold Leaf | Flynn, J. | Anyox | 0.0232 | 0.02 | 0.80 | *Nil* | *Nil* | 0.30 | Trace | ..... | ..... | ..... | 80.20 | |
| 516-T | Hunter Basin | Conwest Exploration Co. (per F. C. Tomlinson) | Telkwa | 0.0704 | 0.22 | 11.80 | 9.70 | ..... | ..... | 0.20 | *Nil* | 15.00 | 6.40 | 32.70 | |
| 517-T | Hunter Basin | Conwest Exploration Co. (per F. C. Tomlinson) | Telkwa | 0.0547 | 1.78 | 22.90 | 13.90 | ..... | ..... | Trace | *Nil* | 14.00 | 5.90 | 33.20 | |
| 518-T | Hunter Basin | Conwest Exploration Co. (per F. C. Tomlinson) | Telkwa | 0.0281 | 0.45 | 3.50 | 5.60 | ..... | ..... | ..... | ..... | 22.00 | 5.30 | 43.10 | |
| 519-T | Hunter Basin | Conwest Exploration Co. (per F. C. Tomlinson) | Telkwa | 0.0079 | 0.72 | 23.00 | 19.20 | ..... | ..... | ..... | ..... | 19.00 | 16.10 | 24.80 | |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 503-T | I.X.L. group | Brodie, J. S. | Porcher Island | 0.6040 | 3.04 | 0.50 | 0.10 | ..... | ..... | ..... | ..... | 18.20 | 16.90 | 52.40 |
| 504-T | I.X.L. group | Brodie, J. S. | Porcher Island | 0.2452 | 1.50 | 1.10 | 0.20 | ..... | ..... | ..... | ..... | 9.60 | 7.10 | 75.80 |
| 505-T | I.X.L. group | Brodie, J. S. | Porcher Island | 0.0356 | 0.90 | 0.70 | 0.10 | ..... | ..... | ..... | ..... | 8.10 | 5.10 | 79.90 |
| 520-T | I.X.L. group | Brodie, J. S. | Porcher Island | 0.7295 | 1.04 | 0.90 | 0.25 | ..... | ..... | ..... | ..... | 6.00 | 2.70 | 83.70 |
| 521-T | I.X.L. group | Brodie, J. S. | Porcher Island | 0.5785 | 0.64 | 0.40 | 0.10 | ..... | ..... | ..... | ..... | 9.20 | 6.10 | 77.60 |
| 522-T | I.X.L. group | Brodie, J. S. | Porcher Island | 0.0881 | 0.40 | 0.30 | *Nil* | ..... | ..... | ..... | ..... | 6.40 | 4.20 | 86.30 |
| 530-T | I.X.L. group | Brodie, J. S. | Porcher Island | 0.0452 | 0.68 | 0.20 | 0.15 | ..... | ..... | ..... | ..... | 3.40 | 1.70 | 87.10 |
| 531-T | I.X.L. group | Brodie, J. S. | Porcher Island | 0.1975 | 0.52 | 0.40 | Trace | ..... | ..... | ..... | ..... | 6.00 | 3.30 | 83.30 |
| 532-T | I.X.L. group | Brodie, J. S. | Porcher Island | 0.1875 | 1.06 | 0.30 | Trace | ..... | ..... | ..... | ..... | 11.60 | 9.90 | 72.50 |
| 533-T | I.X.L. group | Brodie, J. S. | Porcher Island | 0.0473 | 0.12 | 0.20 | *Nil* | ..... | ..... | ..... | ..... | 4.20 | 1.70 | 90.60 |
| 534-T | I.X.L. group | Brodie, J. S. | Porcher Island | 0.0502 | 0.30 | 0.40 | Trace | ..... | ..... | ..... | ..... | 3.00 | 0.80 | 91.60 |
| 535-T | I.X.L. group | Brodie, J. S. | Porcher Island | 0.1530 | 0.56 | 0.60 | Trace | ..... | ..... | ..... | ..... | 6.10 | 3.30 | 87.50 |
| 536-T | I.X.L. group | Brodie, J. S. | Porcher Island | 0.8725 | 0.96 | 0.80 | 0.10 | ..... | ..... | ..... | ..... | 6.00 | 2.60 | 82.30 |
| 537-T | I.X.L. group | Brodie, J. S. | Porcher Island | 0.1480 | 0.74 | 0.40 | *Nil* | ..... | ..... | ..... | ..... | 9.60 | 6.30 | 77.20 |
| 538-T | I.X.L. group | Brodie, J. S. | Porcher Island | 0.1053 | 0.40 | 0.50 | *Nil* | ..... | ..... | ..... | ..... | 6.40 | 4.20 | 85.60 |
| 539-T | I.X.L. group | Brodie, J. S. | Porcher Island | 0.0485 | 0.16 | 0.20 | Trace | ..... | ..... | ..... | ..... | 6.60 | 0.80 | 63.00 |
| 540-T | I X.L. group | Brodie, J. S. | Porcher Island | 0.0397 | 1.94 | 0.90 | Trace | ..... | ..... | ..... | ..... | 24.10 | 11.70 | 49.50 |
| 545-T | I.X.L. group | Brodie, J. S. | Porcher Island | 0.3610 | 2.30 | 1.30 | Trace | ..... | ..... | ..... | ..... | 6.00 | 1.30 | 87.90 |
| 546-T | I.X.L. group | Brodie, J. S. | Porcher Island | 0.3265 | 0.42 | 0.60 | Trace | ..... | ..... | ..... | ..... | 8.00 | 4.40 | 81.70 |
| 527-T | I.X.L. group | Larson, Victor | Rossland | 0.01275 | 761.66 | 90.40 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 505-T | Jones group | Brodie, J. S. | Porcher Island | 0.0356 | 0.90 | 0.70 | 0.10 | ..... | ..... | ..... | ..... | 8.10 | 5.10 | 79.90 |
| 509-T | Last Chance | Watson, O. L. | South Hazelton | 0.2125 | 0.10 | 3.50 | 2.80 | *Nil* | 0.60 | 2.50 | *Nil* | 32.20 | 24.80 | 18.50 |
| 599-T | Lookout M.C. | Heap, M. O. | Tenas Creek, Osoyoos M.D. | 0.2975 | 1.36 | 0.64 | *Nil* | *Nil* | 1.10 | 0.10 | *Nil* | 4.90 | 4.00 | 88.30 |
| 548-T | Mamie group | Herman, J. J. | Smithers | 0.2706 | 1.02 | 4.10 | 1.10 | *Nil* | 13.40 | 16.40 | 0.40 | 21.30 | 20.60 | 18.80 |
| 549-T | Mamie group | Herman, J. J. | Smithers | 0.3000 | 1.34 | 5.90 | 1.50 | *Nil* | 21.10 | 11.20 | 0.30 | 19.50 | 23.40 | 14.00 |
| 550-T | Mamie group | Herman, J. J. | Smithers | 0.1622 | 0.62 | 8.50 | 2.40 | *Nil* | 19.40 | 10.50 | 0.20 | 18.30 | 22.00 | 18.90 |
| 579-T | Moose Horn Quartz Mine | Wade, J. A. | Quesnel | 1.0035 | Trace | 7.00 | Trace | 14.30 | 1.80 | 0.02 | 0.10 | 10.60 | 8.10 | 62.30 |
| 567-T | ? | Morris, W. | Tofino | 0.9655 | 8.88 | 2.49 | 0.63 | ..... | ..... | ..... | ..... | 2.70 | ..... | 83.60 |
| 576-T | Owen Lake mine | Can. Exploration Co., Ltd. | Houston | 0.0411 | 0.08 | 10.30 | 1.40 | Trace | 1.40 | 0.17 | 0.10 | 9.60 | 6.70 | 54.30 |
| 577-T | Owen Lake mine | Can. Exploration Co., Ltd. | Houston | 0.0401 | 0.20 | 93.00 | 7.80 | 0.60 | 1.50 | 0.30 | 0.30 | 13.40 | 11.30 | 47.60 |
| 578-T | Owen Lake mine | Can. Exploration Co., Ltd. | Houston | 0.0428 | 0.03 | 3.00 | 0.10 | 1.10 | 8.60 | 0.02 | *Nil* | 13.70 | 8.00 | 11.60 |
| 598-T | Red Bird | Halden, P. | Porcher Island | 1.2420 | 0.22 | 0.10 | Trace | ..... | ..... | 0.02 | ..... | 9.50 | 4.00 | 62.60 |
| 604-T | Red Bird | Halden, P. | Porcher Island | 0.3860 | 0.38 | 0.62 | 0.30 | ..... | ..... | ..... | ..... | 5.00 | 5.40 | 88.30 |
| 523-T | Red Cliffe | Rennie, J. | Stewart | 0.2531 | 0.30 | 2.20 | 8.60 | *Nil* | 0.50 | 0.05 | *Nil* | 25.60 | 24.30 | 32.80 |
| 510-T | Red Top group | McLean, F. A. | Cedarvale | 0.0020 | 0.13 | 0.30 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 583-T | Red Top (Old Topley Richfield) | Innes, R. Warren | Topley | 0.3275 | 0.72 | 26.20 | 4.70 | 2.50 | 4.60 | 0.30 | 0.40 | 18.50 | 23.10 | 36.50 |
| 584-T | Red Top (Old Topley Richfield) | Innes, R. Warren | Topley | 0.0385 | 0.48 | 21.80 | 4.50 | 1.60 | 2.40 | 0.80 | 0.40 | 18.50 | 24.40 | 31.40 |
| 585-T | Red Top (Old Topley Richfield) | Innes, R. Warren | Topley | 0.0320 | 0.72 | 25.50 | 5.20 | 1.70 | 11.20 | 0.20 | 0.20 | 18.10 | 24.70 | 29.20 |
| 586-T | Red Top (Old Topley Richfield) | Innes, R. Warren | Topley | 0.0375 | 0.16 | 36.20 | 3.30 | 12.00 | 24.90 | 0.20 | 0.30 | 8.20 | 18.70 | 30.00 |

## SAMPLING PLANT—*Continued.*

### *Tonnage Lots*—Continued.

| Lot No. | Property. | Shipper. | Locality. | Dry Tons. | Au | Ag | Cu | Pb | Zn | As | Sb | Fe | S | $SiO_2$ | Others. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Oz. per Ton. | Oz. per Ton. | Per Cent. | Per Cent. | Per Cent. | Per Cent. | Per Cent. | Per Cent. | Per Cent. | Per Cent. | Per Cent. |
| 597-T | Silver Cup | Sam, Matthew | Topley | 0.2635 | 0.20 | 87.90 | 0.10 | *Nil* | *Nil* | 0.05 | Trace | 10.50 | 2.60 | 61.80 | |
| 555-T | ? | Tomlinson, T. R. | Cedarvale | 0.0095 | Trace | 83.22 | 0.20 | 35.70 | 16.50 | 0.40 | 0.40 | 8.40 | 16.90 | 3.80 | |
| 614-T | Yankee Boy | Morris, W. | Tofino | 0.4700 | 3.535 | 1.54 | 0.20 | *Nil* | *Nil* | *Nil* | *Nil* | 2.60 | 0.70 | 88.70 | Te, 0.03 |

### *Assay Lots.*

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 593-X | Esperanza Mines, Ltd. | James, R. P. | Alice Arm | 0.0013 | 0.12 | 76.30 | Trace | 0.90 | 1.00 | 0.40 | 0.20 | ..... | ..... | ..... | |
| 594-X | Esperanza Mines, Ltd. | James, R. P. | Alice Arm | 0.0013 | 0.04 | 11.80 | Trace | *Nil* | 0.20 | 0.30 | 0.10 | ..... | ..... | ..... | |
| 595-X | Esperanza Mines, Ltd. | James, R. P. | Alice Arm | 0.0013 | 0.58 | 349.80 | 0.10 | 2.40 | 1.50 | 1.20 | 0.70 | ..... | ..... | ..... | |
| 596-X | Esperanza Mines, Ltd. | James, R. P. | Alice Arm | 0.0013 | 0.60 | 372.50 | 0.30 | 5.50 | 6.80 | 0.45 | 0.80 | 11.30 | 8.00 | 61.80 | |
| 587-X | Gold Bar | Erickson, A. | Terrace | 0.0013 | 1.32 | 8.50 | 2.10 | ..... | ..... | 0.03 | ..... | ..... | ..... | 74.10 | Te, trace. |
| 607-X | Homestake M.C. | Smith, A. F. | Alice Arm | 0.0003 | 1.90 | 3.10 | 11.80 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | |
| 608-X | Homestake M.C. | Smith, A. F. | Alice Arm | 0.0002 | 0.94 | 3.30 | 13.40 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | |
| 609-X | Homestake M.C. | Smith, A. F. | Alice Arm | 0.0006 | 1.48 | 4.10 | 5.40 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | |
| 605-X | Indian M.C. | Gillett, J. | Nass River | 0.0015 | 0.06 | Trace | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | |
| 606-X | Indian M.C. | Gillett, J. | Nass River | 0.0015 | 0.02 | Trace | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | |
| 560-X | La Marr | Messner, B. F. | Smithers | 0.0005 | 0.04 | 0.60 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | Hg, *nil* |
| 498-X | McGuire M.C. | McGuire, J. | Bridge River | 0.0005 | 0.01 | 9.00 | 0.80 | ..... | ..... | 0.30 | 13.70 | ..... | ..... | 63.50 | |
| 496-X | Oral M (Stewart Canal Gold Mines, Ltd.) | Haahti, J. | Stewart | 0.0015 | 0.04 | 0.40 | 0.15 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | |
| 497-X | Oral M (Stewart Canal Gold Mines, Ltd.) | Haahti, J. | Stewart | 0.0015 | 0.10 | 2.20 | 0.70 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | |
| 511-X | Rainier group | Stewart, J. W. | Stewart | 0.0021 | 1.50 | 64.00 | 0.15 | 7.60 | 1.50 | 0.20 | 0.20 | 12.40 | 12.40 | 60.10 | |
| 512-X | Rainier group | Stewart, J. W. | Stewart | 0.0024 | 0.54 | 63.00 | 0.10 | 27.50 | 4.80 | Trace | 0.20 | 9.00 | 13.30 | 40.50 | |
| 513-X | Rainier group | Stewart, J. W. | Stewart | 0.0026 | 0.11 | 17.20 | 0.80 | 6.10 | 1.30 | *Nil* | *Nil* | 31.80 | 19.70 | 35.30 | |
| 569-X | Red Bird | Halden, A. J. | Porcher Island | 0.0005 | 1.46 | 1.50 | ..... | ..... | ..... | ..... | ..... | 26.60 | 24.80 | 36.00 | |
| 570-X | Red Bird | Halden, A. J. | Porcher Island | 0.0005 | 4.06 | 5.70 | ..... | ..... | ..... | ..... | ..... | 21.30 | 18.00 | 21.80 | |
| 572-X | Rex M.C. | Smith, G. W. | Houston | 0.0022 | 1.16 | 6.90 | 0.30 | 5.20 | 9.10 | 0.02 | 1.70 | 21.70 | 15.10 | 6.70 | |
| 573-X | Rex M.C. | Smith, G. W. | Houston | 0.0017 | 0.38 | 1.70 | 0.10 | 5.10 | 5.30 | 0.02 | 1.00 | 17.10 | 8.40 | 25.90 | |

# GOLD-MINE LEASING EXPERIMENT.

BY

R. J. MACONACHIE.

The Department conducted an experiment in the leasing of small gold properties with the object of (1) assisting owners of small idle mining properties, (2) if possible to improve such properties to make them attractive to capital, and (3) to actually produce gold and so create foreign exchange. In addition to the foregoing, actual mining costs on small operations would be obtained. This information is not ordinarily available and that obtained from the season's operations will prove particularly valuable as a guide to possible mining costs in the case of small war mineral operations that may be developed in the near future in this Province.

A working capital of $10,000 was provided; it being understood that not more than half of this amount could be used at the start for the purchase of equipment and supplies, and that any such expenditures would be chargeable against the operations.

Operations were to be confined to properties which had sufficient gold ore in sight to cover the cost of extraction. Should the operation show profit, then the profit could be used for development-work in search for other ore-bodies.

The scale of operation was intended to be slightly larger than that of the individual leaser and smaller than that undertaken ordinarily by mining companies.

The West Kootenay district, with Nelson as a centre, was selected as the most promising area in which to carry out the experiment.

The expenses of the writer, in charge of the experiment, were not to be charged against the operation.

During the course of the field season twenty-seven properties were examined with a view to operations and many others given consideration through data supplied by the owners and from engineers' reports. Of the properties examined three were sufficiently attractive to warrant attention. One of the properties, the *Arlington,* did not meet all the requirements of the scheme but the other two, the *California* and the *Chapleau,* met the requirements.

The *Arlington* operation met the requirements in that it appeared reasonably certain that some gold could be produced from the dumps, but failed to meet the requirements in that the property itself would not be improved.

The *Chapleau* was operated for a short time, when it was found that the ore mined was not covering expenses and that some expense would have to be made to test other possibilities, and this did not come within the scope of the experiment.

The *California* operation met all the requirements and the property was operated from June 1st to October 5th. This property was idle when taken up and when the lease was relinquished by the Department the owner was able to immediately lease it.

The accompanying table shows a breakdown of the costs of this operation. The expenses of the writer in supervising this operation are not included so that the results will more nearly approximate those of a small group of leasers. Two shifts of two men each, with generally a fifth man available for tramming, mucking, sharpening bits, and truck-driving, comprised the crew. The writer had several operators check this operation to see where costs could be reduced, and it was generally agreed that the operation was carried on without any undue expense. The pay-streak averaged 4 inches.

The cost per ton is astonishingly high in view of the generally accepted cost of extracting ore, even in small operations. This information should be of considerable value to those contemplating small mining operations on war minerals.

A mimeographed description of the *California* property and operation may be obtained upon application to the Department.

## CALIFORNIA OPERATION.

### MACHINE-MINING.

| | Costs for Actual Period of Operation, June 1st to October 5th. | | | | | | | | | | | Additional Costs prior to June 1st and after October 5th. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Wages. | Steel. (1) | Powder, Fuse, and Caps. | Miscellaneous Mining. (2) | Machinery Rental. (3) | Hardware. (4) | Taxation paid to B.C. Govt. | Truck Upkeep. (5) | Total Cost. | Net Smelter Returns. (6) | Profit or Loss. | Wages. | Machinery Rental. | Truck Upkeep. | Total Cost. | Profit or Loss. |
| Total costs | $2,621.41 | $141.36 | $506.68 | $372.60 | $835.25 | $21.59 | $104.77 | $110.92 | $4,714.58 | $4,795.70 | $81.12 | $240.39 | $57.25 | $25.34 | $5,037.56 | —$241.86 |
| Cost per ton (based on production of 75.7500 tons) | $34.61 | $1.87 | $6.69 | $4.92 | $11.03 | $0.28 | $1.38 | $1.46 | $62.24 | $63.31 | $1.07 | $3.17 | $0.76 | $0.33 | $66.50 | —$3.19 |

(1) Includes cost of new bits, steel, cost of upsetting and threading shanks.
(2) Includes lumber, kerosene, carbide, grinder-wheels, lubricating-oil, ore-sacks, gas and oil for compressor.
(3) Compressor and all underground machines, with necessary accessories, rented at $200 per month; owners responsible for first $25 repairs monthly.
(4) Includes nails, pipe-fittings, rope, etc.
(5) Includes gas and oil, tires, general repair involved in hauling ore and camp supplies, but does not include amortization, licences, insurance, etc.
(6) Gross smelter return, less treatment and royalty to owner of property.

## GOLD COMMISSIONERS AND MINING RECORDERS.

The following list shows the Gold Commissioners and Mining Recorders of the Province:—

| Mining Division. | Location of Office. | Gold Commissioner. | Mining Recorder. | Sub-recorder. |
|---|---|---|---|---|
| Atlin | Atlin | G. H. Hallett | G. H. Hallett | J. G. B. Egdell. |
| Sub-office | Telegraph Creek | | | R. W. Meldram. |
| Sub-office | Squaw Creek | | | Mrs. F. Muncaster. |
| Sub-office | Tulsequah | | | W. J. Nelson. |
| Stikine | Telegraph Creek | R. W. Meldram | R. W. Meldram | |
| Sub-office | Boundary via Telegraph Creek | | | J. V. Rees. |
| Sub-office | Burns Lake | | | John Brown. |
| Sub-office | McDame Creek | | | W. R. Henry. |
| Sub-office | Fort St. John | | | F. W. Beatton. |
| Sub-office | Dease Lake Townsite | | | T. A. Retallack. |
| Skeena | Prince Rupert | N. A. Watt | N. A. Watt | A. J. Lancaster. |
| Sub-office | Kitimat | | | Chas. E. Moore. |
| Sub-office | Copper River | | | L. G. Skinner. |
| Sub-office | Terrace | | | J. H. Meredith-Jones. |
| Sub-office | Stewart (Portland Canal) | | | A. Fisher. |
| Sub-office | Rosswood | | | Oscar Olander. |
| Sub-office | Kimsquit | | | Percy Gadsden. |
| Sub-office | Ocean Falls | | | Geo. H. Hill. |
| Sub-office | Bella Coola | | | W. P. Aylward. |
| Sub-office | Queen Charlotte | | | C. N. Ramsay. |
| Portland Canal | Stewart | N. A. Watt (at Prince Rupert) | A. Fisher | |
| Sub-office | Anyox | | | |
| Sub-office | Alice Arm | | | Mrs. L. Cummings. |
| Omineca | Smithers | H. B. Campbell | H. B. Campbell | |
| Sub-office | Bella Coola | | | W. P. Aylward. |
| Sub-office | Finlay Forks | | | A. MacKinnon. |
| Sub-office | Fort St. James | | | Norman Henry. |
| Sub-office | Manson Creek | | | W. B. Steele. |
| Sub-office | Telkwa | | | T. J. Thorp. |
| Sub-office | Prince George | | | Geo. Milburn. |
| Sub-office | Kimsquit | | | Percy Gadsden. |
| Sub-office | Fort St. John | | | F. W. Beatton. |
| Sub-office | Cedarvale | | | John Thompson. |
| Sub-office | Terrace | | | J. H. Meredith-Jones. |
| Sub-office | Fort Fraser | | | J. D. Moore. |
| Sub-office | Vanderhoof | | | Geo. Ogsdon. |
| Sub-office | Hazelton | | | L. I. Olson. |
| Sub-office | Burns Lake | | | John Brown. |
| Sub-office | Usk | | | Jas. L. Bethurem. |
| Sub-office | Takla Landing | | | Mrs. Wilhemina Aiken. |
| Sub-office | Dorreen | | | W. E. Horwill. |
| Sub-office | Copper River | | | L. G. Skinner. |
| Peace River | Fort St. John | H. B. Campbell (at Smithers) | F. W. Beatton | |
| Sub-office | Fort Nelson | | | |
| Sub-office | Prince George | | | G. Milburn. |
| Sub-office | Finlay Forks | | | A. MacKinnon. |
| Sub-office | Pouce Coupe | | | M. S. Morrell. |
| Cariboo | Barkerville | H. A. Bryant | H. A. Bryant | |
| Sub-office | Quesnel | | | E. C. Lunn. |
| Sub-office | Prince George | | | Geo. Milburn. |
| Sub-office | McBride | | | J. Blezard. |
| Sub-office | Fort McLeod | | | J. E. McIntyre. |
| Quesnel | Williams Lake | L. C. Maclure | L. C. Maclure | |
| Sub-office | Quesnel | | | E. C. Lunn. |
| Sub-office | Likely | | | A. Morrison. |
| Sub-office | Barkerville | | | H. A. Bryant. |
| Sub-office | Horsefly | | | A. B. Campbell. |
| Sub-office | Keithley Creek | | | A. H. Watkins. |

GOLD COMMISSIONERS AND MINING RECORDERS—*Continued.*

| Mining Division. | Location of Office. | Gold Commissioner. | Mining Recorder. | Sub-recorder. |
|---|---|---|---|---|
| Clinton | Clinton | R. J. A. Dorrell | R. J. A. Dorrell | |
| Sub-office | Williams Lake | | | L. C. Maclure. |
| Sub-office | Gold Bridge | | | H. E. Brennan. |
| Kamloops | Kamloops | P. H. McCurrach | P. H. McCurrach | |
| Sub-office | Chu Chua | | | George M. Fennell. |
| Sub-office | Vavenby | | | H. Finley. |
| Sub-office | Salmon Arm | | | A. P. Suckling. |
| Ashcroft | Ashcroft | P. H. McCurrach (at Kamloops) | W. F. Knowlton | |
| Sub-office | Lytton | | | J. Blakiston-Gray. |
| Nicola | Merritt | P. H. McCurrach (at Kamloops) | R. G. Couper | |
| Similkameen | Princeton | Chas. Nichols | Chas. Nichols | |
| Sub-office | Hedley | | | D. R. McWhirter. |
| Vernon | Vernon | R. M. McGusty | R. M. McGusty | F. H. C. Wilson. |
| Sub-office | Kelowna | | | C. W. Dickson. |
| Greenwood | Greenwood | L. A. Dodd | L. A. Dodd | |
| Sub-office | Kettle Valley | | | G. B. Gane. |
| Sub-office | Beaverdell | | | T. W. Clarke. |
| Sub-office | Oliver | | | W. H. Laird. |
| Sub-office | Grand Forks | | | E. Harrison. |
| Osoyoos | Penticton | W. R. Dewdney | W. R. Dewdney | |
| Sub-office | Keremeos | | | L. S. Coleman. |
| Sub-office | Hedley | | | D. R. McWhirter. |
| Sub-office | Oliver | | | W. H. Laird. |
| Golden | Golden | A. W. Anderson | A. W. Anderson | C. J. Dainard. |
| Windermere | Windermere | A. W. Anderson (at Golden) | A. M. Chisholm | |
| Fort Steele | Cranbrook | W. G. Taylor | W. G. Taylor | |
| Sub-office | Fernie | | | D. H. Bruce. |
| Ainsworth | Kaslo | Claude MacDonald | W. M. H. Dunn | |
| Sub-office | Trout Lake | | | |
| Sub-office | Poplar | | | A. Robb. |
| Slocan | New Denver | Claude MacDonald (at Kaslo) | Frank Broughton | |
| Sub-office | Slocan | | | W. E. Graham. |
| Nelson | Nelson | J. Cartmel | J. Cartmel | J. A. Stewart. |
| Sub-office | Creston | | | R. H. Hassard. |
| Sub-office | Ymir | | | S. Curwen. |
| Sub-office | Salmo | | | M. C. Donaldson. |
| Arrow Lake | Nakusp | J. Cartmel (at Nelson) | N. A. Herridge | |
| Revelstoke | Revelstoke | Wynfield Maxwell | W. Maxwell | |
| Lardeau | Beaton | Wynfield Maxwell (at Revelstoke) | C. A. McElroy | |
| Sub-office | Trout Lake | | | |
| Trail Creek | Rossland | E. L. Hedley | E. L. Hedley | |
| Nanaimo | Nanaimo | C. L. Monroe | C. L. Monroe | W. H. Cochrane. |
| Sub-office | Alert Bay | | | Jos. Howe. |
| Sub-office | Vananda | | | Henry Carter. |
| Sub-office | Shoal Bay, Thurlow P.O. | | | C. C. Thompson. |
| Sub-office | Granite Bay | | | H. J. Bull. |
| Sub-office | Cumberland | | | A. G. Freeze. |
| Sub-office | Zeballos | | | Geo. Nicholson. |
| Sub-office | Alberni | | | W. H. Boothroyd. |
| Alberni | Alberni | W. H. Boothroyd | W. H. Boothroyd | Russell Sneddon. |
| Clayoquot | Tofino | W. H. Boothroyd (at Alberni) | C. W. Sharp | |
| Sub-office | Zeballos | | | Geo. Nicholson. |
| Sub-office | Alberni | | | W. H. Boothroyd. |
| Sub-office | Nanaimo | | | C. L. Monroe. |
| Quatsino | Quatsino | W. H. Boothroyd (at Alberni) | Ed. Evenson | |
| Victoria | Victoria | R. J. Steenson | P. J. Mulcahy | |

## GOLD COMMISSIONERS AND MINING RECORDERS—*Continued.*

| Mining Division. | Location of Office. | Gold Commissioner. | Mining Recorder. | Sub-recorder. |
|---|---|---|---|---|
| New Westminster | New Westminster | A. P. Grant | A. B. Gray | |
| Sub-office | Chilliwack | | | C. N. Tingle. |
| Sub-office | Lytton | | | J. Blakiston-Gray. |
| Sub-office | Hope | | | L. G. Miller. |
| Vancouver | Vancouver | A. S. Tyrer | A. E. Wilson | |
| Sub-office | Alert Bay | | | Jos. Howe. |
| Sub-office | Powell River | | | J. P. Scarlett. |
| Sub-office | Shoal Bay, Thurlow P.O. | | | C. C. Thompson. |
| Lillooet | Lillooet | L. J. Price | L. J. Price | |
| Sub-office | Gold Bridge | | | H. E. Brennan. |

# GOLD COMMISSIONER'S AND MINING RECORDER'S OFFICE STATISTICS, 1941.

| Districts and Divisions. | Free Miners' Certificates. | | | Lode-mining. | | | | | Placer-mining. | | | | Revenue. | | Total. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Individual. | Company. | Special. | Mineral Claims recorded. | Certificates of Work. | Bills of Sale, etc. | Certificates of Improvement. | Leases of Reverted Crown-granted Mineral Claims. | Placer Claims recorded. | Placer Leases granted. | Certificates of Work, Placer Leases. | Bills of Sale, etc. | Free Miners' Certificates. | General. | Mining Division and Provincial. |
| Atlin | 259 | 5 | 4 | 43 | 70 | 38 | 2 | 3 | 43 | 40 | 162 | 77 | $1,616.50 | $9,487.00 | $11,103.50 |
| Portland Canal | 103 | 3 | ..... | 66 | 208 | 17 | 25 | ..... | ..... | ..... | ..... | ..... | 795.50 | 1,013.25 | 1,808.75 |
| Skeena | 112 | ..... | 1 | 61 | 145 | 5 | ..... | 20 | 2 | 1 | 12 | 1 | 515.25 | 1,456.35 | 1,971.60 |
| Stikine | 71 | 2 | 2 | 17 | 59 | 15 | 5 | ..... | ..... | 7 | 18 | 12 | 491.25 | 1,866.85 | 2,358.10 |
| Cariboo | 301 | 14 | 3 | 171 | 407 | 144 | 10 | 7 | 20 | 86 | 397 | 130 | 2,525.75 | 21,476.75 | 24,002.50 |
| Omineca | 361 | 5 | 1 | 366 | 803 | 66 | ..... | 10 | 11 | 21 | 138 | 17 | 2,116.00 | 9,191.80 | 11,307.80 |
| Peace River | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 1 | 4 | ..... | ..... | 50.00 | 50.00 |
| Quesnel | 329 | 2 | 2 | 104 | 142 | 24 | ..... | ..... | 16 | 17 | 122 | 19 | 1,231.50 | 6,816.25 | 8,047.75 |
| Kamloops | 179 | ..... | 1 | 52 | 134 | 25 | ..... | 1 | 14 | 7 | 4 | 2 | 792.25 | 1,167.25 | 1,959.50 |
| Nicola | 40 | 1 | ..... | 119 | 30 | 5 | 13 | ..... | ..... | ..... | ..... | ..... | 449.50 | 664.50 | 1,114.00 |
| Vernon | 111 | 1 | 3 | 41 | 41 | 6 | 2 | ..... | 8 | 19 | 25 | 15 | 565.75 | 1,834.00 | 2,399.75 |
| Greenwood | 137 | 1 | ..... | 66 | 157 | 9 | 4 | 9 | 2 | 1 | 4 | ..... | 737.25 | 1,296.25 | 2,033.50 |
| Osoyoos | 103 | ..... | 1 | 97 | 94 | 4 | ..... | ..... | ..... | ..... | ..... | ..... | 421.00 | 550.75 | 971.75 |
| Similkameen | 167 | 4 | 5 | 67 | 142 | 12 | ..... | ..... | 13 | 43 | 46 | 17 | 1,333.75 | 3,548.20 | 4,881.95 |
| Ainsworth | 81 | 3 | 1 | 64 | 134 | 3 | 6 | 4 | 1 | ..... | ..... | ..... | 638.75 | 838.00 | 1,476.75 |
| Arrow Lake | 10 | ..... | ..... | 12 | 4 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 42.75 | 58.00 | 100.75 |
| Fort Steele | 120 | 2 | 1 | 37 | 93 | 10 | 2 | ..... | 1 | ..... | 70 | 5 | 673.25 | 2,578.75 | 3,252.00 |
| Golden | 28 | 3 | 1 | 5 | 55 | 4 | ..... | 2 | ..... | ..... | 1 | ..... | 302.25 | 340.25 | 642.50 |
| Lardeau | 18 | ..... | ..... | 17 | 75 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 88.50 | 231.50 | 320.00 |
| Nelson | 265 | 9 | 4 | 108 | 343 | 14 | 9 | 1 | 25 | 1 | 10 | 3 | 2,287.75 | 2,358.50 | 4,646.25 |
| Revelstoke | 46 | ..... | ..... | 32 | 23 | 2 | 3 | 1 | 6 | 11 | 7 | 14 | 193.75 | 1,015.50 | 1,209.25 |
| Slocan | 45 | 1 | ..... | 14 | 98 | 3 | ..... | ..... | ..... | ..... | ..... | ..... | 321.50 | 287.50 | 609.00 |
| Trail Creek | 84 | 3 | 2 | 21 | 21 | 2 | ..... | 7 | 1 | ..... | ..... | ..... | 712.75 | 358.25 | 1,071.00 |
| Windermere | 24 | 1 | 1 | 16 | 30 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 177.00 | 115.50 | 292.50 |
| Alberni | 94 | 2 | 1 | 147 | 113 | 45 | ..... | ..... | ..... | 3 | ..... | 2 | 511.75 | 1,204.30 | 1,716.05 |
| Ashcroft | 48 | 1 | 1 | 104 | 80 | 9 | ..... | ..... | 1 | 3 | 8 | 7 | 252.75 | 1,197.20 | 1,449.95 |
| Clayoquot | 166 | 10 | 4 | 177 | 501 | 115 | 2 | 4 | ..... | ..... | 9 | ..... | 1,605.50 | 3,191.75 | 4,797.25 |
| Clinton | 49 | 1 | 1 | 42 | 53 | 24 | 2 | 3 | 5 | ..... | 18 | 1 | 324.75 | 1,400.00 | 1,724.75 |
| Lillooet | 262 | 10 | ..... | 705 | 492 | 81 | 2 | 1 | 10 | 3 | 16 | 2 | 1,991.00 | 5,007.35 | 6,998.35 |
| Nanaimo | 81 | 1 | 1 | 79 | 144 | 41 | ..... | ..... | 1 | 5 | 4 | 2 | 412.00 | 839.50 | 1,251.50 |
| New Westminster | 174 | 3 | 3 | 164 | 210 | 8 | ..... | 2 | 9 | 11 | 10 | 3 | 1,120.00 | 3,773.50 | 4,893.50 |
| Quatsino | 38 | ..... | ..... | 47 | 34 | 2 | ..... | ..... | ..... | ..... | ..... | ..... | 168.50 | 218.25 | 386.75 |
| Vancouver | 788 | 71 | 19 | 108 | 131 | 4 | ..... | 13 | ..... | ..... | 1 | ..... | 9,807.00 | 1,015.25 | 10,822.25 |
| Victoria | 182 | 10 | 6 | 29 | 52 | 3 | ..... | 1 | 4 | 2 | 28 | ..... | 1,876.75 | 1,260.75 | 3,139.50 |
| Totals | 4,876 | 169 | 69 | 3,198 | 5,118 | 740 | 87 | 89 | 193 | 282 | 1,114 | 329 | $37,099.50 | $87,708.80 | $124,808.30 |

## ANNUAL REPORTS.

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NOTE.—No charge is made for paper-bound copies of Annual Reports, except those for which a charge is shown.

## BULLETINS, OLD SERIES.

Bulletin No. 2, 1918: Bumps and Outbursts of Gas. (By George S. Rice.)
Bulletin No. 2, 1919: The Commercial Feasibility of Electric Smelting of Iron Ores in British Columbia. (By Alfred Stansfield.)
Bulletin No. 2, 1932: Report on McConnell Creek Placer Area. (By Douglas Lay.)

## MISCELLANEOUS.

Special Reports on Coal-mine Explosions. (By George Wilkinson, Thomas Graham, and James Ashworth.) 1918.
Report on Snowflake and Waverley-Tangier Mineral Properties. (By J. D. Galloway.) 1928.
Report on Mineral Properties of the Goldside Mining Company. (By B. T. O'Grady.) 1935.
Notes on Placer-mining in British Columbia. (By Officers of the Department.) 1936.
Elementary Geology Applied to Prospecting. (By John F. Walker.) 1937. 35 cents.
Possibilities for Manufacture of Mineral Wool in British Columbia. (By J. M. Cummings.) 1937.
Lode-gold Deposits of the Zeballos Area. (By J. S. Stevenson.) 1938.
Index to Annual Reports of the Minister of Mines of British Columbia for the years 1874 to 1936, inclusive. (By H. T. Nation.) Paper bound, $1; cloth bound, $2.
Preliminary Investigations into Possibilities for Producing Silica Sand from B.C. Sand Deposits. (By J. M. Cummings.) 1941.
Prospectors Guide for Strategic Minerals in Canada. (Second Edition.) (By Mines and Geology Branch, Department of Mines and Resources, Ottawa, Canada.) 1942.

## BULLETINS, NEW SERIES.

1940.

Bulletin No. 1: Aiken Lake Area, North-Central B.C. (By Douglas Lay.)
Bulletin No. 2: Placer-gold Deposits, Wheaton (Boulder) Creek, Cassiar District. (By Stuart S. Holland.)
Bulletin No. 3: Fraser River Tertiary Drainage-history in relation to Placer-gold Deposits. I. (By Douglas Lay.)
Bulletin No. 4: Saline and Hydromagnesite Deposits of British Columbia. (By J. M. Cummings.)
Bulletin No. 5: Mercury Deposits of British Columbia. (By John S. Stevenson.)
Bulletin No. 6: Geology of Camp McKinney and the Cariboo Amelia Mine. (By M. S. Hedley.)
Bulletin No. 7: Lode-gold Deposits of the Upper Lemon Creek Area and Lyle Creek—Whitewater Mine Area, Kootenay District. (By R. J. Maconachie.)
Bulletin No. 8: Preliminary Report on the Bedwell River Area. (By H. Sargent.)
Bulletin No. 9: Molybdenite in British Columbia. (By John S. Stevenson.)

1941.

Bulletin No. 10: Tungsten Deposits of British Columbia. (By John S. Stevenson.)
Bulletin No. 11: Fraser River Tertiary Drainage-history in relation to Placer-gold Deposits. II. (By Douglas Lay.)
Bulletin No. 12: Reconnaissance in the Area of Turnagain and Upper Kechika Rivers. (By M. S. Hedley.)
Bulletin No. 13: Supplementary Report on Bedwell River Area. (By H. Sargent.)
Bulletin No. 14: Coal Analysis of British Columbia. (By James Dickson.)

1942.

Bulletin No. 15: Hydraulic Mining Methods. (By Stuart S. Holland.)
Bulletin No. 16: Dragline Dredging Methods. (By Stuart S. Holland.)

# PROGRESS NOTES.

The Progress Notes on the mining industry are compiled from information supplied by the Inspectors of Mines and the Bureau of Economics and Statistics, through the courtesy of the property-owners and also from information obtained by the officers of the Mineralogical Staff in the course of their field-work. The Registrar of Companies and Superintendent of Brokers have also supplied information through their respective offices.

## LODE-GOLD DEPOSITS.

### TAKU RIVER AREA.

#### TULSEQUAH.

**Polaris-Taku Mining Co., Ltd.** Company office, 807 Lonsdale Building, Duluth, Minnesota, U.S.A.; mine office, Tulsequah, B.C.; Walter B. Congdon, President and Treasurer; Harvie A. Garver, Secretary; Frank H. McPherson, Manager. Capital: 10,000 preferred shares, $100 par; 20,000 common shares, $1 par; issued—10,000 preferred, 12,200 common.

The property is on the Tulsequah River, about 6 miles from its junction with Taku River. The mine is reached by boat and aeroplane in summer and by aeroplane only in winter-time.

Development during the year consisted of 8,758 feet of drifting and crosscutting, 3,232 feet of raising, and 13,708 feet of diamond-drilling. The mine worked 363 days and 89,610 tons of ore was milled.

There are two main ore zones—" A " vein and " Y " vein. In the upper levels, above Polaris level, the " A " vein has been extensively mined, practically all of the production from the mine, to date, having come from this vein, which has been worked on Polaris, A.J., B, C, and Canyon levels where it outcrops. In the shaft which has been sunk from the Polaris level the vein is now being developed on the 450 level, 450 feet below the Polaris. Stoping has now commenced there. The " A " vein now has a developed length of approximately 1,500 feet and a depth of 800 feet.

The " Y " vein is not present above the Polaris level but outcrops on the hillside just below it. On 300 level, in the shaft, contact was made with this vein and a considerable amount of development on the vein has been done. A raise was put through, on the vein, from 300 level to connect with a drift driven from outside through the overburden. Four stopes are in course of preparation on " Y " vein.

Diamond-drilling is being done on 450 level to locate " Y " vein at that depth.

A new and much larger hoist has been installed which has greatly increased the hoisting capacity of the shaft. The capacity of the mill has been increased to about 300 tons per day. About 170 men are employed.

[Reference: Annual Report, 1936, Part B.]

### UNUK RIVER AREA.

**MacKay Gold Mines, Ltd.**—Nothing was done on this property during 1941.

### PORTLAND CANAL AREA.

#### SALMON RIVER.

**Silbak Premier Mines, Ltd.** Company office, Royal Bank Building, Vancouver, B.C.; mine office, Premier, B.C.; H. A. Guess, President; J. C. Emison, Treasurer; G. A. Brockington, Secretary; Bert F. Smith, Manager; J. G. Pearcey, Mine Superintendent. Capital: 3,000,000 shares, $1 par; issued, 2,500,000. The property is in the Salmon River valley, about 14 miles from Stewart.

During the year 14,564 feet of development-work and 35,004 feet of diamond-drilling was done. The mine worked 311 days and 170,504 tons of ore was mined. In addition a continuous programme of diamond-drilling is carried on. Most of the development-work during the year has been on 5 level adjacent to the Premier Border holdings, which have now been taken over and operated by Silbak Premier. A connection has been made from 5 level to the Premier Border workings. Considerable improvement in the ventilation in the Sebakwe and B.C. Silver sections resulted from this connection. Some exploratory work has been done below 6 level. A crew of about 340 men was employed.

**Buena Vista Mining Co., Ltd.** Company office, Trail, B.C.; mine office, Stewart, B.C.; M. M. O'Brien, President; E. G. Randall, Secretary-Treasurer; E. James, Superintendent. Capital: 500,000 shares, $1 par; issued, 300,000 held by Consolidated Mining and Smelting Company of Canada, Limited, and 200,000 held by Big Missouri Mines Corporation.

This company owns and operates the *Big Missouri* mine, in the Salmon River valley, 18 miles from Stewart.

Very little development-work was done during 1941; this amounted to only 1,911 feet, principally raising into the ore-body in the North section. The mine worked 345 days and produced 190,436 tons of ore.

The ventilation in the stopes was improved to a marked degree by the introduction of mechanical ventilation controlled through them. Fans were also placed on the crushing equipment in the underground mill which brought the dust conditions there under control. A crew of ninety-eight men was employed.

**Tide Lake Gold Group.**—This group, owned by Mrs. J. L. Campbell, of Hyder, Alaska, is on the west side of Tide Lake. Two men on the property made small shipments of high-grade ore to the sampling plant at Prince Rupert.

[Reference: Annual Reports, 1927, 1930, 1939.]

### Bear River.

**Stewart Canal Gold Mines, Ltd.** Company office, Stewart, B.C.; E. T. Applewhaite, Secretary; J. Haahti, Manager. Capital: 3,000,000 shares, 50 cents par; issued, 1,026,510. The property is across the Bear River from Stewart. The property operated on a small scale in the early part of 1941 and made some shipments of concentrates from a small Gibson mill. Since then the property has been idle.

**Red Cliff Group.**—H. D. Haywood has an option on this property. Some small shipments of ore were made during the summer to the sampling plant at Prince Rupert.

**L. L. & H. Group, Bitter Creek.**—A contract was let to drive a crosscut to intersect two veins showing on the property. Power for drilling was furnished by a Pelton-driven compressor. Four hundred and fifty feet of crosscut was driven during the summer and the first vein, 30 inches wide, intersected. Six men were employed.

## NORTHERN COAST.

### Princess Royal Island.

**Surf Inlet Consolidated Gold Mines, Ltd.** Company office, 717 Pacific Building, Vancouver, B.C.; mine office, Surf Inlet, B.C.; Robert L. Reed, President; W. Russell Watson, Treasurer; R. V. Hopper, Mine Manager. Capital: 3,000,000 shares, 50 cents par; issued, 2,672,855. Development has continued in both the *Pugsley* and *Surf* mines during the year. It consisted of 2,746 feet of drifting, 760 feet of raising, and 28,973 feet of diamond-drilling.

At the *Pugsley* mine the 935 drift has been driven until it is now in approximately 5,000 feet from the portal. No new ore has been found in the inside end. A winze has been started, in the ore, from 1,100 level and is to be sunk at least 200 feet. Considerable diamond-drilling has been done on 900 and 1,100 levels.

At the *Surf* mine a considerable amount of drifting was done on the 500 level inside the old workings. Some diamond-drilling has been done here and on 200, which is the upper level.

The shaft from 900 to 1,000 level has been unwatered and retimbered.

Some surface work was done on the *Gold Coast* group, behind the *Pugsley*, by stripping and diamond-drilling from the surface.

A crew of 115 men was employed.

### KHUTZE INLET.

**Hunter Group.**—The property is on the north branch of Khutze River, about 13 miles from the beach. Very little work was done during the year.

### PORCHER ISLAND.

The Porcher Island Mines, Limited, did not operate during 1941.

## TERRACE-HAZELTON AREA.

### ZYMOETZ RIVER.

**Omineca Gold Quartz Mining Co., Ltd.**—F. M. Wells, President. The property did not operate during 1941.

### USK.

**Nicholson Creek Mining Corporation.**—Nothing was done on the property during 1941.

**Grotto Group.**—Some work was done on the group by Canadian Exploration, Limited. [Reference: Annual Report, 1937, Part C.]

## HAZELTON TO HOUSTON AREA.

### SMITHERS.

**Smithers Mines, Ltd.** Herman and Kelly have a lease on the old *Duthie* mine and have been working it steadily for the past two years. An area of high-grade ore has been stoped between 400 and 500 levels and also from open-cuts on the surface. Shipments have been made regularly to Trail smelter. A total of 214 tons of ore yielded 49 oz. gold, 30,107 oz. silver, as well as lead and zinc.

### TOPLEY.

**Golden Eagle Group.** The group owned by D. Heenan, of Topley, and under lease to Williams and Conlin, is about 7 miles by road from Topley. There are four small shafts on the property. No. 1 shaft is down 140 feet on about 40 degrees. A level had been turned off at 50 feet. Stoping is being done on a vein about 22 inches wide between this level and the surface. The ore has been shipped to Trail smelter.

There is a Diesel-driven compressor for drilling and a gasoline-hoist on the shaft. Four men were employed.

### HOUSTON.

The Canadian Exploration, Limited, did some work on the old *Owen Lake* mine. The adits were cleaned up and the ore-bodies in the mine and on the surface were sampled.

## CARIBOO AREA.

### WELLS.

**Cariboo Gold Quartz Mining Co., Ltd.** Company office, 675 Hastings Street West, Vancouver, B.C.; mine office, Wells, B.C.; Dr. W. B. Burnett, President; J. R. V. Dunlop, Secretary-Treasurer; R. R. Rose, Managing Director and Mine Manager; R. E. Vear, Mine Superintendent. Capital: 2,000,000 shares, $1 par; issued, 1,333,309. The property is on Cow Mountain, southeast from Jack of Clubs Lake, 63 miles by road from Quesnel.

During 1941 the 1,500 main crosscut was advanced 683 feet to intersect the downward extension of the " B.C." vein which was subsequently drifted on for a distance of

305 feet. The vein was faulted and heavy ground conditions necessitated close timbering which slowed up the work to a considerable extent. Shaft-sinking on the vein commenced in May. The old "B.C." inclined shaft was retimbered and then extended to the horizon of the 1,500 level. This sinking was completed on December 19th, a total of 926 feet of shaft having been sunk. The shaft followed the vein for a distance of 306 feet, at which point the vein dipped into the foot-wall. After drainage-holes are drilled through, the 1,500 main crosscut will be advanced to connect with the bottom of the shaft.

The deepening of No. 3 shaft was completed to a point below the 1,900 level during the year and the 1,800 and 1,900 levels were opened up. Development-work is proceeding on these levels.

Development raises in the *Butts* zone above the main level were completed and this area is now ready for level development.

The above, and incidental development-work elsewhere in the mine, accounted for 7,367 feet of drifting, 5,326 feet of crosscutting, 2,743 feet of raising, 1,125 feet of shaft-sinking, and 15,586 feet of diamond-drilling. Ore mined and milled amounted to 129,256 tons.

The 200-level drive towards the company's holdings on Island Mountain was suspended during the year.

No important additions or changes were made to the company's milling or surface plant. The average number of employees was 399.

[Reference: Annual Report, 1934, Part C.]

**Island Mountain Mines Co., Ltd.**

Company office, 744 Hastings Street West, Vancouver, B.C.; mine office, Wells, B.C.; F. W. Guernsey, President; Fred Searls, Jr., and H. DeWitt Smith, Vice-Presidents; H. E. Dodge, Secretary-Treasurer; J. A. Pike, Mine Manager; H. W. Seamon, Mine Superintendent. Capital: 1,100,000 shares, 50 cents par; issued, 1,050,716 shares. The property is on Island Mountain, on the north-west side of Jack of Clubs Lake, at Wells, about 4 miles west of Barkerville.

Development-work was carried out on all levels below the 4,000 main level, but was largely concentrated on the 3,000 and 3,125 levels, the two lowest. The 3,000-level station had to be retimbered and ventilation raises were driven between the 3,000 and 3,125 levels and between the 3,125 and 3,250 levels. Preparations are being made to extend the shaft to greater depth. Altogether there was done 1,080 feet of raising, 8,794 feet of crosscutting and drifting, and 37,625 feet of diamond-drilling.

Additions to the surface plant include a 500-cubic-foot compressor, which was put into operation in midsummer, and a 250-horse-power Diesel direct connected to a 187.5-k.v.a. generator. The latter has not yet been put into operation.

Ore mined and milled amounted to 54,398 tons, or an average of 149 tons per day.

The average number of employees was 146.

The Island Mountain Mines Company, Limited, purchased the *Myrtle* group of claims and a portion of the *Shamrock* group. The *Myrtle* group is strategically located with respect to the Rainbow formation and the "B.C." vein, and the *Shamrock* group includes the old Shamrock tunnel which extended some 1,800 feet from a suitable plant-site on the Wells–Barkerville Highway towards the above-mentioned objectives on the *Myrtle* group. Under the supervision of E. E. Mason as tunnel foreman, the old tunnel was straightened, widened, and retimbered, and advanced to about 3,000 feet from the portal by the end of 1941.

A power plant and other necessary facilities were established at the portal and a trestle built across the highway to give adequate dumping space. About twenty-five men are currently employed.

[Reference: Annual Report, 1934, Part C.]

### Yanks Peak.

**Snowshoe Gold Mines, Ltd.**

An option was taken on the property of this company by the Pioneer Gold Mines of B.C., Limited, and an exploratory programme was started under the supervision of A. E. Pike. Old workings were reopened and the surface above them cleared and stripped of over-

burden. Some underground development-work was also accomplished before the end of 1941.

Access to the property is by way of Keithley as there is now a motor-road to the *Midas* group about 2 miles from the *Snowshoe*.

[Reference: Annual Report, 1929.]

## CHILCOTIN AREA.

**Taylor Windfall Mine.**—Messrs. S. Davis and J. Separovich obtained a lease on this property on a royalty basis. A small amount of ore was extracted from high-grade sections of the vein and put through the mill.

**Hi Do Group.**—Messrs. Allaire and Pelletier, owners of this group, did a small amount of exploratory work on the group during the summer. In addition, they treated a few tons of high-grade ore in an improvised grinding mill.

## BRIDGE RIVER AREA.

**Pioneer Gold Mines of B.C., Ltd.** Company office, 470 Granville Street, Vancouver, B.C.; mine office, Pioneer Mines P.O., B.C.; Victor Spencer, President; A. E. Bull, Secretary-Treasurer; H. T. James, Managing Director; E. F. Emmons, Mine Manager. Capital: 2,500,000 shares, $1 par; issued, 1,751,750. This company owns the *Pioneer* mine on Cadwallader Creek, a tributary of Bridge River, 52 miles by road from Bridge River Station on the P.G.E. Railway. The mine is serviced by three shafts: No. 2 shaft extends from the surface to the 2,600 level, No. 3 from the surface to the 1,400 level, and No. 4 from the 2,400 level to the 2,900 level.

Development-work done during the year consisted of 3,313 feet of drifting, 462 feet of crosscutting, and 2,570 feet of raising. This work was largely confined to the levels serviced by the No. 4 internal shaft, and drifting west on the 2,700 and 2,800 levels was completed.

The "27" vein developed by drifting along it on the 1,500, 1,800, and 2,000 levels. These advances totalled 1,583 feet.

Ore milled amounted to 109,311 tons or an average of 300 tons per day. The crew averaged about 242 men. There were no important changes to the plant.

**Bralorne Mines, Ltd.** Company office, 555 Burrard Street, Vancouver, B.C.; mine office, Bralorne, B.C.; Austin C. Taylor, President; R. H. Grace, Secretary-Treasurer; D. N. Matheson, Manager; E. J. Chenowith, General Superintendent; G. H. Wilson, Mine Superintendent; C. M. Manning, Assistant Mine Superintendent. Capital: 1,250,000 shares, no par value; issued, 1,247,000.

Development-work done during the year consisted of 15,699 feet of crosscutting and drifting, 560 feet of raising, 625 feet of shaft transfer raises, and 20,441 feet of diamond-drilling. In the early part of the year a break-through was effected between the *Empire* and *Crown* shafts on the 2,000 level. This provided improved ventilation and servicing facilities on this level. A system of transfer raises was driven at the *Crown* shaft to by-pass both the 1,300 and 1,400 loading-pockets, thus doing away with the spills at these locations. All ore now passes directly to the 1,900 loading-cartridge. The crosscutting and drifting was largely done between the 1,400 and 2,000 levels to develop the veins there.

The average number of men employed per working-day was 348. Ore mined and milled amounted to 191,970 tons.

**Golden Ledge Syndicate.** Company office, 503 Rogers Building, Vancouver, B.C.; J. S. Harrison, President. Capital: 5,000 shares, $50 par. Operations at this syndicate's ground on Cadwallader Creek were restricted to the collaring of a shaft and the driving of a rope raise, and to diamond-drilling to determine the advisability of continuing with the shaft.

**Federal Gold Mines, Ltd.**—Four claims belonging to this company and adjoining the *Minto* mine were optioned during the year by the Pioneer Gold Mines of B.C., Limited.

An old drift already driven 57 feet from the portal was extended a further 200 feet along a vein. Later the option was relinquished.

**Bristol Mines, Ltd.** Company office, 572 Howe Street, Vancouver, B.C.; W. Spence, Secretary; A. E. Stromberg, Managing Director. Capital: 200,000 shares, no par value; issued, 80,000. During 1941 a road was completed to this company's property on Tommy Creek, about 4 miles from the highway. This made it possible to install a three-impellor Pelton wheel and an Ingersoll-Rand two-stage compressor. A new tunnel was collared on the bank of Tommy Creek about 130 feet below the 1940 workings. By the end of the year this had been advanced 358 feet as a crosscut to the downward extension of the mineralized shear, which was then drifted on for 350 feet in a southerly direction.

**Ault Group.**—Bralorne Mines, Limited, have this property under option and during 1941 accomplished 1,110 feet of diamond-drilling on it.

NOTE.—At several other mines in the district, such as the *B.R.X.* and *Grange*, necessary maintenance-work to keep the mine in shape for operation or examination was all that was done.

## LILLOOET AREA.

### BLUE CREEK.

**Elizabeth Group.** Gold discoveries were made on this group, which is about 40 miles north of Lillooet and 16 miles east of Minto in the Shulaps Mountains. Bralorne Mines, Limited, optioned this and adjoining groups and staked a large number of claims in the vicinity. Work then commenced on stripping and drilling the veins already exposed, while the adjacent area was prospected for others. Operations, however, were suspended on October 13th because the severity of the weather made surface work impossible at the elevation of the showings, which outcrop at about 7,000 feet. The work done consisted of five diamond-drill holes aggregating 760 feet and 1,750 feet of stripping on four veins. An 18- by 11-foot log bunkhouse to accommodate twelve men, an 18- by 17-foot wood-shed, an 11- by 11-foot root-cellar, and a 6- by 8-foot log pump-house were erected at a camp-site near the showings. A road was started to the property from the end of the old Moha road and reached to within 14 miles of the camp-site before road-work was suspended on November 1st.

## KAMLOOPS AREA.

**Allied Mining and Development Co., Ltd., Homestake Mine.** Mine office, Kamloops, B.C.; Edward H. Kellner, Managing Director; Trevor W. Page, Superintendent. This mine is on the Louis Creek–Squaam Bay Road, approximately 3 miles north-westward from the head of Squaam Bay on Adams Lake, or 18 miles easterly by auto-road from Louis Creek Station on the Canadian National Railway, 36 miles north from Kamloops. The main adit is about 700 feet above the road and has been driven into the north-west side of Falls Creek, which is tributary to Sinmax Valley, the main valley leading south-easterly into Squaam Bay; the other workings are above this adit and on the same side of Falls Creek.

After being idle for several years work was resumed at the mine, when cleaning-up operations began on August 18th and underground work commenced on October 15th. Development-work was done on the 500 level and one car of ore was shipped to Trail. The 500 level is 600 feet above the mill and the ore is brought down by an aerial tramway. The present development plan aims at connecting the 300 vein from the 500 vein. Four men were employed.

## STUMP LAKE AREA.

**Consolidated Nicola Goldfields, Ltd.** Company office, 506 Dunsmuir Street, Vancouver, B.C.; mine office, Box 68, Merritt, B.C.; H. H. Stevens, President; C. H. Coolidge, Secretary-Treasurer; John F. Coats, Mine Manager. Capital: 6,500,000, $1 par; issued, 4,377,358. This company operates the *Nicola* mine, 2 miles west of the Kamloops–Merritt Highway and 30 miles from Merritt. The 320 adit is the main entry and intersects the *Enterprise* vein 800 feet from the

portal. This vein has a general dip of 45 degrees and has been developed down the dip by an inclined shaft. Work was intermittent during the year and a small amount of ore from the *Enterprise* and *King William* veins was milled and shipped. Ten men were employed underground and ten men on the surface.

Scheelite was discovered on the mine-waste dump by the use of a mercury-vapour lamp. Further tests made underground indicated the presence of scheelite in the old workings. Mining operations were suspended on December 13th and a crew of three men was left on the property to do repairs and alterations in preparation for installing additional mill machinery which will be required to handle the scheelite ore when operations are resumed.

[Reference: Annual Report, 1936, Part D.]

## SIMILKAMEEN RIVER AREA.

### HEDLEY.

**Kelowna Exploration Co., Ltd.** Company office, 75 West Street, New York, N.Y.; mine office, Hedley, B.C.; W. Adams Kissam, Chairman; Sewell T. Tyng, President; John W. Mercer, Treasurer; O. P. Ebeling, Secretary; W. C. Douglass, Mine Manager; Floyd Turner, Mine Superintendent. Capital: 100,000 shares, $5 par; issued, 60,000.

This is a private company operating the *Nickel Plate* mine at Hedley, B.C. The concentrator, machine-shops, and general offices are near Hedley. The mine is at an elevation of 5,600 feet and approximately 4,000 feet above and 4 miles north of the town. Transportation up the side of the mountain is in two sections; a 10,000-foot gravity tramway from the ore-bin at the mill is operated with skips having a capacity of 6 tons; from the central to the upper terminal it is run by electric motors chain-geared to friction and control wheels that maintain a constant speed during the whole of the operation. The portal of the mine is 1½ miles north of the top terminal of the tramway and an electric trolley motor system hauls the ore from the mine to the upper end of the tram.

The most important underground development during the year was the commencement of work on driving the Morning incline. This is an inclined shaft being driven from near the foot of the Dickson incline on the 1,500 level; the shaft will be sunk a distance of 1,000 feet and at an angle of 50 degrees. The *Nickel Plate* mine is directly connected with the *Hedley Mascot* mine, but the workings of the *Nickel Plate* are mostly at a higher elevation, which provides a natural column for ventilation. The relative position of these mines to each other also provide a further opportunity for mutual benefit; the rock taken from the drivage of the Morning incline is used for back-filling in some of the *Mascot* stopes.

Work was commenced on driving the I.X.L. adit and about 2,000 feet of drifting was done on the two branches of the adit. The adit is being driven for the purpose of exploring ground south of the *Nickel Plate* ore-bodies. The two branches are the "808" and the "Climax." The "808" branch is being driven towards the No. 8 level of the *Nickel Plate* mine whilst the "Climax" is being driven to prospect the *Copper Cleft* and *Climax* claims. The old *Silver Plate* workings, originally developed about forty years ago, were rehabilitated during the year for the purpose of ventilating and servicing stoping operations in the "4½" Sunnyside ore-body.

Total underground development-work consisted of 4,718 feet of drifting, cross-cutting, and shaft-work; also 12,156 feet of diamond-drilling. A total of 97,476 tons of ore was milled, yielding 33,881 oz. of gold. An average crew of 186 men was employed.

**Hedley Mascot Gold Mines, Ltd.** Company office, 908 Royal Bank Building, Vancouver, B.C.; mine office, Hedley, B.C.; Wendell B. Farris, President; V. J. Creeden, Secretary; W. S. Charlton, Treasurer; C. W. S. Tremaine, General Superintendent; J. C. Moore, Mine Foreman. Capital: 3,000,000 shares, $1 par; issued, 2,264,130. This company operates the *Mascot* mine, 1 mile north of Hedley. The concentrator and mine offices are on the east bank of 20-mile Creek and the camp is on the side of the mountain, 2,795 feet above the mill. The ore is transported down the

side of the mountain by an aerial tramway, 5,600 feet in length, from the ore-bin at the mine to the mill. The two skips have a capacity of 3 tons each.

The mine has been developed by an 8- by 8-foot adit, 2,500 feet in length and generally known as the 4,800-foot level; this is the main haulage into the *Mascot Fraction.* The raise from the 4,300-foot level to the 4,800-foot level was completed during the year and put into service; four intermediate levels were opened off this raise. Production from the lower section of the mine is being increased and now 50 per cent. of the ore is coming from the lower level.

The workings of this mine are connected through to the workings of the adjacent *Nickel Plate* mine, and this connection provides excellent ventilation for both mines. During the months when natural ventilation is found to be inadequate a Jeffrey propeller-type fan provides the necessary quantity of air. This fan is powered by a 15-horse-power electric motor and has a diameter of 4 feet. The fan is not required during the winter.

Underground development included 1,380 feet of drifting; 1,066 feet of raising; and 24,036 feet of diamond-drilling. A total of 68,155 tons was milled, yielding 21,830 oz. of gold. An average of 129 men was employed.

The cyanide plant was put into operation during the year and treated 60 tons of middlings per day; about one-quarter of the gold production is now in the form of gold bullion. The balance is concentrates, which is shipped to the Tacoma smelter. A new assay grinding-room has been built.

**Canty Gold Mines (Hedley), Ltd.** Company office, 908 Royal Bank Building, Vancouver, B.C.; mine office, Hedley, B.C.; Wendell B. Farris, President; V. J. Creeden, Secretary; W. S. Charlton, Treasurer; R. H. Stewart, Managing Director; Charles Bishop, Mine Superintendent. Capital: 3,000,000 shares, $1 par; issued, 2,172,788. This mine operated during the first half of the year then closed down. Whilst working, a crew averaging eighteen men was employed.

Ore amounting to 1,606 tons was mined which averaged 0.31 oz. of gold per ton. The ore was shipped to the *Mascot* mill where it was treated. The machinery from this mine has been taken over by the Hedley Mascot Gold Mines, Limited.

## VERNON AREA.

**Kalamalka.** This property on Brewer Creek, 2 miles from Lavington, is leased by S. M. and C. Penny, J. A. Thommason, and A. S. Heidler. The small mining plant on the property was put in commission and used during the year. Ore totalling 917 tons was mined and shipped to Trail. This yielded 502 oz. of gold and 247 oz. of silver.

**Skookum.**—This property is about 16 miles north-east of Vernon. T. Levasseur and associates, of Nelson, B.C., mined and shipped some ore during 1941.

## SOUTHERN OKANAGAN.

**Grandoro Mine.** This property was operated under lease by Joseph Wukeluk from the Grandoro Mines, Limited. The mine is on Orofino Mountain, about 25 miles south of Penticton, and consists of fourteen claims, two of which are Crown-granted; all work done during the year was on two claims—the *Orofino* and *Independence.*

About 200 feet of drifting and 50 feet of stoping was done during the year, employing three men who worked intermittently over an eight-month period. Ore totalling 251 tons was shipped to the Trail smelter, and yielded 174 oz. of gold and 86 oz. of silver.

## BEAVERDELL AREA.

**Rosemont.**—This property, situated 9 miles from Beaverdell, was optioned to the Highland Bell, Limited. Development-work included 50 feet of drifting. The option was dropped in the late summer.

## CAMP McKINNEY AREA.

**Cariboo-Amelia.** This property is in Camp McKinney. Early in the year it was operated under lease by George Boag and associates, of Greenwood, B.C. Six men, all partners in the lease, were engaged in removing pillars and stope remnants in the area above the water-level, which is about 80 feet below the collar of the main shaft. A small gasoline-driven compressor was used for this work. Later a lease was taken by the Highland Bell, Limited, and the ground above the water-level was further explored and more ore mined. Development done by the above company included 150 feet of drifting and 50 feet of crosscutting. A small Diesel-driven compressor and air-hoist was used for this work. Seven men were employed. Late in the summer this lease was dropped and the property reverted to the original group. Very little additional work was done by them, as it is necessary to dewater the mine to make additional salvage possible.

[Reference: Bulletin No. 6, 1940.]

**Wiarton.** This property adjoins the *Cariboo-Amelia.* It was bonded to the Highland Bell, Limited, and the development programme, commenced last year, was continued. Six to seven men were employed and power was used from the same equipment which supplied the *Cariboo-Amelia.* Development included 200 feet of drifting, 200 feet of crosscutting, 100 feet of raising, 50 feet of sinking, and 1,500 feet of diamond-drilling. The option was dropped late in 1941.

[Reference: Bulletin No. 6, 1940.]

## GREENWOOD-GRAND FORKS AREA.

### GREENWOOD.

**Gold Finch.**—This property is half a mile from Greenwood. It was operated under lease and bond by Messrs. Larsen, Broomfield, and Malone, of Princeton, B.C. A complete small mining plant was installed.

**No. 7.** This property is owned by the Consolidated Mining and Smelting Company of Canada, Limited, and is operated under lease by W. E. McArthur, of Greenwood, B.C. A crew of from two to three men was employed and a portable compressor used for underground work. Development included 125 feet of drifting and 200 feet of raising. A total of 284 tons of ore was mined and shipped to Trail. The lease was given up late in 1941.

### JEWEL LAKE.

**Dentonia Mines, Ltd.** Company office, 850 Hastings Street West, Vancouver, B.C.; J. R. Reed, President. Capital, 2,500,000 shares, no par value; issued, 1,716,600. The company owns the *Dentonia* mine at Jewel Lake. The property is now leased by A. H. Upton and associates, of Vancouver, B.C. It was equipped by the leasers with a 240-cubic-foot electrically driven single-stage Schramm compressor. The old *Jewel* shaft was partially unwatered but most of the work was confined to the area of the old *Dentonia* workings, where pillars and stope remnants were salvaged. About 70 feet of underground development-work was done during the year. Seven men were employed. Ore amounting to 2,187 tons was mined and shipped to Trail.

[Reference: Bulletin No. 13, 1941.]

**Gold Drop.**—This property adjoins the *Dentonia.* It was operated under lease during the latter part of the year by Messrs. Halstrom and Schuberg, of Greenwood. Hand-steel was used to mine 126 tons of ore which was shipped to Trail.

**Amandy.** This property on Rhoderick Dhu Mountain, above Jewel Lake, is owned by E. C. Henniger, of Grand Forks, B.C. It was operated under lease by W. E. McArthur, of Greenwood, B.C. All the work was done by hand-steel. Development included 30 feet of drifting and 25 feet of sinking and, in addition, 290 tons of ore was mined and shipped to Trail. This yielded 84 oz. of gold and 1,478 oz. of silver.

### GRAND FORKS.

**Yankee Boy.** This property is 4 miles from Grand Forks. It was operated for a short time under lease by John and Steve Klemens, of Grand Forks, B.C. Considerable surface-trenching was done in an effort to find the continuation of the vein. Ore was mined from shallow cuts and trenches and shipped to Trail. A small amount of ore was also sorted from the old dumps.

### FRANKLIN CAMP.

**Homestake.** This property adjoins the *Union* mine in the Franklin Camp. It was operated by the Homestake Syndicate under the direction of A. J. Fee. Six men were employed. A small complete mining plant, including a gasoline-driven hoist, was installed.

**Union.** This property is in the Franklin Camp, about 46 miles north of Grand Forks. It is owned by the J. F. McCarthy estate, of Wallace, Idaho, and is operated under lease and bond by W. E. McArthur, of Greenwood, B.C. A small portable gasoline-driven compressor provides air for underground work. From two to four men were employed 337 days. Development included 50 feet of drifting, 75 feet of raising, 2,200 feet of diamond-drilling, and 500 feet of surface-trenching. Ore totalling 2,480 tons was mined and shipped to Trail.

## LARDEAU AREA.

**Winslow Group.** This property is on Winslow Creek, about 7 miles by tractor-road from Trout Lake. It is equipped with a 20-ton amalgamation and gravity mill. It was operated under lease and bond by W. J. Scorgie and one other man. Hand-steel only was used. A small tonnage, chiefly from the *Okanagan* claim, was mined and treated in the mill.

**Silver Crest.** This property, formerly known as the *Mobbs* mine, is near Poplar Creek. It is owned by Alex. Robb, of Poplar, and is operated under lease by F. J. Bews and associates, of Revelstoke, B.C. A small amount of development-work was done by hand-steel.

## SLOCAN AREA.

### RETALLACK.

**Highland Surprise Gold Mines, Ltd.** Company office, Kaslo, B.C.; R. W. Kennedy, President; A. J. Noble, Secretary-Treasurer. Capital: 3,000,000 shares, 50 cents par. The company's property is on Lyle Creek, 3½ miles from Retallack. The mine is equipped with a small complete mining plant and the ore is treated in the *Whitewater* mill at Retallack under a rental agreement. Ten to fifteen men were employed during the summer under the direction of Joe Gallo and G. H. Grimwood. Operations were confined to mining and milling a shoot of ore between the 3 and 4 levels. The mill was operated on a one-shift basis. The concentrates were shipped to Trail.

[Reference: Bulletin No. 7, 1940.]

### LEMON CREEK.

**Chapleau.** This property, on Chapleau Creek and owned by the Milton Gold Mining Company, of Penticton, B.C., was operated under lease by the British Columbia Department of Mines under the direction of R. J. Maconachie. Three men were employed and hand-steel only was used. Fifteen tons of ore was mined and shipped to Trail. This yielded 34 oz. of gold and 46 oz. of silver.

**Howard Fraction.** This property, at the head of Gold Creek, is owned and operated by F. T. Harbour, of Slocan City, B.C. During the summer a small amount of development-work was done in the long low-level adit and a small amount of ore was mined from surface cuts and shallow workings. Hand-steel

only was used. Ore totalling 27 tons, shipped to Trail, yielded 2 oz. of gold and 322 oz. of silver.

[Reference: Annual Report, 1938, Part E.]

**Marmion and Maryland.**—This property is on the Tiger Creek road beyond the Springer Creek summit. Hans Lyngay made a single shipment.

### SLOCAN CITY.

**Bell.**—This property, owned and operated by R. E. McMillan, is on Springer Creek. During the summer 4 tons of ore was mined by hand-steel and shipped to Trail. This yielded 2 oz. of gold and 75 oz. of silver.

**Evening Star.**—This property is on Dayton Creek, a tributary of Springer Creek. It was leased by W. D. Smith and Maurice Ansaldo.

## ROSSLAND AREA.

### MOUNT ROBERTS.

**Midnight.** This property, on Mount Roberts, is owned and operated by a local private company known as the Midnight Gold Mines, Limited. B. A. Lins, Manager. Capital: 20,000 shares, $1 par. It is equipped with a small complete mining plant. A mill of about 10 tons daily capacity was built this year and run for a short time. Four men were continuously employed.

**I.X.L.**—This property adjoins the *Midnight*. It is equipped with a small complete mining plant and was operated continuously throughout the year by Chris Jorgensen, Victor Larsen, and three partners.

**O.K.**—This property adjoins the *I.X.L.* It was operated under lease by John Hendrickson and Gunnar Nordholm, who did a small amount of development-work with hand-steel.

**Gold Drip.** This property, adjoining the *I.X.L.* and *O.K.*, is under lease and bond to a Vancouver syndicate known as the Elleston Syndicate, B.C. Mining Building, Vancouver, B.C. Development-work was done by hand-steel under the direction of R. W. Haggen, of Rossland, B.C. This included 20 feet of drifting and 300 feet of surface-stripping, as well as cleaning out some of the old workings.

**Christine.**—This property, on the Cascade Highway, about 3 miles east of Rossland, was operated under lease by Mike Slaboski and Mike Gach, of Rossland, B.C. Ore was mined by hand-steel and shipped to Trail.

### SOUTH BELT.

**Mayflower.** This property is operated under lease and bond by the Mayflower Mining Syndicate, Lloyd A. Smith and associates, of Penticton, B.C. The property is equipped with a small mining plant. Five men were employed under the direction of R. W. Haggen, of Rossland, B.C. Development-work included 150 feet of drifting, 26 feet of crosscutting, and 1,975 feet of diamond-drilling, as well as some surface-stripping.

### ROSSLAND.

**Jumbo.** This property, 1 mile east of Rossland, just off the main Cascade Highway, is owned by Mrs. Charlotte Finch Smith, of California, and is operated under lease and bond by M. Michaley and M. Doran, of Rossland, B.C. Some ore mined by hand-steel was shipped to Trail.

## NELSON AREA.

### APEX.

**Humming Bird.** This property is at the head of Clear Creek, about 4 miles from Apex. It was operated under lease by Lawrence Porter and associates, of Nelson, B.C. A total of 50 tons, mined by hand and shipped to Trail, yielded 41 oz. of gold and 88 oz. of silver.

**Euphrates.** This property, near Hall Siding, about 10 miles south of Nelson, is operated by the Gold Silver Tungsten Mining and Milling Company of Seattle, Washington. The work at the mine was under the direction of Sarkis Terzian, of Nelson, B.C. An average of fourteen men was employed, with five working underground. The installation of an 100-ton flotation-mill was completed and the old aerial tram, some 2,000 feet in length, was moved to connect a new ore-bin at the mine with the mill-bin. Power for the mill was supplied by a 200-horse-power Giant semi-Diesel, belt-connected to a 240-k.v.a. generator. A new bunk-house and cook-house, adequate for twenty men, was built at the mine. A small amount of ore from the *Nickel Plate* and later the *Minto* vein was run through the mill as a test with the idea of later putting in a mill of greater capacity. There is some tungsten in the ore but none of this has been recovered to date.

[Reference: Annual Report, 1937, Part E.]

**Golden Age.** This property, on the Nelson–Ymir Road, about 10 miles from Nelson, is owned and operated by the Trimetal, Incorporated, 745 Peyton Building, Spokane, Washington. Six to eight men were employed under the direction of G. H. Grimwood, of Nelson, B.C. During the summer diamond-drilling amounted to about 2,000 feet. Underground work is now under way, 78 feet of drifting having been done to date. Power was obtained from the *Euphrates* power plant originally, but late in the year a small Diesel-driven compressor was installed. The ore of this property is said to contain some tungsten.

### Toad and Morning Mountain.

**Athabasca.** This property, on Morning Mountain, is owned by the Noble Five Mines, Limited. It was operated during the year by several small groups of leasers who, for the most part, used compressed air from small gasoline-driven compressors. A small amount of ore was recovered from pillars and the remnants in stopes. An attempt was also made to mine some zinc ore for the cadmium content.

**California.** This property, on Toad Mountain, is owned by Mrs. Mary Wilson, of Trail, B.C. It was operated under lease by the British Columbia Department of Mines under the direction of R. J. Maconachie. Four men were employed. Compressed air was supplied by an Ingersoll-Rand portable compressor. A total of 75.7 tons, shipped to Trail, yielded 159.4 oz. of gold and 176 oz. of silver. This lease was dropped in October and another taken by R. and L. Bobier, of Nelson, B.C.

**Venus-Juno.** These properties, on Morning Mountain, are owned by the R. Heddle estate and were operated during the year by several small groups of leasers—namely, E. Meyers, Bruno Sterna, and Albert Barbas—all of Nelson, B.C. Hand-steel was used.

**Daylight and Victoria-Jessie.**—These properties, on Toad Mountain, were operated under lease for a short time by P. Rolick and associates, of Nelson, B.C.

### Hall Creek.

**Bear.**—This property, on Hall Creek adjoining the *Fern* mine, was operated by two leasers, J. Bergquist and A. Carlson.

[Reference: Annual Report, 1937, Part E.]

**Fern.**—This property, on Hall Creek, is owned by C. E. and L. R. Hawley, of Spokane, Washington. It was leased by H. B. Frockledge and associates, of Nelson, B.C., who used hand-steel to recover ore from pillars and stope remnants.

**Canadian Belle Mining Co.** Company office, 334 Peyton Building, Spokane, Washington; R. E. Linquist, President. Capital: 1,150,000 shares, 1 cent par; issued, 850,000. The company owns the *Canadian Belle* mine on Hall Creek. A small amount of development was done by hand-steel under the direction of M. Herman. Future plans include the driving of a new low-level adit, the site of which has been connected to the main Hall Creek road by a new road about 1½ miles in length.

[Reference: Annual Report, 1937, Part E.]

### Eagle Creek.

**Livingstone Mining Co.**

Company office, 521 Central Building, Seattle, Washington. H. R. Smith, President and Manager. This company owns and operates the *Granite-Poorman* mine on Eagle Creek, near Blewett, B.C. A crew varying from eleven to twenty-one men was employed throughout the year and, in addition to this, six to twelve men were engaged in leasing in various parts of the mine. The property is equipped with a complete mining plant and a mill. The mill, originally stamps, amalgam plates, and tables, is being changed over to ball-mill and flotation and will have a daily capacity of about 35 tons when this is completed. The mill was not operated during the year. Development-work included 400 feet of drifting and 463 feet of diamond-drilling. A total of 1,679 tons mined and shipped to Trail yielded 1,208 oz. of gold and 1,571 oz. of silver. Of this the leasers shipped approximately 268 tons with an average gold content of 0.96 oz. per ton.

### Sitkum Creek.

**Alpine Gold, Ltd. (N.P.L.).**

Company office, 415 Baker Street, Nelson, B.C.; James B. Curtis, President; Barbara O'Neil, Secretary. Capital: 500,000 shares, 50 cents par. This company operated the *Alpine* mine, at the head of Sitkum Creek and about 9 miles from the Nelson–Kaslo Highway. The property is equipped with a complete mining plant and a flotation-mill of 50 tons daily capacity. An aerial tram about 1 mile in length connects the mine and mill. An average crew of about forty-five men was employed throughout the year under the direction of L. D. Clark. The mill was operated continuously until the end of November, when it was closed and a development programme continued. Total development for the year included 1,500 feet of drifting and 375 feet of raising. During the summer a two-stage 260-cubic-foot Holman compressor driven by an 100-horse-power International Diesel was installed in the power-house at the mine and a new modern bunk-house 24 by 80 feet and an addition to the dry-house was built. The new buildings will accommodate a crew of thirty-two men.

[Reference: Annual Report, 1938, Part E.]

### Rover Creek.

**Stillwater Group.**

This group is on Whitewater Creek, a tributary of Rover Creek, about 5 miles from the Blewett road. The property was bonded by the Highland Bell, Limited. There is a large amount of quartz float carrying good gold values in Whitewater Creek and, during the summer, an attempt was made to find the source of this by driving an adit to bed-rock in an area where a favourable reaction had been obtained by a geophysical survey the year before. Three men were employed and about 50 feet of drift driven by hand.

### Ymir.

**Blackcock.**

This property on Ymir Creek, just above the junction of Huckleberry Creek, is owned and operated by Frank W. Henderson, of Calgary, Alberta. The property is equipped with a complete small mining plant. A crew of from eight to ten men under the direction of R. H. Weaver was employed for the greater part of the year. Some ore was mined and shipped to Trail.

**Ymir Consolidated Gold Mines, Ltd.**

Company office, 704 Royal Trust Building, Vancouver, B.C.; R. C. McCorkell, President; T. G. Cowan, Secretary-Treasurer. Capital: 1,500,000 preferred shares, no par value; 2,500,000 common shares, no par value; issued, 2,159,453 common shares. The company controls the *Goodenough* mine on Elise Mountain and owns the adjoining *Ymir* mine. These properties are equipped with complete mining plants and a flotation-mill of about 100 tons daily capacity, so located as to be able to serve both mines. During the year the property was operated entirely by leasers, at one time as many as twenty being engaged in salvage operations from pillars and the remnants of stopes. With the exception of the mill, the mechanical equipment belonging to the company was

used by the leasers. A total of 2,127 tons of ore mined and shipped to Trail yielded 982 oz. of gold, 7,558 oz. of silver, and lead and zinc.

**Ymir Wilcox.** This property is on Ymir Creek, about three-quarters of a mile above the *Blackcock*. It was operated under lease by R. Golac and associates, of Ymir, B.C. A crew of from three to four men, all partners in the lease, used hand-steel to recover ore from pillars, surface cuts, and trenches.

**Arizona.**—This property, adjoining the *Wilcox*, was operated under lease by Nick Morris and partner. Hand-steel was used to mine some ore which was shipped to Trail.

**Ymir-Yankee Girl Gold Mines, Ltd.** Company office, 525 Seymour Street, Vancouver, B.C.; E. P. Crawford, President; W. A. Sutton, Secretary-Treasurer; L. G. Morrell, Mine Manager. Capital: 3,000,000 shares, no par value; issued, 2,225,005. The company owns and operated the *Yankee Girl* mine on Oscar Creek, 3 miles from Ymir, and operated the adjoining *Dundee* mine on a lease and bond basis. The property is equipped with a complete mining plant and an 175-ton cyanide and flotation mill. During the first part of the year the mill was closed to permit alterations that would make it possible to treat a dump of zinc tailings for their zinc content and was operated until the end of May on these tailings. After that date the mill was operated continuously on ore, chiefly from the *Dundee* workings. An average crew of seventy men was employed. Development on the *Yankee Girl* included 20 feet of drifting and 62 feet of raising, and on the *Dundee* 2,166 feet of drifting, 389 feet of crosscutting, 722 feet of raising, and 125 feet of sinking. A total of 90 tons of old tailings was treated. A total of 32,809 tons of ore chiefly from the *Dundee* workings yielded 6,444 oz. of gold, 60,458 oz. of silver, as well as zinc and some cadmium.

**Wesko (Ymir Centre Star).**—This property, about 3 miles from Ymir, was leased during the year by Oscar Anderson, E. P. Haukedahl, and two partners, of Ymir, B.C. Hand-steel was used to salvage pillars and the remnants of stopes. A total of 299 tons was mined and shipped to Trail.

**Porto Rico.** This property, on Porto Rico Creek, is owned by E. C. Wragge, of Nelson, B.C. It was operated under lease for three months during the summer by Joe and Gus Flagel, Albert Shaw, and H. Erington. A total of 89.5 tons of ore mined by hand-steel and shipped to Trail yielded 39 oz. of gold and 36 oz. of silver.

**Howard (Durango).**—This property, on Porcupine Creek, was operated for a short time by leasers with hand-steel.

## SALMO.

**Clubine-Comstock Gold Mines, Ltd.** Company office, 618 Stock Exchange Building, Vancouver, B.C.; C. F. Hunter, Secretary. Capital: 2,000,000 shares, 50 cents par value. This company owns the *Clubine-Comstock* mine on Boulder Creek, about 4 miles from Salmo. The property is equipped with a complete small mining plant. During the year it was operated under lease by the former manager, L. R. Clubine, three men being employed.

[Reference: Annual Report, 1936, Part E.]

## SHEEP CREEK.

**Kootenay Belle Gold Mines, Ltd.** Company office, 475 Howe Street, Vancouver, B.C.; mine office, Sheep Creek, B.C.; Jonathan Rogers, President; J. A. Clarke, Secretary-Treasurer; Vere McDowall, Mine Manager. Capital: 750,000 shares, 50 cents par value; issued, 675,200. The company owns and operated the *Kootenay Belle* mine on Sheep Creek, about 10 miles from Salmo. The mine and mill operated continuously throughout the year, employing an average crew of 125 men, with ninety working underground. During the early part of the year the possibilities of finding further reserves on the main veins—that is, the "A" and "B" veins—was practically exhausted and work was concentrated on the Black vein, where a considerable tonnage of ore was developed. By the end of the year by far the

greater part of the tonnage milled was coming from this vein. Development-work included 1,165 feet of crosscutting and 716 feet of drifting on the "A" and "B" veins, 1,643 feet of drifting on the Black vein, 86.5 feet on the Queen, and 415 feet on the Yellowstone as well as 261.5 feet of raising and 123.6 feet of sinking. A total of 34,644 tons mined and treated in the mill yielded 9,684 oz. of gold and 2,500 oz. of silver.

**Golden Belle.** This property, between the *Motherlode* and *Gold Belt* mines, was operated under lease and bond by the Kootenay Belle Gold Mines, Limited. It is equipped with a small complete mining plant. A crew of fourteen men with nine underground was employed for the greater part of the year. Underground development included 1,734 feet of drifting.

**Sheep Creek Gold Mines, Ltd.** Company office, 616 Stock Exchange Building, Vancouver, B.C.; mine office, Sheep Creek, B.C.; R. W. Bruhn, President; James Anderson, Secretary-Treasurer; H. E. Doelle, General Superintendent and Managing Director. Capital: 2,000,000 shares, 50 cents par; issued, 1,875,000. The company owns and operated the *Queen* mine on Waldie Creek, a tributary of Sheep Creek. The mine and mill operated continuously throughout the year, employing an average of 115 men with sixty-six working underground. Development for the year included 3,940 feet of drifting, 2,887 feet of crosscutting, 567 feet of raising, and 500 feet of surface-trenching. A total of 55,052 tons of ore was mined and treated in the mill and the bullion yielded 26,083 oz. of gold and 7,958 oz. of silver.

**Gold Belt Mining Co., Ltd.** Company office, 616 Stock Exchange Building, Vancouver, B.C.; mine office, Sheep Creek, B.C.; A. E. Jukes, President; James Anderson, Secretary-Treasurer; M. O'Donnell, Mine Manager. Capital: 3,000,000 shares, 50 cents par; issued, 2,550,000. The company owns and operates the *Gold Belt* mine on Sheep Creek, between the *Reno* and *Kootenay Belle* holdings. The mine and mill operated continuously throughout the year, employing an average of 135 men with 104 working underground. Development-work included 3,750 feet of drifting and crosscutting, 950 feet of raising, and 826 feet of diamond-drilling. It has been found that the ore-horizon on the more northerly veins, which are now under development, is higher than on those which are being worked at present. To facilitate development of this new area a raise is being driven from the 1,400 level to connect with the 600 level of the old upper workings. A total of 56,502 tons was mined and treated in the mill. The bullion from this yielded 15,811 oz. of gold and 6,618 oz. of silver.

**Reno Gold Mines, Ltd.** Company office, 525 Seymour Street, Vancouver, B.C.; mine office, Sheep Creek, B.C.; K. G. Nairn, President; W. A. Sutton, Secretary-Treasurer; W. S. Ellis, General Superintendent. Capital: 2,000,000 shares, $1 par; issued, 1,880,000. This company owns the *Reno, Motherlode, Nugget, Cayote,* and *Bluestone* properties, all of which form a block of ground in the Sheep Creek camp to the north of the *Gold Belt* and *Golden Belle.* These properties are equipped with two complete mining plants, at the *Bluestone* and *Motherlode* respectively, and an 140-ton cyanide mill. The *Reno* was inactive during the year as was the *Bluestone,* except for diamond-drilling. Development-work was carried on on the *Nugget* vein from the *Motherlode* 4,900 tunnel and a shoot of ore opened up between there and the old *Nugget* workings. The mill was started on this ore and some broken reserves from the *Motherlode* vein about the middle of June and was operated continuously until the end of the year, when it was shut down permanently for lack of food. During the summer months development was done in the *Cayote* tunnel, but results were unsatisfactory. An average crew of forty-eight men with twenty-two working underground were maintained throughout the year on the *Motherlode* and *Nugget* and fourteen were engaged in working the *Cayote* tunnel, the latter operation being conducted from the *Bluestone* camp. The development-work during the year is as follows: *Motherlode,* 4,900 tunnel—drifts and crosscuts, 1,119 feet; raising, 190 feet; sinking, 63 feet; *Nugget,* 4,900 tunnel—drifting and crosscutting, 765 feet; raising, 262 feet; diamond-drilling, 486 feet; *Cayote,* drifting and crosscutting, 768.1 feet. In addition to this 4,134 feet of diamond-drilling was done on the

surface of the *Cayote* and *Bluestone*. A total of 13,595 tons of ore was mined and treated in the mill.

**Nugget (Old Workings).**—This property was operated continuously throughout the year under lease to A. Endersby, Jr., of Fruitvale, B.C. Four men were employed and all the work was done by hand-steel. Ore was recovered from pillars and stope remnants.

ERIE CREEK.

**Relief-Arlington Mines, Ltd.** Company office, 626 Pender Street West, Vancouver, B.C.; mine office, Erie, B.C.; Bert F. Smith, President and Managing Director; D. G. Marshall, Secretary-Treasurer; J. C. McCutcheon, General Superintendent. Capital: 3,000,000 shares, $1 par; issued, 3,000,000. The company is controlled by the Premier Gold Mining Company, Limited, which holds 1,530,000 shares. The company owns and operated the *Second Relief* mine on Erie Creek, 13 miles from Salmo, B.C. The mine and mill operated continuously until June 15th, 1941, employing an average of ninety-four men, with fifty-two working underground. It was then closed down as ore reserves for an operation of that size had become exhausted. Development for the period operated included 83 feet of drifting, 29 feet of crosscutting, and 174 feet of raising on the Second Relief vein, and 162 feet of drifting, 15 feet of crosscutting, 60 feet of raising, and 59 feet of sinking on the Inez and Rand veins. A total of 14,310 tons of ore was milled and the bullion yielded 5,306 oz. of gold and 1,857 oz. of silver. The company went into voluntary liquidation on November 15th, 1941.

**Arlington.** This property, on Keystone Mountain, 3½ miles from Erie, B.C., is owned by the Relief-Arlington Mines, Limited, and was operated under lease by R. Oscarson, of Spokane, Washington. Thirteen men were employed continuously throughout the year and hand-steel only was used. A total of 772 tons was shipped to Trail.

**Keystone.** This property, on Keystone Mountain, about 3½ miles from Erie, B.C., was operated by the Slocan Silver Mines, Limited, under lease and bond. A crew of ten men was employed under the direction of Geo. Allen, of Nelson, B.C. Development-work, all done with hand-steel, included 232 feet of drifting, 25 feet of crosscutting, and 300 feet of surface-trenching. In addition to this, 2½ miles of the present road was reconditioned and 1,800 feet of new road built to give access to the portal of the new low-level tunnel. The operation was closed in November.

ROSS SPUR.

**Reliance.**—This property, near Ross Spur and about 9 miles south of Salmo, was operated for a short time early in the year by G. H. Grimwood and associates. Four men were engaged and a small mining plant was used.

SOUTH KOOTENAY LAKE AREA.

**Bayonne Consolidated Mines, Ltd.** Company office, 308 Pacific Building, Vancouver, B.C.; mine office, Bayonne, B.C.; W. C. Ditmars, President; H. T. Wilson, Secretary-Treasurer; J. A. Paterson, Mine Manager. Capital: 2,500,000 shares, no par value; issued, 2,500,000. The company owns and operates the *Bayonne* mine, on Summit Creek, 23 miles by road from Tye Siding. The mine and mill were operated continuously throughout the year, an average crew of seventy-two men, with thirty-eight underground, being employed. During the summer a new office was built to replace the one destroyed by fire last year and another bunk-house to accommodate twenty men was erected. Development-work included 2,414 feet of drifting, of which 49 feet was done on the Main vein and the remainder on the "A" vein; 95 feet of crosscutting and 148 feet of raising on the "A" vein, 4,849 feet of diamond-drilling and 200 feet of surface-trenching. A total of 20,224 tons of ore was mined and treated in the mill, and this yielded 8,274 oz. of gold and 17,575 oz. of silver.

[Reference: Annual Report, 1937, Part E.]

**Spokane.** This property, owned and operated by R. M. and K. K. Laib, is on Wall Mountain, 18 miles from Tye Siding. Seven men were employed during the summer and autumn. Hand-steel only was used. A total of 482 tons, shipped from the old dumps and underground workings, yielded 276 oz. of gold, 3,226 oz. of silver, and some lead and zinc.

[Reference: Annual Report, 1937, Part E.]

## TEXADA ISLAND.

**Gem Gold Mines, Ltd.** Company office, 1604 Royal Bank Building, Vancouver, B.C.; mine office, Vananda, B.C.; Ralph A. Logan, President; J. D. Logan, Secretary-Treasurer; W. J. Slater, Mine Manager. Capital: 2,000,000 shares, $1 par; issued, 1,675,358. This company owns the *Gem* mine on Texada Island, 5 miles from Blubber Bay. Some further development-work has been done from the bottom of No. 2 shaft in Nos. 1 and 2 veins, but the mine was closed for the greater part of the year.

## VANCOUVER ISLAND.

### ZEBALLOS.

**Privateer Mine, Ltd.** Company office, 602 Stock Exchange Building, Vancouver, B.C.; D. S. Tait, President; N. E. McConnell, Manager. Capital: 2,500,000 shares, no par value; issued, 2,454,080. The company operates the *Privateer* mine in Spud Valley, 4 miles by road from Zeballos. The property is equipped with a 75- to 90-ton amalgamation and cyanide mill. No. 2 vein has been stoped on most of the levels and Nos. 3 and 4 veins opened up on the levels above the 1,100, which is the main haulage-level. The shaft was sunk to the 1,300 level and some drifting and raising done on the 1,300 and 1,200 levels. The total amount of drifting for the year amounted to 1,867 feet; raising, 300 feet; sinking, 92 feet; crosscutting, 1,512 feet; diamond-drilling, 1,985 feet. Ninety-eight men are employed.

[Reference: Lode-gold Deposits, Zeballos Area, 1938.]

**Prident Mine.** This mine adjoins the *Privateer* and is owned and operated by Privateer Mine, Limited. Very active development has been carried out during the year; the 200, 400, and 500 levels being opened up and drifting and stoping carried on in each. A crosscut is being driven from the 600 level in the *Privateer* mine to connect with the veins in the *Prident*. This will greatly simplify the haulage operations, as at present the ore from the *Prident* mine is shipped by truck to the *Privateer* mill. Total drifting done was 1,490 feet; raising, 50 feet; and crosscutting, 332 feet. Total number of men employed is twenty-seven.

**White Star Mine, Ltd.** Company office, 814 Rogers Building, Vancouver, B.C.; mine office, Zeballos, B.C.; R. P. Stockton, President; T. D. Pickard, Manager. Capital: 200,000 shares, $1 par. This company operates the *White Star* mine on Spud Creek. Most of the work for this year was stoping in Nos. 1 and 3 levels. Development-work comprised 291 feet of drifting, 25 feet of raising, and 295 feet of diamond-drilling. The average number of men employed throughout the year was twelve.

[Reference: Lode-gold Deposits, Zeballos Area, 1938.]

**Mount Zeballos Gold Mines, Ltd.** Company office, 1001 Federal Building, Toronto, Ont.; mine office, Zeballos, B.C.; F. M. Connell, President; A. Cockeram, Secretary-Treasurer; W. S. Hamilton, Mine Manager. Capital: 1,500,000 shares, $1 par; issued, 1,100,000 shares. The company operates the *Mount Zeballos* mine, on the west side of Spud Creek. During the year three new levels were opened up and stoping continued on all the other levels. The levels operating now are the 1,500, 1,700, 1,800, 1,900, 2,000, 2,150, and 2,250. In addition to this some development-work was done on the Farris vein. Two levels—the Farris 1,800 and Farris 1,900—were opened up on this vein. Development-work completed during the year was as follows: Drifting, 2,264 feet; crosscutting, 115 feet; raising, 1,531 feet;

and diamond-drilling, 2,290 feet. The average number of men employed throughout the year was seventy-two.

[Reference: Annual Report, 1938, Part F.]

**Zeballos (Pacific) Gold Mines, Ltd.**—Company office, 132 Hastings Street West, Vancouver, B.C. This company was operating on the *Gold Peak* property. Two drifts had been driven a considerable distance, one on the No. 4 vein and one on No. 1 vein, but work was discontinued in the early part of the year.

**Spud Valley Gold Mines, Ltd.** Company office, 703 Royal Trust Building, Vancouver, B.C.; mine office, Zeballos, B.C.; P. F. Knight, President; William Elliott, Manager. Capital: 2,500,000 shares, $1 par; issued, 2,325,000. The company operates the *Spud Valley* mine in Spud Valley, 7 miles from Zeballos. The claims extend beyond the ridge between Spud Valley Creek and Gold Valley Creek. The Goldfield and Spud veins have been developed in all the levels and stoping carried out. Some development-work has also been done on the Roper vein from the Gold Valley side of the ridge. The *Big Star* group of claims across the Gold Creek Valley from the present operations was acquired by the company. A jig-back aerial tramway, 3,000 feet in length, with terminals and ore-bins, was constructed to connect with No. 4 tunnel; thus transporting the ore through to the *Spud Valley* aerial tramway and finally to the mill. The following development-work has been done for the year: *Spud Valley* mine—drifting 3,061 feet, crosscutting 72 feet, raising 255 feet; *Big Star* mine—drifting 795 feet and crosscutting 233 feet. The number of men employed at the *Spud Valley* operations is 110 and at *Big Star*, twenty-five.

**Reno Gold Mines, Ltd. (Central Zeballos Mine).** N. F. Brookes, Manager. Mr. Brookes was succeeded as manager by Mr. C. Starr. Stoping in the Nos. 1, 2, 3, and 4 levels continued throughout the year and further drifting in the Nos. 3 and 4 levels in the winze. The principal development has been driving a crosscut at mill-level, known as No. 9 tunnel, to contact the vein below the present workings. This was completed and 380 feet of drifting at this level was done. When connections are made with the upper workings, the haulage system for the whole of the operation will be greatly simplified. The development-work done amounted to: Drifting, 1,004 feet; raising, 303 feet; crosscutting, 2,140 feet; and diamond-drilling, 661 feet. About fifty-four men are employed.

[Reference: Annual Report, 1938, Part F.]

**C.D. Mining Co., Ltd.** Mine office, Zeballos, B.C.; T. C. Denton, President and Mine Manager; W. S. Lane, Secretary. Capital: 200,000 shares, $1 par; issued, 200,000 shares. This company operates the former *Rey Oro* mine in Gold Creek Valley. A winze was sunk from the 1,200 level to the 1,300 and 1,400 levels and the ore shipped to Tacoma. The mine closed down in August, 1941.

**Homeward Mines, Ltd.** Company office, 703 Royal Trust Building, Vancouver, B.C.; J. M. Wood, President; R. C. McCorkell, Managing Director; H. E. Smith, Manager. Capital: 3,000,000 shares, 50 cents par. The property of this company is in Nomash Valley. Two levels in the vein have been developed, Nos. 1 and 2, and some stoping done. A 50-ton mill was constructed and new bunk-house and dining-room. About thirteen men have been employed underground.

[Reference: Annual Report, 1938, Part F.]

### Bedwell River.

**Musketeer Mines, Ltd.** Company office, 607 Rogers Building, Vancouver, B.C.; H. T. James, Managing Director; R. D. Mason, Mine Manager. Mining operations have been carried on steadily throughout the year, a small crew of hand-steel miners doing a certain amount of drifting in the upper workings from January 1st to the early part of April, when the regular crew returned to the property and work was resumed on a normal scale. During the last nine months of the year the average number of men employed was nineteen above ground and six underground. Mill-construction was begun on August 7th, this being completed and

ready for operating on December 15th. The mill employs the flotation method and is designed to treat 25 to 30 tons per day. Actual milling commenced on December 16th, 140 tons of low-grade ore being treated to January 1st, 1942. No shipments of bullion or concentrates had been made to the end of the year. Underground operations included 455 feet of drifting, 29 feet of crosscutting, and a raise 300 feet long which was driven to connect the main vein crosscut tunnel with the 1,000 level for ventilating purposes and provide a second outlet.

[Reference: Bulletin No. 13, 1941.]

**Buccaneer Mines, Ltd.**

Company office, 555 Burrard Street, Vancouver, B.C.; H. L. Hill, General Manager. Mining operations were resumed for the present season at the end of May and were continuous to the end of the year. Development-work included 810 feet of crosscuts, 22 feet of drifts, and 140 feet of raises. Construction of a small mill was begun in the middle of June and completed on August 8th. This building is at the terminus of the newly-completed truck-road which gives access to the mines from the landing at the head of Bedwell Sound and is approximately 10 miles in length to the *Buccaneer* mill. The ore is transported down the mountain from the mine by an aerial tramway, 3,600 feet long, which is operated by a single rope haul-back method. Two buckets, each with a capacity of half a ton of ore, are connected tandem fashion to a ½-inch-diameter running rope and run on a 1½-inch carrying cable. The power plant at the mine consists of one Ingersoll-Rand type 40 compressor and one Sullivan portable compressor; these machines are driven by Diesel caterpillar engines and each has a capacity of 210 cubic feet of air per minute.

[Reference: Bulletin No. 13, 1941.]

## Nitinat River.

**Black Panther Mine.**

Company office, 605 Rogers Building, Vancouver, B.C.; H. T. James, Managing Director; E. H. Parr, Mine Manager. This property, owned by W. Harris and associates, of Port Alberni, is near the headwaters of the Nitinat River. During the present year these claims were operated under option by Pioneer Gold Mines of B.C., Limited, and in January this company contracted with C. H. Cox to do a specified amount of drifting. This contract was terminated in April and all subsequent operations were then carried on under direct company supervision. The surface plant consisted of a small blower-fan driven by a 2½-horse-power gasoline-engine, while the necessary blacksmith equipment and a suitable magazine were located convenient to each tunnel. All drilling done underground by hand-steel miners. A substantial log cabin was used as a cook-house and dining-room, while the men were accommodated in a frame building and three tents partly of frame construction. Work carried out during the year included: Drifting, 907 feet; crosscutting, 297 feet; raising, 66 feet; diamond-drilling, 1,631 feet. An average crew of eleven men was employed from April to the end of the year.

## Nanaimo.

**Thistle Mine.**

Company office, Bank of Toronto Building, Victoria, B.C.; R. A. Pitre, General Manager; D. E. Foote, Mine Manager. This mine is being operated by Vancouver Island Diamond Drilling and Exploration Company, and has been providing steady employment for an average crew of six men from April 1st to the end of the year. The surface plant consists of a Schramm compressor having a capacity of 220 cubic feet of air a minute, this being driven by a 65-horse-power Allis-Chalmers engine. A total of 670 tons of ore was mined and shipped to Tacoma, the greater portion of this tonnage being taken from surface open-cuts. Underground work included: Drifting, 160 feet; raising, 31 feet.

## Great Central Lake.

**Sherwood and P.D.Q. Claims.**

H. T. James, Managing Director; E. H. Lovitt, Mine Manager. These properties are in the Della Falls area of the Great Central Lake district and were operated under option by Pioneer Gold Mines of B.C., Limited, from March 1st to November 15th, 1941, with an average

crew of eighteen men employed between the two groups of claims. The surface equipment consists of a very small portable compressor, a small blower-fan driven by a 2½-horse-power gasoline-engine and three portable blacksmith outfits. Surface buildings include the packer's quarters and warehouse near the end of the logging-railway; a substantial log cabin, 16 by 32 feet, on Drinkwater Creek; a well-built log cabin, 14 by 16 feet, as a cook-house and dining-room; and a 14- by 16-foot frame construction bunk-house; the two latter buildings are convenient to the entrance to No. 7 tunnel. Underground work done during the year included: Drifting, 760 feet; crosscutting, 90 feet; raising, 270 feet; all of the above being done on the *Sherwood* claims. Work done on the *P.D.Q.* claims included 684 feet of drifting and crosscutting. All operations were indefinitely suspended on both of these properties on November 15th.

[Reference: Bulletin No. 13, 1941.]

## GOLD-COPPER DEPOSITS.

### TELKWA.

#### Hunter Basin.

The Conwest Exploration, Limited, worked at Hunter Basin until late in September, when operations were abandoned and all equipment taken from the property. A total of 248 tons of ore yielded 209 oz. gold, 5,652 oz. silver, as well as copper.

### GREENWOOD-GRAND FORKS AREA.

**Granby.** This property, at Phoenix, is owned and operated by W. E. McArthur, of Greenwood, B.C. It is equipped with a complete small mining plant and the ore is treated in the *Providence* mill near Greenwood. An average of twelve men was employed continuously throughout the year. Development-work included 250 feet of drifting, 125 feet of raising, 50 feet of sinking, and 2,100 feet of diamond-drilling. Ore totalling 7,643 tons was mined and milled and the concentrates shipped to the Tacoma smelter.

**Athelstan.**—This property, in the Wellington Camp, near Phoenix, is owned by W. E. McArthur, of Greenwood, B.C. A small gasoline-driven compressor was used to do 125 feet of drifting during the summer. Two men were employed.

**Winnipeg.**—This property, in the Wellington Camp, near Phoenix, was operated under lease by W. E. McArthur. Work was confined to trenching and surface-stripping.

#### Boundary Falls.

**Ruby.**—This property, three-quarters of a mile from Boundary Falls, on the *No. 7* road, is leased by George Boag and partner, of Greenwood, B.C. To date work has consisted of retimbering and reconditioning the old tunnels.

### ROSSLAND AREA.

**Consolidated Mining and Smelting Co. of Canada, Ltd.** Company office, 215 St. James Street, Montreal, P.Q.; mine office, Trail, B.C.; Sir Edward Beatty, Chairman; S. G. Blaylock, President and Managing Director; J. E. Riley, Secretary; Jas. Buchanan, General Manager; R. W. Diamond, Assistant General Manager. Capital: 4,000,000 shares, $5 par; issued, 3,271,669. This company owns the *Centre Star, War Eagle, LeRoi, Josie, Iron Mask, No. 1, Annie,* and *Columbia Kootenay* on Red Mountain, near Rossland, B.C. These properties were operated continuously throughout the year by leasers. From fifty to sixty men were engaged in mining ore from the surface and underground on from sixteen to eighteen

separate leases. Some of the groups have installed small complete mining plants. During the year the company carried out a programme of resampling and about 4,000 feet of diamond-drilling throughout the old workings, the results of this work being made available to the leasers. The work of the leasers was carried on under the supervision of J. K. Cram, of Trail, B.C.

**St. Elmo.** This property, on Red Mountain, near Rossland, is owned and operated by A. Grubsic and Ike Glover of Rossland, B.C. It is equipped with a complete small mining plant. Much of the 2,300 feet of underground workings were reopened and reconditioned.

**Phoenix.**—This property, in the South Belt near Rossland, is operated under lease by S. Berglund and O. Osing, of Rossland, B.C. About 120 feet of tunnel was driven during the year with hand-steel.

**Velvet.** This property, on the Cascade Highway, 13 miles east of Rossland, is owned by the Velgo Mining, Incorporated, of Seattle, Washington, and is operated under lease by the Velvet Gold Leasers, consisting of Harold S. Elmes and Renaldo Bielli, of Rossland, B.C. The property is equipped with a complete mining plant and 100-ton flotation-mill. Twenty-five men were employed continuously throughout the year with twelve working underground. Development included 495 feet of drifting, 146 feet of crosscutting, 230 feet of raising, and 2,492 feet of diamond-drilling. A total of 8,432 tons of ore was milled and the product, a gold-copper concentrate, was shipped to Tacoma. This yielded 1,515 oz. of gold and 1,399 oz. of silver.

## SILVER-GOLD-LEAD DEPOSITS.

### GREENWOOD AREA.

**Providence.** This property, about 1 mile north of Greenwood, was operated under lease continuously throughout the year by W. E. McArthur, of Greenwood, B.C., and associates. It is equipped with a small complete mining plant. A crew of thirteen men with seven underground was employed. Development included 500 feet of drifting, 125 feet of raising, and 2,600 feet of diamond-drilling. Ore totalling 1,899 tons was mined and shipped to Trail. Smelter returns gave 796 oz. of gold, 247,654 oz. of silver, and some lead and zinc.

## SILVER-LEAD-ZINC DEPOSITS.

### BEAVERDELL AREA.

**Highland Bell, Ltd.** Company office, Creston, B.C.; mine office, Beaverdell, B.C.; F. V. Staples, Managing Director. Capital: 1,500,000 shares, $1 par value; issued, 1,315,856. The company owns and operates the *Highland Bell* mine, on Wallace Mountain, about 5 miles from Beaverdell, B.C. The property was operated continuously throughout the year, a crew of thirty-nine men being employed under the direction of A. B. Staples. Development-work included 350 feet of drifting, 400 feet of crosscutting, 130 feet of raising, 50 feet of sinking, and 450 feet of diamond-drilling. A total of 5,758 tons of ore was mined and shipped to Trail. This yielded 410 oz. of gold and 892,868 oz. of silver, as well as lead and zinc.

**Sally Mines, Ltd.** Company office, Penticton, B.C.; S. J. Crocker, President; H. B. Morley, Secretary-Treasurer. Capital: 1,000,000 shares, $1 par value; issued, 1,000,000. The company owns the *Sally* mine on Wallace Mountain, adjoining the *Highland Bell*. The property is equipped

with a complete mining plant. This was not operated during the year. The property was operated entirely by leasers, who carried on some development and salvage operations in different parts of the mine. A total of 108 tons of ore was mined and shipped to Trail. This yielded 2 oz. of gold, 12,648 oz. of silver, and some lead and zinc.

**Beaverdell Wellington Syndicate, Ltd.**—Company office, Greenwood, B.C.; Jas. Kerr, President; G. S. Walters, Secretary-Treasurer. Capital: 50,000 shares, $1 par value; issued, 50,000. This company owns the *Wellington* mine on Wallace Mountain, adjoining the *Sally*. During the year the mine was leased to A. J. Morrison and associates. Hand-steel only was used. Ore was mined and shipped to Trail.

**Highland Chief.** This property is on Wallace Mountain and adjoins the *Highland Bell*. It is owned by Mark Smith, of Beaverdell, B.C., and was operated for a short time by Alex. Bell and associates, two men being employed. Hand-steel only was used.

**Bounty Fraction.** This property is on Wallace Mountain. It is controlled by the Beaverdell Wellington Syndicate and was operated under lease by Oluf Houlind and associates. Four men were employed. It is equipped with a complete small mining plant which was used by the leasers.

## LARDEAU AREA.

**Silver Cup.** This property is on Silver Cup Mountain, about 10 miles from Ferguson, B.C. It is equipped with a 35-ton flotation-mill but has no mining equipment which could be used. It was operated under lease and bond by Messrs. Larsen, Broomfield, and Malone, of Princeton, B.C. A total of twelve men was employed under the direction of E. Larsen. Efforts were directed to milling the dump at the portal of the No. 7 level but, in addition, some underground work was done toward reconditioning these workings. Some ore was treated in the mill and the concentrates shipped to Trail. Late in the year the operation was suspended for the winter because of snow conditions.

## SLOCAN AREA.

### KASLO-THREE FORKS.

**Lucky Boy.** This property, at Blaylock, was operated under lease and bond by the Lucky Boy Mining Syndicate; office, 404 Hastings Street West, Vancouver, B.C. Four men were employed under the direction of W. J. Norrie and a small amount of development-work was done by hand-steel. The shaft is equipped with a small gasoline-driven hoist.

**Caledonia.**—This property, near Blaylock, was operated for a short time by J. E. McCready, who shipped 11.2 tons. This yielded 1,169 oz. of silver and some lead and zinc.

**Zincton Mines, Ltd.** This company is a subsidiary of Sheep Creek Gold Mines, Ltd. It owns and operated the *Zincton (Lucky Jim)* mine at Zincton, B.C. The property is equipped with a complete mining plant and a selective flotation-mill of 220 tons daily capacity. Diesel power is used. Up to June, 1941, ten to eighteen men were employed and work was directed toward reconditioning the mine, mill, and power plant. After that date milling was commenced and a crew of fifty men permanently maintained. The work is now under the direction of F. R. Thompson. Development-work included 190 feet of drifting, 138 feet of cross-cutting, and 2,069 feet of diamond-drilling. A total of 38,208 tons of ore was milled and the zinc concentrate shipped to the Anaconda smelter near Butte, Montana.

### SANDON-THREE FORKS.

**Payne, Washington, Slocan Boy.** These properties, situated on the Payne Ridge, near Sandon, have been consolidated and are being operated by a syndicate under the direction of Arthur Lakes, of Nelson, B.C. Work this year included a topographical and geological survey of part of the area included in these holdings, with the idea of finding a duplication of structural conditions which occur in

the vicinity of the known ore-bodies. This work was started in 1940. Surface-trenching to the extent of two cuts, one 90 by 11 by 14 feet and one 70 by 15 by 18 feet, comprising a total of 606 cubic yards, was done last fall before snow conditions made it advisable to suspend operations until the spring.

**Ruth Hope Mining Co., Ltd.** Company office, Vancouver Block, Vancouver, B.C.; R. H. Stewart, President; R. S. Lennie, Secretary-Treasurer. Capital: 2,500,000 shares, par $1; issued, 1,500,000. The company owns the *Ruth Hope* mine at Sandon, B.C. During the year the property was operated by leasers who shipped 90 tons of ore to Trail. This yielded 5,889 oz. of silver and some lead and zinc.

**Victor.**—This property, 3 miles from Sandon, is owned by Mrs. D. Petty, of Nelson, B.C., and is operated under lease by E. Doney and son. A total of 76 tons of ore was shipped to Trail, which yielded 5 oz. of gold and 8,296 oz. of silver.

NOTE.—A small amount of work was done on the following properties in this area and small shipments made: *Silvenite,* by E. J. Vandergrift; *Hinkley* mine, by Wm. Pengelly; *Monitor,* by S. Silibean.

## SILVERTON-NEW DENVER.

**Bosun.**—This property is on Slocan Lake, between Silverton and New Denver. It is owned by J. Colin Campbell, of New Denver, B.C. During the year leasers shipped 32 tons of ore, which yielded 2,520 oz. of silver and some lead and zinc.

**Galena Farm Consolidated Mines, Ltd.** Company office, 616 Stock Exchange Building, Vancouver, B.C.; James Anderson, Secretary-Treasurer. Capital: 2,500,000 shares, no par value; issued, 1,602,203. This company owns the *Hewitt* mine, about 6 miles from Silverton, B.C. During the year it was operated under lease by H. V. Dewis, of Silverton, B.C. Hand-steel only was used. A total of 240 tons was shipped to Trail.

**Western Exploration Co., Ltd.** This company operated the *Standard* mine, on Emily Creek, about 3 miles from Silverton, B.C. The property is equipped with a complete mining plant and a 200-ton selective flotation-mill. The property operated continuously throughout the year with an average crew of fifty men, eighteen of whom were employed at the mine, all being under the direction of A. M. Ham, of Silverton, B.C. Development included 268 feet of drifting, 789 feet of raising, and reconditioning 6,100 feet of old tunnels. A total of 60,000 tons of zinc tailings was dredged from Slocan Lake and treated in the mill and, in addition to this, some 12,000 tons were extracted from the mine and also milled. The concentrate was shipped to the U.S. Smelting and Refining Company's plant near Kellogg, Idaho.

**Enterprise.** This property is on Enterprise Creek, about 5 miles from the Slocan Highway. It was operated under lease by S. N. Ross, of Nelson, B.C. During the summer a small flotation-mill, driven by water-power, was installed and tailings treated from an old dump. A total of eight men was employed. Operations were suspended during the winter.

## SLOCAN CITY.

**Ottawa.** This property is on Springer Creek, about 5 miles from Slocan. It is operated under lease by W. Hicks and associates, of Slocan, B.C. Four to five men were employed and hand-steel only was used. A total of 43 tons was shipped to Trail and this yielded 15,143 oz. of silver.

**Speculator.**—This property is on Springer Creek, about 7 miles from Slocan, and was operated under lease by H. M. Parker, of Trail, B.C.

NOTE.—In addition to the above operations, a small amount of work, chiefly development and assessment, was done on the following properties in this area: *Myrtle,* by Roy F. Ainslee; *L.T.* mine, by D. B. O'Neail; *Richmond,* by Chas. Lindstrom; *Bondholder,* by P. McGuire; *Jack,* by James L. Howard; and the *Republic No. 2,* by C. W. Tipping.

## AINSWORTH.

**Spokane-Trinket.**—This property, adjoining the *Banker*, near Ainsworth, is being developed under the supervision of Carl Mohr, of Ainsworth, B.C. Late in the year the small mining plant was put in commission and eight men employed in underground work.

## CRANBROOK AREA.

**Consolidated Mining and Smelting Co. of Canada, Ltd.** Company office, 215 St. James Street, Montreal, Quebec; mine office, Trail, B.C.; Sir Edward Beatty, Chairman; S. G. Blaylock, President and Managing Director; J. E. Riley, Secretary; Jas. Buchanan, General Manager. Sullivan mine office, Kimberley, B.C.; William Lindsay, General Superintendent; Jos. R. Giegerich, Mine Superintendent; Hubert R. Banks, Mill Superintendent. The company owns and operates the *Sullivan* mine at Kimberley.

The *Sullivan* mine on Mark Creek and the concentrator at Chapman Camp were operated throughout the year on an unprecedented scale. The rather complex operating problem presented by the necessary reversal of the relative proportions of lead and zinc mined, which the demands of national war economy thrust upon the management, has been solved successfully. In addition, the handling of the enlarged output was by no means a light task. In the latter respect an innovation is the project now under way, with the completion of which the ore crushed on the 3,500-foot level will be raised to the main crosscut adit by means of a series of conveying belts. Much of the preliminary work has already been done and the driving of the long incline, on a gradient of about 16 degrees, has been in progress for some time. When in service, this installation will supplant the present hoisting system at the 3,901 shaft, which will then be required only for the transportation of men and supplies, the shaft itself being eventually displaced for this purpose by another opening, work on which is now well advanced. These new connections will not only facilitate the handling of the output but, besides, will greatly improve the ventilation of the shaft-workings, for which it is also planned to provide a separate intake in the form of a raise to be driven to the surface from the 39,121 drift.

Filling operations involved the placing of 322,271 cubic yards of stowing material in the course of the year, of which 11,347 cubic yards were obtained from development, 66,300 were the result of controlled caving, and 244,624 came from the surface. The volume of stowing thus placed every year, while considerable, still remains behind that corresponding to the tonnage extracted.

The development-work done in the period under consideration included 6,768 feet of drifting, 9,253 feet of raising, 67 feet of sinking, and 10,273.5 feet of diamond-drilling.

At the concentrator, the tin-recovery plant has been operated satisfactorily through the greater part of the year and the erection of smelting equipment to handle its output is in progress. The tailings from the *Sullivan* ore consist mostly of pyrrhotite and is stored separately.

In December there were 940 persons on the pay-roll, of whom 700 were employed underground and 240 on the surface, but, owing to absenteeism ascribed to various causes, these numbers were reduced to averages of 645 and 225 per day, respectively. The total number of men employed in all capacities at the concentrator was 374.

**St. Eugene Mining Corporation, Ltd.**—Company office, 25 King Street West, Toronto, Ontario; W. S. Morlock, President; W. B. Malone, Secretary-Treasurer. This company holds properties on both sides of Moyie Lake, these including the *St. Eugene Extension* and the *Aurora*. Nothing was done on either of these in the course of the year.

## GOLDEN AREA.

**Base Metals Mining Corporation, Ltd.** Company office, 350 Bay Street, Toronto 2, Ontario; J. H. C. Waite, Toronto, President; Hon. Chas. McRae, Toronto, Vice-President; J. C. Ames, Toronto, Secretary-Treasurer; mine office, Field, B.C.; John D. Galloway, Manager; Hy. D. Forman, Mine Superintendent; Jas. A. Edwards, Mill Superintendent. This company operated the *Monarch* and *Kicking Horse* mines throughout the year.

Both the east and west sections of the *Monarch* mine, situated on Mount Stephen, were operated during the year, the former contributing the greater part of the output. In the latter some exploratory, but no actual development, work was done, the output coming entirely from further benching of the floor in stopes and from the extraction of pillars. In the *East Monarch* a new lens of ore was discovered, penetrated by a drift started from one of the inner stopes, and was being prepared for extraction at the end of the year. The ventilation presents some difficulties, owing to the general configuration of the workings.

At the time of the last inspection, sixty-six men were employed; twenty-three underground, twenty others in various capacities on the surface, and twenty-three at the concentrator, at which the output of the *Kicking Horse* mine was treated as well as that of the *Monarch*.

The *Kicking Horse* mine is situated on Mount Field, at about the same elevation above the floor of the valley as the *Monarch*. Two ore-bodies were worked during the year, the ore being brought down by an aerial tramway to a storage-bin near the highway, from which it was loaded in trucks and transported to the *Monarch* mill. All openings are on the face of a very steep cliff and have to be reached from the trail by means of ladders. When visited, in the month of November, the mine employed a total of twenty-four men, of which all but one were working underground.

## COPPER DEPOSITS.

### SIMILKAMEEN RIVER AREA.

#### PRINCETON.

**Granby Consolidated Mining, Smelting & Power Co., Ltd.**

Julian B. Beaty, President, New York; A. S. Baillie, Vice-President and General Manager, Copper Mountain, B.C.; W. R. Lindsay, Assistant General Manager, Allenby, B.C.; W. I. Nelson, General Superintendent, Copper Mountain, B.C.; F. Buckle, Mine Superintendent, Copper Mountain, B.C. Capital: 600,000 shares, $5 par; issued, 450,260. The *Copper Mountain* mine and the concentrator at Allenby have been in continuous operation since operations were resumed early in 1937, following a suspension of several years. The mine is near the peak of Copper Mountain, at an elevation of 4,000 feet, and is 12 miles west of Princeton; the concentrator is at Allenby, 4 miles west of Princeton. A branch line of the Kettle Valley Railway, from Princeton, connects all three points.

The main development of the mine is by two main adit haulage-tunnels known as Nos. 2 and 6 levels; all the ore is passed by haulage and transfer-chutes to No. 6 level, on which is the main transportation system of the mine. The ore is crushed at the portal of No. 6 level and carried on the railway to the concentrator at Allenby, 8 miles distant. During the year development continued on the more recently opened Nos. 7 and 8 levels. These are serviced by a well-equipped vertical shaft from the upper levels.

Development during the year consisted of 8,493 feet of drifting and crosscutting, 17,803 feet of raising, 7 feet of sinking, eight large and two small chutes and sixty-five grizzlies. Diamond-drilling amounted to 27,820 feet.

The average number of men working during December (exclusive of townsite and staff employees) at Copper Mountain was 400, of whom 298 were employed underground. Labour turnover was extremely high during the year; 397 men quit or were discharged and 488 new employees were hired. At the end of the year about half of the underground crew were "green" men; this including practically all the nippers and helpers.

A total of 180 employees were engaged at the Allenby mill and twenty-seven employees at the power plant at Princeton.

### VANCOUVER AREA.

**Britannia Mining and Smelting Co., Ltd.**

Company office, 730 Fifth Avenue, New York City; mine office, Britannia Beach, B.C.; E. B. Schley, President; C. P. Charlton, Secretary-Treasurer; C. P. Browning, General Manager; and George C. Lipsey, Superintendent. The company operates the *Britannia* mines at Britannia Beach on Howe Sound. The property is fully equipped with mining and milling plant to handle 6,000 to 7,000 tons per day. The regular development-work and stoping has been carried on in the *Victoria, Fairview, No. 5,* and *Bluff* mines. The 4,100 tunnel at mill-level has now been connected to the bottom of the Victoria shaft, and No. 6 inclined shaft has been continued to the 4,500 level and 4,500 level drifted on for a considerable distance with satisfactory results. Development-work over the whole mine was made up as follows: Drifting, 18,791 feet; crosscutting, 2,382 feet; and shafts and raises, 6,564 feet. A total of 45,437 feet of diamond-drilling was done. The average number of men employed fell to 870.

The recovery of the metals was augmented by the operations of the copper precipitation plant which continued to treat the copper-bearing portion of the mine-drainage water.

## ANTIMONY DEPOSITS.

### BRIDGE RIVER AREA.

**Stewart and Federal Groups.**—Arthur LeClere and associates, of San Francisco, made a test shipment of 30 tons of cobbed ore; 17 tons from the *Stewart* group on Ferguson Creek and 13 tons from the *Federal* group at Minto. The season was largely devoted to an exploratory campaign.

## MAGNESITE DEPOSITS.

### WILLIAMS LAKE AREA.

**B.C. Magnesium Co., Ltd.**

Company office, 1010 Hall Building, Vancouver, B.C.; C. F. Anderson, President; H. H. Reid, Managing Director. This company holds twenty-four claims near St. Joseph Mission, 14 miles south of Williams Lake, and also on the Bonaparte River, about 5 miles north-east of Clinton. At the first location the company, with E. R. Shepherd supervising, put down seven diamond-drill holes; total footage, 1,200 feet. The holes were spaced about 500 feet apart and staggered across the 3,000-foot known width of the deposit, which is about 4,500 feet long. Several holes extending to at least 200 feet below the general plain level and were still in serpentine.

At the last location the serpentine extends about 9,000 feet alongside a hill and is known to be about 2,000 feet wide. Six holes were drilled, the deepest of which was 196 feet.

### CRANBROOK AREA.

**Consolidated Mining and Smelting Co. of Canada, Ltd.**

In the early summer about 3,000 tons was mined from the outcrop of the magnesite-bed, discovered thirteen years ago by the Geological Survey west of the St. Mary River, and shipped to the Trail smelter for experimental treatment. The ore was hauled by trucks from the point of origin to a siding on the Kimberley branch of the Canadian Pacific Railway, a distance of about 10 miles. When it becomes expe-

dient to work the deposit on a larger scale, the construction of either a bridge across the river, or an aerial tramway, linking the operations with the same railway at Marysville, will simplify the transportation of the output to a considerable extent.

## MERCURY DEPOSITS.

### FORT ST. JAMES AREA.

#### PINCHI LAKE.

**Consolidated Mining and Smelting Co. of Canada, Ltd.**

E. Bronlund, Superintendent. Active development continued during the year and consisted of 5,204 feet of drifting, 1,418 feet of raising, and 13,682 feet of diamond-drilling. The mine worked 365 days. On the 600 (the Upper) level the glory-hole stope operated during the summer and four underground stopes were prepared for winter operation. The 400 and 500 levels have been started from 310 raise. Only drifting is being done on 500 level. A stope has been started on 400 level. One stope is operating on 300 level.

The 200 level is a new level starting from the surface at the elevation of the raw-ore bunker of the new mill. It is intended to be the main haulage-level of the mine. It is 8 by 8 feet in section and is in 1,200 feet to the ore-body. A raise is being put up in the ore to 300 level, which will come through on 300 in line with 310 raise from 300 to 600. Ore-transfer raises will be put through from 200 to 600 level and all ore drawn through these raises to 200 then trammed out to the mill-bunkers.

The new mill section is now in operation, with the exception of the refinery, which has increased the mill capacity. It is in three sections—crushing, retorts, and refinery.

All crushing for both the old and new retorts is now done in the new crushing plant. The ore is passed through a jaw-crusher where it is crushed to 2 inches, it is then conveyed to a set of screens where it is sized. All ore over 1 inch is conveyed by belt to the ore-bin at the old retorts, ore plus ½ inch is conveyed to a disk-crusher and crushed to minus ½ inch, then conveyed to the fine-ore bin at the new retort. All fine ore is put through the new retort which is designed to handle fine ore. Both crushing units and screen are enclosed and an exhaust-fan has been installed with pipe-lines to each unit to dispose of the dust created in crushing.

Disposal of the slag from the retorts is now fully automatic at both plants. Automatic feeders at the slag-bins feed the slag into sluice-boxes through which it is sluiced out to the dump.

The method of recovery of the mercury from the mud by raking on steam-heated tables by hand was to have been eliminated by using a cold filter-press. Some difficulties have been met with in this method and it has not yet been put into operation. The mud is still raked by hand on steam-heated tables. These tables are well hooded over and an exhaust-fan mounted over the hoods to draw air over the tables to prevent vapour escaping into the building.

A mask, approved by the U.S. Bureau of Mines for use in mercury vapour, is provided for each man. Masks are tested daily on the mineralite screen and if any trace of mercury vapour shows the filter is replaced with a new one. Air samples are taken each shift in all sections of the mill buildings where mercury vapour would be likely to be given off, these are tested on the screen. The retort buildings are ventilated by exhaust-fans placed in the highest point in the building and are of sufficient capacity to completely change the air in the building every five minutes. A clean suit of coveralls is furnished daily to each man engaged in the mill or in handling mercury. Medical examination of men engaged in the mill is made every two weeks. Most of the men engaged in the mill have been employed there continuously for about nine months. No suspected cases of mercurial poisoning have been reported during that period.

[Reference: Bulletin No. 5, 1940.]

### YALAKOM RIVER AREA.

**Red Eagle Group.**—J. Thompson, one of the owners of this group, worked alone on it during the 1941 season. He did some stripping and open-cut work and installed a small two-pipe furnace. It is reported that three flasks of mercury were shipped.

[Reference: Bulletin No. 5, 1940.]

**Golden Eagle Group.**—Work on this group was restricted to a small amount of open-cut work.

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## MOLYBDENUM DEPOSITS.

### SALMO AREA.

**Emerald.** This property, 9 miles from Salmo, B.C., is owned and operated by the Iron Mountain, Limited, of San Francisco. Two men were employed continuously throughout the year under the direction of Harold Lakes. During the summer the area lying between the *Dodger* and *Jersey* mineral claims, about 1½ miles long by ½ mile wide, was mapped for structure. This resulted in the discovery of altered limestone-beds containing both molybdenum and scheelite, which were later explored by surface-stripping. The commercial possibilities of this find has not yet been determined. Development-work underground included 70 feet of drifts and crosscuts on the *Dodger* claim and 32 feet of drifting in the old *Emerald* workings. In addition, 400 feet of stripping was done along the molybdenum zone and some 420 feet of stripping elsewhere on the property.

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## TUNGSTEN DEPOSITS.

### HAZELTON AREA.

**Consolidated Mining and Smelting Co. of Canada, Ltd.** *Red Rose Group.*—This is a new operation on Rocher Déboulé range at Hazelton. Diamond-drilling done by the company in 1940 apparently indicated a sufficient quantity of tungsten ore on the *Red Rose* to justify development and work was commenced in June. The road to the old *Rocher Deboule* mine is used to the point where it swings off from the creek just above the old power plant. The road was cleared out and a section of new road built up Red Rose Creek to the main camp and mill location at 3,900 feet elevation. From this point a "cat" road was constructed up the mountain to the mine camp-site at about 5,600 feet elevation. The portal of the tunnel is at 6,130 feet. A surface track has been laid up the mountain from the mine camp-site to the portal of the tunnel. This is being covered and a stairway provided for travelling. A gravity aerial tram has been built from the mine to the mill, a total length of 5,240 feet. The mine power-house and blacksmith-shop are at the mine camp-site. A two-stage compressor, Diesel driven, capacity 210 cubic feet, has been installed. A cook-house, bunk-house, and dry-room has been built.

A crosscut was started at 6,130 feet elevation and intersected the vein at 320 feet from the portal.

The main camp and mill are at 3,900 feet elevation just below timber-line. Mill capacity is 25 tons per day and consists of jaw-crusher, rolls, and jig with tables. There is a storage-room for concentrates. The mill is powered by a 75-horse-power Diesel-driven electric generator.

[Reference: Bulletin No. 10, 1941.]

### CARIBOO AREA.

**Columbia Tungstens Co., Ltd.** Company office, 61 Broadway, New York, N.Y.; F. Hewitt, President; A. E. Pike, Mine Superintendent. The small body of scheelite exposed at the end of the 1940 operation was soon mined out in 1941. After the failure of a detailed geological examination and some 2,000 feet of well-directed diamond-drilling to reveal further mineralization of importance, the mine was shut down.

[Reference: Bulletin No. 10, 1941.]

### BRIDGE RIVER AREA.

**Tungsten Queen.** This property, which has been operated by E. Phillips, locator, with some success, was optioned by the Consolidated Mining and Smelting Company of Canada, Limited, in September. From that time to the end of the year an adit at elevation 4,200 was advanced 54 feet and a lower adit at elevation 4,137 feet was collared and advanced 171 feet, both being driven by hand-miners. About 3 tons of high-grade ore has been mined and shipped to Chapman Camp. E. Phillips had previously shipped about 9 tons of high-grade ore to Ottawa.

[Reference: Bulletin No. 10, 1941.]

### REVELSTOKE AREA.

**Regal Silver.** This property on Woolsey Creek, about 8 miles from Albert Canyon, B.C., was reopened in July by A. S. McCulloch and associates. The property is equipped with a small complete mining plant and a combination gravity and flotation mill of about 70 tons daily capacity, the latter being located in a raise underground. From thirteen to nineteen men were employed under the direction of A. S. McCulloch. Efforts were directed to experimental work in an attempt to produce a marketable scheelite concentrate. A small roasting plant was built at Silver Creek siding on the railroad for this purpose. This was used in an attempt to get rid of the large pyrite content in the concentrates produced by the mill.

[Reference: Bulletin No. 10, 1941.]

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## PLACER-GOLD DEPOSITS.

### ATLIN AREA.

#### SPRUCE CREEK.

**Columbia Development, Ltd.** Mine office, Atlin, B.C.; A. R. Kaufman, President; E. G. Tyrer, Vice-President; James H. Eastman, Managing Director. Capital: 50,000 shares, $1 par; issued, 50,000. This company acquired a lay from John W. Noland on 2,000 feet of ground up-stream from the face of Noland's workings on the *Dream* lease. One of the conditions of the lay was that the company complete a second exit to the *Dream* lease. This was done by completing the sinking of No. 2 shaft and drifting out to the face of Noland's workings and making a connection there. The company then commenced drifting up-stream operating through No. 2 shaft.

Because of the widening of the pay-channel with consequent lessening of values per square foot of bed-rock, it was decided to try out a modified system of long-wall mining. This apparently worked fairly well until some very wet ground was encountered and the long-wall was temporarily abandoned. The water is coming from overhead following the face-line and is apparently from an area of swamp muskeg that is gradually draining into the workings. The overburden stood up very well under the

long-wall system, having been well timbered. The present method of working is to drive two drifts up-stream, one on each side of the pay-channel. The "J" drive is on the north side and on the rim; the "B" drive on the south side is not out to rim. These drives are about 200 feet apart and are kept ahead of the general face-line. A solid pillar, about 40 feet wide, is carried along each drive, with crosscuts about 50 feet apart being driven in to the working section. The section between these pillars, about 100 feet wide, is then taken out by splitting it in several sections and side-swiping. This appears to be working satisfactorily and the exits through "J" and "B" drives are in solid ground.

**Dream Lease.** John W. Noland is the owner and operator. Only pillar-extraction is being done in this section of the lease. All pumping for this area and the Columbia Development up-stream is through No. 1 shaft. A 300-gallon pump was installed at this shaft to handle the extra water from the Columbia workings.

**Spruce Creek Mining Co., Ltd.** Mine office, Atlin, B.C.; J. C. Wheeling, Superintendent. No. 1 shaft is operated on a lay by John Klee and partners, who are working along the old works left when the company abandoned operations. Five men are employed. No. 2 shaft: This shaft is operated by Dave Mattson and partners, laymen. It is connected through to No. 1 shaft and the water from both is pumped through No. 1. They are working in ground left by the company. Five men are employed.

No. 4 shaft: This shaft is operated by the company with Fred Kane, foreman. Considerable difficulty has been encountered from water coming through from the creek, owing to caving which went through to the surface. Only pillar-extraction is being done. About 700 feet of flume was built in the spring and the creek diverted into the flume. This greatly eased the water situation in the mine, permitting it to work steadily. Twenty-two men were employed.

No. 5 shaft: This shaft is also operated on a lay by Aage Falleson. The shaft was flooded on several occasions during the year. There is a bed-rock drain from further down-stream into these workings, but it is apparently partly blocked and unable to take care of the volume of water. There are several caves in the shaft which go through to the surface and give rise to all the water.

**Clydesdale Lease.** Operated by McDonald, McKay, and Munro. This is a bench lease and adjoins No. 4 shaft of the Spruce Creek Mining Co. Only a thin barrier pillar is left along the boundary between this and the *Chance* lease. There was also some trouble with water for the same reason as No. 4 shaft; however, the flume construction greatly reduced the amount of water on their property. The ground has been worked up to the boundary of the lease where it adjoins the *Goodwill* lease on which No. 2 shaft is located. A connection has been made through to the No. 2 shaft workings under an agreement with the Spruce Creek Mining Co. This greatly improved the ventilation in the mine and the barrier pillar between these leases is now being mined.

**Spruce Creek Placers, Ltd.** Company office, 640 Pender Street West, Vancouver, B.C.; mine office, Atlin, B.C.; E. N. Patty, General Manager; W. O'Neil, Superintendent. This is a new organization in the district. An option has been taken on all creek claims and leases from the *Olalla* lease up-stream to the Spruce Creek Mining Company lower line. The ground was drilled extensively during 1940. It is the only surface operation on the creek. The plant consists of a Bucyrus Diesel shovel with 2½-yard bucket having a digging radius of 70 feet. The shovel power plant is a 207-horse-power Diesel. A mobile washing plant, self-propelling, consisting of grizzly, perforated screen, and sluices, has been installed. A Northwest drag-line with a 70-foot boom and 1½-yard bucket stacks the tailings. The drag-line is powered by a 160-horse-power Diesel.

A dam was put in across the creek up-stream from the Brown shaft and the creek waters diverted into a flume which carries the creek past the shovel operations. The flume collapsed just above the Brown shaft and the shaft and also a section of the *Croker* lease upper workings were wrecked by the water entering them. A total of

128,638 cubic yards of gravel was moved. The operation worked twenty-four hours daily during the season and employed twenty-four men.

**Croker Lease and Brown Shaft.** F. Ohman and partners, laymen. These properties were idle most of the summer because of damage caused to the workings by the collapse of Spruce Creek Placers, Limited, flume. The Brown shaft and *Croker* lease are separate properties, but were connected underground for drainage. Although worked by the same group of laymen, the material from each property was hoisted through its own shaft.

The flume passed between the Brown shaft and the bench and was a few feet higher than the collar of the shaft. When the flume collapsed in a few feet up-stream from the shaft all water from it went down the shaft, wrecking it and flooding the workings and also those of the *Croker* lease, causing considerable damage in each place. It was impossible to get into the Brown workings either through the shaft or through the *Croker* lease workings. There is a bed-rock drain from the lower end of the *Poker* lease which is connected through all these workings and the water finally drained off through it. The *Croker* workings could not be reached through their original drive as it was badly caved. A new drive has been started close to the bottom of the *Croker* shaft to reach the section of the *Croker* lease which was being worked prior to the flooding.

**Poker Lease.**—Ivanic and partners, laymen. This is a bench lease adjoining the *Olalla*. The laymen are drifting up-stream and into the bench and are through all the old workings into virgin ground.

A number of other small properties extending from this point down-stream are all operated by laymen with not more than three men working in any one. All are drifting in the bench.

### Pine Creek.

**Northern Resources, Ltd.** Company office, 616 Stock Exchange Building, Vancouver, B.C.; Carl Beal, Manager; H. G. Turnbull, Superintendent. This company has an option on all leases on Pine Creek and Gold Run up to Surprise Lake. It is a drag-line operation which commenced in 1940. Pine Creek was deepened for a considerable distance below the operation to provide bed-rock drainage. The drag-bucket is 1½-yard capacity. A mobile screening and sluicing plant is installed, the tailings from it are stacked by conveyer. A hydro-electric plant was installed, using water from Surprise Lake to provide electric power for the plant. A total of 203,000 cubic yards was moved.

### Boulder Creek.

**Consolidated Mining & Smelting Co. of Canada, Ltd.**—McLeod White, Superintendent. This is a hydraulic operation which has been running for several years. Twenty men are employed and work was carried on continuously during the season. A total of 83,000 cubic yards of material was moved.

### Otter Creek.

**Compagnie Francaise des Mines d'Or du Canada.**—Walter Sweet and partners, laymen. Three men were engaged in a hydraulic operation and two other men were drifting in the bench.

### Ruby Creek.

**Surprise Lake Mining Co., Ltd.**—P. Matson and partners, laymen. This is a hydraulic operation which has been running for several years. Five men were employed. The operation is well up to the limits of the ground.

### Wright Creek.

**Arctic Lease.**—Hodges and Moran. Five men were employed on a hydraulic operation. There was very little water on this creek and only short runs could be made about three or four times daily.

### McKee Creek.

**Gold Run Fraction.**—Gibbs and partners, laymen. This is an underground operation, four men being engaged drifting in the bench.

Swanson and partners were employed on a hydraulic operation. A number of prospectors were engaged on various creeks around Atlin, Birch, O'Donnel River, and others which were not visited.

## SQUAW CREEK AREA.

About twenty individual prospectors were working on this creek during the summer.

## STIKINE AREA.

The Stikine area was not visited during the year. There was considerable placer activity on Boulder and adjoining creeks in the Dease Lake area, but there is no definite information of work done.

## MANSON CREEK AREA.

### Lost Creek.

**Lost Creek Placer Gold, Ltd.** Company office, 826 Vancouver Block, Vancouver, B.C.; H. L. Armes, Manager. This is a hydraulic operation at the junction of Lost Creek with Manson Creek. One monitor is employed in the pit and another on the tailings in Manson Creek. A small drag-line scraper is also used to keep the channel of Manson Creek clear of tailings. There is very little dumping-ground because of the small rise in bed-rock above the level of Manson Creek. There is an ample water-supply brought in by flume and pipe-line from Manson Creek. Ten men were employed.

### Slate Creek.

**Consolidated Mining & Smelting Co. of Canada, Ltd.**—This company renewed operations on Slate Creek, mainly prospecting and testing around the old drag-line pit. Rockers were used for recovery of the gold from the test-pits. A number of Keystone drill-holes were put down in the course of testing.

### Germansen Creek.

**Germansen Mines, Ltd.** Company office, 789 Pender Street West, Vancouver, B.C.; R. C. McCorkell, President; M. A. Manson, Secretary; A. A. McCorkell, Manager. Capital: 750,000 shares, 50 cents par. This is a hydraulic operation in the east bank of Germansen Creek. The overburden is heavy with a thick band of boulder clay above the pay-gravel. Two monitors are operating in the pit with three shifts daily. Water-supply is obtained by ditch and flume from the South Fork of Germansen Creek. Twenty-four men were employed.

**Germansen Ventures, Ltd.** Company office, Besner Block, Prince Rupert, B.C.; Frank de Ganahl, President; W. H. Eassie, Manager. Capital: 100,000 shares, $1 par. The company is controlled by Ventures Exploration Company (East Africa), Limited. This is a hydraulic operation in the west bank of Germansen Creek about 2 miles south of its junction with the Omineca River. Two pits are operating, three monitors working in No. 1 pit and four monitors in No. 7 pit. There is an ample water-supply (about 125 cubic feet a second) from Germansen Lake. Over 800,000 yards of material was moved during the season. Fifty men were employed.

### Twenty-mile Creek.

The head of Twenty-mile Creek lies about 6 miles west of the west end of Germansen Lake. It flows north to the Omineca River. A number of men were engaged prospecting, ground-sluicing. The creek was not visited. There were a number of individual prospectors working on Manson, Slate, Boulder, and Wolverine Creeks.

## TAKLA LAKE AREA.

Very little was done in this area during the year and it was not visited.

## CARIBOO AREA.

### BARKERVILLE-WELLS.

**Lowhee Mining Co., Ltd.** Company office, Rust Building, Tacoma, Washington; mine office, Barkerville, B.C.; C. W. Lea, President and General Manager; Paul Barker, Secretary-Treasurer; Henry Lea, Superintendent. Capital: 750,000 shares, $1 par; issued, 635,156. The hydraulic pit operated by this company was advanced about 300 feet along the channel of Lowhee Creek. The section of the channel worked this year was narrower than previously, and very crooked. The pay-gravels on the bottom were not so rich, but there were fewer large boulders to contend with than in the straighter, wider portion of the channel. The face of the pit is now within 300 feet of the dam, which will have to be taken out next year to ensure the safety of the crew in the pit. The two reservoirs made available an adequate supply of water, and an average of thirteen men on two nine-hour shifts were employed for the greater part of the year. There were no additions to the equipment.

**Barkerville Gold Mines, Ltd.** Company office, Royal Trust Building, Vancouver, B.C.; J. A. Wright, Secretary; C. A. McPherson, Superintendent. Capital: 200,000 shares, $1 par. Following the same gutter as was worked last year, three men hydraulicked about 100,000 yards of gravel. This work extended beyond a deeper cross-channel reported last year. A drilling programme is being planned.

**French Creek Hydraulic Placers, Ltd.**—Work on this ground was restricted to some work in the hydraulic pit and later to washing off high-grade patches on the low benches. This was done under the supervision of I. I. Felker and was for the account of R. M. Van Bibber, of Calgary, who had an option agreement with the company.

**Red Gulch Placers.** J. J. Gunn, who has a lease on this property from the Lowhee Mining Company, Limited, continued to operate it throughout the 1941 season, but was handicapped for lack of water-storage facilities. Part of the ground washed had been worked out by old drift-mining operations. Five men were employed while water was available and about 14,000 yards were moved.

### LITTLE VALLEY CREEK.

**Lease of A. Fleury.**—Two men were employed on sluicing operations on this lease and treated about 4,000 yards of gravel.

**Lease of G. Halverson.**—One man on contract part time hydraulicked about 3,500 yards of gravel on this lease.

### TWO-BIT CREEK.

**Lease of T. Dunlop et al.**—Ground-sluicing operations by the owners, working for a short time only, accounted for about 500 yards of gravel. A pipe-line is being installed.

### MCARTHUR'S GULCH.

**Lease of Knut Johannson.**—Mr. Johannson, using a small monitor, washed about 1,500 yards of gravel.

### WOLFE CREEK.

**Lease of Thompson and Dowsett.** This ground was taken under bond and lease by the Cariboo Cottonwood Placers, Limited. From March 1st to September 15th this company employed an average of fifteen men on development-work. About 1½ miles of road was made to the property, 1,600 feet of pipe were laid, and a storage-dam built. Hydraulicking was then started and about 2,000 yards of material moved to expose both rims of the channel. Some prospecting was also done.

### CUNNINGHAM CREEK.

**Trehouse Placers.** The Northern Refinery Company, Limited, obtained a lay on this ground and did a small amount of hydraulicking, principally for the purpose of testing a gold-saving device. The gold-saving equipment was later moved to Quesnel and was used to recover fine gold from the black sand in the tailings from the operation of Craig, Munn, and Reese on the Fraser River, 2 miles below Quesnel.

### COOPER CREEK.

**Triple Hydraulic Placers.**—At the lease owned by George Warren and Albert Frankish, of Calgary, and operated under the above name, Mr. Warren and a piper continued small-scale operations. They moved about 3,000 yards of gravel.

### SUGAR CREEK.

**Lease of A. Drinkwater.**—A. Drinkwater and partners were recovering gold from Sugar Creek by using a boom-gate several miles below the junction of Cooper Creek. Three partners built a similar arrangement about 2 miles above that of Drinkwater.

### SHEPHERD CREEK.

**Lease of R. D. Reese.**—Mr. Reese washed about 1,000 yards of gravel, using a Hendy No. 1 monitor. He was handicapped by lack of water. There are some quartz veins exposed in the hydraulic pit.

### PINE CREEK.

**Lease of J. P. Roddick.**—Work here was confined to building a flume, ditch, and reservoir to obtain water for hydraulicking.

### EMERY GULCH.

**Claims of J. MacGowan and C. Midan.**—About 400 yards were hydraulicked on this ground, according to report of the owners.

### WELDON CREEK.

**Lease of Clifford Brown and Bernard Fink.**—It is reported that 20,000 yards were moved by hydraulicking on this lease.

### EIGHT-MILE LAKE.

**Leases of M. A. Anderson.**—About 4,000 yards of gravel were washed from hydraulicking and shaft-sinking operations.

**Lease of J. C. Dyer.**—It is reported that this lease was optioned to other interests who employed several men for several months, but finally relinquished the option. Work done was confined to shovelling in operations.

**Lease of Walter H. Savery.**—About 1,500 yards of gravel were treated from drifting, hydraulicking, and sluicing.

### NUGGET GULCH.

**Leases of Neils M. Hansen.**—On these leases, known as the Nugget Placers, about 40,000 yards were moved by hydraulicking. One man was employed.

**Lease of Ben Nelson.**—About 1,000 yards were washed on this lease.

### STEVENS GULCH.

**Lease of W. F. Poquette.**—About 3,000 yards were handled by hydraulicking on this lease.

### ANTLER CREEK.

**Leases of John Keilor.**—Two men, shovelling into the sluice-boxes, handled about 500 yards of gravel on this ground.

**Lease of James Doody.**—Two men were employed on this lease to erect flumes and dig ditches.

## WELLS-STANLEY.

**Ketch, Ltd.** Commencing in March and operating continuously to the end of November, this company employed an average of twelve men on its placer pit, 5 miles west of Wells. There was ample water throughout the season and the same equipment as last year. About 80,000 cubic yards was put through the boxes.

**Dragon Creek Placers.**—Under the supervision of Mr. Peebles, five men were employed on this property and about 20,000 yards were put through the boxes. The recovery was low, partly because of slides, which according to report came down on the boxes.

**Sangdang Placers.** Wm. Hong employed about fourteen men on the average and worked continuously from April 8th, when he started piping, right through to November 5th. There was plenty of water and working three shifts with three monitors about 14 acres of material of an average depth of 35 feet were hydraulicked. It was necessary to strip the surface of a considerable amount of timber, and more than the usual number of heavy boulders to break in the pits. The work this year was east of the former operations and was mostly done on the *Sangdang* claims.

**Montgomery Creek Placers.**—This property is still under development. Two men were engaged for one month on ground-sluicing operations. The pit, which is about 60 feet deep and 80 feet wide at the bottom, was advanced about 75 feet.

**Ennerdale Placers.** This operation at Grub Gulch, across Lightning Creek from Van Winkle, was formerly called the Grub Gulch Placers. Piping started April 22nd and was continued through to the end of October. The water-supply was satisfactory. The pit, which is about 50 feet deep, 140 feet wide at the top and 30 feet wide at the bottom, was advanced about 180 feet. A No. 3 monitor, working under a head of 180 feet, was used.

**B. & K. Placers.** R. E. McDougall, of Wells, and associates, continued development-work on this property. Work commenced on April 2nd and continued to October 31st. The water-supply was good and about six men were employed on the average; four to five in the pit, and two to three on the ditches. Considerable overburden was moved by cutting back to a sloping slum-bed and causing large slides into Lightning Creek. Slum-beds lying near the surface in the vicinity of the pit were cut back to make it safe to work in the pit. All this work, and the time taken to build a ditch to bring water from Amador Creek to ground-sluices, made it impossible to reach the bottom of the channel this year. The yardage moved is estimated to be between 250,000 and 450,000 yards.

**Wingold Development Co., Ltd.**—This company optioned the ground of Mrs. G. Murphy on Houseman (Eagle) Creek, tributary of Lightning Creek, about 3 miles above Stanley. Some hydraulicking was done in the old pit, later a drilling programme was commenced to check theories regarding another channel.

**Stanley Mines, Ltd.** This company is the holder of three placer leases on Lightning Creek, immediately south of Stanley. A shaft was sunk about 80 feet deep in clays and gravels and underground workings were extended up-stream and down-stream on bed-rock in gold-bearing gravel on a bench left by the old-timers. It is estimated that 4,416 yards of gravel were moved up to the end of the year and that the tunnel footage was 1,762. An average of thirty men were employed on two shifts.

**Lease of C. Gedda.**—This lease is on Campbell Creek. It is reported that Mr. Gedda ground-sluiced 20,000 yards but did not make a clean-up.

**Lease of J. F. Williams.**—At this lease near Stanley, two men were employed at drifting operations.

**Lease of E. Estman.**—This lease is on Perkins Creek on Burns Mountain, near Stanley. Two men were employed and about 8,000 yards were treated by hydraulicking.

**Consolidated Gold Alluvials of B.C., Ltd.**—Drilling operations were started on the holdings of this company near Stanley.

## STANLEY-QUESNEL.

**Donovan Creek Placers.**—Mr. Graham, of Kamloops, who had an option on this hydraulic operation employed an average of four men and removed about 20,000 yards of gravel. The ground later was allowed to revert to Magnus Sundberg, the original owner.

**Langford Mines, Ltd.** Company office, Wells, B.C.; H. B. King, Secretary; K. K. Langford, Manager. Capital: 100,000 shares, $1 par. Using the tailings from previous operations, Mr. Langford built a reservoir and prepared a set-up at a new location. It is intended to start operations as soon as weather permits in 1942, and to operate with a tractor and bulldozer feeding the sluice-boxes and a steam slusher stacking the tailings.

**Fry's Placer.**—Hydraulicking operations were continued in Larsen's Gulch this year, but bed-rock was not reached. Five men were employed.

**Slade Creek Placers.** At this operation, west of Tregillus Creek, six partners worked in a small hydraulic pit from April 4th till late in the autumn. About 8,000 yards were put through the boxes with a No. 1 monitor. As the ditch could not utilize all the water available, it is planned to dig a larger ditch and to use a No. 2 monitor next year. The pit-banks are about 35 feet high and consist mainly of boulder-clay with heavy boulders on the bottom.

**No Name Placers.** Previously referred to as Pearson's Placers, this ground was acquired during the year by A. McDonell, of Wells, and operated under the new name. An average of six men was employed and about 12,000 yards put through the boxes with a small monitor. High water in the fall washed out the boxes. Both this operation and the Slade Creek Placers adjoining it are handicapped by lack of dumping space for the tailings. The pit is still small and the banks low.

**Lease of Carl A. Risberg.**—At this lease on Kong Foo Creek, tributary of Tregillus Creek, about 3,300 yards were sluiced.

**Leases of Emil M. Falck.**—Mr. Falck has leases on Anderson Creek, about 1 mile west of Stanley, at Khee Khan Creek, Beaver Pass, and on Lake Creek. He did a small amount of work on all three.

**Operations of E. A. Kent Dredging Co., Ltd.** This company has done considerable prospecting for dredging-ground on the Fraser, Cottonwood, and Swift Rivers. Test-pits 6 feet in diameter were dug to bed-rock wherever possible and all the material from the pits put through a mechanical testing-machine. It is understood that it is tentatively planned to be in operation on the Swift River in 1942 with one 2½-yard drag-line bucket in gravels averaging 12 feet in depth.

**Sovereign Creek.**—D. D. Fraser, of Quesnel, and associates continued to carry out testing operations on this creek during 1941. Three men were employed at this work.

C. A. Colluer, of Quesnel, also did a small amount of sluicing on his lease on this creek.

**Slade Placers, Ltd.** During the dry period this summer, the lack of adequate storage facilities made it necessary to curtail the operation for about a month at this property. About 29,000 yards were moved and put through the boxes with a No. 4 monitor, and a No. 2 as well, when there was sufficient water to operate both. An average of six men was employed.

**Lease of O. Matheson and A. Gustafson.**—At this lease on the Little Swift River it is reported that about 1,400 yards were sluiced into the boxes.

## QUESNEL-PRINCE GEORGE.

**Cariboo Cottonwood Placers, Ltd.** Company office, 470 Granville Street, Vancouver, B.C.; J. W. Phillips, Manager. Capital: 250,000 shares, $1 par. This company maintained a small crew on its ground on the Cottonwood River during the winter and started full-scale operations about the middle of March. It is reported that about 500,000 yards were removed by the two monitors, but that this consisted mainly of boulder-clay, slum, and silt. Operations were discontinued early in September.

**Hixon Creek Placers.**—The Reno Gold Mining Company took an option on this ground from Brian Briscoe. A crew of about sixteen men was employed from May 2nd to November 19th under the supervision of A. Norquist in testing the channel to bed-rock. Two monitors were used. The option was relinquished.

**Operation of Thomas Robertson et al.**—It is reported that operations were carried on at this property on Tabor Creek for a short time.

**Tertiary Mine.**—A new road was built into this property but no work was done at the property and the road has caved or filled in with slides in places.

**Cotwood Tertiary Mine.** This operation was called the *Cormack* mine last year, but a new company was formed during the year and operations resumed. About 450 feet of crosscutting and drifting was done in *Tertiary* gravels to make a bulk test of the channel. The channel was crosscut at two points and the pay-gravels put through a Denver mechanical gold-pan. They lie below 175 feet of *Tertiary* gravels and an additional 100 to 125 feet of overburden. About eleven men were employed from the beginning of June to the middle of December, when the weather became too severe. All of August was lost, however, because of breakdowns.

**Leases of Pearson and De Long.** These adjoin the *Tertiary* mine holdings and are down-stream from them. An adit has been collared about 12 feet above the Fraser River high-water mark and has been driven some 600 feet. It is at present crossing an old channel some distance above bed-rock according to report. It is the intention of the leasers to sink to bed-rock when the channel is crossed.

**Lease of Francis Lahay.**—This lease is on Little Creek, tributary of George Creek, tributary of Willow River, 30 miles from its confluence with the Fraser River. A small amount of development-work, all done by hand, is reported.

**Lease of J. Peterson.**—This lease is on Skaret Creek, tributary of Tabor Creek, about 8 miles south of Prince George. It is reported that 1,500 yards of material were handled by ground-sluicing methods.

**Lease of Alex. Beaton.**—This lease is on Government Creek, near Hixon. It is reported that a dam and 300 feet of ditch were made and that about 500 yards were washed through the boxes by sluicing and shovelling-in.

## QUESNEL-WILLIAMS LAKE.

**Operation of Craig, Munn, and Reese.** The bulldozer and washing plant operated last year on the Quesnel River was moved to ground on the east bank of the Fraser River, about 2 miles south of Quesnel. The equipment was moved during June and operations started on July 1st. Improvements were made to the washing plant and fine gold recovered from the tailings by the Sigmore process. Cold weather about the first week of November made it necessary to discontinue operations for the remainder of the year. Operations were also stopped for a while by high water in the Fraser. The gold is fine, particularly at the down-stream end of the bench, and is difficult to save.

**North American Goldfields, Ltd.** This company was incorporated during 1941 to operate a number of leases located on the Fraser River, at Alexandria Ferry Crossing. This is a drag-line dredge operation, the equipment consisting of a 2½-yard excavator operated by a Lima Diesel engine, and a floating washing plant consisting of trommel, riffles, sluices, and tailings stacker. Digging started during the first week of July.

## LIKELY-KEITHLEY.

**Priority Mine.**—Work at this property was confined to a small amount of development-work.

**Bullion Placers, Ltd.** Company office, 917 Vancouver Block, Vancouver, B.C.; R. F. Sharpe, President and General Manager; H. Ray, Secretary-Treasurer. This company's camp was opened up on March 26th, being earlier than usual, and operations started in the Drop pit with a skeleton crew, piping off some remaining overburden to make the pit safer when working the lower

gravels. About the middle of April a full crew was engaged and work commenced on the lower gravels. The bed-rock cut and sluice-boxes were extended as required.

This section of the channel was apparently glaciated and recoveries were so low that on July 26th, after the last clean-up in the Drop pit, it was decided to abandon this section, at least temporarily, and to change over to the old Bullion pit where some 100,000 cubic yards of virgin gravels had been left behind by previous operators. The work of installing the monitor and sluice-boxes in this section was started on August 1st, and by the 21st piping commenced. The last clean-up was made on November 10th. Up to July 30th the crew averaged sixty-two men, but from that date on it was gradually reduced and averaged only thirty-five men for the latter part of the season. In the Drop pit the monitor was equipped with an 11½-inch nozzle under a 400-foot head and used about 93 second-feet of water. In the Bullion pit a 10-inch nozzle was used under a 380-foot head and used about 62 second-feet of water. There were 1,880 piping-hours. The material treated consisted of:—

| | Cu. Yd. | Cu. Yd. |
|---|---|---|
| Drop pit— | | |
| Overburden | 145,788 | |
| Gravels | 362,591 | |
| Solid rock (bed-rock cut) | 41,650 | |
| | | 550,029 |
| Bullion pit— | | |
| Lower gravels | 84,672 | |
| Bed-rock sluice | 2,700 | |
| | | 87,372 |
| | | 637,401 |

**D. O. Johnson Placers.** D. O. Johnson and associates obtained an option on the property of the Quesnel Mining Company located at the mouth of Spanish Creek, and changing the set-up they commenced piping about the middle of May. Two No. 7 monitors under a head of 80 feet were used to wash down the gravels and a derrick was used to remove the large boulders. All work was done in extending the old pit, but it was found that a large part of the gold had been extracted by old drift-workings. Virgin gravels were being treated at the time of the last inspection. It is reported that the crew for the season averaged twenty-six men.

**Placer Engineers, Ltd.** Company office, 304 Pacific Building, Vancouver, B.C.; mine office, Keithley Creek; George Harrison, President; George V. F. Hudson, Secretary-Treasurer; E. Lang, Superintendent. Capital: 750,000 shares, no par value; issued, 541,452. Operations were confined to the old Onward pit where benches were being piped off in the hope of opening up a portion of the main Keithley channel which is presumed to lie into the hill behind the Onward pit. A No. 7 monitor under a head of 250 feet was being used at the time of inspection. The tailings flume had been brought up through the old deep channel in the Onward pit. Operations had been somewhat curtailed by low water during the dry period last summer. The crew varied from four to ten men.

**Burrard Placers, Ltd.**—Company office, 555 Burrard Street, Vancouver, B.C.; B. Boe, Manager. Capital: 2,000 shares, $1 par value; issued, 2,000. This company curtailed operations at Pine Creek to a considerable extent this year. For a short time, however, six men were employed in the pit on two shifts.

**Harvey Creek Mines, Ltd.**—Company office, 555 Burrard Street, Vancouver, B.C. A crew of six men was employed at Harvey Creek on development-work. Considerable difficulty, because of slides into the narrow gutter, is being experienced in attempts to get to the pay-gravels.

**Other Operations.**—Other operators in the area include Hasbrouck, about 12 miles from Keithley, on Keithley Creek; Asalyne and Johnson at Four-mile, on Keithley Creek; the Moose Syndicate on the Quesnel River below Spanish Creek; and P. Johnson at Half-mile Creek, on the South Fork of the Quesnel River.

## LILLOOET AREA.

### FRASER RIVER.

**Lease of L. D. Leonard.**—Mr. Leonard extended the lower of his two tunnels at the confluence of Sallus Creek with the Fraser River about 30 feet.

**Lillooet Placers.** R. Moreby and E. Hutton formed a syndicate to treat river-gravels on the east bank of the Fraser, about 2½ miles air-line south of Lillooet. Their equipment consists of a ¾-yard Paige-type bucket which is worked with either a high line or drag-line arrangement by a double-drum hoist. The gravels are dumped into a hopper made of poles and thence pass over a 36-foot sluice at about 20 per cent. grade covered with steel wear-plates. At the end of this sluice the minus 1⅛-inch material passes through a grizzly to a flatter sluice about 20 feet long and over a table covered with a double screen of ½-inch mesh. The underflow from this passes over a second table with two ½-inch mesh screens over a ¼-inch mesh screen. The grade of these tables can be adjusted to suit the material being treated. A semi-turbine pump powered by a gasoline-engine is used to deliver water from the river to the hopper against a 90-foot head at the rate of about 300 gallons per minute.

The gold apparently occurs in streaks in the gravel. The gold is also very fine typical Fraser River gold and it is hard to save all of it.

### BRIDGE RIVER.

**Leases of A. N. Wolverton.**—These are at the Big Bend, below the mouth of Yalakom River. One man was employed to make a large open-cut from which about 1,000 yards of material was removed. A wing-dam was also built.

**Lease of Alan Campbell.**—This lease is at the mouth of the Yalakom River. It is reported that some bridge and trail work was done and that several cuts were sluiced out.

**Lease of Frank Haugh.**—This lease is on Marshall Creek, tributary of the Bridge River. A small amount of ground-sluicing is reported.

**Lease of Wm. Haylmore.**—This lease is on the South Fork of the Bridge River at Goldbridge. Mr. Haylmore continued with his open-cuts in the river-wash.

### CAYOOSH CREEK.

**Lease of C. D. Warring.**—Mr. Warring built a breakwater to enable him to work the creek-wash on this lease.

### MCGILLIVRAY CREEK.

**Leases of Leonie Weeden.**—One man was employed for three months in erecting flume and sluices, in removing rock and prospecting ground, after which sluicing operations were carried out for two months.

**Lease of Ernest P. Hicks.**—Mr. Hicks reports that he did some open-cut work in tight gravels on his lease.

## VERNON AREA.

**Rambler Placers.** This property is on Monashee Creek, a tributary of Cherry Creek, about 42 miles east of Vernon. It is owned and operated by H. J. Fallow and associates, of Vernon, B.C. Six men were employed throughout the summer. The operation was continued on the same basis and with the same equipment as last season.

## ROCK CREEK AREA.

**Jolly Creek Placers.** This property is on Rock Creek, about 3 miles from Camp McKinney, and is owned and operated by V. J. Melsted, of Rock Creek, B.C. The gold is recovered by underground drift-mining. The available pay-ground, as far as is known, was exhausted this season and the operation closed. Four men were employed.

### GRAND FORKS AREA.

**Calhopper Lease.** This property is on Taylor Creek. It is owned and operated by C. Hopper, of Grand Forks, B.C. An old channel is being mined by shovelling into sluice-boxes which are equipped with riffles and undercurrents. Two men were employed.

**May Creek Placer.**—This property is on May Creek. It is owned and operated by R. Campbell, of Grand Forks, B.C. The ground is worked by a monitor which is used to wash the gravel into sluice-boxes. Two men were employed.

### PRINCETON AREA.

**Coalmont Placer.** Manager, J. W. James, Vancouver and Coalmont, B.C.; Foreman, C. R. Douglas, Coalmont, B.C. These workings were operated by the Traders Syndicate, who have a lease from the International Placers. The operation is on the highway between Coalmont and Granite Creek and is worked by a small drag-line. Four men were employed.

**Ashley Placer.** Operated by R. L. and A. E. Ashley, Princeton. This small placer operation is about 2 miles west of Princeton, on the Tulameen River. In addition to the Ashley brothers, three other men are employed. The gravel is taken from the pit by auto-truck to the Tulameen River, a distance of about 60 yards, where it is washed. Approximately 900 cubic yards of gravel were handled during the year.

**Haigh Placer.** Operated by Randolph C. Haigh, Princeton, B.C. This property adjoins the Ashley placer pit on the north side and the Great Northern Railway right-of-way on the south side. The gravel was taken from the pit to the Tulameen River, a distance of about 300 feet, by means of a 1-ton mine-car on a 3-foot gauge track. One thousand cubic yards of gravel was handled, yielding 49.33 oz. of gold and 13½ oz. of platinum. Two men were employed.

## CLAY AND SHALE.

### NEW WESTMINSTER AREA.

**Clayburn Co., Ltd.** Company office, 850 Hastings Street West, Vancouver, B.C.; W. C. Cummings, Secretary-Treasurer; J. W. Ball, Manager. Capital: 4,000 shares, $100 par. The mines and plant of this company are about 50 miles east of Vancouver. The method of operating the fireclay deposits is similar to the operating methods in coal mines. An average of thirteen men is employed underground. The production for the year amounted to: Fireclay from Kilgard mine, 16,699 tons; No. 4B mine, 1,735 tons; No. 9 mine, 2,485 tons; and shale, 645 tons; total, 21,564 tons.

## GYPSUM.

### FALKLAND AREA.

**Gypsum, Lime & Alabastine, Canada, Ltd.** Head office, Paris, Ontario; British Columbia office, 509 Richards Street, Vancouver, B.C.; P. P. Tyler, Managing Director; S. H. J. Reid, Secretary; Alex. Jessiman, Quarry Superintendent, Falkland, B.C. Capital: 500,000 common shares; issued, 440,043. During the year this company operated the Nos. 2 and 5 quarries at Falkland, 40 miles south of Kamloops, near the Kamloops–Vernon Highway. Shipping facilities are

provided by the Canadian National Railways, over which the gypsum is shipped to the calcining and board mill at Port Mann, B.C.

The quarries are operated at an elevation of 500 to 600 feet higher than the railway-bunkers, to which the gypsum is transported by means of trucks.

The gypsum is mined in open quarries. The overburden is thin and with the quarry-work advancing into the side of the mountain the walls rise to a considerable height above the quarry-floors: this making it necessary to keep the walls at an angle to inclination for the safety of the employees. The drilling is done by jack-hammers.

Fourteen men are employed and approximately 2,200 tons of gypsum is shipped from these quarries per month.

## LIMESTONE.

### KOEYE RIVER AREA.

**Koeye River Limestone Co.**—P. Christensen, operator. Two small quarries are operated by the company on Koeye River, about 7 miles south of Namu. The limestone is shipped the Pacific Mills at Ocean Falls. During the year 21,000 tons was produced. Fourteen men were employed.

### GRAND FORKS AREA.

**Consolidated Mining and Smelting Co. of Canada, Ltd.**—The company owns and operates the *Fife* limestone quarry at Fife, near Christina Lake. About 36,000 tons of limestone was mined and shipped to Trail to be used as flux. An average of nine men was employed.

### TEXADA ISLAND.

**Pacific Lime Co.**—C. Williams, Manager. Two quarries are operated by this company at Blubber Bay. The plant produces quicklime, hydrated lime, and other limestone products. About fifty men are employed in the quarries.

**B.C. Cement Co.** This company operates a limestone quarry on the opposite shore of Blubber Bay from the Pacific Lime Company. The limestone is shipped to the Bamberton plant. Extensive additions have been made to the power plant and crushing plant during the year. Robert Hamilton is in charge of operations. Seventeen men are employed.

**Van Anda Quarries.**—Operated by the Beale Quarries, Limited, at Vananda. S. Beale, Manager. Several limestone quarry faces have been opened up during the year, and steady shipment of limestone made to the United States and British Columbia industries. A total of thirty-two men is employed.

### VANCOUVER ISLAND.

**B.C. Cement Co.**—Office, Belmont Building, Victoria, B.C. Capital: 32,000 shares, $100 par. This company operates quarries at Bamberton and Texada Island, and a cement plant at Bamberton. At Bamberton the total crew for the whole operation averages about 110 men.

## MICA DEPOSITS.

### BAKER INLET AREA.

**Baka-Mica Group.**—P. M. Ray, of Prince Rupert, owns two claims on Baker Inlet, about 20 miles south of Prince Rupert. The deposit is a micaceous zone in altered mica-schists of the Prince Rupert series.

During the year crude sericite mica was produced and shipped from the *Sericite* claim to Vancouver for marketing.

[Reference: Annual Report, 1934, Part B.]

## STONE, SAND, GRAVEL.

### VANCOUVER AREA.

#### BURRARD INLET.

**Coast Quarries, Ltd.**—T. Burrows, Superintendent. This quarry is at Granite Falls, near the head of Burrard Inlet. The stone is used for general construction-work. The quarry has worked only intermittently throughout the year. Seven to ten men are employed.

#### NORTH VANCOUVER.

**Deeks Sand and Gravel, Ltd.**—Company office, 101 First Avenue, Vancouver, B.C.; H. S. Armstrong, Secretary; T. O. Burgess, Superintendent. About six men are employed.

**Cascade Sand and Gravel Co.**—Company office, 470 Granville Street, Vancouver. W. A. McCullum, Manager. This company now operates the Highland Sand and Gravel pits from which all their sand and gravel is now taken. About fifteen men are employed.

#### NEW WESTMINSTER AREA.

**Gilley Bros. Quarry.**—The quarry of this company is at Silver Valley, on Pitt River. From twenty to thirty men are employed. The stone is used for general construction-work.

**Maryhill Sand and Gravel Quarry.**—Operated by Gilley Bros. on the Fraser River bank. From sixteen to twenty men are employed.

#### NELSON ISLAND.

**Vancouver Granite Co.**—This company operates a dimension stone granite quarry on Nelson Island. Work has been intermittent throughout the year.

# COAL MINES.

BY

JAMES DICKSON.

The Province is divided into six Inspection Districts, as follows:—

| Inspection District. | Mining Divisions in Districts. |
|---|---|
| Coast | Quatsino, Clayoquot, Alberni, Nanaimo, Victoria, Vancouver, and New Westminster. |
| Northern Interior | Lillooet, Ashcroft, Clinton, Quesnel, Cariboo, and Peace River. |
| Interior | Similkameen, Osoyoos, Nicola, Vernon, and Kamloops. |
| East Kootenay and Boundary | Greenwood, Trail Creek, Nelson, Slocan, Arrow Lake, Ainsworth, Lardeau, Revelstoke, Fort Steele, Windermere, and Golden. |
| Northern | Atlin, Stikine, Portland Canal, Skeena, and Omineca. |

The Inspectors inspect the coal mines, metalliferous mines, and quarries in their respective districts.

BOARD OF EXAMINERS FOR COAL-MINE OFFICIALS.

| | |
|---|---|
| James Dickson | Chairman, Victoria. |
| James Strang | Secretary, Victoria. |
| H. E. Miard | Member, Fernie. |

Messrs. Strang and Miard and the Inspector of Mines of the district in which an examination is being held form the Board for granting certificates of competency to coal-miners.

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

INSTRUCTORS, MINE-RESCUE STATIONS.

| | |
|---|---|
| Richard Nichol | Nanaimo Station. |
| James L. Brown | Cumberland Station. |
| Alfred Gould | Princeton Station. |
| Joseph J. Haile | Fernie Station. |

The District Inspectors of Mines have their headquarters in the different mining areas as follows: John MacDonald, Nanaimo; James Strang, Victoria; Robert B. Bonar, Cumberland; James A. Mitchell, Lillooet; E. R. Hughes, Princeton; Hamilton C. Hughes, Nelson; H. E. Miard, Fernie; and Charles Graham, Prince Rupert.

During the year John T. Puckey, who was for many years Instructor at the Fernie Mine-rescue Station, died, and John G. Biggs retired from the Inspection staff.

## PRODUCTION.

The total tonnage produced by the coal mines of the Province for the year ended 1941 was 1,802,353 tons, being an increase of 134,526 tons or 8.07 per cent. over production of 1940.

The Coast District, which includes Vancouver Island, Nicola-Princeton, and Northern Districts, produced 776,295 tons, a decrease of 115,014 tons or 12.90 per cent. from 1940.

Vancouver Island collieries produced 647,958 tons, a decrease of 84,701 tons or 11.5 per cent. from 1940.

The Northern District produced 6,408 tons, an increase of 584 tons over 1940.

The Nicola-Princeton District produced 121,929 tons, a decrease of 30,857 tons or 20.2 per cent. from 1940.

The East Kootenay District produced 1,026,053 tons, an increase of 249,535 tons or 32.1 per cent. over 1940.

The following table shows the output and *per capita* production daily and for the year at the various mines:—

| Colliery and Mine. | Gross Tonnage of Coal mined during Year. | Days worked. | Total No. of Employees. | Tons of Coal mined per Employee daily. | Tons of Coal mined per Employee for Year. | No. of Employees Underground. | Tons of Coal mined per Underground Employee daily. | Tons of Coal mined per Underground Employee for Year. |
|---|---|---|---|---|---|---|---|---|
| Comox Colliery (No. 5 mine) | 119,895 | 200 | 326 | 1.84 | 368 | 266 | 2.25 | 450 |
| Comox Colliery (No. 8 mine) | 161,451 | 213 | 427 | 1.78 | 378 | 336 | 2.25 | 480 |
| Northfield Colliery | 78,739 | 153 | 227 | 2.27 | 347 | 189 | 2.71 | 416 |
| South Wellington (No. 10 mine) | 230,135 | 256 | 310 | 2.90 | 742 | 271 | 3.31 | 849 |
| Wellington mine | 30,355 | 75 | 137 | 3.00 | 221 | 119 | 3.40 | 255 |
| Prospect mine, Extension | 3,246 | 135 | 6 | 4.00 | 541 | 5 | 4.80 | 649 |
| Lantzville Colliery | 2,422 | 285 | 9 | 0.93 | 267 | 6 | 1.41 | 404 |
| Chambers' mine | 6,052 | 251 | 15 | 1.60 | 403 | 12 | 2.00 | 504 |
| Beban mine | 10,893 | 138 | 57 | 1.38 | 191 | 53 | 1.48 | 205 |
| Loudon mine | 661 | 208 | 2 | 1.58 | 330 | 2 | 1.58 | 330 |
| Cassidy mine | 1,341 | 290 | 5 | 1.26 | 368 | 4 | 1.15 | 335 |
| Biggs' mine | 165 | 84 | 1 | 1.96 | 165 | 1 | 1.96 | 165 |
| Lewis' mine | 683 | 259 | 2 | 1.33 | 344 | 2 | 1.33 | 344 |
| Big Flame Wellington (Richardson) | 226 | 80 | 5 | 0.56 | 45 | 5 | 0.56 | 45 |
| Deer Holme mine | 1,471 | 155 | 6 | 1.58 | 245 | 5 | 1.90 | 294 |
| Lake Road mine | 223 | 48 | 1 | 4.64 | 223 | 1 | 4.64 | 223 |
| Middlesboro Colliery | 22,860 | 187 | 83 | 1.47 | 275 | 55 | 2.21 | 415 |
| Granby Consolidated M.S. & P. Co., Ltd. | 69,774 | 287 | 90 | 2.70 | 775 | 75 | 3.22 | 930 |
| Princeton Tulameen Coal Co. | 26,116 | 246 | 50 | 2.12 | 522 | 37 | 2.87 | 705 |
| Tulameen coal mine | 2,883 | 158 | 19 | 0.96 | 152 | 16 | 1.14 | 180 |
| Hat Creek | 296 | 119 | 3 | 0.83 | 99 | 3 | 0.83 | 99 |
| Bulkley Valley Colliery | 5,507 | 229 | 13 | 1.84 | 423 | 8 | 3.00 | 686 |
| Aveling Colliery | 901 | 108 | 7 | 1.18 | 128 | 4 | 2.08 | 225 |
| Coal Creek Colliery | 174,813 | 258 | 177 | 3.43 | 987 | 129 | 5.25 | 1,355 |
| Michel Colliery | 851,240 | 293 | 744 | 3.90 | 1,144 | 624 | 4.65 | 1,364 |
| Gething mine (Peace River) | 5 | ..... | 1 | ..... | ..... | 1 | ..... | ..... |

## Collieries of Vancouver Island Inspection District.

The output of Vancouver Island collieries was 647,958 tons. Of this amount, 102,184 tons or 15.7 per cent. was lost in preparation for the market; 4,828 tons or 0.7 per cent. was consumed by producing companies as fuel; and 552,810 tons was sold in the competitive market. Of the amount sold in the competitive market, 514,755 tons or 91.3 per cent. was sold in Canada, and 38,055 tons or 8.7 per cent. was sold in United States.

## Collieries of the Nicola-Princeton District.

Of the gross output of 121,929 tons produced by the collieries of the Nicola-Princeton District, 4,083 tons or 3.3 per cent. was consumed by the producing companies as fuel, 3,266 tons was taken from stock, making a total of 121,112 tons sold in the competitive market in Canada.

## Collieries of the East Kootenay District.

The output of the collieries in the East Kootenay District was 1,026,053 tons. Of this amount, 68,665 tons or 6.7 per cent. was lost in preparation for the market; 16,239

tons or 1.5 per cent. was consumed by producing companies as fuel; 125,792 tons or 12.2 per cent. was used in making coke; and 815,647 tons was sold in the competitive market. Of this amount, 731,015 tons or 89.6 per cent. was sold in Canada, and 84,632 tons or 10.4 per cent. was sold in United States.

The following table shows the *per capita* production of the various districts for the past five years. Similar figures for years prior to 1937 are shown in previous Annual Reports.

OUTPUT AND PER CAPITA PRODUCTION IN VARIOUS DISTRICTS.

| Year. | District. | Gross Tons of Coal mined during Year. | Total No. of Employees at Producing Collieries. | Tons of Coal mined per Employee for Year. | No. of Men employed Underground in Producing Collieries. | Tons of Coal mined per Underground Employee for Year. |
|---|---|---|---|---|---|---|
| 1937 | East Kootenay District | 459,136 | 628 | 731 | 462 | 972 |
| | Coast District | 985,551 | 2,525 | 390 | 1,824 | 540 |
| | Whole Province | 1,444,687 | 3,153 | 458 | 2,286 | 632 |
| 1938 | East Kootenay District | 434,068 | 693 | 626 | 467 | 972 |
| | Coast District | 875,360 | 2,269 | 386 | 1,621 | 540 |
| | Whole Province | 1,309,428 | 2,962 | 442 | 2,088 | 675 |
| 1939 | East Kootenay District | 561,958 | 731 | 768 | 538 | 1,044 |
| | Coast District | 915,914 | 2,245 | 468 | 1,629 | 562 |
| | Whole Province | 1,477,872 | 2,976 | 496 | 2,167 | 682 |
| 1940 | East Kootenay District | 776,518 | 731 | 1,062 | 550 | 1,412 |
| | Coast District | 891,309 | 2,143 | 462 | 1,625 | 548 |
| | Whole Province | 1,667,827 | 2,874 | 580 | 2,175 | 766 |
| 1941 | East Kootenay District | 1,026,053 | 921 | 1,114 | 753 | 1,632 |
| | Coast District | 776,300 | 1,802 | 431 | 1,476 | 526 |
| | Whole Province | 802,353 | 2,723 | 662 | 2,229 | 808 |

The following table shows the production and distribution of coal by the various collieries and districts, compiled from returns furnished by the owners:—

## COLLIERIES OF BRITISH COLUMBIA—PRODUCTION, 1941.

| Mine. | Sold. | | | Total Sales. | Lost in Washing. | Used in making Coke. | Used under Companies' Boilers, etc. | Total for Colliery Use. | Stock. | | Difference. | | Output for the Year 1941. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | In Canada. | In U.S.A. | Elsewhere. | | | | | | First of Year. | Last of Year. | Added to. | Taken from. | |
| **Vancouver Island District.** | Tons. | Tons. | Tons. | Tons. | Tons. | Tons. | Tons. | Tons. | Tons. | Tons. | Tons. | Tons. | Tons. |
| Canadian Collieries (D.), Ltd.— | | | | | | | | | | | | | |
| Comox Colliery (No. 5 mine) | 98,269 | 6,469 | ..... | 104,738 | 13,299 | ..... | 928 | 14,227 | 1,185 | 2,115 | 930 | ..... | 119,895 |
| Comox Colliery (No. 8 mine) | 130,264 | 8,574 | ..... | 138,838 | 20,833 | ..... | 1,230 | 22,063 | 8,591 | 9,141 | 550 | ..... | 161,451 |
| Northfield Colliery | 78,525 | 5,293 | ..... | 83,818 | 11,352 | ..... | 260 | 11,612 | 16,691 | ..... | ..... | 16,691 | 78,739 |
| South Wellington (No. 10 mine) | 156,513 | 15,593 | ..... | 172,106 | 54,315 | ..... | 769 | 55,084 | 269 | 3,214 | 2,945 | ..... | 230,135 |
| Wellington mine | 25,479 | 2,126 | ..... | 27,605 | 1,789 | ..... | 102 | 1,891 | ..... | 859 | 859 | ..... | 30,355 |
| Prospect mine, Extension | 3,135 | ..... | ..... | 3,135 | 566 | ..... | 2 | 568 | 9,077 | 8,620 | ..... | 457 | 3,246 |
| Lantzville Colliery | 1,912 | ..... | ..... | 1,912 | ..... | ..... | 510 | 510 | ..... | ..... | ..... | ..... | 2,422 |
| Chambers' mine | 6,052 | ..... | ..... | 6,052 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 6,052 |
| Beban mine | 9,866 | ..... | ..... | 9,866 | ..... | ..... | 1,027 | 1,027 | ..... | ..... | ..... | ..... | 10,893 |
| Loudon mine | 661 | ..... | ..... | 661 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 661 |
| Cassidy mine | 1,341 | ..... | ..... | 1,341 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 1,341 |
| Biggs' mine | 165 | ..... | ..... | 165 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 165 |
| Lewis' mine | 683 | ..... | ..... | 683 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 683 |
| Big Flame Wellington (Richardson) | 226 | ..... | ..... | 226 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 226 |
| Deer Holme mine | 1,471 | ..... | ..... | 1,471 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 1,471 |
| Lake Road mine | 193 | ..... | ..... | 193 | 30 | ..... | ..... | 30 | ..... | ..... | ..... | ..... | 223 |
| Totals, Vancouver Island District | 514,755 | 38,055 | ..... | 552,810 | 102,184 | ..... | 4,828 | 107,012 | 35,813 | 23,949 | 5,284 | 17,148 | 647,958 |
| **Nicola-Princeton District.** | | | | | | | | | | | | | |
| Middlesboro Colliery | 19,117 | ..... | ..... | 19,117 | ..... | ..... | 3,993 | 3,993 | 357 | 107 | ..... | 250 | 22,860 |
| Granby Cons. M.S. & P. Co., Ltd. | 69,813 | ..... | ..... | 69,813 | ..... | ..... | ..... | ..... | 119 | 80 | ..... | 39 | 69,774 |
| Princeton Tulameen Coal Co. | 28,446 | ..... | ..... | 28,446 | ..... | ..... | ..... | ..... | 2,330 | ..... | ..... | 2,330 | 26,116 |
| Tulameen coal mine | 2,793 | ..... | ..... | 2,793 | ..... | ..... | 90 | 90 | ..... | ..... | ..... | ..... | 2,883 |
| Hat Creek Colliery | 943 | ..... | ..... | 943 | ..... | ..... | ..... | ..... | 647 | ..... | ..... | 647 | 296 |
| Totals, Nicola-Princeton District | 121,112 | ..... | ..... | 121,112 | ..... | ..... | 4,083 | 4,083 | 3,453 | 187 | ..... | 3,266 | 121,929 |
| **Northern District.** | | | | | | | | | | | | | |
| Bulkley Valley Colliery | 5,537 | ..... | ..... | 5,537 | ..... | ..... | 140 | 140 | 200 | 30 | ..... | 170 | 5,507 |
| Aveling Colliery | 901 | ..... | ..... | 901 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 901 |
| Totals, Northern District | 6,438 | ..... | ..... | 6,438 | ..... | ..... | 140 | 140 | 200 | 30 | ..... | 170 | 6,408 |
| **East Kootenay District.** | | | | | | | | | | | | | |
| Coal Creek Colliery | 137,629 | 34,048 | ..... | 171,677 | ..... | ..... | 3,426 | 3,426 | 319 | 29 | ..... | 290 | 174,813 |
| Michel Colliery | 593,386 | 50,584 | ..... | 643,970 | 68,665 | 125,792 | 12,813 | 207,270 | ..... | ..... | ..... | ..... | 851,240 |
| Totals, East Kootenay District | 731,015 | 84,632 | ..... | 815,647 | 68,665 | 125,792 | 16,239 | 210,696 | 319 | 29 | ..... | 290 | 1,026,053 |
| **Peace River District.** | | | | | | | | | | | | | |
| Gething Colliery | 5 | ..... | ..... | 5 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 5 |
| **Coal.** | | | | | | | | | | | | | |
| Grand totals for Province | 1,373,325 | 122,687 | ..... | 1,496,012 | 170,849 | 125,792 | 25,290 | 321,931 | 39,785 | 24,195 | 5,284 | 20,874 | 1,802,353 |
| **Coke.** | | | | | | | | | | | | | |
| Crow's Nest Pass Coal Co., Ltd.— | | | | | | | | | | | | | |
| Michel Colliery | 52,588 | 29,737 | ..... | 82,325 | ..... | ..... | ..... | ..... | 2,456 | 4,085 | 1,629 | ..... | 83,954 |
| Total coke for Province | 52,588 | 29,737 | ..... | 82,325 | ..... | ..... | ..... | ..... | 2,456 | 4,085 | 1,629 | ..... | 83,954 |

(1,197 tons of coal was recovered from the dump of the Corbin Collieries at Corbin; 606 tons of coal was mined from a surface operation on Hasler Creek, in the Peace River area, during the winter of 1940 to 1941.)

## Collieries of British Columbia—Men employed, 1941.

| Mine. | White Men. | | | | | | | | | | | | | | | | | | Indians. | | | Japanese and Chinese. | | | | | | | | | Total Men employed. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Supervision and Clerical. | | | Miners. | | | Helpers. | | | Labourers. | | | Mechanics and Skilled Labour. | | | Boys. | | | Labourers. | | | Miners. | | | Helpers. | | | Labourers. | | | | | |
| | U. | A. | T. | U. | A. | T. | U. | A. | T. | U. | A. | T. | U. | A. | T. | U. | A. | T. | U. | A. | T. | U. | A. | T. | U. | A. | T. | U. | A. | T. | U. | A. | T. |
| **Vancouver Island District.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Canadian Collieries (D.), Ltd.— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Comox Colliery (No. 5 mine) | 14 | 4 | 18 | 107 | | 107 | | | | 42 | 18 | 60 | 90 | 27 | 117 | 13 | 2 | 15 | | | | | | | | | | | 9 | 9 | 266 | 60 | 326 |
| Comox Colliery (No. 8 mine) | 18 | 6 | 24 | 137 | | 137 | | | | 56 | 15 | 71 | 111 | 39 | 150 | 14 | 13 | 27 | | | | | | | | | | | 18 | 18 | 336 | 91 | 427 |
| Northfield Colliery | 12 | 2 | 14 | 113 | | 113 | | | | 48 | 20 | 68 | 8 | 7 | 15 | 8 | 9 | 17 | | | | | | | | | | | | | 189 | 38 | 227 |
| South Wellington (No. 10 mine) | 10 | 4 | 14 | 143 | | 143 | | | | 108 | 7 | 115 | 10 | 8 | 18 | | 20 | 20 | | | | | | | | | | | | | 271 | 39 | 310 |
| Wellington mine | 5 | | 5 | 82 | | 82 | | | | 24 | 14 | 38 | 8 | 3 | 11 | | 1 | 1 | | | | | | | | | | | | | 119 | 18 | 137 |
| Prospect mine, Extension | 1 | | 1 | 4 | | 4 | | | | | | | | 1 | 1 | | | | | | | | | | | | | | | | 5 | 1 | 6 |
| Lantzville Colliery | 2 | | 2 | 4 | | 4 | | | | | 1 | 1 | | 1 | 1 | | | | | | | | | | | | | | 1 | 1 | 6 | 3 | 9 |
| Chambers' mine | 2 | | 2 | 8 | | 8 | | | | 2 | 2 | 4 | | | | | | | | | | | | | | | | | 1 | 1 | 12 | 3 | 15 |
| Beban mine | 4 | 1 | 5 | 43 | | 43 | | | | 6 | | 6 | | 3 | 3 | | | | | | | | | | | | | | | | 53 | 4 | 57 |
| Loudon mine | | | | 2 | | 2 | | | | | | | | | | | | | | | | | | | | | | | | | 2 | | 2 |
| Cassidy mine | | 1 | 1 | 4 | | 4 | | | | | | | | | | | | | | | | | | | | | | | | | 4 | 1 | 5 |
| Biggs' mine | | | | 1 | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | 1 |
| Lewis' mine | | | | 2 | | 2 | | | | | | | | | | | | | | | | | | | | | | | | | 2 | | 2 |
| Big Flame Wellington (Richardson) | 1 | | 1 | 3 | | 3 | | | | 1 | | 1 | | | | | | | | | | | | | | | | | | | 5 | | 5 |
| Deer Holme mine | 1 | | 1 | 3 | | 3 | | | | 1 | 1 | 2 | | | | | | | | | | | | | | | | | | | 5 | 1 | 6 |
| Lake Road mine | | | | 1 | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | 1 |
| Totals, Vancouver Island District | 70 | 18 | 88 | 657 | | 657 | | | | 288 | 78 | 366 | 227 | 89 | 316 | 35 | 45 | 80 | | | | | | | | | | | 29 | 29 | 1277 | 259 | 1536 |
| **Nicola-Princeton District.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Middlesboro Colliery | 5 | 1 | 6 | 24 | | 24 | 12 | | 12 | 14 | 10 | 24 | | 10 | 10 | | 7 | 7 | | | | | | | | | | | | | 55 | 28 | 83 |
| Granby Cons. M.S. & P. Co., Ltd. | 7 | 1 | 8 | 31 | | 31 | 31 | | 31 | 4 | 3 | 7 | 2 | 11 | 13 | | | | | | | | | | | | | | | | 75 | 15 | 90 |
| Princeton Tulameen Coal Co. | 3 | 1 | 4 | 15 | | 15 | 16 | | 16 | | 9 | 9 | 3 | 3 | 6 | | | | | | | | | | | | | | | | 37 | 13 | 50 |
| Tulameen coal mine | 2 | 1 | 3 | 6 | | 6 | 6 | | 6 | 2 | 1 | 3 | | 1 | 1 | | | | | | | | | | | | | | | | 16 | 3 | 19 |
| Hat Creek Colliery | 1 | | 1 | 1 | | 1 | 1 | | 1 | | | | | | | | | | | | | | | | | | | | | | 3 | | 3 |
| Totals, Nicola-Princeton District | 18 | 4 | 22 | 77 | | 77 | 66 | | 66 | 20 | 23 | 43 | 5 | 25 | 30 | | 7 | 7 | | | | | | | | | | | | | 186 | 59 | 245 |
| **Northern District.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bulkley Valley Colliery | | 1 | 1 | 4 | | 4 | 4 | | 4 | | 1 | 1 | | 2 | 2 | | | | | 1 | 1 | | | | | | | | | | 8 | 5 | 13 |
| Aveling Colliery | | | | 2 | | 2 | 2 | | 2 | | 2 | 2 | | 1 | 1 | | | | | | | | | | | | | | | | 4 | 3 | 7 |
| Totals, Northern District | | 1 | 1 | 6 | | 6 | 6 | | 6 | | 3 | 3 | | 3 | 3 | | | | | 1 | 1 | | | | | | | | | | 12 | 8 | 20 |
| **East Kootenay District.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Coal Creek Colliery | 6 | 3 | 9 | 64 | | 64 | | | | 11 | 23 | 34 | 48 | 22 | 70 | | | | | | | | | | | | | | | | 129 | 48 | 177 |
| Michel Colliery | 33 | 11 | 44 | 352 | | 352 | | | | 58 | 61 | 119 | 181 | 48 | 229 | | | | | | | | | | | | | | | | 624 | 120 | 744 |
| Totals, East Kootenay District | 39 | 14 | 53 | 416 | | 416 | | | | 69 | 84 | 153 | 229 | 70 | 299 | | | | | | | | | | | | | | | | 753 | 168 | 921 |
| **Peace River District.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Gething Colliery | | | | 1 | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | 1 |
| Grand totals for Province | 127 | 37 | 164 | 1157 | | 1157 | 72 | | 72 | 377 | 188 | 565 | 461 | 187 | 648 | 35 | 52 | 87 | | 1 | 1 | | | | | | | | 29 | 29 | 2229 | 494 | 2723 |

NOTE.—U.=Underground; A.=Above ground; T.=Total.

## LABOUR AND EMPLOYMENT.

During 1941, 2,723 persons were employed in and about the coal mines of the Province, a decrease of 151 men from 1940. Taking the average of all the mines in Vancouver Island District, about 24 per cent. of the working-days were lost through lack of trade, principally in the earlier part of the year. In the Nicola-Princeton District the different collieries worked about 76 per cent. of the working-days. In the East Kootenay District the average for the year was about 92 per cent.

The table on page 99 shows the number of persons ordinarily employed in and about the mines, distinguishing the persons and different classes employed underground and above ground, compiled from returns furnished by the owners.

## FUEL-OIL COMPETITION.

During 1941, imports of crude oil for refining in British Columbia totalled 199,275,000 gallons, and 17,978,000 was imported as bunker-fuel for shipping.

## COMPETITION OF COAL PRODUCED OUTSIDE BRITISH COLUMBIA.

During 1941, the importation of coal into British Columbia consisted of 30 tons of anthracite, 1,638 tons of bituminous coal, and 609 tons of lignite; in addition to above, 465 tons of petroleum coke and 477 tons of metallurgical coke was imported. All above imports were from the United States.

Alberta coal sold in British Columbia amounted to 304,928 tons. The following table shows the amount of Alberta coal brought into British Columbia during past years:—

| Year. | Short Tons. | Year. | Short Tons. |
|---|---|---|---|
| 1932 | 136,188 | 1937 | 269,023 |
| 1933 | 119,026 | 1938 | 238,435 |
| 1934 | 123,968 | 1939 | 239,227 |
| 1935 | 221,748 | 1940 | 311,232 |
| 1936 | 244,928 | 1941 | 304,928 |

Of the 1,496,012 tons of British Columbia coal marketed, 223,744 tons was sold for domestic and industrial use in the Provinces of Alberta, Saskatchewan, Manitoba, and Ontario, and 401,346 tons was sold for railroad use in the Provinces; 9,247 tons was sold for railroad use in the United States, and approximately 175,933 tons for railroad use in British Columbia; 122,687 tons was exported to the United States and 80,739 tons was sold for ships' bunkers. The tonnage of coal used in the Province was 482,316 tons of British Columbia coal, 271,385 tons of Alberta coal and briquettes, and 2,277 of imported coals.

## ACCIDENTS IN AND AROUND COAL MINES.

During 1941, 2,723 persons were employed in and around coal mines. Four fatal accidents during the year as compared with six during 1940.

The ratio of fatal accidents per 1,000 persons employed was 1.47 as compared with 2.08 for 1940. In 1939 the ratio was 0.67; in 1938, 3.37; in 1937, 3.17; in 1936, 2.84; in 1935, 1.67; in 1934, 2.07; in 1933, 0.97; and in 1932, 2.21. The average for the ten-year period being 2.06.

The number of fatal accidents per 1,000,000 tons produced during 1941 was 2.21; during 1940 the figure was 3.65; in 1939, 1.35; in 1938, 7.63; in 1937, 6.92; in 1936, 5.94; in 1935, 4.21; in 1934, 4.45; in 1933, 2.37; and in 1932, 5.21. The average for the ten-year period being 4.31 per 1,000,000 tons of coal mined.

The following table shows the collieries at which the fatal accidents occurred during 1941 and comparative figures for 1940:—

| Name of Company. | Name of Colliery. | 1941. | 1940. |
|---|---|---|---|
| F. Beban Lumber Co. | Beban mine | ---- | 1 |
| Canadian Collieries (D.), Ltd. | No. 10 mine, South Wellington | 1 | 4 |
| Crow's Nest Pass Coal Co. | Coal Creek Colliery | 2 | ---- |
| Crow's Nest Pass Coal Co. | Michel Colliery | 1 | 1 |
| Totals | | 4 | 6 |

The following table shows the various causes of fatal accidents in 1941 and their percentage of the whole and comparative figures for 1940:—

| Cause. | 1941. | | 1940. | |
|---|---|---|---|---|
| | No. | Per Cent. | No. | Per Cent. |
| By falls of roof and coal | 1 | 25.00 | ---- | ---- |
| By mine-cars and haulage | 2 | 50.00 | 2 | 33.34 |
| By mine explosions | ---- | ---- | 3 | 50.00 |
| By falling timber | ---- | ---- | 1 | 16.66 |
| By bumps | 1 | 25.00 | ---- | ---- |
| Totals | 4 | 100.00 | 6 | 100.00 |

The following table shows the number of tons of coal mined for each fatal accident in their respective classes in the years 1941 and 1940:—

| Cause. | 1941. | | 1940. | |
|---|---|---|---|---|
| | No. of Fatal Accidents. | Tons of Coal mined per Fatal Accident. | No. of Fatal Accidents. | Tons of Coal mined per Fatal Accident. |
| By falls of roof and coal | 1 | 1,802,353 | ---- | ---- |
| By mine-cars and haulage | 2 | 901,176 | 2 | 833,913 |
| By mine explosions | ---- | ---- | 3 | 555,942 |
| By falling timber | ---- | ---- | 1 | 1,667,827 |
| By bumps | 1 | 1,802,353 | ---- | ---- |
| Totals | 4 | 450,588 | 6 | 277,971 |

The number of tons of coal mined per fatal accident during 1941 was 450,588 tons compared with 277,971 tons in 1940. The average for the ten-year period was 231,990 tons.

The following table shows the fatalities from various causes in coal mines during the year 1941 compared with 1940, according to Inspection Districts:—

| District. | No. of Deaths from Accidents. | | | | | Totals. | |
|---|---|---|---|---|---|---|---|
| | Falls of Roof and Coal. | Mine-cars and Haulage. | Mine Explosions. | Falling Timber. | Bumps. | 1941. | 1940. |
| Vancouver Island | ---- | 1 | ---- | ---- | ---- | 1 | 5 |
| Nicola-Princeton | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| East Kootenay | 1 | 1 | ---- | ---- | 1 | 3 | 1 |
| Northern | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| Province (1941) | 1 | 2 | ---- | ---- | 1 | 4 | ---- |
| Province (1940) | ---- | 2 | 3 | 1 | ---- | ---- | 6 |

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RATIO OF ACCIDENTS.

| District. | Accident Death-rate. | | | |
|---|---|---|---|---|
| | Per 1,000 Persons employed. | | Per 1,000,000 Tons of Coal mined. | |
| | 1941. | 1940. | 1941. | 1940. |
| Vancouver Island | 0.65 | 2.90 | 1.54 | 6.82 |
| Nicola-Princeton | ------ | ------ | ------ | ------ |
| East Kootenay | 3.25 | 1.36 | 2.92 | 1.29 |
| Northern | ------ | ------ | ------ | ------ |
| Province (1941) | 1.47 | ------ | 2.21 | ------ |
| Province (1940) | ------ | 2.08 | ------ | 3.65 |

The details regarding the occurrences of fatal accidents in coal mines during 1941 are as follows:—

The fatal accident which occurred to Frederick Atherton, rope-rider, No. 1 East mine, Coal Creek Colliery, Crow's Nest Pass Coal Company, Limited, on January 17th was due to injuries received in a "bump." Deceased was at work on the main tunnel of the mine when a "bump" occurred. He was alone at the time but was found shortly afterwards by two miners who had left their working-place to investigate the extent of the damage caused by the "bump." Deceased had apparently been thrown against the roof and sustained a fracture of the skull from which he died on January 17th.

The fatal accident which occurred to James Maltman, fireboss, No. 1 East mine, Coal Creek Colliery, Crow's Nest Pass Coal Company, Limited, on July 7th was due to deceased being crushed in a runaway trip of empty cars in which he apparently was riding. An empty trip of cars was being hauled up an incline when one of the car-couplings broke and allowed six of the cars to run at high speed to a point 450 feet below, where they became derailed. Deceased had apparently been riding between the cars and sustained injuries from which he died on July 11th. Deceased should not have been riding on the cars.

The fatal accident which occurred to John Kirkpatrick, rope-rider, No. 10 mine, Canadian Collieries (D.), Limited, Nanaimo, on September 17th was due to deceased being struck by a runaway car on an incline close to a working-face. The mine-car was hauled to the face by a small hoist situated at the side of the incline, with the rope from the hoist led to a sheave-wheel attached to a wheel-post set at the face and then to the car. On this occasion deceased gave the signal that a car was loaded, and when the hoistman started to lower the car the wheel-post pulled out of its position and allowed the car to go uncontrolled. The car struck deceased and inflicted injuries from which he died the same day.

The fatal accident which occurred to Angus Makuch, miner, Michel Colliery, Crow's Nest Pass Coal Company, Limited, on November 21st was due to a fall of coal at the working-face. At the time of the accident he was engaged in drilling shot-holes by means of a compressed-air drill when some coal fell on him from near the roof and killed him instantly.

## EXPLOSIVES.

The following table shows the quantity of explosives used in coal mines during 1941, together with the number of shots fired, tons of coal produced per pound of explosive used, and the average pounds of explosive per shot fired (these quantities include all explosives used for breaking coal and for rock-work in coal mines) :—

### Vancouver Island District.

| Colliery. | Quantity of Explosives used in Pounds. | Tonnage for Mine. | Total No. of Shots fired. | Tons of Coal per Pound of Explosive used. | Average Pounds of Explosive per Shot fired. |
|---|---|---|---|---|---|
| Comox Colliery (No. 5 mine) | 24,495 | 119,895 | 38,057 | 4.89 | 0.64 |
| Comox Colliery (No. 8 mine) | 52,400 | 161,451 | 83,650 | 3.08 | 0.62 |
| Northfield Colliery | 22,350 | 78,739 | 39,500 | 3.52 | 0.56 |
| South Wellington (No. 10 mine) | 81,120 | 230,135 | 86,525 | 2.84 | 0.93 |
| Wellington mine | 8,600 | 30,355 | 18,000 | 2.53 | 0.47 |
| Prospect mine, Extension | 1,490 | 3,246 | 2,350 | 2.11 | 0.63 |
| Lantzville Colliery | 2,300 | 2,422 | 1,700 | 1.05 | 1.35 |
| Chambers' mine | 2,700 | 6,052 | 5,200 | 2.24 | 0.52 |
| Beban mine | 4,000 | 10,893 | 7,000 | 2.72 | 0.57 |
| Loudon mine | 500 | 661 | 1,450 | 1.33 | 0.34 |
| Cassidy mine | 800 | 1,341 | 1,850 | 1.67 | 0.43 |
| Biggs' mine | 50 | 165 | 100 | 3.30 | 0.50 |
| Lewis' mine | 900 | 688 | 1,600 | 0.76 | 0.56 |
| Big Flame Wellington | 100 | 226 | 150 | 2.26 | 0.66 |
| Deer Holme mine | 990 | 1,471 | 2,310 | 1.49 | 0.43 |
| Lake Road mine | 50 | 223 | 150 | 4.46 | 0.66 |
| Totals for district | 202,845 | 647,958 | 289,592 | 3.19 | 0.70 |

### Nicola-Princeton District.

| | | | | | |
|---|---|---|---|---|---|
| Middlesboro Colliery | 7,450 | 22,860 | 10,225 | 3.06 | 0.72 |
| Granby Cons. M.S. & P. Co. | 18,850 | 69,774 | 28,998 | 3.70 | 0.65 |
| Princeton Tulameen Coal Co. | 4,475 | 26,116 | 8,500 | 5.83 | 0.52 |
| Tulameen coal mine | 800 | 2,883 | 1,600 | 3.60 | 0.50 |
| Hat Creek mine | 150 | 296 | 240 | 1.97 | 0.62 |
| Totals for district | 31,725 | 121,929 | 49,563 | 3.84 | 0.64 |

### Northern District.

| | | | | | |
|---|---|---|---|---|---|
| Bulkley Valley Colliery | 1,500 | 5,507 | 2,000 | 3.66 | 0.75 |
| Aveling Colliery | 350 | 901 | 700 | 2.57 | 0.50 |
| Totals for district | 1,850 | 6,408 | 2,700 | 3.46 | 0.68 |

### East Kootenay District.

| | | | | | |
|---|---|---|---|---|---|
| Coal Creek Colliery | 75 | 174,813 | 105 | 2,330.83 | 0.71 |
| Michel Colliery | 53,192 | 851,240 | 72,540 | 16.00 | 0.73 |
| Totals for district | 53,267 | 1,026,053 | 72,645 | 19.07 | 0.73 |

### Peace River District.

| | | | | | |
|---|---|---|---|---|---|
| Gething Colliery | 25 | 5 | 75 | 0.20 | 0.33 |
| Totals for Province | 289,712 | 1,802,353 | 414,512 | 6.22 | 0.69 |

QUANTITIES OF DIFFERENT EXPLOSIVES USED.

| | Lb. |
|---|---|
| Monobel of different grades | 267,513 |
| Permissible rock-powder | 22,149 |
| Total | 289,712 |

The following is a list of explosives permitted for use in coal mines by the Honourable the Minister of Mines, under the provisions of section 101, General Rule 11, clause (*i*), "Coal-mines Regulation Act":—

Polar Monobel No. 4.
Polar Monobel No. 6.
Polar Monobel No. 7.
Polar Monobel No. 14.
Polar CXL-ite No. 2.

## MACHINE-MINED COAL.

During the year 1941, mining-machines produced approximately 760,000 tons or 42.1 per cent. of the total.

The following table gives the district, number of machines, how driven, and type of machine used:—

| District. | Number driven by | | Type of Machine used. | |
|---|---|---|---|---|
| | Electricity. | Compressed Air. | Chain Under-cutting. | Puncher Type. |
| Vancouver Island | ---- | 27 | 20 | 7 |
| Nicola-Princeton | ---- | 28 | ---- | 28 |
| East Kootenay | ---- | 25 | 3 | 22 |
| Northern | ---- | 1 | ---- | 1 |
| Totals | ---- | 81 | 23 | 58 |

## SAFETY-LAMPS.

There were 2,496 safety-lamps in use in the coal mines of the Province. Of this number 200 were flame safety-lamps of the Wolf type and 2,296 were electric lamps of various makes as follows: Edison electric, 2,231; Wolf electric, 65.

The following table shows the distribution of lamps by district, method of locking, and illuminant used:—

VANCOUVER ISLAND DISTRICT.

| Colliery and Mine. | Method of Locking. | | Illuminant used. | |
|---|---|---|---|---|
| | Magnetic Lock. | Automatic Clip. | Naphtha Gasoline. | Electricity. |
| Comox Colliery (No. 5 mine) | 34 | 281 | 20 | 295 |
| Comox Colliery (No. 8 mine) | 71 | 224 | 36 | 259 |
| Northfield Colliery* | ----- | ----- | ----- | ----- |
| South Wellington (No. 10 mine) | 17 | 299 | 17 | 299 |
| Wellington mine | 10 | 152 | 10 | 152 |
| Prospect mine, Extension | 3 | 23 | 3 | 23 |
| Lantzville Colliery | 2 | 12 | 2 | 12 |
| Chambers' mine | 3 | 22 | 3 | 22 |
| Beban mine | 7 | 99 | 7 | 99 |
| Loudon mine | 2 | 6 | 2 | 6 |
| Cassidy mine | 2 | 5 | 2 | 5 |
| Biggs' mine | 1 | 2 | 1 | 2 |
| Lewis' mine | 1 | 2 | 1 | 2 |
| Big Flame Wellington | 2 | 4 | 2 | 4 |
| Deer Holme mine | 3 | 18 | 3 | 18 |
| Lake Road mine | 1 | 2 | 1 | 2 |
| Totals for district | 159 | 1,151 | 110 | 1,200 |

* Closed down, July.

NICOLA-PRINCETON DISTRICT.

| Colliery and Mine. | Method of Locking. | | Illuminant used. | |
|---|---|---|---|---|
| | Magnetic Lock. | Automatic Clip. | Naphtha Gasoline. | Electricity. |
| Middlesboro Colliery | 8 | 65 | 8 | 65 |
| Granby Cons. M.S. & P. Co., Ltd. | 8 | 100 | 8 | 100 |
| Princeton Tulameen Coal Co. | 2 | 70 | 2 | 70 |
| Tulameen coal mine | 2 | 24 | 2 | 24 |
| Hat Creek mine | 2 | 6 | 2 | 6 |
| Totals for district | 22 | 265 | 22 | 265 |

NORTHERN DISTRICT.

| | | | | |
|---|---|---|---|---|
| Bulkley Valley Colliery | 2 | 20 | 2 | 20 |
| Aveling Colliery | 2 | 12 | 2 | 12 |
| Totals for district | 4 | 32 | 4 | 32 |

EAST KOOTENAY DISTRICT.

| | | | | |
|---|---|---|---|---|
| Coal Creek Colliery | 12 | 160 | 12 | 160 |
| Michel Colliery | 50 | 639 | 50 | 639 |
| Totals for district | 62 | 799 | 62 | 799 |

PEACE RIVER DISTRICT.

| | | | | |
|---|---|---|---|---|
| Gething Colliery | 2 | ..... | 2 | ..... |
| Totals for Province | 249 | 2,247 | 200 | 2,296 |

## APPROVED SAFETY-LAMPS, ELECTRIC AND FLAME.

A list of the approved safety-lamps, both electric and flame, was published in the 1930 Annual Report. The following lamps, all electric, are now also approved:—

*No. 8.*—The electric lamp manufactured by the Edison Storage Battery Company, Orange, New Jersey, U.S.A., under Approval No. 18 of the United States Bureau of Mines. The only bulb approved for use in this lamp carries the symbol BM-18 and is manufactured by the National Lamp Works of the General Electric Company, Cleveland, Ohio.

*No. 9.*—The electric lamp manufactured by the Edison Storage Battery Company, Orange, New Jersey, U.S.A., under Approval No. 18F of the United States Bureau of Mines. This model of Edison lamp in reality represents an extension of the lamp approval given under Approval No. 18. The only bulb approved for use with this lamp carries the symbol BM-18F and is manufactured by the National Lamp Works of the General Electric Company, Cleveland, Ohio.

*No. 10.*—The electric lamp manufactured by the Edison Storage Battery Company, Orange, New Jersey, U.S.A., under Approval No. 18H of the United States Bureau of Mines. This lamp represents an extension of the No. 18 approval of the United States Bureau of Mines. The only bulb approved for use with this lamp carries the symbol BM-18H and is manufactured by the National Lamp Works of the General Electric Company, Cleveland, Ohio.

*No. 11.*—The electric lamp manufactured by the Edison Storage Battery Company, Orange, New Jersey, U.S.A., under Approval No. 24 of the United States Bureau of Mines. The only bulb approved for use with this lamp carries the symbol BM-24 and is

manufactured by the National Lamp Works of the General Electric Company, Cleveland, Ohio. This lamp is known as the Edison Model J lamp.

*No. 12.*—The electric lamp manufactured by the Edison Storage Battery Company, Orange, New Jersey, U.S.A., under Approval No. 25 of the United States Bureau of Mines. The only bulb approved for use with this lamp carries the symbol BM-25 and is manufactured by the National Lamp Works of the General Electric Company, Cleveland, Ohio. This lamp is known as the Edison Model K lamp.

*No. 13.*—The electric lamp manufactured by the Koehler Manufacturing Company, and known as the Super-Wheat Model "W" electric safety cap-lamp under Approval No. 20 of the United States Bureau of Mines.

*No. 14.*—The electric lamp manufactured by The Portable Lamp and Equipment Company, and known as the "Portable" electric safety cap-lamp under Approval No. 27 of the United States Bureau of Mines.

(Unless otherwise specified, all lamps are cap-lamps.)

NOTE.—*While the use of flame safety-lamps is permitted, it is the policy of the Department of Mines to encourage the use of approved electric safety-lamps for all persons underground in the coal mines, except such flame-lamps as may be required by the officials of the mines in the carrying-out of their duty and in such cases as it is considered advisable to provide flame safety-lamps in addition to the electric safety-lamps.*

## ELECTRICITY.

Electricity is used for various purposes on the surface at eight mines and underground at four.

The purposes for which it is used, together with the amount of horse-power in each instance, is shown in the following table:—

| Nature of its Use. | Aggregate H.P. |
|---|---|
| Above ground— | |
| Winding or hoisting | 1,945 |
| Ventilation | 1,735 |
| Haulage | 198 |
| Coal-washing | 1,785 |
| Miscellaneous | 6,125 |
| Total horse-power | 11,788 |
| Underground— | |
| Haulage | 1,315 |
| Pumping | 935 |
| Coal-cutting | ------ |
| Miscellaneous | 35 |
| Total horse-power | 2,285 |
| Total horse-power above and below ground | 14,073 |

Of the above amount, approximately 220 horse-power was operated as direct current and 13,853 as alternating current.

## VENTILATION.

The reports of the District Inspectors give detailed information regarding the amount of ventilation in the main airways and working splits of the different mines: the figures given being those resulting from air measurements taken during the last inspections of the year.

At the Comox Colliery there is in most cases a separate split of intake air for each individual long-wall of 300 feet length, and while the quantity of air passing is sufficient for normal mining purposes occasionally roof movements liberate sufficient methane to make necessary the prohibition of shotfiring for some time; in such cases the Inspector orders that no shotfiring shall be done until he again inspects the area and finds it clear of any visible gas-caps.

### METHANE DETECTION.

The Burrell Methane Detector and the M.S.A. Methane Detector were in general use throughout the year to detect the presence of methane in percentages less than could be detected by means of the flame safety-lamp.

The flame safety-lamp is in general use as the everyday means of testing for the presence of methane by the firebosses and mine officials, and during the year intensive efforts were made by the Inspectors to train firebosses and miners to estimate closely the percentage of methane indicated by very small " gas-caps " on the flame safety-lamp. This work was carried out underground where the gas-caps could be immediately calibrated with the results found at the same time and place by one of the above-named methane detectors.

While practically all workmen underground use the electric safety-lamp, many of the miners were given practical instruction in the use of the flame safety-lamp as a methane detector, and all new men who apply for a coal-miner's certificate of competency must show that they possess this knowledge.

### MINE-AIR SAMPLES.

Sampling of mine-air was maintained throughout the year, this varying in the number of samples with the conditions anticipated or existing. During the year 153 samples were taken.

The samples are analysed by the Dominion Bureau of Mines and this service is of much value to this Department. The results, in addition to their immediate value, form a record for future mines that may be opened in the vicinity of the presently operated areas.

## INSPECTION COMMITTEES.

The miners at all the larger mines fully observed the requirements of General Rule 37 of the " Coal-mines Regulation Act " by appointing and maintaining Inspection Committees which inspected the mines on behalf of the workmen every month.

In most cases a copy of the inspection report was sent to the Inspector.

## COAL-DUST.

Sampling of dust was well maintained throughout the year at all mines and a total of 1,457 samples was taken.

Very few samples show less than 50 per cent. incombustible content set as a minimum by the regulations; this is due to the policy of the Inspection Branch to maintain the incombustible content of the dust as high as possible at all times, and this is done by constant reminders to the managements of the different mines whenever any tendency towards a decrease in the incombustible content of dust is noted.

## DANGEROUS OCCURRENCES.

On February 18th a large emission of methane was given off in No. 2 Diagonal slope, No. 10 mine, South Wellington. The men were immediately withdrawn from the affected area until the normal mine ventilation removed the gas produced. No person was injured.

On March 30th while a large electric motor was being hoisted in the Northfield shaft at Nanaimo, a defective sling-chain broke and caused the motor to fall to the bottom of the shaft. Considerable damage was done to the shaft timbering and the mine was idle for three days while the damage was being repaired. No person was injured.

## BUMPS.

During the year a number of " bumps " of varying intensity were experienced in the No. 1 East mine, Coal Creek Colliery; following are brief details of the more serious " bumps ":—

On January 8th, at 12.05 a.m., a heavy " bump " occurred in the main South counter entry, No. 1 East mine, and caused damage over about 675 feet of the roadway.

The air-blast reversed the air-current for a short time; brattices and stoppings were blown down and the ventilation deranged. From 6 to 8 inches of immediate sandstone roof was brought down; timber sets were dislodged and broken and about a 3-foot thickness of coal was thrown off the pillar on the high side. There was no heaving of the floor. No person was injured.

On January 10th, at 6.50 p.m., a heavy "bump" occurred outby 26 West. This broke down some timber sets and from 3 to 5 feet of roof-rock for a distance of approximately 80 feet. No person was injured.

On January 15th, at 8.40 a.m., a major "bump" occurred on the main South entry and caused considerable damage on the main entry over a length of 610 feet. One man who was working in this area was killed by the "bump." Loaded cars in this area were derailed.

On January 17th, at 3.15 a.m., a sharp "bump" occurred in 26 West. This "bump" threw down the bratticing in several other working-places and threw a ventilation-door out of position and damaged two stoppings. No person was injured.

On January 18th, at 7.50 p.m., a sharp "bump" occurred in 26 West and threw out a considerable amount of timber from its position and projected much coal from the ribs. No person was injured. The shock of this "bump" was felt by several persons in Fernie, 5 miles distant.

On February 6th, at 11.15 a.m., a sharp "bump" was felt over the whole mine. The damage appeared to have centred outby 26 West. A return airway was badly heaved and a 6-inch air-line was broken in five places over a distance of 160 feet. A considerable amount of rock was brought down. Apparently this was a major ground movement, although the damage was localized.

On October 2nd, at 10.10 a.m., a small "bump" occurred in one working-place. This slightly injured one man and derailed a mine-car.

On October 21st, at 8.30 a.m., a heavy "bump" occurred which affected the main South entry and return airway. A considerable amount of coal was thrown off the ribs and telephone and signalling wires were broken and haulage operations were interrupted for some time. No person was injured.

On October 27th, at 11.05 p.m., a slight "bump" occurred in the main South entry at 22 West. This did very little damage and no person was injured.

On November 13th, at 9.30 a.m., a local "bump" occurred which affected only the return airway and threw about 30 tons of coal off the ribs. One man was slightly injured.

On November 17th, at 10.08 p.m., a "bump" of considerable force centred on the main entry between 26 West and 22 East, but did no damage beyond throwing several cars of coal and rock off the roof and ribs. No person was injured.

On November 27th, at 4.20 a.m., a sharp "bump" occurred at 28 West parting and vicinity. Cogs were knocked out and several feet of roof-rock was brought down. A ventilation-door was blown off its hinges and the tracks on the parting were badly heaved. Fourteen sets of timber on the parting were knocked out and seventeen loaded cars were thrown off the tracks. No person was injured.

On November 29th, at 4.20 a.m., a small "bump" damaged about 100 feet of the main South entry at 20 West. One set of timber was knocked out and the telephone and signalling wires were deranged. No person was injured.

On November 29th, at 2.20 p.m., a local "bump" occurred in the return airway from 28 West; the floor was badly heaved for a distance of 100 feet and the air-line was dislodged and broken. A ventilation-door was smashed to pieces. No person was injured.

On December 21st, at 12.30 p.m., a "bump" centred around second right 28 West. The track was heaved and the ventilation partly deranged and general work interrupted. The track was heaved up 2 feet in some places. No person was injured.

On December 20th, at 12.30 and 1.45 p.m., two "bumps" occurred in No. 1 room, 22 East. The first one was slight but the second was of considerable magnitude and was felt on the surface. Two stoppings were blown out and the rock parting in one of the places was shattered as if it had been shot. The track was heaved for a distance of 60 feet.

## PROSECUTIONS.

During 1941 there were eight prosecutions made for infractions of the "Coal-mines Regulation Act," as follows:—

| Date. | Colliery. | Occupation of Defendant. | Offence charged. | Judgment. |
|---|---|---|---|---|
| Feb. 1 | No. 5 mine, Comox Colliery | Haulageman | Had a match in his possession while underground | Fined $5 and costs. |
| Mar. 26 | Tulameen Coal Mines, Ltd. | Overman | Having more than one shot-hole charged at one time in a coal-face | Fined $10 and costs. |
| April 25 | No. 5 mine, Comox Colliery | Miner | Quarrelling underground | Suspended sentence. |
| April 25 | No. 5 mine, Comox Colliery | Miner | Quarrelling underground | Suspended sentence. |
| Nov. 20 | No. 10 mine, South Wellington | Fireboss | Preparing to fire a shot without having made an efficient examination to determine whether inflammable gas was present | Fined $25 and costs. |
| Dec. 2 | No. 5 mine, Comox Colliery | Fireboss | Having loaded and fired two shot-holes at one time | Fined $20 and costs. Case later appealed and appeal allowed on grounds of faulty wording of charge. |
| Dec. 9 | No. 5 mine, Comox Colliery | Miner | Failed to report to management a contravention of the "Coal-mines Regulation Act" that he observed | Fined $5 and costs. |
| Dec. 9 | No. 5 mine, Comox Colliery | Miner | Failed to report to management a contravention of the "Coal-mines Regulation Act" that he observed | Fined $5 and costs. |

## GOVERNMENT RESCUE-STATIONS.

The Department of Mines has four fully-equipped mine-rescue stations in charge of trained instructors located in the chief coal-mining districts—namely, at Nanaimo, Cumberland, Princeton, and Fernie. At any of these stations persons engaged in mining may be trained without cost, either on their own application or by request from any mining company. Where a mine is some distance from the rescue-station the instructor, by arrangement, will take the rescue apparatus to such mine and give the necessary training there; this also without cost.

In addition to the above stations, a fully-equipped station with apparatus provided by the Department is maintained at Middlesboro Collieries, Merritt, under the care of the mine management, and a smaller unit of rescue apparatus is stationed at the Premier mine, Stewart, and an H.H. inhalator stationed at Sheep Creek. The use of these stations and apparatus is available to any medical practitioner, and during the year many requests for oxygen and apparatus for administering same are received and given immediate response.

In the larger mining areas of Nanaimo, Cumberland, and the Crowsnest Pass experienced mine-rescue teams maintain a regular schedule of training throughout the year and so keep ready for any emergency calls. Due to so many of the younger men leaving the mines to join the different war services, there is increasing difficulty in obtaining new men of the proper age and physique to undertake the strenuous course necessary to produce efficient mine-rescue men; many of the men who had taken this course at the different mine-rescue stations are now specializing in gas protection in the army and navy.

The rescue-stations are also centres for first-aid lectures and training, and during the war are also centres for air-raid precaution work and casualty stations.

The preliminary training course consists of twelve two-hour lessons in the actual use of oxygen apparatus and Burrell all-service gas-masks in an irrespirable atmosphere, and instruction on the approved method of dealing with mine fires and recovery-work.

During the year, in addition to the regular teams in training, twenty-three new men took the full training and were granted certificates of competency:—

| Cert. No. | Name. | Where trained. | Cert. No. | Name. | Where trained. |
|---|---|---|---|---|---|
| 1102 | James Johnstone | Nanaimo. | 1114 | Frederick E. Burnet | Kimberley. |
| 1103 | George Telford | South Wellington. | 1115 | Edward G. Tapp | Kimberley. |
| 1104 | John F. J. Richardson | South Wellington. | 1116 | Alphonse G. Michaud | Kimberley. |
| 1105 | Michael Mihalech (Jr.) | Extension. | 1117 | Herbert L. McCallum | Kimberley. |
| 1106 | John George Mihalech | Extension. | 1118 | Stewart A. Bennett | Princeton. |
| 1107 | James Fairley | Princeton. | 1119 | Nick N. Kurbotoff | Princeton. |
| 1108 | Leonard R. McFadden | Copper Mountain. | 1120 | Irwin Atkinson | Princeton. |
| 1109 | Austen G. Truax | Copper Mountain. | 1121 | Raymond E. Nordin | Princeton. |
| 1110 | Roy Bakke | Copper Mountain. | 1122 | Arnold J. McIntyre | Princeton. |
| 1111 | Richard James Nichol | Nanaimo. | 1123 | Robert J. Culbertson | Princeton. |
| 1112 | Ross George Terhune | Kimberley. | 1124 | Albert Beckman | Princeton. |
| 1113 | John Cyril McLean | Kimberley. | | | |

## SUPERVISION OF COAL MINES.

During the year nineteen coal companies operated twenty-nine mines, employing 2,229 men underground. In the supervision of underground employees there were ten managers, seventeen overmen, and 103 firebosses and shotlighters; a total of 130, or one official for every seventeen men employed underground.

## "COAL SALES ACT."

There was only one complaint under the "Coal Sales Act" during the year, and this was given immediate attention, but towards the end of the year a number of complaints were received regarding the amount of smaller sizes of coal being sold as lump and nut; however, as there are no regulations specifying minimum or average sizes for lump coal, nut coal, or pea coal, no definite action could be taken in such cases.

In the Vancouver area, valuable assistance is rendered by the Weights and Measures Inspector for Vancouver City, who keeps a close check on the sale of coal in the city.

LIST OF REGISTERED NAMES OF BRITISH COLUMBIA COALS, APPROVED BY THE CHIEF INSPECTOR OF MINES, IN ACCORDANCE WITH THE PROVISIONS OF THE "COAL SALES ACT."

| Registered Names of Coal. | Colliery and District. | Producing Company. |
|---|---|---|
| Comox | Nos. 5 and 8 mines, Comox Colliery (Cumberland) | Canadian Collieries (D.), Ltd. |
| Old Wellington | No. 9 mine (Wellington) | Canadian Collieries (D.), Ltd. |
| Ladysmith-Wellington | No. 10 mine (South Wellington) | Canadian Collieries (D.), Ltd. |
| Hi-Carbon | Mixture of Canadian Collieries' coal and B.C. Electric coke | Canadian Collieries (D.), Ltd. |
| Lantzville-Wellington | Lantzville (Lantzville) | Lantzville Colliery. |
| Fiddick-Douglas | Fiddick mine (South Wellington) | Fiddick mine. |
| Chambers-Extension | Chambers' (Extension) | R. H. Chambers. |
| Wellington Big Flame | Richardson mine | A. B. Richardson. |
| Biggs-Wellington | Biggs' mine (Wellington) | Biggs' mine. |
| Berkley Creek-Little Wellington | Berkley Creek Colliery (Extension) | Hugh McLean Davidson. |
| Nanaimo Jingle Pot | Old East Wellington (Nanaimo) | Thos. Lewis. |
| Cassidy-Wellington | Cassidy mine (Cassidy) | A. H. Carroll. |
| Middlesboro | Middlesboro (Merritt) | Middlesboro Collieries, Ltd. |
| Coalmont | Coalmont (Coalmont) | Coalmont Collieries, Ltd. |
| Tulameen Valley Coal, Princeton | Tulameen (Princeton) | Princeton Tulameen Coal Co. |
| Granby Tulameen | Granby (Princeton) | Granby Consolidated M.S. & P. Co., Ltd. |
| Hat Creek | Hat Creek (Lillooet) | Canada Coal and Development Co., Ltd. |
| Tulameen Gem | Tulameen Collieries (Princeton) | Tulameen Collieries. |
| Bulkley Valley | Bulkley Valley (Telkwa) | Bulkley Valley Colliery, Ltd. |
| Aveling | Aveling (Telkwa) | Aveling Colliery. |
| Crow's Nest, Coal Creek | Coal Creek (Coal Creek) | Crow's Nest Pass Coal Co., Ltd. |
| Crow's Nest, Michel | Michel (Michel) | Crow's Nest Pass Coal Co., Ltd. |

# BOARD OF EXAMINERS FOR COAL-MINE OFFICIALS.

## FIRST-, SECOND-, AND THIRD-CLASS CERTIFICATES AND MINE-SURVEYORS' CERTIFICATES.

BY

JAMES STRANG.

The Board of Examiners, which was formed on July 10th, 1919, now consists of James Dickson, Chief Inspector of Mines, Chairman; H. E. Miard, member; and James Strang, member and Secretary to the Board.

The meetings of the Board are held in the office of the Department of Mines in Victoria. The examinations are held in accordance with the amended rules of the Board of Examiners and approved by the Minister of Mines on September 28th, 1929.

Two examinations were held in 1941, the first on May 14th, 15th, and 16th, and the second on November 12th, 13th, and 14th. The total number of candidates at the examinations were as follows: For Second-class Certificates, 6 (2 passed, 4 failed); for Third-class Certificates, 16 (7 passed, 9 failed).

The following is a list of the candidates who successfully passed in the various classes:—

*Second-class Certificates.*—Arthur Dockrill and Thomas Cochrane.

*Third-class Certificates.*—Samuel Fowler, Hannes Maki, William D. Louden, Ralph Larner, Leon D. Leonard, Henry R. Ebert, and Peter Queen.

## EXAMINATIONS FOR CERTIFICATES OF COMPETENCY AS COAL-MINERS.

In addition to the examinations and certificates already specified as coming under the Board of Examiners, the Act further provides that every coal-miner shall be the holder of a certificate of competency as such. By miner is meant any person employed underground in any coal mine to cut, shear, break, or loosen coal from the solid, either by hand or machinery.

Examinations are held regularly in all coal-mining districts.

No certificate has been granted in any case 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 1941 there were 263 candidates for coal-miners' certificates; of these 228 passed and 35 failed to qualify.

In addition to the certificates granted above, substitute certificates were issued to those who had lost their original certificates.

The Board of Examiners desires to thank the different coal-mining companies for the use of their premises for holding the examinations when necessary.

The Inspector of Mines in each district has authority under the "Coal-mines Regulation Act" to grant, after a satisfactory examination, a provisional certificate as a coal-miner to applicants, which entitles the holder to follow the occupation of a coal-miner for a period not exceeding sixty days or until the date of the next examination before the Board.

# GOVERNMENT MINE-RESCUE STATIONS.

## NANAIMO.

BY

RICHARD NICHOL.

There were no emergency calls from the mines in this district during the year, but there were thirty calls for oxygen and the oxygen apparatus from the different hospitals and medical practitioners. Immediate response was made to these calls.

Two trained teams from the mines maintained weekly practice training throughout the year at this station, and units from different fire brigades took some instruction on the oxygen resuscitation apparatus.

The main equipment at this station consists of six sets of the Gibbs two-hour oxygen machines; seven sets of the McCaa two-hour oxygen machines; one McCaa one-hour oxygen machine; twelve Burrell all-service gas-masks; two H.H. inhalators; one motor-driven pump for charging oxygen cylinders; and a sufficient supply of oxygen and supplies to maintain the above equipment in service for a considerable time.

An 85-horse-power truck is kept in readiness at all times to transport the equipment in response to any emergency calls.

This station is equipped to serve as an air-raid precaution centre and casualty station.

## CUMBERLAND.

BY

JAMES L. BROWN.

Three trained teams from Comox Colliery maintained weekly training practices throughout the year and some formerly trained men took refresher training.

This station is also used as the headquarters for first aid and air-raid precautions supplies for the district, and training in the use of gas-masks and decontamination-work is given to all interested in this work.

The main equipment at this station consists of eleven sets of the McCaa two-hour oxygen machines; twelve sets of the Burrell all-service gas-masks; one H.H. inhalator; one Sparklet resuscitator; thirty self-rescuers; and sufficient supplies to maintain the above equipment during emergencies.

There were no emergency calls from the mines during the year .

## PRINCETON.

BY

ALFRED GOULD.

A trained team from the Granby Colliery maintained a weekly training during the year and a few new men took the full training course.

The main equipment at this station consists of eleven McCaa two-hour oxygen machines; eleven Burrell all-service gas-masks; one H.H. inhalator; with sufficient supplies to maintain the above equipment in efficient service.

This station has also been equipped to serve as the main casualty station in the case of any war emergency.

## FERNIE.

BY

JOSEPH J. HAILE.

The main equipment at this station consists of six Gibbs two-hour oxygen machines; eleven sets of the McCaa two-hour oxygen machines; twelve Burrell all-service gas-masks; thirty-five self-rescuers; and one H.H. inhalator.

A number of men from the Sullivan mine at Kimberley took the full training course and obtained certificates of competency in mine-rescue training.

Several calls for oxygen were received from the Fernie hospital and these were given immediate attention.

There were no emergency calls from the mines during the year.

# INSPECTION OF COAL MINES.

## VANCOUVER ISLAND INSPECTION DISTRICT.

BY

JOHN MACDONALD AND R. B. BONAR.

**Canadian Collieries (Dunsmuir), Ltd.** J. A. Boyd, President, Montreal, Que.; H. R. Plommer, Vice-President, Vancouver, B.C.; P. S. Fagan, Secretary-Treasurer, Nanaimo, B.C.; H. Baird, Superintendent, Nanaimo, B.C.

*Northfield Mine.*—A. Newbury, Manager; J. Sutherland, Overman. A general description of the location of this mine, surface plant, and method of working, etc., has appeared in previous Annual Reports. Conditions in this part of the Wellington field proved so disappointing in the location of workable seams that the management were compelled to abandon this mine in July. It might be mentioned that the original operations were started by the New Vancouver Coal Mining and Land Company, Ltd., on January 8th, 1888, the coal-seam being reached at a depth of 424 feet on July 31st. Development roadways were set off on both sides of the shaft and a limited area opened up by the long-wall method of working, but conditions proved unfavourable to mine economically with the equipment available at that time with the result that operations were abandoned in 1895. The Canadian Collieries (D.), Ltd., commenced unwatering and repairs in April, 1936, this work being completed in October of the same year; from that date until final abandonment the mine produced 608,000 tons of coal.

*No. 10 Mine, South Wellington.*—W. Frew, Manager; Jos. Wilson, Overman. This mine is situated in the Cranberry district about half a mile south of the old No. 5 mine and is now the chief producer in the district, having worked 256.5 days during the year for a total output of 230,135 tons. Additions to the plant included the installation of one of the two modern compressors formerly serving Northfield mine, and the installation of the Northfield Main slope electric hoist in a fire-proof room at the top of No. 1 Diagonal slope; production again being resumed in this district in September after a stoppage of eighteen months. In the early part of November, a beginning was made to level off the ground and prepare the foundations for a wash-house to accommodate 300 men and it is anticipated this building will be in service early in 1942. New development, which was carried on steadily in all districts, amounted to a total drivage of 8,300 feet of main roadways, the bulk of this being done in the Nos. 1 and 2 Diagonal slope sections where the main portion of the field awaits development; work along these lines was curtailed in the Main slope and No. 3 Diagonal slope districts as these workings gradually reached a predetermined boundary-line which had been established as the ultimate limit of drivage in the direction of the abandoned workings of Granby No. 1 mine, a 400-foot barrier pillar being left intact in this area as a safeguard against any inrush of water or noxious gases from these old workings. Working conditions in general have been found satisfactory throughout the year, except when an occasional heavy outflow of gas necessitated a temporary prohibition of blasting operations pending the removal of all visible gas-caps from the general body of the air. Excepting as stated above, the ventilation has been generally good. One hundred and sixty-six samples of dust were collected, all of these being well above the minimum standard of incombustible content as set by the Coal-dust Regulations; 149 tons of lime-dust was used throughout the year to reduce the hazard due to coal-dust.

*Wellington Mine.*—A. Newbury, Manager; J. Sutherland, Overman. This mine is situated in the "timberlands" district, a distance of 14 miles from the washery and cleaning plant at Nanaimo, to which point the output is transported by a fleet of trucks owned and operated by F. W. Beban Company under contract with the coal company. This mine was operated for a few years prior to 1929, when it was closed down for lack of transportation facilities and remained closed until May of this year, when the mine was unwatered, the necessary repairs carried out underground, pit-head and bunkers built, compressor plant and hoisting engine transferred from Northfield, and

the necessary power-lines erected from the main highway into the mine, with production being started on September 23rd. The coal in this area belongs to the Wellington series, is of excellent quality and varies from 2 to 4 feet in thickness. The method employed is the long-wall system of mining, the coal being undercut by Anderson & Boyes coal-cutting machines, while Meco shaking-conveyers are used on the face-lines to transfer the coal to the loading-points on the levels. General conditions have been found satisfactory and the ventilation has been exceptionally good throughout the mine. All roadways in this mine to date have varied from a damp to a very wet condition throughout.

*Prospect Mine, Extension.*—M. Brodrick, Fireboss. This mine is situated at Extension, on the southerly end of the " Harewood Ridge," and is operating in a portion of the Wellington seam. Principal development carried out during the year was confined to extending levels right and left off the Main slope. These were broken away off the slope at a point 150 feet from the portal and driven for a distance of 200 feet in troubled ground, the left level being finally abandoned on this account, but progress is still being made in a trough of coal along the fault-line in the Right side workings. The ventilation was good generally.

**Beban Mine.** F. W. Beban Company, Operators; George Frater, Overman. From January to July 2nd, on which date this property was abandoned, the mine worked a total of 139.5 days and produced 11,948 tons. During the above period, the greater portion of the output was mined from the Main slope pillars which were drawn back almost to the portal.

**Chambers' No. 3 Mine.** R. H. Chambers, Operator; Charles Webber and Thos. McCann, Firebosses. This mine is in the Extension district and is operating an isolated portion of the Wellington seam which was left in this area by former operators. This property has worked steadily throughout the year, having worked a total of 251 days and produced 6,540 tons with an average crew of fourteen men employed.

**Lake Road Mine.** George Frater and Associates, Operators; G. Frater, Overman. This small mine was opened in November in the immediate vicinity of the abandoned Beban mine to recover a limited area of outcrop coal left untouched in this area by former operators. During the period November 1st to December 31st, this mine worked forty-two days and produced 193 tons with a crew of two men engaged. The ventilation is provided by natural means and general conditions were found satisfactory. No accidents were reported from this mine.

**Lewis' No. 2 Mine.** T. and G. Lewis, Operators; G. Lewis, Fireboss. This mine is situated in the Harewood district and is operating in isolated portions of the Wellington seam which were left intact by former operators. Mining at present is being carried on along the high side of the old Harewood Main tunnel at a point approximately 800 feet from the portal. As there are several openings through to the surface from the old workings, a plentiful supply of fresh air is provided by natural means.

**No. 5 Mine, Cassidy.** J. McKellar and Associates, Operators; James Nimmo, Fireboss. This mine is situated in the Cassidy area and is operating in a portion of the Douglas seam lying to the south of the abandoned Granby No. 2 mine. The seam in this area is reached by a slope driven from the surface, but development-work generally has been slowed up by reason of irregularities in the seam and faulted ground. The ventilation is provided by natural means and has always been found sufficient for all practical purposes. No accidents were reported from this mine.

**Big Flame Mine.** A. B. Richardson and Associates, Operators; T. Hunter, Fireboss. This mine is situated in the South Wellington district and operated in a small pillar area left near the outcrop by former operators. Ventilation was produced by natural means and working conditions were good during the course of inspection.

**Lantzville Colliery.** *No. 1 Mine.*—J. A. Challoner and Associates, Operators; J. A. Challoner, Overman. This mine is on the shore-line of the Strait of Georgia, 9 miles north of Nanaimo, and operated in the Wellington

seam until the last week in December, when drainage difficulties caused a suspension of operations and subsequent abandonment of work in this area. It was found fairly satisfactory at all inspections.

**Biggs' Mine.** James Biggs, Operator and Fireboss. This mine was situated in the Wellington district and worked eighty-four days during the first nine months of the year, producing 170 tons with a crew of two men engaged. Operations were entirely confined to a limited area of outcrop coal left in by former operators, all available coal that could be recovered with safety being extracted and the mine closed down for good in September.

**Loudon's Mine.** W. D. Loudon, Operator; J. Unsworth, Fireboss. This mine is being operated in a small area of outcrop coal in the Wellington district; ventilation is produced by natural means and working conditions were found satisfactory at all inspections. No accidents were reported during the year.

**Deer Holme Mine.** Robt. Hamilton and Associates, Operators; Robt. Hamilton, Overman. This mine is situated in the Extension district and was opened up in what was formerly known as old No. 1 heading which was driven out to the surface from No. 2 mine, Extension Colliery. This roadway has been repaired and is now serving as a slope to develop and open up a portion of outcrop coal which was left in to protect the surface when Extension Colliery was in operation.

At the larger mines the inspection committees appointed by the miners in accordance with the "Coal-mines Regulation Act," section 101, General Rule 37, carried out inspections every month and submitted copies of their report to this office.

All report-books required to be kept at the mines were examined frequently throughout the year and found to be maintained in a proper manner.

**No. 8 Mine, Comox Colliery.** James A. Quinn, Manager; Arthur W. Watson, Overman; James Weir and Daniel Morgan, Shiftbosses; E. Surtees, T. Shields, J. Queen, J. Anderson, F. Coates, W. Johnstone, F. Woods, A. Maxwell, D. Waddington, W. Bennie, R. O'Brien, T. Robertson, G. Harvie, and E. H. Devlin, Firebosses.

The mine is in the vicinity of the Lake Trail road and 2 miles east of the mine camp at Bevan. The seams are reached by two shafts, each 1,000 feet in depth. The No. 2 seam, which lies at a depth of 700 feet, is the only one being operated at the present time, although work has commenced on unwatering the lower or No. 4 seam with the view of developing and operating this seam in the near future. In the No. 2 seam, before opening out on the long-wall advance method of work, a circular shaft pillar 1,000 feet in diameter was left and only narrow openings driven through it.

The mine operated throughout the year, but owing to slackness in trade very little development-work was done during the first eight months of the year. All the active workings are at present confined to the South side of the shaft, but the management is considering the reopening of the long inactive North side workings which are at present still in the development stage. The main South level, after being driven through a series of faults for approximately 500 feet, is in regular coal and now is an active producer with one long-wall of 300 feet during the year and is now in faulty ground. No. 1 Incline and its two counters form an advancing long-wall triple-entry system, the incline forming the centre entry and the right and left counters made at top and bottom, respectively, of the 300-foot long-wall face-line. Levels are driven off the incline to the right and left to form long-walls, advancing along the strike, of approximately 300 feet in length. To give the required height the incline and counters are top-brushed and the rock stowed on either side of the roadways in the gob. There are nine long-wall faces in operation, their total length aggregating 2,500 feet, with an average seam thickness of 3 feet 6 inches, including rock bands or bone. Each wall now has a separate split of air, and, to accomplish this, 1,200 feet of airways were driven through the gob and several overcasts constructed. The counter to the main South return airway is being repaired and the stables removed from it, so that in the near future this roadway will be used to duplicate the main South return and so reduce considerably the velocity of the air.

The long-walls and levels are undercut by means of Anderson-Boyes compressed-air long-wall machines, and solid places are driven by radial-type punching machines. Shaker pan-conveyers of the compressed-air Meco type are used to convey the coal down the long-wall faces and load it into 1½-ton capacity mine-cars on the levels. Owing to the numerous slips encountered, the varying thickness of cap-rock, and the slow advance of the walls, the roof conditions are not of the best and require the closest attention and care.

The mine ventilation is supplied by a Sullivan fan having a rated capacity of 250,000 cubic feet of air per minute against a 7-inch water-gauge. As mentioned above, each wall has a separate air-current, and all told there are twelve separate splits.

Twelve samples of mine-air were collected during the year from the main South return and served as a check on safety-lamp readings. The analysis of the air sample taken in the main South return airway on December 9th showed a methane content of 0.45 per cent. A total of 341,000 lb. of lime-rock dust were used underground during the past twelve months, 120,000 lb. being used in tamping shots and 221,000 lb. in treating the roadways and face-lines of the mine to combat the coal-dust hazard. As an additional precaution against the coal-dust hazard, the coal is subjected to a water-spray as it is discharged from the conveyer-pans into the coal-cars. One hundred and ninety-eight samples of mine-dust were analysed during the year for the purpose of ascertaining the percentage of incombustible matter and moisture in the dust collected from the roof, floor, and sides of the mine roadways.

To handle the increasing amount of coal coming from the No. 1 Incline district a first-motion hoist was installed near the face of this incline. The compressed air for the underground machinery is supplied by three electric-driven compressors, having a rated capacity of 4,970 cubic feet per minute, located on the surface near the main hoisting-shaft.

On October 6th work was commenced on a new bath-house in the mine yard, having a capacity for 400 men, and it should be completed early in the coming year. The mine was inspected on forty-eight occasions during the year.

**No. 5 Mine, Comox Colliery.** John S. Williams, Manager; John Christie, Overman; I. Morgan and T. Eccleston, Shiftbosses; William Herd, Robert Walker, J. H. Vaughan, A. G. Jones, C. Williams, A. Somerville, A. Dunsmore, T. Smith, and James Cochrane, Firebosses. This mine operates the No. 2 seam, which is reached by a shaft 280 feet in depth. All the workings lie to the dip from the shaft and are accessible by four slopes which are driven from the level of No. 1 seam. All of the output is produced from advancing long-wall faces and their accompanying development places. At the end of the year there were five active long-wall faces having a total length of 1,230 feet with an average seam thickness of 3 feet 9 inches, including 10 inches of rock. The average daily output of coal during the month of December was 465 tons, with 253 men employed underground and thirty-two men on the surface.

The long-wall faces are equipped with compressed-air Meco-type pan-conveyers which convey the coal from the face-lines to 1-ton capacity mine-cars on the levels. The slopes and levels are bottom-brushed to give the necessary height and most of the rock is stowed in the gob on both sides of the roadways. All the coal-cutting is done by means of compressed-air Anderson-Boyes machines which mine the coal to a depth of 6 feet.

At the end of the year the active workings were confined to the Main slope and No. 4 West slope districts, and the development slope, No. 6 East. No. 2 West slope district stopped production in March on account of the low and bony nature of the seam section.

Due to the gassy nature of the mine the closest attention is at all times required in maintaining efficient ventilation, and while it has been necessary on several occasions during the year to temporarily prohibit blasting on some of the long-wall faces and levels, there were no instances of protracted prohibitions being required.

The mine is ventilated by two electric-driven exhausting-fans which have separate returns but common intakes. The No. 1 fan, which ventilates the abandoned No. 1 seam and No. 2 West slope workings and the active No. 4 West slope district, gave a

reading of 61,200 cubic feet per minute at the time of the last inspection. No. 2 fan, which ventilates the Main slope and No. 6 East slope districts, gave a reading of 156,000 cubic feet per minute against a 4-inch water-gauge.

One hundred and thirty-six tons of limestone-dust were used underground during the year to combat the coal-dust hazard. It was distributed by hand on the roadways and face-lines and is also used in tamping shots. As an added precaution the coal coming off the conveyer-pans is sprayed with water to allay the danger from coal-dust. Two hundred and thirty-three samples of mine-dust were analysed during the year for the purpose of ascertaining the percentage of incombustible matter and moisture in the dust collected from the roof, floor, and sides of the mine roadways; all of which exceeded the minimum requirements of the dust regulations.

A man-trip is run up on this slope, and as a safeguard, the hoist is equipped with an automatic cut-off which cuts off the power and applies the brake if anything should happen to the hoistman. An additional man-trip is run on the lower Main slope to connect with the above man-trip.

The compressed air for the underground machinery is supplied by three electric-driven compressors situated at the top of No. 3 intake drift, and which have a rated capacity of 4,950 cubic feet of air per minute.

The new bath-house, with accommodation for 512 workmen, was opened for use on May 4th and as it is equipped with sixty sprays there is no crowding or waiting by the workmen.

Monthly inspections were made by the miners' " Inspection Committee," and copies of all these reports of inspection were received through the courtesy of the committee members. All report-books required to be kept at the mine were examined regularly and were found to be in order.

The mine was inspected on sixty-two occasions during the year.

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## NICOLA-PRINCETON INSPECTION DISTRICT.

BY

E. R. HUGHES.

Five collieries operated in this district during the year and were as follows: The Granby Colliery of the Granby Consolidated Mining, Smelting, and Power Company, Ltd.; the Middlesboro Colliery, at Merritt, B.C.; the Princeton Tulameen Coal Company, Ltd., at Princeton, B.C.; the Tulameen Coal Mines, Ltd., at Princeton, B.C.; and the Hat Creek Coal Mine, near Ashcroft, B.C. Prospect operations were carried on by the Inland Collieries, Ltd., near Merritt, and a small amount of prospecting was done near Princeton by Chas. Jackson, of Kelowna. There were no fatal accidents in the coal mines of this district during the year.

The output for the year was less than that recorded for last year. The reduction being chiefly due to the loss of market sustained by the closing-down of the Coalmont Colliery during 1940. This market has not been diverted to any other mines in the district. The production from the Middlesboro Colliery remained about the same as last year whilst the Princeton Tulameen Coal Company showed a slight increase. A new producer during the year was the Tulameen Coal Mines, Limited, who commenced mining coal from the No. 3 mine; this being adjacent to the underground operations of the abandoned No. 2 mine formerly worked by the Tulameen Collieries, Limited. The old No. 2 mine closed down during 1936. The production from the Granby Colliery was slightly less than during 1940; this being partly due to increased efficiency of the Granby power plant, which takes almost the entire output of the mine, and partly due to coal for this plant being purchased from other sources. The small coal mine at Hat Creek showed a slight improvement in output.

**Granby Consolidated M.S. & P. Co., Ltd.** Julian B. Beaty, President, New York; A. S. Baillie, Vice-President and General Manager, Copper Mountain, B.C.; W. R. Lindsay, Assistant General Manager, Allenby, B.C.; W. I. Nelson, General Superintendent, Copper Mountain, B.C.

*Granby Colliery, No. 1 Mine.*—Mine Manager, Thos. M. Wilson; Overman, A. McKendrick; Firebosses, T. Cunliff, F. Bond, A. Hilton, D. Jones, and T. Lloyd.

The No. 1 mine is about 6 miles west of Princeton, off the Hope–Princeton Highway. Almost all the output from this mine is used at the company's steam electric power plant near Princeton, which supplies the power requirements at the Copper Mountain mining operation, the concentrator at Allenby, and at the coal mine.

The coal is transported from the mine by auto-trucks to a point near Princeton, from where it is carried across the Similkameen River by an aerial tram to the power plant. The total power capacity of this plant is approximately 17,500 kilowatts. For this coal haulage, three 9-ton trucks, one of which has a 12-ton trailer, are used.

The seam being worked has an average pitch of 27 degrees and mining is carried on by the pillar-and-stall system; the coal being carried from the working-faces by chutes to the different haulage-levels. With the exception of the main underground electric hoist, all the underground power is from compressed air.

All mining is done by means of Ingersoll-Rand post-type punching-machines, of which fourteen are in use. The types used are the R-37 and R-47. Power for the mine is developed by an electrically operated Ingersoll-Rand Imperial No. 10 compressor, having a capacity of 1,200 cubic feet of free air per minute, with a pressure of 90 lb. The surface plant and tipple is electrically operated.

The mine is divided into two main ventilation splits; the North split supplying 30,000 cubic feet of air per minute for the use of thirteen men and the South split supplying 25,000 cubic feet per minute for the use of twenty-two men; each split has a separate fan. Air sample analyses show a methane content of 0.03 per cent. in the return air.

On August 1st signs of incipient heating were discovered in the abandoned gob area in the upper side of No. 1 South level. This area was safely and efficiently sealed off. With a view to preventing further heating in other abandoned parts of the mine, an extensive programme of sealing was undertaken during the year, with the result that all the old workings on the North side of the mine were sealed with block stoppings; twelve seals were required to complete this work. As pillars are being drawn sealing operations follow immediately. All abandoned workings are now permanently sealed.

*Granby Colliery, No. 2 Mine.*—Mine Manager, Thos. M. Wilson. This development mine was closed down during the month of April, but is being held in reserve if further production is required.

**Middlesboro Collieries, Ltd.**

E. W. Hamber, President, Vancouver, B.C.; Miss E. McDonald, Secretary, Vancouver, B.C.; Robert Fairfoull, Superintendent, Merritt, B.C. This colliery is on a branch of the Kettle Valley Railway about 1 mile from Merritt and consists of No. 2 South, No. 2 South Extension, No. 3 North, and Prospect mines. Plant and equipment have been described in previous reports and there have been no changes during the year. Eighty-three men were employed.

*No. 2 South Mine.*—Manager, Robert Fairfoull; Overman, James Fairfoull; Firebosses, W. Ewart and Thos. Rowbottom. There was no new development in this mine during the year and all the coal produced was taken from pillars. During my inspection conditions were found to be generally satisfactory. The roadways and timbering were found to be in good condition. All parts examined were found to be generally well treated with inert dust. This mine is ventilated by natural means and the air measurement taken during the last inspection in 1941 was 4,050 cubic feet of air passing per minute for the use of fourteen men and one horse.

*No. 2 South Extension Mine.*—Manager, Robert Fairfoull; Overman, James Fairfoull; Fireboss, L. Dickie. The Main level of this mine was extended a distance of 300 feet during the year. A slope from the Main level was driven a distance of 300 feet. These were the only developments to record. General conditions were found to be satisfactory during the inspections made at this mine. The ventilation is by natural means and the last air measurement taken during the year showed 10,200 cubic feet of air passing per minute for the use of eighteen men and two horses. Analyses of the air showed a methane content of 0.06 per cent.

*No. 3 North Mine.*—Manager, Robert Fairfoull; Overman, A. Allen; Firebosses, G. Corbett and R. Dunnigan. The only work done during the year at this mine was pillar-extraction. This mine is rapidly coming to a close and the available coal will probably be exhausted during the forthcoming year. A fan is used to assist ventilation during part of the year, but during the winter months natural ventilation is found to be sufficient. The last air measurement taken during the year was of the natural ventilation, which showed 5,250 cubic feet of air passing per minute for the use of ten men. Analyses of the air showed a methane content of 0.04 per cent.

*Prospect Mine.*—Manager, Robert Fairfoull; Fireboss, G. Corbett. This is a small prospect operation situated approximately half a mile east of the company's office at Middlesboro and about 200 yards west of the original No. 2 mine portal. Work on this prospect began during September and ended during the latter part of December when a second opening to the surface had been made. Ventilation was by natural means. Two men were employed underground.

**Inland Collieries.**—Company office, c/o Grossman & Holland, Stock Exchange Building, Pender Street, Vancouver, B.C. Manager, Francis Glover, Merritt, B.C.

*No. 3 North Prospect Mine.*—This is a small prospect operation in the side of a dry creek situated about 10 miles by road in a south-easterly direction from the city of Merritt. A tunnel was driven into the hillside a distance of about 140 feet and except for a very thin lens of coal, no workable seam was encountered. Conditions were found to be generally satisfactory. Three men were employed.

**Hat Creek Coal Mine.** Owned by L. D. and A. A. Leonard, Ashcroft, B.C. This mine is near Upper Hat Creek and about 30 miles from Ashcroft. Only two men are employed underground during the winter season; the coal being taken by truck to Ashcroft, Lillooet, and Kamloops for domestic purposes. During the latter part of the year several hundred tons of slack, some of which had been lying in the mine yard for several years, were picked up and sold to the Epsom salts factory at Ashcroft. This slack is being used for steam-raising. Conditions were found to be generally satisfactory. The ventilation is by natural means. The last air measurement taken showed 5,250 cubic feet of air passing per minute for the use of two men.

**Princeton Tulameen Coal Co., Ltd.** Guy F. Atkinson, President, San Francisco, California; George H. Atkinson, Vice-President, San Francisco, California; W. D. Seaman, Secretary-Treasurer, Princeton, B.C.; James Taylor, Manager, Princeton, B.C.; Ben Cheetham, Robert Gourlay, and Andrew Dean, Firebosses. This company operates the Princeton Tulameen No. 1 mine, formerly known as the Lind mine, situated about 1 mile west of Princeton. The mine is developed from a Main slope driven from the outcrop on a pitch of 16 degrees for a distance of 1,280 feet. Levels have been driven off this slope to the east and west, the usual pillar-and-stall method being followed in developing the field. Development-work during the year was concentrated on the Nos. 13, 14, and 15 Right levels; these levels were advanced approximately 1,000 feet each, with the necessary connecting crosscuts. All coal production during the year was from this development-work.

A Diesel electric power plant supplies the power requirements of the mine. All coal is mined by Ingersoll-Rand post-type punching-machines, three of these machines being in use.

The mine is ventilated by a 48-inch Aerodyne-type fan. The last air measurement taken during December showed 37,500 cubic feet of air passing per minute for the use of twenty-five men. Analyses of the air showed a methane content of 0.1 per cent.

A Lidgerwood hoist was installed at the surface to hoist coal from the mine. This hoist replaced a smaller installation which had proved inadequate for the mine output during the winter months.

The screening plant includes one 3- by 6-foot double-deck Niagara vibrating screen; one ordinary shaking screen, 4 feet wide, in two sections; also two screens, 11 feet and 6 feet in length.

The coal produced at this mine supplies most of the domestic requirements in the Princeton district and is also shipped to Vancouver and Interior points. The coal shipped by rail is taken from the mine to the shipping bunker situated near the Kettle

Valley Railway station at Princeton by an 8-ton capacity International truck. During the winter season sixty-six men are employed at this mine.

**Tulameen Collieries, Ltd.** Head Office, 716 Hall Building, Vancouver, B.C.; Mine Overman, David M. Francis; Fireboss, T. Bryden. This company operates the Tulameen No. 3 mine, which is about 2 miles west of the town of Princeton. During the year a new main haulage-tunnel was driven on a 2-per-cent. grade and the mine-track laid straight from this portal to the tipple; thus greatly facilitating the handling of coal. The tipple is at the side of the Kettle Valley Railway, from which a spur is extended.

The underground workings of this mine are close to the abandoned working of the old Tulameen No. 2 mine and for this reason a considerable amount of precautionary advance drilling has had to be done. Contact with the old workings was made by means of a drill-hole on November 20th and a few days later a full-sized opening was effected; this opening was then sealed because of the large quantity of methane given off from the old workings. A second opening will be made on the west side of the mine which will then provide the necessary means of ventilating the old workings. At the end of the year the west side contact had not been made.

Mine ventilation is provided by a Sheldon fan which was moved from the old No. 2 mine and erected in its present position during the year. The last air measurement taken during December showed 10,500 cubic feet of air per minute passing for the use of seven men. Analysis of the return air showed a methane content of 0.09 per cent.

**Black Mine.**—The only work done at this mine was the shipment of a 30-ton car-load of coal during the month of May.

**Jackson Prospect.** Owned by Chas. Jackson, Kelowna, B.C. This new prospect operation is about 6 miles by road in a south-westerly direction from Princeton. The workings consist of several open-cuts and an exploratory shaft about 15 feet in depth. No coal was produced during the year and the work done was in a burned-out portion of one of the Princeton seams. A number of coal-seam outcrops in this area have undergone metamorphism, being near to the volcanics on the western rim of the Princeton coal area.

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## NORTHERN INSPECTION DISTRICT.

BY

CHARLES GRAHAM.

**Bulkley Valley Collieries.** F. M. Dockrill, President; A. H. Dockrill, Fireboss. The property is on Goat Creek, a tributary of Telkwa River, about 7 miles from Telkwa, to which point coal is hauled by truck. The market is chiefly domestic and confined, by transportation costs, to the area between Prince Rupert and McBride, along the line of the Canadian National Railway.

No methane in explosive quantity was detected during the year, but a gas-cap, about ¼ inch, was found on two occasions. About 4,200 cubic feet of air per minute was passing through the mine for the use of nine men. A total of twelve men were employed.

A Siskol coal-cutter was introduced during the year. Due to a series of faults, further projection of the main slope was abandoned and the extraction of pillar was commenced. Operations in this area are now confined to the extraction of the pillars.

A new operation known as No. 2 slope has been started to the north of No. 1 slope, and is now being developed. The mine only operates single shift.

**Aveling Coal Co., Ltd.** George Yardley, President; J. M. Wilson, Fireboss. This property is located on the north bank of Telkwa River, about 6.5 miles from the railroad at Telkwa, to which point coal is hauled by truck. There are two main seams of coal on the property, known as the "Betty" and "Major" seams.

*Betty Seam.*—This is the lowest seam and a slope is being driven north-east from the outcrop in the river-bank. The seam shows a fine section of coal at this point as

follows: Roof, shale; coal, 2 feet; hard shale, 1.5 inches; coal (blacksmith), 3 feet 4 inches; parting; coal, 3 feet 5 inches; shale, 1.5 inches; coal, 3 feet 8 inches; shale, 8 inches; coal, 4 feet; floor, shale.

The top 2 feet of coal and the shale band is left on as roof. The blacksmith section is mined separately, crushed to size and shipped as a blacksmith coal; 320 tons being shipped during the year.

There is a distinct parting between the blacksmith and the next section, which is 7 feet 1 inch in thickness and is mined as domestic. It has a shale band 1½ inches in thickness in the centre of the section. The lower section of shale, 8 inches, and coal, 4 feet, is not mined at present.

The slope is down 200 feet, development being slow owing to only one shift working, and that only when business offered, very little being done during the summer.

There was a bridge across the river at this point but this was washed out during high water about four years ago and has not been rebuilt. Bunkers were built on the south side and an aerial tram stretched across the river from the mine portal to the bunkers.

There is a fault running about parallel with the slope on the north side which limits, for the present, the area that can be worked to the north. The Telkwa River limits the area to the south of the slope until such time as sufficient depth is attained to make a crossing under the river possible. At present, only two places can be worked, the slope and a crosscut to the north to the fault.

*Major Seam.*—Nothing has been done in the Major seam since the bridge was washed out and nothing can be done there until the bridge is rebuilt. No methane has been seen at any time. Four men are employed underground and two on the surface.

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## EAST KOOTENAY INSPECTION DISTRICT.

BY

H. E. MIARD.

During the year coal-mining operations in the Crowsnest district were restricted to the Coal Creek and Michel collieries of the Crow's Nest Pass Coal Company, Ltd. The greatly enlarged demand for coal and coke induced feverish activity at both properties, the combined output of which (loss in washing being deducted) amounted to 977,388 long tons, this exceeding the total production recorded in the district for any similar period since the year 1914. The production of coke amounted to 83,954 tons. In addition to the foregoing, 1,197 tons of slack taken from the stock pile at Corbin were hauled by road to McGillivray and shipped to the Trail smelter.

Three fatal accidents occurred in the district in the course of the year, two at Coal Creek and one at Michel. The first resulted from a heavy roadway "bump," another was caused by a runaway trip of mine-cars, and the third was due to a fall of rib coal in a working-place. They are described in detail elsewhere in this report. Of the 281 accidents, entailing disablement lasting from five to 294 days, investigated in the period under consideration, 247 occurred underground and thirty-four on the surface. In addition, ten mishaps, as results of which personal injuries were sustained by men employed at the timber camps and the sawmill operated by the company, were recorded at this office but were not investigated. At the end of the year, eight men who had already lost a considerable amount of time were still off work on account of injuries sustained in the course of their employment. Close consideration of the circumstances having surrounded these occurrences evokes the now trite but none the less sad comment that the majority of them was undoubtedly avoidable.

**Crow's Nest Pass Coal Co., Ltd.** Hartley P. Wilson, Fernie, President and General Manager; Thomas Balmer, Seattle, Wash., U.S.A., Vice-President; D. M. Mitchell, Fernie, Secretary; James M. Marshall, Fernie, Treasurer; William C. Whittaker, Fernie, Mining and Construction Engineer; Bernard Caufield, Colliery Manager, Michel; and James Littler, Colliery Manager, Coal Creek.

*Coal Creek Colliery, No. 1 East Mine.*—James Littler, Manager; John Caufield, Overman. This was the only mine active in the course of the year. On the south side of the gulch prospecting operations continued through the greater part of the same period, this involving the driving of three small adits with an aggregate length of some 350 feet. With a total working force of 177 men, the output amounted to 174,813 long tons for 215 days of operation.

The development of a new district, on the East side of the main entry, was undertaken in the second half of the year. There, the general conditions are similar to those found in the area in which active operations have been concentrated for several years. However, even with this addition to the ground made accessible, it seems that, should the present rate of extraction be maintained, the sections at present in operation may last much less than two years. After that, it will be necessary to modify the method of working, so as to adapt it to natural conditions differing widely from those under which operations have been conducted since 1935. There is an enormous reserve of coal, standing in large blocks, outby the sections now active, but a thick bed of shale under the main roof and the presence of an erratic band of rashings in the seam will demand some radical alterations of the present operating practice in order to adjust it to the requirements of the area in question.

The chief difficulty encountered here, and one which may be considered as containing all the others in itself, is the marked tendency of some of the measures to retain accumulated stresses; these being eventually liberated suddenly and giving rise to the now well-known phenomena called " bumps " in coal mines. Eighteen such occurrences were recorded in the course of the year. The theory regarding the origin of these manifestations expounded in former reports gains credence with almost each additional one observed, as far as its basic principles are concerned; but the practical application of an effective remedy remains perforce a semi-empirical matter. However, it is generally admitted that unpleasant consequences are liable to follow swiftly any serious deviation from certain principles now solidly established here as well as abroad. Chief among these axiomatic rules are: The provision of ample room for the displacement of any stratum yielding by deformation under pressure; having all faces advancing in the same general direction and, approximately, lying on what may be called the same general " front " line or lines (whether straight or curved matters little, provided that no prominent angles are formed); with, finally, strict avoidance of long unbroken pillars following the strike of the seam. Occasionally, operating difficulties may prevent complete adherence to one of these principles and, sometimes, the occurrence of more or less severe " bumps " can be linked with such departure from the planned course of action.

Some of the shocks experienced underground were accompanied by earth tremors felt at Fernie and, in at least one instance, certain slight irregularities, observed in the records obtained from automatic devices in use at the Elko power plant, seemed to have been due to the same cause. The opinion that the appearance of these phenomena is usually coincident with periods of seismic activity in the Rocky Mountains region is being slowly confirmed by experience.

Another feature of the problem, to which perhaps too little attention has been paid in the past, is the fact that the actual release of stresses does not forcibly take place over the point at which damage is caused, but may occur at a considerable distance from it and, according to the somewhat confusing evidence available, generally on its dip side. In other words, the earth wave set up travels through the strata, sustaining perhaps a certain amount of deformation according to the nature of the rocks traversed, until it breaks into openings with enormously increased velocity. It is probably for similar reasons that, in some well authenticated instances, earthquake shocks which had passed unnoticed in neighbouring mines were felt sharply on the surface.

The extremely troublesome and onerous heaving of the floor in roadways, incident to the slow re-establishment of stress equilibria disturbed by mining operations, cannot be prevented. Where sufficiently rapid this may lead to the dissipation of stresses which, otherwise, would probably find release in the form of a " bump." Movements of roof-shales are due to the same cause but are much slower. In No. 1 East it has been found advantageous to drive a so-called " sacrifice " road, on the dip side of an

opening which it was intended to maintain permanently, and separated from it by a pillar of only moderate thickness. All timber is subsequently withdrawn from the former place, in order to allow the immediate roof to fall in and facilitate the expansion of the shale band overlying the coal.

The ventilation of the abandoned workings, on the East side of the mine (which cover a much greater area than the parts of it at present in operation), was rearranged with highly beneficial results early in the year. Rising temperatures observed previously at a couple of points remained stationary and later began to decrease. A remarkable feature of the area in question is the low moisture content of the air, the relative humidity, at the point at which the worst conditions are existing in this respect, being only 58 per cent.

As was to be expected, one of the immediate results of more intensive operation was an appreciable increase in the methane content of the mine-air and, in order to counteract this, the speed of the fan was increased sufficiently to raise the ventilating pressure from 1.9 to 2.7 inches. At the time of the December inspection the air measurements taken were as follows:—Total quantity passed by fan: 83,000 cubic feet per minute; 26 West district—11,800 cubic feet per minute for the use of twenty-one men and five horses; 28 West district—23,900 cubic feet per minute for forty-three men and five horses; 20 East section (abandoned)—5,600 cubic feet per minute; 10, 14, and 16 East sections (abandoned)—17,000 cubic feet per minute; the secondary measurements accounting for nearly 70 per cent. of the total quantity. In the course of the year, 168,000 lb. of limestone dust and 54,000 lb. of flue dust were applied to the mine roadways.

The coal is mined almost exclusively by means of pneumatic picks and is carried away from the faces by trough-conveyers, except in development places, in which it is loaded directly into mine-cars. No explosives are used in coal at any time, and it is only exceptionally that a hole charged with CXL-ite has to be fired in rock. A total of 75 lb. of this explosive was used in the course of the year, very nearly all of it in prospecting operations on the surface.

The only addition of any importance made to the plant in the period under consideration was a new coal-bin erected near the boiler-house to replace a framed timber structure, 36 years old, the stability of which had become highly doubtful.

*Michel Colliery.*—Bernard Caufield, Manager; William Chapman, Assistant Manager; Walter McKay, William Gregory, and Wm. Hy. Adams, Overmen. This operation accounted for 80 per cent. of the coal produced in the district, exceeding its own output for the previous twelve months by 29½ per cent. and maintained the only coking plant active during the year. The colliery, operated on 293 days in the course of the year, employed a total of 744 men, 624 underground and 120 on the surface.

Prospecting operations on the north-east side of the gulch led to the discovery of a seam of coal which, before winter compelled temporary abandonment, had been penetrated over a distance of more than 300 feet by a narrow drift started at an elevation of some 600 feet above the railway. Its correlation with those developed up to the present time has not yet been definitely established.

In the early part of the year a 5- by 7-foot Keith-Sheldon fan, with steel housing and a concrete duct, was put into service and is now ventilating the workings of "A" seam. A large, one-story concrete building, the construction of which had begun late in the previous year, was also completed. This includes, besides a garage of sufficient dimensions to house all the motor-vehicles in use at the colliery, a tool-sharpening shop, a plumber-shop, a first-aid room, and a storage-room for mine-rescue apparatus. The former lamp-room, remodelled and enlarged, became a well-appointed workshop for the electricians. Several frame structures, the usefulness of which came to an end with the completion of the building programme, were demolished; this eliminating a by no means negligible fire risk and improving considerably the general appearance of the plant. Very satisfactory heating and ventilating equipment was installed in the wash-house.

Roof measures are not particularly strong in general and, at least in the case of parts of "B" seam, the irregularities known as "pot-holes" appear with almost incredible frequency. There seems to be a result of stresses thrown upon imperfectly

consolidated rock formations by flexion of the measures while the coal was still in a highly plastic condition. The inclination of the seams in the North and South sections, often exceeding 35 degrees, tends to complicate the planning of development-work and the subsequent handling of the output, as it compels the driving of roadways much longer than would be necessary otherwise in order to open a given area of any seam.

*"A" Seam.*—Walter McKay, Overman. This has been the most important single source of the colliery's output for some time. The thickness of the upper section of the seam, in which the present workings are situated, ranges from 8 to 14 feet and the coal is mined chiefly by means of pneumatic picks, although a few of the long-wall faces have been undercut by machines sporadically. Explosives are very seldom required. The roof is of an irregular nature and often weak, this necessitating some care in timbering. The workings are divided into four sections—East, West, North, and South; the greater part of the output being at present derived from the first two, in which long-wall retreating is the method of extraction, only development-work being in progress in the others. The coal is carried away from the faces by shaking-conveyers discharging into belts in the case of the East and West districts and into mine-cars in that of development-work in the balance of the mine.

These workings, with those of the North and South sections of No. 1 seam, are ventilated by the fan installed in the course of last winter. The air supplied enters partly through the main haulage-road of the colliery and partly through a separate intake. Owing to this arrangement, the fluctuations due to changes in the surface temperature are less pronounced than they are in the case of the ventilation of workings situated in the overlying "B" seam. The measurements taken at the time of the December inspections were as follows:—In fan drift: 61,800 cubic feet per minute, against a water-gauge of 2.25 inches; "A" East and "A" West: 19,450 cubic feet per minute for the use of fifty-seven men and five horses; North and South sections, in No. 1 and "A" seams: 40,600 cubic feet per minute for sixty-seven men and four horses.

*"B" Seam.*—William Gregory, Overman. Until the present time, the output from these workings has been only slightly less than that obtained from "A" seam. The moderate thickness of the coal, this ranging from 4 to 6 feet, renders development-work here considerably more onerous than it is in the neighbouring seam, in so far as a much larger area must be opened in order to render the same tonnage available, and in the case of haulage-roads, a considerable amount of rock-work is entailed. The coal is undercut by radial machines in the case of narrow work and with chain-cutters at long-wall faces, it being subsequently blasted in the former case, a procedure necessary only in exceptional circumstances in the other.

The method of working followed is a retreating long-wall system, with abandonment in the goaf of so-called "sacrifice" pillars regulating the rupture of the roof. This is generally weak and, in the West section in particular, is a favourite habitat of "pot-holes," demanding the utmost care in timbering. Except in the case of a few development places, the entire output is carried away from the faces by conveyers discharging into belts in the greater part of the East section and directly into mine-cars in the rest of the mine.

The workings are divided into three districts, East, West, and South, each ventilated by a separate current of air. Surface temperatures are exerting a considerable influence upon the quantity circulating in at least two of these splits, an effect of physical laws which it has been found difficult to counteract successfully up to the present time and which renders one of the intakes useless in the winter season.

The air measurements taken in the course of the December inspections were as follows: East side, 11,120 cubic feet per minute for the use of thirty-five men and three horses; West side, 14,160 cubic feet per minute for the use of thirty-one men and two horses; South side, 13,000 cubic feet per minute for twenty-three men and two horses. In the West district, operations are now limited to the extraction of pillars along the former main roadways.

*No. 1 Seam.*—William H. Adams, Overman. Only three small sections of this seam were in operation in the course of the year. In No. 1 West two slopes were driven for a short distance and rooms were turned off them, but, as these workings were

entering a zone lying below the elevation of the water flooding the abandoned slope section of the underlying No. 3 mine, it would have been necessary to pump out the latter. It was found inadvisable to undertake this operation, as the limited supply of labour available precluded the consideration of an extensive programme of development, and the work already done was abandoned in consequence.

Only development-work was carried out in the North and South sections. These have a weak roof and considerable side-pressure is experienced at some points. Both are ventilated by " A " seam fan, while No. 1 West is at present acting as an ancillary intake.

*No. 3 Mine.*—William H. Adams, Overman. Here, the end of the year saw the final abandonment of the No. 12 Incline district, which had been the most important section of the mine during the past few years, and all operations are now limited to the extraction of pillars along the West level and in the No. 4 Incline district. Only a few working-places can be maintained at one time in each case and the days of the mine are now numbered, although a not inconsiderable tonnage of coal of the highest quality can possibly still be recovered.

Abandoned sections of the mine become speedily filled with an extinctive mixture consisting mostly of excess nitrogen and never carrying more than a surprisingly low percentage of methane. This absorption of oxygen by the coal is often accompanied by an elevation of temperature in some parts of the No. 4 West district, where it proceeds apparently much more rapidly than in the No. 9 and No. 12 Inclines sections, in which it has not been observed to make itself manifest in this manner.

At the time of the December inspection the volume of air supplied to the mine was still reduced by means of a regulator installed in the return airway, as it had been pending the rearrangement of the ventilation of the East and South sections of " B " seam in the previous month. Then, 8,400 cubic feet per minute were being supplied for thirty men and five horses, this being sufficient to maintain satisfactory conditions. Since then, necessary improvements having been effected in the sections aforesaid, this quantity has been more than doubled without any apparent adverse influence upon the ventilation of the " B " seam workings.

No. 3 fan, now ventilating only No. 3 mine and the " B " seam workings, was then passing 89,300 cubic feet of air per minute, against a water-gauge of 3.1 inch. The two main crosscut adits of the colliery intersect abandoned workings of three separate seams and, as these reach the outcrop at many points, there is some opportunity for a considerable amount of leakage, not only between airways, but also directly from the surface. Effective means of eliminating this loss have been under consideration for some time.

*No. 2 Seam.*—Some development-work carried on desultorily in this part of the colliery, on a very small scale, was finally abandoned; difficult ground met at some points and a dearth of trained miners combining to induce this decision. Work still in progress in this part of the colliery is limited to the recovery of equipment.

*No. 3 East Mine.*—The fire, on account of which this part of the colliery was sealed off several years ago, gave some indications of its being still smouldering, at a point remote from its origin, when smoke and some products of coal distillation appeared slightly above the outcrop of the seam in the vicinity of the old No. 4 mine. These symptoms subsided promptly as soon as air had been excluded effectively from the rock-exposure in which they had appeared. Otherwise, samples of the mixture of gases filling the area affected indicated the existence of desirable conditions; i.e., very low oxygen content and an extremely small percentage of methane with, only occasionally, mere traces of other inflammable gases.

In the course of the year 418,100 lb. of limestone dust were applied to the roadways of the colliery. The consumption of explosives, for all purposes, amounted to 53,192 lb. (48,842 lb. of Monobel No. 4 and 4,350 lb. of CXL-ite No. 2) in 72,540 shots, of which ten missed fire. This does not equal the record established in 1938, when the percentage of miss-fires was little more than 0.01, but may nevertheless be looked upon as being satisfactory.

Monthly inspections of all working-parts of both collieries were made regularly by committees of workmen appointed under the provisions of General Rule 37. With the

exception of one or two instances in which some strengthening of timber was recommended, the reports made after such inspections stated that satisfactory conditions had been found to prevail in the workings visited, and no dangerous conditions were reported to this office in pursuance of the provisions of General Rule aforesaid.

# INSPECTION OF METALLIFEROUS MINES.

BY

JAMES DICKSON.

## PRODUCTION.

The output for metalliferous mines for 1941 was 7,956,284 tons. This tonnage was produced from 200 mines, of which ninety-six produced 100 tons or more.

## FATAL ACCIDENTS IN METALLIFEROUS MINES (INCLUDING UNDERGROUND PLACER-MINING).

There were twelve fatal accidents in and around metalliferous mines and concentrators in 1941, being an increase of three over that of 1940. In addition to this there were two fatalities in placer-workings and one quarry fatality for the Province.

There were 5,724 persons under and above ground in the metalliferous mines and 1,025 persons in the concentrators in 1941. The ratio of fatal accidents per 1,000 persons employed was 1.77 compared with 1.27 in 1940.

The tonnage mined per fatal accident during 1941 was 663,023 tons compared with 891,848 tons in 1940. The tonnage mined per fatal accident during the last ten-year period was 419,747 tons.

The following table shows the mines at which fatal accidents occurred during 1941 and the comparative figures for 1940:—

| Mining Division. | Mine. | No. of Accidents. | |
|---|---|---|---|
| | | 1941. | 1940. |
| Vancouver | Britannia | 4 | 1 |
| Lillooet | Bralorne | 1 | ---- |
| Cariboo | Cariboo Gold Quartz | 1 | ---- |
| Similkameen | Copper Mountain | ---- | 1 |
| Osoyoos | Nickel Plate | ---- | 2 |
| Nelson | Wisconsin | ---- | 1 |
| Nelson | Second Relief | ---- | 1 |
| Nelson | Sheep Creek Gold | 1 | ---- |
| Nelson | Gold Belt | 1 | ---- |
| Fort Steele | Sullivan | 1 | 1 |
| Skeena | Surf Inlet | 2 | 1 |
| Portland Canal | Silbak Premier | 1 | 1 |
| Totals | | 12 | 9 |

The following table shows the causes of, the percentages to the whole of the fatal accidents, and comparative figures for 1940:—

| Cause. | 1941. | | 1940. | |
|---|---|---|---|---|
| | No. | Percentage. | No. | Percentage. |
| By falling down chutes or shafts | 2 | 16.67 | 3 | 33.34 |
| Haulage | 1 | 8.33 | ---- | ---------- |
| Falls of ground | 2 | 16.67 | 2 | 22.22 |
| Shaft accident | 1 | 8.33 | ---- | ---------- |
| Overcome by gas | 1 | 8.33 | ---- | ---------- |
| Falling material | 2 | 16.67 | ---- | ---------- |
| Blasting | 1 | 8.33 | 2 | 22.22 |
| Haulage (surface) | 1 | 8.33 | ---- | ---------- |
| Miscellaneous (surface) | 1 | 8.33 | 2 | 22.22 |
| Totals | 12 | 100.00 | 9 | 100.00 |

## FATAL ACCIDENTS IN LODE MINES, PLACER MINES, PROSPECTING, AND QUARRYING.

There were fifteen fatalities during 1941 in all phases of mining; of these, twelve occurred at producing metalliferous mines, two at placer operations, and one at a quarry.

In most cases ordinary care would have averted these fatalities, as they occurred when the surrounding circumstances were normal.

Following are the details of the fatal accidents in lode mines:—

The fatal accident which occurred to Richard Unrou, miner, Bralorne Mines, Limited, on January 5th was due to a fall of rock from the hanging-wall in a stope. Deceased was engaged at the time in putting sprags in place for a drilling platform and had already set a sprag against the slab of rock which fell on him and had a second sprag in his arms when found. Another miner drilling within 40 feet from deceased and within sight of him did not see the accident but had spoken to him some few minutes before it occurred. Deceased had the reputation of being an exceptionally careful miner.

The fatal accident which occurred to John Boic, miner, Britannia Mining and Smelting Company, Limited, on January 25th was due to deceased falling through a grizzly. Deceased was engaged at the time in placing a bulldoze charge in a hang-up in the raise above the grizzly and had spit the fuse. Apparently he tripped and stumbled when turning away from the raise and fell into an open compartment of the grizzly. The Special Rules in force at this mine require grizzlies to be covered by planks or other material, except when the men are barring or shovelling into the grizzly.

The fatal accident which occurred to Archibald D. Macdougall, mining engineer, Sheep Creek Gold Mines, Limited, on January 30th was due to deceased being overcome by carbon monoxide in an atmosphere that was also deficient in oxygen. Macdougall and another engineer were engaged in examining a part of the mine that had been temporarily abandoned for a number of months and both men had been instructed to keep together while making this examination. However, Macdougall, who was the senior engineer, decided that they would each examine different parts and they separated for this purpose.

When Macdougall failed to come out of the mine at lunch-time a search was made and he was found unconscious about 15 feet up the manway leading to one of the stopes off the main level of this part of the mine. Compressed air had to be blown up the manway to provide necessary ventilation before Macdougall could be brought down. This was accomplished in four or five minutes. Artificial respiration was immediately started and was maintained for four hours, but deceased did not respond. Analyses of air samples taken in this manway following the accident showed the following constituents in the atmosphere: Carbon monoxide 0.57 per cent., carbon dioxide 0.92 per cent., oxygen 15.24 per cent., and nitrogen 83.79 per cent. There can be no doubt that prior to blowing compressed air to permit the recovery of the body the atmosphere would be still more deadly than existing at the time of sampling. The high carbon monoxide and low oxygen content in conjunction with the exertion of climbing the manway would make such an atmosphere immediately fatal.

The fatal accident which occurred to Michael M. Preston, electric locomotive driver, Surf Inlet Consolidated Mines, Limited, on March 27th was due to deceased falling from a trestle near the portal of the mine. Deceased had brought his locomotive, with several empty cars ahead, from the waste dump on the surface to where some other empty cars were standing on the trestle and apparently the impact when the empty cars were contacted was sufficient to derail the moving cars and the locomotive, all of which went over the trestle and fell a distance of 20 feet. Deceased fell clear of the train but sustained head injuries from which he died on the following day. Apparently deceased allowed his train to attain a speed that, under the circumstances, was too high.

The fatal accident which occurred to John Cardno, miner, Britannia Mining and Smelting Company, Limited, on April 19th was due to blasting. Deceased was in

charge of one of the bulldoze chambers and at the time of the accident was dealing with a hang-up in the chute by blasting by means of a 100-lb. charge of powder in four bundles of 25 lb. each. These bundles had to be placed in position by means of two 14-foot bulldoze sticks nailed end to end. When placing the last bundle, which contained the primer and a 5-foot fuse, the fuse spit before the bundle was hoisted by the bulldoze sticks and difficulty was experienced in placing the charge, with the result that deceased and his helper were still at the foot of the raise when the charge went off. Deceased was instantly killed but the helper escaped with minor injuries. A longer fuse should have been used or else the charge fired by electrical means.

The fatal accident which occurred to John Guger, skip-tender, Gold Belt Mining Company, on May 8th was due to deceased being struck on the head by a hammer. He was engaged in loading a service skip at the foot of a raise which also contained an ore-chute. At the time of the accident the ore had hung up in the chute at the level above and a man was using an 8-lb. hammer at this point in an attempt to jar the ore loose. The hammer slipped from his hand and fell down the skipway and struck deceased. Deceased was wearing a safety hat but it was completely crushed by the force of the blow.

The fatal accident which occurred to John P. Fitzpatrick, brakeman, Britannia Mining and Smelting Company, Limited, on May 19th was due to deceased being crushed between a moving car and part of the chute structure. Apparently the car caught some part of deceased's clothing and carried him along to the point where he was crushed. This is a main loading-point for the ore trains and the starting and stopping of the cars under the loading-chute is by signal. Deceased should have waited for the train to stop before approaching.

The fatal accident which occurred to Walter Phillips, electrician, Surf Inlet Consolidated Gold Mines, Limited, on May 20th was due to deceased falling from a ladder on the surface. Deceased was working from a ladder which rested against a cross-piece between two poles. The cross-piece broke and deceased fell 30 feet and sustained injuries from which he died on May 29th.

The fatal accident which occurred to Louis Sollinger, mucker, Cariboo Gold Quartz Mining Company, Limited, on June 29th was due to deceased being struck on the head by a piece of broken steel which fell down a raise. Deceased was engaged in loading blasting-supplies in a small service skip at the bottom of the raise after the round had been drilled. While the miners were drilling the round one of the drill-steels had broken and one of the broken parts had not been located. Apparently this part had stuck somewhere in the raise and later fell on deceased with above result.

The fatal accident which occurred to James Fulton, barman, Sullivan Mine, Consolidated Mining and Smelting Company of Canada, Limited, on November 19th was due to a fall of ground. Deceased and others were engaged in barring ground that had been blasted when a large slab of ground that had just been examined and considered safe fell and killed him instantly and slightly injured two other men. Deceased was an experienced barman and in addition to his own head-light was at the time of the accident assisted by another man who operated a special barman's flood-light to make this work as safe as possible.

The fatal accident which occurred to Nels Edlund, miner, Silbak Premier Mines, Limited, on November 19th was due to falling 60 feet in a cage and sustaining injuries from which he died two days later. Deceased and his partner were engaged in taking supplies to a level 60 feet below by means of a shaft and small hoist which was not used for hoisting or lowering men. Deceased had entered the cage with a box of powder and the cage started down with him in it and struck the bottom of the shaft with sufficient force to fatally injure him. Both deceased and his partner were accustomed to handling this hoist, but on this occasion neither of them had ascertained whether the brake or friction control were set. The hoist and equipment were found to be in good working order at the time of this accident.

The fatal accident which occurred to Douglas McKenzie, shiftboss, Britannia Mining and Smelting Company, Limited, on December 20th was due to deceased falling down a raise. In the course of his duty, McKenzie visited two timbermen who were

engaged in installing a bulkhead in a raise and were working from a staging projected into the raise from a level. The staging was carried by two 6- by 12-inch timbers securely anchored by means of timbers on the level but was not supported in the raise. The timbermen reported some loose ground ahead of the staging and he went out on the staging to examine the suspected ground with a bar after obtaining from one of the timbermen a safety-belt and rope which he used while making the examination. Immediately he touched the ground with the bar a large slab of rock fell out and wrecked the staging and supporting timbers, the latter being sheared off at the collar of the raise. Deceased jumped back towards the level but was unable to reach safety and fell down the raise. None of the falling material struck deceased but the connecting " D " link between the safety-belt and the rope broke and allowed deceased to fall several hundred feet. The safety-rope had approximately 10 feet of slack at this time. The cause of the failure of the safety equipment is being investigated.

The fatal accident which occurred to Cameron Morgan, foreman, Bullion Placers, Limited, on June 12th was due to deceased being caught and buried by a slide of rock and gravel from the wall of the placer pit. He had been warned in a written report by the foreman of the previous shift of the possible danger of a slide at this point but had apparently neglected to take the necessary precautions. It required several hours' work on the part of the crew to recover the body.

The fatal accident which occurred to Wong Tip Lun, Chinese miner, Sang Dang placer mine, Barkerville, on October 22nd was due to blasting. Deceased had drilled a hole 18 inches deep in the floor of the placer pit for the purpose of making a channel for drainage purposes. He was observed to start loading this hole a short time before it went off and inflicted injuries from which he died shortly afterwards. As he had not given the usual warning before a fuse is spit it is unlikely that the shot was fired by this means.

There was one fatal accident in quarrying operations during 1941, as follows:—

The fatal accident which occurred to Nels Edberg, driller, Gilley's Quarry, Pitt River, on January 17th was due to deceased being struck on the head by a small rock which fell from the face of the quarry. He was running a drill at the time and had little chance of hearing any noise being made by the rock. Blasting had been done on the quarry-face shortly before the accident and the face had been examined and considered safe immediately after blasting. The use of a safety-hat might have prevented this fatality.

## DANGEROUS OCCURRENCES.

On January 31st, at the Sullivan Mine, Kimberley, a new hoistman was being trained to operate the 3,901 shaft hoist and had had five weeks' training under the supervision of an experienced hoistman. While the latter's attention was directed to a part of the machinery that he was examining, the mucker boss stepped on to the skip at the top landing and gave the signal to lower to one of the levels below. The upper limit switch had been intentionally put out of service while some ore was being hoisted previously. The new man forgot this and, besides, pulled the skip up instead of lowering it. The mucker boss understood what was happening and climbed on the bail, thus avoiding being thrown down into the ore-bin. No personal injuries resulted and the new hoistman was permanently detailed to some other work.

On February 25th, while a round was being fired at the face of the 3,802 drift, Sullivan Mine, Kimberley, a box of powder at the foot of the 3,809 raise, about 150 feet away from the face of the drift, was exploded through some undetermined agency. It is surmised that a piece of rock projected from one of the cut holes struck the box with sufficient violence to explode the powder. No one was injured and the material damage done was insignificant.

On June 14th, at Island Mountain Mine, Wells, a trestle from the mine portal to the waste dump failed and precipitated a motorman, his motor, and train of waste some 80 feet to the foot of the dump. The motorman was seriously injured. The trestle was partly supported by the dump, and it is believed that the thawing-out of the covered frozen ground caused a sudden movement of the dump and trestle.

On July 2nd, during a heavy hail-storm, an ore-train on the surface at the Nickel Plate Mine got out of control due to the wet and icy condition of the track and crashed into the terminal dump. Both the motorman and brakeman were injured.

On July 3rd the office at the Velvet Mine, near Rossland, was struck by lightning and set on fire; no person was injured, but all the mine records and plans were destroyed.

On August 2nd, at the Island Mountain Mine, Wells, while the hoisting-rope in the main shaft was cut and shortened at the drum end, the cage was suspended from an 8- by 8-inch spruce timber across the top of the shaft; the timber broke and the cage fell to the bottom of the shaft.

The safety-catches on the cage were operated daily by lowering the cage on to a timber placed across the collar of the shaft, but apparently failed on this occasion due to excessive clearance between the catches and the guides. The teeth of the catches were filled with wood from the guides, but, as above, did not arrest the cage. This condition was remedied.

On September 11th the steel-shop at the Queen Mine of the Sheep Creek Consolidated Gold Mines was destroyed by fire, due to the overflowing of the gravity fuel-oil supply on to the hot furnace. No person was injured, but as the burning steel-shop was close to the main shaft all the underground employees were withdrawn from the mine.

On December 14th, while two men were engaged in cleaning up the spillage in the bottom of the 601 shaft, Silbak Premier Mine, they had the hoistman spot the skip a few feet above the shaft-bottom, but immediately this was done the hoistman dropped the skip and some slack rope to the bottom of the shaft and took the cage on the opposite side up to the sheave-wheels. No person was injured. Investigation indicated that the hoistman had been partly intoxicated, but he left the district before he could be prosecuted.

## EXPLOSIVES USED IN MINING.

During 1941 the explosives used in mining and quarrying in British Columbia consisted of 10,026,000 lb. of high explosives; 3,688,000 fuse detonators; 376,000 electric detonators; 31,000 delay detonators; 1,000 feet Primacord; and 24,698,000 feet of safety-fuse. While there were several accidents due to the use of explosives, there were none due to faulty explosives.

Throughout the year the Inspectors of Mines were active in seeing that all stocks of explosives at mines where work was suspended or abandoned were disposed of or destroyed.

## AIR-SAMPLING.

Air-sampling was carried out in a number of mines where heavy blasting was carried on, or long single drifts were being driven, to determine whether carbon monoxide or other gases were present in dangerous percentages; no dangerous conditions were indicated, except that dealt with under "fatal accidents" in another part of this report. In a number of instances augmented ventilation was ordered by the Inspector.

## DUST AND VENTILATION.

There were several new fan installations at metalliferous mines during the year and a noticeably increased effort generally to control the ventilating currents to the face of drifts and stopes and to complete ventilating raises before starting stoping operations.

It is now fully realized that adequate ventilation is the only efficient means of quickly removing the unavoidably produced dust.

## MINE-LIGHTING.

The use of the safety electric cap-lamp is standard at all the larger mines with one exception, and many of the smaller mines have adopted this advance in safety and efficiency. In no case where the safety electric cap-lamp has been tried has there been a return to the carbide lamp formerly in use.

## FIRST-AID AND SAFETY WORK.

First-aid and safety work has been well maintained in all the metalliferous-mining areas and, in addition to the work done along this line by the individual mining companies, there are Mine Safety Associations in all the more important districts, such as East Kootenay, Princeton, Britannia, Bridge River, Zeballos, and Portland Canal. These associations draw their membership from the mine officials and miners interested in safety in the different areas, and are financially assisted in this work by the Department of Mines.

The value of safety committees at the larger mines is recognized as an important factor in making for general safety and they are well supported by the managements of the mines. As the members of these safety committees are selected from different parts of a mine and serve for only short periods, this permits a large number of men being brought directly into contact with this work, so that many of them continue to point out potential dangers to their fellow-employees after their official membership on the safety committee has ended. These safety committees, with their personal knowledge of the mine in which they are employed, are in a position to note and report minor defects as they arise and have these matters remedied before they become a contributing factor in an accident. As many of the experienced men have left the mines to work in the various war industries and many of the younger men have joined the Forces, the only replacements are from men who have had no previous experience underground. By personal contact and guidance the members of the safety committees can do much to promote the safety of these new men.

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