ANNUAL REPORT

OF THE

MINISTER OF MINES

OF THE PROVINCE OF

BRITISH COLUMBIA

FOR THE

YEAR ENDED 31ST DECEMBER

1943

PRINTED BY
AUTHORITY OF THE LEGISLATIVE ASSEMBLY.

VICTORIA, B.C.:
Printed by CHARLES F. BANFIELD, Printer to the King's Most Excellent Majesty.
1944.

BRITISH COLUMBIA DEPARTMENT OF MINES.

VICTORIA, B.C.

Hon. E. C. CARSON, *Minister.*

JOHN F. WALKER, *Deputy Minister.*

JAMES DICKSON, *Chief Inspector of Mines.*

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

HARTLEY SARGENT, *Chief Mining Engineer.*

P. J. MULCAHY, *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 1943 is herewith respectfully submitted.

ERNEST CRAWFORD CARSON,
Minister of Mines.

Minister of Mines' Office,
June, 1944.

CONTENTS.

PROGRESS NOTES.

Annual Report of the Minister of Mines, 1943.

THE MINING INDUSTRY.

The gross value of mine production in 1943 was $65,892,395, a decrease of $9,658,698 from 1942. This figure of $65,892,395 is $473,845 less than the actual value due to the valuation of copper on the London price, to conform with the Dominion Bureau of Statistics' figures, whereas British Columbia copper is sold in the United States at the American price. Some British Columbia lead and zinc is also sold in the United States and this would add a little more to the total value of mine production. Comparing the actual figures for 1942 and 1943 the real decrease is approximately $10,569,554.

The decreased value of mine production is due largely to curtailment of gold production resulting from a shortage of labour. The decrease in gold production amounted to $9,053,929.

Copper production declined 15.6 per cent. in volume and 1.6 per cent. in value; lead 12.5 per cent. in volume and 2.3 per cent. in value; and zinc 15.5 per cent. in volume and 1 per cent. in value.

Mercury production, which occasionally amounted to a few hundred pounds a year before the war, jumped to 153,543 lb. in 1940 and in 1943 became one of the Province's major metals with an output of 1,690,240 lb. valued at $4,599,200.

Tungsten, another war metal, with small intermittent production prior to 1940, increased in output from a value of $4,917 in 1939 to $702,385 in 1943.

Antimony, arsenic, cadmium, and other minor metals, with the exception of bismuth, all showed decreases. Most of these metals are by-products from the treatment of lead-zinc ores.

Coal production was down 6 per cent. from 1942 in volume and value.

Non-metallics, clay products, and structural materials all showed small decreases in the aggregates, though some items such as face, paving, and sewer brick showed large increases.

The total number of shipping-mines decreased from 126 to 48. The decrease included nine major operations, eleven minor operations, and numerous leasing and small operations making direct shipments to shelters.

The number of men employed decreased from 13,270 to 12,448.

Wages and salaries decreased from $26,913,160 to $26,051,467.

Dividends decreased from $13,627,000 to $11,860,000.

It is of interest to compare 1939 figures with those for 1943. The value of mine production for the two years is almost the same, amounting to $65,681,547 in 1939 and $65,892,395 in 1943. Base-metal prices have risen slightly, the most important changes being for lead and zinc, though they are still selling at what would be low normal peace-time prices.

Employment has decreased from 15,890 to 12,448, while wages and salaries have increased from $22,357,035 to $26,051,467. Capital employed has increased from $135,473,482 to $140,782,366. Fuel and electricity has increased from $3,266,203 to $7,432,585, whereas process supplies have decreased slightly from $6,714,347 to $6,572,317. The decrease in process supplies may be accounted for in part by shortage of supplies and more repairs, and in part by reduction in tonnage in lode mines from 7,211,223 to 5,429,557 tons.

Dividends are just about the same, being only $5,539 greater in 1939 than in 1943. In view of rising costs against the same value output, this would appear to indicate

drawing on richer ore or the distribution of profits without adding greatly to reserves, for, during the same time, taxation also has increased.

GENERAL SITUATION.

The mining industry is experiencing difficult times and it is in a critical condition, due chiefly to the shortage of labour, and this is a direct result of the war.

Gold production will show a further decline in 1944 and the value will probably be less than $6,000,000. During the past two years eighteen gold mines have closed down and the eight remaining in production are having a difficult time to keep operating. Some of them have to alternate between development and breaking of ore, and accordingly have been milling intermittently.

Copper-mining has fared little better than gold-mining and the Province's two big producers have suffered labour losses comparable to the losses in gold mines. Copper-mining will do well to hold its own in 1944.

Lead-zinc mining also will do well to hold its own.

Mercury production, which has become of major importance, is being almost entirely cut off as from the middle of 1944, and as production is being curtailed during the early part of the year the total will be a fraction only of the output for 1943. British Columbia should be able to break into the world's mercury markets in the post-war period on a competitive basis.

Tungsten production, which also developed rapidly, was suddenly cut off in the early autumn of 1943. Canada's requirements were easily met and production was so ahead of our own requirements that when the outside market was cut off tungsten-mining ceased. It does not appear likely that tungsten-mining will be revived until after the war, when British Columbia may be able to compete in world markets.

Coal production will probably be less in 1944 than in 1943. The domestic coal-supply is likely to be very tight and perhaps critically so during the winter of 1944–45. If all the labour wanted for the coal mines could be made available, it would be some months before a noticeable increase in production could be achieved from Vancouver Island mines.

Non-metallics, clay products, and structural materials are not expected to show any great change in value production.

It appears that a reduction of about $7,500,000 in value output will occur in 1944.

Though 1944 will not be a year of great production, it will mark another milestone in mine production of British Columbia. The value of mine production will pass the $2,000,000,000 mark. Half of this amount has been produced during the past seventeen years. It is of interest to note that during this seventeen-year period, copper has sold at an average of over 13 cents in only three years, lead at an average of over 4 cents in four years, and zinc at an average of over 4 cents in four years. Silver has sold at an average of over 60 cents in only one year and at an average of over 50 cents in four years. Gold has increased in price from $20.67 to $38.50 in Canadian funds, and this increase in value has accounted in the short period of twelve years for $120,000,000 of new wealth.

The urgent demand for the discovery and development of war minerals such as mercury and tungsten is apparently over for the present. The chief problem facing the mining industry is to retain enough labour to keep our presently producing mines in operation and to encourage prospecting and, to a certain extent, some preliminary development-work without affecting our war effort, so that the industry can take its place in the post-war life of our country and provide work for our returned men.

STATISTICS.

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.

Under Dominion regulations, certain mineral production statistics were not allowed to be published as from 1940, but early in 1944 most of the restrictions were removed and statistical tables which were withheld from the Annual Reports for 1940, 1941, and 1942 appear in the present issue, along with the tables for 1943, making the series of tables complete to date.

Since 1939 several mining divisions have been amalgamated with others. These changes may be of interest to those studying the tables and therefore have been set forth under the heading "Amalgamation of Mining Divisions," page ~~22~~ 47

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 1943 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, zinc, and copper the average London metal-market price for the year. 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.

The Dominion Bureau of Statistics and the Provincial Statistical Bureaus have agreed upon the following procedure for taking care of the exchange fluctuations:—

(*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.

(*c.*) For 1943 production of copper, lead, zinc, and silver, average prices were agreed upon with the Dominion Bureau of Statistics, in conjunction with the Dominion Metals Controller. These prices reflect the fact that several producers have been receiving higher prices than those fixed shortly after the outbreak of war.

(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.

TABLE I.—British Columbia Mine Production, 1942 and 1943.

	Quantity, 1942.	Quantity, 1943.	Value, 1942.	Value, 1943.	Per Cent. Increase (+) or Decrease (—). Quantity.	Value.
Metallics.			$	$		$
Antimony			516,975	189,408		— 63.4
Arsenic (As_2O_3) lb.	6,155,751	2,772,023	246,230	27,721	— 55.0	— 88.7
Bismuth			476,408	562,484		+ 18.0
Cadmium			1,130,141	705,780		— 37.5
Copper* lb.	50,097,716	42,307,510	5,052,856	4,971,132	— 15.6	— 1.6
Gold, lode† fine, oz.	444,518	224,403	17,113,943	8,639,516	— 49.5	— 49.5
Gold, placer† crude, oz.	32,904	14,600	1,041,772	462,270	— 55.6	— 55.6
Lead lb.	463,269,005	405,285,476	15,575,104	15,214,417	— 12.5	— 2.3
Mercury lb.	1,035,576	1,690,240	2,942,944	4,559,200	+ 63.2	+ 55.0
Silver oz.	9,677,881	8,526,310	4,080,775	3,858,496	— 12.0	— 5.4
Tungsten concentrates			230,232	702,385		+205.0
Zinc lb.	396,857,260	335,137,014	13,536,801	13,405,481	— 15.5	— 1.0
Other precious metals			7,415	270		
Other metals			790,822	450,623		
Totals			62,742,418	53,749,183		— 14.3
Fuel.						
Coal (2,240 lb.) tons	1,938,158	1,821,654	8,237,172	7,742,030	— 6.0	— 6.0
Non-metallics.						
Barytes, diatomite, fluorspar, and mica			45,052	19,207		— 57.4
Fluxes—limestone, quartz tons	63,280	78,713	41,460	140,299	+ 24.4	+238.4
Granules—slate and rock, talc tons	1,213	664	16,694	11,711	— 45.3	— 29.8
Gypsum products, gypsite			143,934	142,176		— 1.2
Iron oxides			4,604	4,836		+ 5.0
Sodium carbonate, magnesium sulphate tons	1,396	427	40,808	4,697	— 69.4	— 88.5
Sulphur‡ tons	116,246	104,599	1,134,566	1,039,108	— 10.0	— 8.4
Totals			1,427,118	1,362,034		— 4.6
Clay Products and other Structural Materials.						
Clay Products.						
Brick—						
Common No.	4,058,954	2,736,792	77,140	55,508	— 32.6	— 28.0
Face, paving, sewer brick No.	202,664	695,064	7,450	21,825	+243.0	+193.0
Firebricks, blocks			219,680	227,594		+ 3.6
Fireclay tons	843	706	11,467	9,706	— 16.3	— 15.4
Structural tile—hollow blocks			39,353	27,617		— 29.8
Drain-tile, sewer-pipe No.	897,418	1,204,508	148,179	153,153	+ 34.2	+ 3.4
Pottery—glazed or unglazed			3,106	2,917		— 6.0
Other clay products; bentonite			2,481	5,485		+122.0
Totals			508,856	503,805		— 1.0
Other Structural Materials.						
Cement			1,198,014	1,146,865		— 4.3
Lime and limestone tons	104,856	128,469	273,933	340,988	+ 22.5	+ 24.5
Sand and gravel			948,662	890,058		— 6.2
Stone tons	2,709	3,084	58,749	56,436	+ 13.8	— 4.0
Rubble, riprap, crushed rock tons	171,574	108,122	156,171	100,996	— 37.0	— 35.3
Totals			2,635,529	2,535,343		— 4.0
Total value in Canadian funds			75,551,093	65,892,395		— 12.8

* 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 for and paid for in United States funds, and if such had been used an additional gross amount of about $1,384,701 could be added to the above Provincial value for 1942 and $473,845 for 1943. For 1943 production of copper, lead, zinc, and silver, the Dominion Bureau of Statistics, in conjunction with the Dominion Metals Controller, realizing several of the producers were getting higher prices than those fixed shortly after the outbreak of war, agreed on what would be more adequate average prices, and the production values in Table I. reflect that trend. British Columbia lead, zinc, and silver, in addition to being exported to the United Kingdom under war-time contracts, are disposed of in considerable volume in Eastern Canada and the United States.

† Canadian funds.

‡ Sulphur content of pyrites shipped, estimated sulphur contained in sulphuric acid made from waste smelter-gases and elemental sulphur.

Note.—The Dominion Government has now granted permission to disclose production figures on most metals and minerals, and the above table compares in general with Table I. in the Annual Report for 1939, which was the last year in which Table I. appeared in detail.

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

	Quantity, 1940.	Quantity, 1941.	Value, 1940.	Value, 1941.	Per Cent. Increase (+) or Decrease (−). Quantity.	Value.
Metallics.			$	$		$
Antimony			396,468	488,147		+ 23.0
Bismuth			56,384			−100.0
Cadmium			905,734	1,269,533		+ 40.2
Copper* lb.	77,980,223	66,435,583	7,865,085	6,700,693	− 14.8	− 14.8
Gold, lode† fine, oz.	583,416	571,026	22,461,516	21,984,501	− 2.1	− 2.1
Gold, placer† crude, oz.	39,067	43,775	1,236,928	1,385,962	+ 12.1	+ 12.1
Lead lb.	485,364,420	490,185,657	16,317,952	16,480,042	+ 1.0	+ 1.0
Mercury lb.	153,543	536,298	353,809	1,335,683	+249.3	+277.5
Silver oz.	12,327,944	12,175,700	4,715,315	4,658,545	− 1.2	− 1.2
Tungsten concentrates			1,320	21,453		
Zinc lb.	310,767,251	363,302,195	10,600,271	12,392,238	+ 17.0	+ 17.0
Other precious metals			1,055	2,293		
Other metals				2,944		
Totals			64,911,837	66,722,034		+ 2.8
Fuel.						
Coal (2,240 lb.) tons	1,667,827	1,802,353	7,088,265	7,660,000	+ 8.1	+ 8.1
Non-metallics.						
Barytes, diatomite, mica			8,201	8,668		+170.8
Fluxes—limestone, quartz tons	69,420	82,337	31,262	50,929	+ 18.6	+ 62.9
Granules—slate and rock, talc tons	474	950	6,883	12,216	+100.4	+ 77.5
Gypsum products, gypsite			120,043	141,320		+ 17.7
Iron oxides			3,948	2,885		− 26.9
Sodium carbonate, magnesium sulphate tons	220	441	1,760	9,611	+100.5	+446.0
Sulphur‡ tons	90,213	103,140	999,116	1,026,794	+ 14.3	+ 2.8
Totals			1,166,213	1,252,423		+ 7.4
Clay Products and other Structural Materials.						
Clay Products.						
Brick—						
Common No.	8,655,120	7,532,760	132,434	129,541	− 13.0	− 2.2
Face, paving, sewer brick No.	987,161	485,816	38,328	17,645	− 50.8	− 54.0
Firebricks, blocks			140,727	210,911		+ 50.0
Fireclay tons	609	795	8,294	12,216	+ 30.5	+ 47.3
Structural tile—hollow blocks			47,543	21,000		− 55.8
Drain-tile, sewer-pipe No.	1,119,455	1,095,704	130,842	163,096	− 2.0	+ 24.7
Pottery—glazed or unglazed			11,321	11,230		− 0.8
Other clay products; bentonite			10,094	1,308		− 87.0
Totals			519,583	566,947		+ 9.1
Other Structural Materials.						
Cement			704,567	986,322		+ 40.0
Lime and limestone tons	123,461	111,858	294,682	286,006	− 9.4	− 2.9
Sand and gravel			708,622	794,526		+ 12.1
Stone—building, pulpstone tons	1,559	2,228	55,347	60,310	+ 43.0	+ 9.0
Rubble, riprap, crushed rock tons	287,042	192,640	252,039	151,151	− 33.0	− 40.0
Totals			2,015,257	2,278,315		+ 13.0
Total value in Canadian funds			75,701,155	78,479,719		+ 3.7

* 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 for and paid for in United States funds, and if such had been used an additional gross amount of about $1,373,232 could be added to the above Provincial value for 1940 and $1,265,598 for 1941.

† Canadian funds.

‡ Sulphur content of pyrites shipped, estimated sulphur contained in sulphuric acid made from waste smelter-gases and elemental sulphur.

Note.—The Dominion Government has now granted permission to disclose production figures on most metals and minerals, and the above table compares in general with Table I. in the Annual Report for 1939, which was the last year in which Table I. appeared in detail.

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 ,,	13.33 ,,	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 ,,
1942	38.50	41.166 ,,	10.086 ,,	3.362 ,,	3.411 ,,
1943	**38.50**	***45.254** ,,	***11.75** ,,	***3.754** ,,	***4.00** ,,
Average, 1939–43 (inclusive)	38.028	40.684 ,,	10.420 ,,	3.402 ,,	3.460 ,,

* Refer to foot-note on Table I. regarding average prices of copper, silver, lead, and zinc for 1943.

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 1943.

Gold, placer	$91,537,383*
Gold, lode	318,970,944*
Silver	155,423,218
Copper	330,644,819
Lead	327,089,360
Zinc	209,776,126
Coal and coke	415,086,569
Structural materials	90,336,204
Miscellaneous metals, minerals, and materials	40,747,477
Total	$1,979,612,100

* Canadian funds.

TABLE IV.—PRODUCTION FOR EACH YEAR FROM 1852 TO 1943 (INCLUSIVE).

1852 to 1895 (inclusive)	$94,547,370	1921	$28,066,641
1896	7,507,956	1922	35,162,843
1897	10,455,268	1923	41,304,320
1898	10,906,861	1924	48,704,604
1899	12,393,131	1925	61,492,242
1900	16,344,751	1926	67,188,842
1901	20,086,780	1927	60,729,358
1902	17,486,550	1928	65,372,583
1903	17,495,954	1929	68,245,443
1904	18,977,359	1930	55,391,993
1905	22,461,325	1931	34,883,181
1906	24,980,546	1932	*28,798,406
1907	25,882,560	1933	*32,602,672
1908	23,851,277	1934	*42,305,297
1909	24,443,025	1935	*48,821,239
1910	26,377,066	1936	*54,081,967
1911	23,499,072	1937	*74,475,902
1912	32,440,800	1938	*64,485,551
1913	30,296,398	1939	*65,681,547
1914	26,388,825	1940	*75,701,155
1915	29,447,508	1941	*78,479,719
1916	42,290,462	1942	*75,551,093
1917	37,010,392	1943	*65,892,395
1918	41,782,474		
1919	33,296,313	Total	$1,979,612,100
1920	35,543,084		

* Canadian funds.

TABLE V.—Quantities and Value of Mine Products for 1940, 1941, 1942, and 1943.

Description.	1940.		1941.		1942.		1943.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Gold, placer*..... crude, oz.	39,067	$1,236,928	43,775	$1,385,962	32,904	$1,041,772	14,600	$462,270
Gold, lode*..... fine, oz.	583,416	22,461,516	571,026	21,984,501	444,518	17,113,943	224,403	8,639,516
Silver ..... oz.	12,327,944	4,715,315	12,175,700	4,658,545	9,677,881	4,080,775	8,526,310	3,858,496
Copper..... lb.	77,980,223	7,865,085	66,435,583	6,700,693	50,097,716	5,052,856	42,307,510	4,971,132
Lead ..... lb.	485,364,420	16,317,952	490,185,657	16,480,042	463,269,005	15,575,104	405,285,476	15,214,417
Zinc ..... lb.	310,767,251	10,600,271	363,302,195	12,392,238	396,857,260	13,536,801	335,137,014	13,405,481
Coal ..... long tons	1,667,827	7,088,265	1,802,353	7,660,000	1,938,158	8,237,172	1,821,654	7,742,030
Structural materials.....	.....	2,534,840	.....	2,845,262	.....	3,143,382	.....	3,039,148
Miscellaneous metals and minerals.....	.....	2,880,983	.....	4,372,476	.....	7,769,288	.....	8,559,905
Totals.....	.....	$75,701,155	.....	$78,479,719	.....	$75,551,093	.....	$65,892,395

* 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	3,272,336	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	286,491	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	43,195,783	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	2,481,892	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*	12,327,944	4,715,315	77,980,223	7,865,085	485,364,420	16,317,952	310,767,251	10,600,271	61,960,139
1941	571,026	21,984,501*	12,175,700	4,658,545	66,435,583	6,700,693	490,185,657	16,480,042	363,302,195	12,392,233	62,216,019
1942	444,518	17,113,943*	9,677,881	4,080,775	50,097,716	5,052,856	463,269,005	15,575,104	396,857,260	13,536,801	55,359,479
1943	224,403	8,639,516*	8,526,310	3,858,496	42,307,510	4,971,132	405,285,476	15,214,417	335,137,014	13,405,481	46,089,042
Totals	11,872,558	318,970,946	295,377,693	155,000,481	2,345,197,338	330,644,819	8,022,843,526	327,096,887	5,133,633,321	209,776,126	1,341,489,259

* Canadian funds.

TABLE VII.—VALUE OF GOLD PRODUCTION TO DATE.

Year.	Placer Gold.		Lode Gold.		Total.
	Crude, Oz.	Value.	Fine, Oz.	Value.	
1858–1862	493,582	$9,871,634	...	...	$9,871,634
1863–1867	814,180	16,283,592	...	...	16,283,592
1868–1872	494,766	9,895,318	...	...	9,895,318
1873–1877	450,960	9,019,201	...	...	9,019,201
1878–1882	278,996	5,579,911	...	...	5,579,911
1883–1887	192,076	3,841,515	...	...	3,841,515
1888–1892	126,271	2,525,426	...	...	2,525,426
1893	17,806	356,131	1,170	$23,404	379,535
1894	20,276	405,516	6,252	125,014	530,530
1895	24,084	481,683	39,270	785,400	1,267,083
1896	27,201	544,026	62,259	1,244,180	1,788,206
1897	25,676	513,520	106,141	2,122,820	2,636,340
1898	32,167	643,346	110,061	2,201,217	2,844,563
1899	67,245	1,344,900	138,315	2,857,573	4,202,473
1900	63,936	1,278,724	167,153	3,453,381	4,732,105
1901	48,505	970,100	210,384	4,348,605	5,318,703
1902	53,657	1,073,140	236,491	4,888,269	5,961,409
1903	53,021	1,060,420	232,831	4,812,616	5,873,036
1904	55,765	1,115,300	222,042	4,589,608	5,704,908
1905	48,465	969,300	238,660	4,933,102	5,902,402
1906	47,420	948,400	224,027	4,630,639	5,579,039
1907	41,400	828,000	196,179	4,055,020	4,883,020
1908	32,350	647,000	255,582	5,282,880	5,929,880
1909	23,850	477,000	238,224	4,924,090	5,401,090
1910	27,000	540,000	267,701	5,533,380	6,073,380
1911	21,300	426,000	228,617	4,725,513	5,151,513
1912	27,775	555,500	257,496	5,322,442	5,877,942
1913	25,000	510,000	272,254	5,627,490	6,137,490
1914	28,500	565,000	247,170	5,109,004	5,674,004
1915	38,500	770,000	250,021	5,167,934	5,937,934
1916	29,025	580,500	221,932	4,587,334	5,167,834
1917	24,800	496,000	114,523	2,367,190	2,863,190
1918	16,000	320,000	164,674	3,403,812	3,723,812
1919	14,325	286,500	152,426	3,150,645	3,437,145
1920	11,080	221,600	120,048	2,481,392	2,702,992
1921	11,660	233,200	135,663	2,804,154	3,037,354
1922	18,240	368,800	197,856	4,089,684	4,458,484
1923	20,320	420,000	179,245	3,704,994	4,124,994
1924	21,037	420,750	247,716	5,120,535	5,541,285
1925	16,476	280,092	209,719	4,335,269	4,615,361
1926	20,912	355,503	201,427	4,163,859	4,519,362
1927	9,191	156,247	178,001	3,679,601	3,835,848
1928	8,424	143,208	188,087	3,888,097	4,031,305
1929	6,983	118,711	145,339	3,004,419	3,123,130
1930	8,955	152,235	160,778	3,323,576	3,475,811
1931	17,176	291,992	146,039	3,018,894	3,310,886
1932	20,400	395,542	181,564	4,261,307	4,656,849*
1933	23,928	562,787	223,529	6,392,929	6,955,716*
1934	25,181	714,431	297,130	10,250,985	10,965,416*
1935	30,929	895,058	365,244	12,852,936	13,747,994*
1936	43,389	1,249,940	404,472	14,168,654	15,418,594*
1937	54,153	1,558,245	460,781	16,122,727	17,680,972*
1938	57,759	1,671,015	557,522	19,613,624	21,284,639*
1939	49,746	1,478,492	587,180	21,221,272	22,699,764*
1940	39,067	1,236,928	583,416	22,461,516	23,698,444*
1941	43,775	1,385,962	571,026	21,984,501	23,370,463*
1942	32,904	1,041,772	444,518	17,113,943	18,155,715*
1943	14,600	462,270	224,403	8,639,516	9,101,786*
Totals	4,392,165	$91,537,383	11,872,558	$318,970,946	$410,508,327

* Canadian funds.

TABLE VIII.—Output of Mine Products by Divisions, 1941, 1942, and 1943.

Mining Division.	1941.	1942.	1943.
Atlin	$1,449,341	$1,401,357	$314,005
Portland Canal	2,262,577	1,796,684	1,100,439
Skeena	640,785	430,090	58,309
Stikine	32,991	16,211	2,311
Cariboo	3,157,927	2,465,413	1,161,053
Omineca	1,547,379	3,273,590	5,357,775
Peace River	2,459	13,910	59,354
Quesnel	170,457	77,082	20,360
Kamloops	183,054	183,406	161,820
Nicola	107,525	122,930	155,606
Vernon	34,657	10,409	2,177
Greenwood	740,814	511,553	361,396
Osoyoos	2,223,666	2,429,785	1,490,888
Similkameen	4,786,602	4,111,591	3,497,570
Ainsworth	44,408	25,270	49,405
Arrow Lake	127	.....	.....
Fort Steele	35,417,691	35,427,802	34,397,668
Golden	721,155	528,800	438,726
Lardeau	11,823	1,031	95
Nelson	3,748,001	2,682,612	892,159
Revelstoke	19,443	30,997	29,031
Slocan	625,979	884,623	1,089,433
Trail Creek	3,095,444	4,154,407	3,282,427
Windermere	95	.....	.....
Alberni	44,257	34,696	527,401
Ashcroft	9,963	59,598	9,964
Clayoquot	2,429,603	1,612,444	.....
Clinton	13,688	8,602	5,679
Lillooet	5,991,503	5,093,991	3,312,574
Nanaimo	3,034,831	3,418,984	3,435,235
New Westminster	679,169	654,719	607,133
Quatsino	16,347	.....	.....
Vancouver	4,024,175	2,596,739	2,607,391
Victoria	1,211,793	1,491,767	1,465,011
Totals	$78,479,719	$75,551,098	$65,892,395

TABLE IX.A (1942 AND 1943).—PRODUCTION IN DETAIL OF PLACER GOLD, LODE GOLD, AND SILVER.

Divisions.	Year.	Tons.	Gold—Placer.		Gold—Lode.		Silver.	
			Ounces.	Value.	Ounces.	Value.	Ounces.	Value.
				$		$		$
Atlin	1942	31,336	22,713	719,115	17,506	673,981	1,116	471
	1943		**9,814**	**310,734**				
Portland Canal	1942	203,322			39,624	1,525,524	473,423	199,622
	1943	**93,003**			**22,157**	**853,045**	**335,600**	**151,872**
Skeena	1942	26,153	27	855	8,763	337,375	6,423	2,708
	1943		**31**	**982**				
Stikine	1942		512	16,211				
	1943		**73**	**2,311**				
Cariboo	1942	141,801	4,262	134,939	59,180	2,278,430	6,219	2,622
	1943	**60,884**	**2,751**	**87,103**	**26,397**	**1,016,285**	**2,905**	**1,315**
Omineca	1942	296	1,738	55,027	15	577	10,540	4,444
	1943		**1,004**	**31,789**				
Peace River	1942		24	760				
	1943							
Quesnel	1942		2,357	74,625				
	1943		**639**	**20,232**				
Kamloops	1942	107	118	3,736	48	1,848	16	7
	1943		**49**	**1,551**				
Nicola	1942							
	1943							
Vernon	1942	434	61	1,931	142	5,467	171	72
	1943	**38**	**14**	**443**	**10**	**385**	**7**	**3**
Greenwood	1942	11,581	5	158	2,113	81,350	800,691	337,619
	1943	**3,909**			**814**	**31,339**	**381,255**	**172,533**
Osoyoos	1942	165,643			55,011	2,117,924	5,371	2,265
	1943	**115,488**			**36,466**	**1,403,941**	**5,141**	**2,327**
Similkameen	1942	1,705,253	70	2,216	8,337	320,975	207,975	87,695
	1943	**1,363,346**	**18**	**570**	**6,464**	**248,864**	**156,507**	**70,826**
Ainsworth	1942	139			12	462	6,991	2,948
	1943	**13,126**					**7,984**	**3,613**
Fort Steele	1942	2,697,434	256	8,105			7,761,400	3,272,672
	1943	**2,500,714**	**68**	**2,153**			**7,007,800**	**3,171,310**
Golden	1942	86,546					25,052	10,563
	1943	**61,770**					**19,133**	**8,658**
Lardeau	1942							
	1943		**3**	**95**				
Nelson	1942	183,384	21	665	65,663	2,528,026	66,504	28,042
	1943	**51,504**	**2**	**63**	**21,497**	**827,635**	**11,244**	**5,088**
Revelstoke	1942		35	1,108				
	1943		**8**	**253**				
Slocan	1942	161,128			47	1,809	194,844	82,158
	1943	**137,645**			**141**	**5,428**	**420,396**	**190,246**
Trail Creek	1942	12,565	3	95	4,135	159,198	3,919	1,653
	1943	**2,428**			**417**	**16,054**	**63,353**	**28,670**
Alberni	1942	69,241			41,424	1,594,824	19,075	8,043
	1943	**14,106**			**13,485**	**519,173**	**5,352**	**2,422**
Ashcroft	1942		238	7,535				
	1943		**27**	**855**				
Clinton	1942		207	6,554				
	1943		**31**	**982**				
Lillooet	1942	250,719	179	5,667	131,380	5,058,130	27,877	11,755
	1943	**144,897**	**56**	**1,773**	**85,078**	**3,275,503**	**21,247**	**9,615**
Nanaimo	1942	65			28	1,078	57	24
	1943							
New Westminster	1942	238	66	2,090	41	1,578	44	19
	1943		**12**	**380**				
Vancouver	1942	960,892			11,049	425,387	60,173	25,373
	1943	**849,147**			**10,922**	**420,497**	**73,645**	**33,327**
Victoria	1942		12	380				
	1943	**17,552**			**555**	**21,367**	**14,741**	**6,671**
Totals	1942	6,708,277	32,904	1,041,772	444,518	17,113,943	9,677,881	4,080,775
	1943	**5,429,557**	**14,600**	**462,270**	**224,403**	**8,639,516**	**8,526,310**	**3,858,496**

TABLE IX.B (1942 AND 1943).—PRODUCTION IN DETAIL OF COPPER, LEAD, AND ZINC.

Divisions.	Year.	Copper.		Lead.		Zinc.	
		Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
			$		$		$
Atlin	1942						
	1943						
Portland Canal	1942	82,397	8,311	1,880,647	63,227		
	1943	113,208	13,302	1,899,457	71,306		
Skeena	1942	135,045	13,621	1,726	58		
	1943						
Stikine	1942						
	1943						
Cariboo	1942						
	1943						
Omineca	1942			57,075	1,919	12,592	430
	1943						
Peace River	1942						
	1943						
Quesnel	1942						
	1943						
Kamloops	1942	1,211	122				
	1943						
Nicola	1942						
	1943						
Vernon	1942			43	1	56	2
	1943						
Greenwood	1942	7,058	712	478,160	16,076	664,250	22,658
	1943			230,406	8,650	296,564	11,863
Osoyoos	1942	22,086	2,228				
	1943	68,679	8,069				
Similkameen	1942	31,829,383	3,210,312				
	1943	22,892,724	2,939,895				
Ainsworth	1942			13,023	438	650	22
	1943			458,629	17,217	615,620	24,625
Fort Steele	1942			454,468,000	15,279,214	362,394,000	12,361,259
	1943			396,153,000	14,871,584	307,084,000	12,283,360
Golden	1942			4,979,078	167,397	9,358,499	319,218
	1943			3,731,081	140,065	6,350,377	254,015
Lardeau	1942						
	1943						
Nelson	1942			904,511	30,410	1,345,004	45,878
	1943			71,320	2,677	61,396	2,456
Revelstoke	1942						
	1943						
Slocan	1942			396,263	13,322	23,082,209	787,334
	1943			2,223,448	83,468	20,257,281	810,291
Trail Creek*	1942	175,486	17,699				
	1943	2,585,386	303,783	399,925	15,013		
Alberni	1942	72,907	7,353	9,330	314		
	1943						
Ashcroft	1942						
	1943						
Clinton	1942						
	1943						
Lillooet	1942						
	1943						
Nanaimo	1942						
	1943						
New Westminster	1942	708	71				
	1943						
Vancouver	1942	17,771,435	1,792,427	81,140	2,728		
	1943	16,436,868	1,931,332	73,075	2,743		
Victoria	1942						
	1943	210,645	24,751	45,135	1,694	471,776	18,871
Totals	1942	50,097,716	5,052,856	463,269,005	15,575,104	396,857,260	13,536,801
	1943	42,307,510	4,971,132	405,285,476	15,214,417	335,137,014	13,405,481

* Includes zinc and lead, recovered at the Trail Smelter, from current and reclaimed slags, derived from mines in several mining divisions.

TABLE IX.A (1940 AND 1941).—PRODUCTION IN DETAIL OF PLACER GOLD, LODE GOLD, AND SILVER.

Divisions.	Year.	Tons.	Gold—Placer.		Gold—Lode.		Silver.	
			Ounces.	Value.	Ounces.	Value.	Ounces.	Value.
				$		$		$
Atlin	1940	80,364	11,417	361,482	22,954	883,729	1,302	498
	1941	**89,610**	**22,412**	**709,587**	**19,091**	**735,004**	**1,151**	**440**
Portland Canal	1940	383,999	3	95	50,324	1,937,474	624,533	238,878
	1941	**361,130**			**51,296**	**1,974,896**	**530,460**	**202,959**
Skeena	1940	39,437	67	2,121	14,903	573,766	5,224	1,998
	1941	**39,657**	**43**	**1,361**	**13,613**	**524,101**	**11,922**	**4,562**
Stikine	1940		2,121	67,154				
	1941		**1,042**	**32,991**				
Cariboo	1940	161,055	8,722	276,154	64,839	2,496,301	6,577	2,516
	1941	**183,655**	**8,003**	**253,383**	**73,283**	**2,821,396**	**7,570**	**2,896**
Omineca	1940	293	5,432	171,986	91	3,504	47,761	18,268
	1941	**530**	**4,011**	**126,993**	**265**	**10,202**	**47,679**	**18,242**
Peace River	1940		189	5,984				
	1941		**77**	**2,438**				
Quesnel	1940		7,049	223,183				
	1941		**5,284**	**167,297**				
Kamloops	1940	3,386	260	8,232	603	23,216	626	239
	1941	**201**	**108**	**3,356**	**108**	**4,158**	**1,115**	**427**
Nicola	1940	4,759			437	16,824	20,750	7,937
	1941	**4,275**			**141**	**5,428**	**7,031**	**2,690**
Vernon	1940	679	260	8,232	237	9,124	471	180
	1941	**920**	**338**	**10,638**	**503**	**19,365**	**311**	**119**
Greenwood	1940	29,756	243	7,694	4,990	192,115	1,216,140	465,161
	1941	**24,668**	**26**	**823**	**5,314**	**204,589**	**1,195,047**	**457,237**
Osoyoos	1940	159,611	6	190	52,395	2,017,208	6,676	2,554
	1941	**166,918**			**56,228**	**2,164,778**	**8,738**	**3,343**
Similkameen	1940	1,652,626	169	5,351	15,762	606,837	269,111	102,932
	1941	**1,760,686**	**577**	**18,268**	**12,706**	**489,181**	**253,893**	**97,142**
Ainsworth	1940	1,625			401	15,438	3,985	1,524
	1941	**1,286**	**1**	**32**	**769**	**29,607**	**4,996**	**1,912**
Fort Steele	1940	2,484,647	396	12,538	57	2,195	9,480,569	3,626,204
	1941	**2,643,985**	**434**	**13,741**			**9,434,600**	**3,609,772**
Golden	1940	83,118	24	760			94,592	36,181
	1941	**96,747**	**8**	**253**			**76,280**	**29,186**
Lardeau	1940	6,191	7	222	206	7,931	1,549	593
	1941	**1,218**	**12**	**380**	**130**	**5,005**	**9,765**	**3,736**
Nelson	1940	302,571	298	9,435	101,620	3,912,370	114,885	43,942
	1941	**241,134**	**14**	**443**	**90,908**	**3,499,958**	**127,759**	**48,882**
Revelstoke	1940		94	2,976				
	1941		**82**	**2,596**				
Slocan	1940	106,942			165	6,352	150,088	57,407
	1941	**114,130**	**4**	**127**	**67**	**2,579**	**225,263**	**86,188**
Trail Creek	1940	16,713	1	32	9,646	371,371	10,417	3,984
	1941	**18,182**			**7,357**	**283,245**	**7,741**	**2,962**
Alberni	1940	105,589	3	95	74,306	2,860,781	30,431	11,639
	1941	**106,398**			**63,131**	**2,430,543**	**31,314**	**11,981**
Ashcroft	1940		549	17,382				
	1941		**43**	**1,362**				
Clinton	1940	2,745	571	18,079	1,334	51,359	1,299	497
	1941	**2**	**329**	**10,417**	**26**	**1,001**	**4**	**2**
Lillooet	1940	272,542	502	15,894	144,843	5,576,456	39,096	14,954
	1941	**301,281**	**345**	**10,923**	**154,708**	**5,956,258**	**40,851**	**15,630**
Nanaimo	1040	2,330	79	2,501	930	35,805	1,510	577
	1941	**6**	**35**	**1,108**	**7**	**269**	**6**	**2**
New Westminster	1940	296	489	15,483	131	5,043	58	22
	1941	**685**	**505**	**15,989**	**332**	**12,782**	**6,192**	**2,369**
Vancouver	1940	2,125,260			22,242	856,317	200,256	76,596
	1941	**1,781,497**			**21,043**	**810,156**	**146,012**	**55,866**
Victoria	1940	95	116	3,673			88	34
	1941		**46**	**1,456**				
Totals	1940	8,026,639	39,067	1,236,928	583,416	22,461,516	12,827,944	4,715,315
	1941	**7,938,809**	**43,775**	**1,385,962**	**571,026**	**21,994,501**	**12,175,700**	**4,658,545**

TABLE IX.B (1940 AND 1941).—PRODUCTION IN DETAIL OF COPPER, LEAD, AND ZINC.

Divisions.	Year.	COPPER.		LEAD.		ZINC.	
		Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
			$		$		$
Atlin	1940						
	1941						
Portland Canal	1940	2,961	299	1,021,450	34,341		
	1941	**124,579**	**12,565**	**1,870,299**	**62,879**		
Skeena	1940	130,242	13,136				
	1941	**169,853**	**17,131**	**16,034**	**539**	**6,281**	**214**
Stikine	1940						
	1941						
Cariboo	1940						
	1941						
Omineca	1940	2,057	207	148,035	4,977	74,195	2,531
	1941	**73,924**	**7,456**	**140,596**	**4,727**	**70,930**	**2,419**
Peace River	1940						
	1941						
Quesnel	1940						
	1941						
Kamloops	1940	50,784	5,122				
	1941			**1,498**	**50**	**2,412**	**82**
Nicola	1940			109,202	3,672	58,355	1,991
	1941			**11,447**	**385**	**27,361**	**933**
Vernon	1940						
	1941						
Greenwood	1940	161,574	16,297	505,957	17,010	851,784	29,054
	1941	**18,295**	**1,845**	**496,131**	**16,680**	**903,155**	**30,807**
Osoyoos	1940	103,669	10,456				
	1941	**48,055**	**4,948**				
Similkameen	1940	38,165,101	3,849,332				
	1941	**37,147,833**	**3,746,731**				
Ainsworth	1940			67,741	2,277	164,845	5,623
	1941			**32,506**	**1,093**	**48,782**	**1,664**
Fort Steele	1940			469,465,000	15,783,413	285,068,000	9,723,635
	1941			**478,184,000**	**16,076,546**	**331,669,000**	**11,313,230**
Golden	1940			11,772,038	395,776	17,272,468	589,154
	1941			**6,165,640**	**207,289**	**13,608,426**	**464,193**
Lardeau	1940			20,133	677	117,566	4,010
	1941			**49,721**	**1,672**	**30,195**	**1,030**
Nelson	1940			1,673,889	56,276	1,048,996	35,781
	1941			**2,278,383**	**76,599**	**1,772,021**	**60,444**
Revelstoke	1940						
	1941						
Slocan	1940			319,902	10,752	1,882,696	64,219
	1941			**608,628**	**20,395**	**15,151,469**	**516,817**
Trail Creek*	1940	445,669	44,953			4,229,346	144,263
	1941	**355,929**	**35,898**				
Alberni	1940	309,530	31,219	38,070	1,280		
	1941	**69,918**	**7,052**	**31,614**	**1,063**		
Ashcroft	1940						
	1941						
Clinton	1940	608	61				
	1941						
Lillooet	1940	195	20	674	23		
	1941						
Nanaimo	1940	3,721	375				
	1941						
New Westminster	1940	494	50				
	1941			**16,056**	**540**	**12,163**	**415**
Vancouver	1940	38,598,897	3,893,085	222,429	7,478		
	1941	**28,426,192**	**2,867,066**	**285,104**	**9,585**		
Victoria	1940	4,691	473				
	1941						
Totals	1940	77,980,223	7,865,085	485,364,420	16,317,952	310,767,251	10,600,271
	1941	**66,435,583**	**6,700,693**	**490,185,657**	**16,480,042**	**363,302,195**	**12,382,238**

* Includes zinc and lead, recovered at the Trail Smelter, from current and reclaimed slags, derived from mines in several mining divisions.

TABLE IX.C.—PRODUCTION VALUE OF PLACER GOLD, LODE GOLD, SILVER, COPPER, LEAD, AND ZINC IN 1940, 1941, 1942, AND 1943.

Divisions.	1940.	1941.	1942.	1943.
	$	$	$	$
Atlin	1,245,709	1,445,031	1,393,567	310,734
Portland Canal	2,211,087	2,253,299	1,796,684	1,089,525
Skeena	591,021	547,908	354,617	982
Stikine	67,154	32,991	16,211	2,311
Cariboo	2,774,971	3,077,675	2,415,991	1,104,703
Omineca	201,473	170,039	62,397	31,789
Peace River	5,984	2,438	760	.....
Quesnel	223,183	167,297	74,625	20,232
Kamloops	36,809	8,073	5,713	1,552
Nicola	30,424	9,436	.....	.....
Vernon	17,536	30,122	7,473	831
Greenwood	727,331	711,981	458,573	224,385
Osoyoos	2,030,408	2,173,069	2,122,417	1,414,337
Similkameen	4,564,452	4,351,322	3,621,198	3,010,155
Ainsworth	24,862	34,308	3,870	45,455
Fort Steele	29,147,985	31,013,289	30,921,250	30,328,407
Golden	1,021,881	700,911	497,178	402,738
Lardeau	13,433	11,823	.....	95
Nelson	4,057,804	3,686,326	2,633,021	837,919
Revelstoke	2,976	2,596	1,108	253
Slocan	138,730	626,106	884,623	1,089,433
Trail Creek	564,603	322,106	178,645	363,520
Alberni	2,905,014	2,450,639	1,610,534	521,595
Ashcroft	17,382	1,362	7,535	855
Clinton	69,996	11,420	6,554	982
Lillooet	5,607,347	5,982,811	5,075,552	3,286,891
Nanaimo	39,258	1,379	1,102	.....
New Westminster	20,598	32,095	3,758	380
Vancouver	4,833,476	3,742,673	2,245,915	2,387,899
Victoria	4,180	1,456	380	73,354
Totals	63,197,067	63,601,981	56,401,251	46,551,312

TABLE IX.D.—PRODUCTION OF PLACER GOLD, LODE GOLD, AND SILVER, 1900–1943.

Divisions.	GOLD—PLACER.		GOLD—LODE.		SILVER.	
	Ounces.	Value.	Ounces.	Value.	Ounces.	Value.
		$		$		$
Atlin*	612,111	14,301,140	107,104	3,726,094	56,852	34,035
Portland Canal	201	4,260	1,800,830	46,668,423	48,875,386	27,186,913
Skeena	3,879	85,467	414,794	9,379,046	265,198	182,759
Stikine	29,111	759,809	114	4,120	20	8
Cariboo†	1,908,709	38,911,328	491,552	18,031,051	54,503	23,788
Omineca	45,284	1,184,561	8,638	197,545	2,350,470	1,454,199
Peace River	4,057	93,217	.....	.....	.....	.....
Quesnel‡	620,572	12,893,137	198	7,156	271	110
Kamloops	3,284	81,947	39,363	1,317,641	281,229	167,209
Nicola	230	4,652	8,510	234,352	266,459	125,962
Vernon	2,082	54,650	5,202	175,254	7,643	3,780
Greenwood	4,038	95,634	1,084,167	23,342,388	22,176,211	11,106,882
Osoyoos	188	4,079	1,051,138	28,913,858	502,543	320,514
Similkameen	7,045	159,350	90,387	2,989,174	2,166,611	990,089
Ainsworth	213	5,690	3,855	112,444	6,504,000	3,922,188
Fort Steele	17,038	393,817	2,532	56,964	136,771,656	64,980,802
Golden	466	11,203	70	1,447	1,309,501	785,531
Lardeau	1,755	37,886	24,886	652,251	2,084,569	1,119,625
Nelson	3,167	79,404	1,220,549	37,974,076	4,155,745	2,238,334
Revelstoke	3,997	86,159	12	335	50,097	31,309
Slocan	150	3,596	6,263	152,346	39,898,381	24,173,175
Trail Creek	848	24,176	2,603,898	55,555,885	3,305,972	1,843,552
Alberni	1,579	32,094	271,587	10,229,824	147,044	66,954
Ashcroft	10,942	251,620	8,476	289,680	16,804	9,513
Clinton	9,935	236,192	23,391	827,260	31,564	14,214
Lillooet§	90,449	1,852,045	1,656,721	57,227,930	442,231	197,553
Nanaimo	572	13,221	67,890	1,426,275	518,645	298,523
New Westminster	10,227	233,172	4,311	233,172	13,373	5,960
Vancouver	182	5,306	288,923	8,635,176	3,552,711	1,914,344
Victoria	612	15,223	35,903	752,011	749,116	405,803
Provincial totals	3,392,921	71,914,149	11,323,264	309,590,313	276,554,805	143,603,628

* Atlin totals include estimated placer gold production from and including 1898.

† Cariboo totals include estimated placer gold production from and including 1858.

‡ Quesnel totals include estimated placer gold production from and including 1858.

§ Lillooet totals include estimated placer gold production from and including 1874.

TABLE IX.E.—PRODUCTION OF COPPER, LEAD, AND ZINC, 1900–1943.

Divisions.	Copper.		Lead.		Zinc.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
		$		$		$
Atlin	83,161	11,949	109,945	7,036	.....	.....
Portland Canal	649,463,497	96,770,176	28,098,220	1,172,237	.....	.....
Skeena	7,671,642	1,216,080	39,539	1,287	15,277	490
Stikine	.....	.....	.....	.....	.....	.....
Cariboo	.....	.....	656	30	492	16
Omineca	6,126,209	1,345,688	6,239,613	345,809	3,960,018	248,654
Peace River	.....	.....	.....	.....	.....	.....
Quesnel	.....	.....	.....	.....	.....	.....
Kamloops	5,767,133	1,021,694	368,662	20,737	409,170	26,063
Nicola	536,304	103,443	2,219,064	88,661	319,393	10,485
Vernon	614	89	6,374	293	2,820	149
Greenwood	441,171,575	70,493,191	9,092,494	360,117	9,051,559	301,527
Osoyoos	1,779,809	196,579	252,418	7,475	5,209	163
Similkameen	299,687,169	35,361,564	238,577	9,006	64,377	2,616
Ainsworth	10,175	1,201	121,546,266	5,982,472	34,542,548	1,040,198
Fort Steele	28,592	6,193	7,233,687,404	292,877,433	4,561,308,816	183,219,888
Golden	57,378	10,590	94,635,651	3,457,451	100,575,356	3,409,624
Lardeau	5,594	785	9,556,854	381,932	438,478	20,021
Nelson	5,685,261	889,008	53,472,129	2,337,827	24,632,825	1,461,693
Revelstoke	683	124	939,741	55,885	8,093	469
Slocan	219,318	42,287	294,848,399	14,098,469	220,048,151	13,048,136
Trail Creek*	116,850,749	17,374,402	16,970,979	689,209	157,917,364	5,292,401
Alberni	2,225,948	333,373	108,328	3,679	.....	.....
Ashcroft	633,775	155,721	99	4	.....	.....
Clinton	57,548	5,905	193	7	.....	.....
Lillooet	400	41	62,463	2,542	.....	.....
Nanaimo	20,223,405	3,201,703	.....	.....	.....	.....
New Westminster	26,489	6,379	28,144	1,081	12,163	415
Vancouver	709,249,184	96,312,731	7,831,421	272,802	17,981,772	563,988
Victoria	20,721,043	3,075,062	45,135	1,694	471,776	18,871
Provincial totals	2,288,282,655	327,935,958	7,880,398,768	322,175,175	5,133,633,321	208,776,121

* Includes zinc and lead recovered at the Trail Smelter, from current and reclaimed slags, derived from mines in several mining divisions.

TABLE IX.F.—PRODUCTION VALUE OF PLACER GOLD, LODE GOLD, SILVER, COPPER, LEAD, AND ZINC, BY MINING DIVISIONS, 1900–1943.

Divisions.	Mining Division Total.
Atlin*	$18,080,254
Portland Canal	171,912,263
Skeena	11,465,233
Stikine	763,937
Cariboo†	56,966,213
Omineca	4,776,456
Peace River	93,217
Quesnel‡	12,900,403
Kamloops	2,635,291
Nicola	567,555
Vernon	234,215
Greenwood	105,699,739
Osoyoos	29,442,668
Similkameen	39,511,799
Ainsworth	11,064,193
Fort Steele	541,535,097
Golden	7,675,856
Lardeau	2,212,500
Nelson	44,980,342
Revelstoke	174,281
Slocan	51,518,009
Trail Creek	80,779,625
Alberni	10,665,924
Ashcroft	706,538
Clinton	1,083,578
Lillooet§	59,280,111
Nanaimo	4,939,722
New Westminster	357,314
Vancouver	107,704,347
Victoria	4,268,664
Provincial totals	$1,383,995,344

* Atlin totals include estimated placer gold production from and including 1898.
† Cariboo totals include estimated placer gold production from and including 1858.
‡ Quesnel totals include estimated placer gold production from and including 1858.
§ Lillooet totals include estimated placer gold production from and including 1874.

TABLE X.—Production in Detail of Structural Materials, 1940, 1941, 1942, and 1943.

Divisions.		Cement.	Lime and Limestone.	Building-stone.	Riprap and Crushed Rock.	Sand and Gravel.	Brick (Common).	Face, Paving, and Sewer Brick.	Firebrick, Blocks.	Fireclay.	Structural Tile, Hollow, Blocks, Roof-tile, Floor-tile.	*Drain-tile and* Sewer-pipe.	Pottery, Glazed or Unglazed.	Other Clay Products.	Divisions.
		$	$	$	$	$	$	$	$	$	$	$	$	$	$
Atlin and Stikine	1940				500	2,685									3,185
	1941				1,990	2,320									4,310
	1942				3,934	3,836									7,770
	1943				**882**	**2,389**									**3,271**
Portland Canal and Skeena	1940		22,997		14,593	17,791									55,381
	1941		25,225		42,489	31,518									99,232
	1942		26,134		15,929	33,410									75,473
	1943		**26,000**		**20,441**	**21,800**									**68,241**
Cariboo and Quesnel	1940				1,472	48,846								8,585	58,903
	1941				545	63,125									63,670
	1942				334	50,476									50,810
	1943				**2,568**	**53,238**									**55,806**
Omineca and Peace River	1940				11,381	14,146									25,527
	1941				310	14,563									14,873
	1942				6	25,368									25,374
	1943				**4**	**85,743**									**85,747**
Nicola, Vernon, and Kamloops	1940			2,000	468	28,661	2,739	1,904		5	518	251		20	36,566
	1941			1,400	11,640	23,895	1,809				129	257			39,130
	1942			1,800	4,112	30,630	832								37,374
	1943				**2,196**	**22,075**									**24,271**
Greenwood, Osoyoos, and Similkameen	1940				9,581	58,408								1,162	69,151
	1941				10,936	50,174								1,138	62,248
	1942				5,136	66,663								1,003	72,802
	1943				**14,087**	**57,754**								**1,357**	**73,198**
Fort Steele and Golden	1940				7,694	86,696									94,390
	1941				9,739	53,137									62,876
	1942				24,965	44,345									69,310
	1943				**15,068**	**132,548**									**147,616**
Ainsworth, Slocan, and Nelson	1940			5,434	222	51,383									57,039
	1941			6,187	4,291	41,035									51,513
	1942			7,313	9,291	54,336									70,940
	1943			**6,731**	**2,284**	**31,869**									**40,884**
Trail Creek and Revelstoke	1940				69,033	43,044									112,077
	1941			600	762	40,081									45,443
	1942			2,800	7,238	52,340									62,428
	1943			**1,600**	**2,900**	**27,988**									**32,488**

		$	$	$	$	$	$	$	$	$	$	$	$	$	$
Alberni, Nanaimo, and Victoria	1940	704,567	271,060	14,337	25,535	149,428	78,514	440	.....	.....	19,681	11,835	3,048	327	1,278,772
	1941	986,322	256,952	8,385	9,499	167,987	45,764	168	.....	.....	6,220	12,376	3,230	170	1,497,073
	1942	1,198,014	242,903	.....	8,104	254,268	46,120	518	.....	.....	17,600	7,734	3,106	32	1,778,399
	1943	**1,146,865**	**309,942**	.....	**2,972**	**170,808**	**55,508**	.....	.....	.....	**5,979**	**9,809**	**2,917**	.....	**1,304,800**
Ashcroft, Lillooet, and Clinton	1940	.....	.....	.....	4,872	7,832	.....	.....	.....	.....	.....	.....	.....	.....	12,704
	1941	.....	.....	.....	754	2,617	.....	.....	.....	.....	.....	.....	.....	.....	3,371
	1942	.....	.....	.....	2,919	9,351	.....	.....	.....	.....	.....	.....	.....	.....	12,270
	1943	.....	.....	.....	**4,101**	**4,844**	.....	.....	.....	.....	.....	.....	.....	.....	**8,945**
Vancouver and New Westminster	1940	.....	625	33,576	106,098	199,702	51,181	35,984	140,727	8,289	27,344	118,756	8,273	.....	730,555
	1941	.....	3,829	43,738	58,196	304,074	81,968	17,477	210,911	12,216	14,651	150,463	8,000	.....	905,523
	1942	.....	4,896	46,836	74,130	323,639	30,188	6,932	219,680	11,467	21,753	140,445	.....	1,446	881,412
	1943	.....	**5,046**	**48,105**	**33,493**	**279,002**	.....	**21,825**	**227,594**	**9,706**	**21,638**	**143,344**	.....	**4,128**	**793,881**
Totals	1940	704,567	294,682	55,347	252,039	708,622	132,434	38,328	140,727	8,294	47,543	130,842	11,321	10,094	2,534,840
	1941	986,322	286,006	60,310	151,151	794,526	129,541	17,645	210,911	12,216	21,000	163,096	11,230	1,308	2,845,262
	1942	1,198,014	273,933	58,749	156,171	948,662	77,140	7,450	219,680	11,467	39,353	148,179	3,106	2,481	3,144,385
	1943	**1,146,865**	**340,988**	**56,436**	**100,996**	**390,058**	**55,508**	**21,825**	**227,594**	**9,706**	**27,617**	**153,153**	**2,917**	**5,485**	**3,039,148**

TABLE XI.—Production in Detail of Miscellaneous Metals, Minerals, and Materials, 1940, 1941, 1942, and 1943.

Divisions.		Antimony, Arsenic.	Bismuth.	Cadmium.	Diatomite, Mica.	Flux (Limestone and Quartz).	Gypsum Products, Fluorspar.	Iron Oxides, Barite.	Mercury.	Slate and Rock Granules.	Soda and Magnesium Sulphate.	Sulphur.	Tungsten Concentrates.	Others.	Division Totals.
		$	$	$	$	$	$	$	$	$	$	$	$	$	$
Skeena	1940				2,950										2,950
	1941				2,923										2,923
	1942														
	1943														
Cariboo and Omineca	1940	3,800							353,587					117	357,504
	1941								1,335,233				16,582		1,351,815
	1942								2,941,864				219,000	38	3,160,902
	1943								**4,559,200**				**670,519**		**5,229,719**
Peace River and Quesnel	1940				171									78	249
	1941				2,625									535	3,160
	1942				670									38	708
	1943				**128**										**128**
Kamloops and Greenwood	1940					10,516	120,043		222						130,781
	1941					27,359	141,320								168,679
	1942					23,449	169,432		216						193,097
	1943					**124,761**	**142,176**								**266,937**
Osoyoos and Similkameen	1940													860	860
	1941				1,980	1,580								1,758	5,318
	1942	246,230			2,800	2,038								1,452	252,520
	1943	**27,721**			**3,245**	**1,804**								**270**	**33,040**
Fort Steele, Golden, and Lardeau	1940							80							80
	1941							1,140							1,140
	1942							16,084					1,031		17,115
	1943							**15,834**							**15,834**
Nelson and Revelstoke	1940														
	1941			20,262											20,262
	1942									51					51
	1943			**17,306**									**12,628**		**29,934**
Trail Creek	1940	392,668	56,384	905,734								987,060			2,341,846
	1941	488,147		1,249,271								1,008,370		2,944	2,748,732
	1942	516,975	476,408	1,130,141								1,022,990		796,709	3,943,223
	1943	**189,408**	**562,484**	**688,474**								**1,011,580**		**450,623**	**2,902,569**
Ashcroft and Clinton	1940										1,760				1,760
	1941										9,611				9,611
	1942										40,808				40,808
	1943										**4,697**				**4,697**
Lillooet and Nanaimo	1940					20,746							1,320		22,066
	1941					21,990			450				4,871		27,311
	1942					15,973			864				10,201		27,038
	1943					**13,484**							**19,238**		**32,722**
Vancouver and Victoria	1940							3,948		6,883		12,056			22,887
	1941							2,885		12,216		18,424			33,525
	1942							4,604		16,643		111,576			132,823
	1943					**250**		**4,836**		**11,711**		**27,528**			**44,325**
Totals	1940	396,468	56,384	905,734	3,121	31,262	120,043	4,028	353,809	6,883	1,760	999,116	1,320	1,055	2,880,983
	1941	488,147		1,269,533	7,528	50,929	141,320	4,025	1,335,683	12,216	9,611	1,026,794	21,453	5,237	4,372,476
	1942	763,205	476,408	1,130,141	3,470	41,460	169,432	20,688	2,942,944	16,694	40,808	1,134,566	230,232	798,237	7,768,285
	1943	**217,129**	**562,484**	**705,780**	**3,373**	**140,299**	**142,176**	**20,870**	**4,559,200**	**11,711**	**4,697**	**1,039,108**	**702,385**	**450,893**	**8,559,905**

TABLE XII.—British Columbia Mine Production, 1895–1943.

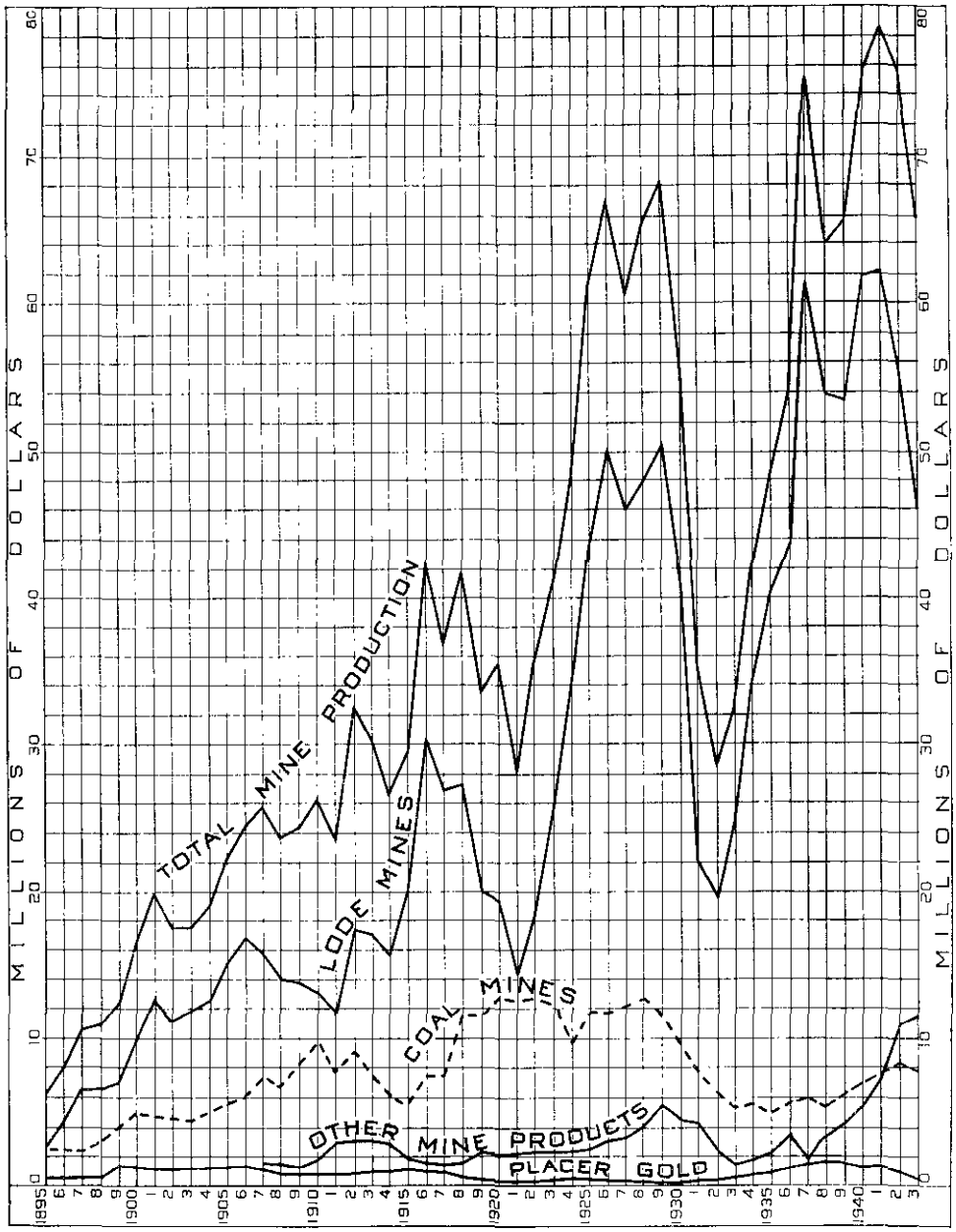


TABLE XIII.—Production of Lode Mines in British Columbia, 1913–1943.

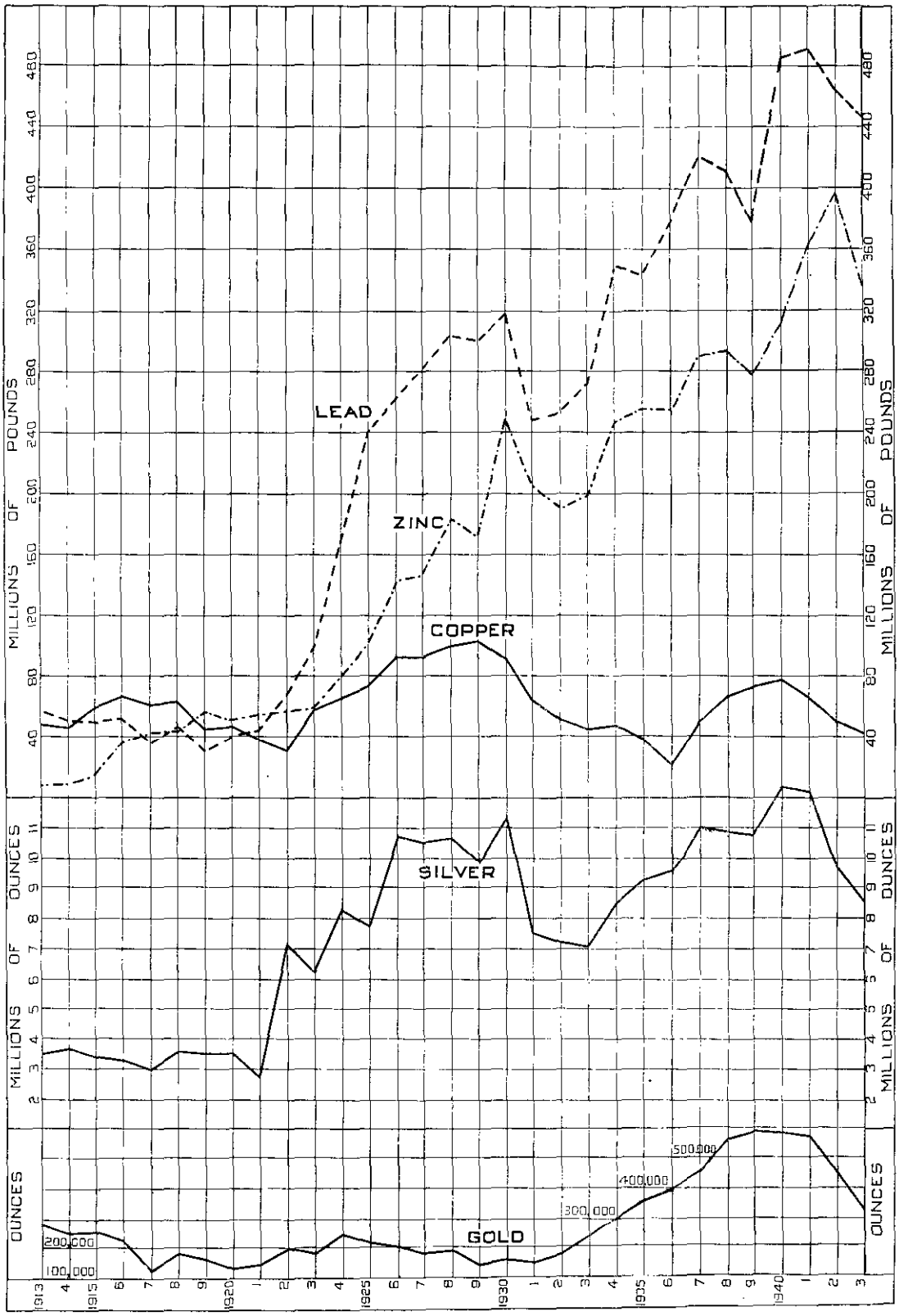


TABLE XIV.—Coal Production per Year to Date.*

	Tons. (2,240 lb.)	Value.		Tons. (2,240 lb.)	Value.
1836–1885	3,029,011	$9,468,557	1916	2,084,093	$7,294,325
1886	326,636	979,908	1917	2,149,975	7,524,913
1887	413,360	1,240,080	1918	2,302,245	11,511,225
1888	489,301	1,467,903	1919	2,267,541	11,337,705
1889	579,830	1,739,490	1920	2,595,125	12,975,625
1890	678,140	2,034,420	1921	2,483,995	12,419,975
1891	1,029,097	3,087,291	1922	2,511,843	12,559,215
1892	826,335	2,479,005	1923	2,453,223	12,266,115
1893	978,294	2,934,882	1924	1,939,526	9,697,630
1894	1,012,953	3,038,859	1925	2,328,522	11,642,610
1895	939,654	2,818,962	1926	2,330,036	11,650,180
1896	896,222	2,688,666	1927	2,453,827	12,269,135
1897	882,854	2,648,562	1928	2,526,702	12,633,510
1898	1,135,865	3,407,595	1929	2,251,252	11,256,260
1899	1,306,324	3,918,972	1930	1,887,130	9,435,650
1900	1,439,595	4,318,785	1931	1,707,590	7,684,155
1901	1,460,331	4,380,993	1932	1,534,975	6,523,644
1902	1,397,394	4,192,182	1933	1,264,746	5,375,171
1903	1,168,194	3,504,582	1934	1,347,090	5,725,133
1904	1,253,628	3,760,884	1935	1,187,968	5,048,864
1905	1,384,312	4,152,936	1936	1,346,471	5,722,502
1906	1,517,303	4,551,909	1937	1,444,687	6,139,920
1907	1,800,067	6,300,235	1938	1,309,428	5,565,069
1908	1,677,849	5,872,472	1939	1,477,872	6,280,956
1909	2,006,476	7,022,666	1940	1,667,827	7,088,265
1910	2,800,046	9,800,161	1941	1,802,353	7,660,000
1911	2,193,062	7,675,717	1942	1,938,158	8,237,172
1912	2,628,804	9,200,814	1943	1,821,654	7,742,030
1913	2,137,483	7,481,190			
1914	1,810,967	6,338,385	Totals	97,226,370	$389,412,969
1915	1,611,129	5,638,952			

* 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, 1942 and 1943.

Description.	1942.		1943.	
	Quantity.	Value.	Quantity.	Value.
Coal used in making coke, long tons	228,448	$866,795	232,441	$983,910
Coke made in bee-hive ovens, long tons	59,664	$439,464	38,184	$291,843
Coke made in by-product ovens, long tons	86,096	608,521	39,192	274,402
Coke made in gas plants, long tons	5,829	54,307	83,673	647,482
Total coke made, long tons	151,589	$1,102,292	161,049	$1,213,727
Gas sold and used		2,165,888		2,453,592
Tar produced		86,113		96,249
Other by-products		22,028		18,321
Total production value of coke industry		$3,376,321		$3,781,889

TABLE XVII.—Dividends paid by Mining Companies, 1897–1943.

*Lode-gold Mines.**

Company or Mine.	Locality.	Class.	Amount paid.
Arlington	Erie	Gold	$94,872
Athabasca	Nelson	Gold	25,000
Bayonne	Tye Siding	Gold	25,000
Bralorne Mines, Ltd.	Bridge River	Gold	11,462,150
Belmont-Surf Inlet	Princess Royal Island	Gold	1,437,500
Cariboo Gold Quartz Mines, Ltd.	Wells	Gold	1,679,976
Cariboo-McKinney Con. M. & M. Co.	Camp McKinney	Gold	565,588
Canadian Pacific Exploration (Porto Rico)	Nelson	Gold	37,500
Centre Star	Rossland	Gold-copper	472,255
Fairview Amalgamated	Oliver	Gold	5,254
Fern Gold Mining & Milling Co., Ltd.	Nelson	Gold	9,375
Goodenough (leasers)	Ymir	Gold	13,731
Gold Belt Mining Co., Ltd.	Sheep Creek	Gold	255,000
Hedley Mascot Gold Mines, Ltd.	Hedley	Gold	1,290,553
Island Mountain Mines, Ltd.	Wells	Gold	982,409
I.X.L.	Rossland	Gold	134,025
Jewel-Denero	*Greenwood*	*Gold*	11,751
Kelowna Exploration, Ltd. (Nickel Plate)	Hedley	Gold	1,200,000
Kootenay Belle Gold Mines, Ltd.	Sheep Creek	Gold	357,856
Le Roi Mining Co.	Rossland	Gold-copper	1,475,000
Le Roi No. 2, Ltd.	Rossland	Gold-copper	1,574,640
Lorne (later Bralorne)	Bridge River	Gold	20,450
Motherlode	Sheep Creek	Gold	163,500
Mount Zeballos Gold Mines, Ltd.	Zeballos	Gold	165,000
Nickel Plate (Hedley Gold Mining Co., Ltd.)	Hedley	Gold	3,423,191
Pioneer Gold Mines of B.C., Ltd.	Bridge River	Gold	9,299,393
Poorman	Nelson	Gold	25,000
Premier Gold Mining Co., Ltd.	Premier	Gold	‡18,858,075
Privateer Mine, Ltd.	*Zeballos*	*Gold*	1,865,101
Queen	Sheep Creek	Gold	85,000
Relief Arlington Mines, Ltd. (Second Relief)	Erie	Gold	†290,000
Reno Gold Mines, Ltd.	Sheep Creek	Gold	†1,433,640
Sheep Creek Gold Mines, Ltd.	Sheep Creek	Gold	2,137,500
Silbak Premier Mines, Ltd.	Premier	Gold	‡2,125,000
Spud Valley Gold Mines, Ltd.	Zeballos	Gold	168,000
Sunset No. 2	Rossland	Gold-copper	115,007
Surf Inlet Consolidated Gold Mines, Ltd.	Surf Inlet	Gold	120,279
War Eagle	Rossland	Gold-copper	1,245,250
Ymir Gold	Ymir	Gold	300,000
Ymir Yankee Girl	Ymir	Gold	†415,002
Miscellaneous mines		Gold	108,623
Total, lode-gold mines			$65,472,446

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

† Includes "Return of Capital" distributions.

‡ Up to and including 1936, dividends paid by Premier Gold Mining Company, Limited, were derived from operations of the company in British Columbia. Subsequent dividends paid by Premier Gold Mining Company, Limited, have been derived from the operations of subsidiary companies in British Columbia and elsewhere and are not included in the figure given. In 1936, Silbak Premier, a subsidiary of Premier Gold Mining Company, took over the former gold operations of that company in British Columbia. Dividends paid by Silbak Premier are given above.

TABLE XVII.—Dividends paid by Mining Companies, 1897–1943—*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
Beaver Silver Mines, Ltd.	Greenwood	Silver-lead-zinc	48,000
Bell	Beaverdell	Silver-lead-zinc	388,297
Bosun (Rosebery-Surprise)	New Denver	Silver-lead-zinc	25,000
Capella	New Denver	Silver-lead-zinc	5,500
Consolidated Mining and Smelting Co. of Canada, Ltd.	Trail	Silver-lead-zinc	*118,265,879
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	620,097
Horn Silver	Similkameen	Silver-lead-zinc	6,000
Idaho-Alamo	Sandon	Silver-lead-zinc	400,000
Iron Mountain (Emerald)	Salmo	Silver-lead-zinc	20,000
Jackson	Retallack	Silver-lead-zinc	20,000
Last Chance	Three Forks	Silver-lead-zinc	213,000
Lone Bachelor	Sandon	Silver-lead-zinc	50,000
Lucky Jim	Three Forks	Silver-lead-zinc	80,000
Mercury	Sandon	Silver-lead-zinc	6,000
Meteor	Slocan City	Silver-lead-zinc	10,257
Monitor and Ajax	Three Forks	Silver-lead-zinc	70,500
Mountain Con	Cody	Silver-lead-zinc	71,387
McAllister	Three Forks	Silver-lead-zinc	45,088
Noble Five	Cody	Silver-lead-zinc	72,859
North Star	Kimberley	Silver-lead-zinc	497,901
No. One	Sandon	Silver-lead-zinc	6,754
Ottawa	Slocan City	Silver-lead-zinc	110,429
Payne	Sandon	Silver-lead-zinc	1,438,000
Providence	Greenwood	Silver-lead-zinc	131,824
Queen Bess	Alamo	Silver-lead-zinc	25,000
Rambler-Cariboo	Rambler	Silver-lead-zinc	467,250
Reco	Cody	Silver-lead-zinc	334,992
Ruth Mines, Ltd.	Sandon	Silver-lead-zinc	125,490
St. Eugene	Moyie	Silver-lead-zinc	566,000
Silversmith and Slocan Star†	Sandon	Silver-lead-zinc	1,267,600
Spokane-Trinket	Ainsworth	Silver-lead-zinc	10,365
Standard Silver Lead	Silverton	Silver-lead-zinc	2,734,688
Sunset and Trade Dollar	Retallack	Silver-lead-zinc	88,000
Utica	Kaslo	Silver-lead-zinc	64,000
Wallace Mines, Ltd. (Sally)	Beaverdell	Silver-lead-zinc	135,000
Washington	Rambler Station	Silver-lead-zinc	20,000
Whitewater	Retallack	Silver-lead-zinc	592,515
Miscellaneous mines		Silver-lead-zinc	70,237
Total, silver-lead-zinc mines			$129,488,744

* Earnings of several company mines, and customs smelter at Trail.

† These two properties were amalgamated as Silversmith Mines, Limited, in August, 1939.

TABLE XVII.—DIVIDENDS PAID BY MINING COMPANIES, 1897–1943—*Continued.*

Copper Mines.

Company or Mine.	Locality.	Class.	Amount paid.
Britannia M. & S. Co.*	Britannia Beach	Copper	$11,327,517
Canada Copper Corporation	Greenwood	Copper	615,399
Cornell	Texada Island	Copper	8,500
Granby Cons. M.S. & P. Co.†	Copper Mountain	Copper	26,433,191
Marble Bay	Texada Island	Copper	175,000
Hall Mines	Nelson	Copper	233,280
Miscellaneous mines		Copper	261,470
Total, copper mines			$39,054,357

* Britannia Mining and Smelting Company, Limited, is a subsidiary of the Howe Sound Company, which is the holding company for *Britannia* and other mines in Mexico and the State of Washington. Dividends paid by the Howe Sound Company, therefore, cannot be credited to British Columbia. Dividends in the above table for *Britannia have been paid by that company, none being paid subsequent to 1930, until 1939.* In making comparison with yearly totals the amounts shown as paid by the Howe Sound Company have been deducted for the years shown, so the total in the annual report concerned will show the higher figure.

† The Granby Consolidated Mining, Smelting and Power Company dividends as set out in the above table in the Minister of Mines Annual Report for 1942 were incorrect, and the correct total is as above. The figure now includes all dividends, capital distributions, and interim liquidating payments, the latter being $4,500,000, paid prior to reorganization. Dividends commenced in 1904 and cover all company activities in British Columbia to date, the present operations being conducted at Allenby and Copper Mountain.

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	13,054,372
Total	$29,054,372

Miscellaneous, Structural, and Placer Gold.

Various	$2,610,104

Aggregate of all Classes.

Lode-gold mining	$65,472,446
Silver-lead-zinc mining and smelting	129,488,744
Copper-mining	39,054,357
Coal-mining	29,054,372
Miscellaneous, structural, and placer gold	2,610,104
Total	$265,680,023

TABLE XVII.—DIVIDENDS PAID BY MINING COMPANIES, 1897–1943—*Continued.*

Dividends paid Yearly, 1917–1943, inclusive.

Year.	Amount paid.	Year.	Amount paid.
1917	$3,269,494	1932	$2,786,958
1918	2,704,469	1933	2,471,735
1919	2,494,283	1934	4,745,905
1920	1,870,296	1935	7,386,070
1921	736,629	1936	10,513,705
1922	3,174,756	1937	15,085,293
1923	2,983,570	1938	12,068,875
1924	2,977,276	1939	11,865,698
1925	5,853,419	1940	14,595,530
1926	8,011,137	1941	16,598,110
1927	8,816,681	1942	13,627,104
1928	9,572,536	1943	11,860,159
1929	11,263,118		
1930	10,543,500	Total	$202,527,163
1931	4,650,857		

Dividends paid during 1942 and 1943.

	1942.	1943.
Arlington (R. O. Oscarson)	$18,305	
Bayonne Consolidated Mines, Ltd.	25,000	
Beaver Silver Mines, Ltd.		*$48,000
Bralorne Mines, Ltd.	1,496,400	1,496,400
Britannia Mining and Smelting Co., Ltd.	266,701	
Cariboo Gold Quartz Mines, Ltd.	173,330	53,332
The Consolidated Mining and Smelting Co. of Canada, Ltd.	8,189,553	8,189,569
The Crow's Nest Pass Coal Co., Ltd.	186,354	186,354
Gold Belt Mining Co., Ltd.	102,000	
Granby Consolidated Mining, Smelting and Power Co., Ltd.	315,163	202,605
Hedley Mascot Gold Mines, Ltd.	181,130	135,848
Highland Bell, Ltd.	105,268	39,476
Island Mountain Mines, Ltd.	136,593	78,804
Kelowna Exploration, Ltd. (Nickel Plate)	240,000	90,000
Pioneer Gold Mines of B.C., Ltd.	402,903	
Privateer Mine, Ltd.	319,030	171,786
Relief Arlington Mines, Ltd.		†45,000
Reno Gold Mines, Ltd.	376,000	†131,600
Sheep Creek Gold Mines, Ltd.	375,000	262,500
Silbak Premier Mines, Ltd.	400,000	325,000
Surf Inlet Consolidated Gold Mines, Ltd.	26,729	
Ymir Yankee Girl, Ltd.		†222,501
Others	291,645	181,384
Totals	$13,627,104	$11,860,159

* Liquidating dividend. † Distribution of capital.

TABLE XVIII.—CAPITAL EMPLOYED, SALARIES AND WAGES, FUEL AND ELECTRICITY, AND PROCESS SUPPLIES, 1943.

Class.	Capital employed.	Salaries and Wages.	Fuel and Electricity.	Process Supplies.
Lode-mining	$95,182,987	$17,013,404	$5,698,212	$3,730,139
Placer-mining	753,133	101,069	9,457	4,211
Coal-mining	22,602,652	5,065,946	325,572	898,968
Miscellaneous metals, minerals, and materials	19,153,086	3,001,515	1,174,542	1,912,675
Structural materials industry	3,090,508	869,533	224,802	26,324
Totals, 1943	**$140,782,366**	**$26,051,467**	**$7,432,585**	**$6,572,317**
Grand totals, 1942	$140,377,568	$26,913,160	$7,066,109	$6,863,398
Grand 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	*3,266,000	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, 1935–43	.....	203,519,870	*36,822,362	56,749,726

* Estimated.

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, 1901–1943.

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	10,513,931	22,535,573
1932	4,340,158	75	29	7,075,393	19,700,235
1933	4,030,978	109	47	13,976,358	25,007,137
1934	5,116,897	145	69	20,243,278	33,895,930
1935	4,916,148	177	72	25,407,914	40,597,569
1936	4,381,027	168	70	30,051,207	43,666,452
1937	6,145,144	185	113	44,763,788	62,912,783
1938	7,377,021	211	92	35,759,352	53,877,333
1939	7,211,223	217	99	40,711,287	53,522,098
1940	7,937,358	216	92	43,550,732	62,848,642
1941	7,938,803	200	96	46,686,076	62,216,019
1942	6,708,277	126	76	45,197,803	55,359,479
1943	**5,429,557**	**48**	**32**	**33,493,503**	**46,089,042**

TABLE XX.—Men employed in the Mining Industry of British Columbia, 1901–1943.

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
1942	489	2,920	1,504	4,424	960	3,555	1,892	468	2,360	842	378	262	13,270
1943	**212**	**2,394**	**1,699**	**4,093**	**891**	**2,835**	**2,240**	**611**	**2,851**	**673**	**326**	**567**	**12,448***

* 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 1943.

Mine or Group.	Location of Mine.	Mining Division.	Owner or Agent.	Process.	Character of Ore.
Silbak Premier	Stewart	Portland Canal	Silbak Premier Mines, Ltd., Premier	Flotation	Gold, silver, lead.
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.
Kalamalka	Lavington	Vernon	A. S. Penny and M. Penny, Rossland		Gold, silver.
Cariboo	Camp McKinney	Greenwood	E. A. Wanke and O. Johnson, Greenwood		Gold, silver, lead, zinc.
Dentonia	Greenwood	Greenwood	W. E. McArthur, Greenwood		Gold, silver.
Highland Bell	Greenwood	Greenwood	Highland Bell, Ltd., Creston		Silver, gold, lead, zinc.
Humming Bird	Greenwood	Greenwood	C. A. Anderson, Grand Forks		Gold, silver, zinc.
Providence	Greenwood	Greenwood	W. E. McArthur, Greenwood		Gold, silver, zinc.
Hedley Mascot	Hedley	Osoyoos	Hedley Mascot Mines, Ltd., Vancouver	Flotation	Gold, silver, copper.
Nickel Plate	Hedley	Osoyoos	Kelowna Exploration Co., Hedley	Cyanidation; flotation	Gold, silver, copper.
Copper Mountain	Allenby	Similkameen	Granby Cons. M.S. and Power Co., Vancouver	Flotation	Copper, silver, gold.
Ainsmore	Ainsworth	Ainsworth	Ainsmore Mines, Ltd., Ainsworth		Silver, lead.
Caledonia	Blaylock	Ainsworth	G. E. McCready, Kaslo		Silver, lead, zinc.
Kootenay Florence	Ainsworth	Ainsworth	Wartime Metals Corp., Montreal		Silver, lead, zinc.
Sullivan	Kimberley	Fort Steele	Cons. Mining and Smelting Co. of Canada, Ltd., Trail	Flotation	Silver, lead, zinc.
Monarch and Kicking Horse	Field	Golden	Base Metals Mining Corporation, Ltd., Toronto	Table concentration; flotation	Silver, lead, zinc.
Arizona	Ymir	Nelson	N. Morris, Nelson; C. Anderson, Ymir		Gold.
Arlington	Erie Creek	Nelson	R. O. Oscarson, Erie		Gold.
Athabasca	Nelson	Nelson	Nelson Slocan Cons. Mines, Ltd., Nelson		Gold, silver.
California	Nelson	Nelson	W. Anderson *et al.*, Nelson		Gold, silver, lead, zinc.
Gold Belt	Sheep Creek	Nelson	Gold Belt Mining Co., Ltd., Vancouver	Cyanidation	Gold, silver.
Goodenough	Ymir	Nelson	A. Fata, Ymir		Gold, silver, lead, zinc.
Granite	Taghum	Nelson	Livingstone Mining Co., Ltd., Blewett	Amalgamation; cyanidation	Gold, silver.
Kootenay Belle	Sheep Creek	Nelson	Kootenay Belle Gold Mines, Ltd., Vancouver	Cyanidation	Gold, silver.
Nugget	Salmo	Nelson	A. Endersby, Sr. and Jr., Sheep Creek		Gold, silver.
Perrier	Nelson	Nelson	A. Endersby, Fruitvale		Gold, silver.
Reno (Clean Up)	Sheep Creek	Nelson	D. H. Norcross, Nelson		Gold, silver.
Second Relief	Erie	Nelson	A. Burgess *et al.*, Salmo		Gold, silver.
Sheep Creek	Sheep Creek	Nelson	Sheep Creek Mines, Ltd., Vancouver	Cyanidation	Gold, silver.
Wilcox	Ymir	Nelson	B. Golac, Nelson		Gold, silver.
Yankee Girl	Ymir	Nelson	A. Madden and E. Emilson, Ymir		Gold, silver, lead, zinc.
Ymir No. 10 Lease	Ymir	Nelson	A. Phare and Associates, Ymir		Gold, silver.
I.X.L.	Rossland	Trail Creek	Leasing Syndicate of I.X.L., Rossland		Gold, silver.
Midnight	Rossland	Trail Creek	B. A. Lins, Rossland	Amalgamation; jig; flotation	Gold, silver.
Bosun	New Denver	Slocan	C. J. Campbell, Vancouver		Silver, lead, zinc.
McAllister	New Denver	Slocan	G. Allen and I. G. Nelson, Nelson		Gold, silver.
Reco	Sandon	Slocan	Reco Mountain Base Metals Mines, Ltd., Nelson		Silver, lead, zinc.

TABLE XXI.—METALLIFEROUS MINES SHIPPING IN 1943—*Continued.*

Mine or Group.	Location of Mine.	Mining Division.	Owner or Agent.	Process.	Character of Ore.
Standard and Mammoth	Silverton	Slocan	Western Exploration Co., Ltd., Silverton	Table concentration; flotation	Silver, zinc, lead.
Victor	*Sandon*	Slocan	*Leased by E. Doney and Sons, Sandon*		Silver, lead, zinc.
Lucky Jim	Zincton	Slocan	Zincton Mines, Ltd., Vancouver	Flotation	Zinc.
Privateer	Zeballos	Alberni	Privateer Mine, Ltd., Vancouver	Amalgamation; cyanidation	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.
Twin "J"	*Mount Sicker*	*Victoria*	*The Twin "J" Mines, Ltd., Duncan*	*Flotation*	*Copper, gold, silver.*
Britannia	Britannia Beach	Vancouver	Britannia Mining & Smelting Co., Ltd., Britannia Beach	Flotation	Copper, gold, silver.

TABLE XXII.—Mining Companies employing an Average of Ten or more Men during 1943.

Shipping Mines.

Name of Mine or Company.	Days operating.		Tonnage.		Average Number of Men.	
	Mine.	Mill.	Mined.	Milled.	Mine.	Mill.
Silbak Premier Mines, Ltd.	312	312	93,003	93,003	144	16
Cariboo Gold Quartz Mining Co., Ltd.	365	365	35,822	38,249	163	10
Island Mountain Mines Co., Ltd.	310	365	22,635	22,635	54	8
Cons. M. & S. Co. (Pinchi Lake)	363	361	337,400	337,400	390	56
Bralorne (Takla Lake)	315	35	556	443	53	1
Cons. M. & S. Co. (Red Rose)	302	302	17,884	17,884	76	13
Highland Bell, Ltd.	305	....	2,249	2,249	33	....
Kelowna Exploration, Ltd. (Nickel Plate)	337	357	67,640	67,640	105	52
Hedley Mascot Gold Mines, Ltd.	324	263	47,669	47,848	66	23
Copper Mountain (Granby Cons. M.S. & P. Co., Ltd.)	318	363	1,365,000	1,363,346	417	200
Wartime Metals Corporation (Kootenay Florence)	214	185	13,410	....	65	4
Sullivan (Cons. M. & S. Co.)	311	349	2,503,214	2,500,714	1,086	321
Monarch and Kicking Horse (Base Metals)	365	365	61,969	61,770	67	13
Standard and Mammoth (Western Exploration Co., Ltd.)	365	365	....	....	78	29
Zincton Mines, Ltd. (Lucky Jim)	365	365	84,858	84,858	35	19
Gold Belt Mining Co., Ltd.	210	169	14,839	14,839	19	4
Sheep Creek Gold Mines, Ltd.	333	228	30,285	30,285	40	8
Wartime Metals Corporation (Emerald)	253	83	10,768	9,372	112	4
Privateer Mine, Ltd.	289	319	19,452	14,106	31	5
Twin "J" Mines, Ltd.	365	164	17,302	17,552	68	3
Bralorne Mines, Ltd.	365	365	125,357	118,462	168	17
Pioneer Gold Mines of B.C., Ltd.	365	365	30,245	26,435	86	6
Britannia Mining & Smelting Co., Ltd.	310	308	849,147	849,147	510	49

Non-shipping Mines.

Whitewater (Kootenay Belle Gold Mines, Ltd.)	299	.....	.....	.....	23	....
Industrial Metals Mining Co., Ltd. (Little Billie)	.....	.....	.....	.....	17	....

DEPARTMENTAL WORK.

ADMINISTRATIVE BRANCH.

The administrative branch is responsible for the administration of the mining laws of the Province regarding the acquisition of mineral rights. These include the "Mineral Act," the "Placer-mining Act," the "Allied Forces Exemption Act," and the "Free Miners' Exemption Act."

The work of the branch is performed by Gold Commissioners, Mining Recorders, and Sub-mining Recorders. The duties of these officials are laid down in the "Mineral Act" and the "Placer-mining Act." Mining Recorders, in addition to their own functions, may also exercise the powers conferred upon Gold Commissioners with regard to mineral claims within the mining division for which they have been appointed. Similar duties may be performed by Mining Recorders with regard to placer claims but not in respect to placer-mining leases. Recording of location and of work upon mineral claims, placer claims, and placer-mining leases as required by the various Acts must be made at the office of the Mining Recorder for the proper mining division. Information concerning claims and leases which are held and concerning the ownership and standing of claims and leases in any division may be obtained from the Mining Recorder for the mining division in which the property is situate. Sub-mining Recorders, who act as forwarding agents, are appointed at various places throughout the Province. They are authorized to accept documents and fees and forward them to the office of the Mining Recorder for the correct mining division. Officials and their offices in various parts of the Province are listed in the table on pages 48, 49, and 50.

Copies of the various Acts, upon payment of the prices listed on page 154, can be obtained from the office of the Chief Gold Commissioner, the King's Printer, Victoria, the Central Records Office in Vancouver, or from the offices of the Gold Commissioners throughout the Province.

Central Records Office.

Returns from all Mining Recorders are made to the Central Records Office, 305 Federal Building, Vancouver, semi-monthly. They include information as to the ownership of claims staked, placer-mining leases issued, certificates of work and bills of sale recorded, and leases of reverted Crown-granted mineral claims. The approximate positions of mineral claims and placer-mining leases from information supplied by the locators are shown on a series of reference maps. The information outlined so far as possible is brought up to date on receipt of the semi-monthly returns. The maps and records may be inspected by any one who calls at the office in business hours.

Joint Office of the British Columbia Department of Mines and of the Department of Mines and Resources, Canada.

The Provincial Department's Engineer, the Gold Commissioner and Mining Recorder for the Vancouver Mining Division, and the officers of the Dominion Geological Survey now occupy one suite of offices. All official information relating to mining is now available to the public in the one suite of offices at 305 Federal Building, Vancouver.

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

Amalgamation of Mining Divisions.

(Particulars of Mining Divisions amalgamated since 1939.)

Date.	Mining Divisions amalgamated.	New Name.	Mining Recorder's Office.
July 2, 1939	Yale and New Westminster	New Westminster	New Westminster.
Sept. 18, 1939	Bella Coola and Skeena	Skeena	Prince Rupert.
Nov. 20, 1939	Slocan City and Slocan	Slocan	New Denver.
Aug. 1, 1940	Queen Charlotte and Skeena	Skeena	Prince Rupert.
Aug. 5, 1940	Grand Forks and Greenwood	Greenwood	Greenwood.
Oct. 15, 1942	Arrow Lake and Slocan	Slocan	New Denver.
Oct. 15, 1942	Golden and Windermere	Golden	Golden.
Nov. 30, 1942	Nanaimo and Quatsino	Nanaimo	Nanaimo.
Dec. 1, 1942	Alberni and Clayoquot	Alberni	Alberni.

Publications.

Annual Reports of the Minister of Mines, bulletins, and other publications of the Department, with prices charged for them, are listed on page 137.

Publications may be obtained from the offices of the Department in Victoria and elsewhere in the Province. They are also available for reference use in the Department's library (Mineralogical Branch) at Victoria, in the joint office, 305 Federal Building, Vancouver, in the offices of the Inspectors of Mines in Nelson and Prince Rupert, as well as in public libraries listed on pages 139 and 140.

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
1942	229	8,068	29.00
1943	93	2,705	29.00
Totals	10,135	$293,448	———

This purchasing scheme was established during the depression years to give the individual miner the best possible price for his gold, and this was realized in that the total price paid has been almost exactly the same as the receipts from the Royal Canadian Mint.

List of Gold Commissioners, Mining Recorders, and Sub-mining Recorders in the Province.

Mining Division.	Location of Office.	Gold Commissioner.	Mining Recorder.	Sub-recorder.
Atlin	Atlin	G. H. Hallett	G. H. Hallett	
Sub-office	Telegraph Creek			A. E. Roddis.
Sub-office	Squaw Creek			Mrs. F. Muncaster.
Sub-office	Lower Post			J. W. Purdy.
Stikine	Telegraph Creek	A. E. Roddis	A. E. Roddis	
Sub-office	Burns Lake			John Brown.
Sub-office	Fort St. John			Mrs. M. B. McLeod.
Sub-office	Dease Lake Townsite			R. A. Farrell.
Sub-office	Lower Post			J. W. Purdy.
Skeena	Prince Rupert	N. A. Watt	N. A. Watt	J. C. Garrett.
Sub-office	Copper River			L. G. Skinner.
Sub-office	Terrace			T. C. Brunton.
Sub-office	Stewart			A. Fisher.
Sub-office	Rosswood			Oscar Olander.
Sub-office	Kimsquit via Ocean Falls			Percy Gadsden.
Sub-office	Ocean Falls			G. H. Hill.
Sub-office	Bella Coola			W. F. C. Trant.
Sub-office	Queen Charlotte			Dr. D. McColl.
Portland Canal	Stewart	N. A. Watt (at Prince Rupert)	A. Fisher	
Sub-office	Alice Arm			Mrs. M. V. Leake.
Omineca	Smithers	H. A. Bryant	H. A. Bryant	D. H. Bruce.
Sub-office	Bella Coola			W. F. C. Trant.
Sub-office	Finlay Forks			Mrs. M. McDougal.
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 via Ocean Falls			Percy Gadsden.
Sub-office	Fort St. John			Mrs. M. B. McLeod.
Sub-office	Terrace			T. C. Brunton.
Sub-office	Fort Fraser			Norman Earl LePoidevin.
Sub-office	Vanderhoof			Geo. Ogsdon.
Sub-office	Hazelton			W. B. Irving.
Sub-office	Burns Lake			John Brown.
Sub-office	Usk			J. L. Bethurem.
Sub-office	Takla Landing			Mrs. Wilhemina Aiken.
Sub-office	Doreen			W. E. Horwill.
Sub-office	Copper River			L. G. Skinner.
Peace River	Pouce Coupe	M. S. Morrell	M. S. Morrell	
Sub-office	Fort St. John			Mrs. M. B. McLeod.
Sub-office	Prince George			G. Milburn.
Sub-office	Finlay Forks			Mrs. M. McDougal.
Cariboo	Barkerville	W. E. McLean (Deputy)		
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	Miss J. Foster (Deputy)	Miss J. Foster (Deputy)	
Sub-office	Quesnel			E. C. Lunn.
Sub-office	Likely			H. W. Speed.
Sub-office	Barkerville			W. E. McLean.
Sub-office	Horsefly			A. B. Campbell.
Sub-office	Keithley Creek			A. H. Watkins.
Clinton	Clinton	R. J. A. Dorrell	R. J. A. Dorrell	
Sub-office	Williams Lake			Miss J. Foster.
Sub-office	Haylmore			W. Haylmore.
Kamloops	Kamloops	D. Dalgleish	D. Dalgleish	
Sub-office	Chu Chua			G. M. Fennell.
Sub-office	Vavenby			H. Finley.
Sub-office	Salmon Arm			A. P. Suckling.

List of Gold Commissioners, Mining Recorders, and Sub-mining Recorders in the Province—*Continued.*

Mining Division.	Location of Office.	Gold Commissioner.	Mining Recorder.	Sub-recorder.
Ashcroft	Ashcroft	D. Dalgleish (Kamloops)	W. F. Knowlton	
Sub-office	Lytton			J. Blakiston-Gray.
Nicola	Merritt	D. Dalgleish (Kamloops)	R. G. Couper	
Similkameen	Princeton	Chas. Nichols	Chas. Nichols	
Vernon	Vernon	E. F. Little	E. F. Little	
Sub-office	Kelowna			C. W. Dickson.
Greenwood	Greenwood	L. A. Dodd	L. A. Dodd	
Sub-office	Kettle Valley			G. B. Gane.
Sub-office	Beaverdell			Mrs. J. J. 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	Oliver			W. H. Laird.
Golden	Golden	A. W. Anderson	A. W. Anderson	C. J. Dainard.
Sub-office	Windermere			A. M. Chisholm.
Fort Steele	*Cranbrook*	*W. G. Taylor*	*W. G. Taylor*	
Sub-office	Fernie			K. D. McRae.
Ainsworth	Kaslo	C. MacDonald	W. M. H. Dunn	
Sub-office	Poplar			A. Robb.
Slocan	New Denver	C. MacDonald (Kaslo)	F. Broughton	
Sub-office	Slocan			W. E. Graham.
Sub-office	Nakusp			N. A. Herridge.
Nelson	Nelson	J. Cartmel	J. Cartmel	J. A. Stewart.
Sub-office	Creston			F. E. Nelson.
Sub-office	Salmo			M. C. Donaldson.
Revelstoke	Revelstoke	W. Maxwell	W. Maxwell	
Lardeau	Beaton	W. Maxwell (Revelstoke)	C. A. McElroy	
Trail Creek	Rossland	E. L. Hedley	E. L. Hedley	
Nanaimo	Nanaimo	W. H. Cochrane	W. H. Cochrane	
Sub-office	Alert Bay			W. H. Davidson.
Sub-office	Vananda			Henry Carter.
Sub-office	Granite Bay			H. J. Bull.
Sub-office	Cumberland			A. G. Freeze.
Sub-office	Zeballos			G. Nicholson.
Sub-office	Alberni			J. H. Byrne.
Sub-office	Quatsino			E. Evenson.
Alberni	Alberni	J. H. Byrne	J. H. Byrne	
Sub-office	Tofino			W. Armitage.
Sub-office	Zeballos			G. Nicholson.
Sub-office	Nanaimo			W. H. Cochrane.
Victoria	Victoria	P. J. Mulcahy	P. J. Mulcahy	Miss J. Broughton.
New Westminster	New Westminster	A. B. Gray	J. F. Macdonald	
Sub-office	Chilliwack			C. N. Tingle.
Sub-office	Lytton			J. Blakiston-Gray.
Sub-office	Hope			H. L. Norman.
Vancouver	Vancouver	J. Egdell (Deputy)	J. Egdell	Mrs. L. E. Christie.
Sub-office	Alert Bay			W. H. Davidson.
Sub-office	Powell River			J. P. Scarlett.
Lillooet	Lillooet	L. J. Price	L. J. Price	
Sub-office	Haylmore			W. Haylmore.

Gold Commissioners' and Mining Recorders' Office Statistics, 1943.

Districts and Divisions.	Free Miners' Certificates.				Lode-mining.					Placer-mining.				Revenue.		Total.
	Individual.	Company.	Special.	Provisional (Placer).	Mineral Claims recorded.	Certificates of Work.	Bills of Sale, etc.	Certificates of Improvements.	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	163	4	2	.....	24	48	1	.....	9	19	3	75	15	$1,073.25	$4,442.25	$5,515.50
Portland Canal	65	1	.....	.....	24	54	64	.....	.....	.....	.....	.....	.....	422.00	466.05	888.05
Skeena	165	.....	1	.....	39	32	85	.....	33	1	.....	.....	.....	737.77	1,421.00	2,158.77
Stikine	86	.....	.....	1	85	42	6	.....	5	.....	.....	15	22	392.75	2,130.05	2,522.80
Cariboo	188	11	1	1	114	127	3	23	10	13	5	93	10	1,762.00	6,627.00	8,389.00
Omineca	330	2	1	.....	442	1,196	37	8	9	3	5	30	6	1,799.75	6,334.50	8,134.25
Peace River	69	.....	.....	.....	11	.....	.....	.....	.....	.....	.....	.....	.....	294.25	47.75	342.00
Quesnel	115	7	.....	7	29	71	1	.....	.....	11	9	49	14	938.75	3,154.62	4,093.37
Kamloops	128	1	3	17	85	153	13	1	5	9	.....	1	2	702.50	1,338.25	2,040.75
Nicola	16	.....	.....	.....	12	86	12	4	.....	.....	.....	.....	.....	63.25	391.85	455.10
Vernon	98	1	1	8	40	13	3	.....	.....	3	.....	4	3	534.00	722.50	1,256.50
Greenwood	95	1	1	.....	32	89	9	.....	2	1	.....	4	.....	550.75	711.50	1,262.25
Osoyoos	68	1	1	3	61	68	42	6	.....	.....	.....	.....	.....	433.75	444.50	878.25
Similkameen	108	1	1	3	27	31	30	.....	.....	2	1	20	30	614.50	609.25	1,223.75
Ainsworth	67	3	1	1	36	86	8	2	10	1	.....	.....	.....	613.75	1,163.00	1,776.75
Fort Steele	117	1	.....	9	19	41	13	.....	.....	.....	.....	8	.....	585.25	1,681.00	2,266.25
Lardeau	22	.....	.....	1	103	59	10	.....	.....	.....	.....	.....	.....	110.75	544.75	655.50
Nelson	245	10	1	11	125	348	25	1	6	.....	.....	.....	.....	2,045.75	1,788.25	3,834.00
Revelstoke	50	.....	.....	.....	44	65	8	.....	1	1	.....	6	18	199.00	1,349.50	1,548.50
Slocan	59	1	.....	.....	20	62	.....	.....	.....	.....	.....	5	.....	359.50	302.25	661.75
Trail Creek	118	2	3	1	56	26	12	1	3	.....	.....	.....	.....	760.50	322.00	1,082.50
Golden	51	3	.....	2	16	112	4	.....	.....	.....	.....	1	.....	437.25	574.25	1,011.50
Alberni	126	5	3	.....	94	144	25	12	121	.....	.....	1	1	1,186.25	1,359.25	2,545.50
Ashcroft	37	.....	.....	.....	43	38	20	.....	.....	1	.....	.....	2	182.75	433.50	616.25
Clinton	18	.....	.....	1	21	54	1	1	40	3	.....	1	9	88.00	429.25	517.25
Lillooet	169	7	.....	5	166	348	40	49	1	1	.....	11	.....	1,382.25	2,451.25	3,833.50
Nanaimo	83	.....	.....	1	38	77	9	89	.....	.....	.....	.....	.....	.....	.....	.....
New Westminster	116	1	1	20	112	87	5	1	4	3	4	1	.....	753.00	1,787.75	2,540.75
Vancouver	746	58	9	33	75	70	66	1	5	.....	.....	.....	1	8,050.25	1,556.68	9,606.93
Victoria	192	6	3	13	36	3	3	.....	5	.....	.....	.....	2	1,312.00	1,313.93	2,625.93
Totals	3,910	127	33	138	2,029	3,629	555	199	269	72	27	325	135	$28,385.52	$45,897.68	$74,283.20

CHEMICAL LABORATORIES AND SAMPLING PLANT.

The Department has its principal laboratory at Victoria, and also has a sampling plant and an assay office at Prince Rupert. The Victoria laboratory now has six analysts and technicians, as well as the Chief Analyst and Assayer, on its staff. The Assayer at Prince Rupert is also in charge of the sampling plant.

During the year 1943 the Department of Mines chemical laboratory in Victoria issued reports on 1,657 samples and specimens. A laboratory examination of a sample consists now of one or more of the following: (1) A mineralogical determination of visible minerals in the sample and a classification of the type of rock; (2) a spectrographic analysis to determine if any base metals are present in interesting percentages; (3) assays for precious metals, and base metals shown to be present in interesting percentages by the spectrographic analysis. The reports were distributed in the following manner amongst *bona-fide* prospectors, *bona-fide* prospectors who are grantees under the "War-time Prospectors' Grub-stake Act," Departmental Engineers, and the Provincial Government Sampling Plant at Prince Rupert:—

	Samples.	Mineralogical Determinations.	Spectrographic Analyses.	Assays.
Bona-fide prospectors	585	393	393	496
Bona-fide prospectors (grantees)	773	581	570	556
Departmental Engineers	252	8	48	368
Sampling plant	37	33	19	74
Totals	1,647	1,015	1,030	1,494

It is noteworthy that 602 more spectrographic analyses were made during 1943 than during 1942, while the number of assays performed has dropped by 1,539. This decrease in the number of assays performed is due chiefly to spectrographic analyses having shown that metals are absent in worth-while percentages from those particular samples, thus making the costlier and more time-consuming assays unnecessary. Proximate analyses and B.T.U. determinations were made on thirty coal samples. Of these, eleven were for the Department of Mines and nineteen were for the Department of Public Works.

For the Attorney-General's Department fifteen examinations of a chemico-legal nature were undertaken. Of these, six were toxicological examinations of pathological specimens and four were determinations for percentages of grain alcohol in liquids. The remainder involved examinations of a variety of materials, including comparisons of cloth and head-lamp glass in a hit-and-run accident.

Fourteen complete analyses of soils and other raw materials for the Department of Agriculture, four analyses for mineral contents of water for the Liquor Control Board, and one analysis for the Provincial Board of Health completed the analytical work of the laboratory for the year.

During the year placer gold amounting to 83.61 oz., representing purchases from individual placer-miners, was received from Gold Commissioners.

Provincial Government examinations for certificates of competency and licence to practise assaying in British Columbia were held in May and December. Fourteen candidates sat for the May examination, of whom seven passed and were granted licences to practise in this Province; three were granted supplemental examinations. Five candidates sat for the December examination, two of whom had been amongst those granted supplementals in the May examination. These latter two now passed the examination and were granted licences to practise assaying in this Province; the other three failed.

Prince Rupert Sampling Plant and Assay Office.*

During 1943, shipments to the sampling plant showed a further decrease from the figures of 1942. This was no doubt due to war conditions which have resulted in a decrease in the number of prospectors and small operators, many of whom are now with the armed forces or engaged in some one of the industrial operations connected with Canada's war effort.

Of the twenty lots handled through the sampling plant, seventeen consisted of small samples for assay purposes only. A number of these were sent in to Victoria for spectrographic analysis and the results served to guide the shippers in their search for the strategic minerals.

One shipment—namely, Lot 677T—was of particular interest. It consisted of 1,797 lb. of wolframite ore received from Norman Fisher and Ole Olsen, lessees of the Wolframite Group, Boulder Creek, in the Atlin area. This ore was sampled at the sampling plant and found to contain 15.20 per cent. tungsten. It was then shipped to the Dominion Government ore-testing laboratories in Ottawa, where it was concentrated and the concentrates, containing some 244 lb. of tungstic oxide, were subsequently sold to the Metals Controller. In spite of the heavy freight charges in shipping this ore from Boulder Creek to Prince Rupert and thence to Ottawa, a substantial net return was made to the shippers.

In addition to the samples shown on the accompanying sampling plant record, a number of hand samples were received for examination and were forwarded to Victoria for assay or spectrographic analysis.

A completely equipped assay laboratory, to be operated in conjunction with the sampling plant, has been installed at Prince Rupert and was ready for use in December, 1943. Prospectors can now send samples to this laboratory for specified assays, saving the time required for shipment to Victoria. Obtaining assay results more quickly will also benefit operators who ship small lots of ore to the sampling plant, as it will be possible to make full payment for a lot of ore a few days after it is received.

From the time the sampling plant first commenced operations in August, 1937, until December 31st, 1943, a total of 746 lots have been handled through the plant. The sum of $50,101.80 has been paid out to shippers. During this same period, thirty-nine consolidated shipments have been made to the smelters, for which the sum of $49,673.48 has been received. To this must be added the sum of $524.53, representing the value of ore on hand, and making a total of $50,198.01. The small difference in these two figures serves to indicate the high degree of accuracy attained by the methods of sampling in use at the plant.

The following is a synopsis of the operating details of the plant for the year 1943, from January 1st to December 31st:—

Class of Shipments.	No. of Shipments.	No. of Different Properties.	Weight of Shipments.
			Dry Tons.
Tonnage lots	1	1	0.6820
Bulk test lots	2	2	0.9600
Assay lots	17	12	0.0240
Totals	20	15	1.6660

* Letters, tonnage lots, or samples should be addressed to: The Manager, Department of Mines Assay Office and Sampling Plant, Prince Rupert, B.C.

SHIPMENTS FROM SAMPLING PLANT TO SMELTERS.

Number of shipments to smelters (Lot 677T, 39 OSP/PR)	1
Dry tons paid for by smelters	0.8985
Received from smelters	$252.21
Estimated smelter value of ore on hand at plant	$524.53
Amount paid out by plant on Ore Purchasing Account	$782.26

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	WO_3	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.	Per Cent.
696	Golden Eagle	Heenan, David	Topley	0.6820	0.08	139.6	0.7	10.0	8.8	0.1	0.8	.....	9.2	.....	.....	

Test Lots.

677-T	Wolframite Group	Fisher, Norman S.	Boulder Creek	0.8985	0.31	.....	0.02	0.1	.....	*Nil*	*Nil*	.....	0.13	.....	15.20	Bi, 0.10 P, 0.01 Sn, 0.18
695-T	Black Bull	Hagen, W.	Copper River	0.0615	2.92	5.6	.....	.....	.....	.....	.....	.....	.....	33.7	.....	MoS_2, *nil*

Assay Lots.

678-X	.....	Peterson, A. B.	Remo	0.0160	0.04	0.76	.....	.....	.....	.....	.....	.....	11.0	34.5	.....	
679-X	Houri Group	Creagh, John	Usk	0.0020	0.03	7.28	26.7	.....	.....	.....	.....	.....	.....	.....	.....	
680-X	.....	Graham, C.	Fitzhugh Sound	0.0020	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.47	
681-X	.....	McNett, C.	Alice Arm	0.0020	0.03	0.07	0.6	.....	.....	.....	.....	.....	.....	.....	*Nil*	
682-X	Molly B.	Haahti, John	Stewart	0.0020	0.03	0.07	0.6	.....	.....	.....	.....	.....	.....	.....	1.06	MoS_2, 0.10
683-X	.....	Martin, Frank J.	South Hazelton	0.0020	0.01	.....	.....	.....	.....	.....	.....	.....	.....	.....	*Nil*	
684-X	Latta Mine	Teed, Ben G.	Fort Fraser	0.0020	Trace	*Nil*	Trace	Trace	0.2	.....	.....	.....	.....	.....	.....	
685-X	Hallett Mine	Teed, Ben G.	Fort Fraser	0.0020	*Nil*	*Nil*	Trace	Trace	0.1	.....	.....	.....	.....	.....	.....	
686-X	.....	Amer, G. V.	Terrace	0.0020	Trace	*Nil*	.....	.....	.....	.....	.....	.....	.....	.....	.....	
687-X	Hot Bed M.C.	Creagh, John	Usk	0.0020	0.01	4.4	7.8	32.6	3.5	.....	.....	.....	.....	.....	.....	
688-X	Hot Bed M.C.	Creagh, John	Usk	0.0020	0.02	4.4	6.2	7.4	1.3	.....	.....	.....	.....	.....	.....	
689-X	Golden Gate	Richardson, E. S.	Copper Island	0.0020	Trace	0.4	2.4	.....	.....	.....	.....	.....	.....	.....	.....	
690-X	Golden Gate	Richardson, E. S.	Copper Island	0.0020	0.05	1.48	13.8	.....	.....	.....	.....	.....	.....	.....	.....	
691-X	.....	McLeod, J. N.	Doreen	0.0020	Spectrographic analysis. No values.					.....	.....	.....	.....	.....		
692-X	.....	McLeod, J. N.	Doreen	0.0020	Spectrographic analysis. No values.					.....	.....	.....	.....	.....		
693-X	.....	Thompson, E. W.	Muskwa	0.0020	Spectrographic analysis. No values.					.....	.....	.....	.....	.....		
694-X	.....	Sam, Mathew	Topley	0.0020	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Mn, trace

INSPECTION BRANCH.

The full reports of the Chief Inspector and of the Inspectors of Mines, dealing with the coal-mining industry, inspection of coal mines, and inspection of metalliferous mines, begin on page 88. The information in the Progress Notes regarding metalliferous, industrial mineral, etc., deposits is largely supplied by the Inspection Branch.

MINERALOGICAL BRANCH.

P. B. Freeland retired as Chief Mining Engineer and was succeeded by Hartley Sargent on April 1st, 1943. Mr. Freeland was one of the original Resident Engineers and the only one in the Service at the time of his retirement. He joined the Department in 1917 as Resident Engineer of No. 4 District. In 1935 he was moved to Victoria and in 1937 became the first Chief Mining Engineer of the Department.

Joseph T. Mandy was transferred from Prince Rupert to the Vancouver office of the Department.

B. T. O'Grady, who had been attached to the Headquarters, Pacific Command, as Field Supervisor, Northern British Columbia Coast, organizing the Pacific Coast Militia Rangers, returned to the service of the Department in April, and was occupied assisting the Superintendent of Brokers in administering the "Securities Act," and in connection with the grub-stake programme and with mining road and trail appropriations.

M. S. Hedley examined strategic mineral prospects and deposits in the Southern Interior and studied silver-lead-zinc deposits in the Slocan and Ainsworth Mining Divisions.

J. S. Stevenson, with one assistant, continued studies of the Mount Sicker (copper, zinc, gold) deposit; investigated the geological suitability of sites which have been suggested for dams in the studies of the possibility of developing Taseko, Chilko, and Tatlayoko Lakes for hydro-electric power; examined strategic mineral prospects and deposits in the Lillooet, Cariboo, and Omineca Mining Divisions; and began studies of copper-gold deposits on Texada Island.

S. S. Holland, with a party of four, made reconnaissance studies in parts of the area tributary to the Alaska Highway between Fort St. John and Fort Nelson, and examined some strategic mineral prospects in Central British Columbia.

K. DeP. Watson and W. H. Mathews, with a party of four, mapped geologically an area lying between the northern part of Dease Lake and the southern part of Teslin Lake.

J. M. Cummings was occupied chiefly in research on problems relating to the milling of strategic mineral ores and of industrial minerals.

Museums.

The Department has a large exhibit of ores and minerals in the museum on Superior Street, Victoria; smaller collections are displayed in the joint office, 305 Federal Building, Vancouver, and in the offices of the Inspectors of Mines in Nelson and Prince Rupert.

Prospectors' Sets.

On request, collections, each consisting of about fifty specimens, including rocks and minerals, are supplied to those actively prospecting and to schools teaching subjects relating to mining or prospecting. Because it is difficult to obtain the material for these sets, only requests from prospectors and schools in British Columbia can be considered. A charge of 50 cents is made for each set; the price should be remitted with a request addressed to the Chief Mining Engineer.

Grub-staking Prospectors.

Prospecting, for many years not as active as it should have been, has fallen off during the past few years to such an extent that this year (1943) the Department undertook to grub-stake a number of prospectors to keep prospecting alive. The Department's grub-stake policy was not designed as a means of providing a remunerative livelihood, but simply to help the prospector through a difficult period. It was hoped that some returned men would be available for training under one of the Dominion rehabilitation schemes and that some of the grub-stake funds would be used to start these men in the field. To date, however, men, discharged from the Army, physically fit to work, have largely been absorbed by war industries.

The "War-time Prospectors' Grub-stake Act," passed at the 1943 session of the Legislature, authorized the provision of grub-stakes as a means of assisting prospectors in the search for strategic minerals required in the prosecution of the war. As requirements of certain minerals, then in critical demand, have since been met, future efforts will be directed principally towards the search for minerals of general importance to the National economy and its post-war needs. Amendments made to the 1943 Act by the Legislature in March, 1944, include the striking out of the term "war-time" as well as the definition of "war minerals."

Grub-stakes were limited under the 1943 Act to $300 per man, $25,000 being provided therefor by the Legislature. For the 1944 season the sum of $50,000 has been appropriated. In addition to the grant of up to $300 per man, the amended Act provides for travelling expenses, to a maximum of $200 per man, if required.

During the 1943 season grub-stakes were allocated for prospecting in likely areas throughout the Province. Applicants were interviewed by representatives of the Department and were tested on their ability to identify ordinary minerals and rocks. Of those who qualified, the best applicants in or nearest to a prospecting area were given the grub-stakes. They undertook to search for all economic minerals but to pay special attention to certain "war minerals" likely to be found in their area. They were supplied with maps, including geological maps where available; with copies of "Prospectors' Guide for Strategic Minerals in Canada," published by the Mines and Geology Branch, Department of Mines and Resources, Ottawa; and with "Notes on War Minerals," a pamphlet prepared by the Department at Victoria for the use of prospectors in British Columbia. Mineralight M-12 lamps, complete with batteries and instructions, were supplied to those men searching for scheelite. The Department planned to provide supervision and assistance in the field, but was unable to obtain the assistance required. Officers of the Mineralogical and Inspection Branches assisted whenever it was possible to do so, the Inspectors of Mines at Prince Rupert, Lillooet, Princeton, and Nelson devoting much time to the grub-staked prospectors.

In the 1944 season it is anticipated that two officers of the Mineralogical Branch will devote their time to the supervision and assistance of prospectors in the field, in addition to part-time co-operation by Inspectors and other officers. Plans also include the establishment of camps, if necessary, where suitable men can be trained in prospecting and hand-mining.

During 1943 ninety prospectors received grub-stakes of amounts varying with individual requirements up to the maximum of $300. Seven hundred and sixty samples were received from them and tested at the Department Assay Office at Victoria. The samples were examined by an engineer, most of them were given spectrographic analysis, and assays were made in all cases where economic values were indicated.

The results of the season's work indicated that scheelite occurrences are even more widespread throughout the Province than was indicated by prospecting in 1942. Appreciable percentages of scheelite were present in samples from fourteen different localities. Towards the end of the season the mines in production were shut down, making it

apparent that tungsten ore was no longer in critical demand. This fact, of which no previous information had been received by the Department, caused a good deal of disappointment amongst prospectors.

Samples from twelve localities contained vanadium in percentages up to 1 per cent. Other samples contained mercury, manganese, chromium, molybdenum, fluorspar, and some appreciable percentages of zinc, copper, and lead. A coal-seam was also reported to have been discovered. Nickel, found in pannings from Wheaton (Boulder) and Ferry Creeks, tributaries of Turnagain River, can be attributed to the mineral awaruite, which was recognized by Holland* in 1939 in concentrates from Wheaton Creek and in the pannings from crushed serpentine of that locality.

Whether or not any of the discoveries are worth while will not be known until more information is obtained concerning them. In the meantime it can be said that operating companies have exhibited sufficient interest to take under lease and bond two properties containing discoveries made by grub-staked prospectors.

* Bulletin No. 2, British Columbia Department of Mines, 1940, page 31.

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 many excellent reports and maps covering British Columbia, issued by the Geological Survey of Canada, a vast amount of information has been made available to prospectors and mining engineers.

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 1942 the Bureau of Geology and Topography had the following officers employed on field-work in British Columbia:—

Geological Parties.

A. F. Buckham: Detailed investigations of the coal deposits and coal-bearing rocks of the Comox-Nanaimo area, Vancouver Island.

W. E. Cockfield: Nicola area. Longitude, 120° 00′–121° 00′; latitude, 50° 00′–51° 00′. Examination of tungsten deposits in South-western British Columbia.

H. M. A. Rice: Ainsworth mining camp, Kootenay Lake; detailed study and mapping.

J. E. Armstrong: Takla area. Longitude, 125° 00′–126° 00′; latitude, 55° 00′–56° 00′. Detailed examination of northern part of Pinchi Lake mercury belt.

E. D. Kindle: Geological reconnaissance along Fort Nelson, Liard, and Beaver Rivers, British Columbia and Yukon.

M. Y. Williams: Geological reconnaissance along Alaska Highway, Fort Nelson, British Columbia, to Watson Lake, Yukon.

C. S. Lord: Geological reconnaissance along Alaska Highway, Teslin River to Liard River, near Watson Lake, Yukon and Northern British Columbia.

C. O. Hage: Geological reconnaissance along Alaska Highway, from Dawson Creek to Fort Nelson.

F. H. McLearn and E. J. W. Irish: Detailed examination of coal deposits in Peace River foothills, west of Hudson Hope.

J. Spivak: Detailed examination of the Hasler Creek-Pine River coal belt in and adjoining the south half of Mount Hulcross area (longitude, 122° 00′–122° 15′; latitude, 55° 30′–55° 45′).

PROGRESS NOTES.

The Progress Notes on metal-mining, quarrying, etc., are compiled from information supplied by the Inspectors of Mines and the Bureau of Economics and Statistics, through the courtesy of the property-owners. The Registrar of Companies and Superintendent of Brokers have also supplied information through their respective offices.

The Notes are grouped in types of mineral deposits (Lode Gold, Limestone, etc.) in named areas. The numbers in parentheses following the name of a property refer to the latitude and longitude of the south-eastern corner of the one-degree quadrilateral in which the property is situated and the letters refer to the particular quarter of the quadrilateral.

LODE-GOLD DEPOSITS.

PORTLAND CANAL AREA.

SALMON RIVER.

Silbak Premier Mines, Ltd. (56° 130° S.E.) B. F. Smith, General 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 1943 only 1,196 feet of development-work and 3,219 feet of diamond-drilling were done. This is a considerable reduction from previous years and is due to shortage of miners. The mine was worked for 312 days and produced 93,003 tons of ore. This yielded 22,157 oz. of gold, 335,600 oz. of silver, and some copper and lead.

Operations have been confined to the area along the *Premier Border* boundary between the 4th and 6th levels. These workings also extend into the *Premier Border* on the 5th and 6th levels.

The labour shortage has severely handicapped operations. Only 160 men, on an average, were employed.

CARIBOO AREA.

WELLS.

Cariboo Gold Quartz Mining Co., Ltd. (53° 121° S.W.) Capital: 2,000,000 shares, $1 par; issued, 1,333,309. This company operates the Cariboo Gold Quartz mine on the south-east side of Jack of Clubs Lake at Wells. Much of the mining at this operation is done on small veins in or near fault zones. Close timbering is required and there is little opportunity to build up large reserves of broken ore. The daily production from the majority of the stopes is small and it is necessary to work a large number of stopes. Hence when the crew dropped to about 20 per cent. of normal strength the situation was serious. The underground crew decreased from 147 in January to sixty in September, but, after that, men who had been placer-mining during the summer returned to work and improved the situation. The average number of men employed underground during 1943 was ninety-four, and the average in all operations was 173.

Development-work was restricted to 46 feet of crosscutting and 343 feet of raising, and was all done for ventilation. A connection made between the lower workings of the *No. 1* zone and the lower workings of the *Rainbow* zone improved conditions in both sections.

The tonnage mined and milled in 1943 totalled 38,249. This yielded 16,195 oz. of gold and 1,328 oz. of silver. The ore came from an average of twenty-seven working-

places in all parts of the mine, except the *Butts* and *B.C. Vein* zones. The tonnages for 1942 and 1941 were 93,885 and 129,256 respectively.

No surface improvements or additions to the plant were made during 1943.

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

Island Mountain Mines Co., Ltd.

(53° 121° S.W.) Capital: 1,100,000 shares, 50 cents par; issued, 1,050,716. This company operates the *Island Mountain* mine on the north-east side of Jack of Clubs Lake at Wells. During 1943 the company lost the services of G. Sinclair, mine superintendent, who was killed in a mine accident. C. Caldwell, an experienced operator from Eastern Canada, was chosen to fill the position.

The operation was seriously affected by the man-power shortage which prevailed during 1943. The average number of employees was sixty-two as against 123 in 1942 and 146 in 1941. Only about half of the crew was employed underground and it was there that the shortage was most acutely felt. Changes were made in the mining practice, which increased the tonnage produced per man-shift, and towards the end of the year a few men returned from placer operations. Only 284 feet of drifts and crosscuts and 145 feet of raises were driven. This work was all incidental to the stoping operations and was scattered through all the levels from the 3,250 up. The figures quoted for development-work represent about 5 per cent. of the development-work done when the mine was operating under normal conditions. The diamond-drilling footage was curtailed to 4,177 feet, or about 10 per cent. of the normal figure. Ore mined and milled totalled 22,635 tons for an average of 62 tons per day. This yielded 10,202 oz. of gold and 1,577 oz. of silver.

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

BRIDGE RIVER AREA.

Pioneer Gold Mines of B.C., Ltd.

(50° 122° N.W.) Capital: 2,500,000 shares, $1 par; issued, 1,751,750. This company operates the *Pioneer* mine on Cadwallader Creek, a tributary of Bridge River, 52 miles by road from the Bridge River Station on the Pacific Great Eastern Railway.

On January 1st, 1943, the number of men on the pay-roll was 120, and of these, sixty were employed underground. On January 1st, 1944, the respective figures were eighty-eight and thirty-four. In normal times these numbers were in the vicinity of 300 and 200. The small underground crew was barely sufficient to keep the mine in condition and much retimbering will have to be done before all the broken ore reserves can be removed. Also, the No. 3 shaft head-frame will have to be replaced with a new structure.

Development-work consisted of 376 feet of drifting and 147 feet of raising, on the "27" vein, up from the 21st level horizon, and diamond-drilling totalled 7,972 feet. The ore milled, 26,435 tons, yielded 11,261 oz. of gold and 2,022 oz. of silver. Not more than 40 tons daily was hoisted during the latter part of the year.

As in the previous year, Mr. McKenzie, the master mechanic, made several new and ingenious devices to prolong the life of equipment that cannot be replaced very easily at the present time.

Bralorne Mines, Ltd.

(50° 122° N.W.) Capital: 1,250,000 shares, no par value; issued, 1,247,000. This company operates the Bralorne mine, situated on Cadwallader Creek, about 50 miles by road from Shalalth, a station on the Pacific Great Eastern Railway.

In 1943, a year when the output of all gold mines was seriously curtailed by the labour shortage, this operation established an enviable record for ability to maintain production and to hold employees not compelled to move elsewhere. With an average underground crew of 126 men, the monthly production for the year averaged 9,872

tons as against 14,258 tons in 1942 when the crew averaged 211 men. Favourable development-work in veins resulted in the delivery of a much better than average grade of ore to the mill, which compensated in some measure for the smaller tonnage milled.

The development-work was all done in the *Crown* and *Empire* mines, and consisted of 5,616 feet of drifting and crosscutting, 769 feet of raising, and 4,193 feet of diamond-drilling. These totals are less than the 1942 figures and considerably below the 1941 figures. Drifting on the " 77 " vein on the 16th, 17th, 18th, and 19th levels, and foot-wall of the 20th level, opened up some excellent ore-bodies, especially on the 16th and 17th levels. Work on the " 53 " vein also opened up a good ore-shoot. Drifting was also done on the " 51 " vein to make a connection between the *Crown* and *Empire* shafts on the 16th level. Two other veins, the " 79 " and " 81," were opened up during the latter two months of the year.

New guides were installed in the Crown shaft from top to bottom. A total of 1,848 feet of two-compartment shaft was reguided and the two 6-foot diameter sheaves in the head-frame were also replaced.

Surface work was kept to a minimum throughout the year and no new buildings were erected. The old Bradian compressor building was moved down to the present Bradian camp portal level to serve as a blacksmith and tinsmith shop. Maintenance-work was required on the 36-inch water-line supplying the compressor-house. This line has been in operation for fifteen years and many of the trestles required replacing.

At the beginning of the year the scheelite plant treated small tonnages of ore from the Bralorne mine and from the *Tungsten King* and *Tungsten Queen* operations. Recoveries of 75 per cent. were made on the low-grade ores and recoveries up to 89 per cent. were made on the better grade ores. The concentrates obtained assayed 72 per cent. WO_3. Good metallurgical results were obtained in the treatment of low-grade scheelite concentrates for the removal of sulphur. The plant was operated again in June and in September and small shipments of scheelite concentrates were made. In the main mill, a new high of 97.7 per cent. gold recovery was obtained during the early part of the year. A total of 118,462 tons of ore was milled in 1943. This yielded 73,817 oz. of gold and 19,225 oz. of silver.

KAMLOOPS AREA.

Homestake Mine, Allied Mining and Development Co., Ltd.

(51° 119° S.W.) Mine office, Kamloops, B.C.; E. H. Kellner, Managing Director; T. 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 of Kamloops.

Work was discontinued during December, 1941, and was not resumed during 1943, except for a small amount of repair-work. The expected reopening of this mine for the production of barite, zinc, and silver did not materialize. A watchman and superintendent were employed on surface repairs.

STUMP LAKE AREA.

Consolidated Nicola Goldfields, Ltd.

(50° 120° S.E.) Capital: 6,500,000 shares, $1 par; issued, 4,537,628. This mine is situated at Stump Lake, 2 miles west of the Kamloops–Merritt Highway and 30 miles from Merritt. Mining operations were suspended on December 9th, 1942, and were not resumed during 1943. An engineer and caretaker remain at the property to take charge of the place and to do the necessary pumping of water from the mine.

SIMILKAMEEN RIVER AREA.

HEDLEY.

Hedley Mascot Gold Mines, Ltd. (49° 120° S.E.) Company office, 908 Royal Bank Building, Vancouver, B.C.; mine office, Hedley, B.C.; B. S. Brown, 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 Hedley Creek and the camp is on the side of Nickel Plate Mountain. 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 ore-skips have a capacity of 2 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 was completed and put into service during 1941. Four intermediate levels are opened off this raise.

The workings of this mine are connected to the workings of the adjacent *Nickel Plate* mine at several points underground; these connections are open, thus permitting of a joint ventilation system. During months when natural ventilation is found to be inadequate a 4-foot diameter Jeffrey propeller-type fan in the 4,800-foot level is used to assist the natural air-current.

Development consisted of 1,252 feet of drifting and crosscutting, 878 feet of raising, and 9,319 feet of diamond-drilling. Four new chutes were built. Preparations were made for the opening of a new tunnel to be started 500 feet lower than the 4,300 level. Underground development during the year was restricted owing to the shortage of labour and no plant additions were made. Also because of the shortage of labour, the mill was closed in September and remained closed at the end of 1943, but it was expected that milling would be resumed early in the new year. Mill employees were found work at the mine and further underground work was devoted to breaking ore and development.

A total of 47,848 tons of ore was produced during 1943, yielding 13,122 oz. of gold, 2,736 oz. of silver, and a quantity of copper and arsenic. At the end of the year sixty men were employed.

Nickel Plate Mine, Kelowna Exploration Co., Ltd. (49° 120° S.E.) Company office, 75 West Street, New York, N.Y.; mine office, Hedley, B.C.; W. A. Kissam, Chairman; T. Tyng, President; J. W. Mercer, Treasurer; R. Emmel, Secretary; W. C. Douglass, General Manager; F. A. McGonigle, Mine Manager; C. B. Hume, Mine Superintendent; Floyd Turner, Mine Foreman.

This is a private company operating the *Nickel Plate* mine at Hedley. The mill, machine-shops, and general offices are at Hedley. The mine is at an elevation of 5,600 feet and approximately 4,000 feet above and 4 miles north of the town. The transportation system up the side of the Nickel Plate 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 each. The portal of the mine is 1½ miles north of the top of the upper terminal; an electric trolley system hauls the ore from the mine to this terminal.

The *Nickel Plate* mine is connected underground at several points with the *Hedley Mascot* mine, and as the upper outlets of the *Nickel Plate* mine are at a higher elevation than the *Mascot* mine a high motive column is provided for natural ventilation.

Development during the year consisted of 1,364 feet of drifting, crosscutting, and raising; 73 feet of sinking, and 6,410 feet of diamond-drilling. The most important underground development during the year was the completing of the *Morning* incline.

The shaft was commenced in 1941 and was completed during February this year. The shaft is sunk on an angle of 50 degrees and is down 1,000 feet; it is 8 by 16 feet in size, consisting of a double track for haulage and a manway compartment. Four levels have been turned off from the shaft and the stations are established at the following elevations above sea-level: 4,600 feet, 4,450 feet, 4,300 feet, and 4,150 feet. Two of these stations were completed during 1943. Owing to shortage of labour it was necessary to curtail development drastically.

A notable feature during 1943 was the recovery of 16,966 tons of slime from the slime-pond, which was taken to the mill for retreatment. A total of 67,640 tons of mined ore and slime was put through the mill. This yielded 23,344 oz. of gold, 2,405 oz. of silver, and a quantity of copper and arsenic. At the end of 1943 eighty men were employed underground, eighty-five on the surface, and seventeen on the staff.

CAMP McKINNEY AREA.

Cariboo-Amelia. (49° 119° S.E.) This property, situated at Camp McKinney, was operated under lease by two groups of leasers, the first consisting of E. Wanke and O. Johnson, of Greenwood, and the second of H. Fritz and F. Fritz, of Midway. Both groups have installed small portable gasoline-driven mining plants. Ore was recovered from stope remnants and surface pillars above the old water-level. Ore mined and shipped to Trail, amounting to 736 tons, yielded 388 oz. of gold, 628 oz. of silver, 7,219 lb. of lead, and 5,381 lb. of zinc.

[Reference: Bulletin No. 6, 1940.]

GREENWOOD-GRAND FORKS AREA.

JEWEL LAKE.

Dentonia Mine. (49° 118° S.W.) This property was leased by W. E. McArthur, of Greenwood. As electrical power was not available a small gasoline-operated mining plant was installed. Development-work included 50 feet of drifting and 2,000 feet of diamond-drilling. The old *Jewel* shaft was partially unwatered to do some of this work. Four men were employed. A total of 434 tons of siliceous ore was mined and shipped to Trail. This yielded 100 oz. of gold and 675 oz. of silver. Late in 1943 the lease was given up.

GRAND FORKS.

Humming Bird. (49° 118° S.E.) This property is about 12 miles north of Grand Forks. It is owned and operated by C. A. Anderson, of Grand Forks. It is equipped with a small complete gasoline-driven mining plant. A total of 62 tons of ore was mined and shipped to Trail. This yielded 13 oz. of gold and 85 oz. of silver.

ROSSLAND AREA.

MOUNT ROBERTS.

Midnight. (49° 117° S.W.) This property, on Mount Roberts, is owned and operated by B. A. Lins and associates, of Rossland. It is equipped with a small complete mining plant. Four men were employed. A total of 177 tons was mined and shipped to Trail.

I.X.L. (49° 117° S.W.) This property adjoins the *Midnight*. It is equipped with a small mining plant. It was operated continuously throughout 1943 by C. Jorgensen and associates, of Rossland, under lease. Two men were engaged in this work. Ore amounting to 50 tons was mined and shipped to Trail, and this yielded 119 oz. of gold and 56 oz. of silver.

NELSON AREA.

Toad Mountain.

California. (49° 117° S.E.) This property, on Toad Mountain, is owned by M. Wilson, of Trail. It was operated under lease by L. J. Gormley and N. Sodolosky, of Nelson, until the middle of the year. A small portable gasoline-driven compressor was used. A total of 41 tons of ore was mined and shipped to Trail.

Eagle Creek.

Granite Poorman, Livingstone Mining Co. (49° 117° S.E.) Company office, 521 Central Building, Seattle, Washington; H. R. Smith, Blewett, B.C., President and Manager. Capital: 10,000 shares, no par value; issued, 7,915. This company owns and operates the *Granite Poorman* on Eagle Creek, near Blewett. The property is equipped with a complete mining plant and mill, but the latter was not operated during 1943. Very little development-work was done as only two men on the average were employed. A total of 238 tons was mined and shipped to Trail. This yielded 155 oz. of gold and 228 oz. of silver.

Venango. (49° 117° S.E.) This property, adjoining the *Granite Poorman,* is controlled by A. Norcross and associates, of Nelson. Development-work, consisting of 150 feet of ground-sluicing, 100 feet of stripping, and 400 feet of diamond-drilling, was continued, and a new vein containing encouraging gold values and some scheelite was uncovered for a length of over 250 feet. The property is equipped with a small complete mining plant.

Rover Creek.

Rover Creek Mining Co., Ltd. (49° 117° S.E.) Company office, Room 11, K.W.C. Block, Nelson, B.C.; L. D. Clark, Manager and Secretary. This company, a subsidiary of Alpine Gold, Ltd., continued to prospect a group of claims on Whitewater Creek, a tributary of Rover Creek, where there is a large amount of quartz float carrying good gold values. In the summer of 1943 work was confined to 1,800 feet of diamond-drilling in an effort to locate the vein or veins indicated in the area outlined by topographic surveying and trenching in 1942. Encouraging results were obtained.

Ymir.

Willcock. (49° 117° S.E.) This property is on Ymir Creek, about 5 miles above Ymir. It was operated by hand-steel for a short time during 1943 by B. Golac, of Ymir. Ore totalling 15 tons was mined and shipped to Trail, yielding 17 oz. of gold and 70 oz. of silver.

Arizona. (49° 117° S.E.) This property, adjoining the *Willcock,* was operated for a short time during 1943 by O. Anderson, of Ymir. A total of 24 tons of ore which was mined yielded 34 oz. of gold and 62 oz. of silver.

Goodenough and Ymir. (49° 117° S.E.) These properties were operated under lease for the greater part of 1943 by E. Haukedahl and A. Phare, of Ymir. Ore was recovered from pillars and stope remnants by hand-steel and from old surface dumps by a gasoline-driven scraper. A total of 1,471 tons was shipped to Trail.

Ymir-Yankee Girl Gold Mines, Ltd. (49° 117° S.E.) Company office, 525 Seymour Street, Vancouver, B.C.; E. P. Crawford, President; W. A. Sutton, Secretary-Treasurer. Capital: 3,000,000 shares, no par value; issued, 2,225,005. This property was operated under lease by L. Madden and E. Erickson, of Ymir. Hand-steel was used to recover ore from pillars and stope remnants.

The aerial tram was used to transport the ore from the mine to the railroad. A total of 124 tons was mined and shipped to Trail. This yielded 115 oz. of gold, 1,153 oz. of silver, and some lead and zinc.

ERIE CREEK.

Arlington. (49° 117° S.E.) This property on Keystone Mountain, about 3½ miles from Erie, is owned by the Relief-Arlington Mines, Limited, and now is operated under lease and bond by B. and K. Golac and A. Shrives, P.O. Box 223, Nelson. Under the original lease the property was closed in July, 1942, because of the scarcity of labour, but it was reopened in August of 1943. Hand-steel only was used. A total of 114 tons was mined and shipped to Trail. This yielded 291 oz. of gold, 864 oz. of silver, and some lead and zinc.

Second Relief. (49° 117° S.E.) This property on Erie Creek, 13 miles from Erie, was purchased from the Relief-Arlington Mines, Ltd., by A. Burgess, M. Burgess, C. M. Esche, and M. Towriss, of Salmo. The owners commenced operations in August. Considerable material was recovered from cleaning up around the old mill. A small water-driven compressor was installed and the owners planned to operate underground on pillars and stope remnants above the No. 5 level as soon as weather conditions interfered with surface work. All workings below the No. 5 level are served by a shaft and are flooded. A total of 245 tons was shipped to Trail. This yielded 215 oz. of gold and 135 oz. of silver.

SHEEP CREEK.

Kootenay Belle Gold Mines, Ltd. (49° 117° S.E.) Company office, 475 Howe Street, Vancouver, B.C.; mine office, Sheep Creek, B.C.; J. Rogers, President; J. A. Clarke, Secretary-Treasurer; V. McDowall, Mine Manager. Capital: 750,000 shares, 50 cents par; issued, 675,200. The company owns and operates the *Kootenay Belle* mine on Sheep Creek, about 10 miles from Salmo. On this property mining was continued on one small stope on the *Black* vein until June, 1943, when the property was closed down. The ore mined was accumulated and treated in the mill during May and June. All material and equipment of any value have been removed from the mine and the workings below the 6 level have been allowed to flood. Part of the milling equipment and several of the buildings, including the bunk-house, cook-house, dry-house, and some residences, have been removed and taken to the company's operation at the *Whitewater* mine. The number of men employed varied from twenty-five at the beginning of the year to six at the close of the operation.

Queen, Sheep Creek Gold Mines, Ltd. (49° 117° S.E.) Company office, 616 Stock Exchange Building, Vancouver, B.C.; mine office, Sheep Creek, B.C.; C. E. Marr, President; J. 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 operates the *Queen* mine on Waldie Creek, a tributary of Sheep Creek. The mine operated continuously throughout the year. Development-work had been so reduced because of labour shortage that it became impossible to supply the mill with ore for continuous operation. The mill was operated continuously until April 12th, 1943, and from then on until about the end of September ran intermittently as supplies of ore warranted. An attempt is being made to save sufficient ore to enable the mill to operate continuously during the cold part of the winter. Development done during 1943 included 166 feet of drifting, 66 feet of crosscutting, and 65 feet of raising. An average crew of only forty-eight men was maintained throughout the year, whereas the normal crew at this mine is from 100 to 110 men. A total of 30,285 tons of ore was mined and treated in the mill during the year, and this yielded 13,079 oz. of gold and 3,929 oz. of silver.

Gold Belt Mining Co., Ltd.

(49° 117° S.E.) Company office, 616 Stock Exchange Building, Vancouver, B.C.; mine office, Sheep Creek, B.C.; A. E. Jukes, President; J. 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. The mine was operated continuously until the end of July, 1943, when the entire property was closed for the duration. The mill was operating at reduced capacity until February 1st, closed until April 1st, and finally closed and cleaned up about the end of July. Only 58 feet of crosscutting and 12 feet of drifting were done during the year. The number of men employed varied from about forty-five at the beginning of the year to about twenty at the close of the operation. Normally about 140 men were employed. When the property was closed, practically all available developed ore had been mined and consequently it will be necessary to start on an extensive development programme when the mine is opened after the war. A total of 8,993 tons was mined and treated in the mill and this yielded 5,785 oz. of gold and 2,606 oz. of silver.

Nugget.

(49° 117° S.E.) This property, adjoining the *Motherlode* and *Reno*, is owned and operated by A. Endersby, Jr., of Fruitvale. It is equipped with a small complete mining plant operated by water-power. During the summer of 1943 four men were employed in recovering ore from the old *Nugget* workings and 574 tons were mined and shipped to Trail. This yielded 173 oz. of gold and 161 oz. of silver.

VANCOUVER ISLAND.

ZEBALLOS.

Privateer Mine, Ltd.

(50° 126° S.W.) Company office, 602 Stock Exchange Building, Vancouver, B.C.; D. S. Tait, President; C. H. Hewat, Manager. Capital: 2,500,000 shares, no par value; issued, 2,454,080. This company operates the *Privateer* mine in Spud Valley, about 4 miles by road from Zeballos. A 75- to 90-ton amalgamation and cyanide mill serves both the road from Zeballos. A 75- to 90-ton amalgamation and cyanide mill serves both the *Privateer* and *Prident* mines. Great difficulty was experienced during 1943 due to labour shortage. During August and September one stope between the 900- and 1,000-foot level was worked and a small pillar on the 900 level was extracted. As it was found impossible to carry on regular development-work due to the labour shortage, the company decided to cease operations for the duration of the war and the mine closed down on October 11th.

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

Prident Mine.

(50° 126° S.W.) This mine adjoins the *Privateer* and is owned and operated by the Privateer Mine, Limited. During August and September one stope was worked between the 500 and 600 levels and some backs were taken down farther along the 600 level. The mine closed down on October 11th. The amount of development-work for the year 1943 for both *Privateer* and *Prident* mines was as follows: Drifting, 255 feet; crosscutting, 122 feet; raising, 132 feet; slashing, 14 feet. The total number of men employed at both mines before closing down was fifty-seven. The total amount of ore mined was 19,452 tons; the amount milled, 14,106 tons, yielded 13,485 oz. of gold and 5,352 oz. of silver.

GOLD-COPPER DEPOSITS.

KASLO AREA.

Voyageur.—(49° 117° N.E.) This property, on Ten Mile Creek, about 13 miles from Kaslo, is controlled by R. D. Wallace, of Walla Walla, Washington. During 1943 a small amount of development-work was done by hand-steel.

SILVER-GOLD DEPOSITS.

GREENWOOD AREA.

Providence. (49° 118° S.W.) This property, about 1 mile north of Greenwood, was operated continuously throughout 1943 by W. E. McArthur, of Greenwood, and associates, under lease. A crew of from five to seven men was employed. The property is equipped with a complete mining plant. Development-work done during 1943 included 400 feet of drifting, 75 feet of crosscutting, 150 feet of raising, 300 feet of diamond-drilling, and a small amount of sinking. A total of 427 tons was mined and shipped to Trail and this yielded 224 oz. of gold, 52,393 oz. of silver, and some lead and zinc.

Gold Finch. (49° 118° S.W.) This property, near Greenwood, is operated by W. E. McArthur, of Greenwood. During 1943 a small complete mining plant was installed near the portal of the main tunnel. Development-work included 2,000 feet of open-cutting, 125 feet of drifting in the main tunnel, and a small amount of raising. In addition to this, a new road, about ½ mile in length, was built to connect the mine with the highway. A crew of from two to five men was employed. No ore was mined.

COPPER DEPOSITS.

SIMILKAMEEN RIVER AREA.

PRINCETON.

Copper Mountain, Granby Consolidated Mining, Smelting and Power Co., Ltd. (49° 120° S.W.) J. B. Beaty, President; A. S. Baillie, Vice-President and General Manager; W. I. Nelson, General Superintendent; F. Buckle, Mine Superintendent; C. H. Brehaut, Assistant Superintendent; R. S. Douglass, Mine Foreman. Capital: 600,000 shares, $5 par; issued, 450,260. The *Copper Mountain* mine and the concentrator at Allenby have been in continuous operation since work was resumed early in 1937, following a suspension of several years. The mine is at Copper Mountain, at an elevation of 4,000 feet, and is 12 miles south of Princeton. A branch line of the Kettle Valley Railway from Princeton connects the mine, concentrator, and power plant.

The main development of the mine is by two main adit haulage-tunnels known as No. 2 and No. 6 levels; all the ore is passed by haulage and transfer-chutes to No. 6 level, on which the main transportation system of the mine is situated. The ore is crushed near the portal of No. 6 level and is carried on the railway to the concentrator at Allenby, 8 miles distant. The more recently opened levels, No. 7 and No. 8, received

no attention in the way of development during the year. The only work done on these lower levels was the drawing of ore mined in some of the upper workings; this ore is then hoisted up the No. 2 shaft to No. 6 level.

Development during 1943 consisted of 5,945 feet of drifting and crosscutting, 9,196 feet of raising, 5 feet of sinking, and 7,255 feet of diamond-drilling. Eleven new chutes were built during 1943 and twenty-seven new grizzlies were made. Development in the *Princess May* workings was completed during the year; this section being mined by glory-hole and diamond-drill shrinkage stoping. New plant installations included a new angle-compound air-compressor having a capacity of 1,500 cubic feet. At the crushing plant the fine-ore bin capacity was increased by the erection of a new 800-ton capacity extension.

Underground ventilation has been generally well maintained and during the year was supplemented by the addition of a new fan on No. 5 level north. Six fans are now employed; these being able to provide constant ventilation, instead of the former method of unreliable natural ventilation.

During 1943 the total of 1,363,346 tons of ore milled yielded 22,892,724 lb. of copper, 6,464 oz. of gold, and 156,507 oz. of silver.

As in 1942, there was again a sharp decrease in development, attributable to the critical shortage of skilled labour and the employment of inexperienced workmen. Exclusive of townsite and staff employees, 257 men were employed at Copper Mountain at the end of the year; of these, 177 men were employed underground. Labour turnover was again high; 225 men were hired and 377 quit or were discharged.

VANCOUVER AREA.

Britannia Mining and Smelting Co., Ltd.

(49° 123° N.E.) 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 G. C. Lipsey, Superintendent. Capital: 100,000 shares, $25 par; issued, 91,966. This company operates the Britannia mines at Britannia Beach, Howe Sound. Development-work and stoping has been continued throughout the year. The mines operating are the *Victoria, No. 5, Fairview,* and the *Bluff*. Regular development-work has been greatly hindered during the year due to the labour shortage and particularly as the management has endeavoured to keep up a reasonable production. No. 7 service shaft was ready for operation and complete equipment installed.

During 1943 the No. 8 shaft has been sunk 1,116 feet from the 4,100 level to a point 36 feet below the 5,250 level. The rope raises and some of the transfer raises have been completed and the hoist-room excavated in preparation for a modern hoist which is to be installed sometime in 1944. This shaft will open up the *No. 8* mine area below the 4,100 level.

Development-work for the year totalled 9,772 feet or 1.83 miles, made up as follows: Drifting, 1,330 feet; crosscutting, 1,158 feet; raises, 4,548 feet; powder-blast workings, 1,578 feet; winzes, 47 feet, and 1,116 feet of shaft sinking. A total of 9,772 feet of diamond-drilling was done. The total number of men employed at the end of the year for all operations underground, on the surface, and mill was 634. A total of 849,147 tons of ore was mined and was treated in the mill to produce pyrite concentrates and copper concentrates. The latter yielded 16,436,868 lb. of copper, 10,922 oz. of gold, and 73,645 oz. of silver.

COPPER-GOLD DEPOSITS.

TEXADA ISLAND.

Little Billie, Industrial Metals Mining Co., Ltd.

(49° 124° N.W.) Company office, 626 Pender Street West, Vancouver, B.C.; L. Prosser, President; W. S. Hamilton, Manager. During 1943 this company reopened the *Little Billie* mine, near Vananda, Texada Island. The shaft, 280 feet in depth, was unwatered and the 80-foot, 180-foot, and 280-foot levels cleaned up. A 90-foot crosscut was driven from the outside to connect with the 80-foot level and 170 feet of drifting and 25 feet of crosscutting were done on this level. On the 180-foot level about 30 feet of crosscutting to connect old drifts and about 20 feet of drifting to the north-east on this level were completed. No development had been done on the 280-foot level by the end of the year. Some 110 feet of diamond-drilling was undertaken on the 80-foot level with no definite results. The number of employees is twenty-seven.

COPPER-ZINC DEPOSITS.

VANCOUVER ISLAND.

DUNCAN.

Mount Sicker.

(48° 123° N.W.) Twin "J" Mines, Limited. Head office, Vancouver, B.C.; mine office address, Duncan, B.C.; E. M. Thomson, President; C. Rutherford, General Manager; R. B. Gayer, Mine Manager. Capital: 3,000,000 shares, $1 par; issued, 3,000,000. The mine has operated steadily throughout 1943 with an average crew of fifty men employed underground and forty on the surface. Development-work done includes 4,017 feet of drifting and crosscutting, 379 feet of raising, and 550 feet of diamond-drilling. During 1943, 17,302 tons of ore were mined and 17,552 tons were milled. In keeping with the general development programme, it was also found necessary to clean up and repair 3,636 feet of old adits.

A complete new camp was built close to the mine and mill and consists of a cookhouse and dining-room; a two-story bunk-house of twenty rooms to accommodate forty men; change-house and first-aid room combined with accommodation in the dry for fifty men; office and a staff-house of five rooms. The buildings at the old *Tyee* camp have been remodelled and equipped to provide living-quarters for married employees. The erection of the mill, begun in December, 1942, was completed and milling operations began in July, 1943. This building, measuring 46 by 84 feet, is of timber construction with concrete foundations and retaining walls and floors; 46-foot single-span roof-trusses of teco ring construction were used throughout. The mill was originally designed to treat from 120 to 130 tons of ore a day and has exceeded expectations in this regard ever since the machinery was properly broken in. Selective flotation is the method used to separate the minerals in this complex copper-zinc ore. The mill machinery is operated by electricity supplied by Nanaimo-Duncan Utilities. Power for underground equipment is provided by a Gardner-Denver compressor having a capacity of 1,000 cubic feet of air a minute. The square set method of mining is employed, the broken ore being brought down from the different levels through main ore raises to No. 3 level, where it is loaded into mine-cars and hauled to the mill by a Mancha storage-battery locomotive; storage-racks for charging the batteries are located convenient to the No. 3 portal.

SILVER-LEAD-ZINC DEPOSITS.

BEAVERDELL AREA.

Highland Bell, Ltd. (49° 119° S.E.) Company office, Creston, B.C.; mine office, Beaverdell, B.C.; R. V. Staples, Managing Director; R. B. Staples, Mine Manager. Capital: 1,500,000 shares, $1 par; issued, 1,315,856. The company owns and operates the *Highland Bell* mine on Wallace Mountain, 4 miles from Beaverdell. This property operated continuously throughout 1943 on a somewhat reduced scale of production. Some difficulty was experienced in maintaining a crew of full strength. During 1943 the number of men employed decreased from about forty to twenty-five. Considerable new work was undertaken. The entire mining plant was moved from its old location near the camp to a site near the portal of the No. 4 or lowest adit-level, where a new compressor-house, blacksmith-shop, office, and small change-house were built. Compressor capacity was augmented by the installation of a two-stage Belliss Morcom 400-cubic-foot compressor, driven by a No. 7 Rushton and Hornsby Diesel engine. Complete electric haulage consisting of a Mancha trammer and charging equipment was installed on the No. 4 level. It is planned to do away altogether with the old camp-site and cook-house and to transport the men from Beaverdell, a distance of about 3½ miles, daily. Underground, a large raise is being driven to connect the 8 level with the 4 level and to provide a more direct means of haulage between these two workings. Development done during 1943 included 510 feet of crosscutting, 420 feet of raising, and 100 feet of sinking. In addition to this, a new road 3,700 feet long was built connecting the 4 level portal with the main Wallace Mountain road. During 1943 a total of 2,249 tons was mined and shipped to Trail. This yielded 89 oz. of gold, 327,487 oz. of silver, and some lead and zinc.

AINSWORTH.

Spokane Group, Ainsmore Mines, Ltd.—(49° 116° N.W.) Company office, Ainsworth, B.C.; C. M. Mohr, Manager. This company operates the *Spokane* group of claims on Munn Creek, about 3 miles from Ainsworth. This property operated continuously throughout 1943, an average of four men being employed. A total of 79 tons of crude lead ore was mined and shipped to the Kellogg Smelter under contract with the Metals Reserve Corporation of Washington, D.C.

Kootenay Florence. (49° 116° N.W.) This property on Kootenay Lake, 2½ miles north of Ainsworth, is being operated by the Wartime Metals Corporation, 637 Craig Street West, Montreal, Que. An active programme has been carried out throughout 1943. Electric power was obtained from the Corporation of the City of Nelson and a power-line run from Ainsworth to the mine. The old camp was altered and added to in order to accommodate about eighty men. The mill was completely remodelled and equipped with up-to-date selective flotation equipment to give it a capacity of about 120 tons per day. A complete mining plant was installed. The mill was put in operation on June 30th, 1943, at a capacity of about 80 tons per day on the tailings which had been dumped into Kootenay Lake during former operations. These tailings were recovered by means of a drag-line scraper and hoist and were hoisted to the mill and put directly into the fine-ore bins. It was not necessary to put this material through a crusher as it was jig tailings ¼- to ½-inch mesh. In the mine a mechanical ventilation system was installed on the 9 and 5 levels in order to reopen these workings. The main work undertaken was the driving of a raise from the 9 to the 5 level in order to provide ventilation in the 9-level workings and another exit from the mine. In order to make this connection it was necessary to reopen a considerable amount of the old workings on the 5 level and crosscut some 260

feet to the top of the raise. This work was completed late in 1943. In addition to this, some work was done on the 8 and 9 levels in order to get ready for stoping. A small amount of the 6,762 tons treated for the year was recovered from these last-mentioned workings. The development-work for 1943 included 241 feet of drifting, 539 feet of raising, 510 feet of crosscutting, and 963 feet of diamond-drilling. The crew varied from fifty men at the first of the year to eighty men when the mill was put into operation.

SLOCAN AREA.

KASLO-THREE FORKS.

Whitewater. (50° 117° S.E.) Control of this property has been acquired by the Kootenay Belle Gold Mines, Limited. Up until the end of August, 1943, underground work consisted of completely reconditioning and examining part of the old workings and diamond-drilling with an idea of proving up a reasonable body of ore. Underground work for the year consisted of 234 feet of drifting and 3,787 feet of diamond-drilling. In addition to this 2,000 feet of old drifts, 200 feet of old crosscuts, and 300 feet of old raises were repaired and reconditioned. On the surface, considerable work was done to ensure adequate living accommodations for the crew. This included the completion of two cottages, the building of a six-suite apartment (which was half completed by the end of 1943), the addition of two bedrooms, a refrigerator plant, and root-house to the cook-house, and the addition of ten bedrooms to the bunk-house. Other surface construction, which is either completed or well under way, included a 26- by 35-foot addition to the mill to house the grinding plant and a power-house building 45 by 90 feet to house four Diesel engines totalling 580 horse-power. These Diesel engines have been purchased but have not yet been installed. Material for a new change-house and blacksmith-shop is on hand and it is planned to start construction on these before the end of the year. A total of twelve to fifteen men was employed while diamond-drilling and underground repair-work were being done, but this crew increased to over forty when construction-work was commenced. The company plans to start milling in February, 1944, with the *Whitewater* grinding unit, at a rate of about 150 tons a day. The completion of the installation of the *Kootenay Belle* grinding unit is planned for early in March, 1944, and this will enable the mill to treat some 300 tons per day. Concentrates are to be shipped under a contract with the Metals Reserve Corporation, Washington, D.C.

Bell. (50° 117° S.E.) This property in the Jackson Basin, about 7 miles from Retallack, was operated under lease and bond by J. Gallo and associates, of Nelson. The road from Retallack to the mine was repaired and reconditioned with the assistance of a Government grant. Four men were engaged in the operation and all work was done by hand methods. A total of 235 tons was recovered from old dumps and pillars and stope remnants in the underground workings. The ore was treated in the mill of Zincton Mines, Limited, yielding 168,221 lb. of zinc in the form of concentrates, which were shipped with those of the Zincton company's mine to the Anaconda Smelter, near Butte, Montana.

Caledonia. (50° 117° S.E.) This property, near Blaylock, is owned and operated by G. E. McCready. During 1943 a total of 80 feet of drifting was done and 2 tons of ore were mined by hand-steel and shipped to Trail, and yielded 208 oz. of silver, 1,217 lb. of lead, and 150 lb. of zinc.

Lucky Jim, Zincton Mines, Ltd. (50° 117° S.E.) This company is a subsidiary of the Sheep Creek Gold Mines, Limited. It owns and operates the Zincton (*Lucky Jim*) mine at Zincton. The mine and mill were operated continuously throughout 1943. An average crew of fifty-four men was employed with about thirty-two working underground. Towards the end of 1943 the twenty M.S. flotation cells were replaced by twelve modern Denver cells. The

installation of these new cells improved the recovery and grade of concentrate and cut down the reagent consumption. The mill capacity of about 320 tons per day was not maintained steadily due to labour shortages and absenteeism. Development-work for the year included 556 feet of drifting, 284 feet of crosscutting, 506 feet of raising, 219 feet of incline at 20 degrees, and 11,645 feet of diamond-drilling. A total of 84,858 tons of ore was mined and milled. A zinc concentrate was made and shipped to the Anaconda Smelter, near Butte, Montana, under a contract with the Metals Reserve Corporation of Washington. No payment was made for silver and no lead was recovered.

SANDON-THREE FORKS.

Western.—(50° 117° S.E.) This property, at Three Forks, is owned by G. F. Gormley and F. Solveoff, of Nelson. About 150 feet of crosscutting was done by hand-steel.

Victor. (49° 117° N.E.) This property, 3 miles from Sandon, is owned by D. Petty, of Nelson, and is operated under lease by E. Doney and partner. A total of 38 tons was mined by hand-steel and shipped to Trail. This yielded 4 oz. of gold and 5,878 oz. of silver, and some lead and zinc.

Noble Five Mine, Reco Mountain Base Metal Mines, Ltd. (49° 117° N.E.) Mine office, Sandon, B.C.; A. H. Honsberger, Manager. Capital: 3,000,000 shares, 50 cents par; issued, 2,000,000; 127,500 debentures, issued 127,500. This company controls and operates the *Noble Five* mine about 2½ miles from Sandon. The company has just spent about $50,000 in bringing the *Noble Five* mine into production. Practically all the surface plant, including camps, mill, and power plants, was repaired and reconditioned. The flumes and penstocks from the power plant on Carpenter and Cody Creeks required considerable repairs and replacements and some $15,000 was spent on this work. The mill was completely reconditioned. Some changes were made in the flow-sheet and four Union Iron Works and two Denver cells were added to the flotation circuit. Power plant equipment was increased by the installation of a Diesel-driven compressor of about 240 cubic feet per minute actual capacity. At the mine an extensive diamond-drilling programme was undertaken and was successful in blocking out a considerable tonnage of ore. In addition to diamond-drilling, 127 feet of box-holes were driven, 45 feet of drifting done, and 2,800 feet of drift reconditioned. The tram-line from the mine to the mill was put in working condition and the underground hoist and raise from the 18 to the 8 level were completely overhauled and put in condition to handle men. The mill was put in operation in September, 1943, and a total of 4,645 tons was treated up to the end of November; of this, 576 tons came from an old tailings dump, 137 tons were hauled from the *Ruth-Hope* mine at Sandon, and 3,932 tons were obtained from the mine. During the construction period from twenty-five to thirty men were employed. After milling was commenced a total crew of about seventy was required. The concentrates were shipped under a Metals Reserve Corporation contract.

SILVERTON-NEW DENVER.

Standard and Mammoth, Western Exploration Co., Ltd. (49° 117° N.E.) Company office, Silverton, B.C. Capital: 2,000,000 shares, 50 cents par; issued, 1,513,482. This company operated the *Standard* mine on Emily Creek, about 3 miles from Silverton, and the *Mammoth* mine on Avison Creek, about 4½ miles from Silverton. Both operations were under the supervision of A. M. Ham, of Silverton. Both mines worked continuously during 1943. The *Standard* employed an average crew of about eighty-five men, including those working in the mill and power plant and on the flume. Development at this property for the company's year ended November 30th, 1943, was 1,743 feet of drifting and crosscutting, 359 feet

of raising, and 6,195 feet of diamond-drilling. New development consisted of driving the No. 6 level. Although no commercial ore-shoots were encountered, there was some encouraging mineralization. At the *Mammoth* mine an average crew of about forty-five men was employed. Due to shortage of labour the mine was operated for only one shift for the greater part of the year. Development-work at this property included 245 feet of drifting and crosscutting, 73 feet of raising, and 811 feet of diamond-drilling. The *Standard* mill treated a total of 48,029 tons of ore. This was made up as follows: From the *Standard*, 15,955 tons; from the *Mammoth*, 21,121 tons; and from the Slocan Lake tailings at Silverton, 9,328 tons. In addition to this, 1,523 tons of tailings and 102 tons of ore were purchased from the *Enterprise* mine. The dredging of the Slocan Lake tailings was discontinued about the end of April as the grade of the material recovered fell to about 2 per cent. zinc. No tailings were dredged from Slocan Lake near the site of the old Rosebery mill. All concentrates were shipped to Kellogg, Idaho, under a contract with the Metals Reserve Corporation, Washington, D.C.

Enterprise. (49° 117° N.E.) This property is on Enterprise Creek, 5 miles from the main Slocan highway. It is operated under lease and bond by S. N. Ross and associates, of Nelson. Work was commenced in June with a crew of four men. Material amounting to 1,523 tons, averaging about 3 per cent. zinc, about 0.25 per cent. lead, and 9 oz. of silver per ton, was salvaged from an old tailings dump and hauled to the *Standard* mill for treatment. After the tailings were disposed of, seven men were employed and work was directed towards getting production from the mine. To do this the installation of a water-driven compressor was completed, a small ore-bin built, and a gasoline-driven jaw crusher was installed above the ore-bin. Some preliminary clean up work and timbering was also done in the mine. Up to November 30th, a total of 102 tons of ore had been mined and hauled to the *Standard* mill for treatment. The operation was closed for the winter on December 17th.

Van Roi. (49° 117° N.E.) This property is now controlled by the International Metals Inc., Limited, 101–102 Pemberton Building, Victoria, B.C. During the early part of 1943 a crew of fourteen men, under the supervision of W. Nelson, of Silverton, was engaged in reopening and cleaning up old workings. The A, 1, 3, 5, 7, and 9 levels have been made accessible for examination and sampling. All this work was done by hand methods. Some repair-work was also done on the old mill, chiefly to preserve the building. Nothing further was done to bring the property into production.

Mountain Chief.—(49° 117° N.E.) This property, near New Denver, was operated by J. Cechelero. A total of 52 tons of ore was mined with hand-steel and shipped to Trail.

Bosun.—(49° 117° N.E.) This property on Slocan Lake, between Silverton and New Denver, was operated by leasers. A total of 8 tons of ore was mined. This yielded 511 oz. of silver and some lead and zinc.

LARDEAU AREA.

FERGUSON.

True Fissure. (50° 117° N.E.) This property is now controlled by the Codan Lead and Zinc Company, of Ferguson. A crew of thirteen men was employed under the direction of M. de Mers. Efforts were directed towards sorting and shipping a dump of high-grade zinc ore. This property is equipped with a complete mining and milling plant and there is a fairly substantial tonnage of lead-zinc ore indicated in the workings. The management had intended to go into full-scale production but was unable to do so because of adverse labour conditions.

CRANBROOK AREA.

Sullivan Mine, Consolidated Mining and Smelting Co. of Canada, Ltd.

(49° 115° N.W.) Company office, 215 St. James Street, Montreal, Que.; mine and smelter office, Trail, B.C.; S. G. Blaylock, Trail, President; R. E. Stavert, Montreal, Vice-President; J. E. Riley, Montreal, Secretary; H. B. Fuller, Trail, Comptroller; James Buchanan, Trail, General Manager. Sullivan mine office: Kimberley, B.C.; William Lindsay, General Superintendent; J. R. Giegerich, Mine Superintendent; H. R. Banks, Mill Superintendent. Capital: 4,000,000 shares, $5 par; issued, 3,276,329. The company owns and operates the Sullivan mine on Mark Creek, near the town of Kimberley, and the Sullivan concentrator at Chapman Camp, some 3 miles away.

During 1943 the output decreased to some extent from the unprecedented high level reached in 1942, owing to various reasons, chief among which was the fact that, in some sections, it was found difficult for the development-work to keep up with the pace set by extraction and that, late in the summer, production was temporarily suspended in several stopes following a large fall of ground.

An unavoidable consequence of increased activity, enlargement of the crew, and the impossibility of maintaining the former careful selection in recruiting, has been a rising accident rate, but determined efforts have been made to reduce accidents to the gratifying rate which was held previously.

Owing to constantly varying conditions in the workings, guidance of the air-currents for proper ventilation demands and receives close attention. The two main fans are passing together a total of 158,000 cubic feet of air per minute, while eleven smaller units in service underground assure adequate distribution.

On September 14th, after some heavy ground sloughing, the hanging-wall collapsed over an area of approximately 12,000 square feet; two stopes were completely, and two others partly, filled by the debris, representing an estimated volume of 300,000 cubic yards. The settlement extended to the surface in which it left a funnel-shaped cavity of rather impressive dimensions. No one was injured although a violent air-blast was induced by the fall, but operations were suspended in several of the adjoining stopes while the possibility of an extension of the movement was being studied. The feasibility of applying seismological methods to the detection of tremors which may precede the final rupture of the ground, in similar circumstances, is under consideration at the present time.

The development-work done in 1943 included 10,880 feet of drifting and cross-cutting, 16,721 feet of raising, and 282 feet of sinking. A total of 12,371 feet of diamond-drilling was done. The new hoisting-shaft was completed from the 3,350-foot to the 3,900-foot level, above which it was raised 416 feet, this leaving 323 feet to be driven to the surface. The 3,902 conveyer-belt incline was completed, as far as excavating is concerned, and the installation of the transporting machinery has now begun. A 10,000-ton ore-pocket has been cut at the upper end of the incline, above the 3,900-foot level.

There was no change of any importance in the methods of mining followed, beyond an increased use of diamond-drilling in sub-level work. Preparation of the ground for blasting, in stoping, and development-work involved the drilling of 1,590,505 feet of holes, this being divided as follows according to the equipment used: Conventional steel, 852,136 feet; detachable bits, 655,716 feet; diamond-drill, 82,653 feet—the last-mentioned representing 5.2 per cent. of the whole.

A total of 776,398 cubic yards of back-filling was placed in the period under consideration. Of this, 8,698 cubic yards was mine waste, stowed in the course of development-work; 329,000 was the result of caving; 364,300 was handled by tractors; and 74,400 was loaded with a power-shovel and transported by trucks to the heads of the

raises. The usual equipment—five R-D 8 tractor units, with three blades, two carryalls, and a rooter—was in use throughout the summer months, and was increased in September by a 6½-cubic-yard Bucyrus-Erie electric shovel and five 150-horse-power Euclid bottom-dump trucks which operated on a 2-mile return haul. To assure an adequate supply of water for this work, a dam and a pumping-station were built on a small creek and a welded 6-inch pipe-line, 6,000 feet long, was laid on the surface from that point to the site of the present filling operations.

An addition to the office and dry-room building, at the portal of the 3,900-foot level, was started but had not been completed at the end of the year. The construction of twenty-five new houses was completed in the Ritchie residential quarter, and these were sold on the company's loan scheme, while thirty other houses were built on the Happy Valley townsite.

In December there was a total of 1,622 persons on the pay-roll, of which 860 were employed underground, 395 at the concentrator, and 367 in various other capacities on the surface. A total of 2,500,714 tons of ore was milled in 1943.

WINDERMERE AREA.

Paradise Mine, Sheep Creek Gold Mines, Ltd. (50° 116° S.E.) Manager, H. Doelle. Some exploratory work was undertaken on the 7,800-foot level of the *Paradise* mine, 18 miles by road from Invermere, in the months of August and September, 1943. A part of the level was cleaned up and some diamond-drilling was done with the object of ascertaining the importance of an ore-body situated at a comparatively short distance from the portal. A crew of ten men, including four drillers, was employed under the direction of G. R. Griffith.

GOLDEN AREA.

Monarch and Kicking Horse Mines, Base Metals Mining Corporation, Ltd. (51° 116° S.E.) Company office, 350 Bay Street, Toronto, Ont.; mine office, Field, B.C.; J. H. C. Waite, President; G. C. Ames, Secretary-Treasurer; Alexander G. Ballachey, Manager; H. D. Forman, Mine Superintendent; John Vallance, Mill Superintendent. Capital: 3,000,000 shares, no par value; issued, 2,330,714. The *Monarch* mine, on Mount Stephen, south of the Kicking Horse River, and the *Kicking Horse* mine, on Mount Field, north of the river, are operated by this company. Practically all production was obtained from the *Kicking Horse* during the greater part of 1943.

The scarcity of labour and the various other difficulties besetting the mining industry almost everywhere made their influence felt here also, and the mill was operated at less than its normal capacity throughout the year. In May, work was suspended at the *Monarch* and all men available were employed at the *Kicking Horse*, but, despite this concentration on one objective, their number was still inadequate to maintain development-work sufficiently far ahead of extraction and, at the beginning of the winter season, another migration took place, in the reverse direction, in order to secure an output from the *Monarch* while drifts were being extended on the other side of the valley.

No development-work of any kind was done in the *Monarch* during 1943. In the West section the work now carried on is limited to the recovery of portions of the ore-body left behind in the course of former operations and, on the East side, two small lenses of ore at the inner end of the section are being extracted.

In the *Kicking Horse* a short slope, 73½ feet in length, was sunk in order to bring a drift below one of the ore-bodies. The remainder of the development-work done included 390 feet of drifting, 204 feet of raising, and 1,429 feet of diamond-drilling. During 1943, a total of 61,770 tons of ore was milled. This yielded 3,731,081 lb. of lead, 6,350,377 lb. of zinc, and 19,133 oz. of silver.

In December, there was a total of eighty-nine persons on the pay-roll, of whom forty were working underground (i.e., twenty-one at the *Kicking Horse* and nineteen in the *Monarch*), thirteen were employed at the concentrator, and thirty-six in various other capacities on the surface.

On January 2nd, 1944, the power plant at the *Monarch* was destroyed by fire. This will mean a serious decrease of activity for some time to come, for the plant was the sole source of electricity and compressed-air for the entire operation. It is understood that an effort will be made to continue development-work at the *Kicking Horse* with the help of portable compressors until the machinery in the main plant has been put into serviceable condition again.

MERCURY DEPOSITS.

FORT ST. JAMES AREA.

PINCHI LAKE.

Pinchi Lake Mercury Mine, Consolidated Mining and Smelting Co. of Canada, Ltd.

(54° 124° N.E.) P. T. Bloomer, Superintendent. Active development continued during 1943, consisting of 4,477 feet of drifting, 4,100 feet of raising, 196 feet of sinking, and 46,641 feet of development diamond-drilling. The mine was worked for 363 days and produced 337,400 tons of cinnabar ore. The glory-hole continued to supply a large portion of the tonnage. A new section, the West zone, was opened during the year and stoping is now being carried on in that area. Development is continuing in No. 6 level, the lowest, off No. 2 shaft. Stoping is being carried on in the upper levels, and pillars have been drawn in the outer section of the 500 level. Diamond-drilling is being used to some extent in drilling of long-holes for blasting in pillars.

Preparations are being made for the sinking of the main shaft from the 500 level. The main hoist, which is located on the surface above the portal to No. 4 level, has been installed. The shaft will be raised from the 500 level up to the hoist-opening.

Changes were made in the crushing section of the mill which, with the addition of a cyclone dust-extractor, has considerably improved the dust conditions. The general precautions taken to protect employees from the hazards of mercurial poisoning appear to be adequate. No cases of mercurial poisoning have been reported since March, 1941. The average number of men employed was 446.

Most of the construction-work around the camp has been completed.

[Reference: Bulletin No. 5, 1940.]

TAKLA LAKE AREA.

SILVER CREEK.

(55° 125° N.E.) Considerable diamond-drilling and prospecting were done by the Consolidated Mining and Smelting Company of Canada, Limited, in this area, on mercury deposits.

Takla Mercury Mine, Bralorne Mines, Ltd.

(55° 125° N.E.) C. Cleveland, Superintendent. This is a new property under development by the Bralorne Mines, Limited, and is located near the headwaters of Silver Creek. It is near the summit of the divide between the Omineca River and Nation River watersheds, at an elevation of about 3,500 feet. A small two-compartment shaft has been sunk to 175 feet and a level was driven from it at 135 feet. The level was driven to intersect the vein and drifting has been carried on along the vein. During 1943 a total of 1,146 feet of drifting and crosscutting, 101 feet of raising, and 5,601 feet of diamond-drilling was done.

The shaft-hoist is a single-drum equipped with an auxiliary brake.

A treatment plant, consisting of a rotary kiln, 50-ton capacity, has been installed and is in operation. The mine was worked every day during 1943, principally on development and construction work. The average number of men employed was fifty-four. A total of 556 tons of cinnabar ore was mined.

A new road has been built from Silver Lake to the mine, a distance of about 13 miles. There is plane service to the mine from Fort St. James to Silver Lake. Heavy freight was taken in by boat to Takla Landing and from there by truck. Passenger, mail, and express service is by plane.

RELAY CREEK AREA.

Relay Creek Prospect, Bralorne Mines, Ltd.

(51° 122° S.W.) At this company's Relay Creek prospect work continued on the crosscut which was collared in 1942. Commencing at 322 feet in from the portal, a zone, 22 feet wide, of silicified and carbonated serpentine was intersected. After some slashing was done in this zone the crosscut was extended another 280 feet to its present face. Drifts were then driven 21 feet to the east and 35 feet to the west on the silicified zone. This work did not expose any mineralization of sufficiently high tenor to warrant further work of a similar nature.

A diamond-drilling programme was then started on May 17th. One hole from the face of the crosscut intersected a conglomerate band at 110 to 118 feet, and the core across the 8 feet gave slight indication of cinnabar mineralization. Two other holes drilled from the same vicinity failed to confirm the results of the first hole. Altogether, six holes were drilled through the carbonate zone. Some fair mercury assays were obtained but no worth-while ore-bodies were outlined. Surface-stripping was done in conjunction with the drilling programme, but although some spectacular float samples were found no continuous shoots of ore were uncovered. Operations were stopped on September 20th and all the equipment had been dismantled and returned to Bralorne by December 5th.

Tyaughton Creek Prospect, Pioneer Gold Mines of B.C., Ltd.—(51° 122° S.W.) During June, July, August, and September, 1943, Pioneer Gold Mines of B.C., Limited, employed from two to six men trenching and stripping on a cinnabar prospect located on the south side of Tyaughton Creek, about 2 miles up-stream from the mouth of Relay Creek. This occurrence had been discovered during the latter part of 1942 by H. H. Heustis, who was prospecting for the company.

MOLYBDENUM DEPOSITS.

SALMO AREA.

Molly.

(49° 117° S.E.) This property, on Lost Creek, is owned by the Consolidated Mining and Smelting Company of Canada, Limited. It was operated until February, 1943, with a crew of about six men. A small tonnage of molybdenum ore was mined with hand-steel but it was not shipped. Development-work included 23 feet of drifting, 4 feet of crosscutting, and 16 feet of raising.

[Reference: Bulletin No. 9, 1940.]

TUNGSTEN DEPOSITS.

HAZELTON AREA.

Red Rose Mine, Consolidated Mining and Smelting Co. of Canada, Ltd.

(55° 127° S.W.) R. J. Armstrong, Superintendent. The property ceased operations at the end of October, 1943. During the period of operation in 1943 a total of 17,884 tons of ore was mined and milled. Active development had been continued up to the end of September. Work done in 1943 included 469 feet of crosscutting, 467 feet of drifting, and 391 feet of raising. All ore was cleaned out of the stopes and was milled, except for a little low-grade left in the 650 stope. All openings to the mine were sealed off and the aerial tram-line slackened off. All plant and equipment has been left in place in care of two watchmen.

[Reference: Bulletin No. 10, 1943.]

CARIBOO AREA.

Cariboo Thompson Group.

(52° 121° N.E.) This group of claims located in the vicinity of Upper Cunningham Creek, south of Barkerville, belongs to J. Wendle and W. Thompson, of Barkerville, and their associates. During 1943 Mr. Thompson did open-cutting and stripping of overburden to expose further the interesting quartz-scheelite veins on Copper Creek where it crosses the Cariboo Hudson road.

Claims of E. S. Dowsett.

(53° 121° S.E.) The presence of a notable amount of scheelite in the placer sands of California Gulch led Mr. Dowsett to seek for lode tungsten in that vicinity. He discovered one interesting occurrence a short distance south of the gulch and was engaged in stripping it when the demand for tungsten ceased. His claims are about 6 miles, air-line, south-east of Barkerville.

BRIDGE RIVER AREA.

Tungsten King Group.

(51° 122° S.W.) All the ore in sight at this group had been extracted and delivered to the Bralorne mill for treatment by the time the Government order cancelling the purchase of scheelite concentrates was issued. From the ore mined and milled several tons of concentrates, assaying 72 per cent. WO_3, or better, were shipped. The property is on the east side of Tyaughton Creek, about 2 miles south of the old *Manitou* mine.

[Reference: Bulletin No. 10, 1943.]

Tungsten Queen Group.—(51° 122° S.W.) From this group of claims, which adjoins the *Tungsten King* on its south boundary, small shipments of scheelite ore were made at irregular intervals to the *Bralorne* scheelite plant. Much of this ore was obtained by sorting material previously thrown on the waste dump.

LARDEAU AREA.

BEATON-CAMBORNE.

United Victory.—(50° 117° N.W.) An option on this property, about 12 miles from Beaton, was taken by the Consolidated Mining and Smelting Company of Canada, Limited. The showings were carefully sampled and the favourable contacts were prospected but no development-work was done. The option was dropped in November, 1943.

[Reference: Bulletin No. 10, 1943.]

TROUT LAKE AREA.

Lucky Boy. (50° 117° N.W.) This property on Wilkie Creek, about 4 miles from Trout Lake, is under option to J. M. Tillen and associates, of Trout Lake. Early in 1943 a few tons of scheelite ore was hand-cobbed and sorted from the dumps. This was shipped to Ottawa for treatment.

[Reference: Bulletin No. 10, 1943.]

GRAND FORKS AREA.

Wyoming. (49° 118° S.E.) This property is on the Granby River, 14 miles north of Grand Forks and near Miller Creek. It was optioned by the Consolidated Mining and Smelting Company of Canada, Limited. The work done included detailed prospecting for scheelite and some 300 lineal feet of trenching. The option was dropped in June, 1943.

ROSSLAND AREA.

Santa Rosa. (49° 117° S.W.) This property is on the west side of Big Sheep Creek, 1 mile south of the main Cascade Highway. It was held under option by the Consolidated Mining and Smelting Company of Canada, Limited. During the summer of 1943 the property was prospected and 75 lineal feet of trenching done. The option was dropped in July.

Blue Eyes. (49° 117° S.W.) This property on Stoney Creek, about 3 miles from Rossland, was optioned in 1943 by the Bayonne Consolidated Mines, Limited. Twelve men were employed under the direction of J. A. Hanna, of Rossland. A small complete portable mining plant was put on the property and several hundred feet of underground workings were driven. Results were understood to have been unsatisfactory and the option was dropped in June and all the equipment removed.

[Reference: Bulletin No. 10, 1943.]

SALMO AREA.

Emerald. (49° 117° S.E.) This property is on Iron Mountain, about 9 miles from Salmo. Work was done on the property for the greater part of 1943 by the Wartime Metals Corporation, 637 Craig Street West, Montreal, under the management of E. E. Mason. The mill was constructed by the Emerald Construction Company, subsidiary of the Consolidated Mining and Smelting Company of Canada, Limited, under the management of J. G. Page. During the construction period a crew of 250 men was employed, but this was reduced to 160 after the property was brought into operation. At the mine a camp to accommodate 120 men, including three duplex cottages, was completed. A complete mining plant, including power-house, blacksmith-shop, and powder-house was completed, and a tram-line from the mine to the mill, with a primary crushing plant at the upper terminal installed. At the mill-site, in addition to the mill, a bunk-house to accommodate about thirty men and a well-equipped assay office were provided. No figures are available as to the amount of development-work done during the year or the tonnage mined and treated. The mill, completed in June, was put into operation on August 1st, at the rate of about 200 tons per day; and was closed on September 10th, on instructions from the Wartime Metals Corporation. It is understood that a commercial grade of scheelite concentrate was produced at a very low cost. All equipment and supplies were left at the property in charge of a watchman.

[Reference: Bulletin No. 10, 1943.]

Jumbo. (49° 117° S.E.) This property is on Nevada Mountain and lies about 2 miles east of the *Emerald*. It was operated under option by the Kelowna Exploration Company, Limited. Five men were employed under the direction of A. Lakes, of Nelson. Considerable surface trenching and stripping was done.

[Reference: Bulletin No. 10, 1943.]

Clubine Tungsten. (49° 117° S.E.) This property is on Lost Creek, about 2 miles from the Nelson–Nelway Highway. It was optioned by the Consolidated Mining and Smelting Company of Canada, Limited. Six men were employed under the direction of C. A. Munro. Development-work included 61 feet of diamond-drilling, 675 lineal feet of surface-trenching, and 15,000 square feet of brush-clearing. In addition to this, a trail 4,180 feet long was constructed. The option was dropped later in 1943.

[Reference: Bulletin No. 10, 1943.]

Comet and Den Groups. (49° 117° S.E.) These properties, adjoining the Clubine Tungsten, were operated by the Consolidated Mining and Smelting Company of Canada, Limited. On the *Comet* group 616 feet of surface-trenching and some clearing and trail construction were done. An option is still held on this group. On the *Den* group, which was staked by the Consolidated Mining and Smelting Company of Canada, Limited, development included 99 feet of surface-trenching and 5,000 feet of clearing.

Little Keen. (49° 117° S.E.) This property is on Sheep Creek, about 8 miles from Salmo. During 1943 an option was taken by the Consolidated Mining and Smelting Company of Canada, Limited. Development-work included 382 feet of surface-trenching and 25,000 square feet of clearing brush. Five men were employed under the direction of H. Lakes. The option was dropped in September.

[Reference: Bulletin No. 10, 1943.]

YMIR AREA.

Stewart Creek Group. (49° 117° S.E.) This property is on Stewart Creek, about 3 miles from the Nelson–Nelway Highway. It was optioned by the Consolidated Mining and Smelting Company of Canada, Limited, for a short time this year. The trail was cleaned out, the showing sampled, and a mill test run on the ore, but no further work done. The option was dropped in July, 1943.

[Reference: Bulletin No. 10, 1943.]

NELSON AREA.

Golden Eagle and T.S. Group. (49° 117° S.E.) These properties on Hall Creek, about 5 miles from the Nelson–Nelway Highway, are owned by W. Rozan, of Nelson, and associates. During the summer of 1943 two men were engaged in doing a small amount of stripping and surface work by hand methods. The property contains several narrow quartz veins on which some work had been done many years ago for their gold content.

KASLO AREA.

V Mineral Claim.—(49° 116° N.W.) This property lies on the outskirts of Kaslo. The owner, A. G. Pearson, of Kaslo, discovered scheelite in the material from an old well and cleaned this out for further examination and sampling. The sand and gravel did not contain sufficient scheelite to be of value.

LUMBERTON AREA.

Moyie River Tungsten.—(49° 115° S.W.) This property on the Moyie River, just west of Lumberton, was staked by the Consolidated Mining and Smelting Company of Canada, Limited. An old shaft about 90 feet deep, sunk by the Moyie River Development Company, was unwatered and sampled for scheelite. The results were not encouraging.

PLACER-GOLD DEPOSITS.

ATLIN AREA.

SPRUCE CREEK.

There has been a large decrease in production during 1943. All the large surface operations were unable to get men and did not operate.

Dream, Shamrock, and New Year Leases, Columbia Development, Ltd.—(59° 133° N.W.) J. H. Eastman, Managing Director. Capital: 50,000 shares, $1 par; issued, 50,000. This is an underground operation working on the *Dream*, *Shamrock*, and *New Year* leases, on a lay from J. W. Noland. Due to shortage of labour, only one shift is working and even that is not at full strength.

There has been no change in the method of mining as outlined in previous reports. General conditions were satisfactory.

Several small lay operations, employing from one to three men, carried on during 1943.

Very little was done on any of the other creeks in the district during 1943.

DEASE LAKE AREA.

No activity was reported in this area in 1943.

MANSON CREEK AREA.

All the hydraulic operations have been closed for the duration. A few men are engaged on various creeks in sniping or ground-sluicing.

CARIBOO AREA.

During 1943, severe labour shortage and a reduction in water-supply seriously affected the placer operations. The number of employees was probably not more than half that of the previous year.

WILLOW RIVER WATERSHED.

Lowhee Mining Co., Ltd. (53° 121° S.W.) A. H. Lea, superintendent of this operation for many years, was absent on active duty in the United States Navy and J. House was in charge during the 1943 season. A crew averaging seven men was employed on a staggered nine-hour shift. Mr. House estimated that about 150,000 yards were washed during the season. The value per yard was lower than it was farther down the gulch. As the face of the pit is now very close to the dam between Lowhee Gulch and Grub Gulch, it will be necessary to remove this dam before the pit can be advanced. The tailings problem of previous years was overcome by providing settling reservoirs for the solids in the tailings. Thus the water entering Jack of Clubs Lake is now almost devoid of silt, and there should be no further blocking of the mouth of the Willow River.

Rouchon Creek Placers. (53° 121° S.W.) This hydraulic placer property is on Larsen Gulch and is owned and operated by T. Fry, who employed two men during the 1943 season. The actual gold-washing operation was confined to a few weeks during which time an appreciable amount of gold was recovered from an unestimated yardage of gravel. The ditch-line and the heaving ground below the sluice-boxes and tailings flume occupied the remainder of the time.

Lease of C. Risberg.—(53° 121° S.W.) C. Risberg reports a small recovery of gold from this summer's operation.

Lease of Dr. Hougen.—(53° 121° S.W.) P. McColm, layman, continued to operate a small plant on this lease.

J. Powell Estate Lease.—(53° 121° S.W.) M. Bastin and J. Chouse, laymen, continued operating this lease on Coulter Creek. They did fairly well, working a new pit which they started in 1942.

Red Gulch Placers.—(53° 121° S.W.) J. J. Gunn continued a one-man piping operation at this property, working on a lay from the Lowhee Mining Company, Limited.

Lease of E. Rask.—(53° 121° S.W.) This lease is on Devils Canyon Creek, about 5 miles west of Wells. Mr. Rask did a small amount of piping to open up a small pit.

Lease of J. C. Dyer.—(53° 121° S.W.) At this lease on Big Valley Creek Mr. Dyer worked alone on a drift and sluice operation.

Williams Creek Watershed.

Stouts Gulch.—(53° 121° S.W.) Working on a lay from the Lowhee Mining Company, Limited, R. Sehl operated a small hydraulic plant on Stouts Gulch. He made an appreciable gold recovery from portions of the rim of the old channel which had been left by the previous operators.

Mink Gulch.—(53° 121° S.E.) W. H. Savery, of Seattle, employed two men on a clean-up basis, on his lease on this gulch. He operated a small hydraulic plant.

Walker Gulch.—(53° 121° S.W.) Ernest Hansen, layman, used a No. 1 monitor on fairly deep gravels during the three weeks that water was available to him. He spent the remainder of the season sniping.

McArthur Gulch.—(53° 121° S.W.) K. Johannson continued to operate his small hydraulic plant by the Wells–Barkerville Road.

Little Valley Creek.—(53° 121° S.E.) G. Halverson, lessee, operated a one-man hydraulic operation.

J. T. A. Fleury, lessee, also worked alone on his sluicing operation.

J. J. Curtis Operation.—(53° 121° S.W.) Backed by the Van Bibber interests, J. J. Curtis began to open a pit on the east side of Williams Creek, a short distance downstream from Barkerville. The work had to be suspended pending the clearing-up of difficulties in connection with the water rights.

Antler Creek Watershed.

Waverly Placers. (53° 121° S.E.) W. Moore continued to hydraulic shallow gravels on Grouse Creek, just above the point at which it is crossed by the Cariboo Hudson road. Two men worked with him on a percentage basis. A very satisfactory recovery is reported. This was the most important operation on the Antler Creek watershed this year.

Nugget Gulch Placers.—(52° 121° N.E.) N. M. Hansen worked alone this year on the ground on Nugget Gulch leased by himself and C. Fuller, of Quesnel. The work was confined to development.

Stevens Gulch.—(53° 121° S.E.) W. F. Poquette worked for a short time on his lease, but at midsummer the plant was offered for sale.

California Gulch.—(53° 121° S.E.) C. Peterson did some spasmodic piping on his lease and spent some time prospecting for scheelite, which was found in some quantity in his concentrates.

Eight-mile Lake.—(53° 121° S.W.) M. A. Anderson, lessee, reported doing a little work at his hydraulic operation. According to his figures, the value per yard of gravel washed is very high.

Shepherd Creek.—(53° 121° S.W.) R. D. Reese piped intermittently on his lease at the head of Shepherd Creek.

Pinus Creek.—(53° 122° N.E.) J. Doody, lessee, continued development-work on his ground and reported the removal of about 550 yards this season in piping operations.

Lease of A. Holm.—(53° 121° S.E.) A. Holm and one partner worked a sluicing operation on Antler Creek and reported a satisfactory recovery.

Lease of C. Bindschedlar.—(53° 121° S.E.) This is a one-man sluicing operation located about 3 miles from the mouth of Antler Creek.

Cunningham Creek.

Lease of Wm. Beamish.—(52° 121° N.E.) Work was confined to ground-sluicing.

Lease of D. Jorgeson.—(52° 121° N.E.) D. Jorgeson was also piping on the east side of Cunningham Creek, a short distance above the old *Cariboo Hudson* base camp. He opened a small pit.

Lightning Creek Watershed.

B. and K. Placers, Ltd. (53° 121° S.W.) This company restricted its activities in 1943 to the pit at Dunbar Flats which it opened up in 1942. The face of the pit is now about 300 yards up-stream from the pit on Amador Creek. The channel is on a 2½-per-cent. grade, which should take it to the *Eldorado* tunnel. The channel is about 120 feet wide and the left side was drifted for a width of 60 to 80 feet in the 1870's. Near the left rim, where the gravel is very shallow and the clay cap was too hard to remove, the present work has revealed that 2-foot posts were used under 8-foot caps. Apparently this side of the channel was richer than the right side. The ground is from 40 to 80 feet deep and consists chiefly of boulder-clay overlying from 2 to 10 feet of glacial and Tertiary (?) gravels.

R. E. McDougall, part owner, supervised the operation. His crew averaged five men and he used a No. 2 and No. 4 monitor under a 100-foot pressure-head. Two shifts were worked daily from April 15th to August 15th when the water was good. From then until the end of the season there was only enough water for one shift. Where it was too difficult to undercut the banks with the monitors, some bank blasting was done with good results. It is estimated that about 50,000 yards were removed.

Butchers Bench.—(53° 121° S.W.) I. I. Felker continued to work on this bench and reports a very satisfactory season. He worked a small hydraulic plant and was alone for most of the season.

Ennerdale Placers.—(53° 121° S.W.) It is reported that J. Hind and partner continued operating their hydraulic plant at this ground on Grub Gulch and that they removed a small yardage.

Slade Placers, Ltd.—(53° 121° S.W.) This operation on Mostique Creek continued under the supervision of Mrs. Caldwell. It is understood that it will be permitted to operate by its backers, provided it can meet expenses. Four men were employed on the average and about 25,000 yards were piped.

Cottonwood River Watershed.

Lease of M. Murlock.—(53° 122° S.E.) Mr. Murlock reports sluicing about 300 yards on this lease on a small tributary of Mary Creek.

Lease of H. D. Wagner.— (52° 121° N.W.) Two boom-gates were operated at this property on McMartin Creek during the early part of 1943.

Fraser River.

Lease of F. DeLong.—(53° 122° S.W.) This lease is located on the down-stream side of the old *Tertiary* mine. Drifting operations were continued by DeLong and Hulatt and it is reported that a total of about 1,600 yards of gravel from the drift was sluiced.

Quesnel River Watershed.

Cariboo Northlands Mining Co., Ltd. (52° 121° N.W.) This company operates a placer operation on Cedar Creek, near the old rich diggings. Under the supervision of A. von Alvensleben, about six men were employed. A steam-shovel of ⅝-yard capacity was used to load the clayey gravels on trucks, which carried them to a washing plant at the edge of a steep high gulch to which water was available on grade from Cedar Creek. This is a temporary expedient, pending such time as more suitable equipment is available.

It is understood that the present work is being done to provide a sluice-box channel to tested ground lying ahead of the shovel location.

Operation of Ashby and Speers.—(52° 121° N.E.) A little work, chiefly maintenance, was done at this operation on the south bank of the North Fork of Quesnel River, near the mouth of Spanish Creek. The repeated damming of the water-supply by beavers proved very troublesome.

F. W. Smith.—(52° 121° N.E.) F. W. Smith erected buildings, repaired the pipe-line, and sank test-pits in the bench above the old *Ruby* pit of the old operation at the mouth of Spanish Creek.

Lease of J. Hasbrouk.—(52° 121° N.E.) Messrs. Hasbrouk and Wagner continued piping at their placer operation about 12 miles up-stream from Keithley. The work was reportedly not as successful as in previous seasons.

Burrard Placers, Ltd.—(52° 121° N.E.) This operation was closed down, but it is understood that some necessary maintenance-work was done.

Lease of Asserlind and Johnson.—(52° 121° N.E.) At this property on Weaver Creek a No. 1 monitor, under a 100-foot head, and a boom-gate were used. There was good water for three months till about the end of August. This operation is thought to be on the old high channel of Keithley Creek. There are about 25 feet of gold-bearing gravels covered by about 50 feet of clay.

McGregor and Tait.—(52° 121° N.E.) Messrs. A. E. McGregor and C. Tait were operating adjoining ground at the Keithley River Falls, approximately 8 miles from the river's mouth. Both parties used boom-gates and reportedly moved considerable ground, working from early spring until late fall.

Cameron and Harris.—(52° 121° N.E.) C. R. Cameron and F. Harris continued to work their drift operation at the mouth of Goose Creek which empties into Cariboo Lake. They went through rim-rock to an old channel, but at a point where it had been worked out. They then started a rim-rock tunnel to cut the channel above the old workings.

Olsen.—(52° 121° N.E.) W. Olsen did some drifting in search of a reported remnant of the old Keithley Channel, about a mile above Keithley.

Chester.—(52° 121° N.E.) G. Chester did some ground-sluicing on Four-mile Creek up-stream from the old *China* pit of Placer Engineers.

LILLOOET AREA.

BRIDGE RIVER WATERSHED.

Principia Placers, Ltd. (50° 122° N.E.) This company operates a small placer property on the west bank of Bridge River, opposite the mouth of Antoine Creek and about 20 miles from the town of Lillooet. Access to the property is by a suspension bridge, 236 feet long and 3½ feet wide, connected by short trail to the Moha road. This bridge was built when the venture was started in 1942.

Water is carried across the river on this bridge from Antoine Creek. A small monitor is used for washing, and a high-line operated by a gasoline double-drum hoist is used to remove large boulders. At the time of inspection, in the summer of 1943, about 1,000 yards of material had been removed from the pit. From two to five men are employed, depending on the availability of local labour, which is chiefly obtained from the Indian population.

Lease of W. Haylmore.—(50° 122° N.E.) At this property on the Hurley River, at Gold Bridge, W. Haylmore continued to advance his long exploratory gravel cut.

Lease of C. Wihksne.—(50° 122° N.E.) It is reported that C. Wihksne did some work on his placer lease at Gold Bridge. It was not visited and the nature of the work is not known.

PRINCETON AREA.

There was no reported activity in placer-gold deposits during 1943.

CLAY AND SHALE.

NEW WESTMINSTER AREA.

Clayburn Co., Ltd. (49° 121° S.W.) Company office, 850 Hastings Street West, Vancouver, B.C.; W. C. Cummings, Secretary-Treasurer; J. W. Ball, Manager. The mines and plant of this company are at Kilgard, about 50 miles east of Vancouver. The method of operating the clay deposits is by room and pillar, similar to that adopted in coal mines. An average of thirteen men is employed underground. The production for 1943 amounted to: Fireclay from Kilgard mine, 18,520 tons; No. 4B mine, 1,585 tons; No. 9 mine, 1,490 tons; and shale from quarry, 295 tons; total production, 21,890 tons.

GABRIOLA ISLAND AREA.

Gabriola Shale Products Quarry did not operate during 1943.

GYPSUM.

FALKLAND AREA.

Gypsum, Lime and Alabastine, Canada, Ltd. (50° 119° N.W.) Head office, Paris, Ontario; British Columbia office, 509 Richards Street, Vancouver; British Columbia Manager, N. Jessiman, Vancouver; Quarry Superintendent, A. Jessiman, Falkland. Capital, 500,000 shares, no par value; issued, 440,043. This company again confined its Falkland operation to the No. 2 and No. 5 quarries, 40

miles south of Kamloops, near the Kamloops–Vernon Highway. Gypsum is shipped via the Canadian National Railways to the calcining and board mill at Port Mann, B.C. The quarries operated are 500 to 600 feet higher than the railway-bunkers, to which the gypsum is transported by trucks.

The gypsum is mined in open quarries advancing into the side of the hill on which the overburden is thin. As the walls rise to a considerable height above the quarry-floors, it is necessary, for the protection of workmen, to keep the walls at a safe angle of inclination, and well barred down. The drilling is done by jack-hammers operated by compressed-air. A crew of eleven men was employed.

LIMESTONE.

KOEYE RIVER AREA.

The Koeye Limestone Co.—(51° 127° N.W.) P. Christensen, Manager. The quarries are located on Koeye River, about 7 miles from Namu. They were worked for 329 days during 1943 and produced 16,920 tons of limestone. The entire output is taken by the Pacific Paper Mills at Ocean Falls.

GRAND FORKS AREA.

Fife Limestone Quarry, Consolidated Mining and Smelting Co. of Canada, Ltd.—(49° 118° S.E.) This company owns and operates the Fife Limestone Quarry near Christina Lake. A crew of from ten to eighteen men was employed during the summer months under the direction of G. E. Clayton, of Trail. Development-work including 308 feet of drifting, 348 feet of crosscutting, 365 feet of raising, 9,858 cubic feet of slashing, and 560 cubic yards of surface-stripping was done in order to open up a new pit. A new ore-bin was built on a spur from the main line of the Kettle Valley Railroad to do away with the surface tram which was necessary in the old location. During the season lime rock amounting to 17,700 tons was mined and shipped to Trail to be used as a flux in the smelter.

TEXADA ISLAND.

Pacific Lime Co.—(49° 124° N.W.) C. Williams, Manager. Capital: 5,000 preferred, $100 par, 10,000 common, $100 par; issued, 2,500 preferred, 7,500 common. Only one quarry is operated by this company at present, at Blubber Bay. The plant produces quicklime, hydrated lime, and other limestone products and has worked to capacity during the year. About twenty-seven men are employed in the quarry.

Texada Quarry, B.C. Cement Co.—(49° 124° N.W.) The 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. Several additions have been made to the plant during 1943. R. Hamilton is in charge of operations. The number of employees is twenty-one.

Van Anda Quarries.—(49° 124° N.W.) Operated by Beale Quarries, Limited. This quarry has been greatly extended during the year and a new crushing plant has been installed for producing agricultural lime. Steady shipments of lime are made to the United States and British Columbia industries. W. D. Webster is in charge of operations. Around thirty men are employed.

VANCOUVER ISLAND.

Bamberton, B.C. Cement Co.—(48° 123° N.W.) Company office, corner of Fort and Wharf Streets, Victoria, B.C. Capital: 15,995 "A" preferred, $100 par; 15,995 "B"

preferred, $100 par; 10 common, $100 par; issued, 32,000. This company operates quarries at Bamberton and Texada Island and a cement plant at Bamberton. At Bamberton the total crew employed in the cement plant and quarry averages 117.

SILICA.

GRAND FORKS AREA.

Bailey Silica, Consolidated Mining and Smelting Co. of Canada, Ltd.—(49° 118° S.E.) This property, 3 miles south of Grand Forks, is owned by the Consolidated Mining and Smelting Company of Canada, Limited. The material mined is almost pure silica and is used as a flux in the smelting operations at Trail. A crew averaging seven men was employed under the direction of G. E. Clayton, of Trail. To date all material has been recovered from a large talus slope by shovelling with a gas-shovel into trucks which haul it to the railroad at Grand Forks. A small Diesel-driven compressor has been installed and operates drills which are used to plug and break up the large boulders. During 1943 a total of 37,340 tons was mined and shipped to Trail.

STONE, SAND, AND GRAVEL.

VANCOUVER AREA.

North Vancouver.

Deeks Sand and Gravel, Ltd.—(49° 123° S.E.) Company office, 101 First Avenue, Vancouver, B.C.; H. S. Armstrong, Secretary; T. O. Burgess, Superintendent. Six to eight men are employed.

Cascade Rock and Gravel Co.—(49° 123° S.E.) Company office, 470 Granville Street, Vancouver, B.C. This company operates the sand and gravel pits formerly belonging to the Highland Sand and Gravel Company. About twelve men are employed.

NEW WESTMINSTER AREA.

Gilley Bros. Quarry.—(49° 122° S.W.) A granite quarry is operated at Silver Valley, Pitt River, the stone being used for construction-work. Over twenty men are employed.

Maryhill Sand and Gravel Quarry.—(49° 122° S.W.) This quarry is operated by Gilley Bros. on the Fraser River bank, about 3 miles from Coquitlam. About twenty-two men are employed regularly.

NELSON ISLAND.

Vancouver Granite Co.—(49° 124° S.E.) Capital: 2,500 shares, $10 par; issued, 2,016. This company operates a dimension stone granite quarry on Nelson Island when there is a demand for stone.

VANCOUVER ISLAND.

Cassidy Gravel-pit.—(49° 123° S.W.) A. Galloway, Foreman. This quarry is located in the Cassidy area, convenient to the main Island Highway, and is operated by the Public Works Department to obtain material for highway construction and repairs as required. A crew of from three to five men has been engaged during 1943 as occasion demanded.

COAL MINES.

BY

JAMES DICKSON.

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

Inspection District.	Mining Divisions in Districts.
Coast	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, Ainsworth, Lardeau, Revelstoke, Fort Steele, 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.

PRODUCTION.

The total tonnage produced by the coal mines of the Province for the year 1943 was 1,821,654, being a decrease of 116,504 tons or 6.01 per cent. from 1942.

The Coast District, which includes Vancouver Island, Nicola-Princeton, and Northern Districts, produced 894,172 tons, an increase of 3,727 tons over 1942.

Vancouver Island Collieries produced 729,989 tons, a decrease of 8,611 tons or 1.16 per cent. from 1942.

The Northern District produced 18,124 tons, an increase of 7,104 tons or 64.55 per cent. over 1942.

The Nicola-Princeton District produced 146,059 tons, an increase of 5,234 tons or 3.71 per cent. over 1942.

The East Kootenay District produced 927,482 tons, a decrease of 120,231 tons or 11.47 per cent. from 1942.

The following table shows the output and *per capita* production daily and for the year 1943 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)	115,507	265	326	1.34	354	249	1.75	464
Comox Colliery (No. 8 mine)	200,673	265	403	1.88	498	317	2.39	633
South Wellington (No. 10 mine)	261,056	276	313	3.02	834	276	3.42	946
Wellington mine	137,366	267	177	2.90	776	150	3.43	916
Prospect mine	3,146	289	7	1.55	449	6	1.80	524
Chambers' mine	3,874	243	10	1.59	387	8	1.99	484
Loudon mine	515	179	3	0.95	171	3	0.95	171
Cassidy mine	1,928	255	6	1.25	321	5	1.51	385
Lewis' mine	646	252	2	1.28	323	2	1.28	323
Deer Home mine	1,989	206	7	1.38	284	5	1.92	397
Lake Road mine	1,826	243	4	1.67	456	4	1.67	456
Wellington No. 9	398	271	2	0.73	199	2	0.73	199
Pacific mine	467	262	2	0.89	232	2	0.89	232
Stronach mine	598	246	3	0.80	199	2	1.22	299
Middlesboro Colliery	33,201	296	106	1.06	313	72	1.56	461
Merritt coal mines	2,275	100	16	1.42	142	14	1.62	162
Granby Consolidated M.S. & P. Co., Ltd.	62,255	277	121	1.85	514	102	2.20	610
Princeton Tulameen Coal Co.	30,375	288	67	1.57	453	50	2.10	607
Tulameen mine	15,699	282	30	1.84	523	22	2.62	713
Black mine	2,254	247	8	1.14	281	7	1.30	322
Bulkley Valley Colliery	7,809	298	20	1.31	391	13	2.02	601
Telkoal Colliery	6,143	252	38	0.63	161	20	1.21	307
Cold Spring mine	128	21	2	3.04	64	1	6.09	128
Hat Creek Colliery	1,555	131	7	1.70	222	6	1.98	259
Packwood mine	1,343	115	12	0.97	112	11	1.06	122
Gething mine	1,146	163	10	0.70	114	7	1.00	163
Elk River Colliery	202,459	286	368	1.92	550	267	2.65	758
Michel Colliery	689,521	292	733	3.22	940	618	3.90	1,115
Corbin Colliery (Consolidated M. & S. Co., Ltd.)*	35,502		49					

* Surface-strip mine.

Collieries of Vancouver Island Inspection District.

The output of Vancouver Island Collieries was 729,989 tons. Of this amount, 123,540 tons or 16.8 per cent. was lost in preparation for the market; 4,492 tons or 0.6 per cent. was consumed by operating companies as fuel; 599,179 tons was sold in the competitive market; and 2,778 tons was added to stock. Of the amount sold in the competitive market 574,722 tons or 95.9 per cent. was sold in Canada and 24,457 tons or 4.1 per cent. was sold in the United States.

Collieries of the Nicola-Princeton District.

Of the gross output of 146,059 tons produced by the collieries of the Nicola-Princeton District, 5,126 tons or 3.4 per cent. was consumed by the producing companies as fuel and 488 tons was taken from stock, making a total of 141,421 tons sold in the competitive market in Canada.

Collieries of the Northern District.

Out of a total of 18,124 tons produced, 649 tons was used by the operating companies as fuel, 417 tons was added to stock, and 17,158 tons was sold in the competitive market in Canada.

Collieries of the East Kootenay District.

The output of the collieries in the East Kootenay District was 927,482 tons. Of this amount, 34,209 tons or 3.6 per cent. was lost in preparation for the market; 16,949 tons or 1.8 per cent. was consumed by producing companies as fuel; 116,485 tons or 12.5 per cent. was used in making coke; and 754,667 tons was sold in the competitive market. Of this amount, 600,428 tons or approximately 79.5 per cent. was sold in Canada and 154,239 tons or 20.5 per cent. was sold in the United States.

The following table shows the *per capita* production of the various districts for the past five years. Similar figures for the years prior to 1939 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.
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
1942	East Kootenay District	1,047,713	864	1,210	696	1,505
	Coast District	890,445	1,496	599	1,196	744
	Whole Province	1,938,158	2,360	821	1,892	1,024
1943	East Kootenay District	927,482	1,150	806	885	1,048
	Coast District	894,172	1,701	525	1,355	659
	Whole Province	1,821,654	2,851	639	2,240	813

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, 1943.

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 1943.
	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)	96,208	4,924		101,132	12,625		1,264	13,889	1,521	2,007	486		115,507
Comox Colliery (No. 8 mine)	163,113	8,348		171,461	26,633		2,142	28,675	915	1,452	537		200,673
South Wellington (No. 10 mine)	185,838	6,913		192,751	66,580		621	67,201	2,395	3,499	1,104		261,056
Wellington mine	114,872	4,272		119,144	17,187		384	17,571	353	1,004	651		137,366
Prospect mine	2,531			2,531	615			615					3,146
Chambers' mine	3,793			3,793			81	81					3,874
Loudon mine	515			515									515
Cassidy mine	1,928			1,928									1,928
Lewis' mine	646			646									646
Deer Home mine	1,989			1,989									1,989
Lake Road mine	1,826			1,826									1,826
Wellington No. 9	398			398									398
Pacific mine	467			467									467
Stronach mine	598			598									598
Totals, Vancouver Island District	574,722	24,457		599,179	123,540		4,492	128,032	5,184	7,962	2,778		729,989
Nicola-Princeton District.													
Middlesboro Colliery	28,191			28,191			5,126	5,126	161	45		116	33,201
Merritt coal mines	2,275			2,275									2,275
Granby Cons. M.S. & P. Co., Ltd.	62,466			62,466					211			211	62,255
Princeton Tulameen Coal Co.	30,536			30,536					161			161	30,375
Tulameen mine	15,699			15,699									15,699
Black mine	2,254			2,254									2,254
Totals, Nicola-Princeton District	141,421			141,421			5,126	5,126	533	45		488	146,059
Northern District.													
Bulkley Valley Colliery	7,504			7,504			250	250	165	220	55		7,809
Telkoal Colliery (Aveling)	5,778			5,778			369	369	62	58		4	6,143
Cold Spring mine (Cariboo)	98			98			30	30					128
Hat Creek Colliery	1,189			1,189						366	366		1,555
Packwood mine (Peace River)	1,343			1,343									1,343
Gething mine (Peace River)	1,146			1,146									1,146
Totals, Northern District	17,058			17,058			649	649	227	644	421	4	18,124
East Kootenay District.													
Crow's Nest Pass Coal Co., Ltd.—													
Elk River Colliery	130,543	65,747		196,290	2,160		3,772	5,932	40	277	237		202,459
Michel Colliery	439,411	88,492		527,903	32,049	116,485	13,084	161,618					689,521
Corbin Colliery (Cons. M. & S. Co., Ltd.)	30,474			30,474			93	93		4,935	4,935		35,502
Totals, East Kootenay District	600,428	154,239		754,667	34,209	116,485	16,949	167,643	40	5,212	5,172		927,482
Coal.													
Grand totals for Province	1,333,629	178,696		1,512,325	157,749	116,485	27,216	301,450	5,984	13,863	8,371	492	1,821,654
Coke.													
Crow's Nest Pass Coal Co., Ltd.—													
Michel Colliery	43,247	35,338		78,585					3,486	2,256		1,230	77,355

Collieries of British Columbia—Men Employed, 1943.

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.			
Vancouver Island District.																																	
Canadian Collieries (D.), Ltd.—																																	
Comox Colliery (No. 5 mine)	14	5	19	121		121				11	18	29	97	35	132	6	3	9											16	16	249	77	326
Comox Colliery (No. 8 mine)	17	6	23	171		171				25	25	50	100	33	133	4	6	10											16	16	317	86	403
South Wellington (No. 10 mine)	9	1	10	142		142				96	19	115	22	12	34	7	5	12													276	37	313
Wellington mine	7		7	106		106				31	21	52	6	5	11		1	1													150	27	177
Prospect mine				5		5				1		1		1	1																6	1	7
Chambers' mine	1		1	6		6	1		1					1	1														1	1	8	2	10
Loudon mine	1		1	2		2																									3		3
Cassidy mine	1	1	2	4		4																									5	1	6
Lewis' mine				2		2																									2		2
Deer Home mine	1		1	3		3	1		1		2	2																			5	2	7
Lake Road mine				4		4																									4		4
Wellington No. 9				2		2																									2		2
Pacific mine				2		2																									2		2
Stronach mine				2		2								1	1																2	1	3
Totals, Vancouver Island District	51	13	64	572		572	2		2	164	85	249	225	88	313	17	15	32											33	33	1031	234	1265
Nicola-Princeton District.																																	
Middlesboro Colliery	4	2	6	34		34	16		16	12	15	27		12	12		3	3	6	2	8										72	34	106
Merritt coal mines	1		1	10		10	1		1	1	1	2		1	1															13	2	15
Granby Cons. M.S. & P. Co., Ltd.	7	1	8	56		56	36		36		6	6	3	12	15																102	19	121
Princeton Tulameen Coal Co.	5	2	7	30		30				15	9	24		6	6																50	17	67
Tulameen mine	1	3	4	16		16				4		4	1	4	5														1	1	22	8	30
Black mine	1	1	2	3		3	3		3																						7	1	8
Totals, Nicola-Princeton District	19	9	28	149		149	56		56	32	31	63	4	35	39		3	3	6	2	8								1	1	266	81	347
Northern District.																																	
Bulkley Valley Colliery		2	2	6		6	6		6		1	1	1	3	4					1	1										13	7	20
Telkoal Colliery (Aveling)	3	3	6	8		8	8		8	1		1		12	12					3	3										20	18	38
Cold Spring mine (Cariboo)				1		1					1	1																			1	1	2
Hat Creek Colliery	1	1	2	2		2	2		2										1		1										6	1	7
Packwood mine (Peace River)		1	1	4		4	6		6	1		1																			11	1	12
Gething mine (Peace River)	1		1	3		3	3		3		1	1		2	2																7	3	10
Totals, Northern District	5	7	12	24		24	25		25	2	3	5	1	17	18				1	4	5										58	31	89
East Kootenay District.																																	
Crow's Nest Pass Coal Co., Ltd.—																																	
Elk River Colliery	11	13	24	147		147				29	32	61	80	42	122		14	14													267	101	368
Michel Colliery	28	23	51	335		335				24	24	48	229	64	293	2	4	6													618	115	733
Corbin Colliery (Cons. M. & S. Co., Ltd.)					2	2					23	23		24	24																	49	49
Totals, East Kootenay District	39	36	75	482	2	484				53	79	132	309	130	439	2	18	20													885	265	1150
Grand totals for Province	114	65	179	1227	2	1229	83		83	251	198	449	539	270	809	19	36	55	7	6	13								34	34	2240	611	2851

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

LABOUR AND EMPLOYMENT.

During 1943, 2,851 persons were employed in and about the coal mines of the Province, an increase of 491 over 1942. Taking the average of the principal mines in the Vancouver Island District, about 15 per cent. of the working-days were lost principally through night-shift and Saturday afternoon crews not working. In the Nicola-Princeton District the different collieries worked about 95 per cent. of the working-days. In the East Kootenay District the average for the year was about 96 per cent.

The table on page 92 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.

COMPETITION OF COAL PRODUCED OUTSIDE BRITISH COLUMBIA.

During 1943 the shipment of Alberta coal to British Columbia totalled 963,000 tons. This consisted of 365,000 tons of lump coal, 255,000 tons of run of mine, 189,000 tons of nut, and 155,000 tons of slack. Probably for the first time Alberta coal was used for ships' bunkers, 49,000 tons being used for this purpose.

The following table shows the amount of Alberta coal brought into British Columbia during past years:—

Year.	Short Tons.	Year.	Short Tons.
1934	123,968	1939	239,227
1935	221,748	1940	311,232
1936	244,928	1941	304,928
1937	269,023	1942	652,222
1938	238,435	1943	963,000

Of the 1,512,325 tons of British Columbia coal marketed, 174,836 tons was sold for domestic and industrial use in the Provinces of Alberta, Saskatchewan, and Manitoba; and 153,602 tons was sold for railroad use in these Provinces; 15,686 tons was sold for railroad use in the United States, and 166,417 tons was sold for railroad use in British Columbia; 163,010 tons was exported to the United States and 82,333 tons was sold for ships' bunkers. The tonnage of British Columbia coal used for domestic and industrial purposes in the Province was 756,441 tons.

ACCIDENTS IN AND AROUND COAL MINES.

During 1943, 2,851 persons were employed in and around coal mines. Eight fatal accidents occurred during the year as compared with ten during 1942. The ratio of fatal accidents per 1,000 persons employed was 2.80 as compared with 4.23 for 1942.

In 1941 the ratio was 1.47; in 1940, 2.08; in 1939, 0.67; in 1938, 3.37; in 1937, 3.17; in 1936, 2.84; in 1935, 1.67; and in 1934, 2.07; the average for the ten-year period was 2.41.

The number of fatal accidents per 1,000,000 tons produced during 1943 was 4.33; during 1942 the figure was 5.15; in 1941, 2.21; in 1940, 3.65; in 1939, 1.35; in 1938, 7.63; in 1937, 6.92; in 1936, 5.94; in 1935, 4.21; and in 1934, 4.45. The average for the ten-year period was 4.36 per 1,000,000 tons raised.

The following table shows the collieries at which the fatal accidents occurred during 1943 and comparative figures for 1942:—

Name of Company.	Name of Colliery.	1943.	1942.
Canadian Collieries (D.), Ltd.	Comox No. 5 mine	....	3
Canadian Collieries (D.), Ltd.	No. 10 mine, South Wellington	1	1
Canadian Collieries (D.), Ltd.	Wellington No. 8 mine	....	1
Granby Consolidated M.S. & P. Co., Ltd.	Granby No. 1	1	....
Crow's Nest Pass Coal Co.	Coal Creek	5	3
Crow's Nest Pass Coal Co.	Michel	1	2
Totals		8	10

The following table shows the various causes of fatal accidents in 1943 and their percentages of the whole and comparative figures for 1942:—

Cause.	1943.		1942.	
	No.	Per Cent.	No.	Per Cent.
By falls of roof and coal	3	37.50	2	20.00
By mine-cars and haulage	1	12.50	4	40.00
By bumps	4	50.00	2	20.00
Miscellaneous (underground)			1	10.00
Miscellaneous (surface)			1	10.00
Totals	8	100.00	10	100.00

The following table shows the number of tons of coal mined for each fatal accident in their respective classes in the years 1943 and 1942:—

Cause.	1943.		1942.	
	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	3	607,218	2	969,079
By mine-cars and haulage	1	1,821,654	4	484,539
By bumps	4	455,413	2	969,079
Miscellaneous (underground)			1	1,938,158
Miscellaneous (surface)			1	1,938,158
Totals	8	227,707	10	193,816

The number of tons of coal mined per fatal accident during 1943 was 227,707 tons, compared with 193,816 tons in 1942. The average for the ten-year period was 223,700 tons.

The following table shows the fatalities from various causes in coal mines during the year 1943 compared with 1942, according to Inspection Districts:—

District.	Number of Deaths from Accidents.					Totals.	
	Falls of Roof and Coal.	Mine-cars and Haulage.	Bumps.	Miscellaneous (Underground).	Miscellaneous (Surface).	1943.	1942.
Vancouver Island	1					1	5
Nicola-Princeton	1					1	
East Kootenay	1	1	4			6	5
Northern							
Province (1943)	3	1	4			8	
Province (1942)							10

Ratio of Accidents.

District.	Accident Death-rate.			
	Per 1,000 Persons employed.		Per 1,000,000 Tons of Coal mined.	
	1943.	1942.	1943.	1942.
Vancouver Island	0.79	4.17	1.37	6.77
Nicola-Princeton	2.88		6.84	
East Kootenay	5.19	5.78	6.46	4.77
Northern				
Totals (1943)	2.80		4.33	5.15
Totals (1942)		4.23		

The details regarding the occurrences of fatal accidents in coal mines during 1943 are as follows:—

The fatal accident which occurred to John W. Ridyard, miner, in No. 1 East mine, Coal Creek Colliery, on January 27th was due to deceased being suffocated by a fall of loose coal which was thrown down from the roof by a bump at his working-face. Although some 4 tons of fine coal covered deceased to a depth of 2 feet, his body was recovered within twelve minutes and artificial respiration was immediately applied but without success.

The fatal accident which occurred to Sidney Weaver, motorman, No. 1 mine, Michel Colliery, on February 20th was due to deceased being crushed under his compressed-air-driven locomotive. He was alone at the time and was dead when discovered. The accident occurred at a ventilation-door on the haulage-road. The door had to be opened to permit the passage of the locomotives and cars and apparently when deceased had approached the door with his train he had reduced the speed and walked ahead of his train to open the door and had been caught and crushed by the moving and unattended train. Deceased had been previously censured for this practice and ordered to bring all trains to a full stop before reaching the door, but had apparently ignored this order. The resistance offered by his body was sufficient to stop the train as the control-valve was slightly open when deceased was discovered.

The double fatality which occurred to Matthew Lukas and Mike Jakubiec, miners, No. 1 East mine, Coal Creek Colliery, on March 22nd was due to a severe bump in their working-place. The bump threw down some fine coal and released a considerable volume of gas which hampered the rescue operations which were started immediately.

Jakubiec was recovered within a few minutes and given first-aid treatment and taken to the local hospital, where he died from his injuries the following day. Lukas was recovered some five hours after the bump. He had been covered by fine coal and suffocated by gas and the fine coal.

The fatal accident which occurred to George Anderson, driver, No. 1 East mine, Coal Creek Colliery, on May 3rd was due to a bump which displaced some timbers and caused a cave of coal which buried deceased. Death was due to asphyxiation. The body was recovered two hours after the bump occurred.

The fatal accident which occurred to Alvar Kotilla, miner, No. 10 mine, South Wellington, on May 18th was due to a small fall of roof material which fell from between the timbers and struck him while he was loading a car. The seam was 12 feet thick at this point and deceased was bent over his shovel when struck. He died from his injuries the following day.

The fatal accident which occurred to Peter Misura, miner, No. 1 East mine, Coal Creek Colliery, on June 15th was due to a fall of overhanging coal from the side of his working-place. Deceased and his partner had been instructed to take down this overhanging coal and had tried to do so with a hand-pick but found this to be too difficult. Deceased then passed in front of the overhang to get a power-pick and the coal fell on him when he passed under the coal. There was no necessity for him to expose himself to this danger as there was ample clearance to pass with safety. Deceased suffered a fracture of the right leg but the actual cause of death was suffocation as he was covered with fine coal. His body was recovered about eight minutes after the accident and artificial respiration and oxygen applied, but he failed to respond.

The fatal accident which occurred to Samuel Lockhart, miner, No. 1 mine, Granby Consolidated Mining, Smelting and Power Company, Limited, Princeton, on October 6th was due to a fall of roof while engaged in retimbering on No. 7 North level. Deceased and his partner had removed a broken stringer and were fitting a new one. While cutting the roof-rock with a pick to make room for the new stringer a large slab of rock fell and crushed deceased, who died a few minutes later.

Of the above eight fatal accidents four were due to bumps from which the men killed had no means of protection, while in the other four fatalities greater care on the part of the deceased would have averted the accidents.

EXPLOSIVES.

The following table shows the quantity of explosives used in coal mines during 1943, 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)	21,843	115,507	36,918	5.29	0.59
Comox Colliery (No. 8 mine)	58,050	200,673	87,300	3.45	0.66
South Wellington (No. 10 mine)	64,392	261,056	61,392	4.05	1.05
Wellington mine	32,000	137,366	52,500	4.28	0.61
Prospect mine	2,100	3,146	3,200	1.49	0.65
Chambers' mine	1,440	3,874	2,600	2.69	0.55
Loudon mine	600	515	1,050	0.85	0.57
Cassidy mine	1,000	1,928	1,750	1.92	0.51
Lewis' mine	650	646	1,250	0.99	0.53
Deer Home mine	1,100	1,989	1,980	1.80	0.55
Lake Road mine	1,250	1,826	2,000	1.46	0.62
Wellington No. 9	100	398	180	3.98	0.55
Pacific mine	200	467	550	2.33	0.36
Stronach mine	800	598	850	0.73	0.94
Totals for district	185,525	729,989	253,520	3.93	0.73

Nicola-Princeton District.

Middlesboro Colliery	19,900	33,201	20,950	1.66	0.90
Merritt coal mines	2,000	2,275	2,900	1.13	0.69
Granby Cons. M.S. & P. Co.	20,750	62,255	28,500	3.00	0.72
Princeton Tulameen Coal Co.	5,500	30,375	10,500	5.52	0.52
Tulameen mine	3,800	15,699	5,000	4.13	0.76
Black mine	1,127	2,254	2,354	2.00	0.50
Totals for district	53,077	146,059	70,204	2.75	0.77

Northern District.

Bulkley Valley Colliery	800	7,809	1,200	9.75	0.66
Telkoal Colliery	2,702	6,143	3,350	2.27	0.80
Cold Spring mine	150	128	120	0.85	1.25
Hat Creek Colliery	700	1,555	1,200	2.22	0.58
Packwood mine	1,100	1,343	2,550	1.22	0.43
Gething mine	600	1,146	1,000	1.91	0.60
Totals for district	5,052	18,124	9,420	3.58	0.53

East Kootenay District.

Elk River Colliery	22,000	202,459	27,300	9.20	0.80
Michel Colliery	43,000	689,521	53,050	16.03	0.81
Corbin Colliery	1,925	35,502	825	18.44	2.20
Totals for district	66,925	927,482	81,175	13.85	0.82
Totals for Province	310,579	1,821,654	414,319	5.85	0.75

QUANTITY OF DIFFERENT EXPLOSIVES USED.

	Lb.
Monobel of different grades	284,993
Permissible rock-powder	25,586
Total	310,579

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 1943 mining-machines produced approximately 1,193,892 tons or 65 per cent. of the total.

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

District.	Number driven by		Type of Machine used.	
	Electricity.	Compressed Air.	Chain Undercutting.	Puncher Type.
Vancouver Island	....	29	20	9
Nicola-Princeton	....	29	....	29
East Kootenay	....	49	8	41
Northern	....	3	....	3
Totals	....	110	28	82

In addition to the above, 105 air-picks are used in the Crow's Nest Pass mines, East Kootenay District.

SAFETY-LAMPS.

There were 2,652 safety-lamps in use in the coal mines of the Province. Of this number 221 were flame safety-lamps of the Wolf type and 2,431 were electric lamps of various makes.

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)	44	260	24	280
Comox Colliery (No. 8 mine)	67	304	31	340
South Wellington (No. 10 mine)	14	290	14	290
Wellington mine	12	154	8	158
Prospect mine	2	20	2	20
Chambers' mine	2	12	2	12
Loudon mine	2	5	2	5
Cassidy mine	2	5	2	5
Lewis' mine	1	2	1	2
Deer Home mine	3	18	3	18
Lake Road mine	1	13	1	13
Wellington No. 9	2	2	2	2
Pacific mine	1	2	1	2
Stronach mine	1	6	1	6
Totals for district	154	1,093	94	1,153

NICOLA-PRINCETON DISTRICT.

Middlesboro Colliery	70	.....	7	63
Merritt coal mines	21	.....	3	18
Granby Cons. M.S. & P. Co.	107	.....	7	100
Princeton Tulameen Coal Co.	74	.....	4	70
Tulameen mine	22	.....	2	20
Black mine	7	.....	2	5
Totals for district	301	.....	25	276

NORTHERN DISTRICT.

Bulkley Valley mine	34	.....	4	30
Telkoal Colliery	34	.....	4	30
Cold Spring mine	.....	.....	.....	.....
Hat Creek Colliery	2	.....	2	.....
Packwood mine	1	11	1	11
Gething mine	12	.....	1	11
Totals for district	83	11	12	82

EAST KOOTENAY DISTRICT.

Elk River Colliery	330	.....	30	300
Michel Colliery	680	.....	60	620
Corbin Colliery	.....	.....	.....	.....
Totals for district	1,010	.....	90	920
Totals for Province	1,548	1,104	221	2,431

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 eleven mines and underground at seven.

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.	Average H.P.
Above ground—	
Winding or hoisting	2,260
Ventilation	1,825
Haulage	388
Coal-washing	2,733
Miscellaneous	8,656
Total horse-power	15,862

Nature of its Use.	Average H.P.
Underground—	
Haulage	1,478
Pumping	1,260
Coal-cutting	
Miscellaneous	43
Total horse-power	2,781
Total horse-power above and below ground	18,643

Of the above, approximately 18,293 horse-power was operated 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 the production of methane makes it necessary to have a separate ventilating split for each long-wall and even a liberal supply of air passing along the faces. The additional gas released by intermittent roof movements makes it necessary to prohibit shot-firing for some time. In such cases the Inspector orders that no shot-firing shall be done until further inspection and report.

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.

The work of sampling mine-air was maintained throughout the year according to the conditions existing or anticipated. While the results of the analyses of the samples are not as immediately available as the information obtained by the methane detectors or the flame safety-lamp, the report of analyses form a valuable record and offer a means of checking the accuracy of the other means of methane testing. During the year 173 samples were taken.

INSPECTION COMMITTEES.

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

committees generally display an efficient interest in their work and as the personnel is changed at three- or six-month intervals a large number of the miners have, in the course of years, been brought directly into this work, which should provide an added safety factor.

A report of each monthly inspection is sent to the District Inspector of Mines.

COAL-DUST.

During the year the sampling and analyses of coal-dust was well maintained and a total of 1,280 samples was analysed.

Very few samples showed less than 50 per cent. incombustible content and in such cases further treatment with lime dust is immediately ordered and the same course is adopted where a tendency for the incombustible content of samples to decrease is noted.

DANGEROUS OCCURRENCES.

On January 9th a fire occurred in the locomotive roundhouse at the tipple of No. 10 mine, Canadian Collieries (D.), Limited, South Wellington. The building was totally destroyed and two locomotives were considerably damaged. No person was injured and the origin of the fire could not be determined.

On January 27th a small local bump occurred at one of the working-faces in 26 West No. 1 East mine, Coal Creek Colliery. There was little damage caused by the bump but a miner was suffocated by the loose coal thrown down by the bump.

On February 3rd in No. 8 mine, Comox Colliery, some loaded cars had been switched in the shaft-bottom on the night shift, when no hoisting was carried on, and one of the cars had been pushed partly on to one of the cages and this had not been noticed. In the early morning the stableman entered the top cage and signalled to be lowered. The car on the lower cage caused that cage to jam in the shaft and tear out several lengths of the guides. No person was injured.

On February 13th a bump occurred in No. 1 East mine, Coal Creek Colliery, which broke some timbers and deranged the ventilation in part of No. 26 West district. No person was injured.

On February 13th, at 2.50 p.m., a bump occurred in 22 East area, No. 1 East mine, Coal Creek Colliery, which did considerable damage. Some ventilation stoppings were thrown out and one roadway was tightly caved over a length of 180 feet. There were no persons in the mine at the time of the bump, the effect of which was felt on the surface and led to investigation. At 7.30 p.m. a second bump occurred in the same general area. This bump blew out stopping and deranged the ventilation and heaved the floor about 2 feet over a distance of 200 feet.

On February 15th two bumps occurred in No. 1 East mine, Coal Creek Colliery, without doing any serious damage. These occurred about three hours apart and were apparently a follow-up of the more serious bumps which occurred on February 13th.

On February 16th two snow-slides came down the mountain above Coal Creek Colliery and did considerable damage to surface installations, including the breaking of the main steam-line from the boilers, but no person was injured.

On February 17th at No. 8 mine, Comox Colliery, a car was being put on a cage at the surface landing and when the car was partly on the cage it was found that the cage was too high and a signal was given to slightly lower the cage. Due to some confusion in the signals, the cage was raised and the car fell to the bottom of the shaft where a small amount of damage was done. The signalling system was found to be in perfect working-order. No person was injured.

On March 27th a severe bump occurred in one of the working-places in No. 1 East mine, Coal Creek Colliery, which caused the death of two miners. One was covered and suffocated by loose fine coal and the other suffered injuries from which he died the following day.

On April 20th a bump occurred in the vicinity of 20 East slope, Coal Creek Colliery, and broke the compressed-air lines in several places and did other incidental damage. No person was injured.

On May 3rd a slight bump occurred in the vicinity of the main level No. 1 East mine, Coal Creek Colliery. This displaced a quantity of fine coal which covered and suffocated a driver.

On May 18th, at No. 5 mine, Comox Colliery, while a loaded car was being raised from the surface landing to the tipple landing, some confusion in the signals resulted in the cage being hoisted to the surface landing before the car was secured on the cage. The car ran off the cage and fell to the shaft-bottom where some damage was done, but no person was injured. The signalling system was found to be in perfect working-order.

On August 20th an outburst of gas occurred at a working-face in the extreme dip workings of No. 1 Diagonal slope, No. 10 mine, Canadian Collieries, South Wellington. A considerable amount of coal was displaced and the roadway was completely filled with loose, fine coal for a distance 15 feet back from the face. The outburst followed immediately the firing of a shot in the face. All men were immediately withdrawn from the district and no person was injured.

On October 9th at No. 5 mine, Comox Colliery, a short-circuit occurred in the armoured electric cable in the air drift and caused a small fire which was noticed at once and extinguished. No further damage was done and no person was injured.

On November 15th at No. 3 South mine, Middlesboro Collieries, Limited, when the fireboss was making his inspections prior to the morning shift entering the mine he discovered that the main entrance was on fire about 200 feet inside the portal. It was found that the fire was beyond direct control and the mine was sealed off. This mine was being reopened after being shut down for a number of years and the recovery operations had extended to a point some 1,200 feet from the portal. The ventilation was good and there had not, at any time, been any indications of spontaneous combustion and there had not been any men at work underground for forty hours prior to the discovery of the fire. No person was injured by the occurrence.

On December 7th an outburst of gas occurred at a working-face in the extreme dip working of No. 7 Diagonal slope, No. 10 mine, Canadian Collieries (D.), Limited, South Wellington. The gas cleared up sufficiently to permit work to be resumed a few hours later. Only a comparatively small amount of coal was thrown out by this outburst. No person was injured by this occurrence, which happened immediately after the firing of a shot in the face.

On December 17th an outburst of gas occurred in a working-face in the extreme dip workings of No. 1 Diagonal slope, No. 10 mine, Canadian Collieries (D.), Limited, South Wellington. The gas was cleared out some eighteen hours later. A considerable amount of coal was displaced by this outburst. No person was injured by this occurrence, which occurred immediately after the firing of a shot in the face.

BUMPS.

During 1943 a number of bumps of varying intensity and magnitude were experienced in No. 1 East mine, Coal Creek Colliery. Some of these were very local in effect while others affected a considerable area of the workings.

The main adit-tunnel of this mine extends for some 2 miles on the strike of the seam and all the bumps experienced during recent years have occurred in the inner part of the mine, which is more than 2,000 feet below the surface.

Largely on account of the recurring bumps the inner part of the mine was abandoned during 1943 and all operations were removed to areas nearer to the portal. Permanent seals were erected which isolate the inner half of the mine.

Following are brief details of the more serious bumps during 1943 as they affected life and property:—

On January 27th a small bump occurred at one of the working-faces in No. 26 West section. One of the miners in the place was thrown down and covered by the fine coal released by the bump. Very little damage was caused to the place.

On February 13th, at 2.50 p.m., a bump occurred in the 22 East area which did considerable damage. Some ventilation stoppings were displaced and one roadway was tightly caved over a length of 180 feet. This bump was distinctly felt on the surface.

At 7.30 p.m. on the same day a second bump occurred in this area which displaced additional stoppings, deranged the ventilation, and heaved the floor in one roadway about 2 feet for a distance of 200 feet.

On February 15th two bumps of moderate violence were experienced in the 22 East area with about three hours' interval between the bumps. These did little damage and were apparently related to the more serious bumps which occurred on February 13th.

On March 27th a bump occurred in one of the working-places in No. 26 West which resulted in the death of two miners in the place. One was suffocated by being covered by fine coal and the other suffered injuries from which he died the following day. There was very little damage done to the working-place.

On April 20th a bump occurred on the main haulage-road in the 20 East area, which caused some falls of roof and broke the air-lines in several places.

On March 27th a severe bump occurred on the main haulage-road in the 24 West area that resulted in the death of a driver who was covered and suffocated by fine coal shaken down by the bump. His horse was not covered but died, apparently from the shock, two hours after the bump.

OUTBURSTS.

During 1943 a number of outbursts of gas and coal were experienced in the No. 10 mine of the Canadian Collieries (D.), Limited, at South Wellington. These have all occurred in the extreme dip workings of the No. 1 Diagonal slope area where the seam is at approximately 1,000 feet depth and at about the same depth at which a large number of outbursts were experienced in the adjacent and now abandoned No. 1 mine, Cassidy Colliery, a number of years ago. As in the case of the Cassidy mine, these outbursts were encountered by the workings being driven down the pitch of the seam and increased in violence and magnitude with depth as far as advance has been made.

The first blowouts consisted largely of sudden emissions of gas with the coal at the working-faces being loosened but not displaced; while as places were further advanced to the dip the loosened coal at the face was pushed outwards into the roadways; while still further advance to the dip encountered outbursts that projected large volumes of coal into the open workings. While none of the outbursts in No. 10 mine have reached the magnitude of some experienced in the adjacent Cassidy mine, some of them have displaced several hundred tons.

So far in No. 10 mine, these outbursts have followed closely the firing of a shot in the coal-face, the interval of time varying from actually accompanying the shot to a maximum of five minutes later.

The "Coal-mines Regulation Act" requires that only one shot-hole may be loaded in a place at one time and that the shot be fired and the place be re-examined by the fireboss before another shot-hole is loaded. As it is customary for a fireboss to fire *several shots on one visit to a working-place, and as the time interval of loading* and firing the second or succeeding shots might coincide with an outburst induced by previous shots, a system of firing two shots simultaneously has been introduced with *a two-hour interval between the shots fired in any one place. All shots in this section* are fired electrically from a distance of 300 feet, and all men dependent on one roadway as a means of exit are withdrawn this distance when shots are being fired.

This system has so far proved satisfactory, as all the recent outbursts have immediately followed the firing of these double shots. Normally none of the places in the affected area give off any quantity of methane that would indicate that an outburst was pending, nor does advance drilling, which may penetrate a zone which later may blow out, give any indication of the danger.

PROSECUTIONS.

During 1943 there were thirteen prosecutions for infractions of the "Coal-mines Regulation Act," as follows:—

Date.	Colliery.	Occupation of Defendant.	Offence charged.	Judgment.
March 13	Michel	Motorman	Allowing persons other than switchman to ride on motor	Fined $10 and costs.
March 13	Michel	Four workmen	Riding on motor without permission	Each fined $5 and costs.
April 3	Michel	Two miners	Not setting sufficient sprags to undermined coal	Each fined $7 and costs.
April 8	Michel	Fireboss	For unlawfully charging and tamping a second hole before the first shot was fired	Fined $20 and costs.
Oct. 30	Princeton Tulameen	Power-house helper	Unlawfully riding on cars underground	Fined $5 and costs.
Oct. 30	Princeton Tulameen	Night-watchman	Failing to report above contravention of rules	Fined $5 and costs.
Dec. 1	Elk River	Fireboss	For unlawfully charging and tamping a second hole before the first shot was fired	Fined $10 and costs.
Dec. 22	Michel	Two drivers	Allowing horses to proceed along haulage-road unattended	Each fined $5 and costs.

GOVERNMENT MINE-RESCUE STATIONS.

The Department of Mines maintains four fully-equipped mine-rescue stations in charge of trained instructors. These are located in the chief mining centres of Nanaimo, Cumberland, Princeton, and Fernie. Those at Nanaimo and Cumberland are for the service of the coal-mining industry in the respective areas, while the stations at Fernie and Princeton serve both coal and metalliferous mining.

In addition to above, the Department has maintained a fully-equipped station at Middlesboro under the supervision of the Middlesboro Collieries, Limited. Since the beginning of the current year these mines have closed down and the equipment from the rescue-station has been transferred to Princeton.

The above rescue-stations provide a full course in mine-rescue work without charge to any men who are physically fit and who volunteer for this work and a number of men outside the mining industry have taken this training; these latter include members of fire brigades and others.

Since the inception of the war there has been a scarcity of the younger men from the mines who formerly took up this work and maintained a regular training, and it is difficult to interest the older men who may be still physically fit to undergo the arduous training schedule which consists of a minimum of twelve two-hour training periods in the actual use of the self-contained oxygen apparatus and Burrell all-service gas-masks in an irrespirable atmosphere.

All of the above rescue-stations are also centres for the instruction of first aid under the St. John Ambulance Association and are, at present, centres for air-raid precaution work and serve as casualty stations.

During the year, in addition to the regular teams in training, thirty-six new men took the full training and were granted certificates of competency:—

Cert. No.	Name.	Where trained.	Cert. No.	Name.	Where trained.
1146	William P. MacDermott	Princeton.	1164	Paul Galarneau	Copper Mountain.
1147	Alexander Adamic	Princeton.	1165	Jacob Anton	Copper Mountain.
1148	Emgott Swanson	Princeton.	1166	Wilfred G. Johnson	Copper Mountain.
1149	Herbert Kraft	Princeton.	1167	Peter Lapeyre	Copper Mountain.
1150	Tho. Sapsford Wilson	Chapman Camp.	1168	Edwin R. Tregunna	Copper Mountain.
1151	Robert John L. Barrett	Chapman Camp.	1169	Isaac Kasdorf	Copper Mountain.
1152	Richard Clements Thompson	Chapman Camp.	1170	Richard C. Taylor	Copper Mountain.
1153	Allan Nelson Cushing	Marysville.	1171	Alexander Dean	Cumberland.
1154	Joseph John Rollheiser	Kimberley.	1172	George Nasadyk	Merritt.
1155	Lisle Ballantyne Gatenby	Kimberley.	1173	Alexander H. Ewart	Merritt.
1156	Harold Robert Hammond	Kimberley.	1174	Carl W. Jurreit	Merritt.
1157	Francis Gordon Shannon	Kimberley.	1175	Matthew C. Moodie	Merritt.
1158	Marcel Edward Cantwell	Kimberley.	1176	George M. Fairley	Merritt.
1159	John Gordon McCullough	Kimberley.	1177	Leslie Williamson	Merritt.
1160	Ridgeway William Wilson	Kimberley.	1178	James A. Hoggan	Merritt.
1161	James A. Dale	Copper Mountain.	1179	Alexander Morris	Merritt.
1162	Philip E. Olson	Copper Mountain.	1180	George W. Ferguson	Merritt.
1163	Leo R. Morris	Copper Mountain.	1181	Albert Littler	Fernie.

SUPERVISION OF COAL MINES.

During the year twenty-four companies operated thirty-five mines employing 2,240 men underground. In the supervision of underground employees there were eleven managers, seventeen overmen, and 112 firebosses and shotlighters; or one official for every sixteen men underground.

"COAL SALES ACT."

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.
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.
Cassidy-Wellington	Cassidy mine (Cassidy)	A. H. Carroll.
Middlesboro	Middlesboro (Merritt)	Middlesboro 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.
Crow's Nest, Elk River	Elk River (Coal Creek)	Crow's Nest Pass Coal Co., Ltd.
Crow's Nest, Michel	Michel (Michel)	Crow's Nest Pass Coal Co., Ltd.
Black Yale	Black mine (Princeton)	Inland Collieries, Ltd.
Jackson Tulameen	Jackson Colliery (Princeton)	British Lands, Ltd.
Merritt Diamond Vale	Diamond Vale Colliery (Merritt)	Merritt Coal Mines, Ltd.
Telcoal	Telcoal Colliery (Telkwa)	Telkoal 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 1943, the first on May 19th, 20th, and 21st, and the second on November 18th, 19th, and 20th. The total number of candidates at the examinations were as follows: For First-class Certificates, 1 (1 passed); for Second-class Certificates, 6 (2 passed, 1 passed with supplemental, and 3 failed); for Third-class Certificates, 20 (12 passed and 8 failed), and for Mine Surveyor, 1 (1 passed).

The following is a list of the candidates who successfully passed in the various classes:—

First-class Certificate.—Walter McKay.

Second-class Certificate.—Thomas O. Heyes and Daniel Chester.

Third-class Certificates.—Thomas W. Holley, Albert Littler, Joseph Kraus, David Thewlis, Thomas F. Krall, Lawrence Hutchison, Henry S. Hughes, Archibald R. Gee, Louis F. Gall, Gregor McGregor, Walter Barber, and James Corrigan.

Mine Surveyor's Certificate.—Thormod Andersen.

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 1943 there were 213 candidates for coal-miners' certificates; of these 204 passed and 9 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 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.

INSPECTION OF COAL MINES.

VANCOUVER ISLAND INSPECTION DISTRICT.

NANAIMO.

BY

JOHN MACDONALD.

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, Cumberland, B.C.; R. K. Smart, Assistant Superintendent, Nanaimo, B.C.

No. 10 Mine, South Wellington.—(49° 123° S.W.) W. Frew, Manager; Joseph Wilson, Overman; A. Hannah, T. Jordan, E. Heyes, J. McArthur, W. Roper, D. McMillan, F. Johnstone, F. Bell, and T. McCann, Firebosses. This mine is situated in the Cranberry district, about half a mile south of the old No. 5 mine, and maintains its position as being the chief producing mine in the district, with a total production of 261,057 tons over a working period of 266.5 days with an average crew of 235 men employed underground and thirty-five on the surface. The major portion of the above tonnage has come from pillar-extraction and the driving of the necessary roadways incidental to such operations. The total distance the pillars have been drawn back from the boundary pillar adjacent to the old Granby No. 1 mine abandoned workings varies from 500 feet in the No. 4 Right district to 1,200 feet in the Main slope section. The excellent recovery accomplished to date may be attributed to the fact that this mine is worked on a three-shift basis, ensuring maximum production in a minimum period of time, coupled with the fact that the closest supervision and care is constantly exercised by all officials and workmen directly engaged in this class of work.

First-aid requirements have been well taken care of during 1943, nine emergency stations being maintained in addition to the main station in the lamp cabin where the main stock of supplies is stored. All emergency stations are examined frequently by a competent person who replaces bandages, etc., as required.

Four dangerous occurrences were reported during 1943; one of these dealt with a fire which completely destroyed the roundhouse and seriously damaged two locomotives, the other three were in connection with outbursts of gas, necessitating the withdrawal of the men from the sections immediately affected. Two mine-rescue teams of six men each have kept up regular training comprising one two-hour period monthly, when the teams assemble the apparatus and work out a practical problem in the experimental mine adjacent to the mine-rescue station at Nanaimo. General working conditions have been found fairly satisfactory in the course of inspection, excepting on those occasions when abnormal emissions of methane caused the imposition of blasting restrictions on certain workings pending the removal of all visible gas-caps from the general body of the air.

Apart from the conditions mentioned above, the ventilation has been generally good throughout the year. At the last inspection in December the fan was delivering a total quantity of 105,200 cubic feet of air a minute for the use of eighty-three men. Thirty-two samples of air were collected in the various return airways, the methane content of these varying from 0.17 per cent. in the main West return to 0.96 per cent. in the main East return. One hundred and thirty-seven samples of dust were gathered from the roadways, all of which were well above the minimum standard of incombustible content as set by the Coal-dust Regulations. Lime-rock dust, amounting to 135 tons, was used in treating 30,000 feet of roadways. One hundred and thirty-one accidents were reported and investigated; of these, one ended fatally; five were in the

serious class; while the balance were tabulated as minor accidents, although many of the latter involved the loss of considerable time.

Wellington Mine.—(49° 124° S.E.) A. Newbury, Manager; J. Sutherland, Overman; A. Bennett, J. Brown, J. Marrs, T. McCourt, A. Kirkham, and J. Wilson, Firebosses. 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 coal is hauled by a fleet of trucks operated by F. W. Beban Company under contract with the coal company. Production for the year amounted to 137,366 tons over a working period of 267 days, with an average crew of 140 men employed underground and eighteen on the surface. The surface plant and underground equipment have been described in previous annual reports, the only addition being the installation of a new electric pump in No. 1 Diagonal slope to cope with the extra surface water entering the mine through the broken ground caused by the settlement of the long-wall areas. Development-work during the year was limited to the driving of a roadway from No. 1 wall haulage-road to the surface, a distance of 650 feet, to serve as an airway for this part of the mine and also to facilitate the development of a portion of the field lying to the rise of the old No. 1 wall. This mine has been operating in a limited area of the Wellington seam and is rapidly approaching the exhaustion stage, eight long-wall faces being finished in 1943. At the moment of writing, it is anticipated that all available coal will be extracted about the end of May, 1944.

Although the roadways are naturally wet throughout, seventy-two samples of dust were collected in the vicinity of the main loading stations, all of which were well above the minimum standard of incombustible content as set by the Coal-dust Regulations; 6,000 lb. of lime-rock dust were used around the above areas and on the main travelling-way for illuminating purposes on this roadway. Excepting on those occasions when crushing and breaking occurred on the walls, working conditions have been found satisfactory in the course of inspection. The ventilation has always been exceptionally good in this mine, the quantity passing in the Main return at the last inspection in December measured 48,000 cubic feet of air a minute for the use of sixty-two men and five horses. Safety-lamp readings indicated a very faint trace of methane at the testing station on the above roadway. Twelve samples of air were taken during 1943, the analyses showing not more than a trace of methane in all samples. Sixty-one minor accidents were reported and investigated; it is gratifying to report that no serious or fatal accidents occurred in 1943.

Prospect Mine, Extension.

(49° 123° S.W.) M. Brodrick, Fireboss. This mine is situated at Extension, on the southerly end of the " Harewood Ridge " and operates in the Wellington seam. Production for 1943 amounted to 3,761 tons over a working period of 289 days with an average crew of six men employed. Because of the broken nature of the ground, No. 3 dip development was abandoned and all work concentrated on the recovery of the available coal adjacent to the slope. A new road was driven along the high side of old No. 1 Left level and a connection put through to the surface to serve as an airway and outlet for the workings on the left side of the Main slope. Considering the faulted nature of the strata and the difficulty experienced in driving suitable connections, the ventilation and working conditions in general have been found fairly satisfactory in the course of inspection. At the last visit in December, 1,600 cubic feet of air was entering the right side air-drift for the use of five men. Three minor accidents were reported and investigated.

White Rapids Mine.

(49° 123° S.W.) This property lies in Section 3, Range 1, in the Cranberry district, and is located close to the Nanaimo River, approximately 2,200 feet in a south-easterly direction from No. 17 Incline outlet of the abandoned Extension No. 3 mine. A programme of

prospecting and diamond-drilling was carried out during the latter part of 1943 to determine the extent and workable area of the Wellington seam in this locality. This provided sufficient data to warrant plans being prepared to open a new mine and progress was being made at the end of the year in the grading of a site for a tipple and entrance to the proposed new slope. It is anticipated this roadway will reach the seam at a distance of 500 feet from the surface.

Deer Home No. 1 Mine. (49° 123° S.W.) Robt. Hamilton and Associates, Operators; Robt. Hamilton, Overman. This mine was situated in the Extension district and operated in a small portion of the Wellington seam that was left in this area by former operators. All coal that could be extracted with safety was recovered at the end of August, all material withdrawn and the mine portal permanently closed off by a solid cog. This mine operated ninety-nine days during the period January to August, 1943, inclusive, and produced 1,275 tons with an average crew of six men engaged. Working conditions generally were found fairly satisfactory during the course of inspection.

Deer Home No. 2 Mine. (49° 123° S.W.) Robt. Hamilton and Associates, Operators; Robt. Hamilton, Overman. This is a new mine, situated approximately 1,500 feet in a south-easterly direction from the old Vancouver slope, and is being developed with a view to recovering some pillars presumably left intact in this area when Extension No. 3 mine was abandoned. The slope has been driven a distance of 220 feet from the surface, mostly through gravel and old waste ground, and two levels set off to the right which are now being driven as skip places alongside two of the pillars mentioned above. The equipment was moved from Deer Home No. 1 mine and a tipple and bunkers built at the new location in July. It may be mentioned in passing that operations were begun to prepare the ground for this mine in May, with the intention of having it ready for production when the No. 1 mine was exhausted, the full crew moving over to the new mine at the end of August. During the period May to December, 1943, inclusive, this mine worked 124 days and produced 709 tons with an average crew of four men. Conditions in general have been found satisfactory at all inspections, the workings being ventilated by natural means pending the development-work reaching the stage requiring the installation of a fan. No accidents were reported during the year.

Chambers' No. 3 Mine. (49° 123° S.W.) R. H. Chambers, Operator and Fireboss. This mine is situated in the Extension district and is operating a portion of the Wellington seam left in this area when Extension No. 3 mine was abandoned. The seam here is badly faulted and the management was compelled to abandon any further development to the dip when the slope had reached a point 800 feet from the surface. Production for 1943 amounted to 3,762 tons over a working period of 243 days, with an average crew of seven men engaged. The major portion of this output has come from pillar-extraction and the recovery of top coal in old roadways. Considering existing circumstances, working conditions have been found fairly satisfactory during the course of inspection. One minor accident was reported and investigated.

Lake Road Mine. (49° 123° S.W.) George Frater, Operator and Overman. This mine is situated in the vicinity of the old Beban mine and is operating in a section of the Wellington outcrop left in this locality when Extension No. 1 mine was abandoned. Production during 1943 amounted to 1,832 tons over a working period of 243 days, with an average crew of four men engaged. Working conditions have usually been found satisfactory in the course of inspection. One minor accident was reported and investigated.

Lewis' Nos. 2 and 3 Mines.

(49° 123° S.W.) These small mines are situated in the Harewood district and have been operating in isolated portions of the Wellington seam left in this area when Harewood mine was abandoned. The No. 2 mine was recovering some coal in the vicinity of the old Harewood Main tunnel; this was worked out and the tunnel closed off at the end of May. The No. 3 mine has been opened on the "Harewood Ridge," where one of the old inclines was driven through to the surface. This roadway was skipped and repaired for a distance of 350 feet from the surface and the incline pillars are now being drawn back. These mines worked a total of 252 days in 1943 and produced 665 tons with two men engaged. To gain access to the No. 3 mine a roadway 700 feet in length was built from the main highway up the ridge to the tipple. General working conditions have been found fairly satisfactory at all visits of inspection. One accident was reported and investigated during the year.

No. 5 Mine, Cassidy.

(49° 123° S.W.) J. McKellar and Associates, Operators; J. Neen, Fireboss. This mine is situated in the Cassidy district and is working a portion of the Douglas seam lying to the south of the abandoned Granby No. 2 mine. Production during 1943 amounted to 1,927 tons over a working period of 137 days with an average crew of five men engaged. Working conditions in general have been found satisfactory throughout the year. One minor accident was reported and investigated.

Loudon's No. 3 Mine.

(49° 124° S.E.) Wm. Loudon, Operator and Fireboss. This mine was situated in the Wellington district and operated in a small portion of outcrop coal left in this locality by former operators. Production during the period January to September, 1943, inclusive, amounted to 532 tons in 157 working-days with two men engaged. All available coal that could be mined with safety was extracted at the end of September, the material withdrawn and the mine portal securely fenced off. Preparations were made in November to drive a new slope to tap a portion of the upper Wellington seam that was left when old No. 9 mine was closed. During the last two months of the year the slope has been driven a distance of 50 feet to reach the seam, tipple, and bunkers built at the mine and a branch roadway built from the highway into the mine yard. No accidents were reported from these operations during the year.

Pacific No. 2 Mine.

(49° 124° S.E.) F. John and H. Gerloch, Operators; F. John, Overman. This mine is situated in the Wellington district and is also operating in a portion of the upper Wellington seam left near the outcrop by former operators. There is very little cover over the seam in this area and short slopes are driven to tap the seam as required. This mine worked 262 days during 1943 and produced 474 tons with a crew of two men engaged. Ventilation is produced by natural means and working conditions have been found satisfactory at all visits of inspection. No accidents were reported from this mine.

Stronach No. 2 Mine.

(49° 124° S.E.) C. Stronach, Operator; F. John, Overman. This mine is situated in the Wellington district and is operating in the upper Wellington seam, which is reached by a short slope from the surface. Production was 585 tons over a working period of 246 days in 1943 with an average crew of three men engaged. Two levels have been driven to the right of the slope, one of which made contact with one of the long-wall faces in the first Left district of old No. 9 mine; these old workings are badly caved in places and cannot be used in the meantime as a second outlet. A new roadway is being driven for this purpose from the first Right level back up to the surface. Working conditions have been found satisfactory in the course of inspection, while a plentiful supply of fresh air is provided as a result of the connection being made with old No. 9 mine. One minor accident was reported and investigated during the year.

Old No. 9 Mine. (49° 124° S.E.) R. B. Carruthers and W. Wakelam, Operators; R. B. Carruthers, Fireboss. The above operators have worked this property under lease from Canadian Collieries (Dunsmuir), Limited, and completed the recovery of all available coal at the end of April. The operations are confined to a small section of outcrop coal lying to the left of the old slope. In an effort to locate some pillars presumably left intact in the lower Wellington seam in the immediate vicinity of old No. 9 mine, a new slope was driven to contact the old Wellington workings. While this exploratory work has met with a fair measure of success, the search for these pillars has proved to be somewhat disappointing. Production for 1943 amounted to 398 tons over a working period of 271 days with a crew of two men engaged. No accidents were reported during the year.

Old No. 1 Mine, Lantzville.—(49° 124° S.E.) Frank and Joseph Michek, Operators. During the period January to March, 1943, inclusive, these men worked thirty-three days and recovered 50 tons from the old surface dump, and finally abandoned this work at the end of March.

COMOX.

BY

R. B. BONAR.

No. 8 Mine, Comox Colliery. (49° 125° N.E.) James A. Quinn, Manager; Arthur W. Watson, Overman; Daniel Morgan and Thomas Robertson, Shiftbosses; John Anderson, William Bennie, Frank Coates, Muir Frame, George Harvie, Sydney Hunt, William Johnstone, Alfred Maxwell, John Queen, Thomas Shields, Edward Surtees, John W. Smith, James Weir, Daniel Waddington, and Frank Woods, 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, but the No. 2 seam, which lies at a depth of 700 feet, is the only one being operated at the present time, although the lower or No. 4 seam workings are being kept unwatered with the view to future development. In the No. 2 seam, before opening out on the long-wall advance system of work, a circular shaft pillar 1,000 feet in diameter was left and only narrow openings driven through it. Most of the active workings are at present confined to the South side of the shaft; except that on the North side of the shaft the Main level has been brushed and regraded, and a slope turned off which is now down 300 feet. There is also 500 feet of long-wall face in operation on this side of the shaft. The main South level and accompanying 300-foot long-wall advanced 600 feet during 1943 but are now inactive due to a thinning of the seam. The No. 2 Incline was driven 300 feet but has been inactive during the latter part of the year, due to faulted ground. There are two single unit long-walls, each 300 feet in length, advancing to the south off No. 2 Incline. No. 1 Incline advance wall and the left side workings off No. 1 Incline are inactive, being cut off by faults, with production confined to the right side, which has three tandem walls advancing along the strike in echelon. Altogether there are ten long-walls in operation, three tandem units and four single units, their total length aggregating 3,000 feet, with an average seam thickness of 3 feet 6 inches, including rock bands or bony coal. An airway was driven from the North side workings to the bottom of the upcast shaft.

The long-walls and levels are undercut by means of Anderson-Boyes compressed-air long-wall machines, and the 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 1¼-ton capacity mine-cars. 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 supervision and care. The average daily output of coal during the month of December was 722 long

tons, with 265 men employed underground and thirty-eight men on the surface. A 7-stage centrifugal pump direct connected to a 150-horse-power electric motor and located in the fire-proof pump-room near the Main shaft bottom handles the mine water. The haulage in the main South level district is handled by an Ironton storage-battery locomotive which is serviced in the fire-proof charging-station located on the main South level just inby No. 1 Incline.

The mine ventilation is supplied by a Sullivan fan and at the time of the December 9th inspection gave a total quantity of 179,000 cubic feet of air per minute against a 6.8-inch water-gauge. Each wall has a separate split and where tandem walls are in operation the middle or escape road is used as a common return. Twenty-four samples of mine-air were taken and analysed 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 0.46 per cent. A total of 268,100 lb. of limestone-dust was used underground during the past twelve months, 89,000 lb. being used in tamping shots and 179,100 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; also several sprays of the atomizing type have been installed on the lower portion of No. 1 Incline to allay the coal-dust there. Two hundred and sixteen 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.

The compressed air for the underground machinery is supplied by three electric-driven compressors having a rated capacity of 4,970 cubic feet of air per minute, which are located on the surface near the main hoisting-shaft engine-room.

The wash-house, put into operation on August 1st, 1943, has a capacity of 400 lockers with thirty sprays and a drying-room for wet clothes. A new first-aid station was built on the surface and is fully equipped to comply with the requirements of the Workmen's Compensation Board.

No. 5 Mine, Comox Colliery.

(49° 125° N.E.) John S. Williams, Manager; John Christie, Overman; A. Somerville and James Cochrane, Shiftbosses; William Herd, Robert Walker, J. H. Vaughan, A. G. Jones, C. Williams, A. Dunsmore, R. Littler, R. O'Brien, L. Cooper, and M. Brown, 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 parallel slopes driven from the level of No. 1 seam on which the shaft-bottom is located. All the output is produced from advancing long-wall faces and their accompanying development levels. At the end of 1943 there were six active long-walls; also two tandem units each 500 feet long and two single units each 260 feet long, their total length aggregating 1,520 feet, with an average seam thickness of 3 feet 6 inches of coal plus 8 inches of rock or bony coal. The average daily output of coal during the month of December was 500 long tons with 220 men employed underground and twenty-nine 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 haulage-levels. The slopes and levels are either bottom or top brushed to give the necessary height and most of the rock stowed in the gob on both sides of the roadways. All the coal cutting is done by means of compressed-air Anderson-Boyes machines. One Goodman duckbill loader unit was put into operation during the year and has been used to advantage in speeding up the development-work.

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 the blasting on some of the walls and levels,

there were no instances of protracted prohibition 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, stables, and Nos. 1 and 2 West slope districts, gave a reading of 72,900 cubic feet of air per minute against a 3.6-inch water-gauge at the time of the last inspection; and the No. 2 fan, which ventilates the No. 4 West district, Main slope district, No. 6 East slope district, and abandoned workings of No. 5 East slope district, gave a reading of 152,500 cubic feet of air per minute.

One hundred and seventy 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 conveyers is sprayed with water to dampen the coal-dust. One hundred and sixty-two 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.

A man-trip is run up the upper Main 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; it is commonly known as the "deadman control." An additional man-trip is run up the upper portion of the lower Main slope to connect with the above-mentioned man-trip. Each man-trip is equipped with a safety-car which is attached to the rear end of the 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 bath-house at the mine is equipped with 512 lockers and has sixty sprays. Monthly inspections were made by the miners' inspection committee, and copies of these reports were received through the courtesy of the committee members. All report-books required to be kept at the mine were examined regularly and found to be in order.

NICOLA-PRINCETON INSPECTION DISTRICT.

BY

E. R. HUGHES.

There were seven producing collieries operating in this district during 1943, as follows: The Granby Colliery, operated by the Granby Consolidated Mining, Smelting and Power Company, Limited, at Princeton; the Middlesboro Colliery, at Merritt; the Princeton Tulameen Coal Company, Limited, at Princeton; the Tulameen Collieries, Limited, at Princeton; the Merritt Coal Mines, Limited, at Merritt; the Black Coal Mine, at Princeton; and the Hat Creek Coal Mine, at Upper Hat Creek, near Ashcroft. Prospect operations were carried on by British Lands, Limited, at the Jackson Prospect, near Princeton. A small amount of prospect-work was done by J. Delprato and E. Hayes on property formerly owned by the now defunct Coalmont Collieries, Limited. The Pleasant Valley Mining and Development Company did some prospecting on their claims near the abandoned Blue Flame mine, south of Princeton.

Accidents.—There was one fatal coal-mining accident during the year when an experienced miner was killed by a fall of rock at the Granby Colliery. Eighty-nine compensable accidents were investigated and of these seven were classified as serious.

Dangerous Occurrence.—On Monday morning, November 15th, at the No. 3 mine, Middlesboro Colliery, a fireboss making his regular inspection before workmen went

on shift discovered smoke in great volume coming from the lower portal of the mine. Investigation by officials revealed that an uncontrollable fire raged about 200 feet inside the portal. The superintendent thereupon ordered the mine to be abandoned and sealed; no efforts being made to recover material. Conditions in the mine were stated to be normal at the end of the last working shift. Officials were firmly of the opinion that the fire was not of spontaneous origin, although no other satisfactory explanation could be definitely established. No persons were underground at the time the fire was discovered. The mine was in the development stage and employed only seven men.

Prosecutions.—There were two prosecutions under the "Coal-mines Regulation Act." A power-house helper and a night-watchman were prosecuted for a violation of Special Rules involving illegal riding on an underground road. One of the men was seriously injured while so riding.

Output.—The output of coal for 1943 was greater than that of the three preceding years and amounted to 161,312 tons, as compared to 157,339 tons for 1942, 131,925 tons for 1941, and 149,827 tons for 1940. As in 1942, the output was less than the demand. Most of the operating mines could have increased their crews if sufficient skilled miners had been available. Labour troubles accounted for a few lost shifts.

Mine-rescue and First Aid.—The Similkameen Valley Mine Safety Association held its annual field-day competitions on the Allison Flats, Princeton, on Saturday, June 26th. The events in both mine-rescue and first aid were keenly contested and a high standard of work was exhibited under ideal weather conditions. The Granby Colliery team, captained by James Fairley, won the mine-rescue event, with a comfortable margin over three other local teams.

Middlesboro Collieries, Ltd.

(50° 120° S.W.) E. W. Hamber, President, Vancouver, B.C.; Miss E. McDonald, Secretary, Vancouver, B.C.; Robert Fairfoull, Superintendent, Merritt, B.C. This colliery is situated 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 South, and No. 5 Prospect mines. The plant and equipment have been described in previous reports and there have been no major changes during 1943. Fifty-eight men were employed underground at the end of the year and the colliery produced 37,374 tons of coal.

No. 2 South Mine.—(50° 120° S.W.) Manager, Robert Fairfoull; Overman, A. Allen; Firebosses, R. Dunnigan and Geo. Maxwell. Development during the year consisted of driving a second dip to open up an area below the old Main level. Levels are laid out in a north-and-south direction from the dip and connecting raises and stalls are then driven for ventilation. During my inspections 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. The mine is usually ventilated by natural means but a standby fan can be operated when required. An air measurement taken during the December inspection indicated 9,000 cubic feet of air per minute to be passing along the Main return for the use of twenty-three men. Safety-lamp tests indicated no visible caps in any of the roadways or working-places.

No. 2 South Extension Mine.—(50° 120° S.W.) Manager, Robert Fairfoull; Overman, James Fairfoull; Firebosses, W. Ewart and G. Walker. Developments during the year were confined to the lower parts of the mine. Three levels are being worked below the main entry, in a north-and-south direction, and are connected with the necessary ventilation raises. A small fan supplies the required ventilation and the last air measurement taken in December showed 15,120 cubic feet of air per minute to be passing along the Main return, for the use of twenty-seven men. Safety-lamp tests indicated no visible gas-caps in any of the roadways or working-places. Conditions were found to be generally satisfactory during the monthly inspections of this mine.

No. 3 South Mine.—(50° 120° S.W.) Manager, Robert Fairfoull; Overman, A. Allen; Fireboss, Geo. Maxwell. This small mine, which had been idle for several years, was reopened during the early part of the year. A level had been driven in from the surface for approximately 750 feet and a ventilation raise completed when the mine previously operated. On reopening, it was found that the Main level had caved extensively for several hundred feet. The work of cleaning up and retimbering was almost completed when a fire, of unknown origin, was found by a fireboss in making his routine inspection before workmen went into the mine on Monday morning, November 15th. The fire was beyond control and the management ordered the entries to be sealed and the mine abandoned.

No. 5 Prospect Mine.—(50° 120° S.W.) Manager, Robert Fairfoull; Fireboss, Thos. Rowbottom. This is a new prospect operation situated approximately 400 feet south of the colliery lamp-cabin and is being developed to recover a small area of coal left between the old No. 4 mine, No. 5 seam, and the abandoned No. 5 East mine. At the end of the year four separate tunnels had been started in the seam from the surface and were in distances varying from 50 to 160 feet from the outside, with the necessary crosscuts for ventilation. The seam was found to be thin and irregular.

Merritt Coal Mines, Limited.

(50° 120° S.W.) Manager, Geo. Murray; Fireboss, James Fairley. After several abortive efforts had been made in reopening and relocating coal-seams on the property formerly owned by the Diamond Vale Collieries, Limited, near the city limits of Merritt, it was finally decided to reopen and develop what was formerly known as the New No. 3 mine, which is located approximately 60 feet below the old Diamond Vale No. 3 mine, where, in 1912, an explosion occurred, killing seven men. In order to prevent confusion in the naming and numbering of these mines, it was decided to call the new workings No. 4 mine.

No. 4 Mine.—(50° 120° S.W.) A slope and two levels had been driven by former operators and these workings were extended during the latter part of 1943. At the time of the December inspection the slope had been driven down to a point approximately 300 feet from the surface. Two levels had been started from the right and two from the left side of the slope, and connections had been made for ventilation. The dip of the slope, so far, is 30 degrees, but if this seam is conformable to the upper seam then the angle of dip should increase considerably in the next 300 to 400 feet. A cross-section of the seam is as follows: Hard shale roof, 10 inches inferior coal, 6 inches cap-rock. This part overlies the portion of the seam that is mined, but when it is necessary to make height this upper part is brushed down. The seam proper is as follows: 14 inches coal, 3 inches rock, 20 inches coal, 2 inches rock, 8 inches coal. On the floor of the seam is 6 inches of shale, under which is a hard sandstone floor. At the present time ventilation is provided in sufficient quantity by natural means. However, if it is intended to develop further dip workings, it will soon become necessary to install a fan. Ten men were employed underground at the time of the December inspection. The output of coal during the four months of production totalled 2,546 tons.

No. 3 Mine.—(50° 120° S.W.) The only work done in this old abandoned mine was the installing of a pump with the intention of unwatering the old workings ahead of the underlying No. 4 mine. A small amount of pumping was done; then the compressor was taken away.

Hat Creek Coal Mine.

(50° 121° S.W.) L. D. and A. A. Leonard, former owners of this mine, sold their interests to the Western City Company, Limited, Vancouver. The sale was made in the name of A. Russell. Up to the time of the sale the mine was managed by L. D. Leonard; since that time M. McGeer has represented the new operators and William H. C. Brown, a miner granted a permit under the "War-time Coal-mine Employment Act," has acted in the capacity of fireboss. The mine is situated in Upper Hat Creek, 30 miles from Ashcroft

and 15 miles from Pavilion, a station on the Pacific Great Eastern Railway. The mine is at an elevation of 2,000 feet above sea-level and is developed by a Main level driven 230 feet into a hill and crosscutting the almost vertical measures, which at this point consist of numerous coal-seams interlayered with clay and shale bands of varying thickness. Development done during 1943 was concentrated in the first Left side level, where the level, counter, and crosscuts were further advanced. It is the intention of the present operators to stop underground work in the near future and confine coal production to surface-stripping. Ventilation is by natural means and conditions during the monthly inspections were found to be generally satisfactory. Three men were employed underground at the end of the year and the mine produced 1,516 tons of coal.

The 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.—(49° 120° S.W.) Mine Manager, Thos. M. Wilson; Overman, A. McKendrick; Firebosses, Thos. Cunliffe, F. Bond, A. Hilton, Thos. Lloyd, and J. Yard.

The No. 1 mine is situated about 6 miles west of Princeton, off the Hope–Princeton Highway. Almost all the output from the mine is used at the company's steam electric power plant near Princeton, which supplies the power requirements at the Copper Mountain copper-mining operation, the concentrator at Allenby, and at the coal mine. The coal is transported from the mine by trucks to a point near Princeton, whence it is carried across the Similkameen River by an aerial tram to the power plant. The total 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 mine is developed from two diagonal slopes, the North diagonal and the South diagonal; this system providing for the development of a large triangular area of unworked coal between the slopes. The North diagonal slope was advanced during 1943 and a new level, No. 8 North, and a counter have been started off the slope. Pillar-extraction was completed in the No. 6 North level and the level was immediately sealed as a safeguard against the possibility of heating; this being one of the principal dangers peculiar to the Princeton lignite field.

The South diagonal slope was also advanced during the year and a new level, No. 6 South, and a counter were started off the slope. A heavy "squeeze" movement enveloped the levels and working-places of No. 4 and No. 5 South, rendering the task of maintenance extremely difficult and costly. The expansion of bentonites above and below the coal-seam, in the presence of moisture, is largely responsible for such adverse roof and floor conditions. Most of the work in these two levels during the year was confined to rehabilitating the squeezed area.

The coal, or lignite, deposits of the Princeton field belong to the Oligocene age, and so, geologically speaking, are very young. The measures are very soft and interbedded, particularly near the coal-seams, with bands of bentonite. Bentonite is used in industry as an absorbent, and this quality that makes it so useful in other fields of endeavour also makes its presence extremely undesirable in the mining of coal, particularly in the presence of water. It is said that fully saturated bentonite occupies a volume approximately sixteen times greater than that occupied by a similar amount of the dried material. Workings lying near the surface are not much affected by the action of bentonite as some of the expansion has undoubtedly already taken place. But as the workings proceed to depth and as water gradually percolates through the broken measures, plus the dead weight of the comparatively soft, superincumbent measures, the expansive qualities of the bentonites are soon made manifest, causing the floor to heave and the roof to sag, to the extent that in a short time the roof and floor meet. If

coal in the Princeton field is ever to be profitably mined to great depth it will be necessary to give some thought to advance planning, and eliminate, as far as possible, the common error of developing, breaking up, and weakening large connecting and contiguous areas. Such planning should include the forming of the mine into panels, sufficiently isolated to prevent the transference of squeezing. Then, if the ground necessary for a year's output was developed and exhausted within that year, maintenance costs could be kept at a minimum.

The average thickness of the No. 1 mine seam is approximately 16 feet, in which occurs no less than eighteen bands of "bone," bentonite, clay, and ironstone. This excess of foreign matter has necessitated that mining be confined to the lower 5 to 7 feet of the seam, which has an average pitch of 27 degrees. The coal is carried from the raise-stalls by means of sheet-iron lined chutes to the levels below. With the exception of the main underground hoist, which is electrically operated, all other underground power is derived from compressed air. All mining is done by means of Ingersoll-Rand post type punching-machines. 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 are electrically operated.

The North and South diagonal slopes are separately ventilated by individual fans, the air entering the Main intake splitting at the top of the haulage-slopes. The last air measurement taken when the mine was working showed 43,200 cubic feet per minute for the use of forty-five men. Safety-lamp tests indicated no visible gas-caps during any of the inspections, although, due to constricted airways in the North side, the ventilation was sometimes found to be sluggish in the vicinity of pillar-drawing operations, with the resultant occasional evidence of black-damp. A sample of the return air gave an analysis of 0.04 per cent. methane in the North return; the South return analysis also showed 0.04 per cent.

Monthly inspections were made by the miners' inspection committee, and copies of their inspection reports were received through the courtesy of the committee members. All report-books required to be kept at the mine were regularly examined and found to be in order. Working conditions in general were found to be satisfactory during the year. On the surface and underground, 122 men were employed, and the coal production for the year was 70,334 tons.

Because of high operating costs and labour troubles this mine ceased operations on December 4th. Coal for the operation of the company's power plant is now being purchased from other mines. The only underground work being done at the end of the year was the withdrawal of material from the mine.

Granby Colliery No. 2 Mine.—(49° 120° S.W.) This development mine remained closed throughout 1943, except for the pumping of water.

Princeton Tulameen Coal Co., Ltd. (49° 120° S.W.) 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, Andrew Dean, and William Devoy, 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, which at the end of 1943 was down 1,450 feet from the portal. At a point 650 feet down, the slope and counter pass underneath the Tulameen River. Before this point was reached nine levels had been developed to the right and left of the slope. After passing under the river six levels were developed to the right, leaving a protecting pillar under the river-bed; the pillar thus divides the mine into the upper and lower workings.

Development during the year was concentrated in the lower right-side levels. Nos. 16 and 17 Right levels were advanced to a point approximately 1,400 feet from the Main slope and the No. 18 Right level was advanced to a point approximately 1,000 feet from the slope. A squeezing movement, similar in cause and effect as that described in the report on the Granby colliery, developed in the Nos. 13, 14, and 15 Right levels. This movement later travelled downward and included the Nos. 16, 17, and 18 Right levels. The progression of squeeze exceeded the speed of rehabilitation to the extent that the roadways soon became impassable and had to be abandoned. Thus the whole of the lower workings were lost to production. As the abandoned workings could not be adequately ventilated it became necessary to isolate the area; this was done by the erection of 15-inch wood-block stoppings in each level. The stoppings were later reinforced by 10 to 30 feet of rock and clay stowage. In conjunction with the building of the stoppings a new return airway was driven; this serving to ventilate the stoppings and will later be improved for use as the return airway for future dip-workings. With the loss of the lower workings, and in an effort to maintain production, the management resorted to withdrawing surface pillars on both sides of the Main slope down to No. 3 Right and No. 3 Left levels. Rehabilitation of the lower end of the Main slope was being continued, with the intention of further development to the dip as soon as the necessary repair-work has been done to the slope and counter.

During the early part of the year electric power from the Granby power plant replaced power from the emergency plant which had been in use since the loss by fire in September, 1942, of the Princeton Tulameen Diesel electric plant. The mine is ventilated by a 48-inch Aerodyne-type fan electrically driven; a standby gasoline-engine is also available and can be connected to the fan in case of an electric power failure. The last air measurement taken during December showed 36,250 cubic feet per minute passing through the fan-drift for the use of twenty-seven men.

New machinery and equipment installed during the year included an Ingersoll-Rand Imperial No. 10 compressor, having a capacity of 1,100 cubic feet, driven by a 200-horse-power electric motor. The 35-horse-power electric motor formerly used on the surface hoist was replaced by a 100-horse-power motor. A 60-horse-power compressed-air hoist and a new 25-horse-power Fairbanks-Morse electric pump was installed underground. A new blacksmith-shop was built and a new 200-amp. Lincoln electric welder was purchased. A new M-S-A generator charging set was installed in the new lamp-room to charge forty-four lamps. A new bath-house was built during the year and has accommodation for 108 men.

Monthly inspections were made by the miners' inspection committee, and copies of their inspection reports were received through the courtesy of the committee members. All report-books required to be kept at the mine were regularly examined and found to be in order.

Coal produced at this mine supplies some 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 by an International truck of 8-ton capacity. At the end of the year fifty-six men were employed underground and eighteen on the surface. Total coal production for 1943 was 34,075 tons.

Tulameen Collieries, Ltd.

(49° 120° S.W.) Head office, 716 Hall Building, Vancouver, B.C.; Mine Overman, Thos. Cunliffe succeeded David M. Francis to this position in December; Fireboss, Thos. Bryden. This company operates the Tulameen No. 3 mine, which is situated about 2 miles west of the town of Princeton. The tipple is at the side of the Kettle Valley Railway, from which a short siding-spur is extended. The underground workings of this mine are connected to the formerly abandoned workings of the old Tulameen No. 2 mine. Some of these abandoned workings have been rehabilitated to meet the needs of present mine develop-

ment, the remaining inaccessible workings are sealed off as a precautionary measure against the possible spontaneous heating of material in the heavily caved area. The old No. 2 mine incline was extended during the year and three levels were started away to the right. No. 10 Right level advancing in a northerly direction reached the 150-foot boundary to be left between these workings and the old No. 1 Mine. Nos. 11, 12, and 13 Right levels running parallel to the boundary reached a distance of 750 feet from the Main incline and ran into gravel and a start was made on the withdrawal of pillars in these levels.

Mine ventilation is provided by a Sheldon fan and the air measurement taken in December showed 11,200 cubic feet of air per minute to be passing for the use of fifteen men. The mine was operated throughout 1943 and produced 14,729 tons of coal. Conditions were found to be generally satisfactory during the inspections made at this mine.

Inland Collieries, Ltd. (50° 120° S.W.) Company office, c/o Grossman and Holland, Stock Exchange Building, Pender Street, Vancouver, B.C. This company's prospect operations near Merritt were inactive during 1943.

Black Coal Mine.—(49° 120° S.W.) Mine Manager, Francis Glover (resigned in December); Fireboss, Wm. Forsyth. During the early part of the year this mine, owned by the Black and Glover interests, was operated by the Inland Collieries, Limited, and later was operated by the Coal Consumers Co-operative Association, Vancouver, B.C. The mine is situated in the Finlay Creek district, 6 miles south-west of the town of Princeton. The measures in the developed part of the mine dip at an angle of 50 degrees. Insufficient work has yet been done to prove the full thickness of the measures but the portion thus far exposed shows several seams of lignite varying in thickness from 5 to 10 feet. The seams thus far partly developed lie close together and are separated by only a few feet of black shale, bentonite, and dirty coal. Mining so far has been chiefly in the Nos. 1, 2, and 3 seams. No. 1 and No. 2 seams have been developed by levels driven from the surface croppings in the side of the hill. The No. 2 seam level is in approximately 1,100 feet from the surface. During the year raises were driven from the No. 2 seam and connected to form a ventilation counter; these workings, however, were too near the outcrop and were discontinued because of the flow of surface water. Short crosscuts were driven at varying distances along the No. 2 seam level through to the No. 3 seam and these were connected. A slope was driven in a northerly direction on the No. 3 seam with the intention of developing coal to the dip; another opening from the surface was driven to meet this, but at the end of the year no contact had been made. Six men were employed at the mine at the time of my last inspection and the output for 1943 was 2,254 tons.

British Lands, Ltd. (49° 120° S.W.) *Jackson Prospect Mine.*—Agent, C. H. Jackson, Kelowna, B.C.; Fireboss, J. Delprato. This small prospect operation is situated about 6 miles south-west of the town of Princeton and about one-half mile north of the Black mine. Prospecting has been carried on in this vicinity for the past several years and during 1942 a coal-seam was discovered on a hillside. During the present year a cross-measure level tunnel was driven at a lower elevation for the purpose of intersecting the seam. The tunnel was driven approximately 100 feet in surface clay, gravel, and sandstone when the seam was located and underground work discontinued. No coal was produced and the only work being done at the end of 1943 was the building of a tipple, at which two men were employed.

Delprato and Hayes Prospect. (49° 120° S.W.) Fireboss, J. Delprato. This is a new prospect operation situated between Blakeburn and Coalmont, and is adjacent to the No. 7 tower on the abandoned aerial tramway formerly operated by the now defunct Coalmont Collieries, Limited. The work done con-

sisted of several surface open-cuts made for the purpose of proving coal-measures to be found in this area. No underground work had been done and no coal was produced in 1943. Two men were employed.

Pleasant Valley Mining and Development Co.

(49° 120° S.W.) *New Blue Flame Prospect Mine.*—Manager, John G. Biggs. This is a new prospect operation situated approximately 8 miles south-west of the town of Princeton and near the eastern extremity of the abandoned workings of the old Blue Flame mine. Two adits which were started into the hillside with the intention of locating a coal-seam had been driven in about 15 and 20 feet respectively when abandoned after the work had been in progress for about two weeks. Four men were employed.

NORTHERN INSPECTION DISTRICT.

BY

CHARLES GRAHAM.

There are two properties operating in the Telkwa district, one located on Goat Creek, a tributary of Telkwa River, and the other on the bank of Telkwa River.

Production during 1943 increased considerably owing to increased demand by Canadian and United States military forces in the district. The increased production for 1943 amounted to about 5,000 tons.

Bulkley Valley Collieries.—F. M. Dockrill, President; A. H. Dockrill, Overman.

No. 1 Mine.—(54° 127° N.E.) Only pillar-extraction is being carried on at this mine. Some time during the coming summer will see the total exhaustion of the mine.

No. 2 Mine.—Asa Robinson, Fireboss. This is a new development, located about one-half mile down-stream on Goat Creek from No. 1 mine on the opposite bank. What appears to be the same seam outcrops in the west bank of Goat Creek. Two entries have been started at this point and are being driven in on the strike of the seam. The overburden at this point is light, being about 60 feet.

A new tipple has been built and is now in operation. There is no mechanical equipment at the mine so far. When No. 1 mine is finished the steam plant and air compressor will be moved to No. 2.

The air compressor and Siskol coal-cutter, which could be used to good advantage in the development of No. 2 mine, are lying idle. The compressor, being steam-driven, cannot be used until the steam-boiler is moved to the new location. Apparently the company was unable to reach an agreement with Ottawa officials on the purchase of a Diesel-driven compressor, which they planned to install, to furnish air for the coal-cutter until the steam plant could be moved. The result is that the development of the mine has been greatly retarded.

No gas was observed or reported at any time during 1943 and general conditions were satisfactory.

Telkoal Company, Limited.—A. M. Richmond, Managing Director; John Gillham, Overman.

Betty Mine.—(54° 127° N.E.) J. M. Wilson and John Wiley, Firebosses. The mine is located on the west bank of Telkwa River, about 6½ miles from Telkwa.

The slope has been driven down about 420 feet. At 240 feet, No. 5 level was turned off and driven through the fault which runs parallel with the counter-slope. They expected to open up some rooms to the rise off this level but another fault was struck running almost parallel with the strike along the high side of No. 5 level. Another fault was struck crossing the main slope at about 45 degrees. No. 6 level was turned off at this point. This level is being pushed ahead. The slope is being driven through the fault. The displacement here does not appear to be over 10 feet downthrow.

A boiler, a steam-driven compound air-compressor, and a fan have been installed. The bridge across the Telkwa River was completed and a tipple built with approach direct to the slope. A cook-house, bunk-house, and change-house have been built.

A small cap of gas was reported at various times, and on one occasion, due to the stoppage of the fan, the men were withdrawn. No gas was detected by the writer on any visit during 1943.

Major Seam.—Operations at this seam were abandoned during the summer. In the main entry they ran into what appeared to be the old Telkwa River bed, or the bed of an adjacent tributary, which had cut down through the coal-seam, cutting off the section showing the outcrop from the rest of the seam. This condition could not be observed from the surface and was a quite unexpected development. Nothing further has been done at this mine.

Diamond-drilling. — A programme of diamond-drilling was carried out by the Emergency Coal Production Board at both the Bulkley Valley and Telkoal properties. These showed considerable erosion and faulting in the field but there has not been enough drilling done to really determine the continuity of the coal-seams in any one section of the field.

Peace River Area.

BY

E. R. Hughes.

An inspection trip was made to the Peace River area during the period May 24th to June 3rd, 1943. Only two small coal-mining properties were being operated—the Gething and the Packwood mines. These mines worked intermittently during the year with small crews. The road from Fort St. John to the mines was improved during the year but much work yet remains to be done before it can be considered a fair road for year-around coal-hauling.

Gething Mine. (55° 122° N.E.) Operator, Quentin F. Gething; Fireboss, Llewellyn Phillips (working under a permit granted in accordance with the provisions of the "War-time Coal-mine Employment Act"). This small mine is situated 1½ miles north of the Peace River and 12 miles south-west of the village of Hudson Hope. The workings are on the eastern slope of Bullhead Mountain and consist of a Main level and two counters, with the necessary crosscuts for ventilation. The seam lies on an angle of 30 degrees and is 5 feet 3 inches in thickness, including three rock-bands totalling 8 inches. The bone and rock present necessitates that great care be taken in cleaning the coal. Six men were employed. An estimated 1,400 tons of coal was produced during 1943.

Packwood Mine. (56° 122° S.E.) Operator, Geo. Packwood; Fireboss, Jacob Reschke (working under a permit granted in accordance with the provisions of the "War-time Coal-mine Employment Act"). This small mine is situated on the west side of Butler Range, 22 miles west of Hudson Hope and 84 miles west of Fort St. John. During the early part of the year the mine was operated by the R. Melville Smith Company, Limited, Canadian contractors on the Alaska Highway. This company intended to mine coal for their own use but found the operation was too expensive; trucking coal from the mine to Fort St. John being chiefly responsible for the excessive costs. However, the road-work done by this company will prove of advantage to the present operators. The seam dips approximately 55 degrees in a westward direction and consists of 3 feet of clean coal. Two adits have been driven along the strike of the seam. The lower level is in approximately 300 feet and the upper level is in about 200 feet. Raises at 40 feet centres were driven up from the levels. Four men were employed and 1,511 tons of coal were produced during 1943.

VICINITY OF QUESNEL.

BY

JAMES A. MITCHELL.

Lease of J. Donnelly. (53° 122° S.W.) This lease is located below the big bend in the Fraser River, about 6 miles north of Quesnel. Lignite coal is exposed over a considerable area on the banks of the Fraser River at extreme low water. The loose gravel was washed off a section of this coal and some 200 tons was pried off the surface at the edge of the river and shipped to Quesnel by barge. Some of this was distributed to the townspeople and some stored in a warehouse. It was recommended to Mr. Donnelly that the latter be disposed of as soon as possible as it would not stand prolonged storage. Comments regarding the burning qualities of this coal are to the effect that it makes a satisfactory fuel.

Lease of F. Hutton.—(52° 122° N.E.) F. Hutton made several open-cuts to expose a seam of coal on the banks of Australian Creek above the railway crossing. At the time of writing this operation has not been visited.

Lease of J. Johnson.—(53° 121° S.W.) In partnership with D. Wells, J. Johnson attempted to strip more overburden from his coal occurrence at Coldstream near Wingdam. A drag-line scraper, operated by a steam donkey, was used for this purpose. A small tonnage of coal was dug and shipped to Wells.

Lease of W. Armstrong.—(53° 121° S.W.) This lease adjoins that of J. Johnson. Work was confined to building a cabin and digging a few open-cuts which exposed some low-grade lignite.

EAST KOOTENAY INSPECTION DISTRICT.

BY

H. E. MIARD.

Unflagging activity prevailed in the mines of the Crow's Nest Pass section of the district throughout 1943, although both construction-work and mine operation were hampered to a considerable extent by the inadequacies of the labour supply available. Production began at the new Elk River colliery of the Crow's Nest Pass Coal Company, Limited, and, impelled by a threatened scarcity of industrial fuel, the Consolidated Mining and Smelting Company of Canada, Limited, secured a lease on a part of the Corbin property with the result that, in the month of September, operations were resumed there at the open pit known as No. 3 mine, which had then been idle for more than eight years. Notwithstanding this reinforcement, the total production remained below early expectations, largely owing to difficulties encountered elsewhere.

The gross output for the entire coal-mining section of the district amounted to 927,483 long tons, from which 35,000 tons must be deducted to cover various losses, these being incurred in washing at the Michel and Elk River collieries while, in the case of the output from Corbin, deductions of another nature, incident to the method of transportation in use, have to be made and will be considered in the part of this report dealing specifically with that operation.

At Michel, where a new battery of ten Curran-Knowles by-products ovens was put in operation at the beginning of the year, 77,355 tons of coke was obtained from the processing of 116,485 tons of coal. Of this amount, 64,147 tons of coal treated in the bee-hive ovens yielded 38,176 tons of coke; and 52,338 tons processed in the Curran-Knowles ovens yielded 39,179 tons of coke, 276,209 gallons of tar, and 238,731,000 cubic feet of surplus gas, used in part under the colliery boilers. The possibility of utilizing the balance of this valuable fuel is receiving deserved attention, and

the design of burners susceptible to meet the requirements of other parts of the plant is being studied.

The accident record for the year constitutes a rather gloomy subject, well apt to induce sombre meditations; easily entitled to first place among all causes of absenteeism, and ranking also as the most pernicious and costly hindrance to successful operation. While a number of the mishaps recorded was due to agencies beyond human control, one must return dejectedly to the hackneyed statement that far too many were the result of either carelessness or lack of proper appreciation of the sometimes obvious possibilities of the immediate environment. These stand out prominently among the factors contributing to the partial frustration of efforts made towards the promotion of safety.

There were five fatal accidents, involving the loss of six lives, in the coal mines of the district. The incidence of bumps accounted for three of these mishaps and four of the fatalities, one was due to a fall of rib coal, and another occurred in the course of haulage operations. They are described in detail in another part of this report. Among other accidents having occurred in and around the mines, 455 were investigated and classified, but the data secured remained incomplete in the case of fifteen other similar occurrences, owing either to the men involved having left their employment shortly thereafter or to various other reasons. For statistical purposes all non-fatal accidents are divided into four classes, according to the loss of time ensuing in each case. Those involving a loss of calendar time of seven days or less are considered as "minor"; those causing disability ranging from seven to thirty days are classed as "slight"; a loss of time of from thirty days to three months ranks the occurrence as "serious"; and a "major" accident is one in the case of which full recovery demands more than ninety days. On this basis, the 455 accidents in question were divided as follows: "Major," fourteen occurrences involving a total loss of time of 2,167 days; "serious," 100, with a loss of time of 4,471 days; "slight," 252, causing a loss of time of 4,211 days; "minor," 89, with a loss of time of 404 days. A total of 11,254 calendar days, corresponding to 8,479 shifts, on the basis of 275 working-days per year, or the full time of thirty-one men. In the third week of the month of January, when this tabulation was completed, twenty men were still off work on account of injuries sustained in 1943.

Men employed at the coal-face constitute the majority of those injured in the period under consideration, they having been involved in 212 of the accidents recorded and included in this summary. The number of other underground employees appearing on the list is 180, and sixty-three workmen suffered mishaps of various kinds on the surface. As to locality, the 455 accidents tabulated were distributed as follows: Coal Creek, 68; Elk River, 60; and Michel, 327; which, if Coal Creek and the Elk River are considered as one operation, gives a ratio of 1.5 accidents per 1,000 tons of coal mined there and, on the same basis, one of 2.107 for Michel.

Crow's Nest Pass Coal Co., Ltd. President and General Manager, H. P. Wilson, Fernie, B.C.; Vice-President, Thos. Balmer, 305 G.N. Building, Seattle, Wash., U.S.A.; Secretary, Thos. G. Ewart, Fernie, B.C.; Treasurer, Jas. H. Marshall, Fernie, B.C.; General Superintendent, Bernard Caufield, Michel, B.C.; Mining and Construction Engineer, Wm. C. Whittaker, Fernie, B.C. Capital, $6,212,666.16. Value of plants, $8,138,981.

Coal Creek Colliery.—(49° 114° S.W.) On the 1st day of December the Coal Creek Colliery ceased to exist as a separate operation. On that day the single mine still active there became a part of the adjoining Elk River Colliery, and is considered as such in this report. At the end of the forty-six eventful years of its existence, Coal Creek passes into history with claims to a colourful and instructive past unexcelled by those of any other contemporary coal-mining operation.

Elk River Colliery.

(49° 114° S.W.) Superintendent, Bernard Caufield; Manager, James Littler. The construction of the new plant, begun in May, 1942, was completed in the latter half of the past year and the gradual transfer of the centre of activity from Coal Creek to the Elk River began. Many difficulties had to be overcome in the course of these eighteen months, some of the natural order and others due to the abnormal conditions created by the present state of national emergency. A few of these have not yet been completely mastered and improvements of various kinds, to be effected in the course of the coming summer, are now being planned.

At present all coal is obtained from No. 1 East, No. 4, and No. 9 mines. The output of the first mentioned is hauled to the plant (a distance of about 4,400 feet) by a steam locomotive. That of No. 9 mine is brought down from an elevation of some 750 feet nearly to the level of the cleaning plant by two retarding conveyers of the rope-and-button type, operated in tandem, with a combined length of 1,550 feet and on gradients ranging from 27 to 30 degrees. In No. 4 mine, the coal is loaded into cars and is dumped at the same point as that brought from No. 1 East.

The coal brought down by the retarding conveyers joins that from the rotary dump over an apron-feeder delivering it to a sizing-screen, upon leaving which it is run over a short picking-table. The oversize lump is then passed through a McNally-Pittsburgh pick-breaker. From that point the coal is either hoisted into a 300-ton storage-bin or is carried directly to the preparation plant over a 42-inch conveyer-belt, by means of which that stored as aforesaid is eventually also delivered there.

The equipment of the cleaning plant includes two boilers used for heating purposes exclusively, two furnaces heating the air supplied to the driers, two Ty-Rock 6- by 16-feet sizing-screens, three Vissac jigs, two Vissac driers, one M.C. centrifugal drier, three Ty-Rock dewatering screens, two boom-loaders, and three box-car loaders. There are seven tracks under the loading-bridge. The dust-collecting apparatus is still to be installed, as is also the Vikingizing system. The refuse from the jigs is hoisted into a bin from which it is subsequently hauled away by trucks.

The main part of the cleaning plant is a steel and brick structure, 120 by 100 feet, and 68 feet high, resting on a monolithic concrete base which prevents any perceptible vibration when the machinery is in operation. The combined power-house and machine-shop is 100 by 60 feet, with an inside height of 27½ feet. At present it is housing two electrically-driven Canadian Ingersoll-Rand compressors with capacities of 3,300 cubic feet of free air each, and foundations are awaiting a 3,000 Belliss and Morcom and a high-pressure compressor to be brought there shortly from Coal Creek. Another building, 100 by 60 feet, with ceiling 10 feet above floor, provides space for the colliery offices, the warehouse, a well-appointed ambulance-room, and a large room intended to be used ultimately for the training of men in mine-rescue work and storage of apparatus, but at present temporarily occupied by the colliery electricians. Finally, an additional structure, 154 by 60 feet, contains the wash-house, capable of accommodating 600 men, and the lamp-room. All these buildings have concrete and brick walls and laminated flat roofs.

The primary power used is electrical current, supplied by the East Kootenay Power Company at 66,000 volts and distributed at voltages of 2,300, 550, and 220 to different parts of the plant.

Hand-pick mining is considered anachronistic at this colliery. The mining equipment on hand includes two Goodman short-wall cutters, fourteen radial coal-cutting machines, and 105 pneumatic picks. In the course of the year 21,500 lb. of Monobel and 500 lb. of CXL-ite were used in blasting coal and rock in 27,290 separate shots, none of which miss-fired. The total output of the colliery amounted to 202,459 long tons, of which 2,160 tons were lost in washing.

No. 1 East Mine.—Overman, Carmichael McNay. Late in 1942 it became evident that the inner section of this mine (which had been the mainstay of the now defunct Coal Creek Colliery since 1933) would have to be abandoned. On November 7th of that year a serious bump had added its effects to the damage already sustained by a few of the roadways, on account of normal heaving of the floor, and some of the working-faces had become temporarily inaccessible as far as coal production was concerned. In consequence, the irregularities of the retreating front began to increase daily and it was realized that rational conditions could not be restored without undue risk being incurred. A transfer of operations outby was then thought advisable. As a temporary measure a few working-places were started on April 1st in the vicinity of the Main level, between Nos. 18 and 20 East entries, or 2,400 feet away from the site of the last bump experienced until that time. This was merely intended to maintain a small output while the 14 East district was being prepared for a resumption of operations. However, a small bump, which unfortunately claimed one life, occurred there on May 3rd, and it was decided to remove the centre of activities to the vicinity of No. 10 East entry, only about 2,200 feet from the portal and 8,800 feet from the face of the main entry. The territory in question lies over an area of old No. 2 mine from which practically all coal was extracted between the years 1902 and 1908, this creating conditions which, it was hoped, might have led to the dissipation of ground stresses and, possibly, also to the fracturing of the superincumbent conglomerate beds. So far, this assumption has proved itself correct and the chief difficulty encountered in the rejuvenated old workings has been due to the band of shale, immediately overlying the coal, which reaches a considerable thickness occasionally and has been badly fractured and thrust out from over the pillars in the course of the twenty-six years that elapsed since the original places were driven. Whether further latent stresses may be released subsequently or not is, of course, still a matter for conjecture.

None among the series of bumps which occurred between January 1st and May 3rd of the past year would have ranked as major occurrences of their kind, according to the method of classification adopted, had not three of them been accompanied by loss of life owing to unfortunate combinations of circumstances. However, they served to focus attention once more on the influence of the underground topography upon the localization of these phenomena, and on the close relation between the sites of such occurrences in No. 1 East and those of similar manifestations experienced in the vicinity of the contour line followed by the main entry of the old No. 3 mine.

The part of the mine lying inby the No. 18 East entry has now been sealed off. In the abandoned 14 and 16 East districts, which must, perforce, remain open, no appreciable variations of the general conditions prevailing were observed in the course of the year. In the south-eastern corner of the latter section, close to the flooded area, the temperature is still high but practically invariable. A characteristic feature of these parts of the mine is the low relative humidity of the air, which seldom reaches 50 per cent., varying usually between 43 and 49 per cent., while that of the return air from the entire East side, like that found in the working sections, is of the order of 82 per cent. From the purely scientific point of view the old workings of No. 1 East present some other interesting features, among which are the very common efflorescences of epsomite on roof and ribs, the formation of stalactites of yellow calcite at one point and, in places in which the temperature has risen above normal, the appearance of a gelatinous substance, evidently of organic origin which, after it has dried and hardened, resembles well-ripened tobacco and can be lifted off the coal in leaves often more than a foot square. More important perhaps from the practical point of view is the fact that, owing to the comparative rarity of saprophytic organisms underground, timber remains sound for a considerable time.

The work at present carried on is limited to the skipping and splitting of large pillars. Very little methane is given off, but a considerable amount of dust is liberated

in the course of the mining operations, both characteristics probably indicating expansion of the coal. In fact, analyses of the main return air lead to the belief that practically all the inflammable gas found there comes from the abandoned sections. The ventilation is good. At the time of the December inspection the fan was passing a total of 92,200 cubic feet per minute against a water-gauge of 3.75 inches, of which 27,500 cubic feet had been circulating through the abandoned 10, 14, and 16 East sections. The actual quantity supplied to the remaining active workings was 50,700 cubic feet per minute for the use of forty-nine men and six horses.

No explosives are used and all coal is mined by means of pneumatic picks.

No. 4 Mine.—Overman, John Caufield. Late in 1942 it was decided to open No. 4 seam, on the south side of the gulch, as a means of maintaining an output until the development of the superincumbent Nos. 9 and 10 seams had progressed sufficiently to make it possible for these two operations to supply the demand entirely. The coal was taken to the Coal Creek tipple by a steam locomotive until the Elk River plant was put into operation, when the procedure was reversed and the output of No. 1 East began to be hauled in the opposite direction. The thickness of the seam varies within wide limits and the roof is a rather weak shale, frequently fracturing after the coal has been extracted, a characteristic rendering careful timbering imperative.

The mine is opened by four parallel entries from which inclines are turned off in pairs. Development of the area to the dip of the main level has not yet been considered. The coal is mined with a Goodman short-wall coal-cutter, radial coal-cutting machines and pneumatic picks, being then blasted with Monobel. In all roadways other than the main entry, in which a track is maintained up to the face, it is carried away by conveyers and loaded into cars. At present the output is hauled to the surface by horses, but compressed-air locomotives will have to be introduced for this purpose before very long; which, however, cannot be done until the high-pressure compressor has been brought from Coal Creek and has been reinstalled at the new plant.

The mine is ventilated by a 5-foot double-inlet Sirocco fan with steel housing, driven by an electric motor and passing 40,000 cubic feet of air per minute, against a water-gauge of 0.4 inch, when exhausting. However, the main intake is also the haulage-road and, being rather damp, it became encumbered with ice early in the winter, a condition which was remedied by reversing the direction of the air-current. Owing to a certain amount of leakage, and to decreased efficiency of the installation under these conditions, the total quantity circulating had dropped to 32,000 cubic feet per minute at the time of the December inspection. This was still ample to meet the requirements of the thirty men and two horses underground.

That methane is given off is proved by the fact that small quantities of it have been known to accumulate, at some of the most advanced working-faces, when the ventilation was cut off, but the highest percentage of it found by analysis in the return air, so far, has been only 0.08.

No. 9 Mine.—Overman, John Caufield. This is intended to provide the main artery for the most important workings of the new colliery, those of Nos. 9 and 10 seams, and development is being planned with the object of rendering the handling of a large output possible. This consists of two pairs of main entries, separated by a pillar to be broken only at long intervals, one serving as intake and the other as return, from which inclines will be turned off in pairs. In addition, two short slopes are being driven with the intention of opening a small section of the seam left unbroken between the abandoned workings of Coal Creek old No. 2 mine and the area now being penetrated.

The workings are ventilated temporarily by a 4-foot single-inlet Sirocco fan, driven by an electric motor. At the time of the last inspection this was handling 18,000 cubic feet of air per minute, against the resistance presented by a regulator with an opening of 6½ square feet, in addition to that of the workings. Despite this precaution, ice was found at a considerable distance from the portals. At that time, twenty-five men

were employed underground on the most important shift. Work on the installation of an 8-foot Jeffrey fan, intended to ventilate these workings eventually, had to be discontinued owing to weather conditions, after the foundations for the fan and motor had been poured and a part of the lining of the fan-drift had been constructed.

Men and supplies are hoisted over a surface incline, 1,900 feet in length, with an average gradient of 29 degrees, over a large part of which the track is carried on trestles owing to the pronounced irregularities of the hillside. The hoist, situated above the mine entrance, has a 4-foot drum, is driven by a 200-horse-power a.c. motor, and is equipped with Simplex automatic controls.

In the course of the year, 252,000 lb. of limestone-dust were applied to the roadways of the colliery in order to neutralize the coal-dust.

Michel Colliery. (49° 114° N.W.) Superintendent, Bernard Caufield; Mine Manager, William Chapman. During 1943 natural difficulties, the scarcity of experienced labour, and a ten days' strike in the month of November all combined to prevent the output from attaining the high mark reached in 1942. A total of 689,521 long tons was mined, of which 32,049 tons were lost in washing (4.65 per cent. of the total). There was also a decrease of 9.77 per cent. in the production of coke.

The coal is hauled from the loading-points, at the discharge ends of shaking conveyers or belts, by compressed-air locomotives directly to the preparation plant, which is equipped with three Vissac jigs, four Vissac air driers, and an R.B. pneumatic separator. Additions made to the surface installation in the course of the year included a second garage, a farrier's-shop, and a welding-shop, all of fire-proof construction.

At the present time practically all the output is obtained from the workings of "A" and "B" seams; No. 3 mine being reduced to a small section in the immediate vicinity of the main level, in which pillar-extraction still continues with an output of little more than 300 tons per day. The active areas are divided about evenly between the east and west sides of the syncline and rather steep gradients are being met on the latter. This involves a transportation problem demanding close consideration when development-work is being planned. Small faults are not uncommon, they being one of the natural corollaries of the folding. The roof irregularities, commonly known as "pot-holes," are fortunately not met now as frequently as they were in the west section of B seam now abandoned. The typical form of these blocks separated from the parent stratum, their orientation and distribution seem to indicate that they owe their origin to stress applied before complete solidification of the measures.

The most prominent place among the natural difficulties complicating the task of managing this colliery can easily be assigned to the saprophytic fungi which have invaded practically all parts of the workings with the exception of the main intakes. They follow advancing roadways with surprising regularity and destroy the timbering in a remarkably short time. Their presence also accelerates the impoverishment of the air in oxygen and its enrichment in carbon dioxide in poorly ventilated sections—i.e., in goaves—and the presence of traces of ammonia, sometimes perceived in such places when the temperature has risen somewhat above normal, can be ascribed to their decomposition.

Six chain long-wall and twenty-seven radial coal-cutting machines are in use and, taken together, these undercut 394,003 long tons or 57.14 per cent. of the total output of the colliery for the year. Otherwise, pneumatic picks are in general use, except in No. 3 mine, where old-style methods of extraction still find favour. Monobel No. 4 is used in blasting the coal where necessary. In the course of the year 35,500 lb. of this explosive were used at the coal faces and 7,500 lb. of CXL-ite in rock-work; this representing a total of 53,050 separate shots, seven of which miss-fired. To neutralize coal-dust, both on roadways and in working-places, 504,000 lb. of ground limestone were applied during the year.

The two main crosscut adits have been extended to meet No. 3 seam on the west side of the syncline. Development-work there was limited to the driving of a connection between the two main roadways, through the coal.

"A" Seam.—Overman, Walter McKay. The workings of this seam, still supplying approximately one-half of the total output of the colliery, comprise three active areas known as the East, West, and South sections respectively. A part of the last-mentioned district is at present idle and only development-work is in progress in the balance of it. There the main roadways are gradually advancing into territory belonging to the North section, now nominally inactive. Development-work has been completed in the lower part of the latter district and final extraction cannot be undertaken until operations in the neighbouring areas have reached a more advanced stage. The seam varies in thickness between 8 and 14 feet and the roof is generally weak.

The East section lies between the trough of the Michel syncline and the crest of a minor anticline flanking the former on the south-east, the major part of which has been eroded away. Owing to this geologic feature, the inclines driven off the main level become constantly shorter. This section has been thoroughly mechanized, as far as transportation is concerned, and conveyer-belts are installed on the inclines as soon as room has been made for them. A short-wall coal-cutter and a duckbill loader are in use. The modified method of retreating long-wall in general use at the colliery is followed in the final extraction. The roadways show the effects of abnormal weight at several widely separated points, and the influence possibly exerted by the workings of the overlying " B " seam in this respect is being studied.

A fault, striking in a general north-and-south direction, divides the upper part of the West district in two separate areas, in one of which little more of the coal than the pillars protecting the airways is now remaining. The other, covering a larger territory, is being developed rapidly. There, all the coal is being carried away from the faces by means of a comprehensive system of conveyer-belts and shaker-conveyers and is loaded at one point. The roof is weak and careful timbering is necessary. For some still unsatisfactorily explained reason, this characteristic is more noticeable in the vicinity of the outcrop than elsewhere in the workings.

The two parallel main return airways belong to this section and show signs of deterioration evidently due much more to the inherent weakness of the ground and to the ravages of dry-rot than to the effects of weight thrown upon them by neighbouring goaves.

The South section, destined to become very extensive, is being developed but slowly for the reason that, in order to maintain gradients suitable for rope-haulage on the main inclines, these have to be driven on a broad angle with the direction of the dip, the seam being rather steeply inclined. The coal is taken from the faces by shaker-conveyers, in roadways following the strike approximately, the tracks being extended whenever a place has been advanced 300 feet in this manner. Chutes are built in splits and raises driven on the full dip of the seam.

At the time of the December inspection the fan was maintaining a water-gauge of 2.05 inches and was passing 72,000 cubic feet of air per minute, this carrying 0.72 per cent. of methane and having a relative humidity of 93 per cent. Notwithstanding the low temperature of the workings (maximum of 51° F.) a considerable amount of condensation is always taking place in the fan-drift. The total quantity of air was divided between two primary splits, No. 1, or East section, receiving 27,000 cubic feet per minute for the use of fifty-seven men and four horses. The return air from this part of the mine carried 0.37 per cent. of methane and had a relative humidity of 85 per cent. In No. 2 split, West and South sections, 30,600 cubic feet per minute were supplied for the use of seventy men and seven horses. The methane content of the return air was 1.07 per cent. and its relative humidity was 91 per cent.

" B " Seam.—Overman, Irving Morgan. Like those of the underlying " A " seam, the workings of this part of the colliery extend around the north-east end of the Michel syncline and are divided in two sections, East and South, separated by the old West district, an area divided in halves by the axis of the trough, at its upper end, now worked out and abandoned. The inclination of the measures is moderate above the main level in the East section, becoming somewhat greater in the slope; but it is considerable on the South side, in the upper workings of which it sometimes exceeds 30 degrees. The coal varies in thickness between 4 and 6 feet, and faults involving moderate displacements are not uncommon, the majority of them running approximately in the same direction as the dip of the seam. The roof is a rather thin bedded shale, apparently fairly strong at a few points, but oftener concealing many joints and bedding-planes along which it fractures readily when exposed for some time. However, the " pot-holes," very common in the West section, are not met so frequently now.

The coal gives off methane rather freely, particularly while undercutting is in progress and after blasting. This is especially noticeable in the East side slope workings where, for this reason, the use of explosives has been discontinued. However, the liberation of gas becomes often negligible when the coal remains absolutely undisturbed. Chain long-wall and radial coal-cutting machines are used in the remainder of the mine. The method of working followed is a form of retreating long-wall, characterized by the abandonment of so-called " sacrifice " pillars left behind to regulate the descent of the roof, which has proved itself satisfactory from all points of view after having been applied for a full decade. The preliminary work consists in dividing the seam into rectangular blocks, 300 feet long and 100 feet wide, by a system of single roadways known as " splits," started from rooms following the strike approximately, in which conveyer-belts are installed or tracks maintained. The extraction begins at the inner of the panels, a small strip of coal being abandoned on the goaf side of each split as the work progresses. This method of development implies abundant ventilation. According to the inclination of the seam, the coal undercut by chain machines or mined with pneumatic picks is either brought to the room by a shaker-conveyer or allowed to slide on sheet iron laid on the floor to batteries constructed on the upper side of the roadways. There, it is either loaded directly into mine-cars or carried by conveyer-belts to central loading-points.

The considerable area covered by the workings, the comparatively small thickness of the seam, and the weak nature of the roof complicate the task of maintaining adequate ventilation, particularly in the winter months. Then, the difference in temperature between the mine and the surface creates a motive column acting against the fan, on the South side, which reaches an elevation 1,300 feet greater than that of the portal of the main return. In this section natural ventilation has been used advantageously in really cold weather.

At the time of the December inspection a total quantity of 50,600 cubic feet per minute was circulating through this part of the colliery and, in the main return airway, carried 1.08 per cent. of methane, a percentage to which the East side slope appears to have been an important contributor. The relative humidity was 93 per cent. This total was divided between the two sections as follows: East side, 21,000 cubic feet per minute for fifty men and five horses; South side, 29,600 cubic feet per minute for the use of fifty men and three horses.

No. 3 Mine.—(49° 114° N.W.) Overman, William Gregory. The area covered by the active workings of this mine has been dwindling down steadily and is now represented solely by a small section, extending for a short distance on both sides of the main level, in which pillar-extraction still continues. Considerable weight is thrown on the remaining coal, the floor heaves rapidly, the roof, once deemed excellent, is of doubtful quality when at its best, and the useful life of timber is exceedingly short.

It is highly probable that this is the last occasion on which the operation, considered the most important at Michel for many years, will be mentioned in one of these reports.

At the time of the December inspection 12,500 cubic feet of air per minute were supplied to the working section for the use of thirty men and four horses. This, sweeping the edges of goaves on its way to the main return, loses oxygen and becomes enriched in nitrogen and carbon dioxide to a considerable extent. The last sample of the return air taken in the course of the past year contained 0.18 per cent. of methane and 4.79 per cent. of black-damp.

No. 3 East Mine.—(49° 114° N.W.) The fire, on account of which this part of the colliery was sealed off some years ago, remained quiescent throughout the year. A typical sample of the mixture of gases filling the isolated area contained 1.95 per cent. of oxygen, 83.49 per cent. of nitrogen, 14.51 per cent. of carbon dioxide, only 0.05 per cent. of methane, and no other combustible gases; which may be considered as indicating the existence of conditions satisfactory in the circumstances.

Consolidated M. and S. Co. of Canada, Ltd., Corbin Colliery.

(49° 114° N.W.) President, S. G. Blaylock, Trail, B.C.; Vice-President, R. E. Stavert, Montreal, Que.; Secretary, J. E. Riley, Montreal, Que.; Comptroller, H. B. Fuller, Trail, B.C.; Superintendent, R. R. McNaughton, Trail, B.C.; Resident Mine Foreman and Acting Manager, Walter Almond, Corbin, B.C. In the early part of 1943 the coal reserves at Trail and Kimberley dwindled down in an alarming manner and it became evident that a critical situation would arise were not some means of replenishing them found speedily. In consequence, the company secured a lease on a part of the Corbin Colliery holdings covering the northern half of Coal mountain, this including practically the entire area in which former operations were situated. The remainder of the field, in which the southern half of the No. 6, or eastern, coal basin presents the greatest possibilities, had previously been leased by another party, but nothing has been done there up to the present time.

In the month of September it was decided to start operations at the open pit known as No. 3 mine, from which an appreciable output could be secured immediately by stripping certain portions of the deposit left behind in former days. Prospecting for an extension of the Mammoth seam, present under conditions rendering further stripping practical, began at the same time, and, at the end of the year, ten drill-holes with an aggregate length of 1,782 feet had been sunk for thus purpose. Lack of water compelled the abandonment of this work in the latter half of January, after an additional 311 feet of holes had been drilled.

The method of mining (or rather quarrying) followed is quite simple. Overburden or shale-bands are drilled and blasted with 60 per cent. Polar Ammonia dynamite, the debris being afterwards either pushed aside with a bulldozer, if the configuration of the surface permits, or loaded in trucks by one of the power-shovels and carried away. The coal is then drilled and blasted with Monobel, if necessary, and is loaded directly into trucks. Monobel, be it said incidentally, is not the most advantageous explosive for the purpose, but has to be used for the sole reason that stumping-powder is now unobtainable. From the beginning of operations until the end of the year, 500 lb. of 60-per-cent. Polar Ammonia dynamite, 1,400 lb. of Monobel No. 4, and 25 lb. of stumping-powder were used in 825 shots (all fired electrically) in both mining operations and road-improvement work.

The chief problem presented by the undertaking is transportation, which depends entirely on self-propelled vehicles between the mine and the Canadian Pacific Railway siding at McGillivray. The old road did not possess the essential requisites for traffic of this kind and, to obviate its deficiencies, the road-bed of the former Eastern British Columbia Railway was broadened and graded, the bridges were repaired, and thus a good one-way road was provided for the loaded trucks. That between Corbin and the mine is now in very good condition, although its rather steep gradient renders careful driving imperative. On the other hand, the insignificant snowfall, which has given the present winter its exceptional character, while undoubtedly beneficial as far as

actual mining operations are concerned, has exerted a detrimental influence upon the condition of the two roads linking Corbin and McGillivray, as it permitted deep penetration of frost, with consequent heaving of the surface and accumulation of ice at some points.

A contract covering all loading and transportation has been given to Frank O'Sullivan, of Lethbridge, who employs a number of sub-contractors supplying their own trucks and one of the power-shovels. In all, a total of ninety-six persons is employed, including the small staff of seven men maintained by the operating company; this consisting of a mining engineer, the resident mine foreman, who is acting as manager, two clerks, two electricians, and a tractor-driver.

As is to be expected, a truck runs into difficulties occasionally and has to dump its load on the roadside. Up to the end of the year a total of 891.5 tons had been jettisoned in this manner, while 4,935.5 tons had been stored at McGillivray. In the same period 29,583 tons were delivered to Trail and Kimberley and 93.5 tons were used at the camp. The total production amounted to 35,503 long tons (the unit in which all the foregoing distribution of output has been computed).

The mechanical equipment includes two power-shovels, a bulldozer, two portable air-compressors, fifty trucks, and four portable electric plants, of which one is used at the mine, one at the loading-point at McGillivray, and two at the camp. Towards the end of the year an electric generator with a capacity of 156 k.v.a., driven by a 205-horse-power Ruston Diesel engine, was installed with the primary object of supplying power for the screening plant which was then nearly completed and has since been put into operation.

The old building formerly housing the cleaning plant has been rehabilitated and equipped with a Ty-Rock screen dividing the mine run into three sizes—lump, stoker, and slack. The coal brought from the mine by trucks is dumped in a covered chute leading first onto a bar screen on which the larger pieces are broken by hand. It is then hoisted to the screens by means of a 36-inch conveyer-belt and the various sizes are dropped into separate bins from which they are loaded into the trucks conveying them to McGillivray. Only slack and stoker sizes are in demand for industrial uses and the lump coal will probably be sold for domestic purposes. The construction of a cleaning plant is being considered but, in common with other improvements now being mooted, this is contingent upon the results of prospecting operations.

The operation presents interest in more respects than one for, up to the present time, only 3.9 per cent. of the estimated tonnage in the field has been extracted. It is certain that the complexity of the geologic structure would render a large proportion of the remaining coal economically inaccessible, but there must also be much of it still awaiting development, even though the former operations, having involved most of the easily reached segments of the Mammoth seam, may have erected more or less effective barriers against further penetration.

When operations were resumed the management was confronted with the problem of providing living accommodation for the working force as well as that of erecting speedily some structures indispensable to the successful prosecution of the work. Many buildings had been taken down while the colliery was idle and the great majority of the remainder was badly dilapidated. Since then the old cleaning plant has been restored to service as far as screening is concerned, a small power-house, an office building, a cook-house, with annex used as living quarters by the kitchen help, an ambulance-room and two garages, offering storage space for sixty trucks, have been constructed. The church and a remodelled warehouse have been equipped as bunk-houses and a number of former private dwellings have been rehabilitated and are now occupied by some of the men who have brought in their families. The water-supply is scanty and, owing to the partial freezing of the main pipe-line, is poorly distributed, a matter which shall be first to claim attention when weather conditions permit the necessary work to be undertaken.

INSPECTION OF METALLIFEROUS MINES.

BY

JAMES DICKSON.

PRODUCTION.

The output of metalliferous mines for 1943 was 5,429,557 tons. This tonnage was produced from forty-eight mines, of which thirty-two produced 100 tons or more.

FATAL ACCIDENTS IN METALLIFEROUS MINES (INCLUDING UNDERGROUND PLACER-MINING AND QUARRIES).

There were thirteen fatal accidents in and around metalliferous mines and concentrators in 1943, being a decrease of one from 1942. There were no fatalities in the quarries and one fatality at a sawmill at one of the placer-mines and one on highway where blasting was being done.

There were 4,093 persons under and above ground in the metalliferous mines and 891 persons in the concentrators in 1943. The ratio of fatal accidents per 1,000 persons employed was 2.60 compared with 2.41 in 1942.

The tonnage mined per fatal accident during 1943 was 417,658 tons compared with 407,734 tons in 1942. The tonnage mined per fatal accident during the last ten-year period was 434,048 tons.

The following table shows the mines at which fatal accidents occurred during 1943 and the comparative figures for 1942:—

Mining Division.	Mine.	No of Fatal Accidents.	
		1943.	1942.
Vancouver	Britannia	3	2
Lillooet	Pioneer	....	1
Cariboo	Island Mountain	1	....
Similkameen	Copper Mountain (surface)	....	1
Similkameen	Allenby Mill (surface)	....	1
Osoyoos	Nickel Plate Mine	1	2
Nelson	Bayonne	....	1
Nelson	Gold Belt	....	1
Fort Steele	Sullivan	3	5
Omineca	Pinchi Lake	3	....
Portland Canal	Silbak Premier	2	....
Totals		13	14

Of the thirteen fatal accidents in and around the metalliferous mines in the Province during 1943 only one occurred to a new man, all the others had had considerable experience in their particular line of work and in most of the following details it will be noted that greater care on the part of the men killed would have averted the accidents.

The fatal accident which occurred to Charles Pearson, miner, Pinchi Lake Mercury Mine, Consolidated Mining and Smelting Company of Canada, Limited, on January 18th was due to a fall of ground which killed him instantly.

The place had been barred down and the deceased was drilling his second hole when the fall occurred, exposing ground slips that previously were not visible.

The fatal accident which occurred to James Milne, miner, Pinchi Lake Mercury Mine, Consolidated Mining and Smelting Company of Canada, Limited, on January 25th

was due to a slide of muck following a fall of ground in a stope where deceased and his partner were barring loose muck into a chute.

This slope had not been worked for a number of weeks and only the loose muck was being dealt with.

Deceased was struck by some of the moving rock and sustained injuries from which he died about two hours later.

The fatal accident which occurred to Harold Swan, pipeman, Sullivan Mine, Consolidated Mining and Smelting Company of Canada, Limited, on March 11th was due to a fractured skull sustained when he slid down the floor of a slope and into a raise. Deceased had been working on a pipe-line laid along a hog-back trail between two slopes when he was seen to throw up his hands and fall from the trail. There was no evidence that anything had struck him and none of the several men in the immediate vicinity noticed anything unusual that would account for his falling. He died within a few minutes of his injury.

The fatal accident which occurred to Peter Buzan, barman, Sullivan Mine, Consolidated Mining and Smelting Company of Canada, Limited, on March 11th was due to deceased being thrown from the top of a 30-foot ladder in a stope. He had drilled a jack-hammer hole into some loose ground when a piece of the ground fell and struck the guy-wires steadying the ladder. The sudden strain on the guy-wire jerked the ladder and caused deceased to be thrown off. His head struck a rock on the floor of the stope and he died instantly.

The fatal accident which occurred to Louis Ernai Johansen, chief electrician, Premier Mine, Silbak Premier Mining Company, on March 25th was due to deceased being crushed between an ore-train and the side of No. 4 tunnel near the 601 shaft. Deceased and his assistant went into No. 4 tunnel for the purpose of inspecting the electric hoist at the 601 shaft and were accompanied by a dog owned by Johansen. Near the inner end of the tunnel they saw an ore-train coming out and both men took shelter in a wide part of the tunnel but the dog stayed on the track. Johansen left his place of safety to rescue the dog and was caught and crushed between the ore-train and the side of the tunnel and suffered injuries from which he died in a few minutes. This tunnel is protected by a system of lights which show when a train is in motion. The mine foreman had previously warned deceased to keep his dog out of the mine as it was likely to get injured or cause injuries to some one. The dog escaped injury in the above accident.

The fatal accident which occurred to A. Ross, electrician, Britannia Mining and Smelting Company, on April 12th was due to deceased falling from the 4,100 station of No. 8 sinking shaft to the bottom, a distance of 500 feet. The deceased and the shiftboss had come down on the bucket from the 4,000 station to the 4,100 station. Both men were standing on the rim of the bucket and holding on to the hoisting-rope. When the bucket stopped at the 4,100 station the deceased started to get off the bucket. He was carrying a carbide lamp in his hand and had a small box of electrical supplies with him which probably prevented him from having the free use of his hands to assure a safe landing from the bucket.

The fatal accident which occurred to John Lutz, labourer, Kelowna Exploration Company, Limited, on April 15th was due to deceased drinking some cyanide solution from a jar on the cyanide operator's desk in the concentrator. The deceased was a new man and had started work only one hour before and was being shown his prospective duties in the mill by an old employee. He had already been shown where to obtain drinking-water from a constantly running tap which was plainly marked "Drinking Water." When the older employee returned after having left Lutz for a few minutes the latter was in difficulty and on being questioned as to what was wrong he pointed to the cyanide operator's desk. The standard antidote was immediately administered and artificial respiration applied together with oxygen, and medical service was given

soon after, but Lutz died. No reason could be deduced for his action in drinking the cyanide solution.

The fatal accident which occurred to Thomas Koski, miner, Pinchi Lake Mercury Mine, Consolidated Mining and Smelting Company of Canada, Limited, on April 19th was due to deceased being carried down a raise by a slide of loose muck which he was barring into the raise from a surface glory-hole in daylight. Deceased and his partner were supplied with safety-ropes and instructed to use them and did so until a few minutes before the accident when deceased discarded his safety-rope and continued to work without it. He was killed instantly by the moving muck.

The fatal accident which occurred to A. W. Male, brakeman, Britannia Mining and Smelting Company, Limited, on June 3rd was due to deceased contacting the overhead electric trolley-wire on the 4,100 tunnel near Victoria shaft. The deceased had climbed on the electric locomotive to sit on the top while the locomotive was stationary. The motorman noticed that Male appeared to be in distress and Male told him that he had contacted the trolley-wire and "was going to pass out." He then became unconscious. The motorman moved Male on to the ground and immediately telephoned for assistance which arrived within a few minutes when artificial respiration was applied, but deceased did not respond. The trolley-wire at the point where deceased contacted it was 6 feet 1 inch above the rail-level and is at one side between the track and the wall of the tunnel.

The death of Joseph Starcevich, Sullivan Mine, Consolidated Mining and Smelting Company of Canada, Limited, on June 15th resulted from a collision between a supply train he was driving and a standing train on the electric trolley haulage. Both drivers had started out with the understanding that the first train would govern the speed and stops. At the time of the collision, the first train had stopped for switching purposes. Starcevich's train was proceeding slowly but apparently he did not apply his brake in time to bring his train to a stop. A long timber projecting from the rear car of the standing train crushed him in the pit of the locomotive, and he died ten hours later. The tunnel is well illuminated by stationary electric lights and the locomotive's headlight was in operation.

The fatal accident which occurred to Albert B. Armstrong, surface labourer, Silbak Premier Mines, Limited, on June 28th was due to the deceased being struck by a timber from an abandoned bridge which he was demolishing. Deceased and another man were pulling down one of the old bents and he failed to get clear when the timber fell. Death was instantaneous.

A fatal accident occurred to George M. Sinclair, mine foreman, Island Mountain Mines, Limited, on August 24th when he was struck by a small timber skip which fell down a raise when the hoisting-rope had broken. Death was practically instantaneous.

Because the raise is not straight it is sometimes necessary when hoisting long timbers to stop the skip and adjust them. Deceased had issued orders to the men that no one was to enter the skipway below the skip or when it was in motion, but on this occasion he had apparently entered the skipway while the skip was being hoisted and was still there when the rope broke and allowed the skip to fall. The skip and timber weighed 200 lb. and the rope used was three-eighths of an inch in diameter.

The fatal accident which occurred to Dudley Dale, sawmill-worker, Noland Mine, Atlin, on September 11th was due to deceased being struck by the exposed end of the fly-wheel shaft of a 10-horse-power gas-engine used to furnish power for a small sawmill used principally for the cutting of mine-timber. This sawmill is in the open with only a makeshift roof over the engine and the whole installation is of a very temporary nature.

The fatal accident which occurred to H. Rolin, miner, Britannia Mining and Smelting Company, Limited, on October 14th was due to a fall of ground while engaged in

barring down his working-place in preparation for setting up his drilling-machine. Deceased died from his injuries about twelve hours later.

The fatal accident which occurred to Henry Kashela, labourer, Rayner Construction Company, Section 2, Prince Rupert, Cedarvale Highway, on May 2nd was due to the collapse of a bank of earth and rock alongside the highway which he was scaling down at the time. Safety belts and ropes were provided on this project but apparently no instructions or efforts had been made by those in charge to see that these safety appliances were used.

DANGEROUS OCCURRENCES.

On January 9th at No. 2 shaft, Pioneer Mine, while a new hoistman was being trained to operate the hoist he forgot to reverse after hoisting one of the skips out of the dump, with the result that he ran the skip too high to where it was stopped by the overwind switch. Two guides were broken but no further damage was suffered by the installation. No person was injured by this occurrence.

On February 2nd at the Crown shaft, Bralorne Mines, while the hoistman was making a test run with one of the cages in the shaft, preliminary to handling men, he found that the brake on one drum did not function. Quickly throwing in the clutch of the stationary drum he brought the moving cage to rest by that means. It was then discovered that a piece of concrete had broken off the side of the brake weight pit and caused the weights operating the brake to become locked in the pit. No person was injured by this occurrence.

On September 22nd at the Sullivan Mines, Consolidated Mining and Smelting Company of Canada, Limited, the hanging-wall on a large stope collapsed and the cave-in which followed filled a space of about 300,000 cubic yards in that and adjacent stopes. The resulting air-blast did some damage to underground installations such as pipe-lines and other equipment. No person was seriously injured by the air-blast although several men were rolled along the floor by the pressure. Seventy-five men who were having their lunch in an underground lunch-room in the vicinity were uninjured. The hanging-wall which collapsed was at a point 650 feet below the surface where the cave-in left a depression 500 feet long, 300 feet wide, and 120 feet deep.

EXPLOSIVES USED IN MINES.

During 1943 the further curtailment of mining resulted in a reduced consumption of explosives used in British Columbia metalliferous mines and in quarries. This consisted of 3,888,000 lb. of high explosives; 1,360,000 fuse detonators; 41,000 electric detonators; 11,750 delay detonators; 68,500 feet of primacord, and 9,767,000 feet of safety fuse. The above explosive supplies are approximately one-half of the normal amount used in British Columbia mines.

During the year the Inspectors of Mines supervised the removal or destruction of small amounts of explosives which had been overlooked in the search for explosives at abandoned properties during the past few years.

AIR-SAMPLING.

Air-samples were taken in cases where conditions indicated the possibility of noxious gases, such as carbon monoxide or nitrous oxide, being present or the oxygen content being below normal. No dangerous conditions were found from this viewpoint although in some cases augmented ventilation was ordered by the Inspector.

DUST AND VENTILATION.

Fan ventilation is now standard at all the larger mines and the general practice is that the various operators, from their experience gained during the past few years with

the advantages of general power ventilation, install fans as soon as required for general ventilation.

The ventilation of long single drifts still presents difficulties, but here also general improvement is noted in the use of larger auxiliary fans and larger diameter ventilation-pipes.

The miners and other employees are also more conscious of the safety provided by the use of water when drilling and in wetting the muck after blasting, although many have to be reminded of this safety measure throughout the year.

SAFETY AND FIRST-AID WORK.

The Mine Safety Associations in the different mining areas of the Province carried on and fostered first-aid work and safety education in their respective districts of Vancouver Island, Britannia, Princeton, East Kootenay, and Bridge River, to which work the safety engineers at the various mines and the District Inspectors of Mines added their efforts throughout 1943.

In addition to their other activities, the above associations held first-aid and safety demonstrations at which not only the men engaged in the mines took part, but also many ladies, girls, and boys so that the value of safety and first aid is being realized beyond the immediate needs of the mines.

While the success of this work depends very largely on the efforts of the personnel of the above Mine Safety Associations, the Department of Mines by means of financial grants supplies most of the funds required to meet any necessary expenses.

During the year the reduced number of the younger men employed at the mines was reflected by some falling off in the number who took special training in the different branches of safety-work, such as mine-rescue training, first-aid courses, and safety meetings. This same cause has resulted in the age of mine employees to-day being raised much above the average and this in turn has resulted in an increased accident ratio. To a very limited extent the loss of the younger experienced men has been offset by new inexperienced men who in most cases were not eligible for the armed forces. Some of these new men may be assimilated in the mining industry, but most of them look on mining as a temporary employment.

The loss of the younger experienced men has resulted in an increased accident ratio as older men have, in many instances, had to take over work in transportation and other departments which was more suitable for the younger men.

There has been a definite increase in the type of accident where only greater care on the part of the individual would ensure safety. It may be that the indirect strain of war is tending to prevent many of the men from keeping fully alert at all times to the potential dangers of their work underground.

LIST OF PUBLICATIONS.

The following publications of the Department are available for distribution:—

INDEXES.

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.

Index to Annual Reports of the Minister of Mines, 1937–1942. And Bulletins Nos. 1–17. Paper bound copies, 50 cents each. Cloth bound copies, $1 each.

Corrigendum, Index to Annual Reports of the Minister of Mines, 1874–1936.

ANNUAL REPORTS.

Paper bound copies, free: 1897, 1901, 1908, 1909, 1910, 1914, 1915, 1916, 1917, 1918, 1919, 1920, 1921, 1922, 1923, 1924, 1925, 1927, 1928, 1929, 1933, 1934, 1935, 1939, 1940, 1941, 1942; Parts A to F for the years 1936, 1937, 1938.

Paper bound copies at 50 cents each: 1907, 1913, 1930, 1931.

Cloth bound copies at $1 each: 1899, 1915, 1916, 1919, 1928, 1929, 1932, 1933, 1934, 1935, 1936, 1937, 1938, 1939, 1940, 1941, 1942.

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.

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.

Prospectors' Guide for Strategic Minerals in Canada. (Third Edition.) (By Mines and Geology Branch, Department of Mines and Resources, Ottawa, Canada.) 1942.

Prices noted against the following publications are charged only when they are sent outside of British Columbia:—

Notes on Placer-mining in British Columbia. (By Officers of the Department.) 1938, reprinted in 1943. (25 cents.)

Preliminary Investigations into Possibilities for Producing Silica Sand from British Columbia Sand Deposits. (By J. M. Cummings.) 1941. (50 cents.)

BULLETINS, NEW SERIES.

1940.

Bulletin No. 1: Aiken Lake Area, North-Central B.C. (By Douglas Lay.) (25 cents.)

Bulletin No. 2: Placer-gold Deposits, Wheaton (Boulder) Creek, Cassiar District. (By Stuart S. Holland.) (25 cents.)

Bulletin No. 3: Fraser River Tertiary Drainage-history in relation to Placer-gold Deposits. I. (By Douglas Lay.) (25 cents.)

Bulletin No. 4: Saline and Hydromagnesite Deposits of British Columbia. (By J. M. Cummings.) (65 cents.)

Bulletin No. 5: Mercury Deposits of British Columbia. (By John S. Stevenson.) (35 cents.)

Bulletin No. 6: Geology of Camp McKinney and the Cariboo Amelia Mine. (By M. S. Hedley.) (25 cents.)

Bulletin No. 7: Lode-gold Deposits of the Upper Lemon Creek Area and Lyle Creek—Whitewater Mine Area, Kootenay District. (By R. J. Maconachie.) (25 cents.)

Bulletin No. 8: Preliminary Report on the Bedwell River Area. (By H. Sargent.) (25 cents.)

Bulletin No. 9: Molybdenite in British Columbia. (By John S. Stevenson.) (35 cents.)

1941.

Bulletin No. 10: Tungsten Deposits of British Columbia. (Revised.) (By John S. Stevenson and Staff of Department of Mines.) (65 cents.)

Bulletin No. 11: Fraser River Tertiary Drainage-history in relation to Placer-gold Deposits. II. (By Douglas Lay.) (35 cents.)

Bulletin No. 12: Reconnaissance in the Area of Turnagain and Upper Kechika Rivers. (By M. S. Hedley and Stuart S. Holland.) (35 cents.)

Bulletin No. 13: Supplementary Report on Bedwell River Area. (By H. Sargent.) (35 cents.)

Bulletin No. 14: Coal Analyses of British Columbia. (By James Dickson.) (10 cents.)

1942.

Bulletin No. 15: Hydraulic Mining Methods. (By Stuart S. Holland.) (35 cents.)

Bulletin No. 16: Dragline Dredging Methods. (By Stuart S. Holland.) (10 cents.)

1943.

Bulletin No. 17: An Introduction to Metal-mining in British Columbia. (By Officers of the Department.)

IN COURSE OF PREPARATION.

Specimens and Samples, their Treatment and Use.

Tuya-Teslin Area, North-western British Columbia.

On General Geology and Lode-gold Occurrences; for the Use of Prospectors.

SPECIAL REPORTS.

Special reports and drawings relating to several properties were advertised as available in the Annual Reports 1936 to 1941, inclusive. These reports and maps have not been printed. Those still available will be supplied, as mimeographed copies of the texts and ozalid prints of drawings, at charges from 25 cents each upward. A list of Special Reports available will be supplied on request. Requests for the reports, accompanied by the proper sum, should be addressed to the Chief Mining Engineer.

LIST OF LIBRARIES.

All Department publications are being sent to the following Government departments and Legislative, University, and Public Libraries:—

CANADA.

Government Departments—
- Department of Secretary of State, Ottawa—Library.
- Department of Mines and Resources, Ottawa—Library of the Bureau of Geology and Topography.
- Department of Mines, Halifax, Nova Scotia.
- Department of Lands and Mines, Fredericton, New Brunswick.
- Department of Mines, Quebec, Quebec.
- Department of Mines, Toronto, Ontario.
- Department of Mines and Natural Resources, Winnipeg, Manitoba.
- Department of Natural Resources, Regina, Saskatchewan.
- Department of Lands and Mines, Edmonton, Alberta.

Legislative Libraries—
- Library of Parliament, Ottawa.
- Legislative Library, Halifax, Nova Scotia.
- Legislative Library, Fredericton, New Brunswick.
- Legislative Library, Quebec, Quebec.
- Legislative Library, Toronto, Ontario.
- Legislative Library, Winnipeg, Manitoba.
- Legislative Library, Regina, Saskatchewan.
- Legislative Library, Edmonton, Alberta.

University Libraries—
- Dalhousie University, Halifax, Nova Scotia.
- Acadia University, Wolfville, Nova Scotia.
- Laval University, Quebec, Quebec.
- McGill University, Montreal, Quebec.
- Queen's University, Kingston, Ontario.
- University of Toronto, Toronto, Ontario.
- University of Manitoba, Winnipeg, Manitoba.
- University of Saskatchewan, Saskatoon, Saskatchewan.
- University of Alberta, Edmonton, Alberta.
- University of British Columbia, Vancouver, B.C.

Public Libraries—
- Public Library, Halifax, Nova Scotia.
- Public Library, Montreal, Quebec.
- Public Library, Toronto, Ontario.
- Public Library, Winnipeg, Manitoba.
- Public Library, Regina, Saskatchewan.
- Public Library, Edmonton, Alberta.
- Public Library, Calgary, Alberta.
- Public Library, New Westminster, B.C.
- Public Library, Nelson, B.C.
- Public Library, Prince Rupert, B.C.
- Public Library, Prince George, B.C.

ENGLAND.

British Columbia House, Regent Street, London, England.
Canada House, London, England.

SOUTH AFRICA.

Public Library, Johannesburg, South Africa.

AUSTRALIA.

Public Library, Sydney, Australia.

UNITED STATES.

Government Departments and Legislative Libraries—
- Library of Congress, Washington, D.C.
- Bureau of Mines, Washington, D.C.
- United States Geological Survey, Washington, D.C.
- California State Division of Mines, Ferry Building, San Francisco, California.
- Oregon State Bureau of Mines, Salem, Oregon.
- Washington State Bureau of Mines, Olympia, Washington.
- Idaho State Bureau of Mines, Boise, Idaho.

University Libraries—
- Columbia University, New York, N.Y.
- University of California, Berkeley, California.
- Oregon State College, Corvallis, Oregon.
- University of Washington, Seattle, Washington (College of Mines).
- University of Nevada (Mackay School of Mines), Reno, Nevada.

Public Libraries—
- New York Public Library, New York, N.Y.
- Free Library, Philadelphia, Pa.
- Public Library, Boston, Mass.
- Public Library, Los Angeles, California.
- Public Library, San Francisco, California.
- Library Association of Portland, Portland, Oregon.
- Public Library, Seattle, Washington.
- Public Library, Spokane, Washington.

SYNOPSES OF MINING LAWS AND LAWS RELATING TO MINING.

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

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.

MINERAL ACT AND PLACER-MINING ACT.

FREE MINERS' CERTIFICATES.

Free miners' certificates must be obtained before any person can prospect for mineral and locate and record mineral claims in British Columbia.

Any person over the age of 18, and any joint-stock company incorporated or registered in British Columbia, 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.

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 ACT.

All minerals occurring in place are acquired under the "Mineral Act," but limestone, marble, clay, sand, gravel, earth, building or construction stone, coal, petroleum, and natural gas are not considered as mineral.

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. 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.

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-mining Act.

In the "Placer-mining Act" "mineral" is defined as in the "Mineral Act," but includes only mineral occurring in any natural unconsolidated material, excluding mineral in place.

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. 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."

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.

Placer-mining Leases.

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.

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:—

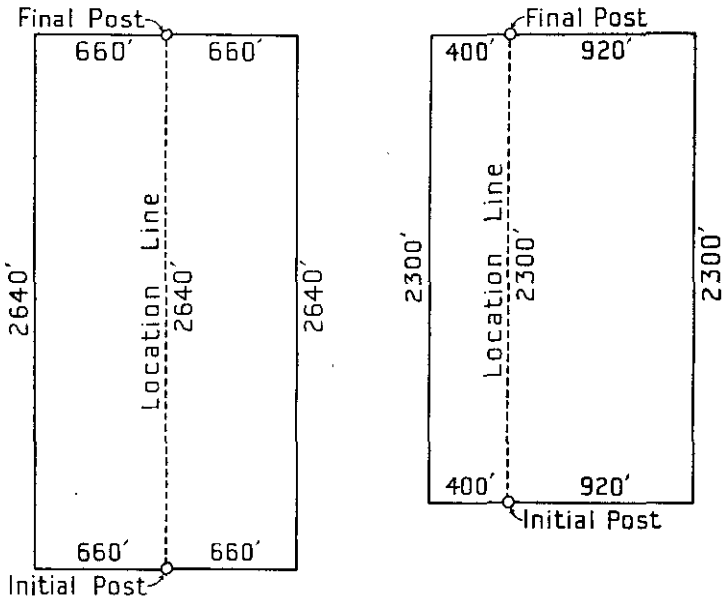
"(*a.*) The name of the intending applicant or each applicant if more than one, and the numbers of their free miners' certificates:

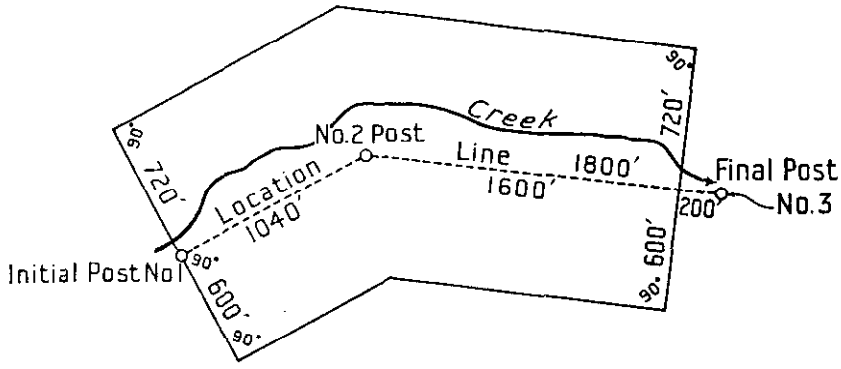
"(*b.*) The date of the location:

"(*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 miner's 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.

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.

WAR-TIME COAL-MINE EMPLOYMENT ACT.

Under this Act it is lawful during the continuance of the war to employ in a coal mine, where not more than twelve men are working underground, as manager, overman, shiftboss, fireboss, shotlighter, or coal-miner a person who is not registered as a holder of a certificate of competency or service under the "Coal-mines Regulation Act," providing he is competent to carry out his duties in the opinion of the Chief Inspector of Mines or of an Inspector of Mines. A permit in writing must be obtained.

QUARRIES REGULATION ACT.

This Act, like the "Metalliferous Mines Regulation Act," is designed to provide for the safe working of quarries by practical regulations.

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.

MINES RIGHT-OF-WAY ACT.

This Act provides for access to mining property. It provides for the obtaining of a right-of-way for any road, railway, aerial, electric, or other tramway, surface or elevated cable, electric or telephone pole-line, chute, flume, pipe-line, drain, or any right or easement of a like nature.

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.

INDIAN RESERVES MINERAL RESOURCES ACT.

This Act validates an agreement between the Dominion and the Province whereby mineral rights on Indian reserves, upon surrender by the Indians, shall be administered by the Province, subject to the laws of the Province. A free miner wishing to prospect on Indian reserves must obtain the approval of the Gold Commissioner for the mining division in which the reserve is situated and also of the Indian Agent for such reserve.

ALLIED FORCES EXEMPTION ACT.

According to the provisions of this Act, any free miner who, since the 3rd day of September, 1939, has joined or joins, for service in the present war, any of the naval

or military forces of His Majesty, or of any power being at the time an ally of His Majesty, for active service (full-time service) shall be exempted from doing assessment-work and from paying recording fees and rentals for the duration of the war and six months thereafter on any mineral claim or placer-mining lease recorded in his name at the time of his enlistment.

WAR MARINERS' BENEFITS ACT.

This Act was passed at the 1944 session of the British Columbia Legislature and confers on mariners any benefits, rights, privileges, or exemptions which have heretofore been conferred upon members of the Allied Forces. A person qualifying as a mariner is entitled to the same exemption as accorded to members of the Allied Forces under the "Allied Forces Exemption Act, 1939."

In this Act "mariner" means a person who has served in deep-sea waters in a war zone during the present war in any ship whose port of registry was during such service in a part of the British Commonwealth of Nations; but does not include a person whose domicile during his period of service was not in British Columbia.

CORPS OF CANADIAN FIRE-FIGHTERS ACT.

This Act, like the "War Mariners' Benefits Act," confers on Canadian fire-fighters who have proceeded overseas any benefits, rights, privileges, or exemptions which have heretofore been conferred upon members of the Allied Forces.

FREE MINERS' EXEMPTION ACT.

The benefits of this Act are exemption from the performance of work or payment in lieu of work on mineral claims or placer-mining leases, and, in the case of placer-mining leases, relief from the payment of the annual rentals. To obtain the benefits of the "Free Miners' Exemption Act" a person must have been the holder of a valid free miner's certificate on June 1st, 1942, and also the owner of a mineral claim or placer-mining lease in good standing at that time. The Act makes provision for obtaining its benefits by the holder of a mineral claim or placer-mining lease making application to the Mining Recorder for the mining division in which the property is situated on or before May 1st, 1943, or on or before the anniversary in that year of the date of recording of the mineral claim, or the date of issue of the placer-mining lease, whichever date is later. In subsequent years application must be made on or before the anniversary date of record or issue. The holder may make application either by letter or in person and $2.50 must be paid to the Mining Recorder as a recording fee for every mineral claim or placer-mining lease in respect of which notice is filed.

No person is entitled to file a notice or obtain the benefit of the Act in respect of more than eight mineral claims or eight placer-mining leases, or a total of eight mineral claims and placer-mining leases. Similarly, no mining partnership nor joint-stock company shall be entitled to file a claim or obtain the benefit of the Act in respect of more than sixteen mineral claims or sixteen placer-mining leases, or a total of sixteen mineral claims and placer-mining leases.

If a person who was the holder of a mineral claim or placer-mining lease in good standing on June 1st, 1942, permitted the property to lapse he is entitled to the benefits of the Act provided he made application for reinstatement to the Mining Recorder on or before May 1st, 1943. Should any person have relocated the ground or any part of the ground the person who held the claim or lease on June 1st, 1942, and the person who relocated shall have a joint interest in that portion of the ground held jointly in proportion to the money expended by each. Failure to agree between the parties concerned upon the interest that each shall have shall be settled by arbitration.

The "Free Miners' Exemption Act" was amended at the 1944 session of the British Columbia Legislature by an Act entitled "Free Miners' Exemption Act Amendment Act, 1944." The amendment was passed to permit those persons who were entitled to apply in 1943 and failed to do so, but kept their mining properties in good standing until 1944 or subsequent year, to gain the benefits of the said Act. Such persons may make application to the Mining Recorder for the mining division in which their properties are situate, but application need not be made until the anniversary date in the last year during which the properties are in good standing. The fees payable and the number of mineral claims and placer-mining leases which may be benefited remain unchanged.

A person who would have been entitled to take advantage of the "Free Miners' Exemption Act" in 1943 but failed to do so, and who has, between the 1st day of January, 1944, and the 1st day of May, 1944, permitted his mineral claim or placer-mining lease to lapse, may gain the benefits of the Act for such mineral claim or placer-mining lease. Reinstatement may be effected by application made on or before July 1st, 1944, to the Mining Recorder for the mining division in which the property is situated.

PROSPECTORS' GRUB-STAKE ACT.

In this Act "grub-stake" means money, food supplies, clothing, powder, tools, or any other thing necessary to the business of prospecting. "Prospector" means any person who is a British subject and who is the holder of a valid free miner's certificate; who has been honourably discharged from any of His Majesty's Services or has been resident in the Province during the year preceding any application for a grub-stake.

Information regarding grub-stakes may be obtained from the Department of Mines, Victoria, B.C., or from any Mining Recorder, Mining Engineer, or Inspector of Mines of the Department.

No grub-stake granted to one applicant shall exceed $300 in value in any one year, but the grub-stake may be increased if an applicant is required to travel to or from the area in which he is to prospect by an amount sufficient to cover such travelling expenses. The total in no case shall exceed $500 in any year. Applicants are required to identify some of the commoner rocks and minerals.

Provision has been made for the establishment and operation of one or more mining training camps at suitable locations within the Province.

COAL ACT.

The "Coal Act," 1944, and the "Petroleum and Natural-gas Act," 1944, when proclaimed will replace the "Coal and Petroleum Act."

The new Act provides for a licence to develop coal and to mine coal not in excess of 10,000 tons per annum. The licence is renewable yearly and the licensee has the first right to a lease over the same ground when he can produce more than 10,000 tons of coal per annum. If an applicant can show the Department that he has a market for more than 100,000 tons of coal per annum he may obtain an additional licence for every 100,000 tons of coal he plans to develop and produce. A licence is 1 square mile in area. The yearly rental is 50 cents per acre and the fee for issuing or renewing a licence is $25. If development-work to the value of $7.50 per acre is done the rental may be rebated.

When a licensee is producing more than 10,000 tons of coal per annum he may obtain a twenty-year lease and if he is producing more than 100,000 tons of coal per annum he may obtain an additional lease for each 100,000 tons of coal being produced. The rental for a lease is $1 per acre and the fee for issuing a lease is $25.

The royalty on coal produced under a licence or lease will be 25 cents per short ton. When the new Act comes into force all mining operations carried on beyond the perime-

ter of presently active workings must have the approval of the Chief Inspector of Mines and the plan of operations must provide for the maximum possible extraction of coal contingent upon good mining practice and safety of operation.

No Crown grants of coal land can be obtained under the new Act.

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.

FOREST ACT.

In 1939 the "Provincial Parks Act" was repealed and the administration of Provincial parks brought under the "Forest Act." Under this Act the Lieutenant-Governor in Council may constitute any portion of the Province a Provincial park and may also extend, reduce, or cancel any park created before or after the amendment to this Act.

The Act provides for three classes of parks to be known as "A," "B," and "C" Class parks.

Lands included in Class "A" and Class "C" parks are reserved from pre-emption, sale, lease, or licence under the "Land Act" and with respect to mining are so reserved unless the consent of the Lieutenant-Governor in Council is obtained, and then only subject to further provisions of the Act.

No holder of any mineral claim in a Class "A" or Class "C" park may obtain a Crown grant of the surface rights of a mineral claim.

All mineral claims in any Class "A" or Class "C" park shall be subject to such terms and conditions and restrictions, including cutting and use of timber, as the Lieutenant-Governor in Council may from time to time prescribe.

The restrictions on prospecting and mining in Class "A" and Class "C" parks do not apply in the case of Class "B" parks.

Where, in the opinion of the Minister of Lands, the safety of life and property is endangered through the hazardous condition of the forest-cover or the occurrence or spread of forest fire the Minister may declare a district closed for travel and prospecting so long as the hazard exists.

LIST OF PRICES CHARGED FOR ACTS.

	Price.
Department of Mines Act	$0.15
Mineral Act	.25
Placer-mining Act	.25
Metalliferous Mines Regulation Act	.50
Coal-mines Regulation Act	.70
Quarries Regulation Act	.15
Mines Right-of-way Act	.15
Provisional Free Miners' Certificates (Placer) Act	.25
Iron and Steel Bounties Act	.15
Indian Reserves Mineral Resources Act	.15
Allied Forces Exemption Act	.15
Corps of Canadian Fire-fighters Act	.15
War Mariners' Benefits Act	.15
Free Miners' Exemption Act	.15
War-time Prospectors' Grub-stake Act	Free
Coal Act	.15
Taxation Act	.75
Forest Act	.80
Garibaldi Park Act	*
Strathcona Park Act	.15
Greater Vancouver Water District Act	.40
Coal and Petroleum Products Control Board Act	.15
Security Frauds Prevention Act	.30
Coal Sales Act	.15
War-time Coal-mine Employment Act	.15

* Out of print.

INDEX.

A.

B.

C.

D.

E.

F.

G.

H.

I.

J.

K.

L.

M.

N.

O.

P.

Q.

R.

S.

T.

U.

V.

W.

Y.

Z.

VICTORIA, B.C.:
Printed by CHARLES F. BANFIELD, Printer to the King's Most Excellent Majesty.
1944.

2,305-544-9381