ANNUAL REPORT

OF THE

MINISTER OF MINES

OF THE PROVINCE OF

BRITISH COLUMBIA

FOR THE

YEAR ENDED 31ST DECEMBER

1942

PRINTED BY
AUTHORITY OF THE LEGISLATIVE ASSEMBLY.

VICTORIA, B.C.:
Printed by CHARLES F. BANFIELD, Printer to the King's Most Excellent Majesty.
1943.

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.*

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

R. J. STEENSON, *Chief Gold Commissioner* (deceased).

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 1942 is herewith respectfully submitted.

ERNEST CRAWFORD CARSON,
Minister of Mines.

Minister of Mines' Office,
June, 1943.

Robert (Bob) Steenson, Chief Gold Commissioner in the British Columbia Department of Mines, died on October 2nd, 1942.

Mr. Steenson was born in Victoria on February 19th, 1896, attended school in that city, and entered the Department of Agriculture in 1913. Transferring to the Department of Mines in 1914, he worked his way up through the positions of Clerk, Mining Recorder and Gold Commissioner for the Victoria Mining Division to Chief Gold Commissioner for the Province.

He was instrumental in introducing modern methods of recording and filing, including the organization and establishment of a central recording office in Vancouver which was opened shortly before his death.

A keen sportsman of sterling character, with an intimate knowledge of departmental affairs accompanied by long service, his loss is keenly felt both by the Department of Mines and his many friends.

It is with deep regret that the Department of Mines records the death of Mr. John D. Galloway, which occurred on February 21st, 1942, in Vancouver.

Mr. Galloway, although born in New Zealand, spent the greater part of his life in Canada, especially British Columbia. He attended school in Greenwood, Vancouver, and Victoria, and in 1907 entered McGill University, where he took the course in mining engineering. Four years later he graduated at the head of his class, winning with this distinction the Sir William Dawson Fellowship and the British Association Medal; and, continuing at the University as a postgraduate student, he obtained the M.Sc. degree in 1912.

In 1913 he joined the British Columbia Department of Mines as Assistant Provincial Mineralogist. In 1917 he was appointed Resident Engineer at Hazelton and in 1925 he became Provincial Mineralogist. He resigned in 1934 to engage in private practice as consulting mining engineer and geologist.

"John D.," as he was affectionately known amongst the mining fraternity, is greatly missed not only as a loyal friend but an outstanding member of his profession.

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PREFACE.

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

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

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

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

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

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

The reports of the officers of the Mineralogical Branch are published now in bulletin form. The publication of bulletins by the Department of Mines is not a new innovation, as forty-three bulletins covering a variety of subjects had previously been published between 1896 and 1934, inclusive, as well as a number of separate publications. In the past the bulletins were not numbered consecutively from year to year but only for each year, and most of them were embodied in the Annual Report. Commencing with the present series of bulletins, replacing a large part of the material formerly contained in the Annual Report, the series is being numbered consecutively from year to year, and to date seventeen bulletins have appeared in place of much of the material that ordinarily would have been contained in this report and in the Annual Reports for 1939, 1940, and 1941. A list of these bulletins, as well as other publications available for distribution by the Department, will be found on page 38.

THE MINING INDUSTRY.

The value of mine production in 1942 was $75,551,093, a decrease of $2,928,626 from 1941. In the figure of $75,551,093 the value of copper is based upon the London price, which is used so that value figures in the tables in this Report will correspond closely with Provincial figures published by the Dominion Bureau of Statistics. The Dominion Bureau uses the London price because most of Canada's copper is sold in London, but British Columbia's copper is sold in the United States, and the settlement is based on the New York price, which is somewhat higher than the London price.

Since the outbreak of war the usual summary and tables reviewing and showing detailed mine production have not been printed, and cannot be published during the war. However, all data are being collected and will be available for publication upon the conclusion of the war.

Compared with 1941 there was a decrease in production in the following: Lode gold, copper, lead, and clay products. A variable increase is recorded in mercury, tungsten, zinc, coal, non-metallics, cement, lime, etc. New products embrace arsenic, tin, and indium. The decrease in copper production was caused chiefly by labour shortage, created by the miners either joining the active forces or finding work in shipyards or other war industries. An attempt was made to remedy this situation towards the end of the year and more labour was obtained. However, as many of the new men were unaccustomed to mine-work, the increase in production was slight. The lode-gold mines suffered more than any other in the industry because of labour shortages, increased costs, fixed price, restrictions on equipment, and competition with higher paid war industries. Fourteen or fifteen gold mines and many smaller operations have closed down during the past two years, most of them in 1942, and the majority of them war casualties. The output of these properties in 1940 had a value of more than $5,000,000. The decrease in gold production from 1941 is between four and five million dollars.

The war-mineral picture is particularly bright. British Columbia's mercury contribution to the war effort is something to be proud of, and it seems likely that the Province will be amongst the future mercury producing countries of the world. British Columbia has also become an important producer of tungsten concentrates and this production is expected to increase materially in 1943.

Coal showed a substantial increase in 1941 compared to 1940 and this increase continued well into 1942. From about the middle of the year, however, labour shortages and wage troubles created a shortage and, although production was greater than in 1941, it did not reach the proportions anticipated earlier in the year.

Zinc production maintained a high level, but shortage of labour delayed additional output from a number of idle properties.

Lead is not classed as a war metal but as a by-product of zinc-mining. Production has been satisfactory.

The Department, working in co-operation with the University of British Columbia, the mining industry, the office of the Metals Controller, and the Dominion Department of Mines, established a War Metals Research Board. The University supplied the laboratories; the Department, the Metals Controller, and the Dominion Department of Mines and Resources provided sufficient funds to carry on the work. A four-man board, representing the University, the Provincial Department of Mines, the Mining Association, and the Dominion Department of Mines and Resources, administered the work. The Board uses the ore-dressing laboratories of the University of British Columbia that are idle during the five-month summer vacation. Research-work in the laboratories was confined to war minerals and their recovery as by-products from existing operations, as well as treatment methods for the possible recovery of war minerals from properties not now in production. This work was supplementary to

that of the ore-dressing laboratories in Ottawa, already crowded with work, and was closely related to the field-work of the Provincial and Dominion Departments. The work done by the Board greatly assisted some mine operators of the Province, who advanced funds for special research.

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.

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 1942 was $38.50 per ounce. On this basis the average crude-gold value per ounce was $31.66 on Provincial placer-gold production.

(3.) The prices used in valuing the different metals are: For gold, the average price for the year; for silver, the average New York metal-market price for the year; for lead, the average London metal-market price for the year; and for zinc, the average London metal-market price for the year. Copper in 1942 is valued at the average London metal-market price. (*See* foot-note to Table I.) Prior to 1932 copper was valued at the average New York price. The change was made because very little copper was being marketed in the United States on account of high tariff charges against importations from foreign countries. The bulk of the lead and zinc production of the Province is sold on the basis of the London prices of these metals and they are therefore used. The New York, St. Louis, and Montreal lead- and zinc-market prices differ materially from the London prices of these metals and are not properly applicable to the valuing of the British Columbia production.

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

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

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

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

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

TABLE I.—British Columbia Mine Production, 1941 and 1942.

	Quantity, 1941.	Quantity, 1942.	Value, 1941.	Value, 1942.
			$	$
Metallics.				
Gold, lode* ..... oz.	571,026	444,518	21,984,501	17,113,943
Gold, placer* ..... oz.	43,775	32,904	1,385,962	1,041,772
Silver, copper, lead, zinc	.....	.....	40,231,518	38,245,536
Antimony, arsenic, bismuth, cadmium, indium, magnesium, mercury, platinum, tin, tungsten	.....	.....	3,120,053	6,341,167
Totals			66,722,034	62,742,418
Fuel.				
Coal (2,240 lb.) ..... tons	1,802,353	1,938,158	7,660,000	8,237,172
Non-metallics.				
Barytes, diatomite, fluorspar, mica, and sulphur	.....	.....	1,035,462	1,179,618
Flux—limestone, quartz ..... tons	82,337	62,380	50,929	41,460
Gypsum products, gypsite	.....	.....	141,320	143,934
Iron oxides, slate and rock granules, talc ..... tons	1,225	1,652	15,101	21,298
Sodium carbonate, magnesium sulphate ..... tons	441	1,396	9,611	40,808
Totals	.....	.....	1,252,423	1,427,118
Clay Products and other Structural Materials.				
Clay Products.				
Brick—				
Common ..... No.	7,532,760	4,058,954	129,541	77,140
Face, paving, sewer brick ..... No.	485,816	202,664	17,645	7,450
Firebricks, blocks	.....	.....	210,911	219,680
Fireclay ..... tons	795	843	12,216	11,467
Structural tile—hollow blocks	.....	.....	21,000	39,353
Drain tile, sewer-pipe ..... No.	1,095,704	897,418	163,096	148,179
Pottery—glazed or unglazed	.....	.....	11,230	3,106
Other clay products; bentonite	.....	.....	1,308	2,481
Totals	.....	.....	566,947	508,856
Other Structural Materials.				
Cement, sand, and gravel	.....	.....	1,780,848	2,146,676
Lime and limestone ..... tons	111,858	104,856	286,006	273,933
Stone—building ..... tons	2,228	2 709	60,310	58,749
Rubble, riprap, crushed rock ..... tons	192,646	171,574	151,151	156,171
Totals	.....	.....	2,278,315	2,635,529
Total value in Canadian funds	.....	.....	78,479,719	75,551,093

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

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

* Canadian funds.

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

Year.	Gold, Fine Ounce.	Silver, Fine Ounce.	Copper, Lb.	Lead, Lb.	Zinc, Lb.
	$	Cents.	Cents.	Cents.	Cents.
1901	20.67	56.002 N.Y.	16.11 N.Y.	2.577 N.Y.	.....
1902	.....	49.55 ,,	11.70 ,,	3.66 ,,	.....
1903	.....	50.78 ,,	13.24 ,,	3.81 ,,	.....
1904	.....	53.36 ,,	12.82 ,,	3.88 ,,	.....
1905	.....	51.33 ,,	15.59 ,,	4.24 ,,	.....
1906	.....	63.45 ,,	19.28 ,,	4.81 ,,	.....
1907	.....	62.06 ,,	20.00 ,,	4.80 ,,	.....
1908	.....	50.22 ,,	13.20 ,,	3.78 ,,	.....
1909	.....	48.93 ,,	12.98 ,,	3.85 ,,	.....
1910	.....	50.812 ,,	12.738 ,,	4.00 ,,	4.60 E. St. L.
1911	.....	50.64 ,,	12.38 ,,	3.98 ,,	4.90 ,,
1912	.....	57.79 ,,	16.341 ,,	4.024 ,,	5.90 ,,
1913	.....	56.80 ,,	15.27 ,,	3.93 ,,	4.80 ,,
1914	.....	52.10 ,,	13.60 ,,	3.50 ,,	4.40 ,,
1915	.....	47.20 ,,	17.28 ,,	4.17 ,,	11.25 ,,
1916	.....	62.38 ,,	27.202 ,,	6.172 ,,	10.88 ,,
1917	.....	77.35 ,,	27.18 ,,	7.91 ,,	7.566 ,,
1918	.....	91.93 ,,	24.63 ,,	6.67 ,,	6.94 ,,
1919	.....	105.57 ,,	18.70 ,,	5.19 ,,	6.24 ,,
1920	.....	95.80 ,,	17.45 ,,	7.16 ,,	6.52 ,,
1921	.....	59.52 ,,	12.50 ,,	4.09 ,,	3.95 ,,
1922	.....	64.14 ,,	13.38 ,,	5.16 ,,	4.86 ,,
1923	.....	61.63 ,,	14.42 ,,	6.54 ,,	5.62 ,,
1924	.....	63.442 ,,	13.02 ,,	7.287 ,,	5.39 ,,
1925	.....	69.065 ,,	14.042 ,,	7.848 Lond.	7.892 Lond.
1926	.....	62.107 ,,	13.795 ,,	6.751 ,,	7.409 ,,
1927	.....	56.37 ,,	12.92 ,,	5.256 ,,	6.194 ,,
1928	.....	58.176 ,,	14.570 ,,	4.575 ,,	5.493 ,,
1929	.....	52.993 ,,	18.107 ,,	5.050 ,,	5.385 ,,
1930	.....	38.154 ,,	12.982 ,,	3.927 ,,	3.599 ,,
1931	.....	28.700 ,,	8.116 ,,	2.710 ,,	2.554 ,,
1932	23.47	31.671 ,,	6.380 Lond.	2.113 ,,	2.405 ,,
1933	28.60	37.832 ,,	7.454 ,,	2.391 ,,	3.210 ,,
1934	34.50	47.461 ,,	7.419 ,,	2.436 ,,	3.044 ,,
1935	35.19	64.790 ,,	7.795 ,,	3.133 ,,	3.099 ,,
1936	35.03	45.127 ,,	9.477 ,,	3.913 ,,	3.315 ,,
1937	34.99	44.881 ,,	13.078 ,,	5.110 ,,	4.902 ,,
1938	35.18	43.477 ,,	9.972 ,,	3.344 ,,	3.073 ,,
1939	36.141	40.488 ,,	10.092 ,,	3.169 ,,	3.069 ,,
1940	38.50	38.249 ,,	10.086 ,,	3.362 ,,	3.411 ,,
1941	38.50	38.261 ,,	10.086 ,,	3.362 ,,	3.411 ,,
1942	**38.50**	**42.166** ,,	**10.086** ,,	**3.362** ,,	**3.411** ,,
Average, 1938–42 (inclusive)	37.364	40.524 ,,	10.064 ,,	3.319 ,,	3.275 ,,

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 1942.

Gold, placer	$91,075,113*
Gold, lode	310,331,428*
Silver, copper, lead, zinc	985,483,997
Coal and coke	407,344,539
Structural materials	87,297,056
Miscellaneous minerals, etc.	32,187,572
Total	$1,913,719,705

* Canadian funds.

TABLE IV.—PRODUCTION FOR EACH YEAR FROM 1852 TO 1942 (INCLUSIVE).

1852 to 1895 (inclusive)	$94,547,370	1920	$35,543,084
1896	7,507,956	1921	28,066,641
1897	10,455,268	1922	35,162,843
1898	10,906,861	1923	41,304,320
1899	12,393,131	1924	48,704,604
1900	16,344,751	1925	61,492,242
1901	20,086,780	1926	67,188,842
1902	17,486,550	1927	60,729,358
1903	17,495,954	1928	65,372,583
1904	18,977,359	1929	68,245,443
1905	22,461,325	1930	55,391,993
1906	24,980,546	1931	34,883,181
1907	25,882,560	1932	*28,798,406
1908	23,851,277	1933	*32,602,672
1909	24,443,025	1934	*42,305,297
1910	26,377,066	1935	*48,821,239
1911	23,499,072	1936	*54,081,967
1912	32,440,800	1937	*74,475,902
1913	30,296,398	1938	*64,485,551
1914	26,388,825	1939	*65,681,547
1915	29,447,508	1940	*75,701,155
1916	42,290,462	1941	*78,479,719
1917	37,010,392	1942	*75,551,093
1918	41,782,474		
1919	33,296,313	Total	$1,913,719,705

* Canadian funds.

TABLE V.—QUANTITIES AND VALUE OF MINE PRODUCTS FOR 1940, 1941, AND 1942.

Description.	1940.		1941.		1942.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Gold, placer* oz.	39,067	$1,236,928	43,775	$1,385,962	32,904	$1,041,772
Gold, lode* oz.	583,416	22,461,516	571,026	21,984,501	444,518	17,113,943
Silver oz.						
Copper lb.		39,498,623		40,231,518		38,245,536
Lead lb.						
Zinc lb.						
Coal tons, 2,240 lb.	1,667,827	7,088,265	1,802,353	7,660,000	1,938,158	8,237,172
Structural materials		2,534,840		2,845,262		3,143,382
Miscellaneous metals and minerals		2,880,983		4,372,476		7,769,288
Totals		$75,701,155		$78,479,719		$75,551,093

* Canadian funds.

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

Year.	Gold.		Silver.		Copper.		Lead.		Zinc.		Total Value.
	Oz.	Value.	Oz.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	
		$		$		$		$		$	$
1887			17,690	17,331			204,800	9,216			26,547
1888			79,780	75,000			674,500	29,813			104,813
1889			53,192	47,873			165,100	6,498			54,371
1890			70,427	73,948							73,948
1891			4,500	4,000							4,000
1892			77,160	66,935			808,420	33,064			99,999
1893	1,170	23,404	227,000	195,000			2,135,023	78,996			297,400
1894	6,252	125,014	746,379	470,219	324,680	16,234	5,662,523	169,875			781,342
1895	39,270	785,400	1,496,522	977,229	952,840	47,642	16,475,464	532,255			2,342,526
1896	62,259	1,244,180	3,135,343	2,100,689	3,818,556	190,926	24,199,977	721,384			4,257,179
1897	106,141	2,122,820	5,472,971	3,272,836	5,325,180	266,258	38,841,135	1,390,517			7,052,431
1898	110,061	2,201,217	4,292,401	2,375,841	7,271,678	874,781	31,693,559	1,077,581			6,529,420
1899	138,315	2,857,573	2,939,413	1,663,708	7,722,591	1,351,453	21,862,436	878,870			6,751,604
1900	167,153	3,453,381	3,958,175	2,309,200	9,997,080	1,615,289	63,358,621	2,691,887			10,069,757
1901	210,384	4,348,605	4,396,447	2,462,008	27,603,746	4,446,963	51,582,906	2,010,260			13,267,836
1902	236,491	4,888,269	3,917,917	1,941,328	29,636,057	3,446,673	22,536,381	824,832			11,101,102
1903	232,831	4,812,616	2,996,204	1,521,472	34,359,921	4,547,535	18,089,283	689,744			11,571,367
1904	222,042	4,589,608	3,222,481	1,719,516	35,710,128	4,578,037	36,646,244	1,421,874			12,309,035
1905	238,660	4,933,102	3,439,417	1,971,818	37,692,251	5,876,222	56,580,703	2,399,022			15,180,164
1906	224,027	4,630,639	2,990,262	1,897,320	42,990,488	8,288,565	52,408,217	2,667,578			17,484,102
1907	196,179	4,055,020	2,745,448	1,703,825	40,832,720	8,166,544	47,738,703	2,291,458			16,216,847
1908	255,582	5,282,880	2,631,389	1,321,483	47,274,614	6,240,249	43,195,733	1,632,799			14,477,411
1909	238,224	4,924,090	2,532,742	1,239,270	45,597,245	5,918,522	44,396,346	1,709,259	8,500,000	400,000	14,191,141
1910	267,701	5,533,380	2,450,241	1,245,016	38,243,934	4,871,512	34,658,746	1,386,350	4,184,192	192,473	13,228,731
1911	228,617	4,725,513	1,892,364	958,293	36,927,656	4,571,644	26,872,397	1,069,521	2,634,544	129,092	11,454,063
1912	257,496	5,322,442	3,132,108	1,810,045	51,456,537	8,408,518	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	7,930,896	29,475,968	1,526,855	56,737,651	3,540,429	19,750,498
1920	120,048	2,481,392	3,377,849	3,235,980	44,887,676	7,832,899	39,331,218	2,816,115	47,208,268	3,077,979	19,444,365
1921	135,663	2,804,154	2,673,389	1,591,201	39,036,993	4,879,624	41,402,288	1,693,354	49,419,372	1,952,065	12,920,398

1922	197,856	4,089,684	7,101,311	4,554,781	32,359,896	4,329,754	67,447,985	3,480,316	57,146,548	2,777,322	19,231,857
1923	179,245	3,704,994	6,032,986	3,718,129	57,720,290	8,323,266	96,663,152	6,321,770	58,343,462	3,278,903	25,347,062
1924	247,716	5,120,535	8,341,768	5,292,184	64,845,393	8,442,870	170,384,481	12,415,917	79,130,970	4,266,741	35,538,247
1925	209,719	4,335,269	7,654,844	5,286,818	72,306,432	10,153,269	237,899,199	18,670,329	98,257,099	7,754,450	46,200,135
1926	201,427	4,163,859	10,748,556	6,675,606	89,339,768	12,324,421	263,023,937	17,757,535	142,876,947	10,586,610	51,508,031
1927	178,001	3,679,601	10,470,185	5,902,043	89,202,871	11,525,011	282,996,423	14,874,292	145,225,443	8,996,135	44,977,082
1928	188,087	3,888,097	10,627,167	6,182,461	97,908,316	14,265,242	305,140,792	13,961,412	181,763,147	9,984,613	48,281,825
1929	145,339	3,004,419	9,918,800	5,256,270	101,483,857	18,375,682	302,346,268	15,269,696	172,096,841	9,268,792	51,174,859
1930	160,778	3,323,576	11,289,171	4,307,270	90,421,545	11,738,525	319,199,752	12,535,931	250,287,306	9,010,093	40,915,395
1931	146,039	3,018,894	7,524,320	2,247,514	63,194,299	5,289,363	248,783,508	6,742,282	205,071,247	5,237,520	22,535,573
1932	181,564	4,261,307*	7,130,838	2,258,453	49,841,009	3,179,956	254,488,952	5,378,878	192,120,091	4,621,641	19,700,235
1933	223,529	6,392,929*	7,006,406	2,650,720	42,608,002	3,176,341	271,606,071	6,495,731	195,963,751	6,291,416	25,007,137
1934	297,180	10,250,985*	8,572,916	4,068,792	48,084,658	3,567,401	347,366,967	8,461,859	247,926,844	7,546,893	33,895,930
1935	365,244	12,852,936*	9,251,544	5,994,075	38,791,127	3,023,768	344,268,444	10,785,930	256,239,446	7,940,860	40,597,569
1936	404,472	14,168,654*	9,521,015	4,296,548	20,806,672	1,971,848	377,971,618	14,790,029	254,581,393	8,439,373	43,666,452
1937	460,781	16,122,727*	11,308,685	5,075,451	46,057,584	6,023,411	419,118,371	21,416,949	291,192,278	14,274,245	62,912,783
1938	557,522	19,613,624*	10,861,578	4,722,288	65,769,906	6,558,575	412,979,182	13,810,024	298,497,295	9,172,822	53,877,333
1939	587,180	21,221,272*	10,771,585	4,361,199	73,254,679	7,392,862	378,743,763	12,002,390	278,409,102	8,544,375	53,522,098
1940	583,416	22,461,516*	.....	.....	.....	.....	.....	.....	.....	.....	61,960,139†
1941	571,026	21,984,501*	.....	.....	.....	.....	.....	.....	.....	.....	62,216,019†
1942	444,518	17,113,943*	.....	.....	.....	.....	.....	.....	.....	.....	55,359,479†
Totals	11,848,155	310,331,430	252,669,858‡	137,687,350‡	2,108,376,306‡	306,055,053‡	6,178,738,968‡	263,509,372‡	3,727,569,601‡	159,841,335‡	1,295,400,217†

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

TABLE VII.—VALUE OF GOLD PRODUCTION TO DATE.

Year.	Placer.	Lode.	Total.
1858–1862	$9,871,634		$9,871,634
1863–1867	16,283,592		16,283,592
1868–1872	9,895,318		9,895,318
1873–1877	9,019,201		9,019,201
1878–1882	5,579,911		5,579,911
1883–1887	3,841,515		3,841,515
1888–1892	2,525,426		2,525,426
1893	356,131	$23,404	379,535
1894	405,516	125,014	530,530
1895	481,683	785,400	1,267,083
1896	544,026	1,244,180	1,788,206
1897	513,520	2,122,820	2,636,340
1898	643,346	2,201,217	2,844,563
1899	1,344,900	2,857,573	4,202,473
1900	1,278,724	3,453,381	4,732,105
1901	970,100	4,348,603	5,318,703
1902	1,073,140	4,888,269	5,961,409
1903	1,060,420	4,812,616	5,873,036
1904	1,115,300	4,589,608	5,704,908
1905	969,300	4,933,102	5,902,402
1906	948,400	4,630,639	5,579,039
1907	828,000	4,055,020	4,883,020
1908	647,000	5,282,880	5,929,880
1909	477,000	4,924,090	5,401,090
1910	540,000	5,533,380	6,073,380
1911	426,000	4,725,513	5,151,513
1912	555,500	5,322,442	5,877,942
1913	510,000	5,627,490	6,137,490
1914	565,000	5,109,004	5,674,004
1915	770,000	5,167,934	5,937,934
1916	580,500	4,587,334	5,167,834
1917	496,000	2,367,190	2,863,190
1918	320,000	3,403,812	3,723,812
1919	286,500	3,150,645	3,437,145
1920	221,600	2,481,392	2,702,992
1921	233,200	2,804,154	3,037,354
1922	368,800	4,089,684	4,458,484
1923	420,000	3,704,994	4,124,994
1924	420,750	5,120,535	5,541,285
1925	280,092	4,335,269	4,615,361
1926	355,503	4,163,859	4,519,362
1927	156,247	3,679,601	3,835,848
1928	143,208	3,888,097	4,031,305
1929	118,711	3,004,419	3,123,130
1930	152,235	3,323,576	3,475,811
1931	291,992	3,018,894	3,310,886
1932	395,542	4,261,307	4,656,849*
1933	562,787	6,392,929	6,955,716*
1934	714,431	10,250,985	10,965,416*
1935	895,058	12,852,936	13,747,994*
1936	1,249,940	14,168,654	15,418,594*
1937	1,558,245	16,122,727	17,680,972*
1938	1,671,015	19,613,624	21,284,639*
1939	1,478,492	21,221,272	22,699,764*
1940	1,236,928	22,461,516	23,698,444*
1941	1,385,962	21,984,501	23,370,463*
1942	1,041,772	17,113,943	18,155,715*
Totals	$91,075,113	$310,331,428	$401,406,541*

* Canadian funds.

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

	Tons. (2,240 lb.)	Value.		Tons. (2,240 lb.)	Value.
1836–1885	3,029,011	$9,468,557	1915	1,611,129	$5,638,952
1886	326,636	979,908	1916	2,084,093	7,294,325
1887	413,360	1,240,080	1917	2,149,975	7,524,913
1888	489,301	1,467,903	1918	2,302,245	11,511,225
1889	579,830	1,739,490	1919	2,267,541	11,337,705
1890	678,140	2,034,420	1920	2,595,125	12,975,625
1891	1,029,097	3,087,291	1921	2,483,995	12,419,975
1892	826,335	2,479,005	1922	2,511,843	12,559,215
1893	978,294	2,934,882	1923	2,453,223	12,266,115
1894	1,012,953	3,038,859	1924	1,939,526	9,697,630
1895	939,654	2,818,962	1925	2,328,522	11,642,610
1896	896,222	2,688,666	1926	2,330,036	11,650,180
1897	882,854	2,648,562	1927	2,453,827	12,269,135
1898	1,135,865	3,407,595	1928	2,526,702	12,633,510
1899	1,306,324	3,918,972	1929	2,251,252	11,256,260
1900	1,439,595	4,318,785	1930	1,887,130	9,435,650
1901	1,460,331	4,380,993	1931	1,707,590	7,684,155
1902	1,397,394	4,192,182	1932	1,534,975	6,523,644
1903	1,168,194	3,504,582	1933	1,264,746	5,375,171
1904	1,253,628	3,760,884	1934	1,347,090	5,725,133
1905	1,384,312	4,152,936	1935	1,187,968	5,048,864
1906	1,517,303	4,551,909	1936	1,346,471	5,722,502
1907	1,800,067	6,300,235	1937	1,444,687	6,139,920
1908	1,677,849	5,872,472	1938	1,309,428	5,565,069
1909	2,006,476	7,022,666	1939	1,477,872	6,280,956
1910	2,800,046	9,800,161	1940	1,667,827	7,088,265
1911	2,193,062	7,675,717	1941	1,802,353	7,660,000
1912	2,628,804	9,200,814	1942	1,938,158	8,237,172
1913	2,137,483	7,481,190			
1914	1,810,967	6,338,385	Totals	95,404,716	$381,670,939

* 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, 1941 and 1942.

Description.	1941.		1942.	
	Quantity.	Value.	Quantity.	Value.
Coal used in making coke, long tons	210,544	$717,584	228,448	$866,795
Coke made in bee-hive ovens, long tons	57,774	$392,473	59,664	$439,464
Coke made in by-product ovens, long tons	77,371	467,440	86,096	608,521
Coke made in gas plants, long tons	7,480	43,758	5,829	54,307
Total coke made, long tons	142,625	$903,671	151,589	$1,102,292
Gas sold and used		1,925,270		2,165,888
Tar produced		63,569		86,113
Other by-products		1,716		22,028
Total production value of coke industry		$2,894,226		$3,376,321

TABLE XVII.—Dividends paid by Mining Companies, 1897–1942.

*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	Bridge River	Gold	9,591,650
Belmont-Surf Inlet	Princess Royal Island	Gold	1,437,500
Cariboo Gold Quartz	Wells	Gold	1,559,968
Cariboo-McKinney	Camp McKinney	Gold	565,588
Canadian Pacific Exploration	Nelson	Gold	37,500
Centre Star	Rossland	Gold	472,255
Fairview Amalgamated	Oliver	Gold	7,922
Fern	Nelson	Gold	15,000
Goodenough	Ymir	Gold	13,931
Gold Belt Mining Co., Ltd.	Sheep Creek	Gold	255,000
Hedley Mascot	Hedley	Gold	1,154,704
Island Mountain	Wells	Gold	903,616
I.X.L.	Rossland	Gold	134,033
Jewel-Denero	Greenwood	Gold	11,751
Kelowna Exploration (Nickel Plate)	Hedley	Gold	1,110,000
Kootenay Belle	Sheep Creek	Gold	347,856
Le Roi Mining Co.	Rossland	Gold	1,475,000
Le Roi No. 2	Rossland	Gold	1,574,640
Lorne	Bridge River	Gold	20,450
Mount Zeballos Gold Mines, Ltd.	Zeballos	Gold	165,000
Nickel Plate	Hedley	Gold	3,423,191
Pioneer	Bridge River	Gold	9,211,771
Poorman	Nelson	Gold	25,000
Premier	Premier	Gold	19,658,075
Privateer	Zeballos	Gold	1,693,315
Queen	Sheep Creek	Gold	85,000
Relief Arlington Mines, Ltd. (Second Relief)	Erie	Gold	245,000
Reno	Sheep Creek	Gold	†1,302,040
Sheep Creek Mines, Ltd.	Sheep Creek	Gold	1,931,250
Silbak Premier	Premier	Gold	1,800,000
Spud Valley Gold Mines, Ltd.	Zeballos	Gold	168,000
Sunset No. 2	Rossland	Gold	115,007
Surf Inlet Consolidated Gold Mines, Ltd.	Surf Inlet	Gold	120,279
War Eagle	Rossland	Gold	1,245,250
Motherlode	Sheep Creek	Gold	162,500
Ymir Gold	Ymir	Gold	300,000
Ymir Yankee Girl	Ymir	Gold	178,001
Miscellaneous mines		Gold	99,263
Total, lode-gold mines			$62,761,187

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

† Includes $376,000 "Return of Capital" in 1942.

TABLE XVII.—Dividends paid by Mining Companies, 1897–1942—*Continued.*

Silver-lead-zinc Mines.

Company or Mine.	Locality.	Class.	Amount paid.
Antoine	Rambler	Silver-lead-zinc	$10,000
Beaverdell-Wellington	Beaverdell	Silver-lead-zinc	97,200
Bell	Beaverdell	Silver-lead-zinc	476,297
Bosun (Roseberry-Surprise)	New Denver	Silver-lead-zinc	27,500
Capella	New Denver	Silver-lead-zinc	5,500
Consolidated Mining and Smelting Co. of Canada, Ltd.	Trail	Silver-lead-zinc	110,076,312
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	580,620
Horn Silver	Similkameen	Silver-lead-zinc	6,000
Idaho-Alamo	Sandon	Silver-lead-zinc	400,000
Iron Mountain (Emerald)	Salmo	Silver-lead-zinc	20,000
Jackson	Retallack	Silver-lead-zinc	20,000
Last Chance	Three Forks	Silver-lead-zinc	213,109
Lone Bachelor	Sandon	Silver-lead-zinc	50,000
Lucky Jim	Three Forks	Silver-lead-zinc	80,000
Mercury	Sandon	Silver-lead-zinc	6,000
Meteor	Slocan City	Silver-lead-zinc	10,257
Monitor and Ajax	Three Forks	Silver-lead-zinc	27,500
Mountain Con	Cody	Silver-lead-zinc	71,387
McAllister	Three Forks	Silver-lead-zinc	45,088
Noble Five	Cody	Silver-lead-zinc	72,859
North Star	Kimberley	Silver-lead-zinc	496,901
No. One	Sandon	Silver-lead-zinc	6,754
Ottawa	Slocan City	Silver-lead-zinc	107,928
Payne	Sandon	Silver-lead-zinc	1,438,000
Providence	Greenwood	Silver-lead-zinc	98,024
Queen Bess	Alamo	Silver-lead-zinc	25,000
Rambler-Cariboo	Rambler	Silver-lead-zinc	575,000
Reco	Cody	Silver-lead-zinc	332,492
Ruth Mines, Ltd.	Sandon	Silver-lead-zinc	165,000
St. Eugene	Moyie	Silver-lead-zinc	566,000
Silversmith*	Sandon	Silver-lead-zinc	725,000
Slocan Silver	Alamo	Silver-lead-zinc	11,600
Slocan Star*	Sandon	Silver-lead-zinc	567,500
Spokane-Trinket	Ainsworth	Silver-lead-zinc	9,564
Standard Silver Lead	Silverton	Silver-lead-zinc	2,700,000
Sunset and Trade Dollar	Retallack	Silver-lead-zinc	88,000
Utica	Kaslo	Silver-lead-zinc	64,000
Wallace Mines, Ltd. (Sally)	Beaverdell	Silver-lead-zinc	135,000
Washington	Rambler Station	Silver-lead-zinc	38,000
Whitewater	Retallack	Silver-lead-zinc	592,515
Miscellaneous mines		Silver-lead-zinc	70,237
Total, silver-lead-zinc mines			$121,385,776

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

TABLE XVII.—DIVIDENDS PAID BY MINING COMPANIES, 1897–1942—*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	9,151,057
Marble Bay	Texada Island	Copper	175,000
Hall Mines	Nelson	Copper	233,280
Miscellaneous mines		Copper	261,470
Total, copper mines			$21,772,223

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

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

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

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

Coal.

Wellington Collieries, Ltd., Nanaimo	$16,000,000
Crow's Nest Pass Coal Co., Ltd., Fernie	12,868,018
Total	$28,868,018

Miscellaneous and Structural.

Various	$2,438,080

Aggregate of all Classes.

Lode-gold mining	$62,761,187
Silver-lead-zinc mining and smelting	121,385,776
Copper-mining	21,772,223
Coal-mining	28,868,018
Miscellaneous, structural, and placer gold	2,438,080
Total	$237,225,284

TABLE XVII.—DIVIDENDS PAID BY MINING COMPANIES, 1897–1942—*Continued.*

Dividends paid Yearly, 1917–1942, inclusive.

Year.	Amount paid.	Year.	Amount paid.
1917	$3,269,494	1931	$4,650,857
1918	2,704,469	1932	2,786,958
1919	2,494,283	1933	2,471,735
1920	1,870,296	1934	4,745,905
1921	736,629	1935	7,386,070
1922	3,174,756	1936	10,513,705
1923	2,983,570	1937	15,085,293
1924	2,977,276	1938	12,068,875
1925	5,853,419	1939	11,865,698
1926	8,011,137	1940	14,595,530
1927	8,816,681	1941	16,598,110
1928	9,572,536	1942	13,627,104
1929	11,263,118		
1930	10,543,500	Total	$190,667,004

Dividends paid during 1941 and 1942.

	1941.	1942.
Arlington (R. O. Oscarson)	$4,900	$18,305
Bayonne Consolidated Mines, Ltd.		25,000
Bralorne Mines, Ltd.	1,496,400	1,496,400
Britannia Mining and Smelting Co., Ltd.	2,835,676	266,701
Cariboo Gold Quartz Mines, Ltd.	319,994	173,330
The Consolidated Mining and Smelting Co. of Canada, Ltd.	8,189,531	8,189,553
The Crow's Nest Pass Coal Co., Ltd.	186,354	186,354
Gold Belt Mining Co., Ltd.	51,000	102,000
Granby Consolidated Mining, Smelting and Power Co., Ltd.	270,140	315,163
Hedley Mascot Gold Mines, Ltd.	181,130	181,130
Highland Bell, Ltd.	105,268	105,268
Island Mountain Mines, Ltd.	189,129	136,593
Kootenay Belle Gold Mines, Ltd.	44,016	
Kelowna Exploration, Ltd. (Nickel Plate)	300,000	240,000
Mount Zeballos Gold Mines, Ltd.	55,000	
Pioneer Gold Mines of B.C., Ltd.	700,700	402,903
Privateer Mine, Ltd.	392,653	319,030
Relief Arlington Mines, Ltd.	90,000	
Reno Gold Mines, Ltd.		376,000
Sheep Creek Gold Mines, Ltd.	300,000	375,000
Silbak Premier Mines, Ltd.	400,000	400,000
Spud Valley Gold Mines, Ltd.	84,000	
Surf Inlet Consolidated Gold Mines, Ltd.	53,457	26,729
Ymir Yankee Girl, Ltd.	44,500	
Others	304,262	291,645
Totals	$16,598,110	$13,627,104

TABLE XVIII.—Capital employed, Salaries and Wages, Fuel and Electricity, and Process Supplies, 1942.

Class.	Capital employed.	Salaries and Wages.	Fuel and Electricity.	Process Supplies.
Lode-mining	$95,973,335	$19,087,848	$5,959,645	$4,882,627
Placer-mining	1,096,440	296,079	60,217	20,806
Coal-mining	21,673,430	4,601,532	269,905	521,634
Miscellaneous metals, minerals, and materials	14,890,728	1,859,819	389,881	1,279,474
Structural materials industry	6,743,635	1,067,882	386,461	158,857
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	2,066,203	6,714,347
Grand totals, 1938	153,012,848	22,765,711	3,396,106	6,544,500
Grand totals, 1937	145,520,641	21,349,690	3,066,311	6,845,330
Grand totals, 1936	142,663,065	17,887,619	2,724,144	4,434,501
Grand totals, 1935	143,239,953	16,753,367	2,619,639	4,552,730
Grand totals, 1935–42	.....	177,468,403	28,189,980	50,177,409

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, 1901–1942.

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	2,090,110	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**	**78**	**45,197,803**	**55,359,479**

TABLE XX.—Men employed in the Mining Industry of British Columbia, 1901–1942.

Year.	Placer-mining.	Lode mining.			Coal-mining.					Structural Materials.		Miscellaneous.	Total.
		Under.	Above.	Total.	In Concentrators.	In Smelters.	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***

* 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 1942.

Mine or Group.	Location of Mine.	Mining Division.	Owner or Agent.	Process.	Character of Ore.
Polaris-Taku	Taku River (Tulsequah)	Atlin	Polaris-Taku Mining Co., Ltd., Tulsequah	Flotation	Gold.
Big Missouri	Stewart (Salmon Arm)	Portland Canal	Buena Vista Mining Co., Ltd., Trail	Flotation; cyanidation	Gold.
Silbak Premier	Stewart	Portland Canal	Silbak Premier Mines, Ltd., Premier	Flotation	Gold, silver, lead.
Surf Inlet	Surf Inlet	Skeena	Surf Inlet Cons. Gold Mines, Ltd., Vancouver	Table concentration; flotation	Gold, silver, copper.
Cariboo Gold	Wells	Cariboo	Cariboo Gold Quartz Mining Co., Ltd., Vancouver	Cyanidation	Gold, silver.
Island Mountain	Wells	Cariboo	Island Mountain Mines, Ltd., Wells	Cyanidation	Gold, silver.
Duthie	Hudson Bay Mountain	Omineca	A. W. Kelly and J. J. Herman, Smithers		Silver, gold, lead, zinc.
Campbell, Geo.	Kamloops	Kamloops	Geo. Campbell, Kamloops		Copper, gold.
Windpass	Dunn Lake	Kamloops	Windpass Gold Mining Co., Ltd., Vancouver	Flotation	Gold, silver, copper.
Kalamalka	Lavington	Vernon	S. M. Penny, Vernon		Gold, silver.
Peerless	Vernon	Vernon	A. C. Liphardt and H. H. Forster, Vernon		Silver, lead.
Bounty (Beaverdell Wellington)	Beaverdell	Greenwood	O. Houlind, Beaverdell		Silver, lead, zinc.
Butte City	Greenwood	Greenwood	C. E. Johnson and J. McDonell, Greenwood		Gold, silver, lead.
Cariboo	Camp McKinney	Greenwood	G. S. Boug *et al.*, Greenwood		Gold, silver, lead, zinc.
Dentonia	Greenwood	Greenwood	Dentonia Leasing Syndicate and A. H. Upton, Greenwood		Gold, silver.
Granby	Phoenix	Greenwood	W. E. McArthur, Greenwood	Concentration	Gold, silver, copper.
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	Providence Mine Syndicate, Greenwood		Gold, silver, zinc.
Starveout	Greenwood	Greenwood	J. McDonell, C. E. Johnson, Greenwood		Silver, gold, lead, zinc.
Tin Horn	Oliver	Greenwood	K. G. Ewers and Ivan A. McKay, Oliver		Gold, silver.
Union	Granby River	Greenwood	W. E. McArthur, Greenwood		Gold, silver.
Vancouver	Beaverdell	Greenwood	J. P. Gachin, Carmi		Silver, lead.
Yankee Boy	Grand Forks	Greenwood	W. Schwarz, J. S. and S. J. Kleman, *et al.*, Grand Forks		Gold, silver.
Empire	Oliver	Osoyoos	Cluff, Ewers, and Smither, Oliver		Gold, silver.
Grandoro	Oliver	Osoyoos	J. P. Wukelick, Penticton		Gold, silver.
Hedley Mascot	Hedley	Osoyoos	Hedley Mascot Mines, Ltd., Vancouver	Flotation	Gold, silver, copper.
K.C.M.	Penticton	Osoyoos	Kleman Bros. and A. Kabatoff, Penticton		Gold, silver.
Nickel Plate	Hedley	Osoyoos	Kelowna Exploration Co., Ltd., Hedley	Cyanidation; flotation	Gold, silver, copper.
Smuggler	Oliver	Osoyoos	K. G. Ewers, Oliver		Gold.
Copper Mountain	Allenby	Similkameen	Granby Cons. M.S. and Power Co., Vancouver	Flotation	Copper.
Ainsmore	Ainsworth	Ainsworth	Ainsmore Mines, Ltd., Ainsworth		Silver, lead.
Caledonia	Blaylock	Ainsworth	G. E. McCready, Kaslo		Silver, lead, zinc.
Dinera	Ainsworth	Ainsworth	H. E. Gauthier *et al.*, Ainsworth		Silver, lead, zinc.
Highland Surprise	Retallack	Ainsworth	Highland Surprise Gold Mines, Ltd., Vancouver		Gold, silver, lead.
Sullivan	Kimberley	Fort Steele	Cons. Mining and Smelting Co. of Canada, Ltd., Trail	Flotation	Silver, lead, zinc.

TABLE XXI.—METALLIFEROUS MINES SHIPPING IN 1942—*Continued.*

Mine or Group.	Location of Mine.	Mining Division.	Owner or Agent.	Process.	Character of Ore.
Monarch and Kicking Horse	Field	Golden	Base Metal Mining Corporation, Ltd., Toronto	Table concentration; flotation	Silver, lead, zinc.
Alpine	Nelson	Nelson	Alpine Gold, Ltd., Nelson		Gold.
Arizona	Ymir	Nelson	N. Morris, Nelson; C. Anderson, Ymir		Gold.
Arlington	Erie Creek	Nelson	R. O. Oscarson, Erie		Gold.
Bear	Hall Creek	Nelson	A. Carlson and J. Berquist, Hall		Gold, silver.
Bayonne	Tye	Nelson	Bayonne Consolidated Mines, Ltd., Vancouver	Cyanidation	Gold, silver, lead, zinc.
Black Cock	Ymir	Nelson	Black Cock Mine, Ymir		Gold.
Bunker Hill	Waneta	Nelson	H. J. LeFevre *et al.*, Rossland		Gold, silver.
California	Nelson	Nelson	Bobier *et al.*, Nelson		Gold, silver, lead, zinc.
Centre Star	Ymir	Nelson	O. Anderson and Associates, Ymir		Gold, silver, lead, zinc.
Clubine Comstock	Boulder Creek	Nelson	L. R. Clubine, Salmo		Gold, silver.
Durango	Ymir	Nelson	L. P. Gormley *et al.*, Salmo		Gold, silver, lead, zinc.
Fern and Fern No. 2	Hall Creek	Nelson	J. Logan *et al.*, Nelson		Gold, silver.
Gold Belt	Sheep Creek	Nelson	Gold Belt Mining Co., Ltd., Vancouver	Cyanidation	Gold, silver.
Gold Hill	Ymir	Nelson	C. Fresu *et al.*, Ymir		Gold, silver.
Goodenough	Ymir	Nelson	Goodenough Leasing Syndicate, Ymir		Gold, silver, lead, zinc.
Granite-Poorman	Taghum	Nelson	Livingstone Mining Co., Ltd., Blewett	Amalgamation; cyanidation	Gold, silver.
Jessie Victoria	*Nelson*	*Nelson*	J. A. Ferguson, Nelson		Gold, silver.
Keystone	Erie	Nelson	G. A. Hanson *et al.*, Rossland		Gold, silver, lead, zinc.
Kootenay Belle	Sheep Creek	Nelson	Kootenay Belle Gold Mines, Ltd., Vancouver	Cyanidation	Gold, silver.
Nugget (Reno)	Salmo	Nelson	A. Endersby, Sr. and Jr., Sheep Creek		Gold, silver.
Reno	Sheep Creek	Nelson	A. Endersby, Sr. and Jr., Sheep Creek		Gold, silver.
Sheep Creek	Sheep Creek	Nelson	Sheep Creek Mines, Ltd., Vancouver	Cyanidation	Gold, silver.
Trimetals (Golden Age)	Nelson	Nelson	Trimetal Mining Inc., Hall		Gold, silver.
Wilcox	Ymir	Nelson	B. Golac, Nelson		Gold, silver.
Yankee Girl	Ymir	Nelson	Yankee Girl Leasers, Ymir	Cyanidation; flotation	Gold, silver, lead, zinc.
Ymir	Ymir	Nelson	Ymir Leasers, Ymir		Gold, silver.
Bosun	New Denver	Slocan	C. J. Campbell, Vancouver		Silver, lead, zinc.
Canadian Group	Sandon	Slocan	J. Fontaine and A. Forsyth, Sandon		Silver, lead, zinc.
Enterprise	Slocan City	Slocan	S. N. Ross, Nelson		Silver, gold, lead, zinc.
Hewitt (Galena)	Silverton	Slocan	H. V. Dewis, Silverton		Silver, lead, zinc.
Lucky Jim	Zincton	Slocan	Zincton Mines, Ltd., Sheep Creek	Table concentrates; flotation	Zinc.
L.T.	Slocan City	Slocan	D. B. O'Neail, Slocan City		Silver, lead, zinc.
Mountain Chief	Silverton	Slocan	J. Cechelero, New Denver		Silver, lead, zinc.
Ottawa	Springer Creek	Slocan	Wm. Hicks and Associates, Slocan		Silver, gold.
Ruth-Hope	Sandon	Slocan	Leasers from Ruth-Hope Mining Co., Ltd.		Silver, gold, lead, zinc.
Silver Ridge	Sandon	Slocan	B. Pengalli, Silverton		Silver, lead, zinc.
Standard and Mammoth	Silverton	Slocan	Western Exploration Co., Ltd., Silverton	Table concentration; flotation	Silver, zinc, lead.

TABLE XXI.—METALLIFEROUS MINES SHIPPING IN 1942—*Continued.*

Mine or Group.	Location of Mine.	Mining Division.	Owner or Agent.	Process.	Character of Ore.
Victor	Sandon	Slocan	Leased by E. Doney & Son, Sandon		Silver, lead, zinc.
I.X.L.	Rossland	Trail Creek	Leasing Syndicate of I.X.L., Rossland		Gold, silver.
Jumbo	Rossland	Trail Creek	Leasers, Rossland		Gold, silver.
Midnight	Rossland	Trail Creek	Midnight Mines, Ltd., Rossland	Amalgamation; jig, flotation	Gold, silver.
Phoenix	Rossland	Trail Creek	S. Berglund, Rossland		Gold, silver.
Rossland Properties	Rossland	Trail Creek	Leased from Consolidated Mining and Smelting Co. of Canada, Ltd., Trail		Gold, silver, copper.
Velvet Gold	Rossland	Trail Creek	Velvet Leasing Syndicate, Rossland		Gold, silver, copper.
Sherwood	Port Alberni	Alberni	Sherwood Mines, Ltd., Port Alberni		Gold, silver, copper.
Bruggy, G. W.	Tofino	Clayoquot	G. W. Bruggy, Tofino		Gold, silver, copper.
Buccaneer	Tedwell River	Clayoquot	Buccaneer Mines, Ltd., Vancouver	Amalgamation; flotation	Gold, silver.
Central Zeballos	Zeballos	Clayoquot	c/o Reno Gold Mines, Ltd., Vancouver	Amalgamation; flotation	Gold, silver.
Homeward	Zeballos	Clayoquot	Homeward Mines, Ltd., Vancouver	Amalgamation; flotation	Gold, silver.
Mount Zeballos	Zeballos	Clayoquot	Mount Zeballos Gold Mines, Ltd., Vancouver	Amalgamation; flotation	Gold, silver.
Musketeer	Tedwell River	Clayoquot	Musketeer Mines, Ltd., Vancouver		Gold, silver.
Privateer	Zeballos	Clayoquot	Privateer Mine, Ltd., Vancouver	Amalgamation; cyanidation	Gold, silver.
Spud Valley	Zeballos	Clayoquot	Spud Valley Gold Mines, Ltd., Vancouver	Amalgamation; flotation	Gold, silver.
White Star	Zeballos	Clayoquot	White Star Mine, Ltd., Vancouver	Flotation	Gold, silver, lead.
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.
Paramount	Thurlow	Nanaimo	Paramount Mines, Ltd., Thurlow		Gold, silver.
Aurum	Hope	New Westminster	Rivers and Rice, Hope		Gold, silver.
Cotterell, E. M.	Hope	New Westminster	Cotterell, E. M., Hope		Gold, silver, copper.
Britannia	Britannia Beach	Vancouver	Britannia Mining and Smelting Co., Ltd., Britannia Beach	Flotation	Copper, gold, silver.

DEPARTMENTAL WORK.

MINERALOGICAL BRANCH.

B. T. O'Grady worked with the Superintendent of Brokers as well as investigating the possibilities of transportation to mining properties in different parts of the Province. In February he left the Department and was attached to the Headquarters Pacific Command as Field Supervisor, Northern British Columbia Coast, to organize the Pacific Coast Militia Rangers.

J. T. Mandy continued to be in charge of the Prince Rupert sampling plant and assisted prospectors and small producers of war minerals.

H. Sargent investigated tungsten and other strategic minerals in several sections of the Province, chiefly near Salmo. During the early part of the year he accumulated data upon potential base-metal properties.

M. S. Hedley examined all likely properties in the Similkameen and Grand Forks-Greenwood areas for tungsten. Later he replaced R. J. Maconachie at Nelson and made a thorough examination of the *Emerald* and other properties near Salmo.

J. S. Stevenson investigated the tungsten and manganese possibilities of the Cariboo and along the Canadian National Railways as far as Hazelton. He also superintended the diamond-drilling of molybdenite at Boss Mountain.

J. M. Cummings continued his work on industrial minerals and also upon the recovery of scheelite from low-grade ores. He spent most of the summer at the University of British Columbia assisting the War Metals Research Board in its investigations of many war-mineral ore-dressing and metallurgical problems.

R. J. Maconachie made examinations of tungsten properties in the Bridge River and in the vicinity of Nelson and later at Salmo. About the end of June he resigned to take a position with an eastern firm. He later joined the Canadian Air Force.

Stuart S. Holland investigated the mica possibilities along the Canadian National Railways south of Tête Jaune and in the vicinity of Mica Mountain north of Canim Lake. He also investigated tungsten in the Cariboo and at Trout Lake.

W. H. Mathews assisted in the spectrographic laboratory at Victoria and also made examinations of mercury near Kamloops and tungsten properties at Stewart and Alice Arm.

C. B. Newmarch made a reconnaissance survey of Incomappleux River and McDougal Creek for tin and tungsten. He also examined manganese prospects at Arrowhead and investigated tungsten and mica possibilities in the Big Bend area north of Revelstoke.

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
Totals	10,042	$290,743	.....

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

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

SAMPLING PLANT, PRINCE RUPERT.

BY

JOSEPH T. MANDY.

During 1942 war conditions and the adverse effects of these on prospecting, exploration, development, and mining of all ore-deposits, except those of the war metals, resulted in a marked decrease of small-tonnage shipments by prospectors and small operators to the sampling plant.

A number of shipments were, however, received from gold, silver, and base-metal properties. The service of the plant proved very useful also in directing exploratory work on, and bulk-sampling of, several war-metal ore-deposits. It assisted also in the solution of metallurgical and marketing problems relative to small-tonnage production.

An increasing number of prospectors, through personal conference and correspondence, also availed themselves of the service, especially in the direction of their search for war-metal deposits; and 270 samples from 104 different individuals were received for examination and determination, and detailed reports were submitted concerning them.

In the late autumn field examinations of several properties in the Tahtsa River and Whitesail Lake areas were carried out.

It is of interest to note that since the inception of the sampling plant service in August, 1937, and up to December 31st, 1942, the plant has handled 726 shipments for which $49,227.63 has been paid to shippers. During the same period thirty-eight shipments have been made by the plant to the smelters, for which $49,421.27 has been received. This sums up to the remarkably small difference of 0.391 per cent. between the value of the purchase of the ore by the plant and the value of the sale to the smelters, and illustrates the high degree of accuracy attained by the hand-sampling method employed in the plant.

The following is a synopsis of the operating details of the plant for the year 1942, from January 1st to December 31st:—

Class of Shipments.	No. of Shipments.	No. of Different Properties.	Weight of Shipments.
			Dry Tons.
Tonnage lots	3	2	4.7995
Bulk test lots	37	13	25.7834
Assay lots	16	12	0.0322
Totals	56	27	30.6151

SHIPMENTS FROM SAMPLING PLANT TO SMELTERS.

Number of shipments to smelters (Lots 37 and 38)	2
Dry tons paid for by smelters	36.6285*
Paid out by plant on Ore Purchasing Account	$3,436.16
Received from smelters	$3,604.12

* Difference between this figure and the total weight of shipments received during the year (30.6151 dry tons) is accounted for by carry-over at the end of 1941 and end of 1942.

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

SAMPLING PLANT.

Test 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.
621-T	Eureka M.C.	Michaud, J. A.	Thornhill Mountain	0.0021											*Nil*	
622-T	Tidewater Molybdenum	Mandy, Dr. J. T.	Alice Arm	0.0014											*Nil*	
623-T	Tidewater Molybdenum	Mandy, Dr. J. T.	Alice Arm	0.0016											*Nil*	
624-T	Oral M.	Haahti, J.	Stewart	0.0017											*Nil*	
625-T		Stevenson, J. S.	Falkland	0.0020											*Nil*	
626-T	Tidewater Molybdenum	Mandy, Dr. J. T.	Alice Arm	0.0018											*Nil*	
627-T	Golden Eagle	Williams, R.	Topley	1.2790	0.05	180.9	0.8	12.9	10.8	0.1	0.2	6.9	12.8	46.6		
630-T	Free Gold group	Kwoczek, A. L.	Tofino	0.9880	9.02	2.8	*Nil*	Trace	*Nil*	Trace	*Nil*	5.2	0.9	86.9		
632-T	Noble B group	Gibson, J. L.	Bedwell River	2.4860	2.68	0.5	Trace	0.8	1.9	Trace	*Nil*	8.6	4.9	77.6		Te, trace
633-T	Duthie mine	Herman, J. J.	Smithers	0.0555	0.20	250.5	0.7	34.6	13.4	1.6	1.5	8.6	16.8	9.5		
634-T	Duthie mine	Herman, J. J.	Smithers	0.0550	0.18	316.5	0.9	40.5	11.8	0.8	1.2	10.0	16.2	11.8		
635-T	Golden Eagle	Williams, R.	Topley	2.4925	0.34	204.3	1.0	8.7	2.3	Trace	0.7	4.3	9.0	56.8		
636-T	Golden Eagle	Williams, R.	Topley	0.0300	0.05	19.8	0.3	0.6	0.5	Trace	0.1	2.1	2.3	82.9		
637-T	Abco mines	Clayton, B. L.	Ahousat	0.8915	1.48	0.7	*Nil*	0.3	0.4	*Nil*	*Nil*	7.1	2.8	77.1		Te, 0.002
642-T	Free Gold group	Larsen, H.	Tofino	0.8955	3.27	0.7	Trace			Trace		4.3	0.5	88.5		Te, 0.0045
644-T	Stewart Canal Gold Mines, Ltd.	Haahti, J.	Stewart	1.7750	0.84	4.2	10.2	0.2	0.3	Trace	Trace	29.9	23.0	19.6		
647-T	Black Bull	Hagen, W.	Copper River	1.0795	2.01	3.1	0.2			*Nil*		20.5	19.2	54.9		
650-T	Nootka Queen	Skogland, O.	Nootka Island	0.6895	24.96	8.2	Trace	0.6	1.7	1.8	0.2	6.1	3.6	80.7		
653-T	Golden Eagle	Williams, R.	Topley	0.9785	0.17	169.7	1.1	4.8	6.5	Trace	0.4	8.7	10.9	54.4		
654-T	Black Bull	Hagen, W.	Copper River	2.1915	1.06	1.8	0.2			0.1		16.3	16.4	63.3		
655-T	Molly B.	Haahti, J.	Stewart	0.1165	Trace	0.1	Trace	*Nil*	0.3	*Nil*	*Nil*	12.1	1.6	39.4	0.8	MoS_2, 2.4
656-T	Molly B.	Haahti, J.	Stewart	0.0305	Trace	*Nil*	Trace	*Nil*	0.6	*Nil*	*Nil*	13.7	2.4	39.6	0.5	MoS_2, 2.7
657-T	Molly B.	Haahti, J.	Stewart	0.0735			0.1	*Nil*		*Nil*	*Nil*		1.5		0.15	MoS_2, 0.2; P, 0.17; Mn, 0.3
662-T	Duthie mine	Herman, J. J.	Smithers	4.6750	0.20	114.2	1.0	37.9	14.0	1.9	0.4					
663-T	Golden Eagle	Heenan, D.	Topley	0.5605	0.12	162.9	0.6	12.2	6.8	0.1	0.6					
664-T	Golden Eagle	Heenan, D.	Topley	0.0405	0.12	308.5	0.8	11.1	5.0	0.1	1.1					
665-T	Golden Eagle	Heenan, D.	Topley	0.0470	0.90	72.4	0.4	34.8	5.1	0.1	0.2					
666-T	Golden Eagle	Heenan, D.	Topley	0.7045	0.10	196.7	1.2	15.8	6.6	0.1	0.3					
673-T	Plant clean-up	Sampling plant		0.0460	0.22	0.5	0.1									
674-T	Discards	Sampling plant		1.9010	0.02	0.6	1.2									
667-T	Cup group	Sam, Mathew	Topley	0.0507	0.05	24.8									0.12	
668-T	Cup group	Sam, Mathew	Topley	0.0525	0.02	8.8									0.02	
669-T	Cup group	Sam, Mathew	Topley	0.0470	0.02	12.1									0.16	
670-T	Cup group	Sam, Mathew	Topley	0.0480	0.01	0.4									0.02	
671-T	Lucille M.C.	Love, E.		0.0110											0.32	
675-T	Black Bull	Hagen, Wm.	Copper River	1.4330	1.40	2.8	0.2							65.5		
676-T	Wolframite gr.	Fisher and Olsen	Atlin	0.0486								6.8		66.4	19.5	Mn, 1.2; P, 0.01

SAMPLING PLANT—*Continued.*

Assay 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.
628-X		Hennessy, T.	Doreen	0.0010											*Nil*	
629-X		Hennessy, T.	Doreen	0.0007											*Nil*	
638-X	Lulu M.C.	Stewart, J. W.	Stewart	0.0028	0.29	15.1	0.2	17.3	1.7	0.1	*Nil*	36.5	38.4	5.6		
639-X		Chisholm, A.	Smithers	0.0004	Trace	0.2	0.1									Ni, *nil*
640-X	Black Bull	Hagen, W.	Copper River	0.00075	0.81	2.7	0.1							5.9		
641-X	Black Bull	Hagen, W.	Copper River	0.00075	3.95	6.4	0.1							33.1		
643-X	Cordillera	Williams, G. A.	Greenwood	0.0005	*Nil*	Trace	Trace									
648-X		Wold, Chris	Topley	0.0026	Trace	*Nil*	1.2					49.9	0.2	21.6		P, 0.024
649-X	Molly B.	Haahti, J.	Stewart	0.0025			Trace	Trace	0.4	Trace	*Nil*	11.0	3.5	40.4	1.5	MoS_2, 4.2; P, 0.24; Sn, trace; Mn, 0.9; Bi, *nil*
651-X	Lafe Group	Bartholomew, L.	Topley	0.0050	0.04	0.6	0.7									
652-X	Rennell Sound gr.	Watson, Luke	Rennell Sound, Q.C.I.	0.0025	Trace	0.56	*Nil*	0.1	0.2	0.6	32.9					
658-X	Molly B.	Haahti, J.	Stewart	0.0034											2.02	MoS_2, 0.5
659-X	Molly B.	Cameron, Art	Stewart	0.0018											10.11	MoS_2, 1.64
660-X	Pleasant Camp			0.0015	Trace	Trace										
661-X	Pleasant Camp			0.0019	Trace	Trace										
672-X	Stork Group	Harrison, C. V.		0.0041												Sn, *nil*

Tonnage Lots.

631	Golden Eagle	Williams, R.	Topley	0.8120	0.13	208.6	1.3	15.6	13.5	0.2	Trace	7.9	13.9	43.7		
645	Golden Eagle	Williams, R.	Topley	3.0930	0.25	140.6	0.7	6.3	1.9	0.1	0.5	9.4	8.9	61.8		
646	Free Gold group	Bosence, F.	Tofino	0.8945	4.09	1.5	Trace			Trace		4.4	1.8	86.6		

CHEMICAL LABORATORY.

BY

G. CAVE-BROWNE-CAVE.

During the year 1942 the staff of the Department of Mines chemical laboratory performed 3,033 assays for precious and base metals in ores. Of these, 2,597 were for *bona-fide* prospectors and for departmental engineers and 436 were for the Government sampling plant at Prince Rupert. A sharp increase in the number of assays for strategic metals was noted.

Proximate analyses and B.T.U. determinations were made on 51 coal samples. Of these, twenty-one were for the Department of Mines and thirty were for the Department of Public Works.

As a part of a free service offered to *bona-fide* prospectors, 202 samples were examined and the minerals identified.

During the year 278.2 oz. of placer gold was received from the Gold Commissioners, who are purchasing amounts up to 2 oz. to aid the prospectors in disposing of their placer gold.

For the Attorney-General's Department seventeen examinations of a chemico-legal nature were undertaken. Of these, three were toxicological analyses of pathological specimens and nine were analyses of contaminated earth for arsenic. The rest were of a varied nature, involving the examination of such samples as paint-chips, contents of an ampulla suspected of being nitro-glycerine, wine, and crystals found in canned salmon which proved to be calcium magnesium phosphate crystals.

Analyses of fourteen boiler-water samples for mineral composition submitted by the Department of Public Works and analyses of sixteen samples of limestone submitted by the Department of Agriculture were made by the staff. One toxicological analysis was made for the Department of Agriculture.

Full use was made of the grating spectrograph and accessories installed in the laboratory last year. During the year complete qualitative analyses were made on 334 prospectors' samples. Standard curves were worked out whereby quantitative analyses can be made for tungsten, tin, copper, lead, and zinc in ores. A part of the 1943 programme involves the preparation of standard curves so that quantitative analyses can be made for several other strategic metals in ores. Further, quantitative analyses were made on some 500 pure mineral specimens taken from the Department of Mines museum. These mineral specimens represented certain areas in the Province. This work is part of a major project, the purpose of which is the complete analysis of pure minerals occurring in selected areas of the Province. The immediate purpose of the project is, however, a search for strategic metals. All except obviously worthless samples, submitted by *bona-fide* prospectors, are now analysed completely by the spectrograph. This complete analysis includes an examination for strategic metals.

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

Attorney-General's Department	$400.00
Department of Public Works	450.00
Department of Agriculture	100.00
Liquor Control Board	5.00
Miscellaneous	130.00
	$1,085.00

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

ADMINISTRATIVE BRANCH.

Amalgamation of Mining Divisions.

In line with the Department's policy to consolidate Mining Divisions, in order to facilitate handling of mining records, both in the public interest and that of the Department, the following amalgamations were made during the year 1942:—

Mining Divisions consolidated.	Effective Date.	Name of Mining Division.	Mining Recorder's Office.
Golden and Windermere	October 15, 1942	Windermere	Golden.
Slocan and Arrow Lake	October 15, 1942	Slocan	New Denver.
Quatsino and Nanaimo	December 1, 1942	Nanaimo	Nanaimo.
Clayoquot and Alberni	December 1, 1942	Alberni	Alberni.

Amalgamation of Offices and Central Records Office.

The Vancouver offices of the Dominion Department of Mines and Resources and the Provincial Department of Mines have been amalgamated.

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

The service includes technical information on mining, the identification of mineral specimens, distribution of Dominion and Provincial mining publications, a reference room, a display of rocks and minerals, and a central records office.

The central records office is a new service. Returns from all Mining Recorders are being made to the central office semi-monthly. They include information as to the ownership of claims staked, placer-mining leases issued, certificates of work and bills of sale recorded. In the course of a year records are expected to be complete up to the latest semi-monthly return. The approximate positions of claims, from information supplied by the locators, are being shown on a series of reference maps available for public inspection in the central records office.

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			E. W. Mayfield.
Stikine	Telegraph Creek	A. E. Roddis	A. E. Roddis	
Sub-office	Boundary via Telegraph Creek			J. V. Rees.
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			E. W. Mayfield.
Skeena	Prince Rupert	N. A. Watt	N. A. Watt	J. G. Garrett.
Sub-office	Kitimat			
Sub-office	Copper River			L. G. Skinner.
Sub-office	Terrace			J. H. Meredith-Jones.
Sub-office	Stewart (Portland Canal)			A. Fisher.
Sub-office	Bosswood			Oscar Olander.
Sub-office	Kimsquit via Bella Coola			Percy Gadsden.
Sub-office	Ocean Falls			G. H. Hill.
Sub-office	Bella Coola			W. F. C. Trant.
Sub-office	Queen Charlotte			C. D. Matheson.
Portland Canal	Stewart	N. A. Watt (at Prince Rupert)	A. Fisher	
Sub-office	Anyox			
Sub-office	Alice Arm			Mrs. L. Cummings.
Omineca	Smithers	H. A. Bryant	H. A. Bryant	
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 Bella Coola			Percy Gadsden.
Sub-office	Fort St. John			Mrs. M. B. McLeod.
Sub-office	Terrace			J. H. Meredith-Jones.
Sub-office	Fort Fraser			J. D. Moore.
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	Sydney Allen (Deputy)		W. E. McLean.
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.

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.
Kamloops	Kamloops	D. Dalgleish (Deputy)		
Sub-office	Chu Chua			G. M. Fennell.
Sub-office	Vavenby			H. Finley.
Sub-office	Salmon Arm			A. P. Suckling.
Ashcroft	Ashcroft	D. Dalgleish (Deputy), Kamloops	W. F. Knowlton	
Sub-office	Lytton			J. Blakiston-Gray.
Nicola	Merritt	D. Dalgleish (Deputy), Kamloops	R. G. Couper	
Similkameen	Princeton	Chas. Nichols	Chas. Nichols	
Vernon	Vernon	R. M. McGusty	R. M. McGusty	
Sub-office	Kelowna			C. W. Dickson.
Greenwood	Greenwood	L. A. Dodd	L. A. Dodd	
Sub-office	Kettle Valley			G. B. Ganc.
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	Hedley			R. S. Collin.
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			D. H. Bruce.
Ainsworth	Kaslo	C. MacDonald	W. M. H. Dunn	
Sub-office	Trout Lake			
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			R. H. Hassard.
Sub-office	Ymir			S. Curwen.
Sub-office	Salmo			M. C. Donaldson.
Revelstoke	Revelstoke	W. Maxwell	W. Maxwell	
Lardeau	Beaton	W. Maxwell (Revelstoke)	C. A. McElroy	
Sub-office	Trout Lake			
Trail Creek	Rossland	E. L. Hedley	E. L. Hedley	
Nanaimo	Nanaimo	C. L. Monroe	C. L. Monroe	W. H. Cochrane.
Sub-office	Alert Bay			A. T. Lashmar.
Sub-office	Vananda			Henry Carter.
Sub-office	Shoal Bay, Thurlow P.O.			C. C. Thompson.
Sub-office	Granite Bay			H. J. Bull.
Sub-office	Cumberland			A. G. Freeze.
Sub-office	Zeballos			G. Nicholson.
Sub-office	Alberni			W. H. Boothroyd.
Sub-office	Quatsino			E. Evenson.
Alberni	Alberni	W. H. Boothroyd	W. H. Boothroyd	R. Sneddon.
Sub-office	Tofino			W. Armitage.
Sub-office	Zeballos			G. Nicholson.
Sub-office	Nanaimo			C. L. Monroe.
Victoria	Victoria	P. J. Mulcahy	P. J. Mulcahy	
New Westminster	New Westminster	A. B. Gray	J. F. McDonald	
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			A. T. Lashmar.
Sub-office	Powell River			J. P. Scarlett.
Sub-office	Shoal Bay, Thurlow P.O.			C. C. Thompson.
Lillooet	Lillooet	L. J. Price	L. J. Price	
Sub-office	Haylmore			W. Haylmore.

GOLD COMMISSIONERS' AND MINING RECORDERS' OFFICE STATISTICS, 1942.

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 Improvement.	Leases of Reverted Crown-granted Mineral Claims.	Placer Claims recorded.	Placer Leases granted.	Certificates of Work, Placer Leases.	Bills of Sale, etc.	Free Miners' Certificates.	General.	Mining Division and Provincial.
Atlin	203	5	3	.....	55	81	5	8	1	17	11	135	15	$1,403.00	$10,521.75	$11,924.75
Portland Canal	97	1	2	.....	44	194	5	.....	.....	.....	.....	.....	.....	538.75	848.25	1,387.00
Skeena	92	.....	3	1	55	74	8	10	40	2	1	1	.....	454.50	3,231.25	3,685.75
Stikine	62	1	1	1	8	17	.....	.....	6	5	5	21	.....	282.25	2,818.50	3,100.75
Cariboo	227	10	2	3	80	392	13	40	7	14	40	380	52	2,056.75	13,338.00	15,394.75
Omineca	353	5	1	.....	252	607	75	8	2	3	19	58	15	1,944.00	5,162.65	7,106.65
Peace River	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	63.00	33.50	96.50
Quesnel	146	2	5	18	69	83	9	7	.....	22	27	127	29	931.50	5,230.00	6,161.50
Kamloops	159	.....	.....	24	163	119	14	1	10	7	2	6	3	706.00	1,625.00	2,331.00
Nicola	31	1	.....	.....	49	82	6	12	.....	.....	.....	.....	.....	226.25	669.50	895.75
Vernon	99	1	.....	12	24	44	1	.....	.....	7	4	15	1	501.00	871.50	1,372.50
Greenwood	104	1	.....	.....	81	126	2	.....	3	1	2	2	.....	571.50	913.75	1,485.25
Osoyoos	82	.....	1	4	118	71	4	7	1	.....	.....	.....	.....	390.50	524.75	915.25
Similkameen	184	3	.....	8	89	66	8	9	.....	3	24	35	22	1,104.50	1,996.00	3,100.50
Ainsworth	63	3	1	2	25	110	4	1	14	1	.....	.....	.....	602.00	868.75	1,470.75
Fort Steele	129	1	1	18	68	68	24	.....	2	.....	4	32	4	635.00	1,857.25	2,492.25
Golden	56	3	2	7	25	85	4	2	3	.....	2	.....	1	480.00	427.75	907.75
Lardeau	34	.....	.....	1	75	60	5	.....	.....	.....	.....	.....	.....	158.75	577.50	736.25
Nelson	264	7	2	10	269	309	37	13	14	1	1	.....	.....	2,118.75	2,661.25	4,780 00
Revelstoke	43	.....	.....	1	62	73	15	.....	13	2	1	4	11	194.00	1,843.75	2,037.75
Slocan	55	1	.....	.....	37	85	.....	3	.....	.....	.....	.....	.....	362.00	355.50	717.50
Trail Creek	100	2	2	7	25	13	4	.....	5	.....	.....	.....	.....	658.75	308.50	967 25
Alberni	47	2	2	.....	27	111	10	3	.....	.....	.....	2	.....	343.50	811.00	1,154.50
Ashcroft	46	1	.....	.....	63	87	16	7	.....	1	1	7	.....	258.75	1,411.25	1,670.00
Clayoquot	110	12	1	.....	63	460	34	.....	.....	.....	.....	.....	.....	1,530.50	2,071.90	3,602.40
Clinton	33	.....	4	4	62	112	15	.....	1	4	.....	17	3	203.00	935.50	1,138.50
Lillooet	194	9	3	8	253	415	63	28	.....	1	4	18	2	1,601.25	3,267.75	4,869.00
Nanaimo	67	.....	.....	.....	46	90	5	.....	3	.....	.....	.....	2	300.25	476.25	776.50
New Westminster	123	1	.....	25	130	148	8	.....	10	3	.....	12	1	665.00	3,223.75	3,888.75
Vancouver	753	54	19	.....	81	108	6	.....	12	.....	.....	1	1	8,641.50	866.00	9,507.50
Victoria	134	6	3	9	64	62	2	.....	14	.....	.....	15	.....	1,073.50	1,202.50	2,276.00
Totals	4,090	132	58	163	2,462	4,352	402	159	161	94	148	888	162	$31,000.00	$70,950.55	$101,950.55

ANNUAL REPORTS.

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BULLETINS, OLD SERIES.

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Bulletin No. 2, 1919: The Commercial Feasibility of Electric Smelting of Iron Ores in British Columbia. (By Alfred Stansfield.)

Bulletin No. 2, 1932: Report on McConnell Creek Placer Area. (By Douglas Lay.)

MISCELLANEOUS.

Special Reports on Coal-mine Explosions. (By George Wilkinson, Thomas Graham, and James Ashworth.) 1918.

Report on Snowflake and Waverley-Tangier Mineral Properties. (By J. D. Galloway.) 1928.

Report on Mineral Properties of the Goldside Mining Company. (By B. T. O'Grady.) 1935.

*Notes on Placer-mining in British Columbia. (By Officers of the Department.) 1938.

Elementary Geology Applied to Prospecting. (By John F. Walker.) 1937. 35 cents.

Possibilities for Manufacture of Mineral Wool in British Columbia. (By J. M. Cummings.) 1937.

Lode-gold Deposits of the Zeballos Area. (By J. S. Stevenson.) 1938.

Index to Annual Reports of the Minister of Mines of British Columbia for the years 1874 to 1936, inclusive. (By H. T. Nation.) Paper bound, $1; cloth bound, $2.

Preliminary Investigations into Possibilities for Producing Silica Sand from B.C. Sand Deposits. (By J. M. Cummings.) 1941.

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

* To be reprinted.

BULLETINS, NEW SERIES.

1940.

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

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

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

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

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

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

Bulletin No. 7: Lode-gold Deposits of the Upper Lemon Creek Area and Lyle Creek—Whitewater Mine Area, Kootenay District. (By R. J. Maconachie.)
Bulletin No. 8: Preliminary Report on the Bedwell River Area. (By H. Sargent.)
Bulletin No. 9: Molybdenite in British Columbia. (By John S. Stevenson.)

1941.

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

* Out of print.

1942.

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

1943.

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

Bulletins are usually supplied free to residents of British Columbia, to certain Public Libraries and Universities (list appended), and other co-operative institutions. Some of the older editions are out of print and will not be reissued. Copies of these can generally be seen in the Public Libraries and Universities. An asterisk is put opposite any numbers out of print.

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PROSPECTORS' SETS.

Prospectors' sets of rocks and minerals, about fifty in number, are provided for the sum of 50 cents a set to those resident in the Province. Because it is difficult and expensive to accumulate these sets, only requests from those actually engaged in prospecting, or teaching subjects relating to mining or prospecting, can be fulfilled.

SYNOPSIS OF MINING LAWS OF BRITISH COLUMBIA.

Mineral Act and Placer-mining Act.

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

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

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

Free Miners' Certificates.

Any person over the age of 18, and any joint-stock company 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 Claims.

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

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

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

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

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

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

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

Placer Claims.

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

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

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

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

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

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

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

"In 'bar diggings' a claim shall be:—

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

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

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

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

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

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

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

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

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

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

A placer claim must be recorded in the office of the Mining Recorder for the mining division within which the same is situate, within fifteen days after the location thereof, if located within 10 miles of the office of the Mining Recorder by the most

direct means of travel. One additional day shall be allowed for every 10 miles additional or fraction thereof. The number of days shall be counted inclusive of the days upon which such location was made, but exclusive of the day of application for record. The application for such record shall be under oath and in the form set out in the Schedule to the Act. A claim which shall not have been recorded within the prescribed period shall be deemed to have been abandoned.

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

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

Lay-overs are declared by the Gold Commissioner upon proof being given to him that the supply of water is insufficient to work the claim. Under similar circumstances he has also the power to declare a close season, by notice in writing and published in the Gazette, for all or any claims in his district. Tunnel and drain licences are also granted by him on the person applying giving security for any damage that may arise. Grants of right-of-way for the construction of tunnels or drains across other claims are also granted on payment of a fee of $25, the owner of the claims crossed having the right for tolls, etc., on the tunnel or drain which may be constructed. These tolls, however, are, so far as the amount goes, under the discretion of the Gold Commissioner.

Co-owners and Partnerships.

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

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

Placer-mining Leases.

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:—

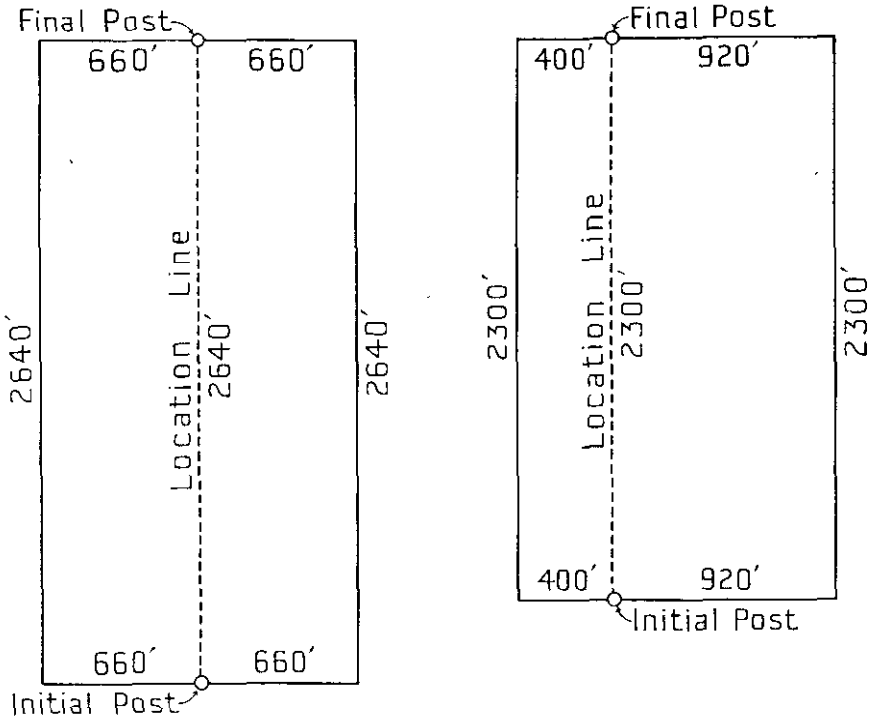
"(*a.*) The name of the intending applicant or each applicant if more than one, and the numbers of their free miners' certificates:

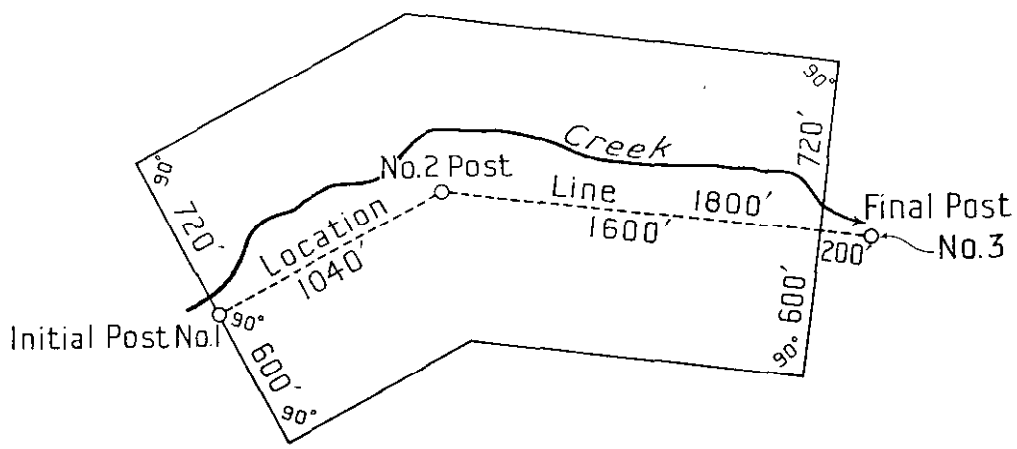
"(*b.*) The date of the location:

"(*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 miners' certificates and are British subjects may acquire knowledge and training in the art of placer-mining and may be afforded gainful work in the recovery of minerals by placer-mining. Reserves for the location of such camps shall not exceed one mile in length by one-half mile in width, and the right is given to enter into agreements with private holders under the Act for the development of their ground by means of unemployment relief camps.

DEPARTMENT OF MINES ACT.

The "Department of Mines Act" empowers the Minister of Mines to organize the Department or to reorganize it from time to time to meet changing conditions in the mining industry. It provides for examination and certification of assayers; for the

conducting of short courses of lectures in practical geology and mineralogy; and for the purchase of ore from the Provincial sampling plants. The said Act also provides for the expenditure of public moneys for the construction, reconstruction, or repair of trails, roads, and bridges to facilitate the exploration of the mineral resources of any mining district, or in the operation and development of any mining property.

Iron and Steel Bounties Act.

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

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

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

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

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

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

Metalliferous Mines Regulation Act.

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

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

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

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

All persons handling or using explosives must hold a certificate of competency for blasting. This certificate is issued by the district Inspector of Mines to miners who show by an oral examination that they are qualified to use explosives safely. This certificate may be cancelled for cause.

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

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

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

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

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

Coal-mines Regulation Act.

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

War-time Prospectors' Grub-stake Act.

In this Act "grub-stake" means money, food-supply, clothing, powder, tools, transportation, or anything necessary for prospecting. "War minerals" mean any minerals urgently needed for the prosecution of the war. "War-time prospector" means a holder of a free miner's certificate who has been honourably discharged from His Majesty's services (present war), or has been resident in the Province during the year preceding his application for a grub-stake.

Information may be obtained from any Gold Commissioner, Mining Recorder, Sub-mining Recorder, Mining Engineer, Associate Engineer, or Inspector of Mines of the Department of Mines.

No grub-stake to one applicant shall exceed $300 in value in any year. Applicants are required to identify some of the commoner rocks and minerals, especially those of a strategic nature.

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.

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, which ever 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.

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.

GEOLOGICAL SURVEY OF CANADA.

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

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

In 1936 a reorganization of several departments in the Federal Government was effected, and the Department of Mines and Resources created. One of the main

branches of this Department is that of Mines and Geology, with sub-branches known as the Bureau of Geology and Topography and the Bureau of Mines. The Geological Survey of Canada and the Topographical Survey are now a part of the Bureau of Geology and Topography. During the season of 1942 the Bureau of Geology and Topography had the following officers employed on field-work in British Columbia:—

GEOLOGICAL PARTIES.

H. H. Beach and J. Spivak: Chinaman Lake area. Longitude, 122° 00′–122° 30′; latitude, 56° 00′–56° 15′.

R. T. D. Wickenden and Geo. Shaw: Commotion Creek area. Longitude, 121° 45′–122° 15′; latitude, 56° 00′–56° 15′.

F. H. McLearn and J. F. Henderson: Lone Mountain area. Longitude, 120° 15′–120° 45′; latitude, 54° 45′–55° 00′.

(The above examination of stratigraphy and structure relating to oil were under the supervision of Dr. J. S. Stewart.)

J. E. Armstrong: Examination of chromite deposits 15 miles south-east of Takla Lake. Examination of mercury properties in Pinchi Lake mercury belt.

C. S. Lord: Examination of chromite deposits 15 miles east of Takla Lake. Supervision of diamond-drilling at Regal silver mine.

H. M. A. Rice: Supervision of drilling of zinc area in Kootenay National Park. Examination of chromite deposits, Scottie and Ferguson Creeks, Ashcroft district.

A. F. Buckham: Examination of chromite deposits near Bridge River district.

W. E. Cockfield: Examination of chromite deposits near Grand Forks and Rock Creek. Examination of tungsten deposits at Emerald mine and Stewart Creek. Examination of manganese at Olalla and of other strategic minerals in Southern British Columbia.

TOPOGRAPHICAL PARTIES.

R. J. Parlee: Dunlevy Creek. Latitude, 56° 00′–56° 15′; longitude, 122° 15′–122° 30′.

J. W. Spence: Commotion Creek (contour interval, 100 feet). Latitude, 55° 30′–55° 45′; longitude, 121° 45′–122° 00′.

W. B. Dingle: Chinaman Lake. Latitude, 56° 00′–56° 15′; longitude, 122° 00′–122° 15′.

J. V. Butterworth: Bullhead Mountain. Latitude, 55° 45′–56° 00′; longitude, 122° 00′–122° 15′.

M. E. Nidd: Mount Hulcross. Latitude, 55° 30′–55° 45′; longitude, 122° 00′–122° 15′.

H. N. Spence: Triangulation control for above sheets.

W. H. Miller, R. C. McDonald, A. O. Gammon, R. Bartlett, and R. F. Dore: Sukunka River and Monkman Road area (about 3,900 square miles). South-east from the Pine River to the British Columbia-Alberta boundary. Control for vertical air photographs.

PROGRESS NOTES.

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

The Notes are grouped in types of metallic mineral deposits (Lode Gold, etc.) in named areas.

LODE-GOLD DEPOSITS.

TAKU RIVER AREA.

TULSEQUAH.

Polaris-Taku Mining Co., Ltd.

Company office, 807 Lonsdale Building, Duluth, Minnesota, U.S.A.; mine office, Tulsequah, B.C.; W. B. Congdon, President and Treasurer; H. A. Garver, Secretary; F. H. McPherson, Manager. Capital: 10,000 preferred shares, $100 par; 20,000 common shares, $1 par; issued—10,000 preferred, 12,200 common.

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

During the period of operation, 1,175 feet of drifting, 1,242 feet of raising, and 2,463 feet of diamond-drilling were done. A total of 30,966 tons of ore was mined and 31,336 tons was milled. The average number of men employed was fifty. Operations were suspended at the end of April.

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

PORTLAND CANAL AREA.

SALMON RIVER.

Silbak Premier Mines, Ltd.

Company office, 718 Granville Street, Vancouver, B.C.; mine office, Premier, B.C.; H. A. Guess, President; J. C. Emison, Treasurer; G. A. Brockington, Secretary; B. F. Smith, Manager. Capital: 3,000,000 shares, $1 par; issued, 2,500,000. The property is in the Salmon River valley, about 14 miles from Stewart.

During the year 7,423 feet of drifting and raising and a continuous programme of diamond-drilling was carried out. The mine was worked for 312 days and produced 140,567 tons of ore. A total of 36,300 oz. of gold was recovered.

An ore-body has been developed along the *Premier Border* boundary between the 4th and 6th levels. Ore is also being mined from the *Premier Border* section on the 5th and 6th levels.

Operations are severely handicapped by a shortage of labour, particularly for underground work. By the end of the year the crew had been reduced by approximately one half—to 187 men.

Buena Vista Mining Co., Ltd.

Company office, Trail, B.C.; M. M. O'Brien, President; E. G. Randall, Secretary-Treasurer. Capital: 500,000 shares, $1 par; issued, 300,000 held by Consolidated Mining and Smelting Company of Canada, Limited, and 200,000 by Big Missouri Mines Corporation. This company owns the *Big Missouri* mine in the Salmon River valley, 18 miles from Stewart.

The mine was worked for eighty-nine days at the beginning of the year and then was permanently abandoned. During this period 102 feet of drifting and 97 feet of raising were done and 62,755 tons of ore was produced. A crew averaging forty-two men was employed.

All equipment, except the hydro-electric power plant, has been removed from the property.

NORTHERN COAST.

PRINCESS ROYAL ISLAND.

Surf Inlet Consolidated Gold Mines, Ltd.

Company office, 717 Pacific Building, Vancouver, B.C.; mine office, Surf Inlet, B.C.; R. L. Reed, President; W. R. Watson, Treasurer; C. K. Moffly, Secretary. Capital: 3,000,000 shares, fifty cents par; issued, 2,672,855. During the year 17,839 feet of diamond-drilling was done on the *Pugsley, Surf,* and other properties. In addition, 3,241 feet of drifting and 507 feet of raising were done in the *Pugsley* and *Surf* mines. The mill was operated for 334 days and treated 26,116 tons of ore. The yield was 8,683 oz. of gold and some silver and copper.

During the period of operation the average number of men employed was eighty. The company suspended work in November for the duration of the war and only watchmen remain at the property.

HAZELTON TO HOUSTON AREA.

SMITHERS.

Smithers Mines, Ltd.—Herman and Kelly, who have leased the old *Duthie* mine for the past two years, have stopped work and the property is now idle.

CARIBOO AREA.

WELLS.

Cariboo Gold Quartz Mining Co., Ltd.

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

Development-work done on the property during 1942 amounted to 2,625 feet of drifting, 2,659 feet of crosscutting, 1,357 feet of raising, and 5,152 feet of diamond-drilling. Development-work was done on all zones, principally on the 1,800 and 1,900 levels off No. 3 shaft, on the 1,200 and 1,300 levels on the *Butts* zone, and on the 1,200 level of the *Pinkerton* zone. The main level was also advanced to connect with the bottom of the "B.C." shaft and some drifting was done back along the "B.C." vein. Because of the shortage of labour during the latter part of the year, practically all the development-work was stopped. Thus the total development footage given above is less than 50 per cent. of that of last year.

Ore mined and milled during 1942 amounted to 93,885 tons and 38,016 oz. of gold was recovered. The daily amount dropped from 350 tons mined and milled at the beginning of the year to 170 tons mined and milled at the end of the year. Considering the nature of the ore occurrence and the fact that the underground crew has been reduced to about 40 per cent. of full strength, this shows that a decided effort is evidently being made to carry on. The average number of men employed was 272.

Several members of the staff, including R. Pitcher, Assistant General Superintendent, and R. I. C. Comfort, Assistant Mine Superintendent, have joined the armed forces. No replacements have been made.

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

Island Mountain Mines Co., Ltd.

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

Development-work consisted of 2,605 feet of drifting and crosscutting, 326 feet of raising, 451 feet of shaft-sinking, and 18,645 feet of diamond-drilling. The lateral development-work was largely confined to the 3,125, 3,250, and 3,375 levels and sub-levels between 3,875 and 4,000 on the bottom of ore-shoots opened up on the 4,000. The shaft was extended to 1,530 feet below the collar and three new stations were established at elevations 2,850, 2,700, and 2,550. No work was done on any of these new levels. These footages, excluding the shaft-sinking, are considerably lower than those of last year because of the labour shortage which began to develop at the mine about the end of June.

Ore mined and milled amounted to 47,916 tons or an average of 131.2 tons per day.

The average number of employees was 123. Possibly because of the shaft-sinking operation and the Shamrock Tunnel project, this company was not affected by the labour shortage as early in the year as the other large operating companies in Inspection District No. 2. At the end of the year the total crew, including the staff, was less than 100.

There were no additions to the surface plant during the year.

During the year 3,393 feet of drifting and crosscutting and 3,379 feet of diamond-drilling were done. This was accomplished with an average crew of nineteen men underground on a three-shift basis and six men on the surface. Despite variable and often difficult ground conditions, the advance averaged 7.31 feet per drilling shift. On August 15th the project was discontinued because of the labour shortage.

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

YANKS PEAK.

Snowshoe Gold Mines, Ltd.

Company office, 785 Dunsmuir Street, Vancouver, B.C.; mine office, Wells, B.C.; F. M. Wells, President; E. J. Gook, Secretary-Treasurer. Capital: 3,000,000 shares, fifty cents par; issued, 1,664,475. The property is situated at the head of Little Snowshoe Creek in the Yanks Peak area. A limited amount of drifting was done on the intermediate tunnel level for the Pioneer Gold Mines of B.C., Ltd. Because of uncertain conditions resulting from the war, operations were suspended in January and the option was extended for six months. At the end of this period it was seen that man-power for the development of gold properties would be unavailable for some time and, therefore, the option was surrendered.

[Reference: Annual Report, 1929.]

BRIDGE RIVER AREA.

Pioneer Gold Mines of B.C., Ltd.

Company office, 470 Granville Street, Vancouver, B.C.; mine office, Pioneer Mines P.O., B.C.; V. Spencer, President; A. E. Bull, Secretary-Treasurer; H. T. James, Managing Director; E. F. Emmons, Mine Manager. Capital: 2,500,000 shares, $1 par; issued, 1,751,750. The company owns the *Pioneer* mine on Cadwallader Creek, a tributary

of Bridge River, 52 miles by road from Bridge River Station on the Pacific Great Eastern Railway.

Development-work consisted of 2,284 feet of drifting, 781 feet of crosscutting, and 4,282 feet of diamond-drilling.

At the beginning of the year 277 men were employed, but at the end of December only 125 men remained. The total crew at the end of the year was less than 50 per cent. of normal; the underground crew was about 35 per cent. of normal. These men are largely occupied in maintenance-work and the production has thus been forced down to about one-third of the normal output of 300 tons per day. A total of 79,624 tons was milled.

The company's field staff was active in seeking deposits of strategic minerals north of Bridge River and in the Fort St. James area. Some surface-stripping and 50 feet of drifting were done on the *Ada* claim of the Canadian Tungsten Company before dropping the option. This claim is situated on the North Bend of the Fraser River, between Hansard and Prince George. As described elsewhere in this report, a limited amount of work was done on the *Snowshoe* group.

Bralorne Mines, Ltd.

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

The company owns the *Bralorne* mine on Cadwallader Creek, a tributary of Bridge River, 50 miles by road from Bridge River Station on the Pacific Great Eastern Railway.

Development-work done during the year consisted of 9,872 feet of crosscutting and drifting, 1,270 feet of raising, and 10,886 feet of diamond-drilling. These totals are considerably lower than those of 1941, principally because the labour shortage made it necessary to curtail development-work in order to maintain production. The principal development projects were on the "75" and "77" veins at the 15th, 16th, and 17th levels and on the "51" vein on the 200 level in the east end of the mine. There was also some development-work to delimit a scheelite zone discovered with the ultra-violet lamp at the end of the 5th level. No work was done in the *King* or the *Coronation* mines.

Ore milled amounted to 171,095 tons and the amount of ore broken was about the same as that of ore drawn. A total of 90,817 oz. of gold and 21,375 oz. of silver was recovered.

The number of men employed underground dropped from an average of 294 per day in January to 137 in December. The average for the year was 211 per day as against 348 in 1941.

An underground transformer-station installed near the 2,000 level Empire Shaft station early in the year was the only plant addition underground. A new stairway was built from the 800 portal level to the townsite level, and a small scheelite reduction plant was added to the main mill buildings.

This plant was built after an unsuccessful attempt had been made to recover scheelite from the mill tailings by running them over blanket tables and retabling and floating the concentrate obtained. The plant has a capacity of 1 ton per hour and uses the crushing plant of the regular mill for preliminary breaking. This is followed in turn by a fine-ore bin, a jig, an 8-mesh trommel-screen, a set of 12- by 30-inch rolls grinding to ⅛ inch, and a Deister table. Products from the table consist of a concentrate which is stored for further treatment, a middling which is pumped back to the jig, and a tailing which is stock-piled.

The plant went into operation about the beginning of September and treated about 150 tons of low-grade tungsten ore. About 10 tons of 13-per-cent. ore was also concentrated up to a product of 70 per cent. WO_3.

Operations were suspended in October because of trouble with the rolls, but were resumed in early January, 1943, when about 30 tons of ore from the *Tungsten King* property was concentrated to better than 70 per cent. WO_3. Two tons of ore from the adjoining *Tungsten Queen* property was also treated, with results unknown at time of writing.

The company also did sufficient diamond-drilling, tunnelling, and open-cutting on its Yalakom holdings to obtain a Crown grant of forty claims in five groups of eight.

The work done on the Relay Creek mercury operation is described elsewhere.

KAMLOOPS AREA.

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

Mine office, Kamloops, B.C.; E. H. Kellner, Managing Director; T. W. Page, Superintendent. This mine is on the Louis Creek-Agate Bay road, approximately 3 miles north-westward from the head of Agate Bay, on Adams Lake, or 18 miles easterly by auto-road from Louis Creek Station on the Canadian National Railways, 36 miles north of Kamloops. Work was discontinued during December 1941 and was not resumed during 1942.

STUMP LAKE AREA.

Consolidated Nicola Goldfields, Ltd.

Company office, 506 Dunsmuir Street, Vancouver, B.C.; mine office, Box 68, Merritt, B.C.; H. H. Stevens, President; C. H. Coolidge, Secretary-Treasurer; B. O. Brynelson, Superintendent. This company operates the *Nicola* mine at Stump Lake, 2 miles west of the Kamloops–Merritt Highway and 30 miles from Merritt. The 320 adit is the main entry and intersects the *Enterprise* vein 800 feet from the portal. This vein has a general dip of 46 degrees and has been developed down the dip by an inclined shaft. Work was intermittent during the year and a small amount of ore was milled. Scheelite was discovered on the property during 1941 and additional mill equipment was installed with a view to treating this ore. A crew varying from ten to thirty-seven men was employed.

During the year 767 tons of ore was mined and milled. Mining operations were suspended in December. An engineer and caretaker were left to take charge of the property and to pump water from the mine when necessary.

SIMILKAMEEN RIVER AREA.

HEDLEY.

Canty Gold Mines (Hedley), Ltd.

Company office, 908 Royal Bank Building, Vancouver, B.C.; W. B. Farris, President; V. J. Creeden, Secretary; W. S. Charlton, Treasurer; R. H. Stewart, Managing Director. Capital: 3,000,000 shares, $1 par; issued, 2,172,788. This mine closed down during 1941 and was not reopened in 1942. The machinery and equipment were removed from the property during the year.

Hedley Mascot Gold Mines, Ltd.

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. 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 with the workings of the adjacent *Nickel Plate* mine at several points and during the year another connection was made on the 4,300-foot level from the *Nickel Plate's* new *Morning* shaft. During the months when natural ventilation is found to be inadequate a Jeffrey propeller-type fan is used. Production during the year was chiefly from the upper levels.

Underground development during the year was restricted owing to the shortage of labour and no plant additions were made. The ground previously worked on Nickel Plate Mountain has generally been very hard but that in the vicinity of the No. 22 stope, in the lower workings, was abnormally soft and square-set timber had to be used. About 50 per cent. of the timbered stope required back-filling; this work is now almost completed. A large part of the back-filling material came from the new *Morning* incline shaft of the *Nickel Plate* mine.

A total of 66,088 tons of ore was produced, yielding 22,477 oz. of gold, 2,757 oz. of silver, and a quantity of copper and arsenic. A crew averaging eighty-five men was employed. During the year 417 feet of drifting, 809 feet of raising, and 12,810 feet of diamond-drilling were done.

Kelowna Exploration Co., Ltd.

Company office, 75 West Street, New York, N.Y.; mine office, Hedley, B.C.; W. A. Kissam, Chairman; S. T. Tyng, President; J. W. Mercer, Treasurer; O. P. Ebeling, Secretary; W. C. Douglass, Manager; C. B. Hume, Chief Engineer; F. Turner, Mine Superintendent. This is a private company operating the *Nickel Plate* mine at Hedley. The concentrator, 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. Transportation up the side of the mountain is in two sections; a 10,000-foot gravity tramway from the ore-bin at the mill is operated with skips having a capacity of 6 tons. During the year new concrete settings were placed under the hoist at the central station. 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 most important underground development during the year was the continuance of shaft-sinking on the *Morning* incline. This was commenced in 1941 and progressed down a distance of 850 feet during 1942. The incline shaft is sunk on an angle of 50 degrees and is 16 by 8 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 at the following elevations above sea-level: 4,600 feet, 4,450 feet, 4,300 feet, and 4,150 feet. The *Nickel Plate* mine is connected to the *Hedley Mascot* mine at many points underground, and as the upper workings of the *Nickel Plate* mine are at a higher elevation than the *Mascot* a high motive column is provided for natural ventilation. The relative positions of these mines also provide a further opportunity for mutual benefit; the rock taken from the drivage of the *Morning* incline is used for back-filling in the timbered stope of the *Mascot* mine.

Further underground development consisted of driving on the *I.X.L.* adit and the *Climax*. Owing to labour shortage, work on this development had to be discontinued in July. A total of 640 feet of development-work was done on the No. 15 level in driving toward the *Copper Cleft* claim in search of a continuation of the "4½" *Sunnyside* ore-body.

Total underground development-work consisted of 3,041 feet of drifting, raising, and shaft-work, and 7,879 feet of diamond-drilling. A total of 99,219 tons of ore was milled, yielding 32,425 oz. of gold, 2,266 oz. of silver, and a quantity of copper and arsenic. It is of interest to note that since this company took over the operation in December, 1934, a total tonnage of 654,968 tons of ore has been produced. An average crew of 176 men was employed during the year.

VERNON AREA.

Kalamalka.—This property on Brewer Creek, 2 miles from Lavington, was operated under lease for the first part of the year by S. M. and C. Penny and associates. A total of about 433 tons of ore was reported as shipped to Trail.

CAMP McKINNEY AREA.

Cariboo-Amelia. This property, situated in Camp McKinney, was operated under lease by E. Wanke and O. Johnson, of Greenwood. Hand-steel was used to recover ore from the surface pillars left by the original operation. Ore totalling about 290 tons was reported as shipped to Trail. Late in the year a lease on another part of the mine was taken by the Fritz brothers, of Greenwood.

[Reference: Bulletin No. 6, 1940.]

BEAVERDELL AREA.

Vancouver.—A total of about 2 tons of ore was reported as mined by J. P. Gechain, of Carmi, by hand-steel This was shipped to Trail.

GREENWOOD-GRAND FORKS AREA.

JEWEL LAKE.

Dentonia Mines, Ltd. Company office, 850 Hastings Street West, Vancouver, B.C.; J. R. Reed, President. Capital: 2,500,000 shares, no par value; issued, 1,716,600. The property was leased by A. H. Upton and associates, of Vancouver, until late in the year, when it was taken over by W. E. McArthur, of Greenwood. Mining was confined to salvaging pillars and stope remnants. Two to four men were employed. Ore amounting to 1,445 tons was mined by A. H. Upton and shipped to Trail.

GRAND FORKS.

Yankee Boy. This property is 4 miles from Grand Forks. It was operated for a short time under lease by J. and S. Klemens, of Grand Forks. A total of 135 tons, mostly sorted from old dumps, was shipped to Trail and yielded 181 oz. of gold and 184 oz. of silver. Development consisted of 32 feet of cross-cutting and 50 feet of drifting.

Humming Bird. This property, about 12 miles from Grand Forks, is owned and operated by A. Anderson, of Grand Forks. It is equipped with a complete small mining plant. A total of 65 tons was mined and shipped to Trail. Fifty feet of drifting was done during the year.

FRANKLIN CAMP.

Union. This property is in the Franklin Camp, about 46 miles north of Grand Forks. It is owned by the J. F. McCarthy Estate, of Wallace, Idaho, and is operated under lease and bond by W. E. McArthur, of Greenwood. A small portable gasoline-driven compressor provides air for underground work. An average crew of four men was employed until June 1st, 1942, when the property was closed and the option was dropped. Development-work included 120 feet of drifting, 55 feet of raising, 550 feet of diamond-drilling, and some surface-trenching. A total of 1,546 tons of ore was mined and shipped to Trail and this yielded 275 oz. of gold and 29,313 oz. of silver.

Homestake. This property adjoins the *Union* in the Franklin Camp. It was operated under lease by W. E. McArthur, of Greenwood, who did considerable trenching and surface-stripping by hand in an attempt to find another ore-shoot. The work was unsuccessful.

SLOCAN AREA.

RETALLACK.

Highland Surprise Gold Mines, Ltd. Company office, Kaslo, B.C.; R. W. Kennedy, President. Capital: 3,000,000 shares, 50 cents par. The property is on Lyle Creek, 3½ miles from Retallack. It was operated under lease by G. H. Grimwood, of Nelson, for one month during the summer. A total of about 30 tons of ore was reported as shipped directly to Trail.

[Reference: Bulletin No. 7, 1940.]

ROSSLAND AREA.

MOUNT ROBERTS.

Midnight. 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 and a mill of about 10 tons per day capacity. The mill was not run during the year. Four men were employed continuously. A total of about 528 tons was reported as mined and shipped to Trail.

I.X.L. This property adjoins the *Midnight*. It is equipped with a small mining plant and was operated continuously throughout the year by K. Jorgensen and associates, of Rossland, under lease. A small amount of development-work was done. A total of 68 tons of ore was mined and shipped to Trail, which yielded 336 oz. of gold and 91 oz. of silver. Development-work consisted of 120 feet of drifting and crosscutting. The average number of men employed was three.

Gold Drip.—This property adjoins the *Midnight* and *I.X.L.* It is under lease and bond to the Elleston's Syndicate, of Vancouver. R. W. Haggen, of Rossland, is in charge of operations. Two men were employed reopening the old workings.

Jumbo. This property, 1 mile west of Rossland, just off the main Cascade Highway, is owned by C. Finch Smith, of California, and was operated for a short time during the year under lease and bond by G. Nordholm, J. Henderson, and B. Schwartzenhauer, of Rossland. Hand-steel was used to mine and about 330 tons of ore was reported as shipped to Trail.

NELSON AREA.

APEX.

Tri-Metals Mining, Inc. Company office, 725 Creighton Building, Spokane, Washington; M. A. Nelson, President. This company operated the *Golden Age* mine on the Nelson–Nelway Highway, about 10 miles south of Nelson. During the year the property was equipped with a small complete mining plant and arrangements were made to treat the ore in the *Euphrates* mill. Operations with a crew of from fourteen to twenty-two men were conducted until the end of April, when the difficulty of getting replacements for breakdown in the mill made it necessary to close down for the duration. A small amount of development-work, including diamond-drilling, was done. A small tonnage of concentrates was reported as mined, milled, and shipped to Trail.

Toad Mountain.

California. This property, on Toad Mountain, is owned by M. Wilson, of Trail. It was operated by three separate groups of lessees during the year, namely, L. Bobier, H. Bremner, and L. J. Gormley. Small portable gasoline-driven compressors were used to mine ore by the different groups. A total of 49 tons of ore was mined and shipped to Trail.

Victoria-Jesse.—This property, on Toad Mountain, was operated under lease by hand-steel by B. Sterna and partner. A total of 17 tons of ore was shipped to Trail and yielded 14 oz. of gold and 15 oz. of silver.

Hall Creek.

Bear.—This property, on Hall Creek, adjoins the *Fern* mine. During the early part of the year it was operated under lease by J. Bergquist and A. Carlson. Hand-steel was used and about 9 tons of ore reported as shipped to Trail.

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

Fern. This property, on Hall Creek, is owned by C. E. and L. R. Hawley, of Spokane, Washington. It was leased by J. and T. Logan and J. Keller, who used hand-steel to recover ore from pillars and stope remnants. Thirty-three tons was shipped to Trail and yielded 61 oz. of gold and 30 oz. of silver.

Canadian Belle Mining Co. Company office, 334 Peyton Building, Spokane, Washington; R. E. Linquist, President. Capital: 1,150,000 shares, 1 cent par; issued, 850,000. The company owns the *Canadian Belle* mine on Hall Creek. A small amount of development-work was done by hand-steel under the direction of M. Herman, of Ymir.

Eagle Creek.

Livingston Mining Co. Company office, 521 Central Building, Seattle, Washington; H. R. Smith, President and Manager. This company owns the *Granite-Poorman* mine on Eagle Creek, near Blewett. A crew varying from four to thirteen men was employed throughout the year and, in addition to this, several small groups leased various parts of the mine. The property is equipped with a complete mining plant and mill, but the latter was not operated during the year. Very little development-work was done. A total of 1,137 tons was mined and shipped to Trail. This yielded 874 oz. of gold and 1,079 oz. of silver.

Venango. This property, adjoining the *Granite-Poorman*, is controlled by A. Norcross and associates, of Nelson. During the early part of the year considerable development-work, consisting of trenching by ground-sluicing, 500 feet of diamond-drilling, and some drifting underground, was done. A new vein showing appreciable amounts of scheelite was uncovered. The property is equipped with a small complete mining plant.

Sitkum Creek.

Alpine Gold, Ltd. (N.P.L.). Company office, 415 Baker Street, Nelson, B.C.; J. B. Curtis, President; B. O'Neil, Secretary. Capital: 500,000 shares, 50 cents par. This company operates the *Alpine* mine at the head of Sitkum Creek, about 9 miles from the Nelson–Kaslo Highway. During the early part of the year a total crew of sixty-eight men was employed in the mine and mill. As a result of the development-work during the winter of 1941–42, the mill was started on February 15th and operated continuously until May 20th when the property, because of the labour shortage, was closed for the duration of the war. Sufficient ore for several months of mill operation remain to be mined and the possibilities of further development are good. Development-work, which was suspended about the end of February,

included 728 feet of drifting and raising. The concentrates, reported as shipped to Trail, amounted to 75 tons.

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

ROVER CREEK.

Rover Creek Mining Co., Ltd. Company office, Room 11, K.W.C. Block, Nelson, B.C.; L. D. Clark, Manager and Secretary. This company, a subsidiary of the Alpine Gold, Limited, was formed 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. A complete topographic survey was made of the area and, in addition, 1,150 feet of trenching and 300 cubic yards of excavating in 4- by 4-foot test-pits were done. Five men were employed from May to September, 1942.

YMIR.

Blackcock. This property on Ymir Creek, just above the junction of Huckleberry Creek, was operated for a short time by W. H. Weaver, of Calgary. A total of 6.9 tons of ore was mined and shipped to Trail. This yielded 2.32 oz. of gold, 7.59 oz. of silver, and some lead and zinc.

Wilcox. This property is on Ymir Creek, about three-quarters of a mile above the *Blackcock*. It was operated under lease by B. Golac and partner. Hand-steel was used to recover ore from surface-cuts and trenches. A total of 88 tons was shipped to Trail, yielding 121 oz. gold, 335 oz. silver, and some zinc.

Arizona.—This property, adjoining the *Wilcox*, was operated under lease by N. Morris and partner. Hand-steel was used to mine 9 tons which was shipped to Trail.

Ymir Consolidated Gold Mines, Ltd. Company office, 704 Royal Trust Building, Vancouver, B.C.; R. C. McCorkell, President; T. G. Cowan, Secretary-Treasurer. Capital: 1,500,000 preferred shares, no par value; 2,500,000 common shares, no par value; issued, 2,500,000 common shares. The company controls the *Goodenough* mine, on Elise Mountain, and owns the adjoining *Ymir* mine. During the year several groups of lessees recovered ore from pillars, stope remnants, and dumps on both properties. The compressor plants at both properties and electric haulage at the *Ymir* were used for some of these operations. A total of 1,237 tons was reported as shipped to Trail. Late in the year the milling equipment, compressor plant, and electric haulage at the *Ymir* mine were disposed of.

Ymir-Yankee Girl Gold Mines, Ltd. Company office, 525 Seymour Street, Vancouver, B.C.; E. P. Crawford, President; W. A. Sutton, Secretary-Treasurer; L. G. Morrell, Mine Manager. Capital: 3,000,000 shares, no par value; issued, 2,225,005. The company owns and operates the *Yankee Girl* mine on Oscar Creek, 3 miles from Ymir, and operated the adjoining *Dundee* mine on a lease-and-bond basis. The mill operated at capacity on ore from the *Dundee* mine until the end of February; about forty-six men were employed. It was then altered to treat zinc tailings which had been stacked from the former operation. These tailings were treated at the rate of 100 tons per day and kept the mill running until June. The company operation was then closed and a lease taken on the *Yankee Girl* mine and plant by L. G. Morrell and associates, of Ymir. The backfill from some of the old stopes was drawn and treated in the mill and the concentrates shipped to Trail. This operation continued until almost the end of the year, when part of the plant and equipment was disposed of by the company. No development-work was done during the year. Under the company operation a total of 19,654 tons was milled and the concentrates shipped to Trail yielded 2,546 oz. of gold, 24,594 oz. of silver, and some lead, cadmium, and zinc. The lessees treated 5,244 tons, which yielded 636 oz. of gold and 2,120 oz. of silver.

Wesko (Ymir Centre Star).—This property, about 3 miles from Ymir, was leased during part of the year by O. Anderson and associates, of Ymir. Hand-steel was used to salvage pillars and stope remnants. A total of 107 tons was shipped to Trail, yielding 142 oz. of gold and 724 oz. of silver.

Durango (Howard).—L. P. Gormley and associates, of Nelson, leased the old tailings dumps at the mill and 17 tons of concentrate was reported as shipped to Trail.

Salmo.

Clubine-Comstock Gold Mines, Ltd. Company office, 618 Stock Exchange Building, Vancouver, B.C.; C. F. Hunter, Secretary. Capital: 2,000,000 shares, 50 cents par. This property, on Boulder Creek, was leased for a short time by R. Hansen and J. Herman, of Rossland. A total of about 33 tons was mined by hand-steel and reported as shipped to Trail.

Airport Group.—A small amount of work was done by the owner, M. Malich, of Salmo.

Sheep Creek.

Kootenay Belle Gold Mines, Ltd. 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. The property was operated until late in the year. During the first six months milling was maintained at 120 tons per day. Then the mill was closed and mining continued with a greatly reduced crew until October 1st, when sufficient broken ore had accumulated to enable the mill to operate until about December 31st, 1942. The property was then closed for the duration of the war. All development-work, which comprised 103 feet of drifting and 19 feet of crosscutting, was done on the *Black* vein and practically all the ore mined came from that vein. The number of men employed varied from 130 at the first of the year to about thirty at the end. A total of 26,016 tons of ore was mined and treated in the mill and yielded 8,310 oz. of gold and 2,414 oz. of silver.

Sheep Creek Gold Mines, Ltd. 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 and mill operated continuously throughout the year. A crew of 114 men was employed early in the year but this was gradually reduced to sixty through labour shortage and restrictions. Development-work included 1,037 feet of drifting, 1,740 feet of crosscutting, 80 feet of raising, and 718 feet of diamond-drilling. A total of 55,395 tons of ore was mined and treated in the mill and the bullion yielded 23,493 oz. of gold and 7,143 oz. of silver.

Gold Belt Mining Co., Ltd. Company office, 616 Stock Exchange Building, Vancouver, B.C.; mine office, Sheep Creek, B.C.; A. E. Jukes, President; 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 and mill operated continuously throughout the year at about 160 to 170 tons per day. The original crew of 130 men was reduced to about forty-five at the end of the year through labour shortage and restrictions. Development-work, which included 1,315 feet of drifting, 610 feet of crosscutting, and 497 feet of raising, was suspended about the end of July. Mining was greatly curtailed but mill tonnage was maintained by drawing heavily on broken reserves. A definite development programme to connect the 1,400 level in the present workings with the 600 level of the old workings, thus providing natural ventilation and

exploring the more northerly veins at a higher horizon, was commenced but could not be completed. A total of 55,299 tons of ore was treated in the mill and the bullion yielded 19,616 oz. of gold and 8,289 oz. of silver.

Reno Gold Mine, Ltd. The holdings of this company in the Sheep Creek camp, including the ground covered by the *Reno, Motherlode, Nugget, Cayote, Fawn,* and *Bluestone* properties, were taken over by A. Endersby, Jr., of Fruitvale. A portion of the plant, including the water-driven compressor in the mill, the surface tram and skip from the 4,900 tunnel, and some miscellaneous light equipment, were also acquired by A. Endersby later in the season. Up to nine men were employed and ore was recovered from pillars and stope remnants in the *Nugget* and *Motherlode* and from a small area in the *Fawn*. Toward the end of the year the work was greatly curtailed because of labour shortage and restrictions. A total of 1,128 tons was mined from the *Nugget* and shipped to Trail. This yielded 883 oz. of gold and 539 oz. of silver.

Erie Creek.

Arlington. This property on Keystone Mountain, 3½ miles from Erie, is owned by the Relief Arlington Mines, Limited, and was operated under lease by R. Oscarson, of Spokane, Washington. Thirteen men were employed originally but this number was finally reduced to three in July, because of labour restrictions, and the mine was closed. Hand-steel only was used. A total of 561 tons of ore was mined and shipped to Trail.

Keystone. This property on Keystone Mountain, about 3½ miles from Erie, was operated for a short time under lease by C. A. Hansen and three partners, of Rossland. A total of 47 tons was mined by hand-steel and shipped to Trail. This yielded 9 oz. of gold and 50 oz. of silver.

Gold Hill.—This property, about 4 miles from Erie and near the *Keystone*, was operated under lease for three months by C. and F. Fresu, of Ymir.

SOUTH KOOTENAY LAKE AREA.

Bayonne Consolidated Mines, Ltd. Company office, 308 Pacific Building, Vancouver, B.C.; mine office, Bayonne, B.C.; W. C. Ditmars, President; H. T. Wilson, Secretary-Treasurer; J. A. Paterson, Mine Manager. Capital: 2,500,000 shares, no par value; issued, 2,500,000. The company owns the *Bayonne* mine on Summit Creek, 23 miles by road from Tye Siding. The mine and mill were operated continuously until August 1st at a capacity of about 50 tons per day, when it was closed, because of labour shortage, for the duration of the war. Some developed ore remains to be mined. All the machinery, plant, and equipment were left at the property. Development-work done during the year included 917 feet of drifting, 66 feet of crosscutting, 80 feet of raising, and 604 feet of diamond-drilling. A total of 11,976 tons of ore was mined and recovered from old dumps and the bullion from this yielded 4,599 oz. of gold and 11,063 oz. of silver.

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

TEXADA ISLAND.

Gem Gold Mines, Ltd. Company office, 1604 Royal Bank Building, Vancouver, B.C.; mine office, Vananda, B.C.; R. A. Logan, President; J. D. Logan, Secretary-Treasurer; W. J. Slater, Mine Manager. Capital: 2,000,000 shares, $1 par; issued, 1,675,358. This company owns the *Gem* mine on Texada Island, 5 miles from Blubber Bay. Only surface-trenching and prospecting was done during the year. Underground operations did not materialize due to war conditions.

VANCOUVER ISLAND.

ZEBALLOS.

Privateer Mine, Ltd. Company office, 602 Stock Exchange Building, Vancouver, B.C.; D. S. Tait, President; N. E. McConnell, Manager. Capital: 2,500,000 shares, no par value; issued, 2,454,080. This company operates the *Privateer* mine in Spud Valley, 4 miles by road from Zeballos. The property is equipped with a 75- to 90-ton amalgamation and cyanide mill which serves both the *Privateer* and *Prident* mines. Stoping continued in the Nos. 1, 2, and 3 veins, principally on the 1,000, 1,100, and 1,200 levels. The total amount of drifting for the year amounted to 961 feet; crosscutting, 253 feet; raising, 70 feet.

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

Prident Mine. This mine adjoins the *Privateer* and is owned and operated by the Privateer Mine, Limited. A crosscut was driven from the 600 level of the *Privateer* to contact the veins of the *Prident* and a raise was driven to the 600 level of the *Prident* mine. All the ore from the *Prident* mine now passes through this raise and through the ore-chutes of the *Privateer* mine to the 1,100 or mill level. Several veins have been developed and stoped in the 400, 500, and 600 levels of the *Prident* mine. The total amount of drifting amounted to 1,964 feet; crosscutting, 152 feet; raising, 598 feet; diamond-drilling, 329 feet. A total of sixty-five men was employed for both *Privateer* and *Prident* mines towards the end of the year.

In the combined operation of the *Privateer* and *Prident* mines, 48,280 tons of ore was mined, 25,073 tons of ore was milled, and 22,360 oz. of gold and 8,859 oz. of silver were produced.

White Star Mine, Ltd.—Company office, 814 Rogers Building, Vancouver, B.C.; mine office, Zeballos, B.C.; R. P. Stockton, President; T. P. Pickard, Manager. Capital: 200,000 shares, $1 par. During the early part of the year, stoping was completed in the No. 3 level and the mine closed in June.

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

Mount Zeballos Gold Mines, Ltd.—Company office, 1001 Federal Building, Toronto, Ontario; mine office, Zeballos, B.C.; F. M. Connell, President; W. S. Hamilton, Mine Manager. Stoping was completed on the various levels at this mine and it closed about the end of July.

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

Spud Valley Gold Mines, Ltd. Company office, 703 Royal Trust Building, Vancouver, B.C.; P. F. Knight, President; W. Elliott, Manager. Capital: 2,500,000 shares, $1 par; issued, 2,325,000. The company operates the *Spud Valley* mine, 7 miles from Zeballos, and the *Big Star* mine across the Gold Creek Valley from the *Spud* mine. Due to a shortage of labour these mines closed in June and it is expected that they will remain closed for the duration of the war. Stoping and development-work was being carried out in the *Goldfield* and *Spud* veins and two levels had been opened up in the *Big Star* mine. A total of 20,060 tons of ore was milled and 3,628 oz. of gold and 1,957 oz. of silver were produced.

Reno Gold Mines, Ltd. (Central Zeballos Mine).—W. S. Ellis, Manager. This mine closed in the autumn. Stoping continued during the first half of the year and the raise from No. 9 tunnel to the No. 5 level was completed before the mine closed down.

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

Homeward Mines, Ltd.—Company office, 703 Royal Trust Building, Vancouver, B.C.; J. M. Wood, President; R. C. McCorkell, Managing Director; H. E. Smith, Manager. Capital: 3,000,000 shares, 50 cents par. Very little work was done in this mine in 1942. It closed down early in May.

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

BEDWELL RIVER.

Musketeer Mines, Ltd. Company office, 607 Rogers Building, Vancouver, B.C.; H. T. James, Managing Director; R. Thompson, Secretary; R. P. Mason, Mine Manager. Operations were carried on steadily at this property with a crew of thirty men until July 15th, when the company decided to close down for an indefinite period owing to the difficulty in obtaining labour and supplies. Development-work during the year included 603 feet of drifting and 125 feet of raising. Tonnage put through the mill amounted to 5,070 tons, from which 1,846 oz. of gold and 1,034 oz. of silver were recovered. The surface plant and buildings are under the supervision of a watchman who resides on the property.

[Reference: Bulletin No. 13, 1941.]

Buccaneer Mines, Ltd. Company office, 555 Burrard Street, Vancouver, B.C.; H. L. Hill, General Manager. Forty-eight men were employed from January 1st to the end of July, when the company decided to cease their activities in this area. No new development-work was undertaken during the year, and mining was confined entirely to the 1,400 and 1,600 stopes on the Main vein and the 1,601 stope in the West vein; 2,922 tons of ore was broken from these areas and put through the mill. Immediately following the cessation of operations, a crew of fifteen men under the supervision of L. Smith was engaged in dismantling the mine and mill machinery. This operation was completed and all equipment was moved to the beach at the head of Bedwell Sound by September 30th.

[Reference: Bulletin No. 13, 1941.]

B.B. and M. Group. Company office, Tofino, B.C. This property is owned by G. W. Bruggy, Brendal, and McFarlane and comprises the following claims: *B.B. and M.* group, located 500 feet from the main highway on the north side of Bedwell River and 6 miles from the beach at Bedwell Sound; *Rita* group, located half a mile north of Bedwell River and 7 miles from the beach; and *Golden Deer* group, 5 miles from the beach and 500 feet from the highway on the south side of Bedwell River. Prospecting and development work done on these claims included the following: *B.B. and M.* group, 50 feet of tunnelling; *Rita* group, 55 feet of tunnelling; *Golden Deer* group, 75 feet of open-cutting. Mr. G. W. Bruggy acts as caretaker during the suspension of operations.

WARN BAY.

Maple Leaf Mine. Company office, 613, 475 Howe Street, Vancouver, B.C.; E. K. Kanaly, Manager. This mine is near Bulson Creek and approximately 2½ miles from the beach at Warn Bay. During 1941 a shaft was sunk and some prospect drifting done under the supervision of F. Letain. Early in 1942 a contract was let to W. J. Murray to build a trail from the beach to the mine and an agreement made with R. Hunstone for 300 feet of drifting and cross-cutting on the shaft vein, but neither of these projects were completed because of Dominion Government regulations curtailing the development of new properties. The sum of $2,700 was expended on the trail and roadway, but R. Hunstone only had time to get his equipment set up and 40 feet of drifting done when operations were suspended indefinitely.

ALBERNI.

Thistle Mine. Company office, Bank of Toronto Building, Victoria, B.C.; R. A. Pitre, General Manager; D. E. Foote, Mine Manager. Work was resumed at this mine in the early part of the year with an average crew of three men employed steadily until July 25th, when the mine was closed down for an indefinite period. During the period of operation 1,119 tons of ore was mined.

GREAT CENTRAL LAKE.

Sherwood Mine. This property is owned and operated by W. J. Sherwood, 2107 Wall Street, Vancouver, B.C., and is in the Della Falls area at a distance of 10 miles from the head of Great Central Lake. During the period June 1st to October 1st, inclusive, two men were employed on development-work, from which 22 tons of ore, averaging 3.25 oz. gold and 5.75 oz. silver, was shipped to the smelter at Tacoma. An amalgam barrel was installed in the latter part of August and 3.5 tons of ore treated, from which satisfactory recoveries were made. Repairs were carried out on a few bridges on the road to the mine.

[Reference: Bulletin No. 13, 1941.]

GOLD-COPPER DEPOSITS.

GREENWOOD-GRAND FORKS AREA.

Granby. This property, at Phoenix, is owned and operated by W. E. McArthur, of Greenwood. The property is equipped with a complete small mining plant and the ore is treated in the *Providence* mill near Greenwood. An average of nine men was employed for the first five months of the year, after which time the property was closed due to shortage of labour and the marginal values in the ore. Development-work included 220 feet of drifting, 80 feet of crosscutting, 30 feet of sinking, 627 feet of diamond-drilling, as well as considerable surface-trenching. Ore totalling 2,256 tons was mined and milled and the product, a gold-copper concentrate, was shipped to Tacoma. This yielded 564 oz. of gold, 1,886 oz. of silver, and some copper.

Athelstan. This property, in the Wellington Camp, near Phoenix, is owned by W. E. McArthur, of Greenwood. A small amount of development-work, consisting of 50 feet of crosscutting, 20 feet of sinking, and some surface-trenching was done during the year.

Starveout.—This property, in the Wellington Camp, near Phoenix, was leased by J. McDonald and C. E. Johnson, of Greenwood. A total of about 36 tons was reported as mined by hand-steel and shipped to Trail.

ROSSLAND AREA.

Consolidated Mining and Smelting Co. of Canada, Ltd. Company office, 215 St. James Street, Montreal, P.Q.; mine office, Trail, B.C.; S. G. Blaylock, President and Managing Director; J. E. Riley, Secretary; J. Buchanan, General Manager; R. W. Diamond, Assistant General Manager. Capital: 4,000,000 shares, $5 par; issued, 3,271,669. The company owns the *War Eagle, Centre Star, Le Roi, Josie, Iron Mask, No. 1, Annie,* and *Columbia Kootenay* mines on Red Mountain, near Rossland. These properties were operated until the end of June by lessees, about fifty men were engaged in mining ore from the surface and underground on seventeen different leases. The reasons given for closing were that these operations, originally started as a relief measure, had largely outlived their usefulness and that this ore, because of its high sulphide content, was curtailing the capacity of the lead furnaces. During the summer the company completed the examination programme started last year and did 2,400 feet of diamond-drilling.

Phoenix.—This property, in the South Belt, near Rossland, was operated under lease for a short time during the summer by S. Berglund, of Rossland. A total of about 45 tons was reported as mined by hand-steel and shipped to Trail.

Velvet. This property on the Cascade Highway, 13 miles west of Rossland, is owned by the Velgo Mining Incorporated, of Seattle, Washington, and is operated under lease by the Velvet Gold Leasers, consisting of H. S. Elmes and R. Bielli, of Rossland. A crew of twenty men was employed at the first of the year but this was gradually reduced to nine in December when the mine was closed for the winter, partly because of labour shortage and partly because of the difficulty in keeping the road open during the winter months. Development-work included 300 feet of drifting, 75 feet of crosscutting, 200 feet of raising, and 1,200 feet of diamond-drilling. A total of 7,880 tons of ore was mined and milled and the product, a gold-copper concentrate, was shipped to Tacoma. This yielded 1,206 oz. of gold, 504 oz. of silver, and some copper.

KASLO AREA.

Voygeur.—This property, on Ten Mile Creek, about 13 miles from Kaslo, is controlled by R. D. Wallace, of Walla Walla, Washington. Late in the year a small amount of development-work was done by hand-steel.

SILVER-GOLD-LEAD DEPOSITS.

GREENWOOD AREA.

Providence. This property, about 1 mile north of Greenwood, was operated continuously throughout the year by W. E. McArthur, of Greenwood, and associates, under lease. A crew of nine men was employed, with seven underground. Development-work included 220 feet of drifting, 150 feet of raising, and 500 feet of diamond-drilling. A total of 812 tons was mined and shipped to Trail. This yielded 379 oz. of gold, 74,600 oz. of silver, and some lead and zinc.

COPPER DEPOSITS.

PORTLAND CANAL AREA.

ANYOX.

Some drilling has been done on the old *Hidden Creek* property by Anyox Metals, a subsidiary of Ventures, Ltd.

SIMILKAMEEN RIVER AREA.

PRINCETON.

Granby Consolidated Mining, Smelting & Power Co., Ltd. Company office, 675 Hastings Street West, Vancouver, B.C.; mine office, Copper Mountain, B.C.; J. B. Beaty, President; A. S. Baillie, General Manager; B. E. Perks, Secretary; A. W. Seaton, Treasurer; W. R. Lindsay, Mine Manager. 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 near the peak of 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 Nos. 2 and 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, Nos. 7 and 8, received very little attention in the way of development during the year. These levels are serviced by a well-equipped vertical shaft, with a hoist placed on No. 5 level.

Development during the year consisted of 5,150 feet of drifting and crosscutting, 9,144 feet of raising, 14 feet of sinking, eight chutes, and thirty-two large grizzlies. Diamond-drilling amounted to 16,649 feet.

The chief new work during the year was the development of the *Princess May* workings from a new surface adit situated north-west of the main mine workings, to which a connection has now been made. The greatest amount of broken ore comes from big blasts.

The sharp decrease in development, in contrast to the previous year, can be attributed to the critical shortage of skilled labour and the employment of inexperienced workmen.

The average number of men employed (exclusive of townsite and staff employees) at *Copper Mountain* was 386, of whom 276 were employed underground. Labour turnover was extremely high; over 600 new employees were hired and a slightly higher number quit or were discharged.

Bonacci. This prospect, owned by S. Bonacci, of Jura, consists of upper and lower adits driven in the side of a hill below the Kettle Valley Railway, near Jura. The upper adit is in a distance of 75 feet and the lower adit in a distance of approximately 400 feet. A little work was done by S. Bonacci during the year but further underground work was prohibited in the lower tunnel until an area near the portal was retimbered.

NICOLA AREA.

Lost Group. Owned by G. Campbell and partners, of Kamloops. This group consists of eight claims situated 32 miles from Kamloops on the Mamette Lake–Kamloops road and approximately 4 miles south of Meadow Creek, from which point a road was built during the year. The property, on which copper is found, is situated in an area of hummocky upland, about 300 feet above the valley, which is heavily timbered with pine and willow. A shaft sunk on this property many years ago was subsequently almost filled. The only mining done this year consisted of some surface-stripping on a copper showing about 1,500 feet west of the old shaft and during the month of October a car-load of ore was trucked to Kamloops for rail shipment to the Tacoma smelter. At the time of inspection, three men were employed.

VANCOUVER AREA.

Britannia Mining and Smelting Co., Ltd. Company office, 730 Fifth Avenue, New York City; mine office, Britannia Beach, B.C.; E. B. Schley, President; C. P. Charlton, Secretary-Treasurer; C. P. Browning, General Manager; and G. C. Lipsey, Superintendent. This company operates the *Britannia* mines at Britannia Beach, Howe Sound. Regular development-work and stoping has been carried on in the *Victoria, Fairview, No. 5,* and *Bluff* mines, although it has been greatly hindered by the shortage of labour. Particular mention should be made of the square set stoping carried out in No. 5 mine. This work has been well planned and carried out very successfully. A new service shaft, No. 7, has been raised from

the 4,100 to the 2,200 level and connections to the shaft made on seven levels. This shaft will be in operation early in 1943. A new three-compartment shaft, No. 8, was collared from the 4,100 level in the No. 8 mine section, raised to the 3,900 level, and will be sunk and equipped to the 5,100 level in 1943. The 4,500 level has been advanced from No. 6 shaft and will connect with No. 8 shaft. Development-work totalled 15,339 feet or 2.91 miles, made up as follows: Drifting, 3,562 feet; crosscutting, 2,779 feet; raising, 4,198 feet; powder-blast workings, 2,631 feet; winzes, 46 feet; and shafts, 2,123 feet. A total of 45,490 feet of diamond-drilling was done. The average number of men decreased to 608. Towards the end of the year, prospects looked a little better for an increase in the number of men.

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

COPPER-ZINC DEPOSITS.

VANCOUVER ISLAND.

DUNCAN.

Twin "J." Company office, Duncan, B.C.; E. M. Thomson, President; C. Rutherford, General Manager; R. B. Gayer, Mine Manager. This mine, formerly owned by Tyee Consolidated Gold Mining Company, is on Mount Sicker and is now being put in shape for production by Twin "J" Mines, Ltd. Under the supervision of C. Erickson, a sampling and diamond-drilling programme was begun on April 20th and completed August 27th; an average crew of six men was employed in these operations. Nothing further was done until November 3rd, when a crew of six men was sent in to the property to clean up and do general repairs; at the end of the year, there were forty-two men on the pay-roll, ten of whom were engaged underground while the remainder were employed repairing roads, building bridges, and clearing a mill-site below No. 3 *Lenora* tunnel. Considering the inclemency of the weather, fairly good progress has been made with the surface works. The necessary machinery required for the mill has been arranged for, and a portion of this is already on the ground. A portable Diesel compressor of 315 cubic feet capacity has been installed at the No. 2 *Lenora* tunnel while the repair-work in No. 3 tunnel has progressed a distance of 535 feet from the portal.

SILVER-LEAD-ZINC DEPOSITS.

BEAVERDELL AREA.

Highland Bell, Ltd. 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. The property was operated continuously throughout the year with an average crew of thirty-eight men. Development-work included 120 feet of drifting, 110 feet of crosscutting, and 200 feet of raising. A total of 4,930 tons of ore was mined

and shipped to Trail. This yielded 166 oz. of gold, 688,932 oz. of silver, and some lead and zinc.

Bounty Fraction. This property, on Wallace Mountain, was operated under lease for a short time early in the year by O. Houlind and associates, of Beaverdell. Twenty-eight tons of ore was mined and shipped to Trail. This yielded 0.48 oz. of gold, 3,312 oz. of silver, and some lead.

AINSWORTH.

Ainsmore Mines, Ltd. Company office, Ainsworth, B.C.; C. M. Mohr, Manager. This company operates the *Spokane* and *Trinket* groups of claims on Munn Creek, about 3 miles from Ainsworth. During the year the property was equipped with a small complete mining plant, including a compressor driven by electric power from Nelson. From ten to seventeen men were employed for the greater part of the year. Development included 700 feet of drifting, 118 feet of sinking, and 50 feet of raising. Some crude lead ore was reported as shipped to the Kellogg Smelter under contract with the Metals Reserve Corporation.

Josephine, Buckeye, and Highland. These properties are on Cedar Creek, about 4 miles from Ainsworth. The *Buckeye* and *Josephine* are owned by W. C. Dalgleish, of New Jersey, and the *Highland* (owned by the Consolidated Mining and Smelting Company of Canada, Limited) is held under lease. Three men were employed under the direction of T. Hawes, of Ainsworth, and a small amount of surface trenching and stripping was done.

Dinera.—This property, near Ainsworth, was leased by H. E. Gauthier. A total of about 6 tons was reported as mined by hand-steel and shipped to Trail.

Kootenay Florence. This property on Kootenay Lake, 2½ miles north of Ainsworth, was optioned by B. S. W. Buffam and associates, of Toronto. The low-level adit-tunnel was reopened and ventilated and an examination made but no other work done. Late in the year the property was acquired by the Wartime Metals Corporation, with H. A. Rose in charge. A power-line is being built from Ainsworth to the mill, and some of the mining equipment of the *Ymir Consolidated* has been acquired and is to be moved to the *Kootenay Florence*.

RIONDEL.

Blue Bell.—This property at Riondel, on Kootenay Lake, is owned by the Consolidated Mining and Smelting Company of Canada, Limited. During the summer 3,934 feet of diamond-drilling was done.

SLOCAN AREA.

KASLO-THREE FORKS.

Zincton Mines, Ltd. 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 the year. An average crew of sixty-one men with thirty-six working underground was employed under the direction of F. R. Thompson. Early in the year the mill capacity was raised from 200 to over 300 tons per day by the installation of two large Denver unit cells designed to remove the graphite from the pulp before sending it to the regular flotation circuit. The power plant was also augmented by the addition of a 225-horse-power Fairbanks-Morse Diesel directly connected to a 185-k.v.a. generator. The 300-ton-per-day mill capacity was not constantly maintained due to labour shortage. Development-work included 678 feet of drifting and crosscutting, 509 feet of raising, and 4,945 feet of diamond-drilling. A total of 87,593 tons was milled and the zinc concentrate shipped to the Anaconda Smelter, near Butte, Montana.

Caledonia.—This property, near Blaylock, produced 3 tons of ore which yielded 458 oz. of silver.

Silver Bear.—This property, on Keen Creek, is owned by F. Helme, of Kaslo. Some development-work was done by the owner.

Red Mineral Claim.—This property is on the old Main road, 4 miles south of Kaslo. The owner, E. Holmstrom, of Kaslo, did some development-work.

Slocan Silver Mines, Ltd. Company office, 504 Empire State Building, Spokane, Washington; P. C. Morey, Secretary. Capital: 500,000 shares, $1 par. This company owns the *McAllister* mine on London Ridge, near Three Forks. Late in the year a lease was taken on the mine by G. Allen and I. G. Nelson, of Nelson. Plans are to mine low-grade siliceous ore by hand-steel and ship it to Trail, to take advantage of the low smelting rate on this type of ore.

Whitewater. This property is on Whitewater Creek, near Retallack. It is equipped with a complete mining plant, camp, and flotation mill of about 100 tons daily capacity. The mill and plant are run by water-power. During the year an option on the property and equipment was taken by the Kootenay Belle Gold Mines, Limited. Late in the year some work was done in reconditioning the camp and mine workings.

Sandon-Three Forks.

Payne, Washington, and Slocan Boy.—These properties on the Payne Ridge, near Sandon, have been consolidated and were operated by the Kelowna Exploration Company, under the direction of A. Lakes, of Nelson. During the summer 7,500 feet of surface-stripping was done by tractor and bulldozer. Three new veins were encountered.

Victor. This property, 3 miles from Sandon, is owned by D. Petty, of Nelson, and is operated under lease by E. Doney and son. A total of 84 tons was mined by hand-steel and shipped to Trail. This yielded 9 oz. of gold, 11,232 oz. of silver, and some lead and zinc.

Noble Five. This property, situated above Cody, was acquired by the Reco Mountain Base Metals Mines, Limited, of Sandon, from the owners, the Nelson Consolidated Mines, Limited. The mine has been a former producer and the property is equipped with a complete mining plant, camp and mill, all somewhat out of date and presumably in need of repairs. A crew of fifteen men under the direction of A. H. Honsberger has been engaged in reconditioning the camp and mine workings.

Ruth Hope.—A total of 35 tons was mined from this property by G. P. Stewart. This yielded 2,132 oz. of silver and some lead and zinc.

NOTE.—Some work was done and small shipments made from the following properties in this area: *Canadian Group*, by J. Fontain and A. Forsyth; *Silver Ridge*, by B. Pengalli and R. Walsh; *New Springfield*, by H. E. Peterson and H. Ekeblad.

Silverton-New Denver.

Bosun. This property on Slocan Lake, between Silverton and New Denver, is owned by J. Campbell, of New Denver. It was leased by A. Pellegrini, of New Denver. Thirty-nine tons of ore was mined by hand-steel and shipped to Trail. This yielded 3.1 oz. of gold, 2,645 oz. of silver, and some lead and zinc.

Galena Farm Consolidated Mines, Ltd. Company office, 616 Stock Exchange Building, Vancouver, B.C.; J. Anderson, Secretary-Treasurer. Capital: 2,500,000 shares, no par value; issued, 1,602,203. This company owns the *Hewitt* mine, about 6 miles from Silverton. During the summer it was operated under lease by H. V. Dewis and associates, of Silverton. A total of 252 tons was mined by hand-steel and shipped to Trail.

Western Exploration Co., Ltd.

Company office, Silverton, B.C. 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. The *Standard* mine worked continuously throughout the year, employing an average crew of sixty-two men, including those in the mill, power plant, and on the tailings dredge. Development-work included 762 feet of drifting, 200 feet of crosscutting, 448 feet of raising, and 300 feet of diamond-drilling. Haulage facilities in the mine were greatly improved by the installation of a Mancha Trammer and, in connection with this, the 6th level track was reconditioned and 910 feet of old workings retimbered. The ore was trucked from the mine to the mill. During the summer the tram from the *Mammoth* to the *Standard* mill was repaired and the *Mammoth* camp and mine reconditioned. Mining was commenced in September and continued throughout the year with a crew of twenty-eight men on a one-shift basis, due to the labour shortage. Development at the *Mammoth* included 85 feet of crosscutting, 114 feet of raising, and the retimbering of 500 feet of old workings. A total of 73,128 tons of ore was treated in the *Standard* mill during the year; 50,000 of this came from the old tailings dump in Slocan Lake and the remainder from the *Standard* and *Mammoth* mines. Prior to October 1st, 1942, the lead and zinc concentrates were shipped to the United States Smelting and Refining Company plant near Kellogg, Idaho. After that date the concentrates were shipped under a contract with the Metals Reserve Corporation of Washington, D.C.

Enterprise.

This property is on Enterprise Creek, about 5 miles from the Slocan Highway. It is operated under lease and bond by S. N. Ross and associates, of Nelson. From three to seven men were employed from June until November, when work ceased because of winter conditions. The mill treated 510 tons from the old tailings dump.

SLOCAN CITY.

Ottawa.

This property is on Springer Creek, about 5 miles from Slocan City. It was operated under lease by W. Hicks and associates, of Slocan City. Three men were employed and hand-steel only was used. A total of 15 tons was mined and 5,263 oz. of silver was produced.

NOTE.—In addition to the above operation, a small amount of work, chiefly development and assessment, was done on the following properties in this area: *Bell*, by J. H. Traynor; *Morris*, by W. Clough; *Morning Star*, by W. R. Clemens; *Jack and Jack*, by J. L. Howard; *White Hope*, by C. W. Tipping; and *L.T.* mine, by D. B. O'Neail.

CRANBROOK AREA.

Consolidated Mining and Smelting Co. of Canada, Ltd.

Company office, 215 St. James Street, Montreal, Quebec; mine and smelter office, Trail, B.C.; S. G. Blaylock, President and Managing Director; J. E. Riley, Secretary; J. Buchanan, General Manager. Sullivan mine general office, Kimberley, B.C.; W. Lindsay, General Superintendent; J. R. Giegerich, Mine Superintendent; H. R. Banks, Mill Superintendent. The company owns and operates the *Sullivan* mine on Mark Creek and the Sullivan concentrator at Chapman Camp, about 3 miles away, near the town of Kimberley.

The results of the past year at the *Sullivan* mine constituted a new record. Beside a considerable increase in production, very satisfactory progress was made with underground development and preparations for a simplified handling of the output from the parts of the mine below the 3,900-foot level, since these are now assuming considerable importance in the planning of future operations. The main haulage system

has been sufficiently reinforced to handle the enlarged tonnage in a satisfactory manner, and a rearrangement of the surface tracks between the portal and the rock-house permitted the elimination of some sharp curves which had caused a certain amount of inconvenience in the past. This involved the erection of heavy trestle-work, resting on massive concrete foundations, but the entire undertaking was carried out with remarkable speed.

Satisfactory progress was made during the year with the belt incline linking the 3,500 with the 3,900 feet levels. At this time only a comparatively short section remains to be driven. A raise, connecting the south end of the 3,901 shaft workings with the 3,912-1 drift was also completed in the course of the year.

Close attention is paid to the ventilation, and an extensive programme of improvements involving a considerable amount of sinking, raising, and drifting is at present under consideration to increase the flow of air through the lower levels in which the dust concentrations found are uniformly higher than those met in the balance of the workings.

Preparations are under way to explore and develop a small area in which tin-bearing minerals are found in higher proportions than in the rest of the mine, but where the low percentage of lead and zinc sulphides present had heretofore rendered regular operation unprofitable.

The development-work done in the period under consideration included 8,370 feet of drifting and crosscutting, 14,412 feet of raising, and 7,988 feet of diamond-drilling. A rapidly increasing use of diamond-drilling is being made in the preparation of large-scale blasting operations in stopes, and 44,085 feet of it was done in the past year for this purpose alone.

Filling operations resulted in the placing of 233,000 cubic yards of stowing material. This is still much below the volume of underground excavating done in the same time and an attempt is to be made in the course of the coming season to increase the volume of filling gravel and rock customarily handled.

On the surface, additions and improvements included the building of a dam on Mark Creek, the installation of a new 22-inch wood-stave pipe-line over part of the distance between the mine and the concentrator, the construction of a temporary change-house for the machine-shop crew, of a dry-room for the female employees at the concentrator, and of a number of dwelling-houses on the Happy Valley and Ritchie townsites.

At the concentrator, the tin smelter was completed early in the year and was in constant operation from March until the end of November, when it was closed for minor repairs and also to permit the accumulation of another stock of concentrates.

At the end of the year, the total number of persons on the pay-roll was 1,536, of whom 813 were employed underground, 367 at the concentrator, and 358 in various other capacities on the surface.

St. Eugene Mining Corporation, Ltd.—Company office, 25 King Street West, Toronto, Ontario; W. S. Morlock, President; W. B. Malone, Secretary-Treasurer. The properties of this company, the *St. Eugene Extension* and the *Aurora*, on Moyie Lake, remained idle throughout the year.

GOLDEN AREA.

Base Metals Mining Corporation, Ltd.

Company office, 350 Bay Street, Toronto, Ontario; mine office, Field, B.C.; J. H. C. Waite, President; G. C. Ames, Secretary-Treasurer; G. Ballachey, Manager; H. D. Forman, Mine Superintendent; J. A. Edwards, Mill Superintendent. This company operates the *Monarch* mine on Mount Stephen and the *Kicking Horse* mine on Mount Field, on opposite sides of the Kicking Horse River and both about 3 miles from the Canadian Pacific Railway station.

The *Monarch* mine will undoubtedly remain active for some time to come, although it is gradually losing importance relative to the *Kicking Horse* mine. A recently discovered lens of ore is being extracted in the *East Monarch*, and exploratory work is still in progress at the inner end of the section. The comparatively high price obtained for zinc is permitting the recovery, on a small scale, of some ore formerly abandoned on the west side. The ventilation of the *East Monarch* has been improved to some extent; portable Edison electric lamps are now in general use; and restrictions have been put on blasting.

The total number of persons employed is seventy-two, of which twenty-one are working underground, twenty-six at the concentrator, and twenty-five are engaged in various other occupations on the surface. Development-work included 506 feet of drifting, 70 feet of raising, and 4,850 feet of diamond-drilling.

The *Kicking Horse* operation is growing in importance, and it is now evident that the former estimates of available ore had been too conservative. The uppermost, or No. 3, ore-body was found to extend downwards considerably more than had been surmised and, at the end of the year, a sloping drift was being driven in the floor of the stope to permit its complete extraction. Water has been met in these workings in greater quantity than in the *Monarch* mine, situated in the same geological formation. This leads to considerable difficulty in the colder part of the winter season, for the tramway adit, which conveys most of the drainage, becomes encumbered with ice.

The ore is brought down to the level of the river by a short aerial tramway and is then transported by motor-trucks to the *Monarch* concentrator for treatment. Twenty-nine men are employed underground and two on the surface. Development-work included 368 feet of drifting, 45 feet of raising, and 2,127 feet of diamond-drilling.

MANGANESE DEPOSITS.

WILLIAMS LAKE AREA.

Newon Manganese Mining Co., Ltd.

This company took an option on claims belonging to A. Haddock, of Williams Lake, and associates. The claims are located near the Chilcotin Highway crossing of the Fraser River west of Williams Lake. Surface outcroppings of manganese ore were stripped by a bulldozer. A short incline was then driven to intersect the downward extension of the ore but failed to expose any such extension. Four diamond-drill holes aggregating 470 feet also failed to intersect any ore at depth. The option was accordingly relinquished. The work was in charge of K. R. North.

MERCURY DEPOSITS.

FORT ST. JAMES AREA.

PINCHI LAKE.

Consolidated Mining and Smelting Co. of Canada, Ltd.

F. T. Bloomer, Superintendent. Active development continued during the year, consisting of 4,824 feet of drifting, 5,988 feet of raising, 56 feet of sinking, and 20,366 feet of diamond-drilling. The mine worked every day. The system of numbering levels was changed. The top level (600) is now No. 1 and they are numbered downward. On No. 1 level (old 600), the glory-hole stope operated most of the year and

produced most of the tonnage. Stoping was also done between No. 3 and No. 6 levels. Eight stopes have been opened on No. 2 level, which is the lowest level at present and is the main haulage for the mine. These stopes are 30 feet wide with a 30-foot pillar between each stope. Raises were put through to No. 3 level and a crosscut driven through each pillar about half-way up before stoping was commenced. The 502 drift from which these stopes were opened is being advanced another 150 feet to open up another ore-body farther west. A 65-degree winze, 10.5 by 6 feet outside section, is being sunk on the ore from No. 2 level and was down 56 feet at the end of the year. It is proposed to sink the winze 250 feet. No. 6 level will be turned off at 175 feet. Preparations are being made for sinking the main shaft which will be three compartment. It is to be raised from No. 2 level to a point near the surface above No. 3 level. A crosscut 70 feet long will be driven in from the surface to connect with the top of the shaft. The shaft-hoist will be located on the surface. A pilot raise is being put up first then the shaft will be slashed out to full size and the timbering done from the top down. The ore and waste pockets will be between No. 3 and No. 2 levels.

Two additional "Wedge" roasters were installed during the year. Some changes were made in the crushing section to take care of the increased tonnage. The secondary crusher, which was of the disk type and had given considerable mechanical trouble, was discarded and a gyratory crusher, formerly at *Big Missouri*, was installed. This required a change in the conveyer system.

The cold-press method of extracting the mercury from the mud has not proved successful. The mud is still raked by hand on steam-heated tables. These tables are well hooded with exhaust-fans mounted over the hood to draw air in over the tables and prevent the escape of mercury vapour into the building.

Precautions taken to protect employees working in the mill and handling mercury appear to be adequate. No cases of mercurial poisoning have been reported since early in 1941.

Many additions have been made to the camp. A new cook-house and dining-hall capable of seating 350 people has been built. Two new three-story bunk-houses and some dwellings have been built. The power plant has been considerably increased.

[Reference: Bulletin No. 5, 1940.]

TAKLA LAKE.

The Consolidated Mining and Smelting Company of Canada, Limited, and the Bralorne Mines, Limited, are developing mercury properties on Silver Creek.

RELAY CREEK AREA.

Bralorne Mines, Ltd.

This operation was started late in the year after Bralorne Mines, Limited, had optioned a group of claims on Relay Creek, about 2 miles above its confluence with Tyaughton Creek, from W. Riley and T. Schwartz. Cinnabar mineralization associated with stibnite and various gangue minerals occurs in a shear zone in conglomerate. The zone appears to dip steeply to the north-east and has been traced for about 1,500 feet in a direction north 28 degrees west along 30-degree slope.

By November 6th about 70 feet of crosscutting and drifting and 60 feet of diamond-drilling had been done. This work was temporarily suspended while the crew rushed erection of winter quarters. Underground development-work was again resumed before the end of the year.

About twenty men were employed under the supervision of S. Wilson, of the Bralorne engineering staff.

YALAKOM RIVER AREA.

Red Eagle Group. Mr. Tovell and associates, of Calgary, obtained an option on this group from J. Thompson and landed a double drum-hoist and scraper on the ground with the intention of stripping the overburden. Nothing was done, however, and the option was later relinquished.

In the meantime Mr. Thompson, who had installed a small double chamber Rossi type retort furnace, cobbed ore from the loose surface rock lying between the overburden and the bed-rock and put it through this furnace. He thus recovered several flasks of mercury.

[Reference: Bulletin No. 5, 1940.]

Christie Group. This group is across the Yalakom River and several miles up-stream from the *Red Eagle* workings. It was optioned to A. E. Smyth and associates, of Calgary, who landed a compressor and other equipment on the ground and drove a 70-foot tunnel. The tunnel revealed nothing of interest and nothing further was done.

MOLYBDENUM DEPOSITS.

SOUTHERN OKANAGAN.

Osoyoos.

Gem. This claim, optioned by J. O. Howells, of Osoyoos, is situated about half a mile north of the *Dividend* mine, Osoyoos. The work done on this claim, up to the time of inspection in December, consisted of 75 feet of surface-trenching and the cleaning out of an old 20-foot deep excavation known as the *Murphy* shaft.

ROSEBERY AREA.

V. and G. Mine.—This property is about three-quarters of a mile from Rosebery. Development-work was done with hand-steel by the owners, E. J. Vandergrift and W. George, of New Denver.

SALMO AREA.

Molly. This property, on Lost Creek, is owned by the Consolidated Mining and Smelting Company of Canada, Limited. It was operated continuously from July 1st, 1942, with six men using hand-steel. The camp was reconditioned and enlarged. After development, including 114 feet of crosscutting and 45 feet of drifting, was completed, the crew was put on mining molybdenum ore. L. D. Clark, of Nelson, was in charge.

[Reference: Bulletin No. 9, 1940.]

TUNGSTEN DEPOSITS.

ATLIN AREA.

The Consolidated Mining and Smelting Company of Canada, Limited, did some prospecting on a showing of wolframite on Boulder Mountain, near the headwaters of Boulder Creek. The results so far obtained have been indefinite.

HAZELTON AREA.

Consolidated Mining and Smelting Co. of Canada, Ltd.

Red Rose Mine.—A. W. Davis, Superintendent. The property is located in the Rocher Déboulé range, near Hazelton. The upper crosscut tunnel No. 300 (at elevation 6,130 feet and about 300 feet below the ridge) was driven in 1941 to the intersection of the vein at about 320 feet. A raise was put up from the 300, and the 200 level driven out to the surface as a drift on the vein. A drift was also started south in the ore from the top of the raise.

At 300 level drifting south opened up the 350 stope which is now producing ore. The 302 drift was started north in the ore and driven through to the surface. This gave a length of the ore-body on 300 level of about 500 feet. The 600 crosscut tunnel was started from the surface 300 feet vertically below 300 level and struck the ore-body at 324 feet. A stope 230 feet long has been opened on this level and a raise is through to 300 level. The upper terminal of the surface tram was moved from 300 down to 600 level.

Another crosscut from the surface is being started at the mine camp level about 300 feet vertically below 600. When this is driven and a raise put through, the aerial tram terminal will be brought down to the lower level.

The mine worked 364 days. A total of 1,515 feet of drifting and crosscutting and 573 feet of raising was done.

[Reference: Bulletin No. 10, 1943.]

CARIBOO AREA.

Hebson Group.

The Cariboo Scheelite Syndicate was formed to option and operate the *Hebson* group of claims on the Little Snowshoe Plateau, owned by E. Taylor, of Barkerville, and associates. The option agreement was drawn up in the late summer and towards the end of the year a small crew of four or five local men was engaged in stripping and open-cutting. A few tons of ore was ready for shipment at the end of the year.

[Reference: Bulletin No. 10, 1943.]

BRIDGE RIVER AREA.

Tungsten Queen Group.

This property, owned by E. Phillips, of Minto, is situated on the east bank of Tyaughton Creek at a point about 17 miles north of Minto. The Consolidated Mining and Smelting Company of Canada, Limited, continued work until the end of June under an option agreement made in 1941. Development-work for the first six months of the year includes 28 feet of drifting, 23 feet of raising, and several hundred feet of surface-trenching and open-cut work.

The drifting was undertaken to try to follow a small flat-lying showing of scheelite about 700 feet east of the main zone and at elevation 4,450 feet. The trenching and open-cutting was done to explore or extract scheelite occurring at several places on the property.

The raising was done to improve the method of handling the broken material from the underhand stope on the 4,200 level of the main zone. The raise was driven from the tunnel at elevation 4,143 to tap the stope. Previously the ore had been hoisted by horse and bucket.

Small shipments of hand-cobbed high-grade scheelite ore were made periodically. An average of twelve men was employed.

[Reference: Bulletin No. 10, 1943.]

Tungsten King Group. E. Lorntzsen and G. Lundberg, partners in this group, discovered scheelite in commercial quantities early in the year. Gathering together the necessary equipment they commenced to extract the ore by open-cut methods. By the end of the year they had recovered about 30 tons of ore of about 5 per cent. grade which was awaiting treatment at the *Bralorne* mill. They had also made one or two small shipments of high-grade ore to Ottawa.

For the purpose of getting underground during the winter, the partners drove two crosscut tunnels. One from the face of the open-cut was advanced 25 feet and intersected a shoot of high-grade scheelite ore from which 2,100 lb. of good ore was mined.

The second crosscut was started at an elevation of 30 feet below the upper one and driven 50 feet in a north-easterly direction. A raise is to be driven to cut the ore-shoot above.

[Reference: Bulletin No. 10, 1943.]

LARDEAU AREA.

BEATON-CAMBORNE.

United Victory.—This property, about 12 miles from Beaton, is under option to the Bralorne Mines, Limited. A programme of diamond-drilling is under way in some scheelite mineralization.

[Reference: Bulletin No. 10, 1943.]

TROUT LAKE AREA.

Lucky Boy. This property, on Wilkie Creek, about 4 miles from Trout Lake, is owned by G. Yuill, of Trout Lake, and is optioned by J. M. Tillen and associates, of Trout Lake. Some scheelite ore was hand-cobbed and sorted from the dumps. Later in the year an option was taken from Mr. Tillen by the Consolidated Mining and Smelting Company of Canada, Limited, who examined and sampled the property.

[Reference: Bulletin No. 10, 1943.]

NELSON AREA.

Athabasca.—This property, on Morning Mountain, was leased for a short time during the summer by G. S. Gormley. A small amount of tungsten ore was mined by hand-steel.

[Reference: Bulletin No. 10, 1943.]

Venango. This property, near Blewett and adjoining the *Granite-Poorman*, is owned by the Venango Gold Mines, Limited, Box 296, Nelson, B.C. Considerable development, including 500 feet of diamond-drilling, a large amount of surface-stripping by ground-sluicing, and a small amount of underground work was done by the owners in the early part of the year. A vein showing appreciable amounts of scheelite was uncovered.

[Reference: Bulletin No. 10, 1943.]

YMIR AREA.

Stewart and Stewart No. 2 Groups. This property is on Stewart Creek, about 3 miles from the Nelson–Nelway Highway. It was located by E. P. Haukedahl and associates, of Ymir, who did about 150 feet of surface-stripping by ground-sluicing on a scheelite showing. In July an option was taken on the groups by the Premier Gold Mining Company, Limited. The trail from the highway was repaired and a temporary summer camp was built. Development-work

included 2,500 feet of surface-stripping on the main Stewart zone, about 100 feet of which was deep cutting and rock-work, and about 25 feet of reconditioning old tunnel and 7 feet of crosscutting. One hundred and ten feet of stripping was done on a minor showing to the west of the main zone. All the work was done by hand methods. A total of sixteen men was employed until November when the option was dropped.

[Reference: Bulletin No. 10, 1943.]

Porky.—This property, about 6 miles from Ymir and near the *Hunter V.*, was located by E. P. Haukedahl and associates, of Ymir. A small amount of surface-stripping was done by hand-steel.

SALMO AREA.

Emerald. This property on Iron Mountain, about 9 miles from Salmo, was owned by The Iron Mountain, Limited, of San Francisco, and was worked by that company until August 17th, when arrangements were made for it to be taken over by the Wartime Metals Corporation of Montreal. Three major occurrences of scheelite—the main *Emerald* zone, the *Scarn Bands*, and the *Dodger* zone—were found. Of these, the *Emerald* zone has so far proved to be the most important. Early in the year The Iron Mountain, Limited, continued development in the old lead-zinc property and did 48 feet of drifting and 12 feet of crosscutting by hand-steel. As soon as weather permitted, work was commenced on the tungsten showings. The old camp was reconditioned, a dry built, and development of the scheelite showings actively prosecuted. This included 200 feet of bulldozer stripping, 705 feet of trenching, and 1,668 feet of diamond-drilling. A crew of from four to twenty men was employed in this work under the direction of H. Lakes, of Nelson. Under the Wartime Metals Corporation, development was continued and other work started with the object of putting the property on a producing basis at the earliest possible date. This included the repairing and relocation of parts of the old mine road, the construction of a modern cook-house, two bunk-houses and dry to accommodate 100 men, the installation of a small Diesel-driven compressor plant of about 500 cubic feet per minute capacity for preliminary work underground, and the preliminary work necessary for the construction of a mill of 300 tons per day capacity, a tram-line from the mine to the mill-site, and an electric transmission-line. This work, with the exception of the mill which is being constructed by the Consolidated Mining and Smelting Company of Canada, Limited, is under the direction of E. E. Mason. Development-work to the end of the year included 270 feet of drifting, 365 feet of crosscutting, 600 feet of trenching, and 6,763 feet of diamond-drilling on the main *Emerald* zone; 516 feet of trenching and 4,054 feet of diamond-drilling on the lower *Scarn Band*, and 220 feet of trenching and 1,365 feet of diamond-drilling on the *Dodger* zone. The crew was gradually increased from about fifty men at the commencement of this work to about 150 at the end of the year.

[Reference: Bulletin No. 10, 1943.]

Jumbo. 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. Development-work, under the direction of H. Lakes, of Nelson, included seventeen surface-cuts aggregating 305 feet in length, indicating a total surface length of about 850 feet, and cleaning out an old tunnel and shaft which indicated a depth of scheelite mineralization of at least 65 feet. Three men were employed.

[Reference: Bulletin No. 10, 1943.]

Gallo Group. This property is on Lost Creek, adjoining the *Molly*. It is controlled by the Consolidated Mining and Smelting Company of Canada, Limited. A crew of five men was employed during August, September, and October. Surface-trenches at intervals along a granite-limestone contact indicated a scheelite-bearing zone 500 feet in length.

Clubine Tungsten. This property is on Lost Creek, about 2 miles from the Nelson–Nelway Highway. It is under option to the Consolidated Mining and Smelting Company of Canada, Limited. Development-work this year included 150 feet of surface-trenching on scheelite showings, some stripping by bulldozer, and 1,200 feet of diamond-drilling. Diamond-drilling is being continued.

[Reference: Bulletin No. 10, 1943.]

Little Keen. This property is on Sheep Creek, about 8 miles from Salmo. It is under option to the Bralorne Mines, Limited. A crew of from five to twelve men has been employed since August under the direction of R. Sinke. About 3,000 feet of new road was built to connect the scheelite and molybdenite showings with the main Sheep Creek road, and, in addition, 300 feet of surface-trenching, 16 feet of drifting, 20 feet of raising, 35 feet of winze, and 700 feet of diamond-drilling was done. All underground and surface work was done by hand. The work has been discontinued for the winter.

[Reference: Bulletin No. 10, 1943.]

NELWAY AREA.

Bunker Hill. This property is on 16-Mile Creek, about 8 miles from Nelway. During the summer it was held under lease and option from the Waneta Gold Mines, Limited, by H. Lefeuve and associates, of Rossland, who shipped a car of gold ore to Trail from the old workings. Later in the season some surface prospecting revealed the presence of scheelite near a granite contact and the option was taken over by the Jason Mines, Limited, 67 Yonge Street, Toronto, Ontario. Surface work is being continued during the winter under the direction of C. Rutherford.

[Reference: Bulletin No. 10, 1943.]

ROSSLAND AREA.

Major (Commander). This property is on the Trail–Rossland Highway, about 1½ miles from Rossland. It was optioned by the Jason Mines, Limited, late in the fall. A small portable gasoline-driven compressor was installed and the shaft was dewatered to the 100-foot level for sampling and examination. As a result of this the option was dropped. Seven men were employed under the direction of C. Rutherford. Scheelite was detected on the shaft-dump.

St. Elmo. This scheelite property is on Red Mountain, about 2 miles from Rossland. It and the adjoining *Cliff* were operated for a short time this summer by the Consolidated Mining and Smelting Company of Canada, Limited. Six men were employed under the direction of W. Selby. Development-work included 221 feet of diamond-drilling on the *Cliff* and 47 feet of trenching on the *St. Elmo*. A small gasoline-driven compressor was used for sampling and examination of the *St. Elmo* tunnel.

[Reference: Bulletin No. 10, 1943.]

Blue Eyes. This property on Stony Creek, about 3 miles from Rossland, has been optioned by the Rayonne Consolidated Mines, Limited. A road is to be built to the showings from the main Stony Creek road and a portable compressor is to be used to drive an adit. Work was continued throughout the winter on veins containing scheelite, with J. A. Hanna, of Rossland, in charge.

[Reference: Bulletin No. 10, 1943.]

ARROW LAKES.

Ground Hog Group. This property, about 5 miles from Deer Park, is owned by J. Gallo and was operated under bond by the Bralorne Mines, Limited, for a short time during the summer. Three men did about 300 feet of surface-stripping by tractor and bulldozer. The option was dropped after examination and sampling for scheelite.

[Reference: Bulletin No. 10, 1943.]

PLACER-GOLD DEPOSITS.

ATLIN AREA.

SPRUCE CREEK.

This is the most important creek in the district. All of the operations on the creek, with the exception of the shovel operation of *Spruce Creek Placers*, are underground, most of them worked by laymen.

Columbia Development, Ltd. Mine office, Atlin, B.C.; A. R. Kaufman, President; E. G. Tyrer, Vice-President; J. H. Eastman, Managing Director. Capital: 50,000 shares, $1 par; issued, 50,000. The company has a lay from John W. Noland on the *Dream*, *Shamrock*, and *New Year* leases, consisting of 2,000 lineal feet along the creek extending up-stream from the face of Noland's workings on the *Dream* lease. The workings are at present on the *Shamrock* lease.

The method of working in use at present is to drive two drifts, up-stream on bed-rock in solid ground on each side of the pay-channel. The "J" drift on the north side is on rim-rock but the "B" drift on the south side is not. These drifts are about 200 feet apart. Crosscuts, 50 feet apart, are driven across the pay-channel connecting the two main drifts. A 40-foot pillar is left between the pay-channel and each drift, leaving a block of mineable ground about 120 by 50 feet. This block is later split in two by driving from one crosscut to the next one ahead, making two pillars approximately 55 by 50 feet. The pillars are then taken out by side-swiping from the centre crosscut to the pillar left along the drift on each side. The exits "J" and "B" are always in solid ground. This method has proved very satisfactory in this type of ground. Development in the drifts has been suspended for the present as there is about nine months of pillar-work ahead. The ground at the face runs approximately 2 oz. of gold per yard. Only one shift is employed owing to the scarcity of men. A total of thirty-five men is employed.

Dream Lease. J. W. Noland, owner and operator. Only pillar-extraction is being carried on in this section of the lease, which is now about exhausted.

All pumping for the area, including the Columbia Development operations, is done through the *Dream* shaft. A drainage-tunnel is being driven, in the solid, up-stream from the *Dream* shaft and is now almost completed to its connection with the Columbia Development workings. It will provide bed-rock drainage through the area. Only one shift was working during the latter part of the year, owing to labour shortage, with six men employed.

Spruce Creek Mining Co., Ltd.—Mine office, Atlin, B.C.; J. C. Wheeling, Superintendent:—

Sunlight Lease.—No. 1 shaft: Vik and partners, laymen. Four men, all partners in the lay, were engaged in working ground left when the company abandoned operations in this shaft.

Goodwill Lease.—No. 2 shaft: D. Mattson and partners, laymen. This is connected to No. 1 shaft and the pumping for both shafts is done here. They are also working ground left by the company. Four men, all partners in the lay, are employed.

Chance Lease.—No. 4 shaft: F. Kane, foreman. This shaft was operated by the company during the first half of the year but operations were suspended in August.

Dorothy Lease.—No. 5 shaft: Nothing was done here during the year.

Clydesdale Lease.—Munro and partners, laymen. There has been considerable difficulty with water because whenever the creek rises water gets into the mine through caved ground. The operators usually have to wait until the creek returns to normal before they can control the water. Four men, all partners in the lay, were employed.

Croker Lease.—Ohman and partners, laymen. These men have been driving a new drift into the area which they lost last year when the section was flooded by a break in Spruce Creek Placers flume. They have now reached these workings. Four men were employed.

Spruce Creek Placers, Ltd. Company office, 640 Pender Street West, Vancouver, B.C.; mine office, Atlin, B.C.; E. N. Patty, General Manager; W. O'Neil, Superintendent. This is the only surface operation on the creek. The shovel is a Bucyrus Diesel, 207 horse-power, with a dipper capacity of 2½ cubic yards and a digging radius of 70 feet. A mobile, self-propelling washing plant, consisting of grizzly, perforated screen, and sluice-boxes, and a Northwest 160-horse-power drag-line with a bucket capacity of 1½ yards and a 70-foot boom, which disposes of the tailings, complete the plant. Operations were carried on in three shifts during the season and approximately 200,000 cubic yards of gravel was handled. Twenty-four men were employed.

Poker Lease.—Ivanic and partners, laymen. Five men were employed, extracting pillars from old workings.

Calder Lease. Worked by Nelson and partners. Three men were employed, all partners in the lay. Their shaft was only a few feet from the line of the Spruce Creek Placers, Limited, shovel workings on the creek claims. When the shovel reached it the company bought them out. The shovel operations destroyed the shaft.

A number of other small operations are along the lower section of the creek, all worked by laymen or owners, with not more than two men employed in any of them.

Boulder Creek.

Consolidated Mining and Smelting Co. of Canada, Ltd.—The company did not operate on their own account this year, but the ground was worked on a lay by N. Fisher and partners. Four men were partners in the lay and an additional five men were employed. It is a hydraulic operation and approximately 40,000 yards was moved.

Pine Creek.

Northern Resources, Ltd. Company office, 616 Stock Exchange Building, Vancouver, B.C.; C. Beal, Manager; M. White, Superintendent. This is a drag-line operation which worked three shifts during the season and employed twenty-one men. The plant is operated by power obtained from a hydro-electric unit using water from Surprise Lake. A total of 200,000 cubic yards of gravel was moved.

Surprise Lake Mining Co.—Matson and partners, laymen. This is a hydraulic operation employing five men, all partners in the lay. This season will probably see the completion of work on this property as they are now up to their boundary. Approximately 32,000 cubic yards was moved.

Cawder Lease.—Arnevik and partners, laymen. This is an underground operation which has been idle for some years. The property was reopened in July and they are drifting up-stream.

OTTER CREEK.

W. Sweet and partners, laymen. This is a hydraulic operation employing four men, all partners in the lay. Approximately 13,000 cubic yards was moved. The underground workings farther up-stream have been abandoned.

WRIGHT CREEK.

Arctic Lease. Hodges and partners, laymen. Four men, all partners in the lay, were employed. It is a hydraulic operation. Owing to the scarcity of water they were able to get only four to five runs of one-half hour duration daily. Approximately 4,000 cubic yards was moved.

MCKEE CREEK.

Gold Run Fraction.—Gibbs and partners, laymen. This is an underground operation on the bench. Three men, all partners in the lay, were employed.

Lucky Strike Lease.—Watts and partners, laymen. This is a hydraulic operation employing five men, all partners in the lay. They moved approximately 25,000 yards.

DEASE LAKE AREA.

There was very little activity in the area and it was not visited.

MANSON CREEK AREA.

GERMANSEN CREEK.

Germansen Ventures, Ltd.—Company office, Besner Block, Prince Rupert, B.C.; F. deGanahl, President; W. H. Eassie, Manager. Capital: 100,000 shares, $1 par. Work was commenced on this hydraulic operation in the spring as usual, but operations were suspended on July 8th and all equipment was removed.

Germansen Mines, Ltd.—Company office, 789 Pender Street West, Vancouver, B.C.; R. C. McCorkell, President; M. A. Manson, Secretary. Capital: 750,000 shares, 50 cents par. No work was done at this property during the year.

MANSON CREEK.

Lost Creek Placer Gold, Limited, did not operate during the year.

SLATE CREEK.

Consolidated Mining and Smelting Co. of Canada, Ltd.—F. Marleau, Superintendent. Some additional prospecting and testing of the ground was done. No attempt was made to operate.

TAKLA LAKE AREA.

Nothing was done at any of the placer properties in the district during the year.

CARIBOO AREA.

BARKERVILLE-WELLS.

Lowhee Mining Co., Ltd. Company office, Rust Building, Tacoma, Washington; mine office, Barkerville, B.C.; C. W. Lea, President and General Manager; P. Barker, Secretary-Treasurer; H. Lea, Superintendent. Capital: 750,000 shares, $1 par; issued, 635,156. This company reports that about 200,000 yards were hydraulicked this year with an average crew of ten men. The recovery in gold ounces was somewhat lower than that of last year. Considerable

difficulty with the tailings overflowing into the Jack of Clubs Lake outlet made it necessary to close the operation for a time during the season. Otherwise there was little lost time as ample storage facilities served to prevent a water shortage which was experienced by many of the operators who did not have any storage capacity. Because of war conditions, H. Lea, manager, reports that this operation may remain closed next year.

Red Gulch Placers.—J. J. Gunn, layman, continued to operate this placer and reported a very satisfactory season.

M. A. and R. L. Bater, of Prince George, also did some prospecting and a little drifting on their lease at Red Gulch.

Little Valley Creek.

Lease of A. Fleury.—A. Fleury treated about 2,500 yards of gravel by shovelling it into sluice-boxes.

Lease of G. Halvorsen.—About 3,500 yards of gravel was hydraulicked.

Two-bit Creek.

Lease of T. Dunlop.—T. Dunlop and partner completed the installation of a 500-foot pipe-line.

McArthur's Gulch.

Lease of K. Johannson.—Operations here continued as usual.

Shepherd Creek.

Lease of R. D. Reese.—About the same amount of work was done as last year.

Eight-mile Lake.

Lease of M. A. Anderson.—About 1,300 yards were washed by hydraulicking.

Lease of J. C. Dyer.—Reporting a hydraulic operation, J. C. Dyer states he washed about 500 yards of gravel.

Stouts Gulch.

Lease of C. Brown and R. Sehl.—By using a monitor these partners washed 8,000 yards.

Emory Gulch.

Claims of McGowan and Midan.—A small amount of work was done during the earlier part of the season.

SOUTH-EAST OF BARKERVILLE.

Williams Creek Watershed.

Lease of W. H. Savery, Mink Gulch.—Two men hydraulicked 4,000 yards on this lease.

Antler Creek.

Barkerville Gold Mines, Ltd.—After failure of a drilling campaign to disclose a satisfactory channel, C. A. McPherson withdrew his financial backing from this operation on Grouse Creek. W. Moore continued hydraulicking operations on a reduced scale.

French Creek Placers.—W. E. North, layman, did a small amount of hydraulicking on this property at intervals during the season.

Canadian Creek.

Lease of Holland and Ross.—About 2,500 yards of gravel were washed by the lessees.

Lease of T. Petersen.—T. Petersen and partner were engaged in sluicing operations.

Lease of J. Doody.—Three hundred yards were hydraulicked.

Nugget Gulch.

Lease of N. M. Hansen and C. Fuller.—Seeking a reported lost channel, Hansen had a man or two with him hydraulicking with a No. 4 monitor.

Lease of W. F. Poquette.—The lease reports hydraulicking 1,200 yards on lease No. 3283.

Cunningham Creek.

Trehouse Placers, Ltd.—W. Beamish, layman, with one to two other men part of the time, washed about 4,500 yards with a No. 4 monitor.

Wells-Stanley.

Ketch, Ltd. This company carried on hydraulicking operations at its property on Burns Lake Gulch until the spring run-off was over. Then, because of Government regulations regarding the employment of labour, the property was closed for the remainder of the season. About 45,000 yards of gravel was treated. Eight men were employed during the period of operation.

Sangdang Placers. W. Hong, owner and operator of the Sangdang Placers, started the season cleaning out a small gutter at the south end of the property. The recovery from this was very disappointing; what was considered to be a good trap for gold had been scoured out. During the latter part of the season operations were confined to the north end of the property. In the early part of the season eight men were employed but at the end of the season this number was reduced to four, all on a percentage basis. W. Hong stated that, with the possible exception of 1938, this was the worst year for water during all the time that he has operated. He never had enough water for more than one monitor. He reported treating about 27,600 yards.

Tai Lee Placers. The operation adjoins Sangdang Placers on the north and consists of 5,000 feet of bench claims worked by five Chinese partners. About 3,300 yards was hydraulicked with a No. 2 monitor. The head of water and the banks were low, with the result that the men worked too close to the banks at times.

Mabyso Placer Lease.—C. Ailport and partners report the removal of 2,000 yards by hydraulicking and sluicing.

Coulter Creek Placers.—At this operation directly across Slough Creek from the Sangdang Placers, M. Bastin and J. Chouse, laymen, opened up a new pit down-stream from the old pit. They hydraulicked about 3,000 yards.

Lightning Creek Watershed.

Ennerdale Placers.—J. Hind and F. W. Freeman continued to operate and are steadily advancing the face. They hydraulicked about 4,000 yards.

B. & K. Placers. At the start of the season, four men and a cook were employed while development-work was in progress. Several large bank blasts were made to remove the dangerous upper strata of slum from above the pit and about 200,000 yards were piped. With the Dominion order prohibiting gold operations to hire men, this operation was closed down. R. McDougall then took his foreman and one other man into partnership on a small-scale piping operation at Dunbar Flats, about 1 mile up-stream from the B. & K. pit.

Lease of G. Murphy.—At this property on Houseman Creek one man was employed with a monitor doing some development-work.

Leases of J. F. Williams.—Williams has three small projects in and around Stanley on which he does a little ground-sluicing at intervals. He reports sluicing about 2,000 yards last season without making a clean-up.

Lease of C. Gadda.—Gadda reports sluicing about 500 yards but he did not make a clean-up. The lease is on Campbell Creek near Van Winkle.

Butchers' Bench.—I. I. Felker is the owner of ground on this famous bench. He washed about 5,000 yards of Tertiary gravels. He used a No. 2 monitor and had no banks with which to contend.

Donovan Creek Placers.—This property reverted to M. Sundberg, who, it is reported, had four men working on it for a short time during the early part of the season. It was inactive when visited for inspection.

Slade Placers, Ltd. M. Caldwell, co-owner and superintendent of this operation, died during the early part of the season and Mrs. Caldwell carried on in his place. Six men were employed on the average and about 5,000 yards was hydraulicked. The banks are low. A part of the crew had to be maintained when the water was low in midseason with practically nothing to do until the fall run-off started.

Leases of J. Strand.—These leases are on Lovett Creek, between Wingdam and Stanley. Work this season was confined to prospecting with a monitor.

Leases of E. M. Falck.—Falck reports handling about 2,300 yards in drifting, hydraulicking, and ground-sluicing on his leases on Anderson, Lake, and Khee Khan Creeks.

Willow River Watershed.

No Name Placers. C. Brown and B. Fink, laymen, opened up a new pit on this property. They were using a stone-boat on a skyline to remove the big boulders; large smoke-stacks from the Wingdam heating plant, split in two longitudinally, were placed at the end of the flume. These could be quickly swung around on the dump from the end of the sluice-boxes, and greatly facilitated the removal of the tailings on the flat dumping-ground. A No. 2 monitor was used under a head of 125 feeet.

Slade Creek Placers. This placer operation is about 5 miles along the Beaver Pass road from the Wells Highway. A group of Chinese partners, apparently laymen, are operating it. They have opened up a small pit with a No. 1 monitor, and since last year have built 1,000 feet of ditch which takes four hours to fill and one to empty. The head from penstock to monitor is about 100 feet. Large boulders and poor dump give considerable trouble and the partners state that their recovery is poor.

Lease of C. Riseberg.—A small pit is being opened up on this lease by ground-sluicing. This season about 2,800 yards was washed. This pit is on Kong Foo Creek, which parallels Slade Creek about 1,000 feet away.

Lease of Dr. Hougen.—P. Malcolm, layman, was operating on this ground and had opened up a small pit with a No. 1 monitor operating under a head of about 75 feet. He had previously made 2,000 feet of ditch-line to bring the water to the soil, which is not over 5 feet deep.

Langford Mines, Ltd. Company office, Wells, B.C.; H. B. King, Secretary; K. K. Langford, Manager. Capital: 100,000 shares, $1 par. In the early part of the season Langford operated with a caterpillar and angledozer feeding the sluice-boxes, and a steam-slusher stacking tailings. This operation was on the *Oro Fino* bench a little west of the previous workings and of an artificial lake which he had built with the old tailings. From this lake he was taking 5,000 gallons per minute to his sluice-boxes. The crew at this time consisted of one caterpillar operator, one sluice-box tender, one third-class steam engineer, one fireman, and two men gathering fuel for the steam-donkey. It was claimed that 100 yards was washed per operating hour or 900 yards per nine-hour shift. Much time was lost by breakdowns, however.

Later, when labour was frozen, Langford closed down this operation and disposed of part of the equipment. He then made a partnership agreement with another man and washed shallow gravels, south of his camp, with a No. 1 monitor. Water was pumped to the monitor by a large gasoline-driven two-stage centrifugal pump.

Ruchon Creek Placers. This property, operated by T. Fry and F. A. Oldfield, is on Larsen Gulch, beyond the Langford operation, and about 11 miles by road from the Wells Highway. Fry had the road completed from Langford's camp during the season without Government help. Piping operations started on April 2nd. The lower pit had to be cleaned out first as pressure from the sides had raised it considerably during the winter. The face of the upper pit was then advanced about 200 feet with piping to bed-rock. The lowest portion of the channel, however, lying on the left side of the pit, is still covered. A No. 2 monitor was operated under a head of from 100 to 125 feet but a No. 4 has been purchased for future use when the water-supply is sufficient to feed it. This year the water started to get low about the end of July, and in August and September a total of only 200 hours' piping was obtained. Prior to the water shortage six men were employed on two shifts, but during the latter part of the season Fry only had one man and a cook besides himself.

Cottonwood River Watershed.

Leases of G. R. Baker.—Some of the ground on these leases was prospected, it is reported, by shallow pits and ground-sluicing. These leases are a few miles below Cottonwood House.

Leases of J. L. Coreau and W. Slade.—These leases are on Norton and Mary Creeks, several miles north-east of Cottonwood House. One man was engaged in development-work with a monitor.

Quesnel-Prince George.

Cotwood Tertiary Mines, Ltd.—This company's property lies on the west bank of the Fraser River across from the old Tertiary mine. The ground was bulk-tested and large-scale underground operations were planned. The work was stopped in the spring owing, it was said, to the impossibility of getting equipment.

Vicinity of Keithley Creek.

Burrard Placers, Ltd. Company office, 555 Burrard Street, Vancouver, B.C.; B. Boe, Manager. Capital: 2,000 shares, $1 par; issued, 2,000. Four men, staggered over a twelve-hour day, were employed for a short time during the early part of the season at the Pine Creek pit. Boe closed the operation after it had worked for only a short time.

Placer Engineers, Ltd. Company office, 304 Pacific Building, Vancouver, B.C.; mine office, Keithley Creek; G. Harrison, President; G. V. F. Hudson, Secretary-Treasurer; E. Lang, Superintendent. Capital: 750,000 shares, no par value; issued, 541,452. The operation of this company on Keithley Creek was started with seven men on the pay-roll, but the crew became progressively smaller and, finally, when the water-shortage became acute, work was discontinued for the season. Encouraging recoveries were made from gravels high up on the rim of the *Onward* pit.

Lease of J. Hasbrouck. Operations commenced on this lease on May 9th and continued through to September 30th. The property is about 12 miles from Keithley up Keithley Creek. Water was fair until the middle of June when it became necessary to discontinue piping with a 2-inch nozzle under 40-lb. pressure and to resort to ground-sluicing with a boom-gate. About 7,000 yards of gravel was treated.

Operation of Ashby and Speers. This is a hydraulic operation on benches along Quesnel River just below Spanish Creek. This year four men were working on a percentage basis and made a satisfactory clean-up in spite of the fact that much dead work was done at the beginning of the season making a deep cut through a hard-pan rim for the sluice-boxes. Shallow gravels lying on a false bed-rock of glacial clay were being washed with a medium sized monitor under an extremely low head. A much higher head could be obtained very easily.

Cariboo Northlands Mining Co., Ltd. This company is working the old Cedar Creek diggings which in the past were very rich in places. Livingstone, superintendent of the operation, obtained a ⅝-yard gas-shovel, trucks and grizzlies, trommel, etc., for washing the gold-bearing gravels. Neither the shovel nor the trommel proved successful and other difficulties arose. A. von Alvensleben then took charge and discarded the trommel washing plant in favour of sluice-boxes designed to break up clayey gravels. He also flumed water from Cedar Creek to the boxes.

Bullion Placers, Ltd. Company office, 917 Vancouver Block, Vancouver, B.C.; R. F. Sharpe, President and General Manager; H. Ray, Secretary-Treasurer. For the first time in many years this company did not operate. The present operation has come to the end of its life. The equipment has been removed and it is understood that most of it has been disposed of. The near-by *Priority* mine was also inactive.

LILLOOET AREA.

No placer operations of any importance were working during the year in this area. Development-work was done on the following leases:—

Fraser River.

Lease of R. Moreby and E. Hutton.—About 2,100 yards were treated.

Bridge River.

Lease of C. Wihksne.—The work consisted of open-cutting.

Lease of W. Gerrullo.—Only open-cut work was done on the lease.

Lease of C. Friberg.—Only gravel cut work was done.

Lease of W. Haylmore.—The work consisted of open-cutting.

Lease of A. N. Wolverton.—Work was done on a wing-dam.

Lease of W. Baker.—Some piping was done with a small monitor.

McGillivray Creek.

Lease of L. Weeden.—Piping and sluicing was carried on for four months.

PRINCETON AREA.

Coalmont Placer.—Work at this operation near Coalmont, on the Tulameen River, was suspended early in the year and the drag-line machinery removed to Princeton.

Ashley Placer. This small placer operation on the Tulameen River, formerly owned by R. L. and A. E. Ashley, was taken over by Kabatoff, Millar, and Rallin and operated for a short time in the summer. The pit is about 2 miles west of Princeton. Drag-line machinery from the Coalmont Placer was installed but it was operated only briefly. Three men were employed.

Haigh Placer. Operated by C. Haigh, Princeton. This property adjoins the *Ashley* placer pit on the north side and the Great Northern Railway right-of-way on the south side. The gravel was taken from the pit to the Tulameen River, a distance of about 300 feet, by means of a 1-ton mine-car on a 3-foot gauge track. Two hundred cubic yards of gravel was handled. The pit worked only forty days.

NELSON AREA.

49 Creek.

Acorn Group. This property, on 49 Creek, is owned and operated by H. A. McKem and associates, of Blewett. A shaft has been sunk in the creek-bed to a depth of 116 feet to prove the presence of a buried Tertiary channel. The owners state that this shaft, from the results of soundings, is only a few feet from bed-rock. Gravel from the bottom of the shaft shows encouraging amounts of gold and some scheelite. The property is equipped with a gasoline-driven hoist, Cornish pump, an overhead carrier so that gravel from the shaft can be dumped on to a grizzly over the sluice-boxes, and a small sawmill. Three men were employed.

CLAY AND SHALE.

NEW WESTMINSTER AREA.

Clayburn Co., Ltd. Company office, 850 Hastings Street West, Vancouver, B.C.; W. C. Cummings, Secretary-Treasurer; J. W. Ball, Manager. Capital: 4,000 shares, $100 par. The mines and plant of this company are about 50 miles east of Vancouver, at Kilgard. The method of operating the clay-deposits is similar to the operating methods in coal mines. An average of thirteen men is employed underground. The production for the year amounted to: Fireclay from Kilgard mine, 19,182 tons; No. 4B mine, 1,848 tons; No. 9 mine, 1,760 tons; and shale from quarry, 450 tons; total, 23,037.

GABRIOLA ISLAND AREA.

Gabriola Shale. Company office, Columbia Street, Vancouver, B.C.; F. A. Higgs, Manager. Operations at this quarry were resumed for the 1942 season on May 16th and continued until November 30th, the total output amounting to 1,900,000 bricks, which were shipped to Vancouver for distribution to the various markets. An average crew of twenty-nine men was employed.

GYPSUM.

FALKLAND AREA.

Gypsum, Lime & Alabastine, Canada, Ltd. Head office, Paris, Ontario; British Columbia office, 509 Richards Street, Vancouver, B.C.; P. P. Tyler, Managing Director; S. H. J. Reid, Secretary; A. Jessiman, Quarry Superintendent. This company again confined its operations to the No. 2 and No. 5 quarries at Falkland, 40 miles south of Kamloops, near the Kamloops–Vernon Highway. Shipping facilities are provided by the Canadian National Railways, over which the gypsum is shipped to the calcining and board mill at Port Mann.

The quarries are 500 to 600 feet higher than the railway-bunkers, to which the gypsum is transported by trucks.

The gypsum is mined in quarries. The overburden is thin and as the quarry has advanced into the side of the mountain the walls rise to a considerable height above the floors. This makes it necessary to keep the walls at a safe angle of inclination for the protection of workmen. The drilling is done by compressed-air-operated jack-hammers. A crew of from ten to fourteen men was employed.

LIMESTONE.

KOEYE RIVER AREA.

Koeye River Limestone Co.—P. Christensen, manager. The quarries are on Koeye River, about 7 miles south of Namu. The entire output of limestone is taken by Pacific Mills at Ocean Falls. The quarry worked every day, single shift, employed ten men and produced 20,103 tons during the year.

GRAND FORKS AREA.

Consolidated Mining and Smelting Co. of Canada, Ltd.

This company owns and operates the Fife Limestone Quarry at Fife, near Christina Lake. In addition to the regular crew of fifteen men, six men were employed during the summer on surface trenching and stripping; 3,200 feet of this work was done under the direction of A. S. Hudson of Trail. As a result of this work, a new pit is to be opened up. This will necessitate driving another crosscut and raises in order to mine by the usual glory-hole methods. About three-quarters of a mile of new road has been built to connect the new site with the present road and work is to be started immediately. A total of 31,666 tons of lime rock was mined and shipped to Trail last year, to be used as a flux in the smelter.

TEXADA ISLAND.

Pacific Lime Co. C. Williams, Manager. Two quarries are operated by this company at Blubber Bay. The plant produces quicklime, hydrated lime, and other limestone products. About twenty-two men are employed in the quarries. More men could be employed if labour were available.

B.C. Cement Co. This company operates a limestone quarry on the opposite shore of Blubber Bay from the Pacific Lime Company. The limestone is shipped to the Bamberton plant. A new crusher is being installed and further additions to the power plant are being made. R. Hamilton is in charge of operations. Fourteen men are employed.

Van Anda Quarries.—Operated by Beale Quarries, Limited, at Vananda. W. D. Webster, Superintendent. Several limestone faces have been opened up along the water-front and steady shipments of lime are made to United States and British Columbia industries. About twenty-three men are employed.

VANCOUVER ISLAND.

B.C. Cement Co.—Office, corner of Fort and Wharf Streets, Victoria. This company operates quarries at Bamberton and Texada Island and a cement plant at Bamberton. At Bamberton the total crew for the whole operation averages around 134.

SILICA.

GRAND FORKS AREA.

Bailey Silica. This property, 3 miles south of Grand Forks, has been acquired by the Consolidated Mining and Smelting Company of Canada, Limited, as a source of silica for use as a flux in the smelting operations at Trail. The rock forms a large talus slope which is to be scraped into a bin from which the railway-cars can be loaded.

STONE, SAND, AND GRAVEL.

PRINCE RUPERT AREA.

The B.C. Bridge and Dredging Company is operating a rock quarry on the line of the Canadian National Railways at Prince Rupert. This is to provide rock for fill under the new wharf being constructed in Prince Rupert harbour. Two shifts were working and thirty-five men employed. Approximately 28,000 cubic yards have been moved.

Watson Island.—The B.C. Bridge and Dredging Company is also doing some excavation on Watson Island, a small island just off Port Edward. The rock taken out is used in road-surfacing at Port Edward.

VANCOUVER AREA.

BURRARD INLET.

Coast Quarries, Ltd.—T. Burrows, Superintendent. This quarry is at Granite Falls, near the head of Burrard Inlet. The stone is used for general construction-work. Very little work has been done at this plant during the year.

NORTH VANCOUVER.

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

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

NEW WESTMINSTER AREA.

Gilley Bros. Quarry.—This company operates a granite quarry at Silver Valley, Pitt River. Between twenty and thirty men are steadily employed. The stone is used for general construction-work.

Maryhill Sand and Gravel Quarry.—Operated by Gilley Bros. on the Fraser River bank. This plant has been very active during the year and the number of men increased to thirty-three.

NELSON ISLAND.

Vancouver Granite Co.—A dimension stone granite quarry is operated on Nelson Island. The quarry works only when there is a demand for stone.

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 Windermere.
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 ended 1942 was 1,938,158 tons, being an increase of 135,805 tons or 7.53 per cent. over production of 1941.

The Coast District, which includes Vancouver Island, Nicola-Princeton, and Northern Districts, produced 890,445 tons, an increase of 114,150 tons or 14.70 per cent. over 1941.

Vancouver Island collieries produced 738,000 tons, an increase of 70,642 tons or 10.9 per cent. over 1941.

The Northern District produced 11,020 tons, an increase of 4,612 tons over 1941.

The Nicola-Princeton District produced 140,825 tons, an increase of 18,896 tons or 15.5 per cent. over 1941.

The East Kootenay District produced 1,047,713 tons, an increase of 21,660 tons or 2.1 per cent. over 1941.

The following table shows the output and *per capita* production daily and for the year 1942 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)	126,858	282	329	1.36	383	250	2.01	507
Comox Colliery (No. 8 mine)	204,058	283	350	2.05	582	268	2.66	754
South Wellington (No. 10 mine)	254,357	265	297	3.23	856	260	3.69	978
Wellington mine	133,958	263	172	2.95	778	153	3.32	875
Prospect mine, Extension	4,767	292	7	2.26	681	6	2.71	794
Chambers' mine	4,378	257	12	1.42	365	10	1.70	438
Loudon mine	413	196	2	1.05	206	2	1.05	206
Cassidy mine	2,412	282	6	1.42	403	5	1.71	482
Victory mine (Biggs)	71	62	1	1.14	71	1	1.14	71
Lewis' mine	823	276	2	1.50	411	2	1.50	411
Deer Home mine	3,323	268	6	2.06	554	5	2.47	664
Lake Road mine	2,462	269	5	1.82	492	4	2.28	615
Lila mine	40	66	3	0.20	13	3	0.20	13
Wellington, No. 9	90	42	2	1.07	45	2	1.07	45
Pacific mine	432	198	2	1.09	216	2	1.09	216
Stronach mine	158	112	2	0.70	79	1	1.41	158
Middlesboro Colliery	28,714	286	85	1.17	337	59	1.70	486
Granby Consolidated M.S. & P. Co., Ltd.	74,360	289	107	2.40	695	90	2.85	826
Princeton Tulameen Coal Co.	27,339	275	48	2.07	570	33	3.01	828
Tulameen mine	10,342	278	20	1.86	517	12	3.10	861
Inland mine	70	68	5	0.20	14	5	0.20	14
Bulkley Valley Colliery	6,929	289	13	1.84	533	8	2.99	866
Aveling Colliery	1,732	186	8	1.16	216	6	1.54	288
Cold Spring mine (Cariboo)	85	20	2	2.10	42	2	2.10	42
Hat Creek Colliery	1,978	282	3	2.33	659	2	3.50	989
Packwood mine (Peace River)	90	.....	3	.....	30	2	.....	45
King Gething mine (Peace River)	206	36	4	1.41	51	4	1.41	51
Coal Creek Colliery	179,633	274	177	3.70	1,014	134	4.89	1,342
Michel Colliery	868,080	299	687	4.22	1,263	562	5.16	1,544

Collieries of Vancouver Island Inspection District.

The output of the Vancouver Island Collieries was 738,600 tons. Of this amount, 119,051 tons or 16.1 per cent. was lost in preparation for the market; 5,118 tons or 0.7 per cent. was consumed by operating companies as fuel; and 633,196 tons, of which 18,765 tons had been taken from stock, was sold in the competitive market. Of the amount sold in the competitive market, 568,782 tons or 89.8 per cent. was sold in Canada and 64,414 tons or 10.2 per cent. was sold in the United States.

Collieries of the Nicola-Princeton District.

Of the gross output of 140,825 tons produced by the collieries of the Nicola-Princeton District, 3,940 tons or 2.8 per cent. was consumed by the producing companies as fuel and 1,732 tons was taken from stock, making a total of 138,432 tons sold in the competitive market in Canada.

Collieries of the East Kootenay District.

The output of the collieries in the East Kootenay District was 1,047,713 tons. Of this amount, 57,080 tons or 5.4 per cent. was lost in preparation for the market; 16,268 tons or 1.5 per cent. was consumed by producing companies as fuel; 128,441 tons or 12.2 per cent. was used in making coke; and 845,913 tons was sold in the competitive market. Of this amount, 719,333 tons or approximately 85.0 per cent. was sold in Canada and 126,580 tons or 15.0 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 1938 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.
1938	East Kootenay District	434,068	693	626	467	972
	Coast District	875,360	2,269	386	1,621	540
	Whole Province	1,309,428	2,962	442	2,088	675
1939	East Kootenay District	561,958	731	768	538	1,044
	Coast District	915,914	2,245	468	1,629	562
	Whole Province	1,477,872	2,976	496	2,167	682
1940	East Kootenay District	776,518	731	1,062	550	1,412
	Coast District	891,309	2,143	462	1,625	548
	Whole Province	1,667,827	2,874	580	2,175	766
1941	East Kootenay District	1,026,053	921	1,114	753	1,632
	Coast District	776,300	1,802	431	1,476	526
	Whole Province	802,353	2,723	662	2,229	808
1942	East Kootenay District	1,047,713	864	1,201	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

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, 1942.

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 1942.
	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)	102,857	9,621		112,478	13,557		1,417	14,974	2,115	1,521		594	126,858
Comox Colliery (No. 8 mine)	165,416	15,473		180,889	29,115		2,280	31,395	9,141	915		8,226	204,058
South Wellington (No. 10 mine)	166,133	23,898		190,031	64,417		728	65,145	3,214	2,395		819	254,357
Wellington mine	107,201	15,422		122,623	11,371		470	11,841	859	353		506	133,958
Prospect mine, Extension	12,796			12,796	591			591	8,620			8,620	4,767
Chambers' mine	4,155			4,155			223	223					4,378
Loudon mine	413			413									413
Cassidy mine	2,412			2,412									2,412
Victory mine (Biggs)	71			71									71
Lewis' mine	823			823									823
Deer Home mine	3,323			3,323									3,323
Lake Road mine	2,462			2,462									2,462
Lila mine	40			40									40
Wellington, No. 9	90			90									90
Pacific mine	432			432									432
Stronach mine	158			158									158
Totals, Vancouver Island District	568,782	64,414		633,196	119,051		5,118	124,169	23,949	5,184		18,765	738,600
Nicola-Princeton District.													
Middlesboro Colliery	24,720			24,720			3,940	3,940	107	161	54		28,714
Granby Cons. M.S. & P. Co., Ltd.	74,229			74,229					80	211	131		74,360
Princeton Tulameen Coal Co.	29,071			29,071					1,732			1,732	27,339
Tulameen mine	10,342			10,342									10,342
Inland mine	70			70									70
Totals, Nicola-Princeton District	138,432			138,432			3,940	3,940	1,919	372	185	1,732	140,825
Northern District.													
Bulkley Valley Colliery	6,578			6,578			216	216	30	165	135		6,929
Aveling Colliery	1,732			1,732									1,732
Cold Spring mine (Cariboo)	85			85									85
Hat Creek Colliery	1,978			1,978									1,978
Packwood mine (Peace River)	40			40	30			30		20	20		90
King Gething mine (Peace River)	206			206									206
Totals, Northern District	10,619			10,619	30		216	246	30	185	155		11,020
East Kootenay District.													
Coal Creek Colliery	123,082	52,969		176,051			3,571	3,571	29	40	11		179,633
Michel Colliery	596,251	73,611		669,862	57,080	128,441	12,697	198,218					868,080
Totals, East Kootenay District	719,333	126,580		845,913	57,080	128,441	16,268	201,789	29	40	11		1,047,713
Coal.													
Grand totals for Province	1,437,166	190,994		1,628,160	176,161	128,441	25,542	330,144	25,927	5,781	351	20,497	1,938,158
Coke.													
Coal Creek Colliery													
Michel Colliery	55,230	31,224		86,454					4,085	3,486		599	85,855
Total coke for Province	55,230	31,224		86,454					4,085	3,486		599	85,855

COLLIERIES OF BRITISH COLUMBIA—MEN EMPLOYED, 1942.

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.					
Vancouver Island District.	U.	A.	T.	U.	A.	T.	U.	A.	T.	U.	A.	T.	U.	A.	T.	U.	A.	T.	U.	A.	T.	U.	A.	T.	U.	A.	T.	U.	A.	T.	U.	A.	T.
Canadian Collieries (D.), Ltd.—																																	
Comox Colliery (No. 5 mine)	12	17	29	107		107				23	19	42	102	27	129	6	3	9											13	13	250	79	329
Comox Colliery (No. 8 mine)	16	18	34	131		131				50	17	67	71	27	98		7	7											13	13	268	82	350
South Wellington (No. 10 mine)	10	4	14	138		138				102	10	112	10	8	18		15	15													260	37	297
Wellington mine	6		6	98		98				36	9	45	13	5	18		5	5													153	19	172
Prospect mine, Extension	1		1	5		5					1	1																			6	1	7
Chambers' mine	1		1	7		7				2		2		1	1														1	1	10	2	12
Loudon mine				2		2																									2		2
Cassidy mine	1	1	2	4		4																									5	1	6
Victory mine (Biggs)				1		1																									1		1
Lewis' mine				2		2																									2		2
Deer Home mine	1		1	3		3	1		1		1	1																			5	1	6
Lake Road mine		1	1	4		4																									4	1	5
Lila mine				3		3																									3		3
Wellington, No. 9				2		2																									2		2
Pacific mine				2		2																									2		2
Stronach mine				1		1					1	1																			1	1	2
Totals, Vancouver Island District	48	41	89	510		510	1		1	213	58	271	196	68	264	6	30	36											27	27	974	224	1198
Nicola-Princeton District.																																	
Middlesboro Colliery	4	2	6	33		33	12		12	4	9	13		11	11		4	4	6		6										59	26	85
Granby Cons. M.S. & P. Co., Ltd.	8	1	9	43		43	37		37		5	5	2	11	13																90	17	107
Princeton Tulameen Coal Co.	4	2	6	13		13				14	7	21	2	6	8																33	15	48
Tulameen mine		2	2	5		5	3		3	2	3	5	2	3	5																12	8	20
Inland mine		1	1	2		2	2		2																						4	1	5
Totals, Nicola-Princeton District	16	8	24	96		96	54		54	20	24	44	6	31	37		4	4	6		6										198	67	265
Northern District.																																	
Bulkley Valley Colliery		1	1	4		4	4		4					3	3					1	1										8	5	13
Aveling Colliery				4		4	2		2		1	1		1	1																6	2	8
Cold Spring mine (Cariboo)				1		1	1		1																						2		2
Hat Creek Colliery				1		1	1		1		1	1																			2	1	3
Packwood mine (Peace River)				1		1	1		1					1	1																2	1	3
King Gething mine (Peace River)				2		2	2		2																						4		4
Totals, Northern District		1	1	13		13	11		11		2	2		5	5					1	1										24	9	33
East Kootenay District.																																	
Coal Creek Colliery	6	10	16	66		66				12	25	37	50	8	58																134	43	177
Michel Colliery	29	30	59	317		317				51	71	122	165	24	189																562	125	687
Totals, East Kootenay District	35	40	75	383		383				63	96	159	215	32	247																696	168	864
Grand totals for Province	99	90	189	1002		1002	66		66	296	180	476	417	136	553	6	34	40	6	1	7								27	27	1892	468	2360

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

LABOUR AND EMPLOYMENT.

During 1942, 2,360 persons were employed in and about the coal mines of the Province, a decrease of 363 men from 1941. Taking the average of the principal mines in the Vancouver Island District, about 10 per cent. of the working-days were lost, six days were lost through labour disputes, the loss of Saturday afternoon shift accounting for the rest. In the Nicola-Princeton District the different collieries worked about 93 per cent. of the working-days, about six days were lost through labour disputes. In the East Kootenay District the average for the year was about 96 per cent.

The table on page 97 shows the number of persons ordinarily employed in and around 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 1942 the importation of coal consisted of 207 tons of anthracite, 1,565 tons of bituminous coal, and 185 tons of lignite.

Alberta coal shipped to British Columbia consisted of 164,073 tons of domestic coal, 177,515 tons of sub-bituminous coal, and 310,634 tons of bituminous coal, a total of 652,222 tons. A considerable tonnage of the bituminous coal was used for ships' bunkers. In addition to above, 22,339 tons of briquettes and 71,505 tons of coke from Alberta was used in British Columbia. The following table shows the amount of Alberta coal brought into British Columbia during past years:—

Year.	Short Tons.	Year.	Short Tons.
1933	119,026	1938	238,435
1934	123,968	1939	239,227
1935	221,748	1940	311,232
1936	244,928	1941	304,928
1937	269,023	1942	652,222

Of the 1,628,160 tons of British Columbia coal marketed, 232,202 tons was sold for domestic and industrial use in the Provinces of Alberta, Saskatchewan, Manitoba, and Ontario, and 312,420 tons was sold for railroad use in these Provinces; 13,055 tons was sold for railroad use in the United States and 136,477 tons was sold for railroad use in British Columbia; 176,026 tons was exported to the United States and 101,653 tons was sold for ships' bunkers. The tonnage of British Columbia coal used in the Province was 656,327 tons.

ACCIDENTS IN AND AROUND COAL MINES.

During 1942, 2,360 persons were employed in and around coal mines. Ten fatal accidents occurred during the year as compared with four during 1941.

The ratio of fatal accidents per 1,000 persons employed was 4.23 as compared with 1.47 for 1941. In 1940 the ratio was 2.08; in 1939, 0.67; in 1938, 3.37; in 1937, 3.17; in 1936, 2.84; in 1935, 1.67; in 1934, 2.07; and in 1933, 0.97. The average for the ten-year period was 2.22.

The number of fatal accidents per 1,000,000 tons produced during 1942 was 5.15; during 1941 the figure was 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; in 1934, 4.45; and in 1933, 2.37. The average for the ten-year period was 4.30 per 1,000,000 tons of coal mined.

The following table shows the collieries at which the fatal accidents occurred during 1942 and comparative figures for 1941:—

Name of Company.	Name of Colliery.	1942.	1941.
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	....
Crow's Nest Pass Coal Co.	Coal Creek	3	2
Crow's Nest Pass Coal Co.	Michel	2	1
Totals		10	4

The following table shows the various causes of fatal accidents in 1942 and their percentage of the whole and comparative figures for 1941:—

Cause.	1942.		1941.	
	No.	Per Cent.	No.	Per Cent.
By falls of roof and coal	2	20.00	1	25.00
By mine-cars and haulage	4	40.00	2	50.00
By bumps	2	20.00	1	25.00
Miscellaneous (underground)	1	10.00	....	....
Miscellaneous (surface)	1	10.00	....	....
Totals	10	100.00	4	100.00

The following table shows the number of tons of coal mined for each fatal accident in their respective classes in the years 1942 and 1941:—

Cause.	1942.		1941.	
	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	2	969,079	1	1,802,353
By mine-cars and haulage	4	434,539	2	901,176
By bumps	2	969,079	1	1,802,353
Miscellaneous (underground)	1	1,938,158	....	....
Miscellaneous (surface)	1	1,938,158	....	....
Totals	10	193,816	4	450,588

The number of tons of coal mined per fatal accident during 1942 was 193,816 tons, compared with 450,588 tons in 1941. The average for the ten-year period was 231,040 tons.

The following table shows the fatalities from various causes in coal mines during the year 1942 compared with 1941, 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).	1942.	1941.
Vancouver Island	1	2	....	1	1	5	1
Nicola-Princeton	....	....	....	....	....	....	....
East Kootenay	1	2	2	....	....	5	3
Northern	....	....	....	....	....	....	....
Province (1942)	2	4	2	1	1	10	....
Province (1941)	....	....	....	....	....	....	4

RATIO OF ACCIDENTS.

District.	Accident Death-rate.			
	Per 1,000 Persons employed.		Per 1,000,000 Tons of Coal mined.	
	1942.	1941.	1942.	1941.
Vancouver Island	4.17	0.65	.....	1.54
Nicola-Princeton	.....	..	.....	.....
East Kootenay	5.78	3.25	.. ..	2.92
Northern	...	...	.....	.....
Province (1942)	4.23	..	.....	.....
Province (1941)	.....	1.47	.....	2.21

The details regarding the occurrences of fatal accidents in coal mines during 1942 are as follows:—

The fatal accident which occurred to Andrew Frew, rock-picker, No. 5 mine, Comox Colliery, on January 16th was due to deceased falling through a hole on the preparation floor on the tipple while engaged in oiling the tipple machinery. The hole, 22 by 30 inches, was used for dropping waste rock into railroad-cars below and had been left unfenced at the time of the accident. Deceased died on the following day.

The fatal accident which occurred to Alfred Calvin, rope-rider, Wellington mine, Canadian Collieries (D.), Limited, on February 28th was due to a fall of roof in a timber-road about 35 feet back from an advancing long-wall face. Deceased was instantly killed.

The fatal accident which occurred to Joseph Urban, miner, No. 3 mine, Michel Colliery, on March 30th was due to deceased falling on the mine-track near his working-face and apparently injuring himself on a 1- by 12-inch centreboard nailed to the ties. He resumed work at the face immediately afterwards but complained of being sick and decided to go home, but refused any assistance. However, the fireboss in charge sent a man out with Urban to help him to change in the bath-house and then accompany him home, by which time Urban was so ill that a doctor had to be called. Urban was taken to the local hospital, where it was found that his intestines were ruptured. An operation was performed, but deceased died the same day about ten hours after being injured.

The double fatality which occurred to Aubrey Snow and Alex. Lozza, miners, No. 1 East mine, Coal Creek Colliery, on April 9th was due to a bump which displaced six sets of timber at their working-face and caused about 20 tons of fine roof coal and shale to fall on them. The adjacent miners immediately started recovery-work but it was over two hours before the bodies were uncovered and both men were dead. The bump was of a comparatively minor nature and did not damage any other part of the mine, although it was felt over a considerable area.

The fatal accident which occurred to William Waugh, machine-helper, No. 5 mine, Comox Colliery, on May 15th was due to being struck on the nose by a machine haulage post which broke under strain. Deceased died on May 18th from an embolism in the left lung caused by a blood clot from his nose-injuries.

The fatal accident which occurred to Adam Watson, rope-rider, No. 10 mine, South Wellington, on June 10th was due to deceased being squeezed between a derailed car and a post. When lowering a trip of empty cars from a main slope into a siding the trip became derailed and he signalled the trip to be pulled up, and on the second attempt to land the trip one of the cars again became derailed and caught deceased. He died in hospital six hours later. It was found that the outer curve rail was broken at the point of derailment.

The fatal accident which occurred to John Martino, miner, Michel Colliery, on June 17th was due to deceased being struck at his slope working-face by a runaway car. Two cars had been hoisted to the level above and the haulage-rope detached, after which the rope-rider pushed the cars back over the slope switch in the direction of a parting inby from the switch. The switch-points were controlled by a lever and spring and after the accident it was discovered that a bolt which attached one of the switch-points to the switch assembly had fallen out, with the result that while the lever was set for the cars to go in the level the switch-points were open to the slope and the cars ran down the slope to the face of Martino's working-place.

The fatal accident which occurred to James Thoburn, loader, No. 5 mine, Comox Colliery, on September 4th was due to deceased being struck by a descending trip of empty cars on the main slope of the mine. Deceased had obtained permission from the mine manager to leave work before the end of the shift and was on his way out at the time of the accident. In addition to his own electric safety-lamp this part of the slope was lighted by a number of 100-watt electric lights, so that visibility was good, but an air-driven hoist, which was in operation at this point, made a considerable noise and may have prevented deceased from hearing the approach of the trip. He died in the local hospital a few hours later.

The fatal accident which occurred to Julius Peters, miner, No. 1 East mine, Coal Creek Colliery, on November 17th was due to deceased being struck by a falling rock. He and others were engaged in repairing and retimbering a roadway that had been damaged by a bump two weeks previously, and at the time of the accident he was attempting to dislodge a piece of roof-rock by means of a lever when another rock which he had apparently disturbed fell and struck him. He died from his injuries in the local hospital on the following day.

EXPLOSIVES.

The following table shows the quantity of explosives used in coal mines during 1942, 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)	14,998	126,858	25,332	8.45	0.59
Comox Colliery (No. 8 mine)	65,650	204,058	100,600	3.11	0.65
South Wellington (No. 10 mine)	75,700	254,357	76,000	3.36	0.99
Wellington mine	35,650	133,958	58,000	3.75	0.61
Prospect mine, Extension	2,250	4,767	2,650	2.11	0.85
Chambers' mine	2,300	4,378	4,900	2.06	0.46
Loudon mine	550	413	900	0.75	0.61
Cassidy mine	1,400	2,412	2,800	1.72	0.50
Victory mine (Biggs)	25	71	50	2.84	0.50
Lewis' mine	1,050	823	1,900	0.78	0.55
Deer Home mine	1,650	3,323	3,700	2.01	0.44
Lake Road mine	650	2,462	1,250	3.78	0.52
Lila mine	100	40	150	0.60	0.66
Wellington, No. 9	50	90	90	1.80	0.55
Pacific mine	133	432	302	3.24	0.44
Stronach mine	90	158	120	1.75	0.75
Totals for district	202,246	738,600	278,744	3.65	0.72

Nicola-Princeton 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.
Middlesboro Colliery	9,700	28,714	12,000	2.95	0.80
Granby Cons. M.S. & P. Co., Ltd.	18,850	74,360	28,998	3.94	0.65
Princeton Tulameen Coal Co.	4,250	27,339	8,450	6.43	0.50
Tulameen mine	1,900	10,342	1,900	5.44	1.00
Inland mine	200	70	200	0.35	1.00
Totals for district	34,900	140,825	51,548	4.03	0.67

Northern District.

Bulkley Valley Colliery	1,200	6,929	1,920	5.77	0.62
Aveling Colliery	1,000	1,732	900	1.73	1.11
Cold Spring mine (Cariboo)	80	85	250	1.06	0.32
Hat Creek Colliery	1,000	1,978	1,200	1.97	0.83
Packwood mine (Peace River)	100	90	60	0.90	1.66
King Gething mine (Peace River)	150	206	258	1.37	0.58
Totals for district	3,530	11,020	4,588	3.12	0.71

East Kootenay District.

Coal Creek Colliery	1,600	179,633	1,910	112.27	0.83
Michel Colliery	49,570	868,080	54,789	17.51	0.90
Totals for district	51,170	1,047,713	56,699	20.47	0.90
Totals for Province	291,846	1,938,158	391,579	6.64	0.74

Quantities of Different Explosives used.

	Lb.
Monobel of different grades	266,795
Permissible rock-powder	25,051
Total	291,846

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 1942, mining-machines produced approximately 873,317 tons or 45 per cent. of the total.

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

District.	Number driven by		Type of Machine used.	
	Electricity.	Compressed Air.	Chain Undercutting.	Puncher Type.
Vancouver Island	...	28	18	10
Nicola-Princeton	...	27	...	27
East Kootenay	...	30	5	25
Northern	...	1	...	1
Totals	...	86	23	63

SAFETY-LAMPS.

There were 2,434 safety-lamps in use in the coal mines of the Province. Of this number 205 were flame safety-lamps of the Wolf type and 2,229 were electric lamps of various makes as follows: Edison electric, 2,186; Wolf electric, 40; portable, 3.

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)	33	240	21	252
Comox Colliery (No. 8 mine)	68	304	32	340
South Wellington (No. 10 mine)	15	282	15	282
Wellington mine	7	162	10	159
Prospect mine, Extension	2	23	2	23
Chambers' mine	2	15	2	15
Loudon mine	2	6	2	6
Cassidy mine	2	5	2	5
Victory mine (Biggs)	1	3	1	3
Lewis' mine	1	2	1	2
Deer Home mine	3	18	3	18
Lake Road mine	1	9	1	9
Lila mine	1	2	1	2
Wellington, No. 9	2	2	2	2
Pacific mine	1	2	1	2
Stronach mine	1	3	1	3
Totals for district	142	1,078	97	1,123

NICOLA-PRINCETON DISTRICT.

Middlesboro Colliery	48	15	8	55
Granby Cons. M.S. & P. Co., Ltd.	8	100	8	100
Princeton Tulameen Coal Co.	2	70	2	70
Tulameen mine	2	10	2	10
Inland mine	3	3	3	3
Totals for district	63	198	23	238

NORTHERN DISTRICT.

Bulkley Valley Colliery	1	22	1	22
Aveling Colliery	4	8	4	8
Cold Spring mine (Cariboo)	...	...	...	...
Hat Creek Colliery	2	8	2	8
Packwood mine (Peace River)	1	...	1	...
King Gething mine (Peace River)	4	...	4	...
Totals for district	12	38	12	38

EAST KOOTENAY DISTRICT.

Coal Creek Colliery	17	215	17	215
Michel Colliery	56	615	56	615
Totals for district	73	830	73	830
Totals for Province	290	2,144	205	2,229

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 nine mines and underground at six.

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	1,895
Ventilation	1,735
Haulage	198
Coal-washing	1,770
Miscellaneous	6,907
Total horse-power	12,505
Underground—	
Haulage	1,418
Pumping	1,190
Coal-cutting	
Miscellaneous	33
Total horse-power	2,641
Total horse-power above and below ground	15,146

Of the above amount, approximately 15,146 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 162 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 1,598 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 April 4th, at No. 5 mine, Comox Colliery, a slight fire was discovered in the insulation of a 2,200-volt cable which supplies power to the pump at the bottom of the shaft. Apparently water had entered through a defective splice and caused a short circuit. The fire was discovered and the cause remedied without further damage.

On May 14th, in No. 10 mine, South Wellington, a sudden slight squeeze at the face of No. 1 Right level liberated a quantity of gas that caused the withdrawing of the men. The gas was cleared away in two hours.

On May 29th, in No. 10 mine, South Wellington, a fairly heavy blowout of gas and coal immediately followed the firing of a shot in a working-place in No. 1 Diagonal district. All men had to be withdrawn from the area.

On August 6th, at No. 8 shaft, Comox Colliery, the hoistman raised one of the cages too high while hoisting coal. The surface cager pushed an empty car forward to put it on the cage and was unable to stop the car when he saw the cage was too high. The empty car went down the shaft and did some slight damage, but fortunately the cager released his hold on the car to save himself from going down the shaft.

On August 12th, at No. 8 mine, Comox Colliery, an empty car coming from the tipple kicked back, pushed aside the spragging dolly and crashed through the shaft gate and fell down the shaft. No damage was done to the shaft, but one cage had to be replaced and both hoisting-ropes had to be reconed.

On August 13th, at No. 8 mine, Comox Colliery, a fire broke out on the surface between the hoist and shaft, due to spontaneous combustion in mine debris which had been used many years ago to level up the mine-yard. The men were withdrawn from the mine at once and the burning material was dug out and removed by a bulldozer.

On August 27th, in No. 10 mine, South Wellington, a large emission of gas immediately followed the firing of a shot in a working-place in No. 1 Diagonal district. All men had to be withdrawn on the return side of this place.

On October 15th, in No. 10 mine, South Wellington, a blowout of gas immediately followed the firing of a shot in a working-place in No. 1 Diagonal district and caused the withdrawal of all the men in this section.

On November 5th, in No. 10 mine, South Wellington, a small blowout of gas occurred following the firing of the second of two consecutive shots in a working-place in No. 1 Diagonal district.

On November 21st, in No. 10 mine, South Wellington, a blowout of gas immediately followed the firing of the second of two consecutive shots in a working-place. All men had to be withdrawn on the return side of this place.

BUMPS.

During the year a considerable number of "bumps" were again experienced in No. 1 East mine, Coal Creek Colliery. Following are brief details of the more serious "bumps":—

On January 25th, in 22 East district, a "bump" did slight damage to No. 1 room and the adjacent part of the main South entry.

On January 26th, in 22 East district, a heavy face "bump" occurred at the face of the heading. A considerable amount of methane was released and one man was injured by being thrown against a prop.

On January 29th, at 5.35 p.m., in 26 West airway, a "bump" affected several hundred feet of the airway. The floor and track were heaved from 2 to 4 feet over this distance and a 6-inch air-line was heaved and broken in four places. Five ventilation-doors were destroyed. A second "bump" occurred in the same area at 8.35 p.m. on the same day and destroyed all the work that had been done to restore the ventilation deranged by the first "bump." The earth tremors accompanying this second "bump" were distinctly felt at Fernie, 5 miles distant.

On January 30th, shortly after midnight, in 26 West, a "bump" centred in the Zero pillar area and heaved several hundred feet of floor from 6 to 12 inches and threw several stoppings and doors out of their position. This "bump" was followed by another one at 3.55 a.m., which again damaged this area and extended to the adjacent 28 West district.

On February 19th, in No. 3 room being driven off the main level, a small local "bump" did slight damage and jarred down about twelve car-loads of roof-shale.

On March 2nd a heavy "bump" affected 22 East slope and one place in 22 East. Five stoppings and a door were damaged beyond repair, several hundred feet of floor was heaved, a considerable amount of roof-shale was thrown down and a number of empty and loaded cars were thrown off the track.

On April 9th, in 28 West, a slight local "bump" displaced five sets of timber at the face of a working-place. This allowed some 80 tons of fine coal and shale to fall and suffocate the two miners in the place. One body was recovered two and one-half hours after the "bump" and the other two hours later. Although this "bump" had only a local effect underground it was felt by people on the surface.

On April 29th, in 26 West, a moderately heavy "bump" threw down the fireboss and several miners without serious injuries. Face conveyors and air-lines were thrown out of position and a door and two stoppings were destroyed. About 150 feet of track was heaved a few inches.

On April 30th, in 28 West main parting air incline, a very heavy "bump" heaved the floor and track on the incline to within 3 feet from the roof for a distance of 150 feet and destroyed a number of stoppings.

On July 24th, in 26 West, a heavy "bump" caused damage over a wide area and heaved the floor a few inches in several places.

On July 25th, in 26 West, a heavy local "bump" in Zero room damaged the conveyor and heaved the floor 2 feet.

On July 25th, at 4.25 p.m. and at 8.30 a.m. on July 26th, shocks were felt on the surface. There was no one underground at above times but later investigation showed slight but widespread damage throughout all the upper part of the mine.

On November 7th, in the upper part of 22 East slope, a severe "bump," followed by a series of lesser ones, did extensive damage consisting of the destruction of stop-

pings and doors and derangement of the ventilation, while the track throughout the mine was more or less disturbed. The track at one point was heaved to within 18 inches from the roof and there were a number of roof falls.

PROSECUTIONS.

During 1942 there were three prosecutions made for infractions of the "Coal-mines Regulation Act," as follows:—

Date.	Colliery.	Occupation of Defendant.	Offence charged.	Judgment.
April 3	Chambers' mine	Manager	Firing shot by means of electric igniter other than that approved by Minister of Mines, General Rule 12	Fined $35 and costs.
June 29	Michel Colliery	Miner	Quarrelling underground	Fined $10 and costs.
Sept. 24	Michel Colliery	Miner	Had a match in his possession while underground	Fined $5 and costs.

GOVERNMENT RESCUE-STATIONS.

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

In addition to the above stations, a fully-equipped station with apparatus provided by the Department is maintained at Middlesboro Collieries, Merritt, under the care of the mine management, and a smaller unit of rescue apparatus is stationed at the Premier mine, Stewart, and an H.H. inhalator stationed at Sheep Creek. The use of these stations and apparatus is available to any medical practitioner, and during the year many requests for oxygen and apparatus for administering same are received and given immediate response.

In the larger mining areas of Nanaimo, Cumberland, and the Crowsnest Pass experienced mine-rescue teams maintain a regular schedule of training throughout the year and so keep ready for any emergency calls. Due to so many of the younger men leaving the mines to join the different war services, there is increasing difficulty in obtaining new men of the proper age and physique to undertake the strenuous course necessary to produce efficient mine-rescue men; many of the men who had taken this course at the different mine-rescue stations are now specializing in gas protection in the army and navy.

The rescue-stations are also centres for first-aid lectures and training, and during the war are also centres for air-raid precaution work and casualty stations.

The preliminary training course consists of twelve two-hour lessons in the actual use of oxygen apparatus and Burrell all-service gas-masks in an irrespirable atmosphere, and instruction on the approved method of dealing with mine fires and recovery-work.

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

Cert. No.	Name.	Where trained.	Cert. No.	Name.	Where trained.
1125	Samuel Fowler	Fernie.	1136	James Whitelaw	Copper Mountain.
1126	Primo Cimolini	Michel.	1137	Ellsworth B. Hansen	Hedley.
1127	Cyril Cimolini	Michel.	1138	Frederick Haluss	Princeton.
1128	Henry Robert Ebert	Michel.	1139	Joseph Parker	Coal Creek.
1129	Michael Slemko	Michel.	1140	James J. E. Anderson	Coal Creek.
1130	William Parsons	Natal.	1141	James W. Brown	Coal Creek.
1131	Paul N. Brulotte	Natal.	1142	William Gill	Fernie.
1132	Anamy Marushko	Michel.	1143	Roger L. Girou	Fernie.
1133	William John Heycock	Michel.	1144	Stephen M. Serek	Fernie.
1134	Joseph George Macdougall	Princeton.	1145	John Coggins	Copper Mountain.
1135	Richard Alexander Krenke	Copper Mountain.			

SUPERVISION OF COAL MINES.

During the year twenty-four companies operated thirty-five mines employing 1,892 men underground. In the supervision of underground employees there were ten managers, seventeen overmen, and ninety-nine firebosses and shotlighters; a total of 126, or one official for every fifteen men employed underground.

"COAL SALES ACT."

There was only one complaint under the "Coal Sales Act" during 1942, and this was given immediate attention, but towards the end of the year a number of complaints were received regarding the amount of smaller sizes of coal being sold as lump and nut; however, as there are no regulations specifying minimum or average sizes for lump coal, nut coal, or pea coal, no definite action could be taken in such cases.

In the Vancouver area, valuable assistance is rendered by the Weights and Measures Inspector for Vancouver City, who keeps a close check on the sale of coal in the city.

LIST OF REGISTERED NAMES OF BRITISH COLUMBIA COALS, APPROVED BY THE CHIEF INSPECTOR OF MINES, IN ACCORDANCE WITH THE PROVISIONS OF THE "COAL SALES ACT."

Registered Names of Coal.	Colliery and District:	Producing Company.
Comox	Nos. 5 and 8 mines, Comox Colliery (Cumberland)	Canadian Collieries (D.), Ltd.
Old Wellington	No. 9 mine (Wellington)	Canadian Collieries (D.), Ltd.
Ladysmith-Wellington	No. 10 mine (South Wellington)	Canadian Collieries (D.), Ltd.
Hi-Carbon	Mixture of Canadian Collieries' coal and B.C. Electric coke	Canadian Collieries (D.), Ltd.
Lantzville-Wellington	Lantzville (Lantzville)	Lantzville Colliery.
Fiddick-Douglas	Fiddick mine (South Wellington)	Fiddick mine.
Chambers-Extension	Chambers' (Extension)	R. H. Chambers.
Wellington Big Flame	Richardson mine	A. B. Richardson.
Biggs-Wellington	Biggs' mine (Wellington)	Biggs' mine.
Berkley Creek-Little Wellington	Berkley Creek Colliery (Extension)	Hugh McLean Davidson.
Nanaimo Jingle Pot	Old East Wellington (Nanaimo)	Thos. Lewis.
Cassidy-Wellington	Cassidy mine (Cassidy)	A. H. Carroll.
Middlesboro	Middlesboro (Merritt)	Middlesboro Collieries, Ltd.
Coalmont	Coalmont (Coalmont)	Coalmont Collieries, Ltd.
Tulameen Valley Coal, Princeton	Tulameen (Princeton)	Princeton Tulameen Coal Co.
Granby Tulameen	Granby (Princeton)	Granby Consolidated M.S. & P. Co., Ltd.
Hat Creek	Hat Creek (Lillooet)	Canada Coal and Development Co., Ltd.
Tulameen Gem	Tulameen Collieries (Princeton)	Tulameen Collieries.
Bulkley Valley	Bulkley Valley (Telkwa)	Bulkley Valley Colliery, Ltd.
Aveling	Aveling (Telkwa)	Aveling Colliery.
Crow's Nest, Coal Creek	Coal Creek (Coal Creek)	Crow's Nest Pass Coal Co., Ltd.
Crow's Nest, Michel	Michel (Michel)	Crow's Nest Pass Coal Co., Ltd.

BOARD OF EXAMINERS FOR COAL-MINE OFFICIALS.

FIRST-, SECOND-, AND THIRD-CLASS CERTIFICATES AND MINE-SURVEYORS' CERTIFICATES.

BY

JAMES STRANG.

The Board of Examiners, which was formed on July 10th, 1919, now consists of James Dickson, Chief Inspector of Mines, Chairman; H. E. Miard, member; and James Strang, member and Secretary to the Board.

The meetings of the Board are held in the office of the Department of Mines in Victoria. The examinations are held in accordance with the amended rules of the Board of Examiners and approved by the Minister of Mines on September 28th, 1929.

Two examinations were held in 1942, the first on May 13th, 14th, and 15th, and the second on November 18th, 19th, and 20th. The total number of candidates at the examinations were as follows: For First-class Certificates, 4 (1 passed, 3 failed); for Second-class Certificates, 4 (1 passed, 1 passed with supplemental, and 2 failed); for Third-class Certificates, 9 (4 passed, 5 failed), and for Mine Surveyor, 2 (2 passed).

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

First-class Certificate.—Stanley J. Lawrence.

Second-class Certificate.—James Cochrane.

Third-class Certificates.—Alexander Dean, Siro J. Cimolini, Romeo Cimolini, and James M. Brown.

Mine Surveyors' Certificates.—Harry Bapty and Alexander M. Richmond.

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 1942 there were 183 candidates for coal-miners' certificates; of these 170 passed and 13 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.

BY

JOHN MACDONALD AND R. B. BONAR.

Canadian Collieries (Dunsmuir), Ltd.

J. A. Boyd, President, Montreal, Que.; H. R. Plommer, Vice-President, Vancouver, B.C.; P. S. Fagan, Secretary-Treasurer, Nanaimo, B.C.; H. Baird, Superintendent, Cumberland, B.C.; R. K. Smart, Assistant Superintendent, Nanaimo B.C.

No. 10 Mine, South Wellington.—W. Frew, Manager; Jos. Wilson, Overman; A. Hannah, Thos. Jordan, E. Heyes, J. McArthur, W. Roper, J. Neen, D. McMillan, J. Greenhorn, and F. Johnstone, Firebosses. This mine is situated in the Cranberry district, about half a mile from the old No. 5 mine, and has maintained its position as the chief producing mine in the district, with a total output of 254,358 tons over a working period of 265.5 days. The surface plant has been described in previous Annual Reports, the only addition during the year being the installation of a rotary dump and creeper chain, which have improved handling facilities at the tipple. The new change-room at the mine, preparations for which were begun in November, 1941, was completed and put into use in August of this year; this building is of two-story construction, measuring 77 by 28 feet, and has accommodation for 300 men. A new electrical pumping unit was installed near the top of No. 1 Diagonal slope; this is driven by a Canadian General Electric motor, 60 horse-power, 3 phase, 60 cycle, operating at 3,500 r.p.m., equipped with push-button control, overload and "no load" protection, and Bender-Warrick controls to regulate the stopping of the pump when low-water mark is reached. This pumping unit is enclosed in a fully fire-proof building.

Two mine-rescue teams of six men each have kept up regular training at the Nanaimo station during the year, and, if necessary, there are six additional men who can be called upon to fill in any vacancies in the above teams.

There are nine first-aid stations maintained at this colliery, the principal one being in the lamp cabin adjacent to the mine, from which supplies are sent out to replenish the stocks at the various emergency stations underground. First-aid equipment at the main station has always been kept up to the required standard, while the underground stations are inspected weekly by a trained first-aid man to check on the adequacy of the supplies at these points.

New development during the year amounted to 5,500 feet of drivage, all of which was confined to the No. 1 Diagonal district where an effort is being made to open up a new area in the general direction of the old Morden mine. All operations in the Main slope and No. 2 Diagonal districts have been confined to the extraction of pillars, from which it is estimated a total recovery of 90 per cent. has been made. One hundred and sixty-five samples of dust were collected, all of these being well above the minimum standard of incombustible content as set by the Coal-dust Regulations; 155 tons of lime-rock dust were used in treating 40,000 feet of roadways to reduce the dangers incidental to coal-dust. Working conditions in general have been found satisfactory, excepting when certain "unusual" occurrences resulted in an abnormal outflow of gas, necessitating the withdrawal of workmen from affected areas or a temporary prohibition of blasting operations pending the removal of all visible gas-caps from the general body of the air. Twenty-seven samples of air were taken in the various returns, the resultant analysis of these varying from 0.2 per cent. in the main West return to 1.02 per cent in the main East return. At the last inspection in December the fan was producing a total quantity of 106,100 cubic feet of air a minute for the use of eighty-

six men. This mine employs an average crew of 247 men underground and thirty-eight on the surface. Accidents reported during the year are classified as follows: Ninety-nine minor; three serious, and one fatal. All of these were investigated as soon as possible following their occurrence.

Wellington Mine.—A. Newbury, Manager; J. Sutherland, Overman; A. Bennett, J. Brown, J. Marrs, T. McCourt, and A. Kirkham, 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 133,956 tons over a working period of 262.5 days, with an average crew of 133 men employed underground and nineteen on the surface. A general description of the seam in this area, method of working, etc., appeared in the 1941 Annual Report. Development-work has been concentrated on extending roadways partly driven in earlier operating periods and opening up new long-wall faces off these levels; Nos. 1 and 3 walls have been driven to the boundary while Nos. 4, 6, and 8 walls are rapidly approaching this point. New faces have been opened up on Nos. 5, 9, and 11 walls, but further development in the slope sections has been halted by faulted ground. New underground installations included an electric hoist at the top of No. 1 slope and two electrical pumping units in a crosscut off this slope, all of these units are housed in fire-proof rooms. Twelve samples of dust were collected adjacent to loading-points on the various levels, all of which were above the minimum standard of incombustible content as set by the Coal-dust Regulations; 5 tons of lime-rock dust were used in treating 2,500 feet of roadways to combat the coal-dust hazard. General working conditions have been found satisfactory and the ventilation maintained at a high standard throughout the year. At the last inspection in December, the fan was producing a total quantity of 57,000 cubic feet of air a minute for the use of sixty-three men and five horses. Twelve samples of air were taken in the Main return, all of which were well under 0.5 per cent. methane. Forty-three minor, three serious, and one fatal accident occurred in this mine during the year; all of which were investigated.

Prospect Mine, Extension.

M. Brodrick, Fireboss. This mine is situated at Extension, on the southerly end of the "Harewood Ridge," and operates in the Wellington seam. Development-work has been confined to Nos. 2 and 3 dips, but irregularities in the seam have slowed up this work to some extent. A crew of six men has been steadily employed over a working period of 292 days, with production amounting to 3,477 tons. As a rule, working conditions have been found fairly satisfactory at all inspections. One minor accident was reported during the year.

Deer Home Mine.

Robt. Hamilton and Associates, Operators; Robt. Hamilton, Overman. This mine is situated in the Extension district and is operating in a small surface area left intact when old No. 2 mine, Extension Colliery, was abandoned. Three levels were driven off each side of the slope to contact the old gobs and the pillars are now being extracted in these roadways. General working conditions have usually been found satisfactory at all inspections. An average crew of six men has been employed over a working period of 268 days, with production amounting to 3,326 tons. One minor accident was reported during the year.

Chambers' No. 3 Mine.

R. H. Chambers, Operator; Thos. McCann and R. H. Chambers, Firebosses. This mine is situated in the Extension district and is working an isolated portion of the Wellington seam left by former operators. Production in 1942 amounted to 4,455 tons during a working period of 257 days, with an average crew of eleven men employed. After some considerable difficulty a bore-hole, 65 feet in length, was put through from the rock slope at the

inby end of No. 3 level to contact the abandoned workings of McCoy's Section in old No. 3 mine, Extension Colliery; a pipe-line is being connected to this bore-hole and this will act as a siphon to drain the lower workings. General working conditions have been found fairly satisfactory at all inspections. One minor accident was reported during the year.

Lake Road Mine. George Frater, Operator and Overman. This mine is operating in the immediate vicinity of the old Beban mine, recovering a portion of the Wellington seam lying near the outcrop which was left in this area when the old No. 1 mine, Extension Colliery, was abandoned. Production in 1942 amounted to 2,447 tons, with an average crew of five men employed over a working period of 269 days. The ventilation is provided by natural means and working conditions have generally been found satisfactory. No accidents were reported during the year.

Lewis' No. 2 Mine. T. and G. Lewis, Operators; G. Lewis, Fireboss. This mine is situated in the Harewood district and operations are continuing adjacent to the old Harewood Main tunnel in a troubled portion of the Wellington seam which was left in this area by former operators. This mine worked 276 days and produced 844 tons with two men engaged. The ventilation is provided by natural means and has been found ample for all requirements at our inspections. No accidents were reported from this mine during the year.

No. 5 Mine, Cassidy. J. McKellar and Associates, Operators. J. Nimmo, Fireboss. This mine is situated in the Cassidy district and is operating in a limited area of the Douglas seam lying to the south of the abandoned Granby No. 2 mine. As in 1941, development-work has been greatly retarded by faulted ground. Operations at present are confined to the levels on the right side of the slope, the roadways on the left of the slope being stopped in the early part of the year in view of their proximity to the prohibited area adjacent to the old No. 2 mine mentioned above. A small fan was installed on the surface at the top of the upcast shaft and an overcast built at No. 1 Right level to carry the return air over the slope to the fan-drift. Ventilating and general working conditions have usually been found satisfactory at all our inspections. This mine worked 282 days and produced 2,415 tons with an average crew of six men engaged. No accidents were reported during the year.

Lila Mine, Lantzville. W. Clifford and Associates, Operators; W. Clifford, Fireboss. This new prospect adit was started from the surface in the vicinity of the old Lantzville No. 1 mine for the purpose of intersecting the old "Jack" adit and developing a virgin portion of the upper Wellington seam. During October and November work was confined entirely to driving the new adit and pumping out the old adit mentioned above. Production commenced in December, the total output being 40 tons for a period of twenty working days with a crew of three men engaged. Work was temporarily suspended in the latter part of the month as the inflow of water from the surface was too heavy for the small pump to cope with during the wet season. The ventilation was provided by natural means and was sufficient for all practical purposes. No accidents were reported during the year.

Loudon's No. 3 Mine. W. Loudon, Operator and Fireboss. Operations at this property have been continued in a limited area of outcrop coal left in the Wellington district by former operators. This mine worked 196 days and produced 388 tons with an average crew of three men engaged. Ventilating and working conditions have usually been found satisfactory at all inspections. No accidents were reported during the year.

Pacific Mine. F. John and H. Gerloch, Operators; F. John, Overman. This mine is reached by a short slope driven from the surface to recover a few small outcrop pillars left in the Wellington district by former opera-

tors. Ventilation is provided by natural means and general working conditions were found satisfactory at our inspections. Production amounted to 427 tons over a working period of 198 days with two men engaged. No accidents were reported from this mine.

Victory Mine. S. Dines and J. Colly, Operators; J. Wallbank and J. Biggs, Firebosses. This small mine was opened up on a part of the Biggs estate, in the Wellington district, in the hope that sufficient outcrop coal would be found to justify this attempt. Unfortunately, this did not materialize and the mine was abandoned. During May, June, and July production amounted to 94 tons over a working period of sixty-two days with an average crew of three men employed. No accidents were reported from this mine. (NOTE.—J. Biggs, noted above as being one of the firebosses for *Victory* mine, is now deceased.)

Stronach Mine. C. Stronach, Operator; F. John, Overman. This small mine is also located in the Wellington district and was reached by a short slope from the surface to tap a small area of outcrop coal in the Wellington seam. Work on this property was begun in August and finished in the latter part of December, all available coal having been recovered. Production amounted to 164 tons over a working period of 112.5 days with a crew of two men engaged. No accidents were reported during the above period.

Old No. 9 Mine. R. B. Carruthers and W. Wakelam, Operators; R. B. Carruthers, Fireboss. This mine was formerly operated in the Wellington district by Canadian Collieries (Dunsmuir), Limited, but has been abandoned for a number of years. The above operators obtained a lease on this property and commenced operations at the beginning of November to extract a limited area of outcrop coal lying on the high side of No. 1 Left level off the old Main slope. As there are several openings through to the surface, a good current of air has been found circulating through the workings by natural means at all our inspections, while general working conditions have also been found satisfactory. Since entering production, this mine has worked forty-two days and produced 86 tons with two men engaged. No accidents were reported during this period.

At all the larger mines the inspection committees appointed by the miners in accordance with the requirements of the "Coal-mines Regulation Act," section 101, General Rule 37, made regular inspections every month and forwarded copies of all reports to this office. Searches for matches and smoking materials were also made each month at these mines, but no prohibited articles were found. All report-books required to be kept at the mines were examined frequently throughout the year and found in order.

No. 8 Mine, Comox Colliery. James A. Quinn, Manager; Arthur W. Watson, Overman; James Weir and Daniel Morgan, Shiftbosses; John Anderson, William Bennie, Frank Coates, George Harvey, William Johnstone, Alfred Maxwell, John Queen, Thomas Robertson, Thomas Shields, Edward Surtees, Daniel Waddington, John W. Smith, 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. The No. 2 seam, which lies at a depth of 700 feet, is the only one being operated at the present time, although the dewatering of the lower or No. 4 seam has been completed with the view to further development. In the No. 2 seam, before opening out on the long-wall advance method of work, a circular shaft pillar 1,000 feet in diameter was left and only narrow openings driven through it. The mine operated throughout the year, but owing to the labour shortage development-work was retarded. All the active workings are at present confined to the south side of the shaft, with the exception of some development places started near the end of the year in the long inactive North side workings. The main South level and accompanying 300-foot long-wall advanced 1,000 feet during the

year, and No. 2 Incline off the main South level was driven 600 feet. No. 1 Incline advance wall and the left side of No. 1 Incline are now inactive, being cut off by faults, with production confined to the right side, which has three tandem walls advancing along the strike in "echelon." There are nine long-walls in operation, three tandem units and three single units, their total length aggregating 2,700 feet, with an average seam thickness of 3 feet 6 inches, including bands of rock or bony coal varying from 1 inch to 14 inches wide. The repair work on the main South return counter was completed early in the year and the stables removed, so that the main South return is now duplicated with beneficial results.

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-conveyors 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 attention and care. The average daily output of coal during the month of December was 650 long tons, with 235 men employed underground and thirty-three men on the surface. A new sump and pump-room, near the Main shaft bottom, were completed early in the year with a 7-stage centrifugal pump and 150-horse-power electric motor installed. The haulage in the main South level district is now handled by an Ironton storage-battery locomotive which is serviced in the recently completed 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 3rd inspection gave a total quantity of 208,000 cubic feet of air per minute against a 7.3-inch water-gauge. Each long-wall has a separate split and all told there are twelve separate splits. 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 3rd showed a methane content of 0.69 per cent. A total of 362,000 lb. of limestone-dust was used underground during the past twelve months, 120,000 lb. being used in tamping shots and 242,000 lb. in treating the roadways and face-lines of the mine to combat the coal-dust hazard. As an additional precaution against the coal-dust hazard, the coal is subjected to a water spray as it is discharged from the conveyor-pans into the coal-cars; also several sprays have been installed on the lower portion of No. 1 Incline to allay the coal-dust there. Two hundred and twenty-eight samples of mine-dust were analysed during the year for the purpose of ascertaining the percentage of incombustible matter and moisture in the dust collected from the roof, floor, and sides of the mine roadways.

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, located on the surface near the main hoisting-shaft engine-room.

The new wash-house was put into operation on August 1st, 1942, and has a capacity of 400 lockers with thirty sprays and a drying-room for wet clothes. A large water-tank with a capacity of 20,000 gallons was erected west of the tipple to service the wash-house and to augment the fire-fighting equipment. The mine was inspected on forty-nine occasions during the year, and all report-books required to be kept at the mine were examined regularly and were found to be in order.

No. 5 Mine, Comox Colliery.

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, and L. Cooper, Firebosses. This mine operates the No. 2 seam which is reached by a shaft 280 feet in depth. All the workings lie to the dip from the shaft and are accessible by four slopes 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 places. At the end of the year there were five

active long-wall faces; two tandem units each 500 feet long and one single unit 270 feet long, their total length aggregating 1,270 feet, with an average seam thickness of 3 feet 9 inches of coal plus 10 inches of rock or bony coal. The mine operated throughout the year, but owing to the labour shortage development-work was reduced to a minimum. The average daily output of coal during the month of December was 420 long tons, with 215 men employed underground and twenty-nine men on the surface.

The long-wall faces are equipped with compressed-air Meco type pan-conveyors which convey the coal from the face-lines to 1-ton capacity mine-cars on the 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 which undercut the coal to a depth of 6 feet.

During the latter part of the year active production was confined to the Main slope district, with both No. 4 West and No. 6 East slope districts idle on account of the shortage of labour.

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 was only one instance of protracted prohibition required. The mine is ventilated by electric-driven exhausting-fans which have separate returns but common intakes. The No. 1 fan, which ventilates the abandoned No. 1 seam, stables, Nos. 2 West and 4 West slope districts, gave a reading of 54,000 cubic feet of air per minute at the time of the last inspection; and No. 2 fan, which ventilates the Main slope district, No. 6 East slope district, and abandoned workings of No. 5 East slope district, gave a reading of 125,000 cubic feet of air per minute against a 4.3-inch water-gauge.

One hundred and twelve 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 conveyor-pans is sprayed with water to dampen the coal-dust. Two hundred and forty-seven 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 on the lower Main slope to connect with the above man-trip. Each man-trip is equipped with a safety-car which is attached to the back 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. The mine was inspected on sixty-five occasions during the year.

NICOLA-PRINCETON INSPECTION DISTRICT.

BY

E. R. HUGHES.

There were five producing collieries operating in this district during 1942, 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, and the Hat Creek Coal Mine, at Upper Hat Creek, near Ashcroft. Prospect operations were carried on by the Inland Collieries, Limited, near Merritt, and during the month of December work was being done by this company in cleaning up and retimbering the old Black mine, near Princeton, with the intention of producing coal early in the new year. Charles Jackson, of Kelowna, had a small amount of prospect-work done near Princeton, which resulted in the location of a coal-seam. Following this discovery no further development was undertaken. The Merritt Coal Mines, Limited, was the only newcomer into the Nicola-Princeton field during the year; this company, under the management of George Murray, former manager of the now defunct Coalmont Colliery, began prospect operations on a small scale on the property formerly owned by the Diamond Vale Collieries, Limited, at Merritt.

No fatal accidents occurred in the coal mines of this district during the year. Fifty-five compensatable accidents were investigated, and of these there was only one that was serious; this as a result of a youth falling from a surface trestle and sustaining a broken leg. No serious accidents happened underground in any of the coal mines.

At approximately 11.30 p.m., September 26th, a fire, originating in the blacksmith-shop at the Princeton Tulameen Colliery, completely destroyed the blacksmith-shop and near-by power-house, resulting in the loss of buildings, machinery, and equipment valued at $17,000. The cause of the fire could not be determined. No one was injured. Due to assistance from other local mining companies, who kindly loaned equipment, the mining of coal was again resumed on September 29th.

The above was the only dangerous occurrence reported to this office from the coal mines of the district during the year.

There were no prosecutions under the "Coal-mines Regulation Act" during the year.

The output of coal for the year was slightly greater than that of the two preceding years, and amounted to 175,339 tons, as compared to 131,925 tons for 1941 and 149,827 tons for 1940. This slight increase, however, is not to be taken as indicative of market requirements; in fact for the first time in many years the output, particularly during the latter part of the year, fell considerably below demand. Only on two occasions since the commencement of coal-mining in the Nicola-Princeton district has the annual output ever exceeded 250,000 tons; these record tonnages were produced in the years 1913 and 1922. It is not unreasonable to suppose that could the exigent need for coal have been fully satiated, then the 1942 production may have approached, if not surpassed, any previously recorded tonnage. When it is realized that the output from most of the mines is produced on a single-shift basis, it becomes obvious that a greatly increased tonnage could have been achieved from the present operating mines without having recourse to the opening of new operations or even spending a great deal on additional equipment at existing collieries. The operating mines could easily have absorbed double the number of men employed at the end of the year; thus, this district, in common with other coal-mining centres, suffered from an acute shortage of skilled mine labour.

In addition to the regular mine-rescue training and first-aid courses undertaken by workmen during the year, the Similkameen Valley Mine Safety Association held its

annual field-day competitions on the Allison Flats, Princeton, on Saturday, June 13th. The events in both mine-rescue and first-aid were keenly contested, and whilst this made the work of the judges very exacting, it nevertheless evinced the painstaking thoroughness of the pre-competition training on the part of the contestants. The competitions were considered to be probably the most successful ever held in the district.

Middlesboro Collieries, Ltd.

E. W. Hamber, President, Vancouver, B.C.; Miss E. McDonald, Secretary, Vancouver, B.C.; Robert Fairfoull, Superintendent, Merritt, B.C. This colliery is 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 North, and Prospect mines. Plant and equipment have been described in previous reports and there have been no changes during the year. Forty-eight men were employed underground at the end of the year and the colliery produced 32,088 tons of coal.

No. 2 South Mine.—Manager, Robert Fairfoull; Overman, A. Allen; Firebosses, Thos. Rowbottom and R. Dunnigan. Pillar-extraction in the upper levels of the mine was completed during the year and the lower parts were further developed by the driving of a new dip from the surface. The new dip was driven down 500 feet and levels laid out in a north and south direction. Stalls were opened from these new levels. During inspections conditions were found to be generally satisfactory. The roadways and timbering were in good condition. All parts examined were generally well treated with inert dust. The mine is usually ventilated by natural means, but a standby fan was installed during the year and can be operated if adverse atmospheric conditions preclude adequate natural ventilation. An air measurement taken during the December inspection indicated 12,000 cubic feet of air to be passing along the main return for the use of nineteen men. Analyses of the air showed a methane content of 0.05 per cent.

No. 2 South Extension Mine.—Manager, Robert Fairfoull; Overman, James Fairfoull; Firebosses, W. Ewart and E. Kelly. During the year the Main dip was driven down 200 feet and a level was driven in from this. Pillar-extraction in the upper levels, above the Main level, was completed. Conditions were found to be generally satisfactory during the monthly inspections of this mine. A small fan was installed during the summer; this was found to be adequate for mine ventilation and the last air measurement taken, in December, showed 10,000 cubic feet of air to be passing per minute for the use of twenty-two men. Analyses of the air indicated a methane content of 0.04 per cent. in the return airway.

No. 3 North Mine.—Manager, Robert Fairfoull; Overman, A. Allen; Firebosses, G. Corbett and R. Dunnigan. Pillar-extraction had been taking place at this mine for some time past and this work was completed during the month of January, when the material and machinery were withdrawn and the mine was abandoned.

Prospect Mine.—Manager, Robert Fairfoull. This small prospect was opened during September, 1941, and after striking a thin seam of coal and making a second opening for ventilation was closed down in December of that year. No work was done at this mine during 1942, but the mine was being kept in reserve for possible future development.

Inland Collieries, Ltd.

Company office, c/o Grossman & Holland, Stock Exchange Building, Pender Street, Vancouver, B.C.; Manager, Francis Glover, Princeton, B.C. This company conducted prospect operations at two points near Merritt, and at the end of the year commenced work on the reopening of the Black mine, near Princeton.

No. 3 North Prospect Mine.—Manager, Francis Glover. This is a small prospect operation in the side of a dry creek, situated about 10 miles by road in a south-easterly direction from the city of Merritt. A slope dipping 35 degrees was driven down a distance of 100 feet and was then continued as a level for another 80 feet. In this level, surface gravel, sandstones, and conglomerates were encountered, with only a thin

lens of coal; no workable seam was found and the prospect was abandoned during the month of February and was allowed to fill with water. Three men were employed.

No. 1 North End Prospect.—Manager, Francis Glover. This prospect, situated approximately three-quarters of a mile in a north-easterly direction from the No. 3 North Prospect mine and about 3 miles south of Nicola, is on Lot 1305 and adjacent to the old Normandale Colliery. Underground work commenced during the month of March when a sandrock adit was driven in a southerly direction. After driving on a level course for 106 feet a raise was put up a distance of 25 feet and made contact with a vertical coal-seam approximately 8 feet in thickness. The coal appeared to be a good grade bituminous and of coking quality. Three bands of rock, however, were present in the seam and thus would probably present cleaning difficulties. The thickest of the rock-bands was 6 inches at the point of contact; the other two bands being 2 inches and 3 inches respectively. An analysis taken of this coal gave a B.T.U. content of 13,040. The grade of the coal having probably been raised by close proximity to the underlying volcanic rocks, the presence of which would preclude continuity of regularity in the coal measures, and would adversely affect the cost of mining at this elevation. After making a second surface connection and advancing the Main level in coal it was found that the seam deteriorated, thickening rock-bands replacing most of the coal. The mine closed in November. The condition of the mine was found to be satisfactory during the monthly inspection. A crew of three to five men were employed producing a total output of 70 tons of coal for the several months of operation.

Black Mine.—General Manager, Francis Glover; Overman, John Gillham. This property is in the Finlay Creek district, 6 miles south-west of the town of Princeton. It has been developed by two levels driven from the surface croppings in the side of the hill. The Main level is in a distance of 750 feet with connections to the Counter level which has been driven 1,000 feet with raises to the surface for ventilation. This mine has worked intermittently for a number of years with only a small production, which, during 1941, amounted to only 30 tons. Work of rehabilitating the mine began during December and it is expected that coal production will resume during January, 1943. No coal was actually produced during the year. An inspection, made after work had begun, found conditions to be generally satisfactory. The mine is ventilated by natural means and an air measurement taken in the intake gave 6,000 cubic feet of air per minute for the use of four men. Safety-lamp tests indicated no visible gas-caps.

Hat Creek Coal Mine.

Owned by L. D. and A. A. Leonard, Ashcroft, B.C. This 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 2,700 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 intersected by clay and shale bands of varying thickness. Levels have been turned off to the right and left of the Main level on five of the seams, which average from 8 to 12 feet in thickness. All development during the year was directed to the No. 2 and No. 3 Right levels and at the close of the year a new ventilation opening was being driven to the surface to give an increased air-supply to these right side workings. Coal is taken by truck to local markets and during the winter some railway shipments were made to Vancouver via Pavilion. A sample of coal was taken from the face of No. 2 Right level on July 15th, the analysis of which gave 9,340 B.T.U.'s. Ventilation is by natural means and conditions were found to be generally satisfactory. The last air measurement taken showed 6,120 cubic feet of air passing for the use of three men. Analysis of the air showed a methane content of 0.03 per cent. in the return airway. In addition to A. A. Leonard, who acts in the capacity of fireboss, two other men were employed and 1,978 tons of coal was produced during the year.

Merritt Coal Mines, Ltd.

Manager, George Murray. During the month of October this company commenced prospecting on land formerly owned by the Diamond Vale Collieries, Limited, near the city limits of Merritt and adjacent to the old company's No. 3 Slope and "New" No. 3 Slope. Neither of these mines has been operated for a number of years. The prospecting undertaken this year consisted of a trial pit sunk to bed-rock and lateral drives along the gravel-covered outcrop of the measures for the purpose of correlating the seams preparatory to opening a new mine. In December a 3-foot seam of coal, with a 6-inch rock parting, had been found. Three men were employed.

Tulameen Collieries, Ltd.

Head office, 716 Hall Building, Vancouver, B.C.; Mine Overman, David M. Francis; Fireboss, Thomas 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 were connected to the abandoned workings of the old No. 2 mine, in the month of February. When tapped, these old workings were found to be filled with methane. All workmen were withdrawn from the mine and the old workings were connected to the No. 3 mine ventilation system, following which the mine entrances were fenced off for twenty-four hours and no naked lights were allowed within 200 feet of the return airway at the mine surface. After the methane had been successfully removed, the old workings were explored but it was found that extensive caving had taken place in the lower workings. After sufficient rehabilitation had been accomplished to meet the immediate needs of mine development the remaining inaccessible workings were sealed off as a precautionary measure against possible spontaneous combustion taking place in the heavily caved area. Subsequent development was in extending the old No. 2 Mine incline and driving levels northward from it. Mine ventilation is provided by a Sheldon fan and the air measurement taken in December showed 12,250 cubic feet of air to be passing for the use of fourteen men. Analysis of the air showed a methane content of 0.04 per cent. in the return airway. The mine operated throughout the year and produced 9,319 tons of coal. The roadways and timbering were found to be generally satisfactory and the roadways were well treated for dust.

Princeton Tulameen Coal Co., Ltd.

Guy F. Atkinson, President, San Francisco, California; George H. Atkinson, Vice-President, San Francisco, California; W. D. Seaman, Secretary-Treasurer, Princeton, B.C.; James Taylor, Manager, Princeton, B.C.; Ben Cheetham, Robert Gourlay, and Andrew Dean, Firebosses. This company operates the Princeton Tulameen No. 1 mine, formerly known as the Lind mine, situated about 1 mile west of Princeton. The mine is developed from a Main slope driven from the outcrop on a pitch of 16 degrees; this slope was extended 130 feet during the year and is now down 1,410 feet from the surface. Before reaching a point 600 feet down the slope, nine levels have been developed to the right and left; pillar-work in this area has been completed for the present and all immediate development is lower down the slope. At a point 650 feet down, the slope passes underneath the Tulameen River, with a minimum coverage of 165 feet. Roadways under the river-bed consist only of an intake and return airway. After passing under the river and at a point 1,000 feet from the portal, three new levels were developed to the right for a distance of 2,000 feet; these levels, Nos. 13, 14, and 15, have a coverage averaging 250 to 300 feet. The levels became too far advanced for hand-tramming and, as sufficient power was not available for mechanical haulage, work in these levels was temporarily suspended during the summer and development was concentrated in two new levels, Nos. 16 and 17 Right, farther down the slope. Most of the coal produced came from these two new levels during the fall and winter months. On September 26th, at approximately 11.30 p.m., a fire, originating in the blacksmith-shop, totally destroyed this building and the near-by power-house, resulting in the loss

of buildings, machinery, and equipment valued at $17,000. The cause of the fire could not be determined. No one was injured. Due to assistance from other local mining companies, who kindly loaned equipment, the mining of coal was again resumed on September 29th. The loss of this equipment, and the fact that the mine was previously underpowered, no doubt was chiefly responsible for the management outlining plans for increased power units to be installed early in the forthcoming year. Already work has been done on the erection of buildings to house the new equipment and arrangements were being made with the Granby Consolidated Mining, Smelting and Power Company, Limited, to supply electric power for the operation of the new units. Three Ingersoll-Rand post-type punching-machines, motivated by compressed air, are used to mine the coal. No additions were made to mine equipment during the year. The mine is ventilated by a 48-inch Aerodyne-type fan, belt-driven from a gas-engine. The last air measurement taken during December showed 40,000 cubic feet of air passing through the fan-drift for the use of twenty men. Analysis of the air showed a methane content of 0.1 per cent.

The coal produced at this mine supplies most of the domestic requirements in the Princeton district and is also shipped to Vancouver and Interior points. The coal shipped by rail is taken from the mine to the shipping-bunker situated near the Kettle Valley Railway station at Princeton by an International truck of 8-ton capacity. During the winter season thirty-three men were employed underground and the total mine production of coal for the year was 30,438 tons.

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.—Mine Manager, Thos. M. Wilson; Overman, A. McKendrick; Firebosses, T. Cunliff, F. Bond, A. Hilton, D. Jones, T. Lloyd, and James Fairley.

The No. 1 mine is situated about 6 miles west of Princeton, off the Hope–Princeton Highway. Almost all the output from this mine is used at the company's steam electric power plant near Princeton, which supplies the power requirements at the Copper Mountain copper-mining operation, the concentrator at Allenby, and at the coal mine. The coal is transported from the mine by auto-trucks to a point near Princeton, from where it is carried across the Similkameen River by an aerial tram to the power plant. The total power capacity of this plant is approximately 17,500 kilowatts. For this coal-haulage three 9-ton trucks, one of which has a 12-ton trailer, are used.

The 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 is down 1,660 feet; no advancement being made during the year. Seven levels have been turned off to the left of this slope, in the first four of which pillar-extraction has been completed and, at the end of the year, was almost completed in the fifth level. No. 6 North level was advanced to a point 1,480 feet north of the slope, and pillar-extraction was commenced; this pillar-drawing has reached a point 350 feet from the level face. No. 7 North level was advanced to a point 1,020 feet from the slope and was still advancing at the end of the year. The levels are approximately 300 feet apart and a small isolation pillar is left between the levels when pillars are drawn; as pillar-drawing is completed the level is immediately sealed as a safeguard against heating, this being one of the principal dangers peculiar to the Princeton lignite field.

The South diagonal is down 1,230 feet; no advancement was made during the year. Five levels have been turned off to the right of this slope, the first three of which had completed pillar-extraction before the commencement of the year, with the exception of a small area in No. 3 South level that had to be abandoned in August, 1941, on account

of incipient heating. Nos. 1, 2, and 3 South levels were sealed at that time and thus this small amount of pillar coal was lost. No. 4 South level was advanced to a point 1,380 feet south of the slope and the No. 5 South level was advanced to a point 720 feet south of the slope. No pillars were drawn on the south side during the year.

The average thickness of the 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 and 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, of which fourteen are in use. The types used are the R-37 and R-47. Power for the mine is developed by an electrically operated Ingersoll-Rand Imperial No. 10 compressor, having a capacity of 1,200 cubic feet of free air per minute, with a pressure of 90 lb. The surface plant and tipple is electrically operated. The North and South diagonal slopes are separately ventilated by individual fans; the North fan supplying 21,900 cubic feet of air per minute for the use of twenty-three men; an analysis made of the air in the return airway showed a methane content of 0.04 per cent. The South fan supplied 24,750 cubic feet of air per minute for the use of eighteen men; a sample taken of the return air gave an analysis of 0.04 per cent. methane.

Monthly inspections were made by the miners' inspection committee, and copies of all these reports of inspection were received through the courtesy of the committee members. All report-books required to be kept at the mine were regularly examined and found to be in order. Working conditions in general have been found satisfactory throughout the year. Eighty-two men were employed underground and the coal production for the year was 83,446 tons.

Granby Colliery No. 2 Mine.—This development mine remained closed throughout the year, except for the necessary pumping of water to keep the workings ready for use if required.

Peace River Area.

During the month of August the Peace River area was visited to gain information relative to possible coal production in view of the potential demand for fuel in connection with the extensive road-building programme of the Alaska Highway, which passes through the Peace River block.

Two small properties, the Gething and Packwood mines, have had only a limited production and were reported upon in the Annual Report of the Minister of Mines for 1940, pages A-126 and A-127. Very little work has since been done at either mine. Whilst the normal local market is small, mining development has to some extent also been limited by adverse road conditions between the mines and Fort St. John and the lack of mining equipment and mining personnel. These difficulties would preclude any accelerated production to meet emergent demands. The seams being worked at these properties, also, do not lend themselves to rapid development, but the existence of more valuable seams is known, particularly in the vicinity of the Peace River canyon where an excellent seam of coal 5 feet 5 inches in thickness was prospected some years ago by Victoria interests. Even if the outlook were more favourable in all other respects, this coalfield cannot be expected to develop until fair roads are provided.

Gething Mine.

This small mine is operated by Quentin F. Gething and 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 an adit 70 feet long driven on the strike of the seam and a raise driven 15 feet up the full pitch, starting near the adit face; the raise requires to

be driven another 20 feet to make a surface connection. The seam is inclined on an angle of 30 degrees. Measurements taken at the face gave the following seam section: Shale roof; 5 inches coal; 4 inches bone; 7 inches coal; ¼-inch rock streak; 12 inches coal; 4 inches rock; 31 inches coal; 30 inches ironstone foot-wall. The bone and rock present necessitates that great care be taken in cleaning the coal. An estimated 57 tons of coal was produced during the year.

Packwood Mine. Operator, Geo. Packwood, Baldonnel, B.C. This small mine is situated on the west slope of Butler Range, 22 miles west of Hudson Hope and 84 miles west of Fort St. John. Up to the time of inspection on August 20th no work had been done during the year. The seam dips approximately 55 degrees in a westward direction and consists of 3 feet of clean coal. An adit has been driven a distance of 130 feet along the strike of the seam. At a point 70 feet from the portal a raise was driven 60 feet out to the surface, thus providing a second outlet for ventilation purposes. Another seam of coal has been found about 15 feet above the present workings; this seam, however, is only 30 inches thick and at the outcrop appears to be more friable than the seam prospected. A sample of this coal taken during 1940 gave the following analysis: Moisture, 1.1 per cent.; volatile combustible matter, 15.4 per cent.; fixed carbon, 80.2 per cent.; ash, 3.3 per cent.; sulphur, 0.6 per cent.; B.T.U.'s, 14,136.

Grant Seam Workings. A visit was made to these prospect workings which have been inactive for several years. The seam is exposed on Grant flat very close to the north bank of the river and 15 miles up-stream from Hudson Hope. The workings are on Lot 1049, owned by the Aylard interests of Victoria, B.C. Some years ago work was done on this seam and about 1,000 tons of coal produced, but owing to transportation difficulties only a small amount of this was shipped. The seam measured 65 inches of excellent high-carbon bituminous coal, with a ½-inch mud parting in the seam centre. The seam dips very gradually to the west and where exposed appears to be extremely regular. Underground development consists of a Main level with crosscuts to the surface, having a total length of about 500 feet. Of the different exposures seen the Grant seam offers by far the best opportunity for successful development. Such development being entirely contingent on the building of a road.

NORTHERN INSPECTION DISTRICT.

BY

CHARLES GRAHAM.

Bulkley Valley Collieries. F. M. Dockrill, President; A. H. Dockrill, Overman. The property is located on Goat Creek, a tributary of Telkwa River, about 7 miles from Telkwa, to which point coal is hauled by truck. The market is chiefly domestic and confined, by transportation cost, to the area between Prince Rupert and McBride on the line of the Canadian National Railways.

Owing to faulting which cut across the face of the slope, in addition to other faulting cutting off the workings on both sides of the slope, development in the No. 1 slope was discontinued and the extraction of pillars is now being carried on. The mine survey was brought up to date before extraction of pillars commenced.

A new slope, No. 2, was started north of No. 1. Development in this slope has been greatly handicapped by faulting. The slope was down about 200 feet when a fault was struck, coming in from the right at an angle of about 30 degrees. The slope was turned left that amount which brought it around almost to the strike of

the seam as shown in No. 1 slope. This was eventually turned on to the strike and driven as a level, with the intention of developing a slope farther in. Another disturbance, a roll, was met coming up in the floor. A little prospecting was done but the roll was not crossed due, principally, to lack of miners. A place was driven along the rise side of the roll but this eventually struck the outcrop. A Siskol coal-cutter is in use. No sign of gas was seen on any visit nor was any reported during the year.

A. M. Richmond, Agent; J. M. Wilson and Wm. Dinsdale, Firebosses.

Telkoal Co., Ltd. This property, which is located on Telkwa River, was formerly operated by the Aveling Coal Company, Limited; the new company taking over the property on November 23rd, 1942. Development on the "Betty" seam is being pushed ahead as fast as possible. A Radialax coal-cutter has been installed and a new air compressor, which should speed up development considerably.

A bridge is being built across the Telkwa River, replacing the one washed out several years ago. When completed it will be possible to open up the "Major" seam.

Additional plant and equipment is being added and development of these two seams should proceed rapidly if there are sufficient men available. No gas has been reported in the mine.

The Consolidated Mining & Smelting Company has located a coal showing on Discovery Creek, a tributary of Omineca River, about 25 miles from Silver Creek, where they are developing a new mercury property. Prospecting and testing of this coal will be done as soon as it is possible to reach the property. If a coal mine can be developed here it will be of very great value to the properties now under development by the Consolidated Mining & Smelting Company and the Bralorne Mines, Limited, in the Silver Creek area.

EAST KOOTENAY INSPECTION DISTRICT.

BY

H. E. MIARD.

In this district the Crow's Nest Pass Coal Company, Limited, was again the sole coal-mine operator during the past twelve months. The combined production of the Michel and Coal Creek collieries amounted to 990,633 long tons, an increase of 33,248 tons over that for the previous year, the loss in washing, amounting to 6.576 per cent. of a gross output of 868,080 long tons, being deducted in the case of the Michel colliery.

The conditions prevailing at the beginning of the year justified the hope, then entertained, that a considerably more important increase would be recorded. However, a number of circumstances, including the scarcity of labour, probably entitled to first place in this case, operating difficulties incident to natural conditions at both Michel and Coal Creek, and, to some extent also, the various impediments delaying the purchase and delivery of mining machinery combined to prevent the expected expansion.

While it has become customary to consider the man-power requirements of coal-mining solely in terms of manual labour, the fact that, for a period of ten years or more, barely enough mine officials have been trained to replace those who disappeared from the field for one reason or another is now bringing about results that could have been foreseen but were not guarded against while the industry was in its comatose condition.

At the Michel plant 85,855 long tons of coke was obtained from the treatment of 128,441 tons of coal. Of this amount, 93,504 tons treated in the bee-hive ovens yielded 59,653 tons of coke, and 34,937 tons processed in the Curran-Knowles by-products

ovens yielded 26,202 tons of coke, 242,940 gallons of tar, and 146,000,000 cubic feet of surplus gas, the greater part of which was burnt under the colliery's boilers.

A second battery of ten by-products ovens was erected at Michel but, owing to the erratic manner in which the operating machinery was delivered, had not yet been put in operation at the end of the year.

The accident record for the period under consideration is by no means one to be considered complacently, and, in view of the dearth of labour already mentioned as having exerted a detrimental influence upon the year's operations, it may well become a subject of deep concern, otherwise than from the strictly humanitarian point of view. The combined contributions of all are needed, if the national war effort is to be sustained adequately, and men unable to attend to their work on account of injuries sustained in the course of their employment are temporarily as useless as if their services had never been available. In fact, were these untoward occurrences eliminated entirely the labour problem would undoubtedly lose much of its present gravity. Viewed from the purely economic standpoint, the matter assumes an equally serious aspect and it can be safely said that compensation payments represent the smaller part of the cost of accidents to the industry. One of the most unfortunate features of this perplexing situation is that carelessness, often on the part of the injured man himself, is responsible for the great majority of all accidents. The degree of safety attained in mining, or in any other industrial operation, is a direct result of the collective mental attitude of all those concerned towards the subject; this usually radiating from the upper stratum downwards.

In the course of the year four fatal accidents caused the death of five men in the coal mines of the district. They are described in detail in another part of this report. At Coal Creek two miners were killed by a face bump and a timberman was struck by a slab of roof-rock that he was taking down on a main entry. At Michel a man died from internal injuries sustained when he stumbled and fell on one of the mine roadways and another was fatally injured by a runaway mine-car. A total of 377 other accidents, forty of which occurred on the surface, was recorded at this office. Among these mishaps, sixteen were classed as "major," seventy-two as "serious," and 276 as "slight"; thirteen remaining unclassified at the end of the year, as the length of time during which the men involved would be incapacitated was then still in doubt.

Six men underwent their first period of training in mine-rescue work at the Fernie station and fourteen others renewed former training. The total number of holders of certificates of training in mine-rescue work in the Crowsnest district is now sixty-five.

Crow's Nest Pass Coal Co., Ltd. Head office, Fernie, B.C.; President and General Manager, Hartley P. Wilson, Fernie; Vice-President, Thomas Balmer, Seattle, Washington, U.S.A.; Secretary, Thomas G. Ewart, Fernie; Treasurer, Jas. H. Marshall, Fernie; Mining and Construction Engineer, Wm. C. Whittaker, Fernie; Managers, Bernard Caufield, Michel; James Littler, Coal Creek and Elk River collieries. The company operated the Michel and Coal Creek collieries throughout the year. In the month of May the construction of a thoroughly modern plant and the opening of new mines were undertaken at a point situated somewhat less than 1 mile west of the present Coal Creek tipple, this being known as the Elk River colliery.

Michel Colliery.—Manager, Bernard Caufield; Assistant Manager, William Chapman. This operation supplied nearly 82 per cent. of the total output of the district and 45 per cent. of the coal produced in the Province. The coal is mined by means of chain undercutting-machines, radial coal-cutters, and pneumatic picks, being blasted afterwards if necessary. In the course of the year 45,000 lb. of Monobel No. 4 were used in coal and 4,510 lb. of Polar CXL-ite No. 2 in rock-work. Of a total of 54,789 separate charges, only four misfired, or 0.0075 per cent.

"A" Seam.—Overman, Walter McKay. Slightly more than half the total output of the colliery comes from the workings of this seam. The thickness of the coal ranges from 8 to 14 feet and the roof is a shale of irregular strength occasionally weakened, in certain areas, by an admixture of carbonaceous matter. Here, as in almost every other part of the colliery, extensive damage to the timber is caused by dry-rot.

The coal is mined chiefly with the help of pneumatic picks, but chain undercutting-machines and radial coal-cutters are in use at a few points. Blasting of the coal is necessary only in very few places. The workings are ventilated separately by means of a fan passing 84,000 cubic feet per minute, against a water-gauge of 2.25 inches. The air enters partly through the Main haulage-road and partly through a special intake. Satisfactory progress was being made with the driving of a second intake opening from the surface at the end of the year, the work being facilitated by the opportunity offered to freeze the loose ground that had to be penetrated.

The mine is ventilated by two distinct currents of air; one, designated as No. 1 split, circulates through the East and West districts, and the other, or No. 2 split, passes through the North and South sections. At the time of the December inspection, 20,000 cubic feet of air per minute were being supplied for the use of sixty-one men and four horses in No. 1 split, and 60,900 cubic feet per minute were passing through the workings of No. 2 split, for fifty-nine men and four horses. The total number employed in the workings of the seam was then 247 in twenty-four hours. The presence of a faint trace of hydrogen sulphide in the air has been occasionally detected in workings immediately adjoining the outcrop, in this as well as in the overlying "B" seam.

In the East and part of the West sections exclusive use is made of conveying-belts on inclines to bring the coal delivered from advancing rooms or long-wall faces to the main entries, where it is loaded into mine-cars for transportation to the surface. Shaking-conveyors are used in all places, except a few driven on very low gradients in which the coal is loaded directly into cars.

"B" Seam.—Overmen, Irving Morgan and William Gregory. The workings of this part of the colliery are next in importance to those of the underlying "A" seam, as far as output is concerned, but are covering a still more extensive area. The coal is much thinner, its thickness ranging from 4 to 6 feet, and the roof is often treacherous, frequently concealing some of the irregularities commonly known as "pot-holes," although these seem to be less numerous in the parts at present in operation than they were in those worked formerly. The method of working followed is that already described in previous reports. The coal is mined by means of chain undercutting-machines at the long-wall faces, and with radial coal-cutters in development roadways, being subsequently blasted in the latter case. With very few exceptions the entire output is carried away from the faces by trough-conveyors discharging either directly into mine-cars, on conveying-belts or in chutes.

The coal gives off an appreciable amount of methane and the ventilation requires close attention. The high inclination of the seam on the South side (about 37°) and the considerable difference in elevation of various parts of the workings exert an influence alternately beneficial and detrimental in this respect. In summer the problem is greatly simplified through the assistance rendered by differences in temperature between the workings and the surface, but in winter the conditions are reversed and the difficulties to be overcome wax greater as the surface temperature decreases.

The workings are divided into three separate districts, each having its own intake, their return airways joining at the top of the air-shaft linking them with the old Main return of the colliery. At the end of the year work on the construction of an overcast across the main East entry, in "A" seam, had begun and this, when completed, will permit the establishment of a second connection with the Main return, which should obviate some of the difficulties experienced until now. At the time of

the December inspection, 18,000 cubic feet of air per minute were supplied to the East section for the use of forty-five men and three horses; 17,000 cubic feet per minute were circulating through the South district for thirty-five men and three horses, and 8,000 cubic feet were supplied to a crew of seventeen men in the West section. The total number of men employed in the workings of this seam in twenty-four hours was then 205.

Most of the future output of the colliery will have to be obtained from the Sparwood side of the Michel syncline, where the measures are rather steeply inclined, as already stated. The inconvenience attached to the method of handling the coal followed up to the present time has led to the evolution of a plan of working based on the transportation of all the output from these areas by conveying-belts. Under the proposed arrangement, the active sections of "A" and "B" seams would be connected by inclined rock crosscuts at various points to permit the transfer of the coal from the secondary to the main system of transportation in the lower seam. This involves the installation of belts with special retarding features. Should it be possible to carry out the project, the maintenance of the present or even of an increased output from the colliery would be assured for some time to come. Among the advantages gained there would be a reduction of the quantity of coal-dust liberated, long and steep chutes being among the worst offenders in this respect.

In the West section, where operations are now restricted to the extraction of pillars immediately adjoining the Main incline, considerable difficulty has been experienced in maintaining the roadway, owing to rapid heaving of the shale floor. The chief defect of the otherwise eminently satisfactory method of working followed is that, in the final stages of extraction, the last open roadway has to be maintained between goaves throwing excessive weight upon the remaining pillars. Abandoning such pillars would mean not only a waste of recoverable coal but also possible injurious effects upon the workings of underlying or overlying seams.

No. 1 Seam.—Overman, William Gregory. Operations in the North and South sections of this part of the colliery have been limited to development-work on a small scale. It is highly probable that they will be suspended entirely as soon as adequate provisions have been made for the ventilation while the two districts are idle. The production is not commensurate with the number of men employed, a paramount consideration at the present time. In the course of the December inspection, the quantity of air circulating in the workings was found to have been 16,000 cubic feet per minute for the use of fourteen men and two horses. The coal gives off a considerable amount of methane.

No. 3 Mine.—Overman, William Gregory. Steam-coal of the highest quality is still produced from this operation, at one time the mainstay of the colliery, but on a considerably reduced scale, the daily output averaging now little more than 250 tons. All work is limited to the extraction of pillars in the immediate vicinity of the Main level. The seam gives off comparatively little methane, but active absorption of oxygen leads to the rapid formation of black-damp in any part of the workings beyond the reach of the main air-current. This, consisting chiefly of excess nitrogen, accumulates to the rise and may invade the live workings when the atmospheric pressure decreases. For this reason the former No. 12 Incline district was sealed off early in the year. The average oxygen content of the atmosphere of this extensive worked-out section had then dropped to 7 per cent. without a corresponding increase in the percentage of carbon dioxide present. At the time of the December inspection, the total quantity of air circulating through the workings amounted to 26,400 cubic feet per minute for the use of thirty men and five horses.

A seam, thought to be No. 3, has been reached on the Sparwood side of the syncline by one of the main rock tunnels, but lack of labour and the necessity to make arrangements to provide adequate ventilation have so far prevented its exploration. The total

quantity of air passed by No. 3 fan (ventilating the workings of both No. 3 mine and "B" seam) amounted to 94,500 cubic feet per minute against a water-gauge of 3.1 inches.

Samples taken at various times in the main return airways of the different seams carried the following proportions of methane: "A" seam (North and South sections), 0.70 per cent.; "B" seam (all workings), 0.67 to 0.79 per cent.; No. 3 mine, 0.32 per cent. In the course of the year 560,000 lb. of limestone-dust were applied to the roadways of the colliery to neutralize the coal-dust.

Coal Creek Colliery.

No. 1 East Mine.—Manager, James Littler; Overman, John Caufield; Shiftboss, Carmichael McNay. Despite the difficulties which attended the operation of the mine practically throughout the year, the total output exceeded that for 1941 by 4,820 tons; a result which it cannot be gainsaid was attained only at the cost of considerable effort. The rapid heaving of roadways in the vicinity of the workings and several series of bumps must be given first place in this case among the obstacles surmounted. On the other hand, roof conditions, on the whole, are more favourable than those prevailing at Michel. The considerable length of the main haulage system is probably the chief hindrance from the purely operating point of view.

Of course, in this case the "bumps" stand foremost among indigenous peculiarities, as usual. There were several series of these manifestations, varying in violence but all attended by a certain amount of material damage, in the period extending from January 23rd to January 30th, on February 19th, March 2nd, April 9th, 29th, and 30th, July 25th and 26th, and November 7th. The last mentioned was particularly violent and was not only accompanied by tremors felt on the surface at Coal Creek and Fernie but coincided with a faint earthquake shock recorded at the Mount Saint Michael seismological station, near Spokane, some 150 miles away. The "bump" of April 9th, although it did comparatively little material damage, caused the death of two miners, trapped under a fall of roof-coal brought about by the shock.

It may be interesting to note here that the earth tremor accompanying a violent "bump" at the Barnborough Main colliery, in South Yorkshire, was recorded at the Kew observatory, about 230 miles away, the ground oscillation there being of the order of one micron and extending over a period of 2½ minutes. Still, the shock was not perceived in adjoining workings of the colliery, a peculiarity observed on several occasions at Coal Creek in former days.

The behaviour of natural forces of the order of those responsible for the occurrence of "bumps" can be discussed only in a very hesitating manner for, there, we are dealing largely with immeasurable factors. It is certain that both the direct load, represented by the weight of the overlying strata, and residual tectonic stresses, with the latter very probably predominating, are jointly responsible for the dynamic phenomena observed, and that the extent to which such stresses are retained is a function of the greater or less rigidity of some parts of the measures. Beyond this, no one has so far been able to offer an entirely satisfactory explanation of all the characteristic effects of "bumps," these depending probably less on the initial nature of the accumulated stresses than on their mode of release. Should they be dissipated slowly, there may be only gradually increasing pressure on pillars with a flow of floor-shale in the roadways (or of roof-shale, if this be the weaker stratum) and a constant innocuous rearrangement of equilibria. If, on the other hand, hard and correspondingly unyielding measures are steadily accumulating a store of such stresses, then release is apt to take place "in quanta" and with explosive violence.

The hypothesis that the passage of an earth tremor, originating at a considerable distance from the actual site of the "bump," could augment the existing stresses sufficiently to initiate the phenomenon derives considerable support from the few

reliable chronologic observations permitting to establish the moment at which the earth-wave passed different widely separated points.

The former explanation, based on the assumption of a hammer-blow struck by suddenly descending overlying strata, is not confirmed by the experience gained at Coal Creek. There, violent "bumps" occurred in territory from which only 15 per cent. of the seam, or even less, had been extracted. Of course, the effective size of pillars cannot be judged from the area that they cover on the mine plan, for there is a zone on the periphery of each one of them which becomes gradually separated from the main body of the pillar and ceases to act as effective ground support.

Notwithstanding the dubious attitude displayed in the foregoing paragraphs, some well ascertained facts based on experience have permitted the establishment of certain rules from which no serious departures should be tolerated; they have already been stated in previous reports, but are briefly recapitulated here for, although it is probable that the inner section of No. 1 East will soon be abandoned, some coal deposits lying at depths exceeding 1,500 feet will have to be worked in the perhaps not very remote future, and the costly experience already gained can then be of some service.

The formation of long and strong pillars extending in the direction of the strike should be avoided. Narrow places should be driven in pairs, with their faces in alignment and with only a small pillar between them. Some form of advancing long-wall extraction affords the greatest degree of security and, adequate stowing being impracticable here, this can be applied most efficaciously by working the seam in successive lifts, proceeding from the outcrop inby and following in order from the highest point of the seam downwards. That the thick conglomerate bands overlying No. 1 East have been fractured can be inferred from the fact that percolating water is now found in parts which were previously perfectly dry. The minimum amount of narrow work consistent with effective operation should be done in advance of the faces. The weakening of existing pillars, elsewhere than in the immediate vicinity of the faces, may be either beneficial or highly detrimental and should be undertaken only with due circumspection, particularly when it implies the widening of existing roadways. All faces should advance in the same direction and on a definite line or lines. Pillars and stumps sufficiently large to present any appreciable resistance to movements of the overlying ground should not be abandoned in the goaves. At Coal Creek the maximum width tolerable in this respect has been found to be about 15 feet.

In No. 1 East, operating difficulties, largely due to the damaging of roadways by heaving and bumps, led to departures from the principles aforesaid which may have helped to aggravate an already precarious situation. The fact that the method of working adopted a few years ago differed so widely from that formerly followed militated also against their absolute application, it being necessary to make use of development originally laid out with another object in view.

It is now planned to withdraw as rapidly as possible from the inner section of the mine and to secure the output, which present conditions will continue to demand for some time to come, from parts of the mine situated at some distance outby. The abandoned territory will be sealed off in two stages, one of the areas worked out being now ready for this operation. The goaves may be said to have behaved remarkably well and no tendency towards heating has been observed. As it was not possible to provide effective ventilation, the policy followed has been to promote the formation of an extinctive atmosphere, with low oxygen and high nitrogen and methane contents, which seems to have been achieved successfully.

The condition of the old workings, on the east side of the Main level, remained satisfactory throughout the year. The air in this extensive area is always surprisingly dry, showing a relative humidity of only 48 per cent. on the average, while it is usually about 88 per cent. in the working sections.

The ventilation is good, as it has to be in No. 1 seam, and, except where disturbed through the closing of roadways by ground movements, was sufficiently powerful and well managed to maintain satisfactory conditions in all parts of the mine. Coal-dust constitutes a serious problem demanding constant attention. In the course of the year, 80,000 lb. of limestone-dust and a large but not exactly determined quantity of flue-dust were applied to working-places and roadways. The use of the latter material explains the extraordinarily high percentages of ash (as much as 78 per cent.) found in some samples of roadway-dust from No. 1 East. Pure limestone-dust leaves only 56 per cent. of its original weight as solid residue after incineration.

At the time of the December inspection, the fan was passing 101,500 cubic feet of air per minute against a water-gauge of 3.6 inches. A total quantity of 45,900 cubic feet per minute, travelling in two splits, was supplied to seventy-three men and eight horses; the greater part of the balance circulating through the abandoned workings on the east side. The return air, immediately outby the last working-place, carried from 0.8 to 1.4 per cent. of methane, this varying with the time of the day and the day of the week on which the samples were taken. The average Burrell gas-detector reading at the same point is about 1.2 per cent.

Elk River Colliery.

Manager, James Littler. The opening of this new operation constitutes undoubtedly the outstanding development in the history of the district in several respects. The result of long and careful consideration, it was undertaken with the intention of avoiding most of the slow and unprofitable stages through which the average colliery passes on its way to full productive capacity. It will start with equipment sufficient, in almost all branches, to handle an intended output of 4,000 tons per day, which, it is hoped, will be reached or closely approached at the end of 1944.

As a beginning, it is proposed to open and develop rapidly three of the coal-seams present, Nos. 4, 9, and 10; the last two being known at Coal Creek as Nos. 2 and 1 respectively. Six adits had been started in No. 9 seam, when weather conditions and lack of facilities to bring the coal down to the plant compelled a temporary suspension of operations. On the other hand, No. 4, situated much lower in the measures, will be opened immediately and a judicious use of the mining machinery available will permit a substantial output to be obtained from development-work there in a very short time.

The main transportation system for the two upper seams will be installed in No. 9, and the coal from No. 10 will be brought down to it through inclines driven in the intervening measures. The entire output will be handled exclusively by conveying-belts as far as the portal, from where it is to be brought down to the preparation plant by a retarding conveyor of the conventional type. Men and supplies will be brought up over a surface track by means of an electric hoist installed in the front of the cliff above the mine entrances.

It is possible that in time No. 11 seam, known as "B" seam at Coal Creek, may also be reached and developed in the same manner as No. 10.

At the end of the year considerable progress had already been made with the construction of the plant. The area to be used as a railway-yard required a large amount of filling (about 100,000 cubic yards) and all buildings, except the preparation plant, are carried on concrete pillars raising them above the new surface. The other structure, which is to house the preparation plant and the boiler-room, is resting partly on outcropping rock and its foundation will be a practically solid mass of reinforced concrete. The other three buildings had been completed, as far as walls and roofs are concerned, before winter began in earnest. They are a combined power-house and machine-shop, 100 feet long and 60 feet wide; a warehouse and office building of the same dimensions, which will also contain the first-aid and mine-rescue rooms, and a wash-house, 154 by 60 feet, providing accommodation for 600 men. A part of this structure is being fitted as a lamp-room. All buildings are of concrete and brick

construction with steel window-sashes. The work remaining to be done indoors had to be deferred pending the installation of the central heating system. The cleaning plant, with the boiler-room, covers an area of 12,000 square feet (120 by 100 feet).

A steel bridge has been constructed across Coal Creek and a spare track has been laid from the main line of the M.F. & M. Railway to the new plant, in order to bring all construction material, shipped by rail, directly to its final destination. A narrow-gauge track has also been constructed to link the new operation with the Coal Creek plant, where the output obtained in the early stages of development will be handled until the loading installation at the Elk River has been put into service. The procedure will then be reversed.

Corbin Collieries, Ltd.—This firm has been in liquidation for some years and the final disposition of its assets is now almost completed. In the early part of the summer, 348 tons of slack coal was shipped to Trail, from the stock pile at Corbin, but motor-trucks soon ceased to be available for the 14-mile haul to the Canadian Pacific Railway station at McGillivray. Most of the serviceable machinery has been sold and 849 tons of scrap iron and steel have been shipped to the War Time Salvage Board.

INSPECTION OF METALLIFEROUS MINES.

BY

JAMES DICKSON.

PRODUCTION.

The output for metalliferous mines for 1942 was 5,708,277 tons. This tonnage was produced from 126 mines of which seventy-six produced 100 tons or more.

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

There were fourteen fatal accidents in and around metalliferous mines and concentrators in 1942, being an increase of two over that of 1941. There were no fatalities in the quarries or placer-workings in the Province for 1942.

There were 4,422 persons under and above ground in the metalliferous mines and 960 persons in the concentrators in 1942. The ratio of fatal accidents per 1,000 persons employed was 2.41 compared with 1.77 in 1941.

The tonnage mined per fatal accident during 1942 was 407,734 tons compared with 663,023 tons in 1941. The tonnage mined per fatal accident during the last ten-year period was 420,498 tons.

The following table shows the mines at which fatal accidents occurred during 1942 and the comparative figures for 1941:—

Mining Division.	Mine.	No. of Accidents.	
		1942.	1941.
Vancouver	Britannia	2	4
Lillooet	Bralorne	....	1
Lillooet	Pioneer	1	....
Cariboo	Cariboo Gold Quartz	....	1
Similkameen	Copper Mountain (surface)	1	....
Similkameen	Allenby Mill (surface)	1	....
Osoyoos	Nickel Plate Mine	2	....
Nelson	Bayonne Mine	1	....
Nelson	Sheep Creek Gold	....	1
Nelson	Gold Belt	1	1
Fort Steele	Sullivan	5	1
Skeena	Surf Inlet	....	2
Portland Canal	Silbak Premier	....	1
Totals		14	12

Following are the details of the fatal accidents in lode mines:—

The fatal accident which occurred to Harvey W. Smith, miner, Britannia Mining and Smelting Company, Limited, on January 9th was due to deceased drilling into a bootleg left by the previous round which evidently contained some unexploded powder. From the evidence of an eye-witness it was established that deceased had attempted to clean out the bootleg with the shank-end of a drill, then put the drill in the machine and started drilling in the bootleg with an immediately resulting explosion.

The fatal accident which occurred to Oiva Saatela, miner, Sullivan mine, Consolidated Mining and Smelting Company of Canada, Limited, on March 10th was due to deceased being struck by a falling rock while assisting to raise a 33-foot ladder for the purpose of enabling barmen to bar down recently blasted ground. The top of the ladder touched and dislodged some loose rock which fell on deceased with immediately fatal results.

The fatal accident which occurred to Leonard William Hystead in the ore-crushing plant on the surface at the Sullivan mine on March 22nd was due to deceased being crushed between a belt-conveyor and one of its pulleys while engaged in cleaning up spillage from the conveyor. It is believed that his shovel caught in the conveyor and that in trying to recover the shovel he himself was caught and drawn into the pulley. This conveyor has a speed of only 3¼ miles per hour.

The fatal accident which occurred to Duncan William McKenzie, chuteman, Sullivan mine, Consolidated Mining and Smelting Company of Canada, Limited, on March 28th was due to deceased being run over by an ore-train on which he travelled between transfer chutes. There were no witnesses of the actual accident, but McKenzie was found alongside the train where it was stopped to discharge its load and had apparently fallen off the train or stumbled after stepping off. He died fifteen minutes later.

The fatal accident which occurred to Angelo Lorenzo Maddalozzo, miner, Gold Belt Mining Company, Limited, on May 14th was due to deceased being caught by a slide of ore in a stope where he and his partner were engaged in moving loose ore down the floor of part of the stope, but had orders not to move ore down the part of the stope where the accident occurred as this part was kept open for ventilation. Deceased apparently did not have enough work to keep him busy and decided to go over to examine the other part of the stope and used a safety-rope for this purpose. The loose ore started to run and carried deceased down and broke the safety-rope, which was in good condition. Forty cars of ore had to be drawn from the chute below before the body was recovered.

The fatal accident which occurred to Marko Humjan, miner, Sullivan mine, Consolidated Mining and Smelting Company of Canada, Limited, on May 26th was due to deceased being poisoned by carbon monoxide in a raise which had been driven up about 40 feet from the 3,651 drift. It was known that the air in this raise was defective and there were notices at the manway to this effect. Deceased was looking for a timber-chain and knew there was one in this raise and went up the manway despite the notices. He was found unconscious shortly afterwards and given immediate artificial respiration and oxygen but did not recover.

The fatal accident which occurred to Frederick Gordon Meister, barman, Sullivan mine, Consolidated Mining and Smelting Company of Canada, Limited, on June 8th was due to his falling or jumping from a barman's ladder in a stope. A 20-foot ladder was raised and secured by guy-ropes and when Meister went up the ladder he found that one of the guy-ropes was tangled at the top of the ladder. When trying to correct the guy-rope the ladder began to sway and deceased climbed down part of the ladder and jumped off from a height of 10 feet to the floor of the stope, where he stumbled and fell over a ledge 14 feet high. He sustained a fracture of the skull, from which he died shortly after being taken to the hospital.

The fatal accident which occurred to John Johnson, miner, Bayonne Consolidated Mines, Limited, on July 2nd was due to deceased being struck by a falling rock which almost severed his left leg and required over one hour's work to move before deceased could be treated or recovered. He died from shock the following day. Johnson was barring down this place when the accident occurred.

The fatal accident which occurred to Ivor Forsell, leading shaft-sinker, Kelowna Exploration Company, Limited, on July 22nd was due to a fall of rock from the back of an inclined shaft which was being sunk. The rock fell about 10 feet and inflicted internal injuries from which Forsell died the following day. He had barred the place before starting work, but probably the vibration of the drills had loosened the ground.

The fatal accident which occurred to Harry Blomquist, labourer, Allenby Concentrator, Granby Consolidated Mining, Smelting and Power Company, on July 24th was due to suffocation. Deceased and others were engaged in cleaning down a fine-ore bin when he was caught and covered by a slide of the fine material, which had to be drawn

off below before Blomquist could be recovered, by which time life was extinct. There were safety-ropes at the ore-bins but deceased had not been instructed to use them.

The fatal accident which occurred to Michael Herman, brakeman trainee, Copper Mountain mine, Granby Consolidated Mining, Smelting and Power Company, Limited, on September 16th was due to deceased falling or jumping from the locomotive of an ore-train at the ore-dump on the surface. Deceased was being trained as a brakeman under the supervision of the locomotive driver and the regular brakeman and had been three days on this work. On this trip the ore was being dumped into a different bin from the previous trips, and the brakeman instructed Herman to stay on the locomotive while the brakeman himself got off the train to supervise the dumping, which is done automatically as the train passes the bins at low speed. Herman was seen to fall into the open bunker and the brakeman signalled to stop the train, but two cars of ore had been dumped before the train was brought to rest and Herman was partly covered by ore and was dead when extricated.

The fatal accident which occurred to Louis Oldenburg, surface trackman, Kelowna Exploration Company, on September 10th was due to deceased being thrown from a runaway freight-car on the surface incline. Deceased and several others were engaged in salvaging disused ropes lying alongside the incline, and at the time of the accident had a rope stretched out on the incline for the purpose of lowering the rope by means of attaching the upper end of the rope to the descending skip, with the freight-car on the lower end of the rope to supply the necessary tension to control the rope. The rope was secured at the upper end by means of two sets of clamps. Before the skip was set in motion the rope slipped through the upper clamps and allowed the rope and freight-car to run wild down the incline. Three other men who were on the freight-car with Oldenburg jumped off before it attained a high speed, but Oldenburg remained on the car until it became derailed, at which point he was thrown off and instantly killed.

The fatal accident which occurred to Frank Reith, hoistman, Britannia Mining and Smelting Company, Limited, on September 19th was due to electrocution by either direct or indirect contact with a 500-volt trolley-wire. His work consisted of operating the service hoist in a shaft that was being raised from the 3,100 level and in handling the necessary supplies. He had apparently been unloading some shaft timbers from a flat car at the shaft station when he sustained an electric shock. The trolley-wire is 7 feet 4 inches above the rail-level and 5 feet 3 inches above the floor of the flat car from which he was taking the timber. There were no witnesses of this accident and he was probably shocked some time before being found. When discovered, immediate artificial respiration was applied but without result.

The fatal accident which occurred to Samuel John Jamen, miner, Pioneer Gold Mines of B.C., Limited, on October 20th was due to deceased being carried down a stope when the muck gave way over a hung-up chute. Deceased knew of the hang-up and had been specifically warned by his shiftboss not to cross the affected area. He disregarded this order and was approximately over the hang-up when it was released by a bulldoze from below. The actual cause of death was suffocation.

EXPLOSIVES USED IN MINING.

During 1942, due to the general curtailment of mining, the quantity of explosives used in British Columbia mines was much reduced as compared with previous years and consisted of 7,166,000 lb. of high explosives; 2,300,000 fuse blasting-caps; 460,000 electric blasting-caps; 27,750 delay blasting-caps; 1,000 feet of Primacord; and 14,650,000 feet of safety-fuse.

During the year the Inspectors of Mines supervised the removal or destruction of explosives which had been left at a number of abandoned properties.

AIR-SAMPLING.

A number of air-samples were taken in cases where long single drifts were being driven, to determine whether carbon monoxide or other noxious gases were present in dangerous percentages. No dangerous conditions were indicated, although in some cases augmented ventilation was ordered by the Inspector.

DUST AND VENTILATION.

The ventilating-fans installed at the different mines were all maintained in operation throughout the year and in no case where a fan has been installed for the main ventilation of a mine has the management considered again depending on natural ventilation.

It is now fully realized that adequate ventilation, efficiently controlled and directed, is the chief practical means of reducing the dust-hazard.

FIRST-AID AND SAFETY WORK.

The different Mine Safety Associations maintained safety-work during the year and did much to encourage safety-work and the training of men in first aid in the different mining centres, while the safety committees at the larger mines continued to do their share in carrying on safety education for their fellow employees.

Many of the experienced mine employees have left to join the armed forces and others to engage in war industries, and their places, in many instances, were filled by inexperienced men who had to be given safety training and instruction by the safety engineer and safety committees. While there is an inherent risk in the employment of new men, there has been no increase in the number of accidents from this cause.

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VICTORIA, B.C.:
Printed by CHARLES F. BANFIELD, Printer to the King's Most Excellent Majesty.
1943.

2,125-543-4696