ANNUAL REPORT

OF THE

MINISTER OF MINES

OF THE PROVINCE OF

BRITISH COLUMBIA

FOR THE

YEAR ENDED 31ST DECEMBER

1939

PRINTED BY
AUTHORITY OF THE LEGISLATIVE ASSEMBLY.

VICTORIA, B.C.:
Printed by CHARLES F. BANFIELD, Printer to the King's Most Excellent Majesty.
1940.

BRITISH COLUMBIA DEPARTMENT OF MINES.

VICTORIA, B.C.

Hon. W. J. ASSELSTINE, *Minister.*

JOHN F. WALKER, *Deputy Minister.*

JAMES DICKSON, *Chief Inspector of Mines.*

J. B. ADAMS, *Chief Analyst and Assayer.*

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

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

To His Honour ERIC WERGE HAMBER,
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 1939 is herewith respectfully submitted.

W. J. ASSELSTINE,
Minister of Mines.

Minister of Mines' Office,
May, 1940.

Polished specimen of cinnabar ore from Pinchi Lake, B.C.

THE MINING INDUSTRY.

BY

JOHN F. WALKER.

The value of mine production in 1939 was $66,614,179, an increase of $2,128,628 over 1938. This figure of $66,614,179 is $932,632 greater than the figures for total production and for copper in the following tables. The value for copper in the tables is based on the London price, whereas British Columbia copper is sold at the New York price. The London price is used so that value figures in the following tables 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 through London.

The increased value of mine production is due largely to greater volume and correspondingly greater value for copper, gold, and silver, and to antimony and bismuth which did not appear in 1938 figures. All phases of the industry, except structural materials such as cement, sand, gravel, stone, and riprap, showed increases.

Lode-gold production which has been establishing successive yearly records since 1933 shows an increase in volume and a greater proportionate increase in value due to exchange.

Copper shows an increase in volume and a corresponding increase in value; but to this must be added the $932,632 difference between London and New York figures, not shown in the tables.

Silver showed little change in volume and value production.

Lead decreased slightly in volume and to a greater extent in value, due to relatively low prices for the metal throughout the greater part of the year.

Zinc production for the year was slightly lower than in 1938, and the average price being about the same the value production is correspondingly less.

Cadmium shows an appreciable increase and antimony and bismuth substantial values as against nothing in 1938.

Coal production, valued at $6,280,956, shows an increase of 13 per cent. over 1938.

Non-metallic minerals show a substantial gain in value of 39.8 per cent. as compared to 1938, and this is due largely to an appreciable increase in both volume and value of sulphur output. The greatest loss in this group was for gypsum products. Clay products show a slight gain, but other structural materials such as cement, sand, and riprap show a decrease of 9.3 per cent. as compared to 1938.

The total number of shipping-mines increased from 211 to 217, those shipping 100 tons increased from 92 to 99.

The number of men employed decreased slightly from 16,021 to 15,890; wages and salaries decreased from the 1938 record of $22,791,685 to $22,357,035.

Dividends decreased slightly from $11,992,316 to $11,865,698.

Machinery to the value of $1,393,353, building supplies to the value of $581,553, and food supplies to the value of $1,187,503 were purchased by the industry during the year.

GENERAL SITUATION.

It is anticipated lode gold will show a slight increase in volume and an appreciable increase in value, due to the differential in exchange which has been constant for some months, and provided it remains constant during the remainder of the year.

Placer gold shows a decrease for 1939 as compared to 1938, but the bringing into production of one or two new operations should result in some improvement during the present year.

It is impossible to predict what may happen to the price of silver, but it is anticipated that volume production will increase and, if prices hold firm, there should be a slight increase in value production.

Copper production should show a further increase in volume and there should be a substantial increase in value.

Lead production should show an increase in volume and an appreciable increase in value due to better average prices for the metal.

Zinc production should also show an increase in volume and, like lead, an appreciable increase in value.

Non-metallic minerals and structural materials will likely have about the same value as last year.

In preparing the foregoing estimate war conditions have been taken into consideration and it is assumed that no major disaster will affect the mining industry or any of the large producers. If the industry functions smoothly throughout the year, it is anticipated that the value of mine production will be about $6,000,000 greater than in 1939.

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 in 1939 amounted to 2,322 lots, valued at approximately $60,000. 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. This purchasing scheme has returned to the individual miners from $10,000 to $15,000 per annum more than if they had sold through the ordinary channels.

DOMINION-PROVINCIAL YOUTH TRAINING.

The Dominion-Provincial Youth Training Plan in connection with mining was continued during the summer and autumn of 1939 with the idea in mind that, if the trainees were given more instruction in geology, mineralogy, etc., by qualified men, they would be better fitted to take their places as prospectors.

With the above ideas in mind, the Department of Mines felt that within a period of a few years about fifty young men might be trained, particularly in the field, so that they could identify, within reasonable limits, the rocks and minerals which they came across.

There was a total of 450 applications received by the Department of Labour for training. Out of these, 228, between the ages of 19 and 25, were enrolled and sent to Emory Creek camp in two separate lots about six weeks apart. Approximately 96 of the applicants were rejected for various reasons, 53 failed to report, and 73 held in reserve.

Six weeks' preliminary training was given at Emory Creek, where the rudiments of mining, geology, mineralogy, field traversing, mapping, cabin construction, tempering and sharpening steel, hand-drilling, placer-mining in all its phases, construction of sluice-boxes and rockers, panning, dam construction, first aid, packing-horses, back-packing, making pack-boards, cooking over a camp-fire and in a "dutch" oven, making yeast bread, etc., were taught.

Examinations were held from time to time throughout the six weeks' course and those who did not qualify were discharged. Good behaviour, ability to work, and aptitude towards mining and prospecting played a large part in choosing the young men for further training at Cowichan Lake, Vancouver Island. All those sent to Cowichan Lake were orally examined, after passing written examinations, by the Deputy Minister of Mines or the Chief Mining Engineer.

Those who did not pass the examinations and desired to continue prospecting on their own account were given a "grub-stake" and transportation to Quesnel Forks where they were supervised. Parties of four and eight under a "captain" either placer-mined or prospected until war was declared when several parties quit and were given their transportation home so that they might enlist. Others continued in the field until the end of October.

For the first time since the Youth Mining Training began at Emory Creek, the trainees were instructed by qualified geologists. Classes were held in mineralogy and

rock classification, for which specimens were supplied; map reading; plotting traverses; identification of rocks and minerals in the field; compass traversing; staking claims, etc.

The fifty men chosen for further training made their headquarters in the spare cabins belonging to the Forestry Department on the south side of Cowichan Lake, Vancouver Island, and about 7 miles from the south-east end. This camp was used as a base for supplies and as headquarters by N. F. G. Davis, Ph.D., who was in charge of the training. Five parties of ten men each under the supervision and instructorship of graduate geologists back-packed their supplies and equipment into different areas both north and south of Cowichan Lake and, after setting up a fly-camp consisting of light mosquito-tents and a fly for the cook trainee, ran traverses at one-eighth mile intervals from which the section was geologized in a general way and mapped.

Work commenced about June 5th and continued with some interruption on account of the fire-hazard until September, when the parties were called in on account of the declaration of war. In all about 170 square miles was prospected; the average per party being 3 square miles a week.

After it was ascertained that all young men were not required at present for active service, and word had been received from the Dominion Department of Mines that tungsten, manganese, mercury, and molybdenum might be needed for Empire war material, about ten of the Cowichan Lake trainees were sent, under the management of H. Sargent, Department of Mines Engineer, to further investigate the possibilities of the manganese deposits lying north of Cowichan Lake.

Six other Cowichan Lake trainees were sent to Yalakom River area and near Savona, where some further geological work, under the supervision of M. S. Hedley, Department of Mines Engineer, was done on cinnabar deposits.

About twenty of the trainees who took the advanced course have obtained jobs in the operating mines of the Province and they have proved very satisfactory to the operators.

SAMPLING PLANT, PRINCE RUPERT.

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

The sampling plant is, as its name implies, only a sampling plant and not a concentrator. Ores containing sufficient value to ship direct to the smelter are purchased and assembled at the plant until sufficient tonnage is accumulated to warrant shipment to the smelter. By mixing lots at the plant it is possible also to reduce smelter penalties on individual shipments and so give the prospector the benefit of a mixed lot.

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

For the calendar year 1939, 43 lots for shipment, 101 lots for testing, and 27 samples for assaying were received at the plant. These lots aggregated 217 tons. Ten shipments totalling 201.7 tons were made to smelters, for which $12,596.75 was received as against $12,663.92 paid out by the plant.

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 1939 the Bureau of Geology and Topography had the following officers employed on field-work in British Columbia:—

GEOLOGICAL PARTIES.

1. E. D. Kindle continued the study and mapping of the geology of the Hazelton area, west half (latitude 55° to 56°, longitude 127° to 128°), and of the Hudson Bay Mountain area (latitude 54° 45′ to 54°, longitude 127° 10′ to 127° 30′).

2. A. H. Lang completed the study and mapping of the geology of the Smithers area, east half (latitude 54° to 55°, longitude 126° to 127°), and continued work in the west half of the same area (latitude 54° to 55°, longitude 127° to 128°).

3. C. H. Crickmay completed the study and mapping of the geology of the Tyaughton Lake area (latitude 50° 50′ to 51° 05′, longitude 122° 40′ to 123° 05′).

4. A. F. Buckham commenced the study and mapping of the geology of an area on the east coast of Vancouver Island (latitude 49° 30′ to 49° 45′, longitude 124° 45′ to 125° 15′).

5. W. E. Snow continued the study and mapping of the geology of the Hope area, west half (latitude 49° to 50°, longitude 121° to 122°).

6. H. M. A. Rice commenced the study and mapping of the geology of the Hope area, east half (latitude 49° to 50°, longitude 120° to 121°).

7. W. E. Cockfield commenced the study and mapping of the geology of the Ashcroft area, east half (latitude 50° to 51°, longitude 120° to 121°).

TOPOGRAPHICAL PARTIES.

C. H. Smith mapped the Zeballos area (92 E/15, west half), latitude 49° 45′ to 50° 00′, longitude 126° 45′ to 127° 00′; and the Tahsis area (92 E/15, east half), latitude 49° 45′ to 50° 00′, longitude 126° 30′ to 126° 45′. This was for publication on a scale of 1 inch to 1 mile with 100-foot contours.

H. A. S. West mapped 90 per cent. of the west half of the Nelson sheet (82 F/6), longitude 117° 15′ to 117° 30′, latitude 49° 15′ to 49° 30′. This was for publication on a scale of 1 inch to 1 mile with 100-foot contours.

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 1939 was $36.141 per ounce. On this basis the average crude-gold value per ounce was $29.72 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 1939 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.

TABLES.

The collection and compilation of mining statistics was taken over on April 1st, 1939, by the Bureau of Economics and Statistics, Department of Trade and Industry. The Department of Mines Statistician, H. Pearson, was transferred to the Bureau on the same date.

The arrangement with the Dominion Bureau of Statistics for the collection of mining information is still in effect and no change has taken place, except to centralize to a greater extent the collection of statistical information in one Provincial department.

The Bureau of Economics and Statistics now prepares all the statistical tables in this report for the Department of Mines. The Bureau also supplies to the Department of Mines statistical information when required.

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.

D. E. Whittaker, Chief Analyst and Assayer, who retired at the end of the year after forty-two years' service with the Provincial Government, died on May 18th, 1940.

D. E. Whittaker was born in Providence, Rhode Island, in 1875, and came to Victoria in 1879, where he received his education at the city schools. He entered the Government service in August, 1897, as an apprentice to the Provincial Assayer and Public Analyst and was appointed Assistant Assayer in 1901. In 1913 he was also appointed Public Analyst and in 1925 he was promoted to Provincial Assayer, as well as Public Analyst. In 1937 he became Chief Assayer and Analyst, the office of Provincial Assayer and Public Analyst long since having been absorbed in the Department of Mines.

Mr. Whittaker's long and faithful service with the Department is deeply appreciated by all those with whom he had dealings.

INDEX TO TABLES.

TABLE I.—British Columbia Mine Production, 1938 and 1939.

	Quantity, 1938.	Quantity, 1939.	Value, 1938.	Value, 1939.	Per Cent. Increase (+) or Decrease (—). Quantity.	Per Cent. Increase (+) or Decrease (—). Value.
Metallics.			$	$		
Antimony				152,739		+100.0
Bismuth				466,362		+100.0
Cadmium			410,090	563,242		+ 37.3
Copper* lb.	65,769,906	73,254,679	6,558,575	7,392,862	+ 11.4	+ 12.7
Gold, lode† oz.	557,522	587,180	19,613,624	21,221,272	+ 5.3	+ 8.2
Gold, placer† oz.	57,759	49,746	1,671,015	1,478,492	— 13.9	— 11.5
Lead lb.	412,979,182	378,743,763	13,810,024	12,002,390	— 8.3	— 13.1
Mercury lb.	760	436	760	1,226	— 42.6	+ 61.3
Platinum oz.	16	32	515	1,122	+100.0	+117.9
Silver oz.	10,861,578	10,771,585	4,722,288	4,361,199	— 0.8	— 0.8
Tungsten concentrates				4,917		+100.0
Zinc lb.	298,497,295	278,409,102	9,172,822	8,544,375	— 6.7	— 6.9
Totals			55,959,713	56,190,198		+ 0.4
Fuel.						
Coal (2,240 lb.) tons	1,309,428	1,477,872	5,565,069	6,280,956	+ 13.0	+ 13.0
Non-metallics.						
Diatomaceous earth			363	448		+ 23.4
Fluxes limestone, quartz tons	21,089	35,144	16,676	23,090	+ 66.6	+ 27.8
Gypsum products, gypsite			171,372	99,703		— 41.8
Iron oxides, mica			4,560	8,017		+ 75.8
Slate and rock granules, talc tons	274	265	3,295	3,587	— 3.3	+ 8.8
Sodium carbonate, magnesium sulphate tons	722	850	11,668	12,300	+ 17.7	+ 5.4
Sulphur‡ tons	78,918	133,676	777,586	1,230,814	+ 69.4	+ 58.3
Totals			985,520	1,377,959		+ 39.8
Clay Products and other Structural Materials.						
Clay Products.						
Brick—						
Common No.	7,221,378	5,914,812	102,767	84,563	— 19.0	— 17.7
Face, paving, sewer brick No.	525,715	789,222	21,045	29,223	+ 48.2	+ 39.0
Firebricks, blocks			105,933	112,079		+ 5.8
Fireclay tons	467	592	6,489	8,324	+ 27.0	+ 28.3
Structural tile—hollow blocks			30,411	29,095		— 4.4
Drain tile, sewer pipe No.	953,240	1,084,408	87,139	88,649	+ 13.8	+ 1.7
Pottery—glazed or unglazed			9,699	11,360		+ 17.1
Bentonite; other clay products			2,486	8,873		+257.0
Totals			365,969	372,166		+ 1.7
Other Structural Materials.						
Cement			626,731	520,420		— 17.0
Lime and limestone tons	42,373	58,672	102,444	190,751	+ 38.5	+ 86.2
Sand and gravel			609,464	558,676		— 8.3
Stone—building, pulpstone tons	12,207	4,550	90,970	74,159	— 62.7	— 18.5
Rubble, riprap, crushed rock tons	230,538	140,514	179,671	116,262	— 39.5	— 35.3
Totals			1,609,280	1,460,268		— 9.3
Total value in Canadian funds			64,485,551	65,681,547		+ 1.9

* 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 additional gross amount of about $932,632 could be added to the above Provincial value for 1939.

† Canadian funds.

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

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 ,,	2.891 ,,	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 ,,
Average 1935–39 (inclusive)	35.306	47.752 ,,	10.082 ,,	3.734 ,,	3.491 ,,

NOTE.—In making comparisons with average prices used prior to 1926, 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 1926 was taken at "net"; silver, at 95 per cent.; lead, at 90 per cent.; and zinc, at 85 per cent. Subsequent to 1926 (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 1939.

Gold, placer	$87,410,451*
Gold, lode	248,771,468*
Silver	138,110,087
Copper	306,055,053
Lead	263,501,845
Zinc	159,841,335
Coal and coke	384,359,102
Structural materials	78,773,572
Miscellaneous minerals, etc.	17,164,825
Total	$1,683,987,738

* Canadian funds.

TABLE IV.—PRODUCTION FOR EACH YEAR FROM 1852 TO 1939 (INCLUSIVE).

1852 to 1895 (inclusive)	$94,547,370	1918	$41,782,474
1896	7,507,956	1919	33,296,313
1897	10,455,268	1920	35,543,084
1898	10,906,861	1921	28,066,641
1899	12,393,131	1922	35,162,843
1900	16,344,751	1923	41,304,320
1901	20,086,780	1924	48,704,604
1902	17,486,550	1925	61,492,242
1903	17,495,954	1926	67,188,842
1904	18,977,359	1927	60,729,358
1905	22,461,325	1928	65,372,583
1906	24,980,546	1929	68,245,443
1907	25,882,560	1930	55,391,993
1908	23,851,277	1931	34,883,181
1909	24,443,025	1932	*28,798,406
1910	26,377,066	1933	*32,602,672
1911	23,499,072	1934	*42,305,297
1912	32,440,800	1935	*48,821,239
1913	30,296,398	1936	*54,081,967
1914	26,388,825	1937	*74,475,902
1915	29,447,508	1938	*64,485,551
1916	42,290,462	1939	*65,681,547
1917	37,010,392		
		Total	$1,683,987,738

* Canadian funds.

TABLE V.—QUANTITIES AND VALUE OF MINE PRODUCTS FOR 1937, 1938, AND 1939.

Description.	1937.		1938.		1939.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Gold, placer* oz.	54,153	$1,558,245	57,759	$1,671,015	49,746	$1,478,492
Gold, lode* oz.	460,781	16,122,727	557,522	19,613,624	587,180	21,221,272
Silver oz.	11,308,685	5,075,451	10,861,578	4,722,288	10,771,586	4,361,199
Copper lb.	46,057,584	6,023,411	65,769,906	6,558,575	73,254,679	7,392,862
Lead lb.	419,118,371	21,416,949	412,979,182	13,810,024	378,743,763	12,002,390
Zinc lb.	291,192,278	14,274,245	298,497,295	9,172,822	278,409,102	8,544,375
Coal tons, 2,240 lb.	1,444,687	6,139,920	1,309,428	5,565,069	1,477,872	6,280,956
Structural materials		2,098,337		1,975,249		1,832,434
Miscellaneous metals and minerals		1,766,617		1,396,885		2,567,567
Totals		$74,475,902		$64,485,551		$65,681,547

* 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	17,381	.....	.....	204,800	9,216	.....	.....	26,547
1888	.....	.....	79,780	75,000	.....	.....	674,500	29,813	.....	.....	104,813
1889	.....	.....	53,192	47,873	.....	.....	165,100	6,498	.....	.....	54,371
1890	.....	.....	70,427	73,948	.....	.....	.....	.....	.....	.....	73,948
1891	.....	.....	4,500	4,000	.....	.....	.....	.....	.....	.....	4,000
1892	.....	.....	77,160	66,935	.....	.....	808,420	33,064	.....	.....	99,999
1893	1,170	23,404	227,000	195,000	.....	.....	2,135,023	78,996	.....	.....	297,400
1894	6,252	125,014	746,379	470,219	324,680	16,234	5,662,523	169,875	.....	.....	781,342
1895	39,270	785,400	1,496,522	977,229	952,840	47,642	16,475,464	532,255	.....	.....	2,342,526
1896	62,259	1,244,180	3,135,343	2,100,689	3,818,556	190,926	24,199,977	721,384	.....	.....	4,257,179
1897	106,141	2,122,820	5,472,971	3,272,836	5,325,180	266,258	38,841,135	1,390,517	.....	.....	7,052,431
1898	110,061	2,201,217	4,292,401	2,375,841	7,271,678	874,781	31,693,559	1,077,581	.....	.....	6,529,420
1899	138,315	2,857,573	2,939,413	1,663,708	7,722,591	1,351,453	21,862,436	878,870	.....	.....	6,751,604
1900	167,153	3,453,381	3,958,175	2,309,200	9,997,080	1,615,289	63,358,621	2,691,887	.....	.....	10,069,757
1901	210,384	4,348,605	4,396,447	2,462,008	27,603,746	4,446,963	51,582,906	2,010,260	.....	.....	13,267,836
1902	236,491	4,888,269	3,917,917	1,941,328	29,636,057	3,446,673	22,536,381	824,832	.....	.....	11,101,102
1903	232,831	4,812,616	2,996,204	1,521,472	34,359,921	4,547,535	18,089,283	689,744	.....	.....	11,571,367
1904	222,042	4,589,608	3,222,481	1,719,516	35,710,128	4,578,037	36,646,244	1,421,874	.....	.....	12,309,035
1905	238,660	4,933,102	3,439,417	1,971,818	37,692,251	5,876,222	56,580,703	2,399,022	.....	.....	15,180,164
1906	224,027	4,630,639	2,990,262	1,897,320	42,990,488	8,288,565	52,408,217	2,667,578	.....	.....	17,484,102
1907	196,179	4,055,020	2,745,448	1,703,825	40,832,720	8,166,544	47,738,703	2,291,458	.....	.....	16,216,847
1908	255,582	5,282,880	2,631,389	1,321,483	47,274,614	6,240,249	43,195,733	1,632,799	.....	.....	14,477,411
1909	238,224	4,924,090	2,532,742	1,239,270	45,597,245	5,918,522	44,396,346	1,709,259	8,500,000	400,000	14,191,141
1910	267,701	5,533,380	2,450,241	1,245,016	38,243,934	4,871,512	34,658,746	1,386,350	4,184,192	192,473	13,228,731
1911	228,617	4,725,513	1,892,364	958,293	36,927,656	4,571,644	26,872,397	1,069,521	2,634,544	129,092	11,454,063
1912	257,496	5,322,442	3,132,108	1,810,045	51,456,537	8,408,513	44,871,454	1,805,627	5,358,280	316,139	17,662,766
1913	272,254	5,627,490	3,465,856	1,968,606	46,460,305	7,094,489	55,364,677	2,175,832	6,758,768	324,421	17,190,838
1914	247,170	5,109,004	3,602,180	1,876,736	45,009,699	6,121,319	50,625,048	1,771,877	7,866,467	346,125	15,225,061
1915	250,021	5,167,934	3,366,506	1,588,991	56,918,405	9,335,500	46,503,590	1,939,200	12,982,440	1,460,524	19,992,149
1916	221,932	4,587,334	3,301,923	2,059,739	65,379,364	17,784,494	48,727,516	3,007,462	37,168,980	4,043,985	31,483,014
1917	114,523	2,367,190	2,929,216	2,265,749	59,007,565	16,038,256	37,307,465	2,951,020	41,848,513	3,166,259	26,788,474
1918	164,674	3,403,812	3,498,172	3,215,870	61,483,754	15,143,449	43,899,661	2,928,107	41,772,916	2,899,040	27,590,278
1919	152,426	3,150,645	3,403,119	3,592,673	42,459,339	7,939,896	29,475,968	1,526,855	56,737,651	3,540,429	19,750,498
1920	120,048	2,481,392	3,377,849	3,235,980	44,887,676	7,832,899	39,381,218	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	5,236,818	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	146,225,443	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	248,783,503	6,742,282	205,071,247	5,237,520	22,535,573
1932	181,564	4,261,307*	7,130,838	2,258,453	49,841,009	3,179,956	254,488,952	5,378,878	192,120,091	4,621,641	19,700,235
1933	223,529	6,392,929*	7,006,406	2,650,720	42,608,002	3,176,341	271,606,071	6,495,731	195,963,751	6,291,416	25,007,137
1934	297,130	10,250,985*	8,572,916	4,068,792	48,084,658	3,567,401	347,366,967	8,461,859	247,926,844	7,546,893	33,895,930
1935	365,244	12,852,936*	9,251,544	5,994,075	38,791,127	3,023,768	344,268,444	10,785,930	256,239,446	7,940,860	40,597,569
1936	404,472	14,168,654*	9,521,015	4,296,548	20,806,672	1,971,848	377,971,618	14,790,029	254,581,393	8,439,373	43,666,452
1937	460,781	16,122,727*	11,308,685	5,075,451	46,057,584	6,023,411	419,118,371	21,416,949	291,192,278	14,274,245	62,912,783
1938	557,522	19,613,624*	10,861,578	4,722,288	65,769,906	6,558,575	412,979,182	13,810,024	298,497,295	9,172,822	53,877,333
1939	587,180	21,221,272*	10,771,585	4,361,199	73,254,679	7,392,862	378,743,763	12,002,390	278,409,102	8,544,375	53,522,098
Totals	10,049,195	248,771,470	262,669,858	137,687,350	2,108,376,306	306,055,053	6,178,738,968	263,509,372	3,727,569,601	159,841,335	1,115,864,580

* Canadian funds.

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*
Totals	$87,410,451	$248,771,468	$336,181,919*

* Canadian funds.

TABLE VIII.—Output of Mine Products by Districts and Divisions, 1935, 1936, 1937, 1938, and 1939.

Names.	Divisions.					Districts.				
	1935.	1936.	1937.	1938.	1939.	1935.	1936.	1937.	1938.	1939.
North-western District						$4,543,389	$2,904,200	$3,273,581	$4,039,662	$4,471,099
Atlin, Stikine, and Liard*	$406,378	$549,047	$663,570	$1,261,309	$1,271,259					
Nass River†	2,221,212	61,834								
Portland Canal	1,636,954	2,053,210	2,213,728	2,411,757	2,449,304					
Skeena, Queen Charlotte, and Bella Coola‡	278,845	240,109	396,283	366,596	750,536					
North-eastern District						1,717,546	1,998,344	2,418,194	3,004,755	3,336,569
Cariboo and Quesnel	1,618,191	1,867,539	2,275,097	2,852,392	3,172,102					
Omineca and Peace River	99,355	130,805	143,097	152,363	164,467					
South Central District						2,894,642	3,321,537	4,961,159	7,658,839	7,811,711
Nicola and Vernon	315,550	194,490	255,320	138,828	126,142					
Kamloops	248,891	437,550	364,789	429,168	207,642					
Grand Forks, Greenwood, and Osoyoos	1,799,685	2,118,630	2,643,559	3,027,462	2,804,441					
Similkameen	530,516	570,867	1,697,491	4,063,381	4,673,486					
South-eastern District						28,994,311	33,258,173	48,020,055	34,761,321	32,800,780
Fort Steele	23,067,831	27,089,325	39,507,405	27,279,192	24,505,887					
Windermere and Golden	530,863	12,513	16,770	15,443	9,575					
Ainsworth	215,104	55,962	268,820	34,789	41,521					
Slocan and Slocan City§	406,133	194,696	667,696	127,706	79,887					
Nelson and Arrow Lake	1,991,723	3,051,401	4,267,950	4,721,998	4,107,126					
Trail Creek	2,582,959	2,742,916	3,224,300	2,523,800	4,024,299					
Revelstoke and Lardeau	199,698	111,460	67,114	58,393	32,485					
South-western District						10,671,351	12,599,713	15,802,913	15,020,974	17,261,388
Nanaimo, Alberni, Clayoquot, Quatsino, and Victoria	3,262,171	3,881,722	4,463,293	4,499,167	5,989,856					
Vancouver, New Westminster, and Lillooet‖	7,172,367	8,303,079	11,069,818	10,315,933	11,091,525					
Yale, Ashcroft, and Clinton	236,813	414,912		205,874	180,007					
Totals¶	$48,821,239	$54,081,967	$74,475,902	$64,485,551	$65,681,547	$48,821,239	$54,081,967	$74,475,902	$64,485,551	$65,681,547

* Liard Mining Division combined with Stikine Mining Division from and including 1937.
† Nass River Mining Division combined with Portland Canal Mining Division from and including 1937.
‡ Stikine and Bella Coola Divisions combined as Stikine Division as from September, 1939.
§ Slocan and Slocan City Divisions combined as Slocan Division as from November, 1939.
‖ New Westminster and Yale Divisions combined as New Westminster Division as from July, 1939.
¶ Canadian funds.

TABLE IX.A.—Detail of Placer Gold, Lode Gold, and Silver in 1938 and 1939.

Districts and Divisions.	Year.	Tons.	Gold—Placer.		Gold—Lode.		Silver.	
			Ounces.	Value.	Ounces.	Value.	Ounces.	Value.
				$		$		$
North-western District:								
Atlin	1938	58,759	24,871	719,538	12,765	449,073	.....	.....
	1939	**68,969**	**17,958**	**533,727**	**16,997**	**614,288**	**830**	**336**
Portland Canal	1938	339,027	13	376	57,616	2,026,931	824,211	358,342
	1939	**373,987**	**2**	**59**	**56,413**	**2,038,822**	**944,779**	**382,522**
Queen Charlotte	1938	.....	75	2,170	.....	.....	.....	.....
	1939	**15**	**68**	**2,021**	**127**	**4,590**	**9**	**4**
Skeena*	1938	21,052	26	752	8,872	312,117	7,817	3,399
	1939	**34,051**	**33**	**981**	**18,034**	**651,767**	**13,544**	**5,484**
Stikine	1938	.....	2,181	63,098	.....	.....	.....	.....
	1939	**130**	**3,475**	**103,280**	**114**	**4,120**	**20**	**8**
North-eastern District:								
Cariboo	1938	149,893	13,616	393,922	62,105	2,184,854	6,304	2,741
	1939	**166,916**	**10,868**	**323,005**	**70,418**	**2,544,977**	**8,845**	**3,581**
Omineca	1938	.....	3,728	107,854	.....	.....	.....	.....
	1939	**60**	**3,860**	**114,722**	**13**	**470**	**4,593**	**1,859**
Peace River	1938	.....	155	4,484	.....	.....	.....	.....
	1939	.....	**218**	**6,479**	.....	.....	.....	.....
Quesnel	1938	.....	8,283	239,634	.....	.....	.....	.....
	1939	**2,250**	**8,500**	**252,627**	**198**	**7,156**	**271**	**110**
South Central District:								
Kamloops	1938	19,445	172	4,976	6,208	218,397	969	421
	1939	**9,774**	**225**	**6,687**	**1,836**	**66,355**	**792**	**321**
Nicola	1938	16	.....	.....	.....	.....	5,520	2,400
	1939	.....	**2**	**60**	.....	.....	.....	.....
Vernon	1938	1,277	148	4,282	378	13,298	1,274	554
	1939	**1,078**	**149**	**4,428**	**441**	**15,938**	**385**	**156**
Grand Forks	1938	1,980	27	781	673	23,676	3,861	1,679
	1939	**2,678**	**15**	**446**	**1,069**	**38,635**	**3,797**	**1,537**
Greenwood	1938	28,841	156	4,513	4,655	163,763	998,636	434,177
	1939	**28,198**	**165**	**4,904**	**4,903**	**177,199**	**961,486**	**389,287**
Osoyoos	1938	247,294	12	347	62,563	2,200,966	57,867	25,159
	1939	**223,412**	**9**	**268**	**55,990**	**2,023,535**	**34,082**	**13,799**
Similkameen	1938	1,223,214	324	9,374	8,749	307,790	214,705	93,347
	1939	**1,452,230**	**247**	**7,341**	**12,423**	**448,979**	**242,727**	**98,275**
South-eastern District:								
Ainsworth	1938	968	31	897	507	17,836	8,261	3,592
	1939	**944**	**12**	**357**	**325**	**11,746**	**15,055**	**6,095**
Arrow Lake	1938	50	2	58	19	669	93	40
	1939	.....	**6**	**178**	.....	.....	.....	.....
Fort Steele	1938	2,273,264	957	27,687	79	2,779	8,012,355	3,483,532
	1939	**2,091,362**	**652**	**19,378**	**83**	**2,999**	**7,976,707**	**3,229,609**
Golden	1938	.....	16	463	.....	.....	.....	.....
	1939	.....	**11**	**327**	.....	.....	.....	.....
Lardeau	1938	367	.....	.....	272	9,569	15,288	6,647
	1939	**1,186**	**9**	**268**	**376**	**13,589**	**204**	**83**
Nelson	1938	332,274	232	6,712	124,957	4,395,987	225,620	98,093
	1939	**277,886**	**364**	**10,818**	**107,631**	**3,889,892**	**148,184**	**59,997**
Revelstoke	1938	.....	144	4,166	.....	.....	.....	.....
	1939	.....	**111**	**3,299**	.....	.....	.....	.....
Slocan	1938	4,867	.....	.....	89	3,131	123,799	53,824
	1939	**1,026**	**6**	**178**	**118**	**4,265**	**109,506**	**44,337**
Slocan City	1938	880	10	289	105	3,694	68,741	29,886
	1939	**651**	.....	.....	**88**	**3,180**	**26,357**	**10,671**
Trail Creek	1938	119,038	216	6,249	8,496	298,889	60,649	26,368
	1939	**18,446**	**251**	**7,460**	**8,635**	**312,078**	**8,489**	**3,437**
Windermere	1938	.....	2	58	.....	.....	.....	.....
	1939	.....	**4**	**119**	.....	.....	.....	.....
South-western District:								
Alberni	1938	75	.....	.....	23	809	28	12
	1939	**3,125**	**2**	**60**	**984**	**35,563**	**1,905**	**771**
Ashcroft	1938	.....	504	14,581	.....	.....	.....	.....
	1939	.....	**570**	**16,941**	.....	.....	.....	.....
Clayoquot	1938	26,483	.....	.....	17,979	632,501	11,750	5,108
	1939	**57,929**	.....	.....	**54,892**	**1,983,852**	**18,750**	**7,592**
Clinton	1938	6,765	969	28,034	3,289	115,707	3,926	1,707
	1939	**6,552**	**727**	**21,607**	**3,206**	**115,868**	**3,155**	**1,277**
Lillooet	1938	308,646	549	15,883	162,215	5,706,724	44,830	19,491
	1939	**272,952**	**627**	**18,635**	**148,475**	**5,366,035**	**42,872**	**17,358**
Nanaimo	1938	423	2	58	63	2,216	61	26
	1939	**325**	**8**	**238**	**146**	**5,276**	**233**	**94**
New Westminster	1938	.....	211	6,104	.....	.....	.....	.....
	1939	**572**	**508**	**15,098**	**352**	**12,722**	**279**	**113**
Quatsino	1938	.....	.....	.....	.....	.....	.....	.....
	1939	.....	.....	.....	.....	.....	.....	.....
Vancouver	1938	2,212,106	.....	.....	14,769	519,574	164,930	71,707
	1939	**2,113,972**	**69**	**2,051**	**22,893**	**827,376**	**203,729**	**82,486**
Victoria	1938	3	4	116	.....	.....	14	6
	1939	.....	**15**	**445**	.....	.....	.....	.....
Yale	1938	84	123	3,559	76	2,674	69	30
	1939	.....	.....	.....	.....	.....	.....	.....
Totals	1938	7,377,091	57,759	†1,671,051	557,522	19,613,624	10,861,578	4,722,288
	1939	**7,210,676**	**49,748**	**†1,478,492**	**587,180**	**21,221,272**	**10,771,585**	**4,361,199**

From and including 1937 the Liard Mining Division is combined with Stikine Mining Division.
From and including 1937 the Nass River Mining Division is combined with the Portland Canal Mining Division.
New Westminster and Yale Mining Divisions consolidated as the New Westminster Mining Division from July, 1939.
Stikine and Bella Coola Mining Divisions consolidated as the Stikine Mining Division from September, 1939.
Slocan and Slocan City Mining Divisions consolidated as the Slocan Mining Division from November, 1939.
* Includes all shipments to Government sampling plant at Prince Rupert during 1938 and 1939.
† Includes placer gold purchased by Gold Commissioners from "snipers" and others, and in many instances was not obtained in the mining division where sold, but disposed of at the most convenient place.

TABLE IX.B.—PRODUCTION IN DETAIL OF COPPER, LEAD, AND ZINC IN 1938 AND 1939.

DISTRICTS AND DIVISIONS.	YEAR.	COPPER.		LEAD.		ZINC.	
		Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
North-western District:			$		$		$
Atlin	1938						
	1939						
Portland Canal	1938	303	30	779,834	26,078		
	1939			**880,427**	**27,901**		
Queen Charlotte	1938						
	1939	**125,736**	**12,689**				
Skeena	1938	133,851	13,348				
	1939			**21,779**	**690**	**8,996**	**276**
Stikine	1938						
	1939						
North-eastern District:							
Cariboo	1938						
	1939						
Omineca	1938						
	1939			**42,629**	**1,351**	**12,713**	**390**
Peace River	1938						
	1939						
Quesnel	1938						
	1939						
South Central District:							
Kamloops	1938	97,094	9,682				
	1939	**116,645**	**11,772**				
Nicola	1938			5,328	178	6,616	203
	1939						
Vernon	1938			880	30	322	10
	1939						
Grand Forks	1938	6,146	613	1,559	52	1,481	45
	1939	**1,608**	**162**	**1,368**	**43**	**17,192**	**528**
Greenwood	1938	240,048	23,938	636,464	21,283	807,344	24,810
	1939	**338,798**	**34,232**	**610,831**	**19,357**	**792,935**	**24,335**
Osoyoos	1938	372,596	37,155	34,869	1,166	287	9
	1939	**338,417**	**34,153**	**18,857**	**598**	**406**	**12**
Similkameen	1938	29,652,613	2,956,958				
	1939	**33,430,508**	**3,373,807**	**3,116**	**99**	**657**	**20**
South-eastern District:							
Ainsworth	1938			72,168	2,413	24,760	761
	1939			**124,432**	**3,943**	**45,372**	**1,393**
Arrow Lake	1938						
	1939						
Fort Steele	1938			406,222,153	13,584,069	267,766,054	8,228,451
	1939			**372,991,646**	**11,820,105**	**228,104,177**	**7,000,517**
Golden	1938						
	1939						
Lardeau	1938			258,718	8,652	73,598	2,262
	1939			**526**	**17**	**28**	**1**
Nelson	1938			3,890,303	130,092	1,547,177	47,545
	1939			**1,841,307**	**58,351**	**1,223,560**	**37,551**
Revelstoke	1938						
	1939						
Slocan	1938			500,658	16,742	637,388	19,587
	1939			**377,536**	**11,964**	**158,960**	**4,879**
Slocan City	1938			12,198	408	4,723	145
	1939			**8,477**	**269**	**4,701**	**144**
Trail Creek*	1938	1,700,694	169,593	287,362	9,609	27,627,545	848,994
	1939	**1,659,104**	**167,437**	**1,651,992**	**52,352**	**48,039,405**	**1,474,329**
Windermere	1938						
	1939						
South-western District:							
Alberni	1938	4,362	435				
	1939	**170,240**	**17,181**	**6,339**	**201**		
Ashcroft	1938						
	1939						
Clayoquot	1938	189,738	18,921	6,754	226		
	1939	**141**	**14**	**11,625**	**368**		
Clinton	1938	2,267	226				
	1939	**375**	**38**				
Lillooet	1938	109	11				
	1939	**96**	**10**	**1,561**	**49**		
Nanaimo	1938	301	30				
	1939	**3,591**	**362**				
New Westminster	1938						
	1939	**3,242**	**327**				
Quatsino	1938						
	1939						
Vancouver	1938	33,368,792	3,327,536	269,934	9,026		
	1939	**37,065,178**	**3,740,618**	**149,315**	**4,732**		
Victoria	1938	685	68				
	1939						
Yale	1938	307	31				
	1939						
Totals	1938	65,769,906	6,558,575	412,979,182	13,810,024	298,497,295	9,172,822
	1939	**73,254,679**	**7,392,862**	**378,743,763**	**12,002,390**	**278,409,102**	**8,544,375**

* Includes zinc and lead recovered from slag and reclaimed slags which cannot be credited to individual mines.

TABLE IX.c.—Production Value of Placer Gold, Lode Gold, Silver, Copper, Lead, Zinc in 1938 and 1939.

Districts and Divisions.	Mining Division Total.		District Total.	
	1938.	1939.	1938.	1939.
	$	$	$	$
North-western District	.....	.....	3,975,252	**4,383,565**
Atlin	1,168,611	**1,148,351**	.....	.....
Portland Canal	2,411,757	**2,449,304**	.....	.....
Queen Charlotte	2,170	**19,304**	.....	.....
Skeena	329,616	**659,198**	.....	.....
Stikine	63,098	**107,408**	.....	.....
North-eastern District	.....	.....	2,933,489	**3,256,727**
Cariboo	2,581,517	**2,871,563**	.....	.....
Omineca	107,854	**118,792**	.....	.....
Peace River	4,484	**6,479**	.....	.....
Quesnel	239,634	**259,893**	.....	.....
South Central District	.....	.....	6,586,032	**6,797,328**
Kamloops	233,476	**85,135**	.....	.....
Nicola	2,781	**60**	.....	.....
Vernon	18,174	**20,522**	.....	.....
Grand Forks	26,846	**41,351**	.....	.....
Greenwood	672,484	**649,374**	.....	.....
Osoyoos	2,264,802	**2,072,365**	.....	.....
Similkameen	3,367,469	**3,928,521**	.....	.....
South-eastern District	.....	.....	31,550,438	**28,267,612**
Ainsworth	25,490	**23,534**	.....	.....
Arrow Lake	767	**178**	.....	.....
Fort Steele	25,326,518	**22,072,608**	.....	.....
Golden	463	**327**	.....	.....
Lardeau	27,130	**13,958**	.....	.....
Nelson	4,678,429	**4,056,609**	.....	.....
Revelstoke	4,166	**3,299**	.....	.....
Slocan	93,284	**65,623**	.....	.....
Slocan City	34,422	**14,264**	.....	.....
Trail Creek	1,359,702	**2,017,093**	.....	.....
Windermere	58	**119**	.....	.....
South-western District	.....	.....	10,503,137	**12,295,358**
Alberni	1,256	**53,776**	.....	.....
Ashcroft	14,581	**16,941**	.....	.....
Clayoquot	656,756	**1,991,826**	.....	.....
Clinton	145,674	**138,790**	.....	.....
Lillooet	5,742,109	**5,402,087**	.....	.....
Nanaimo	2,330	**5,970**	.....	.....
New Westminster	6,104	**28,260**	.....	.....
Quatsino	.....	.....	.....	.....
Vancouver	3,927,843	**4,657,263**	.....	.....
Victoria	190	**445**	.....	.....
Yale	6,294	.....	.....	.....
Totals	55,548,348	**55,000,590**	55,548,348	**55,000,590**

From and including 1937 the Liard Mining Division is combined with Stikine Mining Division.
From and including 1937 the Nass River Mining Division is combined with the Portland Canal Mining Division.
New Westminster and Yale Mining Divisions consolidated as the New Westminster Mining Division from July, 1939.
Stikine and Bella Coola Mining Divisions consolidated as the Stikine Mining Division from September, 1939.
Slocan and Slocan City Mining Divisions consolidated as the Slocan Mining Division from November, 1939.

TABLE IX.D.—Production of Placer Gold, Lode Gold, and Silver, 1900–1939.

Districts and Divisions.	Gold—Placer.		Gold—Lode.		Silver.	
	Ounces.	Value.	Ounces.	Value.	Ounces.	Value.
North-western District:		$		$		$
Atlin*	545,755	12,200,222	47,553	1,433,380	53,283	32,626
Bella Coola	5	104	.....	.....	.....	.....
Liard	14,356	285,770	.....	.....	.....	.....
Nass River	175	3,500	124,395	2,765,216	8,175,679	5,604,918
Portland Canal	23	665	1,513,034	37,612,268	38,735,691	20,788,664
Queen Charlotte	1,553	35,465	2,080	45,764	29,422	16,920
Skeena	2,151	44,683	375,435	8,498,040	212,207	156,571
Stikine	11,007	355,372	114	4,120	20	8
District totals	575,025	12,925,781	2,062,611	50,358,788	47,206,302	26,599,707
North-eastern District:						
Cariboo†	1,884,971	38,159,749	267,853	9,418,639	31,232	14,439
Omineca	33,099	798,766	8,267	183,262	2,244,490	1,413,245
Peace River	3,767	84,035	.....	.....	.....	.....
Quesnel‡	605,243	12,407,800	198	7,156	271	110
District totals	2,527,080	51,450,350	276,318	9,609,057	2,275,993	1,427,794
South Central District:						
Kamloops	2,751	65,071	38,604	1,288,419	279,472	166,536
Nicola	230	4,652	7,932	212,100	238,678	115,335
Vernon	1,411	33,406	4,310	140,913	6,683	3,406
Grand Forks	666	14,098	165,549	3,588,191	1,944,781	856,720
Greenwood	3,098	72,861	905,387	19,244,804	16,638,297	8,817,612
Osoyoos	182	3,889	853,038	21,210,007	476,617	310,025
Similkameen	6,211	132,945	47,118	1,323,317	1,279,125	631,494
District totals	11,798	326,922	2,021,938	47,007,751	20,863,653	10,901,128
South-eastern District:						
Ainsworth	212	5,658	2,673	66,937	6,480,044	3,912,191
Arrow Lake	115	2,598	180	4,052	13,699	10,527
Fort Steele	15,884	357,280	2,475	54,769	103,087,337	51,300,844
Golden	214	4,921	6	124	388,762	197,445
Lardeau	872	20,052	19,048	525,590	152,554	84,456
Nelson	2,832	68,798	940,861	27,206,087	3,835,353	2,112,380
Revelstoke	3,778	79,226	12	335	50,097	31,309
Slocan	7	207	4,008	90,172	35,453,941	21,746,042
Slocan City	24	664	1,655	41,954	3,440,150	2,000,607
Trail Creek	844	24,049	2,582,343	54,726,017	3,220,542	1,806,283
Trout Lake	861	17,137	5,502	113,725	1,920,701	1,030,840
Windermere	220	5,279	64	1,323	705,682	503,498
District totals	25,863	585,869	3,558,827	82,831,085	158,748,862	84,736,422
South-western District:						
Alberni	268	5,563	1,393	49,155	3,486	1,694
Ashcroft	10,085	224,486	8,476	289,680	16,804	9,513
Clayoquot	1,308	26,436	77,848	2,775,348	57,386	31,175
Clinton	8,797	200,160	22,031	774,900	30,261	13,715
Lillooet§	89,367	1,817,788	1,140,712	37,361,583	313,160	145,599
Nanaimo	225	4,710	66,866	1,887,904	512,827	295,763
New Westminster	1,732	46,701	352	12,722	547	280
Quatsino	233	4,902	59	1,219	4,245	2,157
Vancouver	182	5,306	223,667	6,122,819	3,072,625	1,723,182
Victoria	438	9,714	35,348	730,644	734,287	399,098
Yale	7,423	152,529	3,455	78,182	6,532	3,270
District totals	120,058	2,498,295	1,580,207	49,584,156	4,752,160	2,625,446
Provincial totals	3,259,824	67,787,217	9,499,901	239,390,837	233,846,970	126,290,497

From and including 1937 the Liard Mining Division is combined with Stikine Mining Division.
From and including 1937 the Nass River Mining Division is combined with the Portland Canal Mining Division.
From and including 1931 the Trout Lake Mining Division was combined with Lardeau Mining Division.
New Westminster and Yale Mining Divisions consolidated as the New Westminster Mining Division from July, 1939.
Stikine and Bella Coola Mining Divisions consolidated as the Stikine Mining Division from September, 1939.
Slocan and Slocan City Mining Divisions consolidated as the Slocan Mining Division from November, 1939.
* Atlin totals include estimated placer gold production from and including 1898.
† Cariboo totals include estimated placer gold production from and including 1858.
‡ Quesnel totals include estimated placer gold production from and including 1858.
§ Lillooet totals include estimated placer gold production from and including 1874.

TABLE IX.E.—PRODUCTION OF COPPER, LEAD, AND ZINC, 1900–1939.

DISTRICTS AND DIVISIONS.	COPPER.		LEAD.		ZINC.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
North-western District:		$		$		$
Atlin	83,161	11,949	109,945	7,036	.....	.....
Bella Coola	.....	.....	.....	.....	.....	.....
Liard	.....	.....	.....	.....	.....	.....
Nass River	645,243,514	96,155,780	50,148	2,621	.....	.....
Portland Canal	3,896,838	579,919	21,376,219	937,863	1,867,664	110,254
Queen Charlotte	1,583,277	289,160	.....	.....	.....	.....
Skeena	5,653,225	883,032	21,779	690	8,996	276
Stikine	.....	.....	.....	.....	.....	.....
District totals	656,460,015	97,919,840	21,558,091	948,210	1,876,660	110,530
North-eastern District:						
Cariboo	.....	.....	656	30	492	16
Omineca	6,050,228	1,338,025	5,893,907	334,186	3,802,301	243,274
Peace River	.....	.....	.....	.....	.....	.....
Quesnel	.....	.....	.....	.....	.....	.....
District totals	6,050,228	1,338,025	5,894,563	334,216	3,802,793	243,290
South Central District:						
Kamloops	5,715,138	1,016,450	367,164	20,687	406,758	25,981
Nicola	536,304	103,443	2,098,415	84,604	233,677	7,561
Vernon	614	89	6,331	292	2,764	147
Grand Forks	47,137,964	7,327,003	416,512	18,406	568,729	14,529
Greenwood	393,846,684	63,147,334	6,965,319	288,295	5,767,077	192,616
Osoyoos	1,536,320	170,878	252,418	7,475	5,209	163
Similkameen	169,652,123	21,865,294	238,577	9,006	64,377	2,616
District totals	618,425,147	93,630,491	10,344,736	423,765	7,048,591	243,613
South-eastern District:						
Ainsworth	10,175	1,201	120,974,367	5,961,447	33,712,651	1,008,264
Arrow Lake	216,034	41,651	24,734	1,564	140	4
Fort Steele	28,592	6,193	5,435,417,404	230,866,676	3,275,094,816	137,538,404
Golden	10,822	1,949	54,189,305	1,717,514	53,392,821	1,750,083
Lardeau	155	12	984,663	45,187	228,012	10,748
Nelson	5,685,261	889,008	48,544,026	2,171,865	20,405,408	1,317,134
Revelstoke	683	124	939,741	55,885	8,093	469
Slocan	3,284	636	285,578,788	13,733,136	159,106,043	10,834,459
Slocan City	.....	.....	5,698,786	235,882	568,313	35,012
Trail Creek	113,288,249	16,972,068	16,571,054	674,196	153,688,018	5,148,138
Trout Lake	5,439	773	8,502,337	334,396	62,705	4,233
Windermere	46,556	8,641	13,298,509	829,410	592,765	33,011
District totals	119,295,350	17,922,256	5,991,223,664	256,627,108	3,696,859,785	157,679,909
South-western District:						
Alberni	483,886	68,510	6,602	209	.....	.....
Ashcroft	633,775	155,721	99	4	.....	.....
Clayoquot	1,289,707	219,239	22,712	813	.....	.....
Clinton	56,940	5,844	193	7	.....	.....
Lillooet	205	21	61,789	2,519	.....	.....
Nanaimo	20,045,042	3,173,635	.....	.....	.....	.....
New Westminster	24,954	6,224	.....	.....	.....	.....
Quatsino	174,642	27,693	.....	.....	.....	.....
Vancouver	608,015,792	85,828,821	7,169,673	250,268	17,981,772	563,988
Victoria	20,505,707	3,049,838	.....	.....	.....	.....
Yale	333	34	12,088	541	.....	.....
District totals	651,230,983	92,535,580	7,273,156	254,361	17,981,772	563,988
Provincial totals	2,051,461,723	303,346,192	6,036,294,210	258,587,660	3,727,569,601	158,841,330

From and including 1937 the Liard Mining Division is combined with Stikine Mining Division.
From and including 1937 the Nass River Mining Division is combined with the Portland Canal Mining Division.
From and including 1931 the Trout Lake Mining Division was combined with Lardeau Mining Division.
New Westminster and Yale Mining Divisions consolidated as the New Westminster Mining Division from July, 1939.
Stikine and Bella Coola Mining Divisions consolidated as the Stikine Mining Division from September, 1939.
Slocan and Slocan City Mining Divisions consolidated as the Slocan Mining Division from November, 1939.

TABLE IX.F.—Production Value of Placer Gold, Lode Gold, Silver, Copper, Lead, and Zinc, by Mining Divisions and Districts, 1900–1939.

Districts and Divisions.	Mining Division Total.	District Total.
	$	$
North-western District		**188,862,856**
Atlin*	13,685,213	
Bella Coola	104	
Liard	285,770	
Nass River	104,532,035	
Portland Canal	60,029,633	
Queen Charlotte	387,309	
Skeena	9,583,292	
Stikine	359,500	
North-eastern District		**64,402,732**
Cariboo†	47,592,873	
Omineca	4,310,758	
Peace River	84,035	
Quesnel‡	12,415,066	
South Central District		**152,533,670**
Kamloops	2,583,144	
Nicola	527,695	
Vernon	178,253	
Grand Forks	11,813,947	
Greenwood	91,763,522	
Osoyoos	21,702,437	
Similkameen	23,964,672	
South-eastern District		**600,382,649**
Ainsworth	10,955,698	
Arrow Lake	60,396	
Fort Steele	420,124,166	
Golden	3,671,986	
Lardeau	686,045	
Nelson	33,765,272	
Revelstoke	167,348	
Slocan	46,404,652	
Slocan City	2,314,069	
Trail Creek	79,350,751	
Trout Lake	1,501,104	
Windermere	1,381,162	
South-western District		**148,061,826**
Alberni	125,131	
Ashcroft	679,404	
Clayoquot	3,053,011	
Clinton	994,626	
Lillooet§	39,327,510	
Nanaimo	4,862,012	
New Westminster	65,927	
Quatsino	35,971	
Vancouver	94,494,384	
Victoria	4,189,294	
Yale	234,556	
Provincial totals	1,154,243,733	**1,154,243,733**

From and including 1937 the Liard Mining Division is combined with Stikine Mining Division.
From and including 1937 the Nass River Mining Division is combined with the Portland Canal Mining Division.
From and including 1931 the Trout Lake Mining Division was combined with Lardeau Mining Division.
New Westminster and Yale Mining Divisions consolidated as the New Westminster Mining Division from July, 1939.
Stikine and Bella Coola Mining Divisions consolidated as the Stikine Mining Division from September, 1939.
Slocan and Slocan City Mining Divisions consolidated as the Slocan Mining Division from November, 1939.
* Atlin totals include estimated placer gold production from and including 1898.
† Cariboo totals include estimated placer gold production from and including 1858.
‡ Quesnel totals include estimated placer gold production from and including 1858.
§ Lillooet totals include estimated placer gold production from and including 1874.

TABLE X.—Production in Detail of Structural Materials, 1939.

Districts and Divisions.	Cement.	Lime and Limestone.	Building-stone.	Riprap and Crushed Rock.	Sand and Gravel.	Brick (Common).	Face, Paving, and Sewer Brick.	Firebrick, Blocks.	Fireclay.	Structural Tile, Hollow.	Drain-tile and Sewer-pipe.	Pottery, Glazed or Unglazed.	Other Clay Products.	Divisions.	Districts.
	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$
North-western District															85,434
Atlin and Stikine				8,715	6,785									15,500	
Portland Canal															
Skeena and Queen Charlotte				20,494	29,440									49,934	
Bella Coola		20,000												20,000	
North-eastern District															49,230
Cariboo and Quesnel				1,453	32,762								480	34,695	
Omineca and Peace River		5		4,346	10,184									14,535	
South Central District															74,329
Nicola, Vernon, and Kamloops			2,000	870	23,002	3,238				4,920	460			34,490	
Grand Forks and Greenwood				340	2,648									2,988	
Osoyoos				244	20,256									20,500	
Similkameen				27	15,297								1,027	16,351	
South-eastern District															159,710
Fort Steele				1,020	43,937									44,957	
Windermere and Golden				262	8,707									8,969	
Ainsworth				700	17,287									17,987	
Slocan and Slocan City															
Nelson			6,372		43,967									50,339	
Trail Creek				6,060	14,170									20,230	
Revelstoke			2,000	3,212	12,016									17,228	
South-western District															1,463,731
Nanaimo and Alberni		160,757	23,000	1,925	21,990	14,106								221,778	
Victoria and Quatsino	520,420	9,989		4,573	74,310	31,799	120			4,728	8,732	4,271	258	659,200	
Lillooet				1,786	8,870									10,656	
Yale				1,792	7,655									9,447	
Clinton															
Ashcroft				825										825	
Vancouver			40,787	16,785	80,963							7,089		145,624	
New Westminster				40,833	84,430	35,420	29,103	112,079	7,844	19,447	79,457		7,588	416,201	
Totals	520,420	190,751	74,159	116,262	558,676	84,563	29,223	112,079	7,844	29,095	88,649	11,360	9,353	1,832,434	1,832,434

TABLE XI.—PRODUCTION IN DETAIL OF MISCELLANEOUS METALS, MINERALS, AND MATERIALS, 1939.

Districts and Divisions.	Antimony.	Bismuth.	Cadmium.	Diatomite.	Flux (Limestone and Quartz).	Gypsum Products.	Iron Oxides.	Mercury.	Platinum.	Slate and Rock Granules.	Soda and Magnesium Sulphate.	Sulphur (Elemental) and Sulphur Content of Pyrite and Sulphuric Acid manufactured.	Tungsten Concentrates.	Others.	Division Totals.	District Totals.
	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$
North-western District																2,100
Atlin and Stikine																
Portland Canal																
Skeena and Queen Charlotte														2,100	2,100	
North-eastern District																10,348
Cariboo and Quesnel				403					631				4,917		5,951	
Omineca and Peace River	4,397														4,397	
South Central District																118,057
Nicola, Vernon, and Kamloops						99,703									99,703	
Grand Forks and Greenwood					17,863										17,863	
Osoyoos and Similkameen									491						491	
South-eastern District																1,985,136
Fort Steele																
Windermere and Golden							160								160	
Ainsworth																
Slocan and Slocan City																
Nelson and Arrow Lake																
Trail Creek and Revelstoke	148,343	466,362	563,242									807,030			1,984,976	
South-western District																451,926
Nanaimo and Alberni				45	5,227										5,272	
Victoria and Quatsino										2,920					2,920	
Lillooet and Clinton								1,226			2,400				3,626	
Yale and Ashcroft											9,900				9,900	
Vancouver and New Westminster							5,757			667		423,784			430,208	
Totals	152,739	466,362	563,242	448	23,090	99,703	5,917	1,226	1,122	3,587	12,300	1,230,814	4,917	2,100	2,567,567	2,567,567

TABLE XII.—British Columbia Mine Production, 1895–1939.

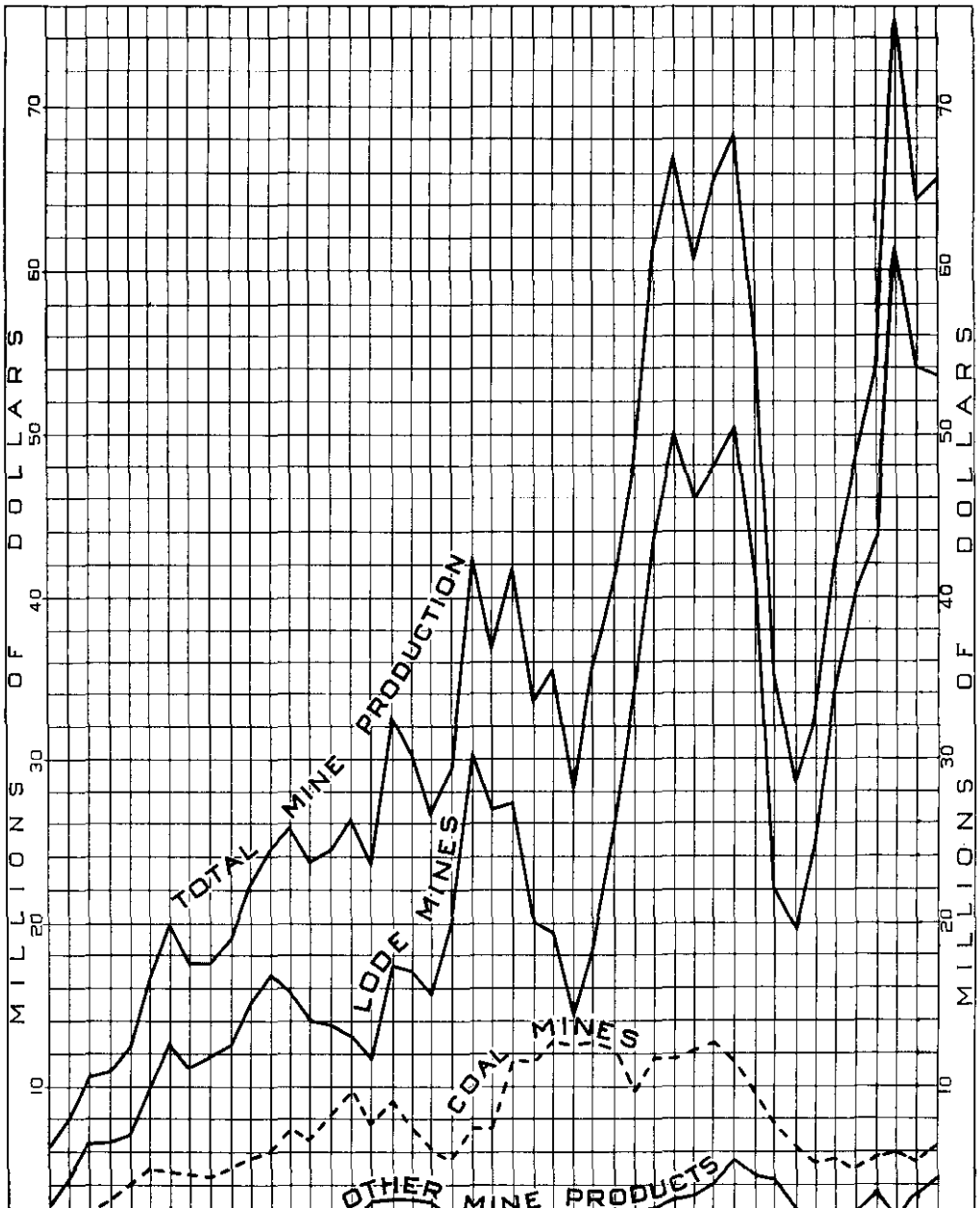


TABLE XIII.—Production of Lode Mines in British Columbia, 1913–1939.

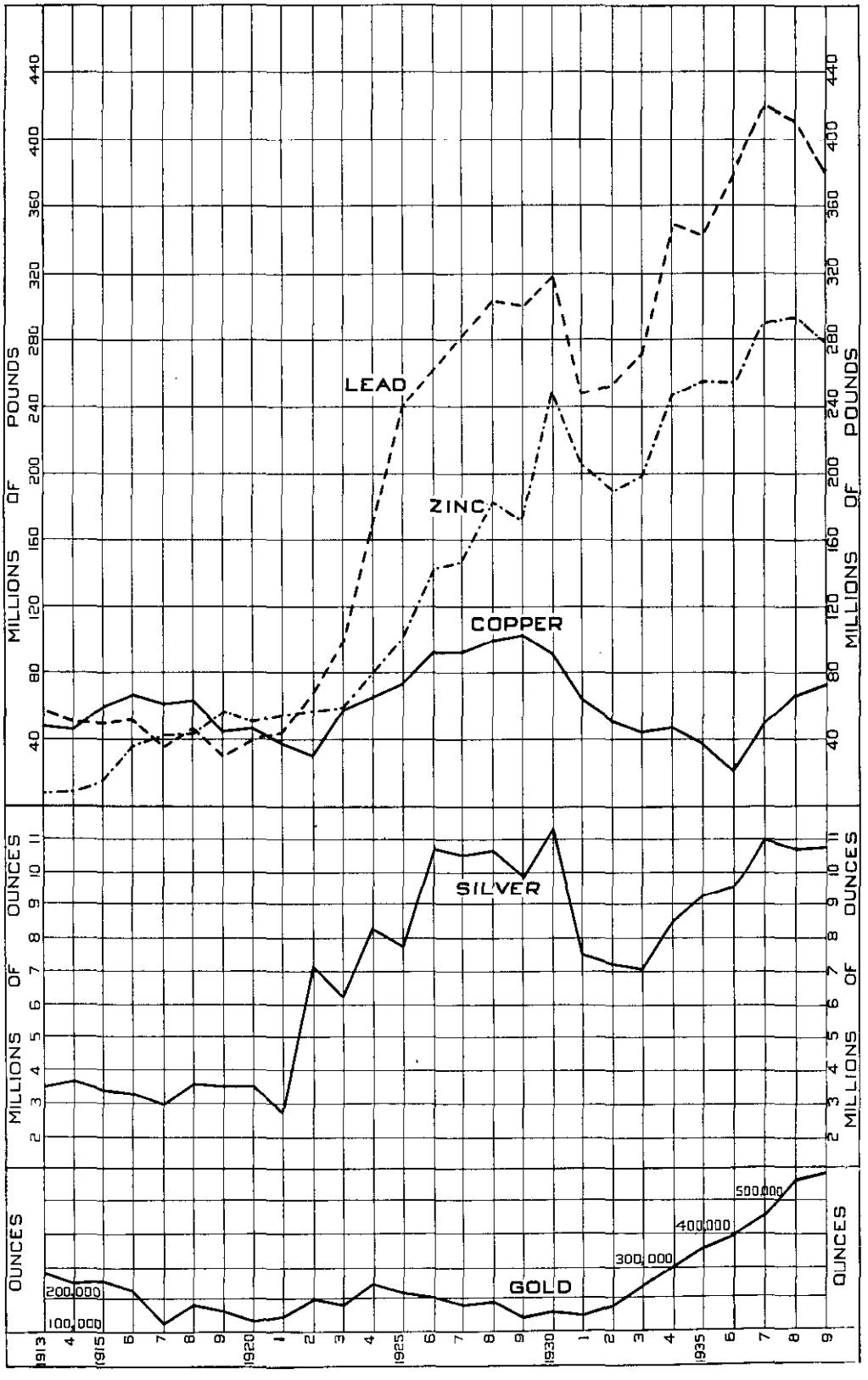


TABLE XIV.—Coal Production per Year to Date.*

	Tons. (2,240 lb.)	Value.		Tons. (2,240 lb.)	Value.
1836–1885	3,029,011	$9,468,557	1913	2,137,483	$7,481,190
1886	326,636	979,908	1914	1,810,967	6,338,385
1887	413,360	1,240,080	1915	1,611,129	5,638,952
1888	489,301	1,467,903	1916	2,084,093	7,294,325
1889	579,830	1,739,490	1917	2,149,975	7,524,913
1890	678,140	2,034,420	1918	2,302,245	11,511,225
1891	1,029,097	3,087,291	1919	2,267,541	11,337,705
1892	826,335	2,479,005	1920	2,595,125	12,975,625
1893	978,294	2,934,882	1921	2,483,995	12,419 975
1894	1,012,953	3,038,859	1922	2,511,843	12,559,215
1895	939,654	2,818,962	1923	2,453,223	12,266,115
1896	896,222	2,688,666	1924	1,939,526	9,697,630
1897	882,854	2,648,562	1925	2,328,522	11,642,610
1898	1,135,865	3,407,595	1926	2,330,036	11,650,180
1899	1,306,324	3,918,972	1927	2,453,827	12,269,135
1900	1,439,595	4,318,785	1928	2,526,702	12,633,510
1901	1,460,331	4,380,993	1929	2,251,252	11,256,260
1902	1,397,394	4,192,182	1930	1,887,130	9,435,650
1903	1,168,194	3,504,582	1931	1,707,590	7,684,155
1904	1,253,628	3,760,884	1932	1,534,975	6,523,644
1905	1,384,312	4,152,936	1933	1,264,746	5,375,171
1906	1,517,303	4,551,909	1934	1,347,090	5,725,133
1907	1,800,067	6,300,235	1935	1,187,968	5,048,864
1908	1,677,849	5,872,472	1936	1,346,471	5,722,502
1909	2,006,476	7,022,666	1937	1,444,687	6,139,920
1910	2,800,046	9,800,161	1938	1,309,428	5,565,069
1911	2,193,062	7,675,717	1939	1,477,872	6,280,956
1912	2,628,804	9,200,814			
			Totals	89,996,378	$358,685,502

* 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, 1938 and 1939.

Description.	1938.		1939.	
	Quantity.	Value.	Quantity.	Value.
Coal used in making coke, long tons	157,951	$623,649	152,818	$569,945
Coke made in bee-hive ovens, long tons	48,760	$315,294	44,787	$286,491
Coke made in by-product ovens, long tons	.....	.....	6,426	37,015
Coke made in gas plants, long tons	53,004	345,790	51,909	325,435
Total coke made, long tons	101,764	$661,084	103,122	$648,941
Gas sold and used	.....	1,770,839	.....	1,768,977
Tar produced	.....	44,324	.....	44,108
Other by-products	.....	.....	.....	.....
Total production value of coke industry	.....	$2,476,247	.....	$2,462,026

TABLE XVII.—Dividends paid by Mining Companies, 1897–1939.

*Lode-gold Mines.**

Company or Mine.	Locality.	Class.	Amount paid.
Arlington	Erie	Gold	$66,898
Athabasca	Nelson	Gold	25,000
Bralorne	Bridge River	Gold	5,102,450
Belmont-Surf Inlet	Princess Royal Island	Gold	1,437,500
Cariboo Gold Quartz	Wells	Gold	746,650
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
Hedley Mascot	Hedley	Gold	611,314
Island Mountain	Wells	Gold	420,287
I.X.L.	Rossland	Gold	132,533
Jewel-Denero	Greenwood	Gold	11,751
Kelowna Exploration	Hedley	Gold	300,000
Kootenay Belle	Sheep Creek	Gold	222,816
Le Roi Mining Co.	Rossland	Gold	1,475,000
Le Roi No. 2	Rossland	Gold	1,574,640
Lorne	Bridge River	Gold	20,450
Nickel Plate	Hedley	Gold	3,423,191
Pioneer	Bridge River	Gold	7,407,468
Poorman	Nelson	Gold	25,000
Premier	Premier	Gold	19,658,075
Privateer	Zeballos	Gold	539,898
Queen	Sheep Creek	Gold	85,000
Relief	Erie	Gold	5,000
Reno	Sheep Creek	Gold	926,040
Sheep Creek Mines, Ltd.	Sheep Creek	Gold	900,000
Silbak Premier	Premier	Gold	600,000
Sunset No. 2	Rossland	Gold	115,007
War Eagle	Rossland	Gold	1,245,250
Motherlode	Sheep Creek	Gold	162,500
Ymir Gold	Ymir	Gold	300,000
Ymir Yankee Girl	Ymir	Gold	133,501
Miscellaneous mines		Gold	23,530
Total, lode-gold mines			$48,808,945

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

Silver-lead-zinc Mines.

Antoine	Rambler	Silver-lead-zinc	$10,000
Beaverdell-Wellington	Beaverdell	Silver-lead-zinc	97,200
Bell	Beaverdell	Silver-lead-zinc	476,297
Bosun (Rosebery-Surprise)	New Denver	Silver-lead-zinc	27,500
Capella	New Denver	Silver-lead-zinc	5,500
Consolidated Mining and Smelting Co. of Canada, Ltd.	Trail	Silver-lead-zinc	86,329,773
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	264,816
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 Batchelor	Sandon	Silver-lead-zinc	50,000
Carried forward			$88,197,827

TABLE XVII.—DIVIDENDS PAID BY MINING COMPANIES, 1897–1939—*Continued.*

Silver-lead-zinc Mines—Continued.

Company or Mine.	Locality.	Class.	Amount paid.
Brought forward			$88,197,827
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	40,894
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	33,810
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			$97,255,025

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

Copper Mines.

Britannia M. & S. Co.*	Britannia Beach	Copper	$6,759,502
Canada Copper Corporation	Greenwood	Copper	615,399
Cornell	Texada Island	Copper	8,500
Granby Cons. M.S. & P. Co.†	Copper Mountain	Copper	8,205,568
Marble Bay	Texada Island	Copper	175,000
Hall Mines	Nelson	Copper	160,000
Miscellaneous mines		Copper	260,770
Total, copper mines			$16,184,739

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

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

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

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

TABLE XVII.—DIVIDENDS PAID BY MINING COMPANIES, 1897–1939—*Continued.*

Coal.

Wellington Collieries, Ltd., Nanaimo	$16,000,000
Crow's Nest Pass Coal Co., Ltd., Fernie	12,308,956
Total	$28,308,956

Miscellaneous and Structural.

Various	$1,773,595

Aggregate of all Classes.

Lode-gold mining	$48,808,945
Silver-lead-zinc mining and smelting	97,255,025
Copper-mining	16,184,739
Coal-mining	28,308,956
Miscellaneous and structural	1,773,595
Total	$192,331,260

Dividends paid Yearly, 1919 to 1939, inclusive.

Year.	Amount paid.	Year.	Amount paid.
1919	$2,494,283	1931	$4,650,857
1920	1,870,296	1932	2,786,958
1921	736,629	1933	2,471,735
1922	3,174,756	1934	4,745,905
1923	2,983,570	1935	7,386,070
1924	2,977,276	1936	10,513,705
1925	5,853,419	1937	15,085,293
1926	8,011,137	1938	12,068,875
1927	8,816,681	1939	11,865,698
1928	9,572,536		
1929	11,263,118	Total	$139,872,297
1930	10,543,500		

Dividends paid during 1938 and 1939.

	1938.	1939
Arlington	$11,510	$11,430
Bralorne Mines, Ltd.	1,184,650	1,496,400
Britannia	.....	206,924
Cariboo Gold Quartz Mines, Ltd.	213,329	266,660
The Consolidated Mining and Smelting Co. of Canada, Ltd.	8,164,587	6,540,672
Crow's Nest Pass Coal Co., Ltd.	186,354	186,354
Fairview Amalgamated Gold Mines	2,661	2,593
Granby	.....	180,097
Hedley Mascot Gold Mines, Ltd.	362,260	249,054
Highland Bell, Ltd.	92,110	105,269
Island Mountain Mines, Ltd.	105,072	157,607
I.X.L.	900	.....
Kelowna Exploration	90,000	210,000
Kootenay Belle	101,280	121,536
Pioneer Gold Mines of B.C., Ltd.	700,700	700,700
Privateer	.....	539,898
Reno Gold Mines, Ltd.	197,400	28,200
Sheep Creek Gold Mines, Ltd.	281,250	318,750
Silbak Premier	200,000	400,000
Others	174,812	143,554
Totals	$12,068,875	$11,865,698

TABLE XVIII.—Capital employed, Salaries and Wages, Fuel and Electricity, and Process Supplies, 1939.

District and Class.	Capital employed.	Salaries and Wages.	Fuel and Electricity.	Process Supplies.
	$	$	$	$
North-western District—				
Lode-mining	5,826,987	1,365,638	117,989	427,643
Placer-mining	677,183	204,843	30,312	16,954
Coal-mining	.....	.....	.....	.....
Miscellaneous and structural	484,000	60,975	18,339	27,167
Totals	6,988,170	1,631,456	166,640	471,764
North-eastern District—				
Lode-mining	2,534,594	843,819	100,477	228,655
Placer-mining	1,264,012	424,768	20,045	17,215
Coal, miscellaneous, and structural	73,569	56,986	2,820	11,130
Totals	3,872,175	1,325,573	123,342	257,000
South Central District—				
Lode-mining	8,436,318	2,044,444	324,245	882,462
Placer-mining and coal-mining	1,109,882	507,009	50,184	59,727
Miscellaneous and structural	314,759	84,453	16,211	40,921
Totals	9,860,959	2,635,906	390,640	983,110
South-eastern District—				
Lode-mining	57,206,887	8,295,335	642,397	2,103,682
Placer-mining	32,805	12,693	1,161	20
Coal-mining	6,145,769	987,150	78,496	254,950
Miscellaneous	791,923	83,896	880	2,294
Structural	66,384	17,979	1,031	4,107
Totals	64,243,768	9,397,053	723,965	2,365,053
South-western District—				
Lode-mining	18,186,756	4,013,666	275,439	1,818,234
Placer-mining	266,952	12,898	88	41
Coal-mining	14,422,441	2,418,820	175,048	560,809
Miscellaneous	15,718,668	558,249	120,475	223,441
Structural	1,913,593	363,414	90,566	34,895
Totals	50,508,410	7,367,047	661,616	2,637,420
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, 1935–1939	.....	101,113,422	13,872,403	29,091,408

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 in 1939, 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.).

A special survey was made covering the mining industry for 1939 and the following data were compiled from all returns received, and is additional to the statistics set forth in Table XVIII. It should also be kept in mind that in the aggregate a substantial amount can be credited to individuals who do not make a return to the Department.

Origin.	Machinery.	Building Materials.	Food-supplies.	Totals.
Canada	$977,953	$568,154	$1,183,716	$2,729,823
United States	271,816	.....	.....	271,816
Great Britain	143,584	.....	.....	143,584
Others	.....	13,399	3,787	17,186
Totals	$1,393,353	$581,553	$1,187,503	$3,162,409

TABLE XIX.—Tonnage, Number of Mines, Net and Gross Value of Lode Minerals, 1901–1939.

District.	Year.	Tonnage.	No. of Shipping-mines.	No. of Mines Shipping over 100 Tons.	Net Value to Shipper of Lode Minerals produced.	Gross Value of Lode Minerals produced.
	1901	920,416	119	78	.....	$14,100,282
	1902	998,999	124	75	.....	11,581,153
	1903	1,286,176	125	74	.....	12,103,237
	1904	1,461,609	142	76	.....	12,909,035
	1905	1,706,679	146	79	.....	15,980,164
	1906	1,963,872	154	77	.....	18,484,102
	1907	1,804,114	147	72	.....	17,316,847
	1908	2,083,606	108	59	.....	15,847,411
	1909	2,057,713	89	52	.....	15,451,141
	1910	2,216,428	83	50	.....	14,728,731
	1911	1,770,755	80	45	.....	11,454,063
	1912	2,688,532	86	51	.....	17,662,766
	1913	2,663,809	110	58	.....	17,190,838
	1914	2,175,971	98	56	.....	15,225,061
	1915	2,690,110	132	59	.....	19,992,149
	1916	3,188,865	169	81	.....	31,483,014
	1917	2,761,579	193	87	.....	26,788,474
	1918	2,892,849	175	80	.....	27,590,278
	1919	2,112,975	144	74	.....	19,750,498
	1920	2,178,187	121	60	.....	19,444,365
	1921	1,562,645	80	35	.....	12,920,398
	1922	1,573,186	98	33	.....	19,227,857
	1923	2,421,839	77	28	.....	25,347,092
	1924	3,397,105	86	37	.....	35,538,247
	1925	3,849,269	102	40	.....	46,200,135
	1926	4,775,073	138	55	$38,558,613	51,508,031
	1927	5,416,021	132	52	27,750,364	44,977,082
	1928	6,241,310	110	49	29,070,075	48,281,825
	1929	6,977,681	106	48	34,713,887	51,174,859
	1930	6,803,846	68	32	21,977,688	40,915,395
	1931	5,549,103	44	22	9,513,931	22,535,573
	1932	4,340,158	75	29	7,075,393	19,700,235
	1933	4,030,778	109	47	13,976,368	25,007,137
	1934	5,087,334	145	69	20,243,278	33,895,930
	1935	4,916,149	177	72	25,407,914	40,597,569
	1936	4,456,521	168	70	29,975,608	43,666,452
	1937	6,145,254	185	113	44,762,860	62,912,783
	1938	7,377,091	211	92	35,759,022	53,877,333
North-western	**1939**	**477,152**	**12**	**8**	**3,283,380**	**3,743,497**
North-eastern	**1939**	**169,228**	**6**	**4**	**2,471,731**	**2,559,894**
South Central	**1939**	**1,717,370**	**72**	**34**	**5,771,361**	**6,773,194**
South-eastern	**1939**	**2,391,501**	**96**	**38**	**18,282,984**	**28,225,230**
South-western	**1939**	**2,455,427**	**31**	**15**	**10,901,831**	**12,220,283**
Totals	**1939**	**7,210,676**	**217**	**99**	**40,711,287**	**53,522,098**

TABLE XX.—Men employed in the Mining Industry of British Columbia, 1901–1939.

District.	Year.	Placer-mining.	Lode-mining.			In Concentrators.	In Smelters.	Coal-mining.			Structural Materials.		Miscellaneous.	Total.
			Under.	Above.	Total.			Under.	Above.	Total.	Quarries and Pits.	Plants.		
	1901	.....	2,736	1,212	3,948	.....	.....	3,041	931	3,974	.....	.....	.....	7,922
	1902	.....	2,219	1,126	3,345	.....	.....	3,101	910	4,011	.....	.....	.....	7,356
	1903	.....	1,662	1,088	2,750	.....	.....	3,137	1,127	4,264	.....	.....	.....	7,014
	1904	.....	2,143	1,163	3,306	.....	.....	3,278	1,175	4,453	.....	.....	.....	7,759
	1905	.....	2,470	1,240	3,710	.....	.....	3,127	1,280	4,407	.....	.....	.....	8,117
	1906	.....	2,680	1,303	3,983	.....	.....	3,415	1,390	4,805	.....	.....	.....	8,788
	1907	.....	2,704	1,239	3,943	.....	.....	2,862	907	3,769	.....	.....	.....	7,712
	1908	.....	2,567	1,127	3,694	.....	.....	4,432	1,641	6,073	.....	.....	.....	9,767
	1909	.....	2,184	1,070	3,254	.....	.....	4,713	1,705	6,418	.....	.....	.....	9,672
	1910	.....	2,472	1,237	3,709	.....	.....	5,903	1,855	7,758	.....	.....	.....	11,467
	1911	.....	2,435	1,159	3,594	.....	.....	5,212	1,661	6,873	.....	.....	.....	10,467
	1912	.....	2,472	1,364	3,837	.....	.....	5,275	1,855	7,130	.....	.....	.....	10,967
	1913	.....	2,773	1,505	4,278	.....	.....	4,950	1,721	6,671	.....	.....	.....	10,949
	1914	.....	2,741	1,433	4,174	.....	.....	4,267	1,465	5,732	.....	.....	.....	9,906
	1915	.....	2,709	1,435	4,144	.....	.....	3,708	1,283	4,991	.....	.....	.....	9,135
	1916	.....	3,357	2,036	5,393	.....	.....	3,694	1,366	5,060	.....	.....	.....	10,453
	1917	.....	3,290	2,198	5,488	.....	.....	3,760	1,410	5,170	.....	.....	.....	10,658
	1918	.....	2,626	1,764	4,390	.....	.....	3,658	1,769	5,247	.....	.....	.....	9,637
	1919	.....	2,513	1,746	4,259	.....	.....	4,145	1,821	5,966	.....	.....	.....	10,225
	1920	.....	2,074	1,605	3,679	.....	.....	4,191	2,158	6,349	.....	.....	.....	10,028
	1921	.....	1,355	975	2,330	.....	.....	4,722	2,163	6,885	.....	.....	.....	9,215
	1922	.....	1,510	1,239	2,749	.....	.....	4,712	1,932	6,644	.....	.....	.....	9,393
	1923	.....	2,102	1,516	3,618	.....	.....	4,342	1,807	6,149	.....	.....	.....	9,767
	1924	.....	2,353	1,680	4,033	.....	.....	3,894	1,524	5,418	.....	.....	.....	9,451
	1925	.....	2,298	2,840	5,138	.....	.....	3,828	1,615	5,443	.....	.....	.....	10,581
	1926	299	2,606	1,735	4,341	808	2,461	3,757	1,565	5,322	493	324	124	14,172
	1927	415	2,671	1,916	4,587	854	2,842	3,646	1,579	5,225	647	138	122	14,830
	1928	355	2,707	2,469	5,176	911	2,748	3,814	1,520	5,334	412	368	120	15,424
	1929	341	2,926	2,052	4,978	966	2,948	3,675	1,353	5,028	492	544	268	15,565
	1930	425	2,316	1,260	3,576	832	3,197	3,389	1,256	4,645	843	344	170	14,032
	1931	688	1,463	834	2,297	581	3,157	2,957	1,125	4,082	460	526	380	12,171
	1932	874	1,355	900	2,255	542	2,036	2,628	980	3,608	536	329	344	10,524
	1933	1,134	1,786	1,335	3,121	531	2,436	2,241	853	3,094	376	269	408	11,369
	1934	1,122	2,796	1,729	4,525	631	2,890	2,050	843	2,893	377	187	360	12,985
	1935	1,291	2,740	1,497	4,237	907	2,771	2,145	826	2,971	536	270	754	13,737
	1936	1,124	2,959	1,840	4,799	720	2,678	2,015	799	2,814	931	288	825	14,179
	1937	1,371	3,603	1,818	5,421	1,168	3,027	2,286	867	3,153	724	327	938	16,129
	1938	1,303	3,849	2,266	6,115	919	3,158	2,088	874	2,962	900	295	369	16,021
North-western	**1939**	**292**	**372**	**266**	**638**	**82**	.....	.....	.....	.....	**61**	**3**	**19**	**1,095**
North-eastern	**1939**	**688**	**376**	**130**	**506**	**33**	.....	**10**	**4**	**14**	**44**	.....	**21**	**1,306**
South Central	**1939**	**45**	**604**	**359**	**963**	**318**	.....	**270**	**140**	**410**	**75**	**9**	**51**	**1,871**
South-eastern	**1939**	**105**	**1,120**	**575**	**1,695**	**377**	**3,187**	**538**	**193**	**731**	**119**	**3**	**203**	**6,420**
South-western	**1939**	**122**	**1,433**	**720**	**2,153**	**188**	.....	**1,349**	**472**	**1,821**	**353**	**296**	**267**	**5,198**
Totals*	**1939**	**1,252**	**3,905**	**2,050**	**5,955**	**996**	**3,187**	**2,167**	**809**	**2,976**	**652**	**311**	**561**	**15,890**

* 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 1939.

Mine or Group.	Location of Mine or Mill.	Owner or Agent.	Rated Daily Capacity. 1938.	Rated Daily Capacity. 1939.	Operating at	Date of First Operation.	Process.	Character of Ore.
			Tons.	Tons.	Tons.			
Polaris-Taku	Taku River (Tulsequah)	Polaris-Taku Mining Co., Ltd., Tulsequah	150	150	100	Nov., 1937	Flotation	Gold.
Coffman, A. E.		Coffman, A. E., Tulsequah						Gold.
Big Missouri	Stewart (Salmon River)	Buena Vista Mining Co., Ltd., Trail	750	750	500	Mar., 1938	Flotation; cyanidation	Gold.
Dolly Varden	Alice Arm	T. W. Falconer, Alice Arm						Silver, gold, lead.
Prosperity	Marmot River	C/o Premier Gold Mining Co., Ltd., Premier						Silver, lead, gold.
Idaho	Marmot River	C/o Premier Gold Mining Co., Ltd., Premier						Silver, lead, gold.
Silbak Premier	Stewart	Silbak Premier Mines, Ltd., Premier	500	500	500	July, 1922	Flotation	Gold, silver, lead.
Payne, T. H.	Alice Arm	Payne, T. H., Alice Arm						Silver, gold.
Kidd, Anne	Queen Charlotte City	Kidd, Anne, Queen Charlotte City						Gold, silver.
Sampling Plant	Prince Rupert	British Columbia Department of Mines, Prince Rupert				1937		Gold, silver, copper, lead, zinc.
Surf Inlet	Surf Inlet	Surf Inlet Cons. Gold Mines, Ltd., Vancouver	50	100	100	Aug., 1937	Table concentration; flotation	Gold, silver, copper.
Surf Point	Porcher Island	Porcher Island Mines, Ltd., Vancouver	25	25	*50	July, 1933	Flotation	Gold, silver.
McDames Lake	McDame Lake	McDames Lake Mining Co. Inc., Seattle		7	†7	July, 1939	Amalgamation	Gold, silver.
Cariboo Gold	Wells	Cariboo Gold Quartz Mining Co., Ltd., Vancouver	300	300	300	Jan., 1938	Cyanidation	Gold, silver.
Cariboo Hudson	Wells	Cariboo Hudson Gold Mines, Ltd., Vancouver	100	100	100	Sept., 1938	Cyanidation	Gold, silver.
Island Mountain	Wells	Island Mountain Mines, Ltd., Wells	110	110	110	Nov., 1934	Cyanidation	Gold, silver.
Coronado	Hudson Bay Mountain	H. Orme and F. Griffin, Smithers						Silver, gold, lead, zinc.
Duthie	Hudson Bay Mountain	J. J. Herman and A. W. Kelly, Smithers						Silver, gold, lead, zinc.
Quesnelle Quartz	Hixon Creek	Quesnelle Mining Quartz, Ltd., Vancouver	25	25	*25	Nov., 1938	Cyanidation	Gold, silver.
Clairdon	Knutsford	Clairdon Mines, Ltd., Kamloops						Gold, silver.
Copper King	Kamloops	McKelvie Bros., Kamloops	25	25	†25	1938	Concentration	Gold, silver, copper.
Windpass	Dunn Lake	Windpass Gold Mining Co., Ltd., Vancouver	50	50	*50	Mar., 1934	Flotation	Gold, silver, copper.
Downey, R.	Chu Chua	R. Downey, Chu Chua						Gold, silver, copper.
Cherry Creek	Cherry Creek	Smith and King, Cherry Creek						Copper, gold, silver.
Kalamalka	Lavington	Kalamalka Gold Mines, Ltd., Vernon						Gold, silver.
Alice L.	Paulson	Inland Empire Mines Syndicate, Paulson						Gold, silver.
Athalstan	Grand Forks	W. E. McArthur, Greenwood						Gold, silver.
Berlin	Paulson	Inland Empire Mines Syndicate, Paulson						Gold, silver.
Boris Boy	Grand Forks	Nick Boris, Grand Forks						Gold, silver.
Cascade Bonanza	Paulson	Inland Empire Mines Syndicate, Paulson						Gold, silver.

* Idle at present. † Intermittent.

TABLE XXI.—METALLIFEROUS MINES SHIPPING IN 1939—*Continued.*

Mine or Group.	Location of Mine or Mill.	Owner or Agent.	Rated Daily Capacity. 1938.	Rated Daily Capacity. 1939.	Operating at	Date of First Operation.	Process.	Character of Ore.
			Tons.	Tons.	Tons.			
City of Paris	Grand Forks	H. M. Brinkman, Grand Forks						Gold, silver, lead, zinc.
Golden Eagle	Grand Forks	Chernenkoff, L., Grand Forks						Gold, silver.
Golden Pheasant	Grand Forks	John Makortoff and Nick Markin, Grand Forks						Silver, gold.
Humming Bird	Grand Forks	Carl A. Anderson, Grand Forks						Gold, silver, lead, zinc.
Inland Empire	Paulson	Inland Empire Mines Syndicate, Paulson						Gold, silver.
Little Bertha	Grand Forks	D. C. Manly, Box 230, Grand Forks						Gold, silver.
Simpson	Grand Forks	L. A. Grant, Supt., Grand Forks						Gold, silver.
Simpson	Grand Forks	John Zuco and R. F. Simpson, Grand Forks						Gold, silver.
Smokey	Paulson	M. H. Doner, Paulson						Gold, silver.
Sunrise	Grand Forks	Max Hansen, Tulameen						Gold, silver.
Union	Granby River	Leasers from J. F. McCarthy, Wallace, Idaho						Gold, silver, lead, zinc.
Union	Granby River	W. E. McArthur, Greenwood						Gold, silver.
Winnipeg	Grand Forks	Reeves and Tremblay, Grand Forks						Copper, gold, silver.
Yankee Boy	Grand Forks	W. L. and W. M. Schwarz, Grand Forks						Gold, silver.
Amandy	*Jewel Lake*	*E. C. Henniger, Grand Forks*						Gold, silver.
Badger	Greenwood	E. A. Wanke, Greenwood						Gold, silver, lead, zinc.
Barnato	Kettle River	F. O. Peterson, Westbridge						Gold, silver.
Beaver	Greenwood	H. Nordman, I. L. Foster, and E. L. Staples, Beaverdell						Gold, silver, lead, zinc.
Brooklyn-Stemwinder	Phoenix	W. E. McArthur, Greenwood						Gold, silver, copper.
Caledonia	Westbridge	E. Hendry and C. Sherydal, Boundary Falls						Gold, silver.
Dentonia	Greenwood	Robert Lee *et al.*, Greenwood, and W. J. Cudworth, Greenwood			*100	April, 1934		Gold, silver.
Elkhorn	Greenwood	George S. Boug, Greenwood						Gold, silver, lead, zinc.
Ethiopia	Greenwood	Ethiopia Syndicate, 850 Hastings Street West, Vancouver						Gold, silver.
Gold Bug	Greenwood	S. Wickwire and R. Mitchell, Greenwood						Gold, silver, lead, zinc.
Gold Drop	Jewel Lake	L. Bosshart and leasers, Greenwood						Gold, silver.
Granby	Phoenix	W. E. McArthur, Greenwood	50	50	50	Sept., 1936	Flotation	Gold, silver, copper.
Highland Bell	Greenwood	*Highland Bell, Ltd., Penticton*						*Gold, silver, lead, zinc.*
Highland Chief	Greenwood	Highland Chief Mines, Ltd., Kelowna						Silver, lead.
Iron Clad	Greenwood	Nick Ogloff, Greenwood						Gold, silver, copper, lead.
Lakeside	Greenwood	Nick Ogloff, Greenwood						Gold, silver.
Maybe	Crick (Trapper) Creek	S. Bergland, Westbridge						Gold, silver.

* Idle at present.

Mogul	Greenwood	C. Sherdahl and O. Sherdahl, Westbridge						Gold, silver.
North Star	Jewel Lake	Greenbridge Gold Mines, Ltd., Calgary, Alta.						Gold, silver.
Number Seven	Boundary Falls	W. E. McArthur, Greenwood						Gold, silver, lead.
Providence	Greenwood	W. E. McArthur, Greenwood						Gold, silver, lead, zinc.
Rambler	Beaverdell	J. J. Kennedy, Sec., R.S.K. Mining Syndicate, Beaverdell						Silver, lead, zinc.
Roadside	Westbridge	R. Gaustin, Westbridge						Silver, gold.
Sally	Beaverdell	Sally Mines, Ltd., Penticton						Gold, silver, lead, zinc.
Tiger	Beaverdell	J. S. Nordman, Beaverdell						Silver, lead, zinc.
Waterloo	Edgewood	J. N. McLeod, Edgewood						Silver, lead, zinc.
Wellington	Beaverdell	Beaverdell-Wellington Syndicate, Greenwood						Gold, silver, lead, zinc.
W.S. Group	Westbridge	S. G. Peterson, Westbridge						Gold, silver.
Bathfield Silver Lode	Summerland	G. F. Shaw and F. Semenoff, Penticton						Gold, silver, lead, zinc.
Canty	Hedley	Canty Gold Mines, Ltd., Hedley						Gold, silver.
Empire	Oliver	Mowat and Kerr, Victoria						Gold, silver.
Fairview Amalgamated	Osoyoos	Fairview Amalgamated Gold Mines, Ltd., Vancouver	150	150	*150	Aug., 1935	Amalgamation, blanket tables, flotation	Gold, silver, copper, lead.
Gold Standard	Oro Fino Mountain	Gold Standard (Fairview) Mining Co., Ltd., Penticton						Gold, silver.
Grandoro	Oliver	J. P. Wukelick, leaser, Penticton	20	20	†20	Jan., 1935	Amalgamation; cyanidation	Gold, silver.
Hedley Mascot	Hedley	Hedley Mascot Mines, Ltd., Vancouver	175	175	175	May, 1936	Flotation	Gold, silver, copper.
Kelowna Exploration	Hedley	Kelowna Exploration Co., Ltd., Hedley	250	250	250	Sept., 1934	Cyanidation; flotation	Gold, silver, copper.
Lucky Strike	Salmo	Stuart Howard, Oliver						Gold, silver.
Monashee	Lumby	Monashee Development Co., Ltd., Vancouver		50	*50	Oct., 1939	Flotation	Gold, silver.
Mak Siccar	Osoyoos	A. Whitehead and P. Davedoff, Penticton						Gold, silver.
Osoyoos	Osoyoos	Osoyoos Mines of Canada, Ltd., Calgary, Alta.	75	150	150	Mar., 1936	Table concentration; flotation; cyanidation	Gold, silver, copper.
Silver King	Oliver	J. Pearson *et al.*, Oliver						Gold, silver.
Smuggler	Oliver	H. C. Boumstead, Oliver						Gold, silver.
Yellow Valley	Oliver	R. F. C. Stewart, Penticton						Gold, silver.
B.C. Gold	Tulameen	Rabbitt Bros., Tulameen						Gold, silver.
Carusa	Princeton	Frank Carusa, Princeton						Copper, gold, silver.
Copper Mountain	Allenby	Granby Con. M.S. and Power Co., Vancouver	3,000	4,000	4,000	1920	Flotation	Copper, silver, gold.
Red Buck	Princeton	Red Buck Mines, Ltd., Princeton		100	†100	Dec., 1938	Flotation	Copper, silver, gold.
Silver King	Tulameen	P. Y. Porter, Murrayville						Silver, lead, zinc.
Silver Moon	Princeton	E. Michel *et al.*, Princeton, and C. Nelson, Princeton						Gold, silver.
Amazon	Woodbury Creek	J. R. Tuikess, Kaslo						Silver, lead, zinc.
Caledonia	Blaylock	Geo. E. McCready, Kaslo						Silver, gold, lead, zinc.
Highland Surprise	Retallack	Highland Surprise Gold Mines, Ltd., Vancouver						Gold, silver.
Charleston	Retallack	A. J. Harris, Kaslo						Silver, lead, zinc.
Krao	Ainsworth	Krao Mines, Ltd., Kaslo						Silver, lead, zinc.

* Idle at present. † Intermittent.

TABLE XXI.—METALLIFEROUS MINES SHIPPING IN 1939—*Continued.*

Mine or Group.	Location of Mine or Mill.	Owner or Agent.	Rated Daily Capacity. 1938.	Rated Daily Capacity. 1939.	Operating at	Date of First Operation.	Process.	Character of Ore.
			Tons.	Tons.	Tons.			
L.H. Group	Silverton	L.H. Syndicate, Nelson						Gold, silver.
Olson Group	Ainsworth	E. M. Conger *et al.*, Nelson						Silver, gold, lead, zinc.
Silver Bear	Zwicky	F. Helme, Kaslo						Silver, lead, zinc.
Silver Coin	Woodbury Creek	W. D. Smith *et al.*, Ainsworth						Silver, lead, zinc.
Revenue	Sturgis Creek	H. E. Singel, Kaslo						Silver, lead, zinc.
Whitewater	Retallack	Whitewater Mines, Ltd., Vancouver	125	125	*125	1927	Table concentration, flotation	Silver, lead, zinc.
Midway	Aldridge	George Whitehead, Moyie						Gold, silver.
Silver Key	Canal Flats	W. S. Bryant, Canal Flats						Silver, lead, zinc.
Sullivan	Kimberley	Consolidated Mining & Smelting Co. of Canada, Ltd., Trail	6,000	6,000	6,000	Aug., 1923	Flotation	Silver, lead, zinc.
Meridian	Camborne	Cory Menhinick, Camborne						Gold, silver.
Silver Cup	Ferguson	Brandon and Daney, Ferguson						Silver, lead, zinc.
Silver Crest	Gerrard	Silver Crest Mining Syndicate, Revelstoke						Gold, silver.
Winslow	Trout Lake	W. G. Wilkins and W. J. Scorgie, Penticton		25	†25	May, 1939		Gold, silver.
Arlington	Erie Creek	R. O. Oscarson, leaser, Erie						Gold, silver, lead, zinc.
Athabasca	Nelson	Noble Five Mines, Ltd., Nelson						Gold, silver, lead, zinc.
Baltic	Nelson	Henry Erickson, Nelson						Gold, silver.
Bayonne	Tye	Bayonne Consolidated Mines, Ltd., Vancouver	50	50	†50	Nov., 1936	Cyanidation	Gold, silver.
Bear	Hall Creek	R. E. Crerar, Nelson, and Bear Development Co., Nelson						Gold, silver.
Bunker Hill	16-Mile Creek	Waneta Gold Mines, Ltd., Nelson						Gold, silver.
California	Nelson	L. Bobier, Mrs. Mary Wilson, and R. H. Kline, Nelson						Gold, silver, lead, zinc.
Catherine	Nelson	M. Egan, G. D. Gormley, and L. J. Gormley, Nelson						Gold, silver, lead, zinc.
Clubine Comstock	Boulder Creek	Clubine Comstock Gold Mines, Ltd., Nelson						Gold, silver.
Daylight	Nelson	Daylight Gold Mines, Ltd., Vancouver						Gold, silver.
Euphrates	Hall Creek	Euphrates Mining Co., Ltd., per E. Terzian, Nelson						Gold, silver, lead, zinc.
Fern	Hall Creek	J. E. Cummins *et al.*, Nelson						Gold, silver.
Gold Belt	Sheep Creek	Gold Belt Mining Co., Ltd., Vancouver	100	150	150	1938	Cyanidation	Gold, silver.
Gold Crown	Nelson	S. Reise *et al.*, Nelson						Gold, silver.
Gold King	Hall Creek	J. MacDonald *et al.*, Ymir						Gold, silver.
Granite-Poorman	Taghum	Livingstone Mining Co., Ltd., Blewett	30	30	*30	Sept., 1934	Amalgamation; cyanidation	Gold, silver.
Great Eastern	Nelson	N. Rollick, Nelson						Gold, silver.
Grimwood	Nelson	G. H. Grimwood, Nelson					Concentration	Gold, silver, lead, zinc.

* Idle at present. † Intermittent.

Harriet	Erie	S. A. Curwen and J. Turk, Ymir						Gold, silver.
Howard	Ymir	John Lundstrom, Ymir						Gold, silver, lead, zinc.
Irene	Nelson	N. Rollick, Nelson						Gold, silver.
Keystone	Erie	N. S. Smith, 850 Hastings Street West, Vancouver						Gold, silver, lead, zinc.
King Solomon	Sitkum Creek	T. Paris *et al.*, Nelson, and A. D. Papazian, Nelson						Gold, silver.
Kootenay Belle	Sheep Creek	Kootenay Belle Gold Mines, Ltd., Vancouver	100	150	150	Oct., 1934	Cyanidation	Gold, silver.
Law Mac	Erie	Law Mac Mines, Ltd., Nelson						Gold, silver.
Lucky Strike	Salmo	R. C. McCorkell, Vancouver						Gold, silver, lead, zinc.
Molly Gibson	Kitto's Landing	W. J. Turner, Nelson						Silver, lead, zinc.
Nugget-Motherlode	Salmo	A. Endersby, Sr. and Jr., Sheep Creek						Gold, silver.
Relief-Arlington	Erie	Relief-Arlington Mines, Ltd., Erie	75	75	75	1933	Amalgamation; flotation; cyanidation	Gold, silver.
Reno	Sheep Creek	Reno Gold Mines, Ltd., Vancouver	120	120	120	Dec., 1932	Cyanidation	Gold, silver.
Sheep Creek	Sheep Creek	Sheep Creek Gold Mines, Ltd., Vancouver	150	150	150	May, 1935	Cyanidation	Gold, silver.
Spokane	Tye	R. M. and K. K. Laib, Bayonne						Gold, silver, lead, zinc.
Venango	Blewett	Venango Gold Mines, Ltd., Blewett						Gold, silver.
Venus Juno	Nelson	R. Heddle, Nelson						Gold, silver.
Wesko	Ymir	G. N. J. Shaw and G. N. Stacey, Vancouver			‡100	Oct., 1936	Flotation; cyanidation	Gold, silver, lead, zinc.
Wilcox	Ymir	Frank and L. Gormley, Nelson						Gold, silver.
Ymir Consolidated	Ymir	Ymir Consolidated Gold Mines, Ltd., Vancouver	100	100	100	July, 1935	Amalgamation; flotation	Gold, silver, lead, zinc.
Yankee Girl	Ymir	Ymir-Yankee Girl Gold Mines, Ltd., Vancouver	100	100	100	Dec., 1934	Cyanidation; flotation	Gold, silver, lead, zinc.
Bosun	New Denver	C. J. Campbell, New Denver						Silver, gold, lead, zinc.
Capella	New Denver	C. Stedile, New Denver						Gold, silver, lead, zinc.
Hewitt	Silverton	Galena Farm Consolidated Mines, Ltd., leasers						Silver, lead, zinc.
Howard Fraction	Slocan City	F. T. and H. L. Harbour, Slocan City						Gold, silver.
McAllister	Three Forks	George Allen, New Denver						Gold, silver.
Maple Leaf Fraction	Cody	M. J. Byrne, Sandon						Silver, lead, zinc.
Molly Hughes	New Denver	Slocan Idaho Mines Corp., 509 Hutton Building, Spokane						Silver, lead, zinc.
Monitor	Three Forks	D. J. McAskill, New Denver						Silver, lead, zinc.
Palmita	Alamo	Paul Chmelar *et al.*, Sandon						Silver, lead, zinc.
Payne	Sandon	H. A. Peterson, Sandon						Silver, lead, zinc.
Ruth-Hope	Sandon	Leasers from Ruth-Hope Mining Co., Ltd., Vancouver						Silver, lead, zinc.
Silver Ridge	Sandon	Fanchin and Walters, Sandon						Silver, lead, zinc.
Victor	Sandon	E. Doney & Son, Sandon						Gold, silver, lead, zinc.
Washington	Retallack	O. Kahle and E. W. Garrett, Kaslo						Silver, lead, zinc.
Arlington	Slocan City	H. E. Scovil, Slocan City						Gold, silver, lead, zinc.
Chapleau	Slocan City	J. Walters and S. Romer, Slocan City						Gold, silver.
Crusader	Slocan City	C. A. Richie, Slocan City						Gold, silver.
Hummingbird	Slocan City	E. Hammerer *et al.*, Slocan City						Silver, lead, zinc.

* Idle at present. † Intermittent. ‡ Dismantled.

TABLE XXI.—METALLIFEROUS MINES SHIPPING IN 1939—*Continued.*

Mine or Group.	Location of Mine or Mill.	Owner or Agent.	Rated Daily Capacity.		Operating at	Date of First Operation.	Process.	Character of Ore.
			1938.	1939.				
			Tons.	Tons.	Tons.			
Kilo	Slocan City	H. V. Dewis, Silverton						Gold, silver.
Lakeview	Slocan City	Peter Johnson, Slocan City						Silver.
Marmion & Maryland	Slocan City	W. J. Ternan *et al.*, Trail						Gold, silver.
Meteor	Slocan City	G. Larson *et al.*, Slocan City						Gold, silver.
Ottawa	Springer Creek	Leasers, Ottawa Silver Mining & Smelting Co., Slocan City	100	100	*100	1937	Concentration	Silver.
Republic	Slocan City	C. W. Tipping, Slocan City						Gold, silver.
Senator	Slocan City	F. R. Jankowski, Slocan City						Gold, silver.
Albion	Paulson	Joe Kloman, Paulson						Gold, silver.
Cariboo Group	Rossland	G. J. Whitehead and L. Chernenkoff *et al.*, Rossland						Gold, silver.
Caselton	Rossland	J. Grafton, Rossland						Gold, silver.
Evening Star	Rossland	J. Barnes, Mrs. L. Heap, H. W. Griswold *et al.*, Rossland						Gold, silver.
Georgia	Rossland	Gold Cup Mining Co., Ltd., Rossland						Gold, silver.
Gold Drip	Rossland	F. M. and S. J. Hackney, Rossland						Gold, silver.
Hattie	Rossland	S. Berg, Rossland						Gold, silver.
Holoboff	Rossland	A. Holoboff, Rossland						Gold, silver.
I.X.L.	Rossland	I.X.L. Lessors, Ltd., Rossland						Gold, silver.
Mame	Rossland	C. Pearson, Rossland						Gold, silver.
Midnight	Rossland	Bert A. Lins, Rossland						Gold, silver.
O.K.	O.K. Mountain	O.K. Leasing Co., Box 522, Rossland						Gold, silver.
Phoenix	Rossland	H. Fors, W. C. and E. J. Holm, Rossland						Gold, silver.
Rossland Properties	Rossland	Leasers from Cons. Mining & Smelting Co., Trail						Gold, silver, copper.
Velvet	Rossland	Velvet Leasing Syndicate, Rossland						Gold, silver, copper.
Havilah	Port Alberni	Havilah Gold Mines, Ltd., Victoria						Gold, silver, lead.
Thistle	Alberni	United Prospectors, Ltd., Victoria						Gold, silver, copper.
Vancouver Island	Port Alberni	Vancouver Island Gold Mines, Ltd., Vancouver						Gold, silver.
Central Zeballos	Zeballos	C/o Reno Gold Mines, Ltd., Vancouver						Gold, silver.
Martin	Ahousat	P. N. Martin, Ahousat						Gold, silver, copper.
Murphy	Zeballos	R. V. Murphy, Zeballos						Gold, silver, copper.
Mount Zeballos	Zeballos	Mount Zeballos Gold Mines, Ltd., Vancouver		50	50	Aug., 1939	Amalgamation; concentration	Gold, silver.
Prident	Zeballos	Prident Gold Mines, Ltd., Vancouver						Gold, silver.
Privateer	Zeballos	Privateer Mine, Ltd., Victoria	75	75	75	Sept., 1938	Cyanidation; concentration	Gold, silver.
Rey Oro	Zeballos	Rey Oro Gold Mining Corp., Ltd., Vancouver	10	10	*10	1938	Cyanidation; concentration	Gold, silver.

* Idle at present.

Spud Valley	Zeballos	Spud Valley Gold Mines, Ltd., Vancouver	50	50	50	1938	Cyanidation; concentration	Gold, silver.
Tagore	Zeballos	Tagore Mines, Ltd., Zeballos						Gold, silver, copper.
White Star	Zeballos	White Star Mine, Ltd., Vancouver						Gold, silver.
Zeballos Dome	Zeballos	Zeballos Gold Dome Mine, Ltd., Vancouver						Gold, silver.
Zeballos Oh Boy	Nootka Sound	Zeballos Oh Boy Gold Mines, Ltd., Victoria						Gold, silver.
Vidette	Savona	Vidette Gold Mines, Ltd., Vancouver	60	60	60	Dec., 1933	Flotation	Gold, silver, copper.
Bralorne	Bridge River	Bralorne Mines, Ltd., Vancouver	475	500	500	Feb., 1932	Amalgamation; flotation	Gold, silver.
Jagee	Shalalth	Jagee Mining Co., Ltd., Shalalth						Gold, silver, copper.
Pioneer	Bridge River	Pioneer Gold Mines of B.C., Ltd., Vancouver	425	300	375	Feb., 1928	Cyanidation	Gold, silver.
Alexandria	Thurlow	F. H. Fox, lessee, Vancouver						Gold, silver.
Aarnes	*Shoal Bay*	*Martin Aarnes, Thurlow*						*Gold, silver.*
Golden Gate	Roy	Loughborough Gold Mines, Ltd., Vancouver						Gold, silver.
Nelmes	Vananda	H. T. Nelmes, Vananda						Gold, silver.
Piedmont	Shoal Bay	Piedmont Mining Co., Ltd., Vancouver						Gold, silver, copper.
Santiago	Lasqueti Island	Santiago Mines, Ltd., Vancouver						Gold, silver, copper.
Blue Devil	Haney	F. C. and R. H. Macey, Vancouver						Gold, silver.
Aurum	Hope	Kunke and Currie, Hope						Gold.
Ventures	Hope	Northwest Ventures, Hope						Gold, silver, copper.
Ashloo	Squamish	Ashloo Gold Mines, Ltd., Vancouver	25	25	*25	Sept., 1936	Table concentration, flotation	Gold, silver, copper.
Britannia	Britannia Beach	Britannia Mining and Smelting Co., Ltd., Britannia Beach	6,000	6,000	6,000	Jan., 1923	Flotation	Copper, gold, silver.
Nugent Queen	Nugent Sound	Nugent Queen Mine, Nugent Sound						Gold, silver, copper.

* Idle at present.

TABLE XXII.—Mining Companies employing an Average of Ten or more Men during 1939.

Shipping Mines.

Name of Mine or Company.	Days Operating.		Tonnage.		Average Number of Men.	
	Mine.	Mill.	Mined.	Milled.	Mine.	Mill.
Polaris-Taku Mining Co., Ltd.	363	364	69,045	68,968	119	7
Big Missouri (Buena Vista Mining Co., Ltd.)	334	303	202,321	202,321	89	36
Silbak Premier Mines, Ltd.	311	311	169,164	169,164	305	26
Surf Inlet Consolidated Gold Mines, Ltd.	364	351	32,821	27,264	75	8
Porcher Island Mines, Ltd.*	....	....	6,600	6,600	15	3
Cariboo Gold Quartz Mining Co., Ltd.	313	365	110,208	110,208	290	13
Cariboo Hudson Gold Mines, Ltd.*	....	....	10,500	10,500	60	8
Island Mountain Mines Co., Ltd.	365	365	46,209	46,209	119	9
Quesnelle Quartz Mining Co., Ltd.*	....	....	2,250	2,250	15	3
Windpass Gold Mining Co., Ltd.†	97	212	....	11,750	15	2
Brooklyn (W. E. McArthur)	327	327	17,236	17,236	11	....
Highland Bell, Ltd.	296	....	6,706	....	34	....
Canty Gold Mines, Ltd.	....	....	....	....	25	....
Fairview Amalgamated Gold Mines, Ltd.	270	150	15,500	15,000	7	3
Gold Standard (Fairview) Mining Co., Ltd.*	....	....	765	100	8	2
Hedley Mascot Gold Mines, Ltd.	336	361	68,590	67,572	69	18
Kelowna Exploration Co., Ltd. (Nickel Plate)	334	365	90,251	90,204	112	57
Monashee Development Co., Ltd.	177	55	1,566	1,566	18	1
Osoyoos Mines of Canada, Ltd.	365	365	45,962	45,962	49	11
Granby Cons. Mining, Smelting & Power Co., Ltd.	362	362	1,451,491	1,450,352	406	218
Red Buck Mines, Ltd.*	....	....	....	680	8	2
Highland Surprise Gold Mines, Ltd.	357	....	197	....	10	....
Cons. M. & S. of Canada, Ltd. (Sullivan)	365	365	2,097,124	2,091,064	757	272
Arlington (R. O. Oscarson)	304	....	783	....	11	....
Daylight Gold Mines, Ltd.	224	....	200	....	11	....
Gold Belt Mining Co., Ltd.	363	361	57,838	57,838	81	9
Granite-Poorman (Livingstone Mining Co., Ltd.)	279	....	1,296	....	10	....
Kootenay Belle Gold Mines, Ltd.	365	365	52,666	52,666	139	11
Relief-Arlington Mines, Ltd.	365	365	51,700	31,498	94	28
Reno Gold Mines, Ltd.	365	157	16,085	16,421	75	14
Sheep Creek Gold Mines, Ltd.	336	361	55,558	55,558	83	9
Ymir Consolidated Gold Mines, Ltd.	356	210	9,595	8,345	22	2
Ymir-Yankee Girl Gold Mines, Ltd.	365	365	47,317	47,218	69	13
Molly Hughes (Slocan Idaho Mines Corp.)	365	....	191	....	18	....
Rossland Properties (C. M. & S.)	....	....	9,434	....	80	....
Havilah Gold Mines, Ltd.	255	....	1,039	....	18	....
Vidette Gold Mines, Ltd.	365	365	6,449	6,522	56	4
Central Zeballos Gold Mines, Ltd.	359	....	14	....	30	....
Mount Zeballos Gold Mines, Ltd.	365	137	8,821	6,337	49	3
Privateer Mine, Ltd.	334	363	38,262	26,820	87	13
Rey Oro Mine, Ltd.*	....	....	3,368	3,368	10	5
Spud Valley Gold Mines, Ltd.	365	365	35,607	20,950	70	10
White Star Mine, Ltd.	360	....	358	....	12	....
Bralorne Mines, Ltd.	365	365	184,922	184,922	356	22
Pioneer Gold Mines of B.C., Ltd.‡	239	284	103,738	88,009	188	25
Britannia Mining & Smelting Co., Ltd.	365	340	2,112,784	2,112,784	1,133	100

Non-shipping Mines.

Anvox Exploration (C. M. & S.)	210	....	....	....	14	....
Snowshoe Gold Mines, Ltd.	365	....	....	....	11	....
Cons. Nicola Goldfields, Ltd.	365	....	....	....	30	....
Alpine Gold, Ltd.	254	....	....	....	19	....
Silver Ridge Mining Co., Ltd.	304	....	....	....	10	....
Muskateer Mines, Ltd.	158	....	....	....	10	....
Kennedy Lake Gold Mines, Ltd.	365	....	....	....	15	....
B.R.X. (1935) Consolidated Mines, Ltd.	243	....	....	....	14	....
Gem Gold Mines, Ltd.	300	....	....	....	10	....

* Estimated; no official return received.

† Clean-up operations; lessees.

‡ Labour strike at mine, October, 1939, to March, 1940.

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 in work, which may be spread over five years, 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 any Mining Recorder, or from the Department of Mines or the King's Printer, Victoria, B.C.

Free Miners' Certificates.

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

The fee to an individual for a free miner's certificate is $5 for one year. To a joint-stock company having a capital of $100,000, or less, the fee for a year is $50; if capitalized beyond this, the fee is $100.

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

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

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

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

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

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

Mineral Claims.

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

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

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

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

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

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

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

Placer Claims.

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

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

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

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

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

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

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

"In 'bar diggings' a claim shall be:—

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

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

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

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

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

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

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

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

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

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

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

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

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

Lay-overs are declared by the Gold Commissioner upon proof being given to him that the supply of water is insufficient to work the claim. Under similar circumstances he has also the power to declare a close season, by notice in writing and published in the Gazette, for all or any claims in his district. Tunnel and drain licences are also granted by him on the person applying giving security for any damage that may arise. Grants

of right-of-way for the construction of tunnels or drains across other claims are also granted on payment of a fee of $25, the owner of the claims crossed having the right for tolls, etc., on the tunnel or drain which may be constructed. These tolls, however, are, so far as the amount goes, under the discretion of the Gold Commissioner.

Co-owners and Partnerships.

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

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

Placer-mining Leases.

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

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

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

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

"(3.) The location-line shall at the time of location be marked between the legal posts throughout its length so that it can be distinctly seen; in a timbered locality, by blazing trees and cutting underbrush, and in a locality where there is neither timber nor underbrush, by placing legal posts or monuments of earth or stones not less than two feet high and not less than two feet in diameter at the base, so that the location-line can be distinctly seen.

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

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

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

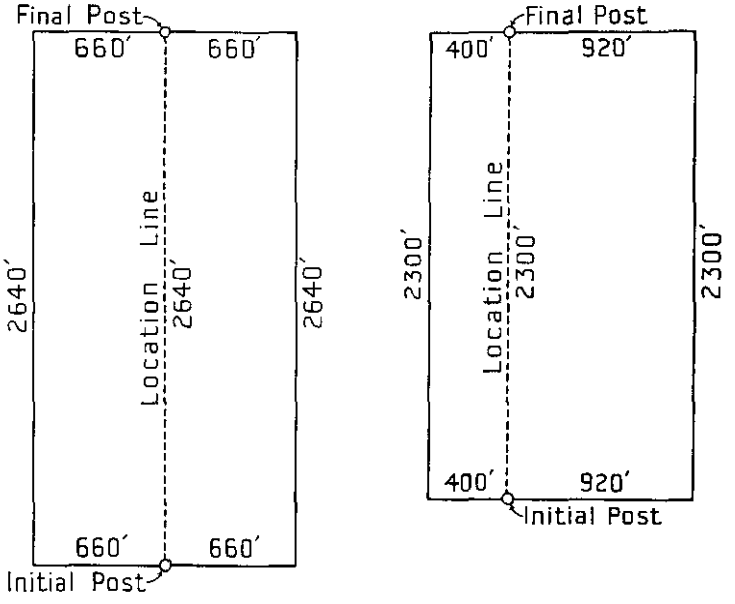
"(*b.*) The date of the location:

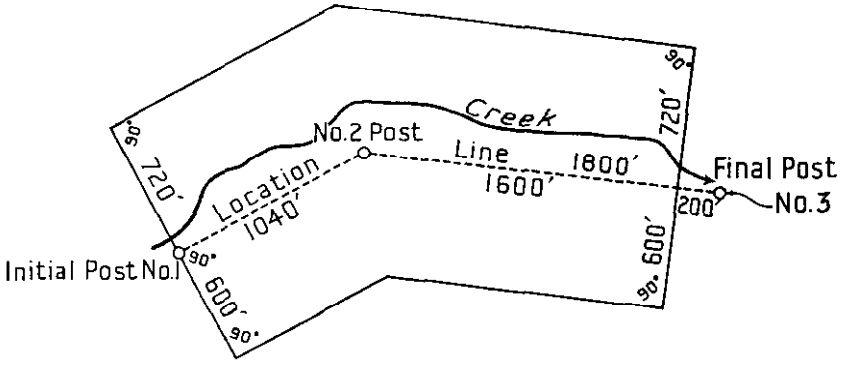
"(*c.*) The number of feet lying to the right and left of the location-line, and the approximate area or size of the ground.

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."

EXAMPLES OF VARIOUS METHODS OF LAYING OUT PLACER LEASEHOLDS.

Showing Areas secured with Location-lines of Various Lengths.





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 or placer claim	2.50
Recording certificate of work, mineral claim	2.50
Rerecord of placer claim	2.50
Recording lay-over	2.50
Recording abandonment, mineral claim	10.00
Recording abandonment, placer claim	2.50
Recording any affidavit	2.50
Records in "Records of Conveyances"	2.50
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, 1937.

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, 1929.

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.

Metalliferous Mines Regulation Act.

At the 1935 session of the Provincial Legislature "An Act to amend and consolidate the Enactments regulating the Working of Metalliferous Mines, Quarries, and Metallurgical Works" was passed. This Act is known as the "Metalliferous Mines Regulation Act," and, in its general tone, its clear purpose is to maintain the highest standard in respect of safety and of healthy conditions, both on the surface and underground in mining operations. The idea is to not only assure, as far as practicable, the protection of workmen against injury, but to establish those conditions best calculated to safeguard the health of the men employed. The Act also provides for the drafting of regulations, if such are found necessary, for the protection of men who are working under conditions which may lead to pulmonary disability.

This Act may be divided into six parts, as follows:—

(1.) Administration:

(2.) Duties of owners, managers, and others:

(3.) Special Rules for protection of miners:

(4.) General Rules, having reference to: (*a*) Employees; (*b*) Ventilation; (*c*) Explosives and blasting; (*d*) Fire-protection; (*e*) Connection between mines; (*f*) Mine signals; (*g*) Aid to injured; (*h*) Prevention of dust; (*i*) Handling of water; (*j*) Sanitation; (*k*) Protection of working-places, shafts, winzes, raises, etc.; (*l*) Ladder-ways; (*m*) Shaft equipment and operation; (*n*) Testing of brakes; (*o*) Haulage; (*p*) Protection from machinery; (*q*) Electrical installations:

(5.) General Rules for quarries:

(6.) Supplemental.

SUMMARY OF ACTS SPECIALLY RELATING TO MINING.

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

Mining Licences under the Coal and Petroleum Act.

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

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

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

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

Taxation Act.

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

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

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

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

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

Taxation of Mines.

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

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

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

All mines are subject to a tax upon income, subject to the exemptions and allowances given in the "Income Tax Act"; provided, in the case of those mines paying an output tax, that an income tax is only collected if such tax prove greater than the output tax, and the output tax is then regarded as part payment of the income tax.

In addition to the ordinary working expenses, mines are allowed to deduct from their income a charge for:—

(1.) Development—being such proportion of this capital expenditure as is ascertained to be chargeable to the year's operation:
(2.) Depreciation of buildings and plant:
(3.) Depletion—being such proportion of the capital cost of the mine as, being a wasting asset, is ascertained to be chargeable to the year's operation.

The above-mentioned charges are allowable at the discretion of the Minister of Finance, subject, however, to an appeal to the Lieutenant-Governor in Council.

The rate of income tax varies from 1 per cent. up to a maximum of 10 per cent. on incomes of $19,000 and over.

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

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

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

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

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

ASSAY OFFICE.

BY

J. B. ADAMS.

During the year 1939 there were made by the staff in the Government Assay Office, 7,015 assays or quantitative determinations and 432 analyses; of these the majority were for the Department of Mines or for the other departments, for which no fees were received.

The fees collected by the office were as follows:—

Fees for analyses	$167.00
Fees for assaying	134.95
Fees for assayers' examinations	360.00
Total cash receipts	$661.95

Determinations and examinations made for other Government departments, for which no fees were collected:—

Attorney-General's Department	$195.00
Agricultural Department	96.50
Board of Health	480.00
Treasury	2,322.00
Forest Branch	35.00
	$3,128.50

Two thousand three hundred and twenty-two lots of gold were received from the Gold Commissioners, who are purchasing amounts up to 2 oz. to aid the prospector in disposing of his gold.

FREE DETERMINATIONS.

In addition to the above quantitative work, 203 qualitative determinations, or tests, were made in connection with the identification and classification of rocks or minerals sent to the Assay Office for a report; for these no fees were charged, as it is the established custom of the Department to examine and test qualitatively, without charge, samples of minerals sent in from any part of the Province, and to give a report on same. This has been done for the purpose of encouraging the search for new or rare minerals and ores, and to assist prospectors and others in the discovery of new mining districts, by enabling them to have determined, free of cost, the nature and probable value of any rock they may find. In making these free determinations, the Department asks that the locality from which the sample was obtained be given by the sender.

EXAMINATIONS FOR ASSAYERS.

The writer has the honour, as Secretary, to submit the Annual Report for the year 1939 of the Board of Examiners for Certificates of Competency and Licence to practise Assaying in British Columbia, as established under the "Department of Mines Act."

Five candidates applied for examination on May 15th and four passed the examination. Eight candidates applied for examination on November 20th and one failed in the examination. One candidate applied for exemption under the Act and was granted a certificate.

DEPARTMENT OF MINES SAMPLING PLANT, PRINCE RUPERT.

BY
JOSEPH T. MANDY.

A sampling plant was constructed by the Department of Mines, Victoria, at Prince Rupert during the summer of 1937. The plant is on a portion of the "Lumber Dock" leased from the Canadian National Railways and is accessible by railway or steamship. It has a coarse crushing capacity (to 1 inch) of about 16 tons per eight-hour shift and a continuous sampling capacity of average ores, by hand-methods, of about 4 tons per day.

The service of the sampling plant is free and its function has been organized to assist prospectors and operators in the finding, exploration, and development of mining properties, by the following means:—

(1.) Bulk test-sampling of mineral deposits to ascertain the mineralization and values and to establish the commercial or non-commercial aspects of these deposits.

(2.) Guidance through information concerning the factors governing the markets and marketability of the content of mineral deposits, together with assistance in the sale of ores to the smelter or ore-buyer.

(3.) Guidance in the exploration and development of mineral deposits of commercial importance, through contact and advice in the field.

(4.) Assistance through the advantageous purchase, grading, assembly, and marketing of shipping-grade ores by the plant during the preliminary stages of exploration and development of mineral deposits.

The objective of the plant is to promote and foster the actual production of ore and in this way bring mining properties into continuous profitable production. As bearing on this, the all-important matter of freight rates and transportation costs covering shipments of ore from properties to seaboard or the railway is carefully considered. The railway and steamship companies have co-operated in this regard and grant preferential freight tariffs applied to shipments destined for the sampling plant at Prince Rupert. To assure this, a shipping permit signed by the sampling plant manager is, on application, mailed to intending shippers. On presentation of this to the transportation company agent, the shipper is granted the advantage of the preferential freight tariff. In this way many prospectors and small operators have been enabled to profitably mine, ship, and market small lots of ore, and by this means secure funds for further prospecting, exploration, and development of properties.

During 1939, the sampling plant continued to function with increasing popularity and usefulness. A total of 171 shipments was received from fifty-six different properties located over an ever-expanding area extending south to Vancouver Island.

In its relation to the Portland Canal Mining Division, increasing interest in the service of the sampling plant was shown in the Alice Arm and Stewart districts and a number of substantial shipments were made from properties in these localities.

Relative to the Omineca Mining Division, the interest in and utilization of the services of the sampling plant continued and increased and is doubtless an important factor in the gradual revival of lode-mining activity in that area.

The following is a synopsis of the operating details of the plant for the year 1939 from January 1st to December 31st:—

	No. of Shipments.	Different Properties.	Weight of Shipments.
			Tons.
Tonnage lots	43	20	200.5824
Bulk test lots	101	40	17.0534
Assay lots	27	13	0.0364
Totals	171	56	217.6722

SHIPMENTS FROM PLANT TO SMELTER.

Number of shipments to smelters	10
Dry tons paid for by smelters	201.6960*
Paid out by plant to shippers and for freight charges advanced	$12,663.92
Received from smelters	$12,596.75

* Difference between this figure and total weight of shipments received (217.6722 dry tons) is accounted for by carry-over at end of 1938 and end of 1939.

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

SAMPLING PLANT.

Tonnage Lots.

Lot No.	Property.	Shipper.	Locality.	Dry Tons.	Au	Ag	Cu	Pb	Zn	As	Sb	Fe	S	SiO_2	Bi	Se	MoS_2
					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.	Per Cent.
139	Canadian Cadillac Gold Mines, Ltd. (Silver Standard)	A. S. Williamson	New Hazelton	12.2430	0.12	144.00	0.7	25.5	14.7	0.2	*Nil*	6.9	14.1	29.0	.....	.....	.....
140	Canadian Cadillac Gold Mines, Ltd. (Silver Standard)	A. S. Williamson	New Hazelton	1.2835	0.34	22.00	0.5	Trace	13.3	1.3	*Nil*	10.3	12.6	55.5	.....	.....	.....
141	Canadian Cadillac Gold Mines, Ltd. (Silver Standard)	A. S. Williamson	New Hazelton	0.3895	0.74	36.30	0.8	Trace	19.2	0.7	*Nil*	20.3	24.8	24.6	.....	.....	.....
184	Columario	J. Lee Bethurem	Usk	11.3965	1.98	2.90	1.45	*Nil*	*Nil*	*Nil*	*Nil*	15.65	14.0	61.2	.....	.....	.....
203	Columario	W. W. Duncan	Usk	2.4970	2.00	6.00	1.8	Trace	Trace	*Nil*	*Nil*	13.5	10.3	66.5	.....	.....	.....
226	Columario	W. W. Duncan	Usk	1.9707	1.205	3.20	0.3	*Nil*	*Nil*	*Nil*	*Nil*	20.2	13.6	54.4	.....	.....	.....
156	Cordillera	J. Darby	Usk	1.0665	0.78	4.50	7.9	*Nil*	*Nil*	*Nil*	*Nil*	2.9	2.2	77.4	.....	.....	.....
178	Crusader Mining Co. (Gold Knife, Gold Drop, etc.)	K. Gordon Mackenzie	Stewart	2.0445	0.44	1.40	Trace	*Nil*	1.4	*Nil*	*Nil*	29.8	17.8	39.8	.....	.....	.....
297	Dunwell mine	J. D. Rochfort and A. Bugnello	Stewart	12.1990	2.01	37.57	0.21	4.9	4.4	0.51	*Nil*	9.0	20.2	39.6	.....	.....	.....
310	Dunwell mine	J. D. Rochfort and A. Bugnello	Stewart	5.7815	1.33	27.54	0.3	5.7	4.4	0.49	*Nil*	15.2	15.6	41.6	.....	.....	.....
308	Duthie mine	A. W. Herman and J. J. Kelly	Smithers	2.6180	0.17	223.60	Trace	44.0	13.6	1.0	*Nil*	6.6	17.4	8.6	.....	.....	.....
309	Duthie mine	A. W. Herman and J. J. Kelly	Smithers	5.6955	0.19	184.90	0.4	22.0	21.4	1.2	*Nil*	8.8	17.6	21.5	.....	.....	.....
153	Grotto group	J. Lee Bethurem	Usk-Pitman	13.3560	0.95	20.40	3.5	*Nil*	0.5	*Nil*	*Nil*	19.5	18.6	50.2	.....	.....	.....
173	Grotto group	J. Lee Bethurem	Usk-Pitman	4.1870	0.77	15.20	2.5	*Nil*	*Nil*	*Nil*	*Nil*	16.9	14.6	59.2	.....	.....	.....
174	Grotto group	J. Lee Bethurem	Usk-Pitman	2.1865	0.43	17.20	4.0	*Nil*	0.2	*Nil*	*Nil*	21.4	21.3	47.1	.....	.....	.....
194	Glacier Gulch	W. Banta, G. E. Loveless, and S. F. Campbell	Smithers	0.1465	5.085	1.10	*Nil*	*Nil*	*Nil*	*Nil*	*Nil*	2.8	0.3	57.0	1.9	.....	.....
214	Glacier Gulch	W. Banta, G. E. Loveless, and S. F. Campbell	Smithers	12.2355	1.442	0.60	*Nil*	*Nil*	*Nil*	*Nil*	*Nil*	0.9	0.15	56.2	1.2	.....	.....
219	Glacier Gulch	W. Banta, G. E. Loveless, and S. F. Campbell	Smithers	6.1755	1.044	0.20	*Nil*	*Nil*	*Nil*	*Nil*	*Nil*	0.7	0.1	55.5	0.5	.....	.....
249	Glacier Gulch	W. Banta, G. E. Loveless, and S. F. Campbell	Smithers	10.2391	1.2125	0.20	*Nil*	*Nil*	*Nil*	*Nil*	*Nil*	0.5	0.2	55.2	.....	.....	.....
258	Glacier Gulch	W. Banta, G. E. Loveless, and S. F. Campbell	Smithers	2.0421	3.49	0.10	*Nil*	*Nil*	*Nil*	*Nil*	*Nil*	0.5	0.2	53.8	5.6	.....	.....

SAMPLING PLANT—*Continued.*

Tonnage Lots—Continued.

Lot No.	Property.	Shipper.	Locality.	Dry Tons.	Au	Ag	Cu	Pb	Zn	As	Sb	Fe	S	SiO_2	Bi	Se	MoS_2
					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.	Per Cent.
179	Gold Boulder	J. Haahti	Stewart	0.7480	1.76	1.70	0.5	*Nil*	0.25	*Nil*	*Nil*	26.3	19.9	42.6			
180	Gold Boulder	J. Haahti	Stewart	2.7840	2.05	3.80	1.2	*Nil*	1.2	*Nil*	*Nil*	36.0	31.2	20.0			
298	Gold Boulder	J. Haahti	Stewart	7.2630	2.71	2.00	0.7	*Nil*	0.3	*Nil*	*Nil*	34.2	22.8	33.4			
299	Gold Drop	J. Morin and Casey	Stewart	4.8660	2.34	4.30	0.2	2.0	0.2	*Nil*	*Nil*	14.4	7.6	56.2			
185	Golden Eagle	D. Heenan	Topley	1.3010	0.35	461.50	2.1	13.2	13.6	*Nil*	1.08	7.1	13.8	35.2			
188	Golden Eagle	D. Heenan	Topley	0.3210	0.21	20.50	0.7	27.8	11.6	*Nil*	0.5	5.0	14.4	31.2			
207	Golden Eagle	D. Heenan	Topley	0.4258	0.16	215.50	1.2	19.2	15.2	0.2	*Nil*	6.8	16.3	32.8			
191	Gold group	Mathew Sam	Topley	0.1415	0.04	70.70	2.4	13.9	9.1	*Nil*	0.8	6.2	5.5	33.6			
199	Gold group	Mathew Sam	Topley	0.1360	0.01	23.00	0.8	11.4	12.3	Trace	Trace	6.3	8.0	32.9			
200	Gold group	Mathew Sam	Topley	0.0575	0.03	73.50	0.8	*Nil*	Trace	*Nil*	*Nil*	4.5	2.0	78.1			
260	Gold Leaf	J. Flynn	Anyox	1.8255	1.962	0.60	*Nil*	*Nil*	*Nil*	0.9	*Nil*	3.2	0.9	84.2			
261	Gold Leaf	J. Flynn	Anyox	3.6721	0.930	0.60	*Nil*	*Nil*	*Nil*	0.9	*Nil*	3.2	0.9	84.2			
264	Homestake (British Lion Mines, Ltd.)	K. Gordon Mackenzie	Alice Arm	8.8067	4.100	5.90	7.4	0.8	3.8	Trace	*Nil*	19.2	18.0	38.1			
143	Oral M.	J. Lehto and J. Haahti	Stewart	5.1685	0.830	2.00	3.5	*Nil*	0.4	*Nil*	*Nil*	10.0	6.3	66.6			
311	Ruth claim	T. H. Payne	Alice Arm	5.9575	0.220	150.00	*Nil*	0.6	1.2	0.8	0.35	6.2	4.4	74.8			
175	Snowbird group	T. E. Neilson	Stuart Lake	13.2205	Trace	Trace	*Nil*	*Nil*	*Nil*	*Nil*	55.0	0.3	19.8	19.5		0.11	
197	Snowbird group	T. E. Neilson	Stuart Lake	17.9585	0.04	0.20	*Nil*	*Nil*	Trace	*Nil*	57.5	0.4	22.0	17.0		0.17	
208	Tide Lake Gold	Mrs. J. L. Campbell	Stewart	0.7690	23.92	48.80	*Nil*	3.6	16.5	0.1	*Nil*	3.4	10.8	50.3			
224	Tide Lake Gold	Mrs. J. L. Campbell	Stewart	1.0163	16.37	39.30	*Nil*	2.33	10.17	*Nil*	*Nil*	3.7	9.5	49.3			
246	Victory group	Mrs. M. C. Simpson	Smithers	2.6851	0.50	28.00	0.9	15.2	6.8	5.3	*Nil*	11.6	8.8	33.2			
267	Victory group	Mrs. M. C. Simpson	Smithers	3.8545	0.525	34.50	0.9	20.2	8.6	4.3	*Nil*	10.8	9.3	24.8			
268	Victory group	Mrs. M. C. Simpson	Smithers	2.4310	0.305	26.50	0.7	15.8	8.8	3.5	*Nil*	9.0	9.2	34.6			
152	Wolf	J. Fiva	Alice Arm	5.4200	0.325	262.95	0.5	5.0	6.2	*Nil*	0.3	4.6	6.4	65.0			

Test Lots.

281-T	Alexander group	S. Chalmers	Stewart	0.0093	Trace	0.80											
282-T	Alexander group	S. Chalmers	Stewart	0.0151	0.06	49.00	Trace	3.7	6.4	Trace	*Nil*	5.4	11.6	66.0			
283-T	Alexander group	S. Chalmers	Stewart	0.0012	Trace	Trace											
293-T	American Boy	Mrs. B. S. Sargent	South Hazelton	0.1760	0.36	7.30	*Nil*	0.6	*Nil*	27.4	*Nil*	22.4	10.7	21.3			
182-T	Aurora M.C.	Karl Eklund	Anyox	0.0121	0.37	14.40	*Nil*	0.35	1.6	*Nil*	*Nil*	3.6	2.2	83.2			
183-T	Aurora M.C.	Karl Eklund	Anyox	0.0035	0.17	4.20	*Nil*	0.15	0.9	*Nil*	*Nil*	3.6	1.6	64.4			
304-T	Border M.C.	Wm. Kern	Porcher Island	0.0232	2.50	1.75	*Nil*					12.1	5.8	72.0			

241-T	Butedale	A. McLeod	Butedale	0.0520	Trace	Trace											
242-T	Butedale	A. McLeod	Butedale	0.0512	Trace	Trace											
292-T	Butedale	A. McLeod	Butedale	0.0440	0.04	1.50	5.2	*Nil*	*Nil*			7.0	1.6	53.2			
149-T	Columario	W. W. Duncan	Usk	0.0080	0.51	0.50	*Nil*			*Nil*		16.8	16.5	64.2			
157-T	Columario	J. Lee Bethurem	Usk	0.0140	0.90	1.18											
158-T	Columario	J. Lee Bethurem	Usk	0.0065	2.37	6.59											
159-T	Columario	J. Lee Bethurem	Usk	0.0030	1.74	6.40											
163-T	Columario	J. Lee Bethurem	Usk	0.0035	2.07	6.70											
164-T	Columario	J. Lee Bethurem	Usk	0.0077	0.57	1.57											
167-T	Columario	W. W. Duncan	Usk	0.0030	0.29	1.47											
168-T	Columario	J. Lee Bethurem	Usk	0.0040	0.76	4.72	10.29										
171-T	Columario	J. Lee Bethurem	Usk	0.0590	3.68	8.30	1.8			*Nil*		23.3	24.5	46.0			
202-T	Columario	W. W. Duncan	Usk	0.0635	1.69	4.10	*Nil*	*Nil*	*Nil*	*Nil*	*Nil*	28.4	18.6	41.0			
169-T	Cordillera	J. Darby	Usk	0.0427	0.26	0.90	1.2							83.0			
170-T	Cordillera	J. Darby	Usk	0.0343	0.26	1.00	1.0							86.6			
160-T	Coronado	H. Orm	Hudson Bay Mountain	0.0525	0.28	36.92	0.4	25.2	12.6	2.5	*Nil*	9.0	14.4	22.4			
161-T	Coronado	H. Orm	Hudson Bay Mountain	0.0670	0.42	72.00	0.5	16.2	19.6	2.6	*Nil*	9.9	16.6	24.4			
176-T	Coronado	H. Orm	Hudson Bay Mountain	0.0700	0.22	65.70	0.6	48.1	11.2	2.0	0.5	6.8	16.3	9.0			
177-T	Coronado	H. Orm	Hudson Bay Mountain	0.0645	0.26	47.00	0.7	32.4	14.1	2.9	0.6	8.0	15.2	18.2			
186-T	Coronado	H. Orm	Hudson Bay Mountain	0.0701	0.09	53.90	1.2	29.0	19.5	0.1	*Nil*	6.7	19.2	10.9			
187-T	Coronado	H. Orm	Hudson Bay Mountain	0.0542	0.06	15.60	0.1	9.2	33.0	0.1	*Nil*	7.7	20.0	15.1			
205-T	Coronado	H. Orm	Hudson Bay Mountain	0.0726	0.10	90.20	1.0	70.1	5.5	0.9	*Nil*	2.8	15.2	2.8			
206-T	Coronado	H. Orm	Hudson Bay Mountain	0.0487	0.25	1.30	*Nil*	0.8	2.0	16.8	*Nil*	16.7	8.9	37.9			
252-T	Coronado	H. Orm	Hudson Bay Mountain	0.0793	0.06	79.30	0.2	67.0	2.5	0.1	0.2	2.0	13.0	3.2			
195-T	Crusader Mining Co. (Gold Knife, Gold Drop, etc.)	K. Gordon Mackenzie	Stewart	0.0485	0.63	2.00	Trace	*Nil*	4.2	*Nil*	*Nil*	26.9	16.2	41.7			
215-T	Doiron	E. W. Doiron	Queen Charlotte Islands	0.0097	Trace	0.08	*Nil*	0.7	1.6	*Nil*							
269-T	Duthie mine	A. W. Kelly and J. J. Herman	Smithers	0.0462	0.12	34.50	Trace	10.7	9.0	2.7	*Nil*	9.9	10.7	29.1			
270-T	Duthie mine	A. W. Kelly and J. J. Herman	Smithers	0.0535	0.23	127.70	0.2	36.4	7.8	1.9	*Nil*	6.9	13.6	13.1			
271-T	Duthie mine	A. W. Kelly and J. J. Herman	Smithers	0.0686	0.30	226.00	0.8	33.3	9.1	5.3	0.1	9.5	16.3	12.0			
272-T	Duthie mine	A. W. Kelly and J. J. Herman	Smithers	0.0572	0.24	62.00	0.7	40.0	13.5	0.8	*Nil*	9.5	20.0	7.0			

SAMPLING PLANT—*Continued.*

Test Lots—Continued.

Lot No.	Property.	Shipper.	Locality.	Dry Tons.	Au	Ag	Cu	Pb	Zn	As	Sb	Fe	S	SiO_2	Bi	Se	MoS_2
					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.	Per Cent.
273-T	Duthie mine	A. W. Kelly and J. J. Herman	Smithers	0.0113	0.20	48.00	0.7	41.8	8.8	0.1	Trace	14.3	23.8	1.1			
305-T	Duthie mine	A. W. Kelly and J. J. Herman	Smithers	0.0547	0.06	62.00	Trace	4.0	6.2	2.8	*Nil*	9.0	8.0	36.0			
306-T	Duthie mine	A. W. Kelly and J. J. Herman	Smithers	0.0898	0.20	127.50	Trace	26.0	15.8	2.7	0.2	12.0	18.3	15.6			
307-T	Duthie mine	A. W. Kelly and J. J. Herman	Smithers	0.1102	0.16	136.75	Trace	51.0	5.8	1.5	0.3	8.0	16.3	8.0			
189-T	Edith Gold Fraction	H. B. Cox	Saanich	0.0485	Trace	1.40											
190-T	Edith Gold Fraction	H. B. Cox	Saanich	0.0055	*Nil*	*Nil*											
232-T	Edith Gold Fraction	H. B. Cox	Saanich	0.1380	Trace	0.30	*Nil*	*Nil*	*Nil*	*Nil*	*Nil*						
216-T	Gem No. 1	W. Hagen	Copper River	0.2000	0.86	1.50	*Nil*	Trace	Trace	0.15	*Nil*	10.0	7.8	76.7			
244-T	Gem No. 1	W. Hagen	Copper River	0.1818	0.62	1.30	*Nil*	*Nil*	*Nil*	*Nil*	*Nil*	8.4	6.0	80.9			
301-T	Georgia M.C.	J. Bissonnette	Terrace	0.0125	0.02	Trace	*Nil*										
204-T	Glacier Gulch	W. Banta	Smithers	0.0272	0.18	Trace	*Nil*										
248-T	Glacier Gulch	W. Banta, G. Loveless, and S. F. Campbell	Smithers	0.3308	2.66	0.40	*Nil*	*Nil*	*Nil*	*Nil*	*Nil*	0.6	0.3	54.8			
212-T	Gold Drop	J. Morin and Casey	Stewart	0.2286	3.09	1.20	Trace	*Nil*	*Nil*	*Nil*	*Nil*	15.2	11.7	65.0			
262-T	Golden Eagle	D. Heenan	Topley	0.1988	0.12	182.20	1.1	17.0	15.0	1.3	*Nil*	6.2	14.6	37.1			
263-T	Gold group	Mathew Sam	Topley	0.0856	0.24	67.70	0.8	1.4	6.2	Trace	*Nil*	7.8	4.0	52.3			
284-T	Gold group	Mathew Sam	Topley	0.0378	0.22	173.40	0.5	*Nil*	*Nil*	Trace		5.8	1.9	66.3			
150-T	Gold Knife group	K. Gordon Mackenzie	Stewart	0.0420	1.55	2.60	0.3	*Nil*	6.0	*Nil*	*Nil*	27.8	20.0	35.4			
151-T	Gold Knife group	K. Gordon Mackenzie	Stewart	0.0400	Trace	Trace	*Nil*	*Nil*									
253-T	Gold Leaf	J. Flynn	Anyox	0.0194	28.73	7.50	*Nil*	*Nil*	1.0	*Nil*	*Nil*						
217-T	Goodwill	J. B. Goodwill	Telkwa	0.0016	481.2	38.00											
145-T	Grotto group	J. Lee Bethurem	Usk-Pitman	0.0480	1.20	23.60	3.4	*Nil*	*Nil*	*Nil*	*Nil*	18.7	18.6	54.5			
154-T	Grotto group	J. Lee Bethurem	Usk-Pitman	0.0492	0.28	7.10	1.2	*Nil*	*Nil*	*Nil*	*Nil*	9.2	6.4	61.0			
155-T	Grotto group	J. Lee Bethurem	Usk-Pitman	0.0542	0.38	12.10	2.3	*Nil*	*Nil*	*Nil*	*Nil*	10.6	9.2	65.8			
165-T	Grotto group	J. Lee Bethurem	Usk-Pitman	0.0200	0.80	15.20	2.1	*Nil*	*Nil*	*Nil*	*Nil*	13.8	12.0	60.0			
172-T	Grotto group	J. Bell	Usk-Pitman	0.0042	0.60	20.00	5.8	*Nil*	0.6	*Nil*		21.7	23.1	46.6			
257-T	Haahti	J. Haahti	Stewart	0.0280	*Nil*	*Nil*	*Nil*	*Nil*	*Nil*			14.3	3.2	38.9			0.9
230-T	Hyland Basin	C. M. Campbell	Smithers	1.2855	0.49	164.00	2.8	16.1	4.0	Trace	*Nil*	3.0	3.7	61.6			
231-T	Hyland Basin	C. M. Campbell	Smithers	0.2525	0.76	52.50	0.8	2.5	4.0	*Nil*	*Nil*	9.0	1.2	66.0			
235-T	Hyland Basin	C. M. Campbell	Smithers	0.7775	0.60	217.00	2.3	17.8	4.5	*Nil*	1.1	3.2	6.1	45.8			
236-T	Hyland Basin	C. M. Campbell	Smithers	1.9360	1.04	190.00	2.0	23.7	9.3	*Nil*	1.2	2.6	7.4	38.0			
237-T	Hyland Basin	C. M. Campbell	Smithers	0.2801	2.17	216.00	3.0	29.4	8.9	*Nil*	0.9	4.8	11.3	15.7			

238-T	Hyland Basin	C. M. Campbell	Smithers	0.0955	0.96	150.00	2.0	19.1	28.7	*Nil*	1.0	2.0	18.3	20.9			
239-T	Hyland Basin	C. M. Campbell	Smithers	0.0940	1.64	1255.00	15.6	2.4	2.2	*Nil*	2.0	10.5	4.8	30.0			
240-T	Hyland Basin	C. M. Campbell	Smithers	0.0985	1.74	301.10	4.0	22.2	9.1	*Nil*	1.0	2.6	6.9	40.7			
245-T	Homestake (British Lion Mines, Ltd.)	K. Gordon Mackenzie	Alice Arm	0.0405	0.15	3.20	4.0	9.6	8.1	*Nil*	*Nil*	13.4	18.4	33.4			
146-T	Marrigold	L. Bartholomew	Topley	0.1055	0.03	12.00	1.0	4.6	2.0	*Nil*	*Nil*	5.0	1.4	70.9			
243-T	Ness-Telkwa group	T. A. Logie	Smithers	0.4254	0.43	160.30	3.4	25.2	1.1	*Nil*	0.8	4.4	7.5	48.2			
251-T	Nugent Queen	E. M. Morrison	Allison Harbour	0.2721	2.08	2.40	0.2	*Nil*	1.8	*Nil*	*Nil*	7.6	6.6	74.8			
259-T	Nugent Queen	E. M. Morrison	Allison Harbour	0.5502	0.58	0.20	Trace	*Nil*	*Nil*	*Nil*	*Nil*	7.0	6.1	64.8			
274-T	Nugent Queen	E. M. Morrison	Allison Harbour	0.1332	1.60	8.00	1.2	3.2	0.9			10.1	8.8	71.9			
220-T	Rainbow group	A. A. McLean	Smithers	0.5390	0.57	40.20	12.0	Trace	0.9	0.55	1.65	14.3	11.8	37.6			
221-T	Rainbow group	A. A. McLean	Smithers	0.1828	0.12	75.10	14.1	*Nil*	1.4	1.55	5.4	10.9	11.4	24.9			
285-T	Red Cliffe	H. D. Haywood	Stewart	1.7995	2.33	10.00	0.2	Trace	0.6	Trace	*Nil*	16.2	7.6	58.4			
286-T	Red Cliffe	H. D. Haywood	Stewart	2.0105	3.83	10.10	Trace	Trace	0.5	*Nil*	*Nil*	16.1	7.1	58.2			
287-T	Red Cliffe	H. D. Haywood	Stewart	0.9920	2.55	11.00	0.4	20.4	6.5	*Nil*	*Nil*	15.3	13.0	26.6			
288-T	Red Cliffe	H. D. Haywood	Stewart	0.4465	2.32	10.00	1.0	8.2	22.7	*Nil*	*Nil*	14.0	19.9	22.8			
289-T	Red Cliffe	H. D. Haywood	Stewart	0.0301	10.15	3.35	Trace	*Nil*	*Nil*								
213-T	Rattacker	D. Rattacker	Manson Creek	0.0624	0.90	5.30	0.1	*Nil*	*Nil*	*Nil*	0.1	2.6	0.3	77.2			
294-T	Ruby	W. H. Harrison	White Sail Lake	0.0040	0.08	28.90	0.8	17.7	8.4	0.15	*Nil*	19.2	21.0	25.3			
295-T	Ruby	W. H. Harrison	White Sail Lake	0.0045	0.02	35.20	0.5	42.0	7.8	0.4	*Nil*	16.2	18.0	6.5			
302-T	Ruth claim	T. H. Payne	Alice Arm	0.0871	0.24	153.00	*Nil*	*Nil*	2.0	1.0	0.2	6.0	4.3	78.8			
303-T	Ruth claim	T. H. Payne	Alice Arm	0.0018	0.01	6.90	*Nil*	*Nil*	Trace	0.1	*Nil*	11.5	6.9	74.4			
201-T	Ruth & Francis	D. J. McLean	Stewart	0.0422	0.04	7.50	*Nil*	11.6	6.3	0.6	4.8	12.8	29.0	10.0			
196-T	Ryder	H. A. Ryder	Parksville	0.1975	0.02	0.20	*Nil*	*Nil*	0.2	Trace	28.7	1.6	11.0	52.0			
147-T	Three Star group	L. Kylling	Topley	0.4760	0.23	27.60	1.5	*Nil*	10.0	*Nil*	0.7	17.9	14.1	19.4			
148-T	Three Star group	L. Kylling	Topley	0.0242	0.12	1.80	Trace	1.9	2.2	*Nil*	*Nil*	5.0	4.5	80.2			
296-T	Tilicum M.C.	J. A. Goodspeed	Port Hardy	0.0015	2.58	5.50	0.2	7.4	6.2	Trace	*Nil*	20.4	20.1	41.4			
227-T	Victor group	W. W. Duncan and S. G. Cooper	Usk	0.0050	0.18	0.20	0.4	0.1	*Nil*	*Nil*	*Nil*	6.7	1.6	81.6			
228-T	Victor group	W. W. Duncan and S. G. Cooper	Usk	0.0057	4.12	2.40	1.8	0.2	*Nil*	*Nil*	*Nil*	25.0	25.2	44.8			
229-T	Victor group	W. W. Duncan and S. G. Cooper	Usk	0.0010	0.10	0.20	*Nil*	*Nil*	Trace	*Nil*	*Nil*	44.2	47.4	4.2			
142-T	Wolf	J. Fiva	Alice Arm	0.1060	0.58	237.50	0.2	5.0	6.1	*Nil*	*Nil*	5.1	6.7	72.1			

GOLD COMMISSIONERS AND MINING RECORDERS.

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

Mining Division.	Location of Office.	Gold Commissioner.	Mining Recorder.	Sub-recorder.
Atlin	Atlin	H. F. Glassey	H. F. Glassey	G. H. Hallett.
Sub-office	Telegraph Creek			T. S. Dalby.
Sub-office	Squaw Creek			Mrs. F. Muncaster.
Sub-office	Tulsequah			W. J. Nelson.
Stikine	Telegraph Creek	T. S. Dalby	T. S. Dalby	
Sub-office	Boundary via Telegraph Creek			F. W. Grimble.
Sub-office	Burns Lake			John Brown.
Sub-office	McDame Creek			Gerald Davis.
Sub-office	Fort St. John			F. W. Beatton.
Sub-office	Dease Lake Townsite			R. J. Campbell.
Skeena	Prince Rupert	N. A. Watt	N. A. Watt	A. J. Lancaster.
Sub-office	Kitimat			Chas. E. Moore.
Sub-office	Copper River			L. G. Skinner.
Sub-office	Terrace			P. Kelsberg.
Sub-office	Stewart (Portland Canal)			H. W. Dodd.
Sub-office	Rosswood			Oscar Olander.
Sub-office	Kimsquit			Percy Gadsden.
Sub-office	Ocean Falls			Geo. H. Hill.
Sub-office	Bella Coola			C. A. Brynildsen.
Portland Canal	Stewart	N. A. Watt (at Prince Rupert)	H. W. Dodd	
Sub-office	Anyox			
Sub-office	Alice Arm			Mrs. L. Cummings.
Queen Charlotte	Queen Charlotte	N. A. Watt	A. G. McKinnon, M.D.	
Sub-office	Lockeport			
Omineca	Smithers	H. B. Campbell	H. B. Campbell	
Sub-office	Fort Grahame			J. Copeland.
Sub-office	Bella Coola			C. A. Brynildsen.
Sub-office	Finlay Forks			A. MacKinnon.
Sub-office	Fort St. James			Mrs. A. Kynoch.
Sub-office	Manson Creek			W. B. Steele.
Sub-office	Telkwa			T. J. Thorp.
Sub-office	Prince George			Geo. Milburn.
Sub-office	Hudson Hope			M. Kyllo.
Sub-office	Kimsquit			Percy Gadsden.
Sub-office	Fort St. John			F. W. Beatton.
Sub-office	Whitewater (Finlay River) via Fort Grahame			James Ware.
Sub-office	Cedarvale			John Thompson.
Sub-office	Terrace			P. Kelsberg.
Sub-office	Fort Fraser			J. D. Moore.
Sub-office	Vanderhoof			Geo. Ogsdon.
Sub-office	Pacific			J. C. McCubbin.
Sub-office	Hazelton			L. I. Olson.
Sub-office	Burns Lake			John Brown.
Sub-office	Usk			Jas. L. Bethurem.
Sub-office	Takla Landing			Mrs. Wilhemina Aiken.
Sub-office	Copper River			L. G. Skinner.
Peace River	Fort St. John	H. B. Campbell (at Smithers)	F. W. Beatton	
Sub-office	Fort Nelson			H. J. Engleson.
Sub-office	Prince George			G. Milburn.
Sub-office	Finlay Forks			A. MacKinnon.
Sub-office	Hudson Hope			Melvin Kyllo.
Sub-office	Pouce Coupe			A. E. Roddis.
Cariboo	Barkerville	H. A. Bryant	H. A. Bryant	
Sub-office	Quesnel			A. Sydney.
Sub-office	Prince George			Geo. Milburn.
Sub-office	McBride			M. B. McBrayne.
Sub-office	Fort McLeod			J. E. McIntyre.

GOLD COMMISSIONERS AND MINING RECORDERS—*Continued.*

Mining Division.	Location of Office.	Gold Commissioner.	Mining Recorder.	Sub-recorder.
Quesnel	Williams Lake	L. C. Maclure	L. C. Maclure	
Sub-office	Quesnel			A. Sydney.
Sub-office	Likely			A. Morrison.
Sub-office	Barkerville			H. A. Bryant.
Sub-office	Horsefly			A. B. Campbell.
Sub-office	Keithley Creek			Wm. Lowden.
Sub-office	Hanceville			E. R. Hance.
Clinton	Clinton	R. J. A. Dorrell	R. J. A. Dorrell	
Sub-office	Williams Lake			L. C. Maclure.
Sub-office	Haylmore via Gold Bridge			W. Haylmore.
Sub-office	Hanceville			E. R. Hance.
Kamloops	Kamloops	P. H. McCurrach	P. H. McCurrach	
Sub-office	Chu Chua			George M. Fennell.
Sub-office	Vavenby			H. Finley.
Sub-office	Salmon Arm			A. P. Suckling.
Ashcroft	Ashcroft	P. H. McCurrach (at Kamloops)	W. F. Knowlton	
Sub-office	Lytton			H. Elgie.
Nicola	Merritt	P. H. McCurrach (at Kamloops)	R. G. Couper	
Similkameen	Princeton	Chas. Nichols	Chas. Nichols	
Sub-office	Hedley			Charles H. Martin.
Vernon	Vernon	R. M. McGusty	R. M. McGusty	F. H. C. Wilson.
Sub-office	Kelowna			C. W. Dickson.
Greenwood	Greenwood	L. A. Dodd	L. A. Dodd	
Sub-office	Kettle Valley			G. B. Gane.
Sub-office	Beaverdell			T. W. Clarke.
Sub-office	Oliver			W. H. Laird.
Grand Forks	Grand Forks	E. Harrison	E. Harrison	
Osoyoos	Penticton	W. R. Dewdney	W. R. Dewdney	
Sub-office	Keremeos			L. S. Coleman.
Sub-office	Hedley			Charles H. Martin.
Sub-office	Oliver			W. H. Laird.
Golden	Golden	A. W. Anderson	A. W. Anderson	C. J. Dainard.
Windermere	Windermere	A. W. Anderson (at Golden)	A. M. Chisholm	
Fort Steele	Cranbrook	W. G. Taylor	W. G. Taylor	A. A. Robertson.
Sub-office	Fernie			J. R. Nolan.
Ainsworth	Kaslo	Claude MacDonald	W. M. H. Dunn	
Sub-office	Trout Lake			
Sub-office	Poplar Creek			A. Robb.
Slocan	New Denver	Claude MacDonald (at Kaslo)	Frank Broughton	
Sub-office	Slocan			W. E. Graham.
Nelson	Nelson	J. Cartmel	J. Cartmel	J. A. Stewart.
Sub-office	Creston			R. H. Hassard.
Sub-office	Ymir			S. Curwen.
Sub-office	Salmo			M. C. Donaldson.
Arrow Lake	Nakusp	J. Cartmel (at Nelson)	N. A. Herridge	
Revelstoke	Revelstoke	Wynfield Maxwell	W. Maxwell	
Lardeau	Beaton	Wynfield Maxwell (at Revelstoke)	Stephen Rowe	
Sub-office	Trout Lake			
Trail Creek	Rossland	A. C. Sutton	A. C. Sutton	
Nanaimo	Nanaimo	C. L. Monroe	C. L. Monroe	W. H. Cochrane.
Sub-office	Ladysmith			J. A. Knight.
Sub-office	Alert Bay			Jos. Howe.
Sub-office	Vananda			Henry Carter.
Sub office	Shoal Bay, Thurlow P.O.			C. C. Thompson.
Sub-office	Granite Bay			H. J. Bull.
Sub-office	Cumberland			A. G. Freeze.
Sub-office	Zeballos			Geo. Nicholson.
Sub-office	Alberni			W. H. Boothroyd.
Alberni	Alberni	W. H. Boothroyd	W. H. Boothroyd	G. C. Rolf.

GOLD COMMISSIONERS AND MINING RECORDERS—*Continued.*

Mining Division.	Location of Office.	Gold Commissioner.	Mining Recorder.	Sub-recorder.
Clayoquot	Tofino	W. H. Boothroyd (at Alberni)	C. W. Sharp	
Sub-office	Zeballos			Geo. Nicholson.
Sub-office	Alberni			W. H. Boothroyd.
Sub-office	Nanaimo			C. L. Monroe.
Quatsino	Quatsino	W. H. Boothroyd (at Alberni)	Ed. Evenson	
Victoria	Victoria	R. J. Steenson	P. J. Mulcahy	
New Westminster	New Westminster	A. P. Grant	A. B. Gray	
Sub-office	Chilliwack			C. N. Tingle.
Sub-office	Lytton			H. Elgie.
Sub-office	Hope			Mrs. B. Valair.
Vancouver	Vancouver	A. S. Tyrer	R. A. Burgoyne	
Sub-office	Alert Bay			Jos. Howe.
Sub-office	Powell River			J. P. Scarlett.
Sub-office	Shoal Bay, Thurlow P.O.			C. C. Thompson.
Lillooet	Lillooet	L. J. Price	L. J. Price	T. B. Williams.
Sub-office	Haylmore via Gold Bridge			W. Haylmore.
Sub-office	Taseko River			

GOLD COMMISSIONERS' AND MINING RECORDERS' OFFICE STATISTICS, 1939.

Districts and Divisions.	Free Miners' Certificates.			Lode-mining.					Placer-mining.				Revenue.		Total.	
	Individual.	Company.	Special.	Mineral Claims recorded.	Certificates of Work.	Bills of Sale, etc.	Certificates of Improvements.	Leases of Re-verted Crown-granted Mineral Claims.	Placer Claims recorded.	Placer Leases recorded (Bench, Creek, and Dredging).	Certificates of Work, Placer Leases.	Bills of Sale, etc.	Free Miners' Certificates.	General.	Mining Divisions.	Districts.
North-western District																**$22,050.75**
Atlin	356	4	1	107	52	1	.....	.....	54	62	157	117	$1,951.75	$11,134.85	$13,086.60	.....
Portland Canal	178	3	.....	75	533	27	2	.....	.....	5	.....	6	1,164.50	1,791.55	2,956.05	.....
Queen Charlotte	11	.....	.....	10	8	.....	.....	.....	.....	.....	.....	1	96.50	68.25	164.75	.....
Skeena	116	.....	.....	46	113	7	17	20	2	6	.....	.....	496.75	1,169.25	1,666.00	.....
Stikine	155	.....	2	46	90	16	8	.....	.....	25	46	37	784.25	3,393.10	4,177.35	.....
North-eastern District																**52,459.76**
Cariboo	388	17	3	332	750	61	66	.....	39	163	319	131	3,318.75	21,285.40	24,604.15	.....
Omineca	461	8	3	174	632	37	9	5	28	29	305	43	3,136.50	11,088.01	14,224.51	.....
Peace River	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Quesnel	459	3	5	187	326	32	14	.....	46	71	180	79	1,611.75	12,019.35	13,631.10	.....
South Central District																**22,707.00**
Kamloops	264	1	6	148	253	26	.....	6	31	30	12	11	1,430.00	2,189.20	3,619.20	.....
Nicola	30	1	1	72	74	4	.....	.....	1	.....	.....	.....	235.50	380.50	616.00	.....
Vernon	223	8	3	64	84	23	.....	.....	20	15	42	13	1,389.75	2,514.25	3,904.00	.....
Grand Forks	94	1	2	83	49	25	.....	7	.....	.....	7	1	497.75	772.50	1,270.25	.....
Greenwood	188	2	1	154	275	33	.....	4	9	3	7	1	978.50	2,129.00	3,107.50	.....
Osoyoos	193	2	.....	109	193	15	7	1	.....	.....	.....	.....	1,021.00	890.45	1,911.45	.....
Similkameen	350	7	1	141	247	30	.....	.....	10	49	43	57	2,161.25	6,117.35	8,278.60	.....
South-eastern District																**21,997.15**
Ainsworth	95	3	1	96	186	14	1	14	3	.....	.....	.....	671.75	1,332.00	2,003.75	.....
Arrow Lake	21	.....	.....	15	6	.....	.....	.....	1	.....	.....	.....	93.00	52.75	145.75	.....
Fort Steele	236	3	3	119	128	43	3	.....	12	18	48	36	1,317.50	3,820.25	5,137.75	.....
Golden	29	2	.....	16	27	9	.....	1	.....	1	2	1	281.25	313.55	594.80	.....
Lardeau	46	.....	.....	54	82	12	.....	.....	4	.....	.....	.....	186.25	451.00	637.25	.....
Nelson	387	14	3	157	589	90	32	8	42	4	22	9	2,800.75	4,564.70	7,365.45	.....
Revelstoke	85	2	.....	51	67	12	11	4	3	5	27	11	503.00	2,940.30	3,443.30	.....
Slocan	33	2	.....	30	36	2	.....	.....	.....	.....	.....	.....	344.50	251.00	595.50	.....
Slocan City	36	.....	.....	23	82	4	.....	.....	.....	.....	.....	.....	172.00	273.00	445.00	.....
Trail Creek	143	3	.....	30	25	2	1	1	1	2	.....	.....	868.00	246.35	1,114.35	.....
Windermere	44	2	1	6	58	4	.....	.....	.....	.....	.....	.....	333.75	180.50	514.25	.....
South-western District																**59,259.90**
Alberni	176	2	1	156	114	22	69	7	.....	.....	1	.....	880.00	1,804.25	2,684.25	.....
Ashcroft	95	3	2	38	127	13	8	.....	9	24	15	47	859.25	2,020.50	2,879.75	.....
Clayoquot	463	17	2	1,122	1,505	345	70	.....	14	3	4	.....	3,481.70	9,542.25	13,023.95	.....
Clinton	70	3	.....	96	223	38	15	.....	20	4	18	18	544.25	1,932.20	2,476.45	.....
Lillooet	270	11	.....	365	588	74	22	.....	9	14	28	.....	2,066.50	4,351.40	6,417.90	.....
Nanaimo	181	1	1	143	66	13	.....	1	.....	.....	.....	1	732.50	566.75	1,299.25	.....
New Westminster	188	4	1	578	331	79	8	4	10	2	6	5	1,190.25	3,641.70	4,831.95	.....
Quatsino	71	.....	1	19	46	13	.....	.....	.....	.....	.....	.....	327.25	209.80	537.05	.....
Vancouver	1,520	114	20	222	232	27	2	6	.....	1	.....	.....	16,027.25	1,392.85	17,420.10	.....
Victoria	502	14	4	144	56	10	.....	3	18	9	26	5	2,970.25	1,811.75	4,782.00	.....
Yale*	120	6	.....	117	153	20	1	.....	14	.....	7	1	1,200.50	1,706.75	2,907.25	.....
Totals	8,277	263	68	5,315	8,406	1,183	366	92	400	545	1,322	631	$58,125.95	$120,348.61	$178,474.56	**$178,474.56**

* Yale Mining Division was combined with New Westminster Mining Division as from June 30th, 1939, and statistics for Yale Mining Division cover the period January 1st to June 30th, 1939.

PROGRESS NOTES.

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

LODE-GOLD DEPOSITS.

TAKU RIVER AREA.

TULSEQUAH.

Polaris-Taku Mining Co., Ltd.

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

The property is located on Tulsequah River, longitude 133° 36′, latitude 58° 44′, about 6 miles by road from its junction with Taku River. It is reached by boat and aeroplane in summer and by aeroplane only in winter.

It is equipped with a complete mining plant and 150-ton flotation plant built in 1937. Development to date is on four levels. Development during the year consisted of 8,171 feet of drifting and 2,446 feet of raising. A diamond-drilling programme to test the ground below the *Polaris* (present lowest level) was commenced and 18,891 feet of drilling done. A raise was put up from C level to the Canyon level veins which have not yet been developed. The mine was worked 364 days and 69,045 tons of ore produced; 126 men were employed.

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

DEASE RIVER AREA.

MCDAME CREEK.

McDames Lake Mining Co., Inc.

Company office, 703 Royal Bank Building, Vancouver, B.C.; Henry G. Boulton, Seattle, President; A. W. Boulton, Seattle, Secretary-Treasurer. Capital: 2,500 preferred shares, $10 par; 100,000 common shares, 1 cent par; issued—625 preferred, 75,500 common. This company installed a 10-ton mill, comprising a small jaw-crusher and combination ball-mill and amalgamator, on claims situated at an elevation of 4,650 feet, or 1,400 feet above McDame Lake, on the slope of Erickson Creek, longitude 129° 35′, latitude 59° 15′. This equipment was flown from Carcross to McDame Lake and taken in from there by dog-teams. A broken plate in the jaw-crusher at the start delayed operation for six weeks. When the property was examined the mill was on its third week of operation and 60 oz. of gold was reported to have been recovered from 50 tons of ore in two weeks. All ore was being taken from an open-cut in No. 2 vein. The operation has been suspended and it is understood there is some trouble regarding title to the claims.

[Reference: Annual Reports, 1935, Part B, and 1937, Part B.]

QUARTZ CREEK.

Another small mill was taken in via Telegraph Creek and Dease River to be installed by Hope and Hankins on a property on the north side of McDame Lake almost directly across from the Erickson Creek property.

UNUK RIVER AREA.

MacKay Gold Mines, Ltd.

Company office, Room 102, Pacific Building, Vancouver, B.C.; G. B. Duncan, Secretary; T. S. MacKay, Manager. Capital: 10,000 shares, $1 par. This company, financed by Selukwe Gold Mining and Finance Company, Limited, acquired the MacKay Syndicate property situated near the headwaters of the Unuk River, longitude 130° 30′, latitude 56° 37′. The property consists of the Unuk Gold and Unuk Valley groups, on which considerable stripping and some diamond-drilling was done by Premier Gold Mining Company, Limited, in 1937 and 1938.

Supplies for the winter were taken over the Unuk River trail and also by plane to the property. A drift has been started on the north end of the Unuk Gold group and another one at a different showing. Work has been done by hand as it was impossible to get a compressor in before winter. A camp has been built and nine men were employed.

PORTLAND CANAL AREA.

SALMON RIVER.

Silbak Premier Mines, Ltd.

Company office, Royal Bank Building, Vancouver, B.C.; mine office, Premier, B.C. H. A. Guess, President; J. C. Emison, Treasurer; G. A. Brockington, Secretary; Bert F. Smith, Manager; J. G. Pearcey, Mine Superintendent. Capital: 3,000,000 shares, $1 par; issued, 2,500,000. The property consists of the former holdings of: Premier Gold Mining Company, Limited; B.C. Silver Mines, Limited; Selukwe Gold Mining and Finance Company; Sebakwe and District Mines, Limited; and British Canadian Silver Corporation, Limited. It is located in the Salmon River valley, longitude 130°, latitude 56° 03′, about 14 miles from Stewart.

The property is equipped with a complete mining plant and 500-ton flotation plant. It is developed on six levels. The mine was worked 311 days and 169,164 tons of ore produced. An average of 351 men were employed.

The mill operated 311 days with mill-heads assaying: Gold, 0.25 oz. per ton; silver, 6.21 oz. per ton. From this, 14,538 dry tons of concentrates was produced and shipped, assaying: Gold, 2.78 oz. per ton; silver, 64.99 oz. per ton. No crude ore was shipped during the year. During the year 20,649 feet of drifting, raising, and crosscutting and 38,088 feet of diamond-drilling was done.

The following table shows the production for 1939 and for the four years to the end of 1939:—

	1939.	Four Years to End of 1939.
Tonnage milled	169,164	747,418
Gold ounces produced	40,417	176,402
Silver ounces produced	897,539	3,606,507

Buena Vista Mining Co., Ltd.

Company office, Trail, B.C.; mine office, Stewart, B.C.; M. M. O'Brien, President; E. G. Randall, Secretary-Treasurer; D. S. Campbell, Manager; E. James, Mine Superintendent. Company owns the *Big Missouri* mine in Salmon River valley, longitude 130°, latitude 56° 06′, about 18 miles from Stewart. Property is equipped with complete mining and underground milling plant of 750 tons capacity; also hydro-electric plant at Long Lake. Milling started in May, 1938, and production to end of 1939 was 356,708 tons.

During the year 4,253 feet of drifting and raising and 2,745 feet of diamond-drilling were done. The property was worked 334 days, operations being suspended, due to power shortage, for six weeks in the spring. The dam at Long Lake has been raised 5 feet 3 inches to increase water-storage to provide for continuous operation. Additions and improvements were made to the camp.

Salmon Gold Mines, Ltd.

Company office, 800 Hall Building, Vancouver, B.C.; E. C. Morris, President. Capital: 3,000,000 shares, 50 cents par; issued, 1,200,000. The property is situated on the west side of Summit Lake, longitude 130° 06′, latitude 56° 13′, about 27 miles from Stewart. The Consolidated Mining and Smelting Company of Canada, Limited, continued development in

the early summer, but dropped their option at the end of July when operations were suspended.

Pioneer Group. This group, owned by Mrs. J. L. Campbell, of Hyder, Alaska, is located on the west side of Tide Lake, longitude 130° 4′, latitude 56° 15′. It is reached by road to the *Big Missouri* mine and thence by 13 miles of rough trail. An adit at 2,500 feet elevation, started by Jancowski brothers in 1933, was advanced and some drifting done on a shear from which two small shipments of selected ore was made to the sampling plant (*see* page 56). The property was examined in August and the sampling results may be obtained on application to the Department of Mines, Victoria.

[Reference: Annual Reports, 1927 and 1930.]

Portland Group.—This group, owned by Alphonse Thomas, of Stewart, is located on the westerly side of a glacier on the west side of the lower end of Tide Lake. The owner continued stripping and open-cutting.

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

STEWART.

Silverado Group. This group is on the mountain-side 2 miles south-east of Stewart. This property was formerly operated by Silverado Mines, Limited. With the exception of intermittent operations by leasers it has been inactive for a number of years. During the year John Stewart and two miners explored the so-called "canyon" vein at 1,860 feet elevation on the *Rainier Fraction*, with the object of mining ore for shipment. No ore was shipped.

BEAR RIVER.

Red Cliff Group. This group was optioned by the R. W. Wood and W. R. Wilson estates to H. D. Haywood, of Vancouver. It is located on the west side of Bear River about 15 miles from Stewart. H. D. Haywood explored a small showing in Lydden Creek canyon, at 1,900 feet elevation, on the *Montrose* claim. Some small shipments were made to the sampling plant. This showing was examined and sampled and the results may be obtained on application to the Department of Mines, Victoria, B.C.

AMERICAN CREEK.

Napco Gold Mines, Ltd. Company office, 800 Hall Building, Vancouver, B.C. Russell W. Kennedy, Secretary. Capital: 1,500,000 shares, no par value. The holdings comprise twenty-one mineral claims on the west side of American Creek, about 27½ miles by motor-road and pack-horse trail from Stewart. During 1939, open-cut exploration of the new showings in the northern part of the claims, particularly the "Bugnello" cut, was continued. Some work was also done in the "Johnny" cut, adjacent to the boundary of the *Tooth* group, on a probable continuation of the "McLeod" shear.

[Reference: Annual Reports, 1937, Part B, and 1938, Part B.]

MARMOT RIVER.

Crusader Mines, Ltd. Company office, 521 Metropolitan Building, Vancouver, B.C. Capital: 50,000 shares, no par value. This company optioned in 1938 the *Gold Drop* group from Joseph Morrin and Albert Casey, of Hyder, Alaska, and Stewart, B.C. The claims are located on the rugged south ridge of the Marmot River valley, longitude 130°, latitude 55° 52′, about 2 miles from its mouth, and extend from 500 to 5,000 feet elevation. The property is reached by 2 miles of road, the Marmot crossed, and thence trail to a tent-camp at 2,100 feet elevation. During the winter of 1938–39 exploratory work was carried out for the company by Chartered Mining Explorers. The option was dropped in the spring and the owners resumed work. The company made a shipment of 2 tons and the owners one of 4.8 tons of selected ore to the sampling plant (*see* pages 56 and 58).

Stewart Canal Gold Mines, Ltd. Company office, 603 Central Building, Victoria, B.C. Capital: 3,000,000 shares, 50 cents par. This company owns the *Gold Boulder* claim on the north side of the Marmot River, longitude 130°, latitude 50° 52′, about 2½ miles from its mouth. The showings, between 1,000 and 1,400 feet elevation, are reached by road for 2 miles; thence by pack-horse trail to 800 feet elevation; and thence by foot-trail to the camp at 1,000 feet elevation.

Development to date consists of one adit 176 feet long, one started, and two open-cuts. Three shipments of 0.74, 2.78, and 7.26 tons of selected ore were made to the sampling plant (*see* page 56).

NASS RIVER.

Nass River Mining Syndicate. The *Meziadin* group of sixteen claims, being explored by this syndicate, is located at the head of Porter Creek, longitude 129° 25′, latitude 56°, about 10 miles southerly from Meziadin Lake. The property is about 14 miles by road and 47 miles by trail from Stewart. The property, staked in 1938 by Owen McFadden, covers ground explored and staked by a Mr. Porter and James Mowat many years ago (previous to 1913) as the *Bullion* claim, and later, about 1922, by J. Green and H. Ficklin, of Hyder, Alaska, as the *Delnorte* group. The syndicate has explored the ground by a series of fifteen open-cuts and some small pop-holes. The property was examined and sampled and a preliminary plan showing the results may be obtained from the Department of Mines, Victoria, upon payment of 50 cents.

ANYOX.

Gold Leaf Claim.—This claim is owned by James Flynn, of Anyox, and is about 2 miles south of Anyox. The owner did further exploratory work by stripping and open-cutting to the south-west of the beach showings.

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

ALICE ARM.

Gold Strike Group. This group of five claims is owned by G. Fiva, of Alice Arm. The property, discovered in 1938, is situated on the east side of Kinskuch Lake, longitude 129° 20′, latitude 55° 40′. It is reached by speeder on the Dolly Varden railway for 12 miles; thence by trail up East Creek for 7 miles to Kinskuch Lake at 3,950 feet elevation; thence across the lake, about 1¾ miles wide, by a small rowboat to the tent-camp on the east side. G. Fiva further explored this discovery. It was examined and sampled, and the results may be obtained on application to the Department of Mines, Victoria, B.C.

British Lion Mines, Ltd.—Company office, 553 Granville Street, Vancouver, B.C. A. F. Smith, President; Thos. Slattery, Secretary-Treasurer.

This company continued exploratory work on the *Homestake* group, in the Upper Kitsault Valley.

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

QUEEN CHARLOTTE ISLANDS.

D. F. Kidd, lessee, made a small shipment of high-grade ore from the old *Early Bird* group at Gold Harbour.

NORTHERN COAST.

PRINCESS ROYAL ISLAND.

Surf Inlet Consolidated Gold Mines, Ltd. Company office, 507 Stock Exchange Building, Vancouver, B.C.; mine office, Surf Inlet, B.C.; Robt. L. Reed, President; Lindsey Hooper, Treasurer; J. C. Ralston, Secretary; Angus McLeod, Manager. Capital: 3,000,000 shares, 50 cents par; issued, 2,672,855. The property comprises the old *Surf* and *Pugsley* mines at the head of Surf Inlet, longitude 128° 55′, latitude 53°. The property is equipped with mining plant and an old 300-ton milling plant reconditioned to operate at about 70 tons per day.

Development-work consisted of 5,888 feet of drifting and raising. The mine was operated 364 days and 27,264 tons of ore milled; eighty-three men were employed.

Some new ore was developed in the *Pugsley* mine on the 900 and 1,000 levels. The upper levels of the *Surf* mine were explored, sampled, some ore mined, and preparations made to open up above the old stopes.

KHUTZE INLET.

Hunter Group.—This group, owned by J. M. Meldrum and J. G. Campbell, was optioned late in the year to P. W. Racey and Seattle interests and exploration and development-work commenced. The group is located on the north branch of Khutze River, longitude 128° 18′, latitude 53° 10′, about 12 miles from tide-water.

PORCHER ISLAND.

Porcher Island Mines, Ltd.—This company went into bankruptcy in October, 1939. It owned the *Surf Point* and *Edye Pass* properties on Porcher Island, longitude 130° 40′, latitude 54°.

[Reference: Annual Reports, 1934, Part B, and 1935, Part B.]

TERRACE-HAZELTON AREA.

ZYMOETZ RIVER.

Omineca Gold Quartz Mining Co., Ltd. Company office, 785 Dunsmuir Street, Vancouver, B.C.; Fred M. Wells, President; C. Hansen, Superintendent. The property, longitude 128° 10′, latitude 54° 30′, is situated on the north bank of the Zymoetz River, 14 miles from Copper City. The property is equipped with a small compressor driven by a water-turbine. An adit is being driven to intersect veins exposed on the surface and is in 705 feet. A 4-foot vein was cut at 410 feet. Six men were employed and operations suspended in September.

USK.

Cordillera Group. This old property in the vicinity of Usk was formerly operated by the Kitselas Mountain Copper Company and the Usk Mining Company, Limited, but no work has been done on it for many years. During the year James Darby, of Usk, carried out work with a view to mining shipping-grade ore, and sent 1 ton of ore to the sampling plant (*see* page 57). The property was examined and it was found that the outlook for profitable mining, sorting, and cobbing of shipping-grade ore was not encouraging.

Victor Group. This group of six claims, covering ground formerly held by Columario Consolidated Gold Mines, Limited, was staked in 1937 by W. W. Duncan, of Usk, and S. C. Cooper, of Terrace. The claims are between 200 and 4,200 feet elevation on the westerly slope of Kleanza Mountain and are reached by motor-road from Usk for 3.3 miles; thence go-devil trail for 1.75 miles to the *Columario* camp at 1,700 feet elevation; thence a good pack-horse trail for 2 miles to the main showings at 4,000 feet elevation. Three samples were sent to the sampling plant (*see* page 59). The property was sampled to determine the possibility of sorting and cobbing a shipping-grade of ore. Four samples from No. 2 vein indicate the presence of such ore.

Golden Crown Group. This is an old group of five mineral claims, owned by W. R. Adams, of Usk. It is located around 800 feet elevation on the west side of Kleanza Mountain, and is reached by motor-road for 3½ miles from Usk and thence by foot-trail for ½ mile. Old work consists of open-cuts, stripping, and four adits. The owner extended No. 4 adit drift on No. 2 vein.

[Reference: Annual Report, 1921, page 95.]

Nicholson Creek Mining Corporation. Company office, 300 Insurance Building, Seattle, Washington. British Columbia office: 602 Hastings Street, Vancouver, B.C. R. K. Young, President; W. A. Schwalbe, Secretary-Treasurer. Capital: 5,000,000 shares, 1 cent par. The corporation owns a number of claims on the south side of Nicholson Creek, between 1,500 and 220 feet elevation, about 5 miles northward from Usk station on the Canadian National Railways.

During 1938 and 1939, some stripping and open-cutting was done on a showing at 1,800 feet elevation on the *Mac-Shannon* claim, about 9,000 feet south-eastward from the long adit. This showing has no relation to any of the showings in the locality of the long adit. In 1938 the following shipment was made from this showing to the Government sampling plant at Prince Rupert: Dry tons, 0.374; gold, 1.26 oz. per ton; silver, 44 oz. per ton; copper, 16.3 per cent.; sulphur, 8.6 per cent.; silica, 49.6 per cent.

The showing was sampled in 1939 as follows:—

(1.) Across 2.5 feet, width of mineralization, in shear at centre of cut at 1,830 feet elevation: Gold, trace; silver, 1 oz. per ton; copper, 1.2 per cent.

(2.) At locality of (1), two flat quartzose stringers each 3 inches wide: Gold, 0.12 oz. per ton; silver, 5 oz. per ton; copper, 3.4 per cent.; silica, 58.94 per cent.

(3.) Selected cobbed-grade from dump of 1.5 tons (could be cobbed to about 1 ton): Gold, 1.10 oz. per ton; silver, 47 oz. per ton; copper, 17.3 per cent.; silica, 43.74 per cent.

Columario Consolidated Gold Mines, Ltd.

This company is in liquidation. The property, on the east side of the Skeena River, 3 miles below Usk, was leased to W. W. Duncan and associates, of Usk. Their object was to selectively mine and ship high-grade ore from certain sections of the old workings. They shipped 15.86 tons of selected ore and also ten samples to the sampling plant (*see* page 55).

The property was examined and sampled with the object of determining the possibility of selectively mining stripping ore. Details of the sampling may be obtained upon application to the Department of Mines, Victoria, B.C.

PITMAN.

Grotto.

This group of twelve claims is owned by J. Bell, A. M. Bethurem, G. Alger, and R. L. Brash, of Usk. It is located in the valley of Hardscrabble Creek, longitude 128° 22′, latitude 54° 43′, about 2 miles south-westward from Pitman, on the Canadian National Railways.

During the first half of the year, the owners carried out exploration and development on both the upper and lower showings and shipped 19.7 tons of selected ore to the sampling plant (*see* pages 55 and 58).

In the late summer the property was optioned to Canadian Explorations, Limited, of Royal Bank Building, Vancouver, B.C. This organization with a crew of two men carried out superficial exploration up to about the middle of December. This consisted of stripping and tracing of No. 6 and No. 7 veins, and drifting on No. 2 and No. 3 veins.

[Reference: Annual Report, 1937, Part C; additional information obtained in 1938 may be had from Department of Mines, Victoria, B.C., for 50 cents.]

In the vicinity of Usk and Terrace work was done on several groups of claims, including the following:—

Zymoetz group, by T. Turner, of Terrace; *Black Bull* group, by W. Hagen, of Copper City; *Nugget, Lucky Strike,* and *Morning Star* claims, by P. Brusk, of Usk and Vanarsdol; *Lucky Luke,* by L. E. Moody and partner, of Usk; and *Four Ace* group, by Milton Allison, of Usk.

HAZELTON TO HOUSTON AREA.

SMITHERS.

Duthie Mines, Ltd.

A. W. Herman, J. J. Kelley, and associates took an option on this property and commenced work in October. The property is at longitude 127° 25′ and latitude 54° 47′, about 9 miles by road from Smithers.

Two shipments were made to the sampling plant at Prince Rupert. One shipment of 2.68 tons contained 0.17 oz. gold per ton, 223.6 oz. silver per ton, 44 per cent. lead, 13.6 per cent. zinc, and 1 per cent. arsenic. The second lot of 5.7 tons

contained 0.10 oz. gold per ton, 184.9 oz. silver per ton, 22 per cent. lead, 21 per cent. zinc, and 1.2 per cent. arsenic.

La Marr Gold Mines, Ltd. Company office, 1010 Hall Building, Vancouver, B.C. This is a private company. A. M. Pallan, President; Stanley W. Taylor, Secretary. This company has taken an option from Messrs. Messner and Harrer on a group of claims situated at the head of Driftwood Creek at longitude 126° 55′, latitude 53° 55′. A camp was erected and work started on a prospect adit in November.

Glacier Gulch Group. This property, consisting of thirteen claims, is owned by S. F. Campbell, Grover Loveless, and Wesley Banta, of Smithers. The property embraces claims on both the north and south sides of Glacier Gulch, on the eastern slopes of Hudson Bay Mountain, and is reached by motor-road from Smithers for 6 miles to the camp at 2,440 feet elevation. From this point a trail ascends the steep slope of the mountain to the main workings around 3,100 feet elevation. The owners worked the auriferous bismuth-telluride deposit on the south side of the gulch. Several short adits and extensive open-cutting has been done on this showing. Seven lots of ore and samples aggregating 31 tons were shipped to the sampling plant (*see* page 55).

CARIBOO AREA.

WELLS.

Cariboo Gold Quartz Mining Co., Ltd. Company office, 675 Hastings Street West, Vancouver, B.C.; mine office, Wells, B.C. Dr. W. B. Burnett, President; J. R. V. Dunlop, Secretary-Treasurer; R. R. Rose, Managing Director and Mine Manager; R. E. Vear, Mine Superintendent. Capital: 2,000,000 shares, $1 par; issued, 1,333,309. The property is on Cow Mountain, south-east from Jack of Clubs Lake, longitude 121° 35′, latitude 53° 05′, and is reached by 63 miles of road from the terminus of Pacific Great Eastern Railway at Quesnel. It is equipped with a complete mining plant and a 300-ton cyanide plant. Access to the mine is by three crosscut adits. Below the main haulage-level (1,500) the mine is developed through three shafts.

During 1939, development-work amounted to 9,418 feet of drifting, 6,481 feet of crosscutting, 1,667 feet of raising, 238 feet of shaft sinking, and 7,168 feet of diamond-drilling. The 1,500 main haulage-level was advanced throughout the year towards the *B.C.* vein. The No. 1 shaft was sunk 215 feet from the 1,800 level and two new levels were opened up. On the lower of these, the 2,000 level, a drive will be made in a northerly direction to the company's claims on Island Mountain. A new hoist was installed at No. 3 shaft and work resumed on the 1,600 and 1,700 levels.

In the *Pinkerton* zone, service raises were driven from the 1,500 level to the 1,200 level, and the 1,300 and 1,400 levels were opened up. Other development-work was principally on the 1,300, 1,400, 1,800, and 1,900 levels of the *Rainbow* zone. In the power plant, a 4,500-cubic-foot-per-minute after-cooler was installed, and it has proved effective in taking moisture out of the air.

A bonus scheme was recently inaugurated whereby one-third of the exchange premiums received on gold is distributed *pro rata* amongst the employees. During 1939, 112,414 man-shifts were worked in the entire plant.

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

Island Mountain Mines Co., Ltd. Company office, 744 Hastings Street West, Vancouver, B.C.; mine office, Wells, B.C. F. W. Guernsey, President; Fred Searls, Jr., and H. DeWitt Smith, Vice-Presidents; H. E. Dodge, Secretary-Treasurer; T. H. Munn, General Superintendent. Capital: 1,100,000 shares, 50 cents par; issued, 1,050,716 shares. The property is on Island Mountain on the north-west side of Jack of Clubs Lake, at Wells, about 4 miles west of Barkerville. It is reached by 55 miles of motor-road from Quesnel on the P.G.E. Railway. It is equipped with a mining plant and 125-ton cyanide plant. Below the main haulage-level the mine is opened by an internal three-compartment shaft sunk to a depth of 1,079 feet below the collar. Stations were cut at distances of 625, 750, 875, and 1,000 feet below the

collar. The 625 and 750 levels were opened up from the new section of the shaft and development-work was done on the 125, 250, and 375 levels. On completion of the shaft, a new hoist was installed.

In 1939, development consisted of 9,040 feet of drifting and crosscutting, 1,869 feet of raising, 78 feet of sinking, and 21,494 feet of diamond-drilling. The company also did 1,377 feet of diamond-drilling on its claims on Proserpine Mountain. Ore mined and milled during 1939 was 46,209 dry tons.

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

PROSERPINE MOUNTAIN.

Proserpine Gold Mines, Ltd.

Company office, 544 Howe Street, Vancouver, B.C.; mine office, Barkerville, B.C. Colin S. Cradock, President; Hugh McL. Russell, Treasurer; W. Gordon McKee, Secretary; C. B. North, Mine Manager. Capital: 3,000,000 shares, $1 par; issued, 1,630,167, of which 1,065,000 are escrowed. The holdings of this company extend over a large area on Proserpine Mountain, 2½ miles from Barkerville, longitude 121° 29′, latitude 53° 02′.

As early as snow conditions permitted in the spring of 1939, a road was cleared up Grouse Creek and a tent camp established about 2 miles above the *Cariboo Hudson* road. Equipment was purchased, a compressor plant and blacksmith-shop set up, and work was commenced. By September 9th, when operations ceased, a deep-level adit-crosscut had been driven for 1,056 feet.

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

CUNNINGHAM CREEK.

Cariboo Hudson Gold Mines, Ltd.

Company office, Royal Bank Building, Vancouver, B.C. Dr. W. B. Burnett, President; Frederick Field, Secretary-Treasurer; I. S. Comfort, General Superintendent. Capital: 3,000,000 shares, 50 cents par; issued, 2,145,338. The property is at the head of Cunningham Creek, longitude 121° 19′, latitude 52° 53′, about 20 miles by road south-east from Barkerville. It is equipped with mining plant and a 100-ton cyanide plant. During 1939, the development-work consisted of 1,052 feet of drifting, 400 feet of raising, and 3,197 feet of contracted diamond-drilling.

The raise between the 600 and 300 levels was completed and the 400 was opened up from the raise from a distance of 150 feet. Considerable exploratory drifting was done on the 600 level. Stoping operations were carried out on the 200, 250, and 600 levels, but facilities for hoisting from the latter were not completed at the time of shut-down. Up until August 8th, 1939, when the mine and mill were closed, 13,492 tons of ore having a gold content of 4,013 oz. was milled. The equipment at the property is intact and a watchman is employed.

YANKS PEAK.

Amparo Mining Co., Ltd.

Company office, Royal Bank Building, Vancouver, B.C. Howard W. White, President; J. B. Knaebel, Managing Director; W. S. Jordon, Secretary-Treasurer. Capital: 10,000 shares, $1 par; issued, 1,000 shares. The company is doing development-work on the *Midas* group on Yanks Peak, longitude 121° 26′, latitude 52° 51′, about 12 miles north of Keithley Creek. Extensive crosscutting and drifting operations were carried out from the north side of Yanks Peak. Bulk samples were taken and reduced in a sampling plant erected on the south side of the peak at the new camp-site. Bunk-houses and a warehouse were also constructed preparatory to further underground development. Between fifty and seventy men were employed by the company on surface and underground development-work until late in the year.

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

Snowshoe Gold Mines, Ltd.

Company office, 785 Dunsmuir Street, Vancouver, B.C. Fred M. Wells, President and Manager; E. T. Gook, Secretary-Treasurer. Capital: 3,000,000 shares, 50 cents par; issued, 1,656,475. The property, known as the *Jane* group, is at the head of Little Snowshoe Creek, longitude 121° 26′, latitude 52° 52′. It is reached by tractor-road from Barkerville.

Underground operations were carried on intermittently during 1939 and several hundred feet of drifting and crosscutting accomplished by hand-miners. A compressor was installed in August and one shift, drilling and blasting one round per day, was employed up to the end of the year. The low-level adit was advanced 650 feet from the portal and considerable crosscutting was done from it. The total over-all footage to date is 1,200 feet. Eleven men were employed while the camp was in operation. A team of six huskies is kept at the camp for emergency use when the roads are blocked with snow.

[Reference: Annual Report, 1929.]

Spanish Mountain.

Three Hills Group. Owned by P. Hunter and associates. The property is on Spanish Mountain, longitude 121° 25′, latitude 52° 34′, about 4 miles south-east of Likely. It is reported that an adit was started in 1939 to cut at depth a quartz vein much oxidized on the surface and apparently responsible for rough, coarse gold found in a small dry gulch below. This adit was stopped before the objective was reached.

Chilcotin Area.

Taylor Windfall Gold Mining Co., Ltd. Company office, 208 Pacific Building, Vancouver, B.C.; mine office, Williams Lake, B.C. Ervin J. Taylor, President; Wm. Warner, Secretary-Treasurer; S. H. Davies, Mine Manager. Capital: 2,000,000 shares, $1 par. The company operates the *Taylor Windfall* mine on the upper Taseko River. The mine operated from May 17th to August 15th. A maximum of about twenty men were employed. Development-work was continued on the 200 and 300 levels. On the former, this work consisted of 150 feet of drifting north-easterly along the zone and of 223 feet of crosscutting both ways from the drifting. On the latter, it consisted of 270 feet of drifting to the north-east and 260 feet of crosscutting. A new powder magazine was erected and a Gardner-Denver H.K. hoist and fan for the 300 level were installed.

[Reference: Annual Report, 1935, Part F.]

Blackhorn Mountain.

Homathko Gold Mines, Ltd. Company office, 507 Stock Exchange Building, Vancouver, B.C. Wm. Pohlman, President. Capital: 3,000,000 shares, 50 cents par. The company owns claims on Blackhorn Mountain, longitude 124° 40′, latitude 51° 43′, near the head of Homathko River. It is reached by road and trail from Williams Lake, on the P.G.E. Railway. N. A. Timmins, Limited, optioned the property in 1938, and in 1939 did 180 feet of drifting, 120 feet of crosscutting, and 2,100 feet of diamond-drilling before relinquishing the option in September.

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

Bridge River Area.

Cadwallader Creek.

Pioneer Gold Mines of B.C., Ltd. Company office, 470 Granville Street, Vancouver, B.C.; mine office, Pioneer Mines P.O., B.C. Victor Spencer, President; A. E. Bull, Secretary-Treasurer; H. T. James, Managing Director; E. F. Emmons, General Superintendent. 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 P.G.E. Railway. The mine is equipped with mining plant and 400-ton cyanide plant. The mine is developed by two shafts from the surface and one internal shaft, No. 4, from the 24th to the 29th level. The levels are at 125-foot intervals.

On October 8th, 1939, this mine was closed by a strike and remained closed for the remainder of the year. Up to that date the development-work carried out consisted of 4,279 feet of drifting, 38 feet of crosscutting, and 2,456 feet of raising. No. 4 shaft

was put into operation at the beginning of the year, and drifting on the 27, 28, and 29 levels, served by that shaft, was carried on. Raising from the 29 level was commenced just prior to the strike. Production amounted to 103,738 tons mined and 88,009 milled, yielding 48,118 oz. gold. During the strike a maintenance crew was employed at keeping the mine-workings under repair.

Holland Gold Mines, Ltd. Company office, 1403 Dominion Bank Building, Vancouver, B.C.; mine office, Pioneer, B.C. Dr. G. H. Worthington, President; F. W. Holland, Manager. *Capital: 1,000,000 shares, 50 cents par;* issued, 422,457. The property is located above the *Pioneer* mine on the lower slopes of Mount Ferguson. It is reached by a mile of narrow steep road from Pioneer. A crew averaging five men on one shift advanced the exploratory adit to a point 1,050 feet from the portal.

Bralorne Mines, Ltd. Company office, 555 Burrard Street, Vancouver, B.C.; mine office, Bralorne, B.C. Austin C. Taylor, President; R. H. Grace, Secretary-Treasurer; D. Matheson, General Superintendent. Capital: 1,250,000 shares, no par value; issued, 1,247,000. The company owns and operates the *Bralorne* mine on Cadwallader Creek, a tributary of Bridge River, 50 miles by road from Bridge River station on the P.G.E. Railway. *It is equipped with mining* plant and 550-ton capacity flotation plant.

Underground development is in three sections—the *King* mine, the *Empire* mine, and the *Coronation*. Operating throughout the year, a total of 184,922 tons of ore was produced with a content of 104,862 oz. of gold and 34,956 oz. of silver. Development-work consisted of 21,219 feet of drifting, 660 feet of raises, 1,462 feet of shaft sinking, 22 feet shaft transfer crosscuts, 181 feet of ventilation raises and crosscuts, and 13,578 feet of diamond-drilling.

The *Empire* shaft was sunk 619 feet from the 1,000 level to the 1,400 level. Following this, work commenced on the sinking of the *Crown* shaft a distance of 900 feet, from the 1,400 level to the 2,000 level. This was almost completed at the end of the year and pockets were cut for the 1,900 level. From the *Empire* shaft, the 1,100, 1,200, 1,300, and 1,400 levels were opened up and ventilation raises extended through to the 100 level on the 51 vein, and from 1,400 to 1,200 on the 55 vein. From the *Crown* headframe a ventilation raise was put through to the 600 level.

Additions to the plant include an electric boiler in the heating plant; electric car on the 6 by 6 Allis-Chalmers ball-mill; a new powder magazine; new general offices, and new aluminium cage and skip combinations in the *Crown shaft*. Three hundred and seventy-eight men were employed and a total of 129,697 man-shifts were worked.

Golden Ledge Syndicate. Company office, 503 Rogers Building, Vancouver, B.C. J. S. Harrison, President. Capital: 5,000 shares, $50 par. The *Golden Ledge* property lies on both sides of Cadwallader Creek, several miles north of Bralorne. A crosscut adit, about 70 feet above the river on the east bank, was advanced 350 feet to intersect a mineralized quartz vein exposed in No. 3 adit, 135 feet above. Drifts were then driven along the vein, 20 feet to the south and 150 feet to the north. The crew consisted of six men, mining on day shift and mucking on night shift.

TYAUGHTON CREEK.

Lucky Strike Gold Mines, Ltd.—Company office, 811 Credit Foncier Building, Vancouver, B.C. Robt. S. Macdonald, President; George F. Corlett, Secretary. Capital: 3,000,000 shares, 50 cents par. Open-cut work was done during the summer.

[Reference: Annual Report, 1936, Part F (Goldside Mines, Ltd.).]

TOMMY CREEK.

Bristol Mines, Ltd. Company office, 425 Howe Street, Vancouver, B.C. W. Spence, Secretary; A. E. Stromberg, Managing Director. Capital: 50,000 shares, no par value. This company is developing a property on Tommy Creek, about 4 miles south of the highway, at a point 12 miles east of Minto. Development consisted of 250 feet of drifting on an oxidized vein and 250 feet of crosscutting in an adit started 185 feet lower. A maximum of twelve men were employed on three shifts.

TRUAX MOUNTAIN.

Easter Group.—This group on Truax Mountain is owned by T. Morrison and associates, of Bralorne. On it, 100 feet of adit was driven for the account of Bralorne Mines, Limited.

LILLOOET AREA.

Grange Consolidated Mines, Ltd. Company office, 1351 Broadway West, Vancouver, B.C.; mine office, Kelly Lake, B.C. W. L. Gilbert, President; John Bennett, Secretary-Treasurer. Capital: 3,000,000 shares, 50 cents par; issued, 2,600,000. The company owns the *Grange* mine, near Kelly Lake station on the P.G.E. Railway. Three men were employed on maintenance-work and in advancing No. 3 adit-level.

ASHCROFT-KAMLOOPS AREA.

Vidette Gold Mines, Ltd. Company office, 404 Pacific Building, Vancouver, B.C.; mine office, Savona, B.C. C. E. Smythe, President; G. F. H. Long, Secretary-Treasurer; R. Avison, Mine Manager. Capital: 2,000,000 shares, no par value; issued, 1,104,568. The company operates the *Vidette* mine, reached by 33 miles of road north from a point on the highway 5 miles west of Savona, B.C. This mine milled 6,522 tons of ore, producing 3,206 oz. of gold. The combined lateral and inclined development footage totalled 2,036 feet, and about 900 feet of diamond-drilling was done. From the 470 south drift a winze was sunk 150 feet on the 70 vein, and the 570 level was opened up from this winze. Other development-work was confined to the 3rd and 4th levels. Early in December a working was started from the south wall of 35 crosscut to pass under the lake towards the *Dexheimer* showings. It had been advanced 200 feet by the end of the year. Approximately sixty men were employed.

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

Martel Gold Mines, Ltd. Company office, 789 Pender Street, Vancouver, B.C. C. S. McKee, President; G. S. Ruddell, Secretary-Treasurer; E. A. Jamieson, Managing Director. Capital: 3,000,000 shares, no par value. It is reported that the equipment at the *Martel* mine was disposed of by sheriff's sale which took place early in October.

Windpass Gold Mining Co., Ltd. Company office, 608 Pacific Building, Vancouver, B.C. Geo. F. Johnson, Secretary. Capital: 2,000,000 shares, $1 par. This company operated the *Windpass* mine on Baldy Mountain, overlooking Dunn Lake, near Boulder station, on the Canadian National Railways, about 54 miles north of Kamloops. The mine was closed early in the year.

SIMILKAMEEN RIVER AREA.

HEDLEY.

Kelowna Exploration Co., Ltd. Company office, Room 2402, 19 Rector Street, New York, N.Y.; mine office, Hedley, B.C. W. Adams Kissam, Chairman; Sewell T. Tyng, President; John W. Mercer, Treasurer; O. P. Ebeling, Secretary; W. C. Douglass, Mine Manager. This is a private company. The company operates the *Nickel Plate* mine at Hedley, longitude 120° 04′, latitude 49° 35′. The concentrators, bunkers, machine-shops, and general offices are at Hedley, at an elevation of 1,600 feet, and the portal of the mine is at an elevation of 5,600 feet, 4 miles from the mill. The mine is reached by a 10,000-foot gravity plane which is operated in two sections. Steel skips having a capacity of 6 tons are used for the transportation system and are operated and controlled by electric motors at the central and top terminals. The portal of the mine is 1½ miles north of the top terminal of the tramway, and electric trolley motor-haulage is used between the mine and the bunkers at the top of the tramway.

Access to the mine is by an incline shaft with levels at 100-foot intervals. During 1939 development was in the lower, west section of the mine and chiefly Nos. 8 and 15 west drifts. The latter has been driven through to the surface and together with the No. 12 drift, driven into the *Mascot* mine at a much lower elevation than the portal of

the *Nickel Plate* mine, cause a current of air to circulate through the mine. There are 112 men employed at the mine, fifty-seven in the mill, and a staff of sixteen.

Hedley Mascot Gold Mines, Ltd.

Company office, 1132 Marine Building, Vancouver, B.C.; mine office, Hedley, B.C. Wendell B. Farris, President; V. J. Creeden, Secretary; W. S. Charlton, Treasurer; C. W. S. Tremaine, General Superintendent. Capital: 3,000,000 shares, $1 par; issued, 2,264,130. The property is 1 mile north of Hedley, longitude 120° 04′, latitude 49° 35′. The concentrator and mine offices are on the east bank of Hedley (20-Mile) Creek and the mine, 2,795 feet higher in elevation, is connected to the plant by a "quad" haul-back aerial tramway, 5,600 feet in length. The flotation plant operates at a capacity of 190 tons a day.

Recent development-work comprises diamond-drilling below the 4,800 or main haulage-level, followed by driving an adit at 4,300 feet elevation. This working was in 1,600 feet at the end of the year. Eighty-seven men were employed, forty-two on the surface and forty-five underground.

Canty Gold Mines (Hedley), Ltd.

Company office, 1132 Marine Building, Vancouver, B.C.; mine office, Hedley, B.C. Wendell B. Farris, President; V. J. Creeden, Secretary; W. S. Charlton, Treasurer; R. H. Stewart, Managing Director; Charles Bishop, Mine Superintendent. Capital: 3,000,000 shares, $1 par; issued, 2,172,788. The property is about 2 miles east of the *Nickel Plate* mine.

The mine is developed by a three-compartment vertical shaft sunk to a depth of 427 feet. Ore-pockets have been cut at the 200- and 400-foot levels and drifts run to the north of the shaft. A vertical raise driven from the 400 to the 200 level was continued some distance above the latter. In addition, a considerable amount of diamond-drilling was done. Underground operations were suspended during the summer with a view towards installing a 50-ton mill. However, after cleaning a mill-site this was deferred and there was no further work done in 1939. It is understood that an addition is being made to Hedley Mascot Gold Mines concentrator to handle about 50 tons of *Canty* ore daily. There were fifty-six men employed when operations were suspended.

OLALLA.

Gold Valley Mines, Ltd.

Company office, 206 Royal Trust Building, Vancouver, B.C. J. E. Beck, President; Fred Norman, Secretary. Capital: 3,000,000 shares, 50 cents par. The property is on the west side of the Keremeos–Penticton Road at Olalla, longitude 119° 53′, latitude 49° 16′. The workings consist of three adit-drifts known as No. 1, No. 2, and No. 3 drifts. The work has been entirely exploratory and during 1939 consisted of extending the No. 1 or lower drift a distance of approximately 500 feet. The plant consists of a portable gas-driven compressor operating a drifter. Four men were employed at the property.

[Reference: Annual Reports, 1936, Part D, and 1937, Part D.]

SOUTHERN OKANAGAN.

OSOYOOS.

Osoyoos Mines of Canada, Ltd.

Company office, Bank of Toronto Building, Calgary, Alberta; mine office, Osoyoos, B.C. J. I. McFarland, President; Norman Hindsley, Secretary; J. O. Howells, General Manager. Capital: 3,000 6-per-cent. cumulative, redeemable preferred shares; 1,750,000 common, no par value; issued, 1,247,195 shares common. This company acquired the assets of Osoyoos Mines, Limited, on a share-for-share basis. The property on the east side of Osoyoos Lake, longitude 119° 27′, latitude 49° 02′, close to the International Boundary, is equipped with a complete mining plant, 150-ton flotation-mill, and cyanide plant for tailings treatment. Power for the whole operation is provided by the West Kootenay Power and Light Company, Limited. The mine and mill employ sixty men.

Work was confined to a huge glory-hole on the *Dividend* claim, close to the flotation plant. The main haulage-level is connected by raises to the glory-hole.

FAIRVIEW.

Fairview Amalgamated Gold Mines, Ltd. Company office, 812 Standard Bank Building, Vancouver, B.C.; mine office, Oliver, B.C. G. T. Vaux, Managing Director; H. D. Campbell, Secretary-Treasurer; T. A. McKenzie, Mine Manager. Capital: 91,235 preferred shares, $1 par; 8,450,700 common shares of no par value; issued, 35,100 preferred and 2,650,400 shares common. The property, longitude 119° 36′, latitude 49° 11′, is at Fairview, on a branch of the Kettle Valley Railway, about 3 miles south of Oliver. The company owns the *Morning Star* and *Fairview Amalgamated* mines, where a large amount of mining development has been done in the past. A 150-ton flotation plant is located near the *Morning Star* mine, and the *Fairview* mine is 1½ miles distant; the ore from the *Fairview* being carried by motor-truck to the mill.

The *Fairview* mine has been developed by two adit-drifts, known as the No. 5 and No. 6 drifts, 2,600 feet and 1,000 feet long, respectively, and 135 feet vertical distance between them. A large amount of stoping has been done above the No. 5 drift and raises have been driven through from these drifts to the surface for ventilation. Milling was suspended in May and an active programme of development was carried on in the *Fairview* mine until the end of September, when operations were suspended. Power is supplied by the West Kootenay Power and Light Company, Limited.

An average of ten men were employed at the mine.

STUMP LAKE AREA.

Consolidated Nicola Goldfields, Ltd. Company office, 506 Dunsmuir Street, Vancouver, B.C.; mine office, Box 759, Kamloops, B.C. Mathew Sutton, President; C. J. White, Secretary-Treasurer; R. A. Petter, Mine Superintendent. Capital: 6,500,000 shares, $1 par. The company's main operations is at the *Nicola* mine, longitude 120° 21′, latitude 50° 22′, 2 miles west of the Kamloops–Nicola Highway, about 30 miles north from Merritt.

During 1939, work was confined to development in the *Nicola* mine on the *Enterprise* and *King William* veins at depths below the 320, or the main haulage-level of the mine. Development below the 320 level is by an inclined shaft that follows the *Enterprise* vein to the 900-foot level. The main developments during the year have been the extension of drifts on the south 320, 550, 675, 800, and 900 levels, a raise from the lower drifts to those above for ventilation, and extension of drifts on the north side of the shaft on 675, 800, and 900 levels, all on the *Enterprise* vein.

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

CAMP McKINNEY AREA.

Cariboo Amelia. This old mine, in Camp McKinney, was the largest producer in this camp in the early days. It was optioned by Pioneer Gold Mines of B.C., Limited. The extensive underground workings were dewatered for sampling and examination. A crew of twenty men with sixteen underground was employed with E. H. Lovitt in charge.

[Reference: Bulletin No. 6, 1940.]

KETTLE RIVER AREA.

Boomerang Group.—This group is 7 miles from Westbridge. Arthur Miller and associates shipped 33 tons of ore from this property which yielded 7 oz. of gold and 55 oz. of silver.

Barnato. This claim on Horseshoe Mountain, 23 miles north of Westbridge, is owned by H. Redden, of Vancouver, and is operated under lease by F. O. Peterson and partners. A total of 75 tons of ore, mined by hand-steel from shallow pits and surface trenches, was shipped to Tacoma and yielded 82 oz. of gold and 8 oz. of silver.

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

Mogul.—This claim on Horseshoe Mountain, about 24 miles north of Westbridge, is operated under lease by C. Sherdahl, who shipped to Trail 59 tons of ore yielding 58 oz. of gold and 61 oz. of silver.

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

Maybe. This claim on the North Fork of the Kettle River, about 24 miles north of Westbridge, is owned by L. Clery and S. Berglund. Early in the year it was optioned to the Bayonne Consolidated Mines, Limited, who, after carrying out a diamond-drilling programme under the direction of John Broatch, dropped the option.

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

Roadside. This property, 8 miles from Westbridge, on the Beaverdell Road, was operated by Arthur Miller and Ralph Gaustin, of Westbridge, who from shallow workings and open-cuts shipped 30 tons of ore to Trail. This ore yielded 17 oz. of silver.

BEAVERDELL AREA.

Carmi Mine.—Situated at Carmi. An option has been taken on this property by the Highland Bell, Limited, who are engaged in dewatering the workings for sampling and examination.

Rosemont. This property, situated about 9 miles from Beaverdell, is under option to the Highland Bell, Limited. Development-work yielded 22 tons of ore containing 10 oz. of gold and 4 oz. of silver. Operations were temporarily suspended during the winter months.

GREENWOOD-GRAND FORKS AREA.

JEWEL LAKE.

Dentonia Mines, Ltd. Company office, 850 Hastings Street West, Vancouver, B.C. Nelson S. Smith, President; G. T. Vaux, Vice-President. Capital: 2,500,000 shares, no par value; issued, 1,645,000. The company owns the *Dentonia* mine, near Jewel Lake. The property is operated under lease by John Halstrom and associates, of Greenwood. Six men, five of whom worked underground, were employed throughout the year. A total of 1,809 tons of ore, mined and shipped to Trail, yielded 977 oz. of gold and 6,576 oz. of silver.

Greenbridge Gold Mines, Ltd. Company office, Lancaster Building, Calgary, Alberta; mine office, Greenwood, B.C. W. C. Armstrong, President; M. Featherley, Secretary; E. O. Parry, Treasurer; L. M. Mansfield, Mine Manager. Capital: 4,000,000 shares, no par value; issued, 1,864,969. The company operates the *North Star*, near Jewel Lake. Six men, with four underground, were employed until October. Development included 322 feet of drifting, 70 feet of crosscutting, 40 feet of raising, and 40 feet of sinking. A total of 141 tons of ore was mined from the shaft and shipped to Trail, yielding 68 oz. of gold and 344 oz. of silver.

BOUNDARY FALLS.

No. 7. This property is owned by the Consolidated Mining and Smelting Company of Canada, Limited, and is operated under lease by W. E. McArthur, of Greenwood. It was worked continuously throughout the year, two to three men being employed. Hand-steel was used originally, but recently a portable compressor has been installed. Development-work included 60 feet of drifting and 100 feet of raising. Ore totalling 47 tons mined and shipped to Trail yielded 152 oz. of gold and 4,621 oz. of silver.

PAULSON AREA.

Kootenay Mining and Leasing Syndicate. The *Berlin* and *Alice L.*, situated 8 miles east from Paulson, are operated under lease by the Kootenay Mining and Leasing Syndicate, of Trail, with Rudolph Nelson in charge. Eleven to fourteen men, with from seven to ten working underground, were employed on these properties for the greater part of the year. Very little development-work

INSPECTION OF METALLIFEROUS MINES.

BY

JAMES DICKSON.

PRODUCTION.

The output from the metalliferous mines for 1939 was 7,210,676 tons, a decrease of 166,415 tons from the tonnage of 1938. This tonnage was produced from 217 mines, of which ninety-nine produced 100 tons or more.

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

There were fourteen fatal accidents in and around the metalliferous mines and concentrators in 1939, being an increase of two over the figures for 1938. In addition to this, there were eight fatal accidents reported, as follows: Two prospectors, four surface placer-workers, and two men drowned. Of the two men drowned, one was trying to secure a line on a scow during a storm and one was drowned in the Fraser River at a placer property. There were no fatalities in the quarries of the Province.

There were 5,955 persons under and above ground in the metalliferous mines, and 996 persons in the concentrators in 1939. The ratio of fatal accidents per 1,000 persons employed was 2.01.

The tonnage mined per fatal accident during 1939 was 515,048 tons, compared with 614,757 tons during 1938. The tonnage mined per fatal accident during the last ten-year period was 384,761 tons.

The following table shows the mines at which fatal accidents occurred during 1939 and the comparative figures for 1938:—

Mining Division.	Mine.	No. of Accidents.	
		1939.	1938.
Alberni	Kavilah	1	—
Zeballos	Privateer	1	—
Vancouver	Britannia	5	3
Lillooet	Bralorne	1	—
Lillooet	Pioneer	—	1
Clinton	Vidette	1	—
Cariboo	Columbia Tungstens	1	—
Cariboo	Williams Creek	—	1
Similkameen	Copper Mountain	1	1
Osoyoos	Hedley Mascot	—	2
Nelson	Yankee Girl	1	—
Nelson	Ymir Consolidated	—	1
Greenwood	Old Granby Mine	1	—
Rossland	Le Roi	—	1
Fort Steele	Sullivan	1	1
Atlin	Polaris Taku	—	1
Totals		14	12

Kilo. This property on Lemon Creek, about 9 miles from the Slocan Highway, was operated under lease for a short time by H. V. Dewis, of Silverton, B.C. Ore totalling 48 tons was mined and shipped to Trail, and yielded 31 oz. of gold and 37 oz. of silver.

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

Barnett Mining Co. Company office, Seattle, Wash. R. G. McLeod, in charge. The company is operating the *Barnett* group on McGuire Creek, a tributary at the head of Lemon Creek. It is about 14 miles from a point on the Trans-Provincial Highway, 5 miles east of Nelson. During 1939 a crew of seven men was engaged in clearing out old workings and in surface-stripping on the *Barnett* vein.

[Reference: Bulletin No. 7, 1940.]

AINSWORTH.

Scranton Consolidated Mining Co. Company office, 404 Title and Trust Building, Portland, Oregon; British Columbia office, Ainsworth, B.C. Ben W. Scott, President; S. O. Griffith, Secretary. Capital: 650,000 shares, no par value. The *Scranton,* at the head of Woodbury Creek, about 10 miles from the Nelson–Kaslo Highway, is operated by the company, with R. B. Mahon in charge. A complete small mining plant has been installed. This equipment, together with sufficient camp and mine supplies to operate all winter on a one-shift basis, have been packed into the mine by horses from the Main Kaslo Highway. A contract for at least 600 feet of drifting, in which five men will participate, has been let. A total of 275 feet of drifting was done before the end of the year.

SILVERTON.

Batchelor. This property, situated on Memphis Creek, about 5 miles from Slocan City, was operated under lease by F. R. Jancowski and associates; four men being engaged in underground work with hand-steel. About three-quarters of a mile of go-devil trail from the mine to the main Slocan Highway was built by the operators. Not much development-work was done, but 10 tons of ore, mined and shipped to Trail, yielded 5 oz. of gold and 436 oz. of silver.

L.H. This property, owned by F. Fingland, of Silverton, is near the head of L.H. Creek, about 5 miles from Silverton. It was operated under lease for several months by A. H. W. Crossley, R. Rowe, Dr. Borden, and associates, of Nelson. From three to five men, with two working underground, were employed during the summer months. A short 2-bucket tram was built to connect the portal of No. 2 adit with the road and a compressed-air unit installed. Not much development-work was done, but 216 tons of ore was mined and hauled 3 miles to the old Silverton–Slocan City road by tractor and from there to Trail by truck. This ore yielded 111 oz. of gold and 61 oz. of silver.

NELSON AREA.

Catherine. This property, about 6 miles south of Nelson, above the *Perrier* mine, was operated under lease by G. and L. Gormley and N. Norris, of Nelson. Hand-steel only was used. A total of 26 tons of ore was mined and shipped to Trail, yielding 29 oz. of gold and 68 oz. of silver.

General Lee Mining and Milling Co., Inc. Company office, 700 Insurance Building, Seattle. G. L. Covingham, President; George W. Barker, Secretary; Sarkis Terzian, Manager. The company owns the *Euphrates* mine at Hall Siding, about 11 miles south of Nelson, on the Nelson–Salmo Highway. It was operated for a short time near the first of the year by leasers, a maximum of sixteen men being engaged at one time, three of whom were on the company pay-roll. The company operated the water-driven compressor and sold compressed air to the leasers. Very little development-work was done. Ore totalling 77 tons, mined and shipped to Trail, yielded 35 oz. of gold and 352 oz. of silver.

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

TOAD MOUNTAIN.

Daylight Gold Mines, Ltd. Company office, 404 Hastings Street West, Vancouver, B.C. J. Y. Carter, President; C. L. A. Lietze, Secretary-Treasurer; W. G. Norrie-Loewenthal, Managing Director. Capital: 3,000,000 shares, 50 cents par. This company had under option the *Daylight* and *Victoria-Jessie* properties on Toad Mountain, south-west of Nelson. A development programme, commenced in 1938, was concluded in September, 1939, and all machinery and supplies removed to Nelson for storage. Development-work was done in the *Victoria-Jessie* adit and in sinking on the *Daylight*. A crew of twelve to eighteen men was employed. A total of 200 tons of ore was shipped to Trail, yielding 70 oz. of gold and 54 oz. of silver.

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

Irene. This property, just east of the *Daylight* group, is owned by C. Riley, of Nelson, and is operated under lease by M. and N. Rolick, who also hold an option to purchase. This option includes the adjoining *Great Eastern* and *Great Western*. Hand-steel only was used. A total of 17 tons of ore, shipped to Trail, yielded 8 oz. of gold and 11 oz. of silver.

California. This property is owned by Mrs. Wilson, of Nelson, B.C., and was operated desultorily during the year by several groups of leasers. Not more than four men were engaged in this work at any one time. Power was supplied by a small gasoline-driven compressor. A total of 131 tons of ore, shipped to Trail, yielded 188 oz. of gold and 292 oz. of silver.

Venus-Juno. These properties on Morning Mountain, just north of Toad Mountain, are owned by R. Heddle, of Nelson. They were operated spasmodically during the year by several groups of leasers using hand-steel. A total of 192 tons of ore, mined and shipped to Trail, yielded 221 oz. of gold and 408 oz. of silver.

HALL CREEK.

Baltic.—This prospect was operated by H. Erickson, of Nelson, who did a small amount of development-work with hand-steel.

Bear. This property, adjoining the *Fern* mine, was operated by a local syndicate with P. H. Russell, of Nelson, as secretary. Three miles of new road was constructed from the main Hall Creek Road to the mine. A maximum of seven men, with three underground, were employed under the supervision of Lafe McLellan. Development-work included 45 feet of drifting, 15 feet of crosscutting, and 30 feet of surface-trenching. In addition, a new low-level crosscut-adit was advanced 45 feet, and 28 tons of ore was mined and shipped to Trail, yielding 13 oz. of gold and 21 oz. of silver.

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

Canadian Belle. This property is owned and operated by Mike Herman and associates, who worked it intermittently, employing a maximum of four men, doing some trenching and underground-work. A total of 17 tons of ore was mined and shipped to the customs mill at Granite Siding. The concentrates, shipped to Trail, yielded 10 oz. of gold and 9 oz. of silver.

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

Fern. The new road to the *Bear* group passes this property and provides a means of trucking ore from it. The mine is owned by C. E. and L. R. Hawley, of Spokane, and operated under lease by H. Frocklage, J. E. Cummins, and J. E. Logan, of Nelson. Hand-steel only was used. Stoping was confined to removing remnants of ore left in the stopes and pillars by former operators. Ore totalling 20 tons, mined and shipped to Trail, yielded 28 oz. of gold and 11 oz. of silver.

EAGLE CREEK.

Livingstone Mining Co., Inc. Company office, 521 Central Building, Seattle, Wash. H. R. Smith, President and Manager; R. W. Hutchison, Secretary. This company owns and operates the *Granite-Poorman* on Eagle Creek, near Blewett, B.C. The property was operated continuously throughout the year.

From sixteen to twenty men were employed, with from eight to twelve working underground. In addition to the company operations, several groups of leasers worked different parts of the mine. Practically all the ore mined by the leasers as well as that from the company operations was treated in the customs mill at Granite Siding. Concentrates produced were shipped to Trail. Development-work by the company included 400 feet of drifting and 175 feet of raising. A total of 1,296 tons shipped yielded 719 oz. of gold and 255 oz. of silver.

Venango Gold Mines, Ltd.

Company office, Nelson, B.C. D. H. Norcross, President and Mine Manager; J. A. Cullinane, Secretary-Treasurer. The company owns and operates the *Venango*, on the west side of Eagle Creek, adjoining the *Granite-Poorman*. Five men were employed throughout the year, all working underground on occasions. The shaft was sunk 120 feet and 400 feet of stripping by ground-sluicing was done to trace the vein. A new adit 294 feet below other workings was started. In all, 280 feet of drifting and 225 feet of crosscutting was done. A total of 512 tons of ore was mined and shipped to Trail. This yielded 240 oz. of gold and 346 oz. of silver.

SITKUM CREEK.

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

Company office, 415 Baker Street, Nelson, B.C. James B. Curtis, President; Barbara O'Neil, Secretary. Capital: 500,000 shares, 50 cents par. The property lies between 6,500 and 7,000 feet elevation at the head of Sitkum Creek, about 9 miles from a point on the Nelson–Kaslo Highway, 8 miles north-east of Nelson. It is equipped with a Diesel-driven mining plant and 50-ton flotation plant. The concentrator is about 1 mile below the mine and is connected to it with a high-speed 2-bucket Riblet tram. Development-work included 600 feet of drifting and 700 feet of crosscutting. The concentrator was put in operation on December 10th.

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

King Solomon Group.

This property, about 1½ miles below the *Alpine*, is owned and operated by T. L. Paris and A. D. Papazian, of Nelson. This year a go-devil road was constructed from the main *Alpine* road to the mine, a distance of about three-quarters of a mile. A maximum of four men were employed and hand-steel only was used. Ore totalling 19 tons was mined and shipped to Trail. This yielded 13 oz. of gold and 17 oz. of silver.

Gold Crown.

This property, adjoining the *Alpine*, is owned by Mrs. Anna Belle Radcliffe, of Nelson, and was operated under lease by S. Reese, Malcolm Smith, and E. Sheldrith. Hand-steel only was used and most of the ore came from surface cuts and trenches. A total of 3 tons, shipped to Trail, yielded 2 oz. of gold and 2 oz. of silver.

YMIR.

Colorado.

This property, situated on Ymir (Wildhorse) Creek, at the junction of Huckleberry Creek (North Fork), is operated by a local syndicate composed of J. D. Ferguson, W. Griffiths, A. Holstrom, and S. Curwin, with J. D. Ferguson as manager. The mine was operated continuously until October, employing three to four men, and development-work included 60 feet of raising and 100 feet of drifting. No ore was shipped.

Maple Leaf Gold Mining Co., Inc.

Company office, 333½ Riverside Drive, Spokane, Wash.; mine office, Ymir, B.C. Ernest H. Carlson, President; Elizabeth L. Johnston, Secretary-Treasurer; J. D. Ferguson, Mine Manager. Capital: 2,000,000 shares, 1 cent par; issued, 348,964, of which 10,221 are pooled. This company is operating the *Ymir Commodore* mine on Wildhorse Creek. The mine was closed down from February to October. Three men, all working underground, did 250 feet of drifting and 250 feet of diamond-drilling was done; no ore was shipped.

The company also has an option on the *Porcupine* group, owned by E. P. Haukedahl. Development included 160 feet of drifting and 60 feet of crosscutting, all by hand-steel; no ore was shipped. In addition, 1,300 feet of tractor-road was built.

Ymir Consolidated Gold Mines, Ltd.

Company office, 704 Royal Trust Building, Vancouver, B.C.; mine office, Ymir, B.C. R. C. McCorkell, President; T. G. Cowan, Secretary-Treasurer; G. G. Sullivan, Mine Manager. Capital: 1,500,000 preferred shares, no par value; 2,500,000 common shares, no par value. Issued, 2,159,453 common shares. This company owns and operates the *Goodenough* mine on Elise Mountain.

The mine was operated continuously throughout the year, but, owing to lack of ore, the mill was closed down on August 13th. The crew varied from a total of thirty-three men with twenty-one underground, while both mine and mill were running, to a development crew of twenty-one with fourteen underground after the mill closed down. In addition two to four leasers were engaged in mining ore from the old upper workings. Toward the latter part of the summer a new low level was started. Development-work included 2,646 feet of drifting, 535 feet of crosscutting, 459 feet of raising, and 1,219 feet of diamond-drilling. A total of 8,345 tons of ore was milled during the year. The concentrates from this yielded 3,401 oz. of gold, 25,063 oz. of silver, and 505,967 lb. of lead. In addition, 754 tons of crude ore shipped to Trail yielded 501 oz. of gold, 3,383 oz. of silver, and 66,354 lb. of lead.

This company also owns the *Ymir* mine, adjoining the *Goodenough*. The *Ymir* was operated continuously throughout the year by two leasers with hand-steel. A total of 347 tons of ore was recovered from the dumps, surface-cuts, and underground workings. This was shipped crude to Trail and contents are indicated in figures above.

Ymir-Yankee Girl Gold Mines, Ltd.

Company office, 525 Seymour Street, Vancouver, B.C.; mine office, Ymir, B.C. E. P. Crawford, President; R. B. Lamb, Managing Director; 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 Bear Creek, 3 miles from Ymir. The property is equipped with a 100- to 140-ton combination flotation-cyanide plant.

The mine and mill operated continuously throughout the year. A total of about ninety men were employed, with sixty working underground. In addition, an average of nineteen leasers were engaged in recovering ore from pillars and remnants of stopes as well as dumps and spill from the tramway. All this ore was purchased by the company on a basis of its gold content and treated in the mill. Attempts to discover new ore-bodies have, on the whole, been unsuccessful, and the present policy is to recover all the ore left chiefly in pillars, as cheaply as possible, before abandoning the mine. Development-work included 653 feet of drifting, 469 feet of crosscutting, 2,193 feet of raising, and 2,163 feet of diamond-drilling. A total of 47,317 tons of ore was broken, 6,855 tons of this being supplied by the leasers. A total of 47,219 tons of ore was treated in the mill, this being an increase of 10 per cent. over previous years. Total production for the year was 12,594 oz. of gold, 76,351 oz. of silver, 1,031,294 lb. of lead, and 677,469 lb. of zinc.

SALMO.

Clubine-Comstock Gold Mines, Ltd.

Company office, 616 Stock Exchange Building, Vancouver, B.C. Charles F. Hunter, Secretary. Capital: 2,000,000 shares, 50 cents par. The company owns and operates the *Clubine-Comstock* on Boulder Creek, about 4 miles north of Salmo. The property was operated continuously throughout the year, employing a total of seven men, with four underground. Development-work included 152 feet of drifting, 12 feet of crosscutting, and 577 feet of raising. A total of 711 tons of ore, mined and shipped to Trail, yielded 578 oz. of gold and 1,483 oz. of silver.

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

Lucky Strike.—Located near Rosebud Lake, about 10 miles south of Salmo. Late in the year a lease was taken on this property by G. H. Blaney and associates, of Nelson.

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

SHEEP CREEK.

Kootenay Belle Gold Mines, Ltd.

Company office, 475 Howe Street, Vancouver, B.C.; mine office, Sheep Creek, B.C. Jonathan Rogers, President; J. A. Clarke, Secretary-Treasurer; Vere McDowall, Mine Manager. Capital: 750,000 shares, 50 cents par; issued, 675,200. The property is on Sheep Creek, about 10 miles by road from Salmo. It is equipped with a mining plant and 120-ton cyanide plant.

The mine and mill operated continuously throughout the year, employing from 142 to 164 men, with from 112 to 127 underground. A vertical shaft was sunk from the 6 level (formerly called the No. 4 adit) and two levels opened up below this. At the end of the year a large proportion of the ore milled was being drawn from below the 6 level, mining above this being mainly in the nature of salvage. Considerable development-work was also done on the *Dixie* vein, across Sheep Creek from the main workings. This vein was intersected after crosscutting some 1,400 feet and is now being developed by raises and sub-level drifts.

Reno Gold Mines, Ltd.

Company office, 525 Seymour Street, Vancouver, B.C.; mine office, Salmo, B.C. K. G. Nairn, President; W. A. Sutton, Secretary-Treasurer; W. S. Ellis, General Superintendent. Capital: 2,000,000 shares, $1 par; issued, 1,880,000. The company owns the *Reno*, *Motherlode*, and *Nugget* mines and the *Bluestone* prospect, all lying between Sheep and Nugget Creeks, about 10 miles from Salmo.

Milling ceased about March 15th, when ore reserves in the *Reno* mine were almost exhausted. Twenty-two feet of drifting, 14 feet of crosscuts, and 1,002 feet of diamond-drilling was done in the *Reno* mine. Development was continued in the old *Motherlode* mine, the new 4,900 adit being extended 1,172 feet to intersect the *Motherlode* vein, on which 1,893 feet of drifting, 241 feet of crosscutting, 254 feet of raising, and 66 feet of slashing was done. A crosscut from this level was driven 1,376 feet toward the *Nugget* vein. The 4,900 level was connected to the mill with a 2,000-foot 2-bucket Riblet tram. A new bunk-house and dry were built and the concentrator thoroughly overhauled. Development was also done on the *Bluestone*, consisting of 1,150 feet of drifting, 196 feet of crosscutting, 13 feet of raising, and 1,255 feet of diamond-drilling. A complete 40-man camp was built and the old *Reno* tram cut and a new terminal built. The number of men employed varied from forty to 107. A total of 16,421 tons of ore was treated and yielded 7,206 oz. of gold and 2,650 oz. of silver.

The *Nugget* mine was operated continuously throughout the year by two leasers with hand-steel. A total of 1,245 tons of ore was mined and shipped direct to Trail. This yielded 1,075 oz. of gold and 796 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; Jas. Anderson, Secretary-Treasurer; H. E. Doelle, Mine Manager. Capital: 3,000,000 shares, 50 cents par; issued, 2,535,000. The property is on Sheep Creek, adjoining the *Reno* and about 14½ miles from Salmo. It is equipped with a mining plant and 150-ton cyanide plant. Development-work included 4,704 feet of drifting, 1,051 feet of crosscutting, 1,501 feet of raising, and 345 feet of diamond-drilling. A total of 57,838 tons of ore was mined and milled and the bullion yielded 16,569 oz. of gold and 6,158 oz. of silver. One hundred and fifteen men were employed.

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

Sheep Creek Gold Mines, Ltd.

Company office, 616 Stock Exchange Building, Vancouver, B.C.; mine office, Sheep Creek, B.C. R. W. Bruhn, President; Jas. 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. It has options on adjoining properties. The *Queen* mine is equipped with a complete mining plant and 150-ton cyanide plant. Development on the *Queen* mine included 3,980 feet of drifting, 4,437 feet of crosscutting, 647 feet of raising, and 1,022 feet of diamond-drilling.

A crosscut is being driven from the 5 level in the *Queen* toward the *Ore Hill*, held under option; 550 feet of trenching and 191 feet of crosscutting being done on this property. Development on the *Midnight* included 492 feet of drifting, 225 feet of crosscutting, and 125 feet of diamond-drilling. Development on the *Bonanza*, held under option from C. Donaldson, of Salmo, included 676 feet of drifting, 216 feet of crosscutting, and 60 feet of trenching. A total of 55,558 tons of ore was treated, yielding 27,750 oz. of gold and 10,116 oz. of silver. One hundred and fifteen men were employed.

ERIE CREEK.

Relief-Arlington Mines, Ltd. Company office, 626 Pender Street West, Vancouver, B.C.; mine office, Erie, B.C. Bert F. Smith, President and Managing Director; D. G. Marshall, Secretary-Treasurer; S. M. Manning, General Superintendent. Capital: 3,000,000 shares, $1 par; issued, 3,000,000. The company is controlled by Premier Gold Mining Company, Limited, which holds 1,530,000 shares. The company owns and operates the *Relief* mine on Erie Creek, 13 miles by road from Erie. The property is equipped with mining plant and 75-ton cyanide plant. The mine and mill operated continuously throughout the year, employing an average of 122 men. The ore is hand-sorted, about one-third being rejected, before being treated.

Development-work in the mine included 1,726 feet of drifting, 475 feet of crosscutting, 1,326 feet of raising, and 214 feet of sinking. The main shaft was put down to the 11th level, 200 feet below the 10th. Across Erie Creek 1,015 feet of drifting, 260 feet of crosscutting, 66 feet of sinking, and 257 feet of surface-trenching was done on the *Inez* vein, and 137 feet of crosscutting and 137 feet of raising on the *Rand* vein. A total of 51,700 tons of ore was mined and 31,498 tons milled. The bullion produced yielded 14,758 oz. of gold and 2,557 oz. of silver. In addition, refinery slag and amalgam yielded 139 oz. of gold and 1,126 oz. of silver.

Harriett. This property, owned by E. Ballanger, of Salmo, and operated under lease by S. Curwin and associates, is situated on Craigtown (East Fork of Erie) Creek, about 3 miles from the road to the *Second Relief*. Four men were employed underground, using hand-steel until late in the year, when a small gasoline-driven compressor was installed. In addition to about 40 feet of sinking and considerable open-cut work, a new low-level adit is being driven to give about 90 feet of added depth on the vein. About 1½ miles of truck-road from the *Second Relief* road was also completed. A total of 35 tons of ore, mined and shipped to Trail, yielded 57 oz. of gold and 11 oz. of silver.

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

Keystone. This property on Keystone Mountain was operated under lease by W. S. Harris and associates for a short time during the summer. Work was confined to sorting and shipping from the old dumps, although it is understood that the winze underground was dewatered for sampling and examination. A total of 111 tons of ore, shipped to Trail, yielded 43 oz. of gold, 143 oz. of silver, 3,193 lb. of lead, and 2,623 lb. of zinc.

Arlington. This property, situated on Keystone Mountain, 3 miles north of Erie, is owned by Relief-Arlington Mines, Limited, and is leased to Roger Oscarson, of Spokane. Thirteen men were employed under the supervision of A. J. Johnson. Hand-steel only was used and development included 141 feet of drifting, 77 feet of crosscutting, 535 feet of raising, and reconditioning of 530 feet of drifts and 20 feet of raises in the old workings. A total of 783 tons of ore shipped to Trail yielded 1,193 oz. gold, 2,247 oz. silver, and 41,548 lb. lead.

Law-Mac Mines, Ltd. Company office, Baker Street, Nelson, B.C.; mine office, Erie, B.C. Roderick J. Mackay, President; Leonard Hayman, Secretary-Treasurer; R. J. Mackay, Mine Manager. Capital: 200,000 shares, 50 cents par; issued, 105,990. This company's property, on the Salmo–Trail Road, near Erie, was operated for a short time during the summer and about 60 feet of underground work done. A maximum of seven men were employed with three underground. A small Ingersoll-Rand portable compressor was used. Ore totalling 14 tons, mined and shipped to Trail, yielded 1 oz. of gold and 28 oz. of silver.

Pend-d'Oreille River.

Waneta Gold Mines, Ltd. Company office, 675 Dunsmuir Street, Vancouver, B.C. Harry Burns, President and Managing Director; Eric P. Dawson, Secretary. Capital: 1,500,000 shares, 50 cents par. The company owns the *Bunker Hill*, on Limpid (16-Mile) Creek, longitude 117° 23′, latitude 49° 3′, and leased it to James Grant, Jack Pendray, and Duke Hurd. A total of 45 tons was mined by hand-steel and shipped to Trail. This yielded 8 oz. of gold and 8 oz. of silver. The operation ceased in May and late in the autumn the small mining plant was removed from the property and sold.

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

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; John Broatch, Mine Manager. Capital: 2,500,000 shares, no par value; issued, 2,500,000. The company owns and operates the *Bayonne* mine on Summit Creek, 23 miles by road from Tye. The property is equipped with a mining plant and a 50-ton cyanide plant.

During 1939 a development campaign was undertaken in an attempt to locate new ore-bodies in the same general areas from which the former production was made. During the early part of the summer hand-steel was used but, later, part of the power plant was put in operation and compressed air used for development. Development-work included 335 feet of crosscutting and 666 feet of surface-trenching. The mill and power plant have not been dismantled and could be put in operation at short notice should a supply of ore become available. Some clean-up material from the old workings was washed and concentrated by placer methods. A total of 114 tons yielded 516 oz. of gold and 1,514 oz. of silver.

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

Spokane Group. This property, owned and operated by R. M. and K. K. Laib, of Bayonne, B.C., is on Wall Mountain, 18 miles by road from Tye. Five men were employed for the greater part of the year, with three working underground. Surface construction undertaken this year includes a 1,750-foot 2-bucket jig-back tram from the lowest adit-portal and 1,500 feet of new road to connect the lower tram-terminal with the main *Bayonne* road. A truck of 5 tons capacity was also purchased. Very little development-work was done, but 16.8 tons of ore, shipped from the dumps and underground workings, yielded 96 oz. of gold, 2,467 oz. of silver, and 68,986 lb. of lead.

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

CRANBROOK AREA.

Midway Mine. This property, beside the highway near Aldridge, is owned by John Leask, of Cranbrook. Towards the end of 1939, George Whitehead, of Moyie, took a lease on it and shipped a car-load of ore. Development-work done to date consists of an adit about 1,400 feet in length, a "stope raise" started near the portal, and a small winze. Recent operations were carried on near the mine entrance.

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

ROSSLAND AREA.

Mount Roberts.

Midnight. This property is owned by Mrs. Laura Gilmour, of Rossland, and operated under lease and bond by B. A. Lins and associates. Four men, with two working underground, were engaged throughout the year. Development-work included 150 feet of drifting. In addition, 1,500 square feet of timber crib and 600 feet of riprap was built on the surface. Compressed air was used

underground. A total of 60 tons of ore mined and shipped to Trail yielded 902 oz. of gold and 189 oz. of silver.

[Reference: Annual Report, 1935, Part E.]

O.K. This property is operated under lease by John Hendrickson and associates, of Rossland. Hand-steel only was used by the three men working underground. Late in 1939 the leasers opened up an area on the *O.K.*, which was accessible only through the No. 3 level of the *I.X.L.* A total of 24 tons of ore mined and shipped to Trail yielded 47 oz. of gold and 32 oz. of silver.

[Reference: Annual Report, 1935, Part E.]

I.X.L. This property was operated first by the I.X.L. Leasers, with K. Jorgensen in charge, and later by K. Jorgensen and associates under a separate lease. No development was done by the I.X.L. Leasers, but Jorgensen and associates plan to reopen some of the old workings. A total of 119 tons of ore mined and shipped to Trail yielded 99 oz. of gold and 50 oz. of silver. In addition, a lease on the dumps was held by Alex. Malcolm and associates.

[Reference: Annual Report, 1935, Part E.]

Gold Drip. This property is owned by Mrs. M. D. McKinnon, of Beverley Hills, Cal. It was operated under lease by S. J. Hackney and partner. Some of the old workings have been reopened. A total of 6 tons of ore mined and shipped to Trail yielded 1 oz. of gold and 14 oz. of silver.

Velgo Mining, Inc. Company office, 8655 West Marginal Way, Seattle, Wash.; mine office, Rossland, B.C. Arch Wilson, Secretary-Treasurer and Manager. Capital: 40,000 shares, $1 par; issued, 30,153. The company owns the *Velvet* mine, on the Cascade Highway, 13 miles west of Rossland, which was operated under lease by the Velvet Leasing Syndicate, consisting of Harold Elmes, Renaldo Bielli, and Ole Osing, of Rossland, with Ole Osing in charge of mining operations. The mine and mill were operated continuously for the greater part of the year, employing an average of twenty men, with from eight to ten working underground. Development-work included 50 feet of drifting, 50 feet of crosscutting, 350 feet of raising, and 250 feet of diamond-drilling. A total of 7,000 tons of ore was mined and milled and the product, a gold-copper concentrate, was shipped to Tacoma. This yielded 1,462 oz. of gold, 1,016 oz. of silver, and 192,768 lb. of copper. In addition two cars of crude ore were shipped to Tacoma.

HOPE AREA.

Northwest Ventures, Ltd.—This company was operating the *Aufeas* mine, on the lower slopes of Silver Peak, 3 miles from Hope. Stoping operations were being carried out from a single drift. There were two stopes. About fifteen men were employed.

SQUAMISH AREA.

Ashloo Gold Mines, Ltd. Company office, 602 Hastings Street West, Vancouver, B.C. T. G. McConville, President; K. T. Robinson, Secretary; Chas. T. White, Treasurer; W. V. Smitheringale, Mine Manager. Capital: 1,000,000 shares, $1 par; issued, 735,005. The company owns and operates the *Ashloo* mine, on Ashlu Creek, 28 miles by road and trail from Squamish. Some development-work was done on the 1,000 level and stoping was carried on from the 1,100 level up to the surface. The mine closed down early in October.

[Reference: Annual Report, 1935, Part F.]

TEXADA ISLAND.

Gem Gold Mines, Ltd. Company office, 1604 Royal Bank Building, Vancouver, B.C.; mine office, Vananda, B.C. Ralph A. Logan, President; R. E. Logan, Secretary-Treasurer; W. J. Sclater, Mine Manager. Capital: 2,000,000 shares, $1 par; issued, 1,669,628. The company owns the *Gem* mine on Texada Island, 5 miles from Blubber Bay. A new 2-compartment shaft has been sunk to the 250-foot level, and crosscutting has commenced to cut the Nos. 1 and 2 veins, which were met on the 150-foot level of the old shaft. Fourteen men are employed.

Seccondee Mines, Ltd. Company office, 325 Standard Bank Building, Vancouver, B.C.; mine office, Vananda, B.C. John Morgan, Secretary. Capital: 50,000 shares, $1 par; company in voluntary liquidation (February, 1940). The company was operating the old *Marjorie* property on Texada Island. They were dewatering a shaft which is about 120 feet deep and had about 60 feet of this shaft dewatered. An inclined drift from the surface enters this shaft about 50 feet down and some ore has been stripped from this drift. No other work has been done.

VANCOUVER ISLAND.

ZEBALLOS.

Privateer Mine, Ltd. Company office, 606 Bank of Toronto Building, Victoria, B.C.; mine office, Zeballos, B.C. D. S. Tait, President; W. P. Marchant, Secretary-Treasurer; T. W. Murray, Mine Manager. Capital: 2,500,000 shares, no par value; issued, 2,454,080. The company operates the *Privateer* mine, in Spud Valley, 4 miles by road from Zeballos. The property is equipped with a 75- to 85-ton amalgamation and cyanide mill. Stoping has been carried out on all the levels from the 1,100 level up to the 600 level. On the 900 and 800 levels crosscuts were driven to the No. 2 vein and drifting commenced on these levels on the No. 2 vein. A 3-compartment shaft is being sunk from the 1,100 level and was down 128 feet at the end of the year. Preparations were being made to start the 1,200 level off this shaft. During the year there has been 128 feet of sinking done, 850 feet of crosscutting, 1,611 feet of drifting, 1,075 feet of raising, and 4,126 feet of diamond-drilling. A little over 130 men are regularly employed.

The company also operates the *Prident* mine adjoining the *Privateer*. Two levels —the 200 and 400 levels—have been opened up and a raise connecting these levels has been completed. Formerly the ore from this property was shipped to Tacoma; it is now put through the *Privateer* mill.

[Reference: Lode Gold Deposits, Zeballos Area, 1938.]

Mount Zeballos Gold Mines, Ltd. Company office, 1001 Federal Building, Toronto; mine office, Zeballos, B.C. F. M. Connell, President; A. Cockeram, Secretary-Treasurer; W. S. Hamilton, Mine Manager. Capital: 1,500,000 shares, $1 par; issued, 1,100,000. The company operates the *Mount Zeballos* mine, on the west side of Spud Creek. There are four levels—1,900, 1,800, 1,600, and 1,500—all started from the surface. Stoping is being carried out on the 1,800, 1,600, and 1,500 levels, shrinkage and cut-and-fill methods being used. A 35- to 50-ton mill was built in 1939, amalgamation-flotation type, and is in operation. The ore is brought to the mill from the mine on an inclined tramway. Sixty-five men are employed.

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

White Star Mine, Ltd. Company office, 814 Rogers Building, Vancouver, B.C.; mine office, Zeballos, B.C. R. P. Stockton, President; Marion Metchen, Secretary; T. D. Pickard, Manager. Capital: 200,000 shares, $1 par. The company operates the *White Star*, on Spud Creek, adjoining the *Privateer*. During the year 780 feet of drifting on the Nos. 1 and 2 veins has been done and 24 feet of raising. Two stopes have been started and about 360 tons of ore has been shipped to Tacoma smelter. An overhead tram-line brings the ore from the mine to the highway, where it is trucked to the wharf.

[Reference: Lode Gold Deposits, Zeballos Area, 1938.]

Spud Valley Gold Mines, Ltd. Company office, 703 Royal Trust Building, Vancouver, B.C.; mine office, Zeballos, B.C. P. F. Knight, President; J. R. Pyper, Secretary-Treasurer; W. Elliott, Mine Manager. Capital: 2,500,000 shares, $1 par; issued, 2,100,000. The company operates the *Spud Valley* mine, in Spud Valley, 7 miles from Zeballos, B.C. The claims extend across the ridge between Spud Creek and Gold Valley Creek. A great deal of development-work has been carried out during the year. In all, five tunnels are operating, Nos. 2, 3, 4, and 5, and the Roper tunnel. Most of the work has been done on what is known as the *Goldfield* vein, with a certain amount of drifting on the *Spud* vein, which intersects the main vein on each of the levels. The Roper tunnel is on the same elevation as No. 4 tunnel and is

being driven from the Gold Valley side of the property. Stoping is being carried out on all levels from the No. 4 level up. The mill is the amalgamation-flotation type and is handling from 60 to 70 tons per day. The total tonnage milled during the year amounted to 20,950 tons. Eighty men are employed.

[Reference: Lode Gold Deposits, Zeballos Area, 1938.]

Central Zeballos Gold Mines, Ltd. Company office, 815 Hastings Street West, Vancouver, B.C.; mine office, Zeballos, B.C. A. J. Hendrey, President; R. R. Steeves, Secretary-Treasurer; N. F. Brooke, Mine Manager. Capital: 2,500,000 shares, $1 par; issued, 1,450,000. Reno Gold Mines, Limited, in March, 1939, acquired a 40-per-cent. interest in the company for financing $30,000 development-work. Active development-work has been carried out since. There has been 943 feet of drifting, 344 feet of crosscutting, 95.5 feet of raising, 100 feet of sinking, and 1,504 feet of diamond-drilling. Most of this development-work has been carried out in the lower west drift. A 25- to 40-ton mill was built and was ready for operation by the end of 1939. A power plant developing a total of 235 horse-power has been built and a new road has been built into this property. Forty-nine men are employed.

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

ALBERNI.

Havilah Gold Mines, Ltd. Company office, Bank of Toronto Building, Victoria, B.C.; mine office, Port Alberni, B.C. J. A. Burchett, President; D. S. Tait, Secretary-Treasurer; J. P. Murray, Mine Manager. Capital: 2,000,000 shares, no par value; issued, 1,620,000. The *Havilah* mine is at an elevation of 3,800 feet, at the headwaters of McQuillan Creek, a tributary of China Creek, 14 miles south-west of Port Alberni. Prospecting and development-work was begun in the early part of July, 1938, and continued steadily until August, 1939, when all operations were suspended. During this period, in addition to a diamond-drilling programme, the principal work consisted of 1,822 feet of drifting, 50 feet of crosscutting, and 200 feet of raising on the *Gillespie* vein, in the course of which 1,038 tons of ore was mined and hauled by truck a distance of 15 miles to Port Alberni and then shipped to Tacoma smelter for treatment. An average of eighteen men was employed.

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

United Prospectors, Ltd. Company office, Bank of Toronto Building, Victoria, B.C. R. A. Pitre, General Manager. Capital: 100,000 shares, no par value. The company owns the *Thistle* mine, at an elevation of 2,500 feet, on the headwaters of the North Fork of Franklin River, and reached by means of an old logging-railway grade, a distance of 12 miles, between Underwood Cove, on the banks of the Alberni Canal, and the mine. Some surface work was done from September to November, inclusive, in 1938; this was confined to cleaning over the old dumps, from which 80 tons of ore was sacked and shipped. Operations were resumed in April and continued right through to the end of the year, with a crew of fourteen men employed. All work was of the open-cut and "glory-hole" method of mining, and 1,840 tons of ore was produced and hauled by trucks and shipped to the Tacoma smelter for treatment.

Red Panther and Black Panther. These claims, owned and operated by Walter Harris, of Port Alberni, are located at an elevation of 2,900 feet on the headwaters of the West Fork of the Nitinat River, and are reached by a good pack-trail, 2 miles in length, connecting with the truck-road at the *Thistle* mine. A crew of four men was engaged constructing the trail and prospecting during October, November, and part of December. Some drifting and crosscutting was done on both claims, but no shipments of ore were made. Two roomy log cabins provide suitable accommodation for the men engaged at this property.

Vancouver Island Gold Mines, Ltd. Company office, 602 Hastings Street West, Vancouver, B.C. Victor MacLean, Secretary-Treasurer; A. Kurtzahls, Manager. Capital: 4,500,000 shares, 50 cents par. The company's property is at an elevation of 2,700 feet on Mineral Creek, a tributary of China Creek, and

is reached by following the Alberni Pacific Lumber Company's old logging grade for a distance of 9 miles from Port Alberni and then by a caterpillar trail 2 miles in length to the mine. After having been closed down since September, 1936, work was resumed in the early part of July, 1939, and continued until October 31st, with a crew of four men engaged in cleaning up and repairing the lower and upper *Mac* adits and also doing some stoping in the 279 raise. Some open-cutting and drifting was done on the south *Mac* vein prior to the suspension of operations at the end of October. Forty-eight tons of ore was shipped to the Tacoma smelter for treatment, yielding 34 oz. of gold. Following the stoppage of work by the company, G. Moffatt undertook to operate under a lease on a small scale for the balance of the year.

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

NANAIMO.

Nanoose Bay Gold Mines, Ltd. Company office, Room 10, Herald Building. F. A. Whitehouse, Secretary and Manager. Capital: 50,000 shares, $1 par. The company is developing a gold prospect, approximately 20 miles north of Nanaimo, within a quarter of a mile from the main Island Highway. The prospect-shaft on this property was sunk a further 30 feet, making a total depth of 60 feet. Work was suspended in November.

GOLD-COPPER DEPOSITS.

KAMLOOPS AREA.

Copper King Group. This property, consisting of nine Crown-granted claims and fractions, owned by Baroness Sartorio, of Kamloops, and under option to James T. McKelvie and brothers, of Grand Forks, is 16 miles west of Kamloops and adjoins the highway on the north side of Cherry Creek. The property is equipped with a 35-ton mill and at mid-December was operating two weeks a month with a crew of seven men. During 1939 a total of 4,140 tons of ore was milled and yielded 367 oz. of gold, 730 oz. of silver, and 108,140 lb. of copper. In addition, 36 tons of ore was shipped to Tacoma. A report on this property may be obtained from the Department of Mines, Victoria, B.C.; cost, 25 cents.

[Reference: Annual Report, 1935, Part D.]

SIMILKAMEEN RIVER AREA.

Red Buck Mines, Ltd. Company office, 208 Yorkshire Building, 525 Seymour Street, Vancouver, B.C. R. J. G. Richards, President; Allan A. Drummond, Secretary-Treasurer. Capital: 2,500,000 shares, 50 cents par. The *Red Buck* mine is 11 miles south of Princeton, on the west side of the Similkameen River, longitude 120° 34′, latitude 49° 19′, about 1½ miles north of the *Copper Mountain* main adit. The mine is reached by a winding trail down the side of the mountain from the Hope–Princeton Highway to the river-bank, where the mine camp and surface plant are located.

During 1938 a 100-ton flotation mill was installed on the opposite side of the river from the mine and near the branch of the Kettle Valley Railway that runs to the coarse crushing plant of the Granby Consolidated Mining, Smelting, and Power Company, Limited, at Copper Mountain. The mine is connected to the concentrator by an aerial tramway. The concentrator went into operation during the latter part of 1938, and, after operating a short time, all work at the mill ceased during the early part of 1939.

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

VANCOUVER ISLAND AREA.

Sheep Creek Gold Mines, Ltd. Company office, 640 Pender Street West, Vancouver, B.C. James Anderson, Secretary; F. Hemsworth, Manager. Capital: 2,000,000 shares, 50 cents par. This company acquired the old *Tyee* and *Lenora* mines from Tyee Consolidated Mining Company, Limited, and commenced development-work on December 7th. The properties are on Mount Sicker, 15 miles by road from Duncan. A crew of five men commenced cleaning up and repairing the *Lenora* No. 2 adit and part of the *Tyee* workings.

GREENWOOD-GRAND FORKS AREA.

PHOENIX.

Brooklyn. This property at Phoenix is owned by Robert Forshaw and operated under lease by W. E. McArthur, of Greenwood, B.C. The mine was operated continuously throughout the year, sixteen to twenty-two men being employed there and at the mill in Greenwood. Approximately 18,000 tons of ore was mined and concentrated and the product shipped to the Tacoma smelter. Early in the year the mine was dewatered to the 250 level and the ore-bodies were found to terminate on a bed of limestone. Two hundred feet of raising was done from this level to the 150 and several raises run from the 150 to the 80. New equipment installed during the year included a Gardner-Denver compressor, steel-sharpener, and Ford V-8 gasoline-power unit to operate the hoist. A total of 2,473 tons of concentrate, which included a small tonnage taken from the *Granby* mine, yielded 2,481 oz. of gold, 4,265 oz. of silver, and 292,901 lb. of copper.

Granby. This property is owned by W. E. McArthur, of Greenwood; payments on the option having been completed in October. A small tonnage was mined from the glory-hole of this property early in the year, about six men being employed. Toward the end of the year some 1,800 feet of the No. 3 level was reopened and reconditioned preparatory to stoping. A rather interesting problem in connection with the reopening of the old adit was the removal of about 900 feet of ice, which was done by cutting the ice in strips by laying steam-pipes on top of it and hauling the strips out in sections.

Athelstan.—This property, in the *Wellington* camp, near Phoenix, is operated under lease by W. E. McArthur. A small amount of ore was recovered from surface cuts and shallow workings. One man was employed.

ROSSLAND AREA.

Consolidated Mining and Smelting Co. of Canada, Ltd. Company office, 215 St. James Street West, Montreal, Quebec; mine office, Trail, B.C. Sir Edward Beatty, Chairman; S. G. Blaylock, President and Managing Director; J. E. Riley, Secretary; Jas. Buchanan, General Manager; R. W. Diamond, Assistant General Manager. Capital: 4,000,000 shares, $5 par; issued, 3,271,669. The company owns the *War Eagle, Le Roi, Centre Star, Josie, Iron Mask, Annie, Columbia,* and *Kootenay,* at Rossland, B.C. These properties were operated continuously throughout the year by leasers. About seventy men were engaged in mining ore from surface and underground operations on twenty-three leases. The work was carried on under the supervision of J. K. Cram, of Trail. A total of 9,434 tons of ore was mined and shipped to the smelter. This yielded 5,915 oz. of gold and 6,694 oz. of silver. In July the company commenced a complete re-examination, including a geological survey, of all the Rossland properties, with a view to ascertaining the possibilities of developing new ore-bodies.

SILVER-GOLD-LEAD DEPOSITS.

GREENWOOD-GRAND FORKS AREA.

GREENWOOD.

Providence. Operations at this property, about 1 mile north of Greenwood, by W. E. McArthur and associates, commenced in September and nine men were employed from then on to the end of the year. A crosscut from the third level some 35 feet in length encountered a vein which has been drifted on for approximately 105 feet. In order to work this section of the mine economically, the old main shaft was reconditioned and a new head-frame with ore- and waste-bins erected. Ore to the amount of 81 tons was mined and shipped to Trail, yielding 28 oz. of gold, 7,975 oz. of silver, and 2,716 lb. of lead.

Gold Bug. Situated 2 miles north of Greenwood. Owned by George Walters, of Greenwood, and operated under lease by R. Mitchell and S. Wickwire. About 60 feet of underground development-work was done, using hand-steel methods. Four tons of ore, shipped to Trail, yielded 4 oz. of gold, 112 oz. of silver, and 186 lb. of lead.

GRAND FORKS.

Simpson Mine. This property, 13 miles north of Grand Forks, was optioned by L. E. Hanley, of Wallace, Idaho, and developed under the direction of L. A. Grant. Seven to eleven men, with four to eight working underground, were employed for about five months. A complete small mining plant was installed. Development-work included 286 feet of drifting, 370 feet of crosscutting, 10 feet of sinking, and 6 feet of raising. The property was closed in September. A total of 364 tons of ore mined and shipped to Trail yielded 259 oz. of gold and 90 oz. of silver.

Little Bertha. Situated on the Granby River, about 12 miles above Grand Forks, this property is operated under lease by G. H. Gepman and Henry Doreen, who mined 129 tons of ore by hand-steel. This was shipped to Trail and yielded 21 oz. of gold and 229 oz. of silver.

Regal Mines, Ltd. Company office, Room 40, Williams Building, Vancouver, B.C. George L. McInnis, Secretary. Capital: 5,000,000 shares, no par value. The company owns the *Yankee Boy* mine, 4 miles from Grand Forks, B.C. It is operated under lease by W. M. and W. L. Schwarz and associates. Five men, all working underground, were employed, using hand-steel. Practically no development-work was done, but 463 tons of ore, mined and shipped to Trail, yielded 345 oz. of gold and 315 oz. of silver.

NELSON AREA.

Howard. This property, on Active Creek, 7 miles from Ymir, owned by J. F. Duthie, of Seattle, was operated under lease by John Linstrom and C. Peterson. Ore was recovered from remnants left in the stopes, pillars, and from the dumps. Hand-steel was used as the entire mining plant has been removed. A total of 196 tons of ore shipped to Trail yielded 102 oz. of gold, 1,774 oz. of silver, 75,036 lb. of lead, and 52,708 lb. of zinc.

SILVER-GOLD DEPOSITS.

SLOCAN LAKE AREA.

Slocan Silver Mines, Ltd. Company office, 504 Empire State Building, Spokane, Wash. Percy G. Morey, Secretary. Capital: 500,000 shares, $1 par. The company owns the *McAllister*, on London Ridge, near Three Forks. The property was operated under lease by Geo. Allen, who employed a crew of four men, with three working underground, during the summer months. No develop-

ment was done, but 148 tons of ore was mined and shipped to Trail. This yielded 3 oz. of gold and 25,328 oz. of silver.

Jo-Jo.—This property adjoins the *McAllister*. J. Tier and W. George did a small amount of development-work with hand-steel.

Slocan Idaho Mines Corporation. Company office, 204 Howard Street, Spokane, Wash. John Stanford, Manager. The company operates the *Molly Hughes*, on Slocan Lake, about 1 mile north of New Denver. An average of eighteen men, with eleven working underground, were employed throughout the year. The main shaft from the No. 2 to the No. 4 level, originally sunk as a winze, was straightened and retimbered. On the completion of this it was continued down to the 5 level. A new single-drum electric hoist, equipped with all safety devices necessary to handle men, and a 10-horse-power electrically driven centrifugal pump were installed. Development-work done during the year included 397 feet of drifting, 145 feet of crosscutting, 163 feet of sinking, and 50 feet of raising. In addition, 200 feet of old drift was retimbered. A total of 191 tons of ore mined and shipped to Trail yielded 98 oz. of gold, 26,148 oz. of silver.

ROSSLAND AREA.

Mayflower. This property is operated under lease by the Mayflower Mining Syndicate (Lloyd R. Smith and associates, of Penticton), with Frank Brinson as mine foreman. A total of five men was employed, with three underground. A small mining plant was installed and low-level crosscut was commenced and driven to intersect the downward extension of the upper showings. Development included 210 feet of crosscutting and 60 feet of drifting.

Phoenix.—This property is operated under lease by W. C. Holm and two partners. A total of 11 tons of ore, mined from a shallow winze by hand-steel and shipped to Trail, yielded 7 oz. of gold and 24 oz. of silver.

SILVER-LEAD-ZINC DEPOSITS.

SMITHERS.

Coronado Group. This property on Hudson Bay Mountain, adjoining the *Mamie, Duthie,* and *Victory* groups, is owned by the R. J. McDonell Estate. It is 16 miles by road from Smithers. The property was leased to H. Orm and Fred Griffin, who shipped 46 tons of ore to the Trail smelter. Stripping and open-cutting was done in the southerly part of the property and two converging adits started. Test samples were sent to the sampling plant (*see* page 57).

[Reference: Annual Report, 1914.]

Victory Group. This group of six claims, owned by Mrs. M. C. Simpson, of Smithers, adjoins the *Coronado* group on Hudson Bay Mountain. Mrs. Simpson and two miners did further development-work with the object of determining the possibility of selectively mining and cobbing a shipping-grade ore. Several test and three tonnage samples were sent to the sampling plant (*see* page 56).

[Reference: Annual Report, 1928.]

TOPLEY.

Golden Eagle Group. This group, owned by D. Heenan, of Topley, and the C. Matheson Estate, is about 7 miles northerly from Topley by road. D. Heenan continued selective mining from open-cuts on No. 1 and No. 2 veins, chiefly at the easterly open-cut on the latter. Four small shipments were made to the sampling plant (*see* page 58).

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

NORTH THOMPSON AREA.

Iron Cap. This group of eight located claims, formerly known as the *O.K.* group, owned by Nick Forsberg and associates, of Barriere, B.C., is in the valley of Birk Creek, ½ to 1½ miles from the end of the North Barriere Lake Road. Development-work to date consists of ten short adits and one 160 feet long. A report on this property may be obtained from the Department of Mines, Victoria, B.C.; cost, 25 cents.

North Star. This group of nine claims is owned by Nick Forsberg, Carl Johnson, and associates, of Barriere. The property is 8 miles up Birk Creek from the end of the North Barriere Lake Road. Since 1936, a new adit 140 feet long has been driven and several open-cuts made.

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

BEAVERDELL AREA.

Highland Bell, Ltd. Company office, Penticton, B.C.; mine office, Beaverdell, B.C. F. V. Staples, President; Miss A. H. Doyle, Secretary-Treasurer; R. B. Staples, Managing Director. Capital: 1,500,000 shares, $1 par; issued, 1,315,856. The company owns and operates the *Highland Bell,* on Wallace Mountain, about 5 miles from Beaverdell. The mine was operated continuously throughout the year, employing thirty-six men, with twenty-seven working underground. Development-work included 300 feet of drifting, 400 feet of crosscutting, and 100 feet of raising. A total of 6,706 tons of ore was mined and shipped to Trail and yielded 206 oz. of gold, 886,010 oz. of silver, 550,276 lb. of lead, and 720,973 lb. of zinc.

Sally Mines, Ltd. Company office, Penticton, B.C.; mine office, Beaverdell, B.C. S. J. Crocker, President; H. B. Morley, Secretary-Treasurer; R. C. McLanders, Mine Manager. Capital: 1,000,000 shares, $1 par; issued, 1,000,000 shares. The company owns and operates the *Sally,* on Wallace Mountain, adjoining the *Highland Bell.* A small section of ground adjoining the *Wellington* is being mined. Under an agreement with the management of that property all ore and waste is being handled through the 5 level of the *Wellington.* Compressed air is used and is conducted through the new *Sally* shaft to the present operation. An exploratory programme from this shaft is being considered. Total development-work amounted to 170 feet. Five men were employed, with four working underground. Sixty-three tons of ore, shipped to Trail, yielded 5 oz. of gold, 9,867 oz. of silver, 8,052 lb. of lead, and 13,795 lb. of zinc.

Beaverdell-Wellington Syndicate, Ltd. Company office, Greenwood, B.C.; mine office, Beaverdell, B.C. Jas. Kerr, President; G. S. Walters, Secretary-Treasurer; A. J. Morrison, Manager. Capital: 50,000 shares, $1 par; issued, 50,000. The company owns the *Wellington,* on Wallace Mountain, near Beaverdell. A small amount of work was done on this property, as the main activities of the company were concentrated on the *Bounty* and *Bounty Fraction.* Development on the *Wellington* included 50 feet of raising and 140 feet of test-holes. A total of 125 tons of ore, mined and shipped to Trail, yielded 4 oz. of gold, 18,656 oz. of silver, and 15,831 lb. of lead. Late in 1939 a lease was taken on the property by A. J. Morrison and associates.

The company also operates the *Bounty* and *Bounty Fraction,* on Wallace Mountain, in conjunction with the *Wellington.* During the early part of the year twelve men, with five underground, were employed, but this was reduced to five, with two underground, and the work was confined chiefly to development. This included 315 feet of drifting, 30 feet of sinking, 50 feet of raising, and 140 feet of test-hole drilling.

Beaver Silver Mines, Ltd. Company office, Box 609, Kelowna, B.C.; mine office, Beaverdell, B.C. R. B. Staples, President; J. C. Ralston, Secretary. Capital: 2,000,000 shares, 50 cents par; issued, 1,600,000. Controlling interest in the company is held by the Highland Bell, Limited. The company owns the *Beaver* claim, adjoining the *Highland Bell,* on Wallace Mountain.

The property was worked under lease, during the first half of the year, by H. S. Nordman and associates. Five men were employed, four working underground.

Development-work included 105 feet of drifting and 45 feet of raising. A total of 157 tons of ore, shipped to Trail, yielded 5 oz. of gold, 11,916 oz. of silver, and 8,673 lb. of lead. This work was discontinued during the summer and a lease taken on the dumps by C. Staples.

Tiger. This property, situated on Wallace Mountain, is owned by the Wm. Law Estate and is operated under lease by J. L. Nordman and partner. Compressed air, piped from the *Beaver Silver* about 1,500 feet away, is used for underground work. Development included 100 feet of drifting, 120 feet of crosscutting, 25 feet of raising, and 25 feet of sinking. Fifty-three tons of ore shipped to Trail yielded 1 oz. of gold, 6,721 oz. of silver, 6,651 lb. of lead, and 12,171 lb. of zinc.

Revenge. This property, situated on Wallace Mountain, adjoining the *Highland Bell*, is under lease to R. C. McLanders, two men with hand-steel being employed. A total of about 200 feet of underground work and surface stripping was done in an attempt to locate a faulted segment of ore overlooked by the former operators.

Highland Chief. This property, situated on Wallace Mountain, adjoining the *Highland Bell*, is owned by Mark Smith, of Beaverdell, and is leased by Alex. Bell and associates. Three men were employed and all the work was done by hand-steel. Development-work included 234 feet of drifting, 287 feet of crosscutting, 48 feet of raising, and 120 feet of surface-trenching. Five tons of ore mined and shipped to Trail yielded 450 oz. of silver and 498 lb. of lead.

British Silver and Gold Mines Syndicate.—Prospecting on the *British* claim, on Wallace Mountain, adjoining the *Wellington*, for the possible continuation of the *Wellington* vein has been continued this year, efforts being directed to exploring favourable areas by crosscutting. Two men were employed using hand-steel.

LARDEAU AREA.

New True Fissure Mining and Milling Co., Ltd. Company office, 804 Guaranty Trust Building, Windsor, Ont.; mine office, Ferguson, B.C. David I. Hubar, President; J. G. Brislin, Secretary; Dr. A. Oven, Treasurer; G. O. Kelly, Superintendent. Capital: 3,500,000 shares, $1 par; issued, 1,976,000, of which 750,000 pooled. The company owns the *True Fissure* mine, on Great Northern Mountain, about 3½ miles from Ferguson. The property is equipped with a 75-ton mill. A contract let in November, 1938, to the Interior Contracting Company, of Penticton, was completed in April, 1939. In all, 836 feet of drifting, 516 feet of crosscutting, and 76.5 feet of drifting were done, chiefly in the Morgan and C. level adits. A total of twenty-three men, with eleven working underground, were engaged in this work. The property was closed down on completion of the contract.

SLOCAN.

KASLO-THREE FORKS.

Lucky Boy.—This property, about 12 miles from Kaslo, on the Kaslo–New Denver Highway, is owned and operated by Charles Lind and sons, of Kaslo.

Sturgis Creek Mines, Ltd. Company office, 303 Maclean Block, Calgary. W. S. Davidson, Secretary-Treasurer. Capital: 2,000,000 shares. The company owns the *Revenue*, at the head of Sturgis Creek, a tributary of Keen Creek. It was operated under lease for a short time by H. E. Singel and two men. A total of 55 tons of ore mined and shipped to Trail yielded 4,681 oz. of silver, 23,775 lb. of lead, and 13,282 lb. of zinc.

Caledonia.—This property is situated at Blaylock, and is operated by George McCready, who shipped 18 tons of ore to Trail. This yielded 1,020 oz. of silver and 23,529 lb. of lead.

Whitewater.—Situated at Retallack and operated under lease by Ole Larsen, of Kaslo, who milled 400 tons of ore, and with 17 tons of crude ore yielded 11 oz. of gold, 4,825 oz. of silver, and 65,786 lb. of lead.

Sandon-Three Forks.

Ruth Hope Mining Co., Ltd. Company office, Vancouver Block, Vancouver, B.C. R. H. Stewart, President; R. S. Lennie, Secretary-Treasurer. Capital: 2,500,000 shares, $1 par; issued, 1,500,000. The company owns the *Ruth Hope* mine at Sandon. It is equipped with a 50-ton mill. The *Ruth Hope* was operated by two groups of leasers—namely, A. T. Forsyth and two partners, who have a lease on the ground from the 3 level to the surface, and C. Stewart and sons, who have a lease on the dumps and on the ground between the 3 and 5 levels. On the upper lease hand-steel only is used and the crude ore is shipped to Trail. On the lower lease, power is obtained from the water-driven compressor located in the mill, and the ore mined underground and from the dumps is concentrated by a system of mechanical jigs. A total of 174 tons of ore yielded 14,862 oz. of silver, 19,935 lb. of lead, and 28,479 lb. of zinc.

Silver Ridge Mining Co., Ltd. Company office, Sandon, B.C. R. A. Grimes, President; D. D. Townsend, Secretary-Treasurer. Capital: 2,000,000 shares, 50 cents par; issued, 760,000, of which 260,000 pooled. The company owns and operates the *Sunshine* group, on Silver Ridge, about 4½ miles from Sandon; fifteen men being employed, with an average of seven underground. The main low-level crosscut was extended 1,820 feet and 100 feet of drifting done on veins intersected by it. In addition, some 3,000 feet of surface-stripping by tractor and bulldozer was accomplished. A mile and a half of road was built to connect the lower camp to the main road to Sandon, to avoid areas frequently swept by snowslides.

Silver Ridge Mines. This property, on the Silver Ridge Road, about 3 miles from Sandon, is owned by J. H. Cory, of New Denver, and is operated under lease by F. Walters, Joe Francina, and Emil Battelle. Hand-steel only is used. Development included 324 feet of drifting and crosscutting, 15 feet of raising, and 10 feet of sinking. A total of 7 tons of ore, shipped to Trail, yielded 794 oz. of silver, 7,600 lb. of lead, and 361 lb. of zinc.

Victor. This property, situated about 3 miles from Sandon, is owned by Mrs. D. Petty, of Nelson, and is operated under lease by E. Doney and son. Hand-steel only is used. Sixty-five tons of ore, shipped to Trail, yielded 20,428 oz. of silver, 78,745 lb. of lead, and 363 lb. of zinc.

Dardanelles. This property, situated at the head of Dardanelles Creek, near Three Forks, was optioned by S. Ross and H. Lazier, of Nelson, and P. Johnson, of Silverton, with S. Ross in charge of operations. The main shaft, some 500 feet deep, was dewatered for examination and sampling. Nothing further was done with the property. Six men were employed for several months during the summer.

Silverton-New Denver.

Galena Farm Consolidated Mines, Ltd. Company office, 616 Stock Exchange Building, Vancouver, B.C. S. W. Miller, President; Jas. Anderson, Secretary-Treasurer. Capital: 2,500,000 shares of no par value; issued, 1,602,203. The company owns the *Hewitt* mine, 6 miles by road from Silverton, which is operated under lease by George Mathews and partners. A total of 230 tons of ore was shipped to Trail and yielded 8,927 oz. of silver, 20,486 lb. of lead, and 66,852 lb. of zinc.

Bosun. This property, situated on Slocan Lake, between Silverton and New Denver, is owned by C. J. Campbell and is operated under lease. Six men were engaged throughout the year. A total of 90 tons was shipped to Trail, chiefly from pillars and remnants of former ore-bodies. This yielded 6,779 oz. of silver, 25,690 lb. of lead, and 52,226 lb. of zinc.

Capella. This property, situated on Mount Carpenter, above New Denver, and owned by the Wells Estate, was leased by Chas. Stedile and partner, who shipped 14 tons of ore to Trail. This yielded 2,341 oz. of silver and 342 lb. of lead.

SLOCAN CITY.

Arlington. This property, situated on Springer Creek, about 7 miles from the main Slocan Highway, was operated under lease by F. W. Jancowski and associates for a short time during the early part of the year. A total of 202 tons of ore, chiefly sorted from the old dumps, was shipped to Trail. This yielded 5,034 oz. of silver, 7,367 lb. of lead, and 4,438 lb. of zinc. The underground workings are in very bad condition and are, for the most part, inaccessible.

Ottawa Silver Mining and Milling Co. Company office, 401 Sherwood Building, Spokane, Wash. C. R. Thomas, President; J. J. Bigger, Treasurer. Capital: 2,500,000 shares, 1 cent par; issued, 2,150,000. The company owns the *Ottawa* mine, on Springer Creek, about 5 miles from Slocan City. The property is equipped with a 100-ton flotation plant. The mine was operated almost continuously, under lease, by W. Hicks and associates throughout the year. Hand-steel was used to mine ore from the 8 level as well as from the old upper workings. A total of 283 tons, crude and concentrates, shipped to Trail yielded 15,991 oz. of silver. Five men were employed.

Meteor. This property, situated at the head of Tobin Creek, a tributary of Springer Creek, was leased by G. Larsen and C. Lindstron, of Slocan City, who mined 33 tons of ore with hand-steel and shipped to Trail. This yielded 11 oz. of gold and 3,534 oz. of silver.

AINSWORTH.

Krao.—A small amount of work was done on this property under the direction of Joe Gallo. A total of 12 tons of ore shipped to Trail yielded 543 oz. of silver and 1,958 lb. of lead.

COFFEE CREEK.

Crescent and Eden.—A total of 292 tons of ore, all mined in 1938, was shipped to and treated in the customs mill at Granite Siding. The concentrates were shipped to Trail.

Olsen Group. This property, 9 miles up Coffee Creek from the Nelson–Kaslo Highway, is owned by Alex. Grabt, of Ainsworth, and is held under lease and bond by W. Rozan and associates. Three men, using hand-steel, were employed for four months. In addition to reconditioning the old workings, 7 miles of the main trail was rebuilt and 2 miles of new trail constructed. A total of 9 tons of ore mined and shipped to Trail yielded 1 oz. of gold, 878 oz. of silver, and 1,897 lb. of lead.

NELSON AREA.

SALMO.

Iron Mountain, Ltd. Company office, 6 Royal Bank Building, Nelson, B.C. Stewart M. Marshall, President. This company operates the *Emerald,* on the south side of Sheep Creek, 8 miles from Salmo and 4 miles from the Sheep Creek Road. Three men, all of whom worked underground, were employed throughout the year. Hand-steel only was used. Development included 71 feet of drifting and 274 feet of crosscutting. No ore was shipped.

CRANBROOK AREA.

Consolidated Mining and Smelting Co. of Canada, Ltd. Company office, 215 St. James Street, Montreal, Quebec; mine office, Trail, B.C. Sir Edward Beatty, Chairman; S. G. Blaylock, President and Managing Director; J. E. Riley, Secretary. Sullivan mine office, Kimberley, B.C. William Lindsay, General Superintendent. Capital: [illegible]

CORRIGENDUM.

Page A 96, line 7 of last paragraph: For "The total output amounted to 2,091,064 tons, thus exceeding the tonnage milled by 2,829," read "The total output amounted to 2,097,124 tons, thus exceeding the tonnage milled by 6,060."

In some parts of the mine, difficult back conditions led to the experimental substitution of sub-level mining with slashing, sub-level drift-mining and shrinkage stoping for the open stope-and-pillar method of extraction heretofore in general use, this having been carried out with a considerable measure of success. A start on pillar recovery was made in the X-9 block. The filling of worked-out stopes continued, a total of 304,545 cubic yards, equivalent to 1,095,000 tons of ore in the solid, having been placed in the course of the year. Of this, 212,000 cubic yards was obtained from the surface, the stowing material being dropped in the mine through raises. These operations necessitated the construction of twelve concrete and seven timber bulk-heads.

The maximum number of persons on the pay-roll in the course of the year was 1,192, of whom 540 were employed underground, 303 in various capacities around the mine, and 257 at the mill.

St. Eugene Mining Corporation, Ltd. Company office, 25 King Street West, Toronto, Ont. W. S. Morlock, President; W. B. Malone, Secretary-Treasurer. Capital: 3,000,000 shares, $1 par; issued, 1,450,005. The company acquired the holdings of the St. Eugene Extension Gold Mines, Limited, at Moyie. A geological investigation of the company's holdings was made in the course of the summer and some of the prospect adits on the west side of Moyie Lake were reopened to permit an underground examination.

Ehlinger Group. This group of sixteen claims, 7 miles east of Wasa, on the Canadian Pacific Railway, is reached by a truck-road. The claims lie between 3,800 and 6,000 feet elevation. They are held by location by John J. Ehlinger, of Spokane, Wash.

Up to 1939 the following work has been done: On the *Golden Fleece* claim, two adits, 64 and 80 feet. On the *Stanley* claim, several small workings and open-cuts. On the *Tiger* claim, an adit 206 feet long, a short adit, and several open-cuts. On the *Wanda B.* claim, a vertical shaft 76 feet deep and an adit 213 feet long towards the bottom of the shaft. On the *Larchwood* claim, three adits totalling 370 feet. On the *Emily* claim, a drift 163 feet long.

A report on this property may be obtained from the Department of Mines, Victoria, B.C.; cost, 25 cents.

GOLDEN AREA.

Base Metals Mining Corporation, Ltd. Company office, 350 Bay Street, Toronto, Ont.; mine office, Field, B.C. J. H. C. Waite, President; G. C. Ames, Secretary-Treasurer; John D. Galloway, Mine Manager. Capital: 3,000,000 shares, no par value; issued, 2,330,714. The company operates the *Monarch* mine, on Mount Stephen, 3 miles east of Field. The property is equipped with a 300-ton concentrator. Operations were resumed at this property late in December, 1939, after having been suspended entirely for nearly a year, following a period during which they had been limited to development-work in the part of the mine known as the East Monarch. Some difficulties had to be surmounted before the plant could be brought back to full working order, but rapid progress was made and the mill was soon operated on a basis of 300 tons per day. A total of ninety men is employed, forty-four of them underground.

[Reference: Annual Reports, 1935, Part E, and 1938, Part E.]

COPPER DEPOSITS.

PORTLAND CANAL AREA.

ANYOX.

Consolidated Mining and Smelting Co. of Canada, Ltd.—D. Matheson, Superintendent. After doing a considerable amount of drifting and diamond-drilling adjacent to the old *Hidden Creek* mine, the company has apparently abandoned the property. All plant and equipment has been sold.

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. Julian 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 company owns and operates the *Copper Mountain* mine, 12 miles south of Princeton, longitude 120° 30′, latitude 49° 28′. The property is equipped with complete mining, flotation, and power plants. The coarse crushing plant is at the portal of No. 6 main haulage-adit, elevation 3,200 feet. The fine grinding and flotation plant with a capacity of 4,000 tons per day is situated at Allenby, 8 miles distant. The ore is conveyed in standard-gauge railway-cars from the coarse crushing plant to the concentrator. Machine-shops and a new electric foundry are also at Allenby. The power plant is situated near Princeton, 3 miles from Allenby. It is a steam-electric generating plant with a total capacity of 7,500 k.w. The coal mine is at Bromley Vale. The power is distributed to the mine, concentrator and shops, and the coal mine. Improvements were made to the concentrator and camp at Allenby.

Exploration and development included 13,183 feet of drifting and crosscutting, 12,980 feet of raising, and 19,906 feet of diamond-drilling. A total of 1,450,352 tons of ore was treated at the concentrator. Eight hundred and nineteen men were employed as follows: 428 at the mine, Copper Mountain; 170 at the concentrator and shops, Allenby; 36 at the power plant, Princeton; 110 at the coal mine, Bromley Vale; 75 in other departments.

VANCOUVER AREA.

HOWE SOUND.

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. Charleton, Secretary-Treasurer; C. P. Browning, General Manager. Capital: 100,000 shares, $25 par; issued, 91,966; all owned by Howe Sound Co. The company operates the *Britannia* mine at Britannia Beach, on Howe Sound. The property is fully equipped with mining and milling plant having a daily capacity of 6,500 to 7,000 tons.

Development-work totalled 32,203 feet, or 6.1 miles, made up as follows: Drifting, 10,282 feet; crosscuts, 4,634 feet; raises and winzes, 12,604 feet; powder blast workings, 4,460 feet; No. 6 shaft raise, 73 feet; and No. 2 Victoria shaft, 150 feet. A total of 12,665 feet of diamond-drilling was done.

A new raise system was driven between the 4,100 level and the 2,700 level to handle the ore to the new primary crusher installed above the 4,100 level, and control chutes built at the crusher on the 3,900 level, at the 3,800 level, the 3,500 level, and the 3,100 level. Most of the ore is now handled through this raise, and after passing through

CORRIGENDUM.

Page A 98, line 1 of last paragraph: For "112,784 tons" read "2,112,784 tons."

COPPER-SILVER DEPOSITS.

TELKWA.

Conwest Exploration Co., Ltd. Company office, 86 Richmond Street, Toronto, Ont.; B.C. office, 5141 Royal Bank Building, Vancouver, B.C. F. M. Connell, President; Alan Cockeram, Secretary-Treasurer; Gordon F. MacDonnell, in charge of B.C. operations. Capital: 2,000,000 shares, no par value; issued, 1,250,007 shares. This company took an option on the *Hunter* group in Hunter Basin, longitude 127° 10′, latitude 54° 30′, late in the year and contracted for 100 feet of tunnelling. The property is reached by road from Telkwa for 8½ miles, thence sleigh-road for 4 miles, thence trail for 4½ miles to the camp at 4,900 feet elevation.

D. and N. Group (Last Chance). This group of two adjoining claims is owned by K. Nysven, J. G. Donaldson, and J. Oakes, of Telkwa. It is at about 4,400 feet elevation, on the north-western slope of Grouse Mountain, longitude 126° 43′, latitude 54° 38′, about 9 miles by road from Quick station on the Canadian National Railways. It is reached by motor-road from Quick for 4½ miles to Wakefield's ranch; thence 4½ miles by winter-road to the new camp at 4,515 feet of elevation. A vein has been explored by a 51-foot adit and several open-cuts. Further work was done at the southerly end of the previous workings.

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

ANTIMONY DEPOSITS.

St. James Antimony Co. This company owns an antimony property on the south shore of Stuart Lake, at a point 12 miles west of Fort St. James. The workings (as of June 12th, 1939) are on the *Snowbird* mineral claim. As of June 12th, 1939, the workings consisted of (1) an open-cut and an incline shaft that extends for 20 feet on a 20-degree slope, both lying 80 feet south-westward of the main stibnite body, (2) two open-cuts and an incline shaft driven for 28 feet on a 45-degree slope on the main stibnite lens, (3) a stripping 185 feet in length that extends north-westerly and south-easterly from (2). Considerable work is reported to have been done since June, 1939. Fifty tons of ore was shipped to the sampling plant (*see* page 56).

Silver Bell Mine. This antimony property, owned by R. H. Davis, Royston, and associates, is situated on the north-west arm of Horne Lake. A good road connects the main Island Highway at a point north from Qualicum Beach to the terminus at the lake, where a boat connection is made for the remaining 6 miles up the lake to the property. Operations were begun in March, 1939, and carried on fairly steadily until November 15th, when work was suspended. During the above period an adit was driven for a distance of 100 feet.

MERCURY DEPOSITS.

FORT ST. JAMES AREA.

PINCHI LAKE.

Consolidated Mining and Smelting Co. of Canada, Ltd. E. Bronlund, Superintendent. The company owns the cinnabar property on the north side of Pinchi Lake, north of Fort St. James. Considerable prospecting was done on the property during 1939. It comprised 232 feet of drifting, 319 feet of crosscutting, 26,395 feet of trenching, and 3,289 feet of diamond-drilling. The average number of men employed during the year was 11.

[Reference: Department of Mines, Bulletin No. 5, 1940.]

BRIDGE RIVER AREA.

Empire Mercury Mines, Ltd. Company office, 2050 Eighteenth Street West, Vancouver, B.C.; mine office, Minto, B.C. C. P. Riel, President; S. W. Taylor, Secretary-Treasurer. Capital: 3,000,000 shares, 50 cents par. The company owns the *Manitou* mine, on Mud Creek, near Minto. A small production was recorded in 1939, but the property was inactive most of the year. A watchman lives at the mine.

[Reference: Bulletin No. 5, 1940.]

Golden Eagle Group. This group, owned by A. Young and associates, of Lillooet, is located on the Yalakom River, 24 miles by road, and 4 miles by trail from the town of Lillooet. The property was leased to Tacoma interests late in 1939, and preparations were being made to install a small plant. Work was confined to trail-construction and surface-stripping.

[Reference: Bulletin No. 5, 1940.]

Red Eagle Group. This property is located directly across the Yalakom River from the *Golden Eagle* group and is owned by J. Thompson and associates, of Vancouver. In addition to surface-stripping, an exploratory adit was driven 24 feet in 1939.

[Reference: Bulletin No. 5, 1940.]

MOLYBDENUM DEPOSITS.

Anticlimax. This property, 17½ miles north-west of Littlefort (Mount Olie), is owned by C. A. Reid and associates, of Littlefort. Considerable open-cutting and stripping was done by D. S. Tait and associates, of Victoria. The option was dropped early in 1939, and work on the property stopped.

[Reference: Department of Mines, Bulletin No. 9, 1940.]

Little Keen.—This property on Sheep Creek, 8 miles from Salmo, is owned by Jack Sapples, of Salmo. H. L. Batten and associates, of Vancouver, optioned the property, did considerable surface work and then dropped the option.

[Reference: Department of Mines, Bulletin No. 9, 1940.]

H.L.M. This property on Silver Creek, east side of Harrison Lake, is owned by Mrs. Minnie Peterson, of Louis Creek. Considerable surface work and exploratory prospecting was done in 1938 by H. L. Batten and associates before dropping their option in the early part of 1939.

[Reference: Department of Mines, Bulletin No. 9, 1940.]

Stella.—This property is 7 miles south of Endako and is owned by A. Langley, C. H. Foote, and associates, of Endako. They are reported to have made a number of open-cuts during 1939.

[Reference: Department of Mines, Bulletin No. 9, 1940.]

PYRITE DEPOSITS.

ECSTALL RIVER.

Northern Pyrites, Ltd. Company office, 744 Hastings Street West, Vancouver, B.C.; mine office, Port Essington, B.C. R. H. Stewart, President; Sherwood Lett, Secretary-Treasurer; E. E. Mason, Mine Manager. Capital: 1,100,000 shares, 50 cents par; issued, 1,050,716. The property is on the east side of Ecstall River, about 45 miles from Port Essington, and is reached by small river-boat from that point. The main crosscut adit which was started in 1938 is now in 2,008 feet, of which 1,876 feet was driven this year. In addition, three crosscuts, totalling 239 feet, were driven from the main adit. Operations were suspended for the winter on November 8th. An average of nineteen men was employed.

TUNGSTEN DEPOSITS.

WELLS.

Columbia Tungstens Co., Ltd. Company office, 61 Broadway, New York, N.Y. Fl. Hewitt, President; A. E. Pike, Mine Superintendent. The company owns and operates the *Hardscrabble* mine on Hardscrabble Creek, 5 miles north of Wells. The property is equipped with a 50-ton pilot mill. Small-scale operations were carried on in 1939. During the first three months a crew of four men was employed in completing the power plant installation, keeping the mine dewatered, and salvaging and reconditioning equipment from the fire of the previous summer. During the next three months the pilot mill was under construction and a hoist and hoisting equipment were installed.

Underground development was resumed in June on a single-shift basis and the mill was started about the end of July. It was fed largely from two small stopes, until it was closed with the advent of cold weather in the late autumn. About 4½ tons of scheelite concentrate was shipped. Only shaft sinking was in progress at the end of the year. Mine-development consisted of 112 feet of drifting, 47 feet of crosscutting, 60 feet of raising, and 18 feet of shaft sinking. Maximum employment of twenty men was reached in July during mill-construction. The average for the year was ten men.

PLACER-GOLD DEPOSITS.

ATLIN AREA.

SPRUCE CREEK.*

Dream Lease. John W. Noland is the owner and operator. No. 1 shaft is the farthest up-stream and the deepest shaft on Spruce Creek. The shaft is 208 feet deep and two drifts have been carried up-stream approximately 900 feet from it. Crosscuts are driven between the drifts and out to the rim on both sides to determine rim location and values.

Spruce Creek Mining Co., Ltd. Company office, 615 Credit Foncier Building, 850 Hastings Street West, Vancouver, B.C. J. G. Wheeling, Manager. Capital: 50,000 shares, $1 par. Workings from No. 1 shaft are being operated on a "lay" by John Clee and partners. Four men are working single shift, drifting up-stream just clear of the old workings. Tailings from No. 2 and No. 4 shafts were resluiced during the summer. Workings from No. 4 shaft are operated by the company. This shaft is adjacent to shafts on the adjoining *Clydesdale* and *Wolf* leases, but they are not connected. There has been considerable difficulty with excess water in the three shafts. The No. 4 shaft of the Spruce Creek Mining Company was idle from June until November, and the *Clydesdale* and *Wolf* shafts were idle the rest of the year. It was a season of abnormal high water in the creek and the excess water underground is due to seepage, when the creek is high, through caving-in of old workings. Workings from No. 4 shaft were being worked on November 21st with four places working double shift. Twenty-two men were employed.

Croker Lease. Fred Ohman and partners, lay-men. The lay-men are driving a drainage working from the upper end of the *Poker* lease through to the *Croker* lease workings, approximately 700 feet distant. This drain is now up about 450 feet. In the meantime, the Brown workings have been permitted to fill with water until the working is completed. They will then be unwatered and the connection made. Five men are employed, working two shifts.

Friendship Lease. Wright and Brown, lay-men. This property is also idle owing to excess water. Considerable time and money was spent fluming the creek, but apparently the flume was not carried far enough up-stream

* Reference: Annual Report, 1936, Part B.

to be effective. Through this stretch, including the claims operated by Nelson and Johnson, there is less than 50 feet of cover, mainly loose gravel and the creek water percolates freely through it. These are the only places in the district where breast-boards are required in driving.

Rose Claims. Nelson and Johnson, lay-men. There are two shafts on this property. The upper shaft was sunk first to a depth of 47 feet. After considerable difficulty with water, a drain connection was made from down-stream and the creek was also flumed by extending the flume of Wright and Brown, operating the *Friendship* lease immediately up-stream. The fluming and the *Friendship* workings have taken most of the water so that they are now in good shape.

When Columbia Development Company, operating a steam-shovel on the *Olalla* lease down-stream, reached the *Olalla* and *Rose* lease-line, Nelson and Johnson sank another shaft, 43 feet deep, close to the boundary-line and made connection through to their upper shaft. They are now working out the area around the lower shaft and down to the lease-line. Eighteen men were employed.

Columbia Development Co., Ltd. James Eastman, Manager. The company is working on the *Olalla* lease. This is a steam-shovel operation, the only surface operation on the creek. One cut has been worked up to the boundary lease-line and a second cut is now being advanced along the north bank of the creek. It was necessary to flume the creek and connect with Nelson and Johnson's flume to keep the creek water out of the shovel pit. Thirty-two men were employed. Some drilling was done on the *Baldwin* lease farther down-stream.

Joker and Poker Leases. I. Matthews, owner. These are bench leases on the south bank and adjoining the *Olalla* and *Rose* leases. Two groups of lay-men—Ivanic and partners, and Troha and partners—are operating on these leases, drifting up-stream. There is a bed-rock drain through these leases so that they are free of water.

Keno and Star Leases.—Gus Holgren, lay-man. This is a bench lease on the south bank, next below the *Poker*. Holgren is working alone, drifting up-stream, trying to reach some pillars left from an earlier operation.

Peterborough Lease.—Otto Miller and sons, owners. The owners are working around old workings made in the early days.

Hardscrabble Lease.—Buntzen and Bachlund, lay-men. This is a bench lease on the south bank. The lay-men are drifting up-stream and also into the bench.

Elk Lease. This is a bench lease on the north bank of Spruce Creek. J. Hoking, lay-man, is working alone, drifting up-stream at the upper end of the lease. In the lower part Crowe and partner, lay-men, are drifting up-stream along old workings. These old workings are standing in remarkable shape considering that they have been idle for over twenty years. Very few timbers are down, and in some instances arched roadways without timber are standing just as they were when driven.

Key Lease. This creek lease is owned by C. McKinnon, who is working alone, drifting up-stream. In the lower section of the lease Brandes and Howes, lay-men, have started an open-cut to reach the bank before starting to drift into the bench.

Erickson Lease.—John Walton, lay-man, is working alone, drifting into the south bench. He has not yet located bed-rock.

Jewel Lease.—John Lox and partners, lay-men. Two men are drifting up-stream and into the bench on the south side.

St. Quentin Lease.—D. Falconer, owner, is working, drifting into the bench on the south side.

Sullivan Gold Mines, Ltd. Company office, 510 Hastings Street West, Vancouver, B.C. Laura L. McGhee, Secretary; J. Jebne, Manager. Capital: 500 shares, $100 par; 1,500 shares, no par value. The company, originating in San Francisco, has taken an option on eighteen leases in the Blue Canyon section on Spruce Creek. Some Keystone-drilling was done during the season.

PINE CREEK.*

Blackburn Lease. Acheson and sons, owners and operators. This is a hydraulic operation. The depth from surface to bed-rock of about 32 feet consists of about 10 feet of surface gravel, 15 feet of glacial clay, and 7 feet of pay-gravel on bed-rock. Bed-rock is about 7 feet below drainage-level. The method of operating is to hydraulic off the surface gravels and glacial clay down to the pay-gravel. When a sufficient amount of pay-gravel is uncovered, an hydraulic elevator is used to lift the bed-rock gravels to sluicing-level. The glacial clay is extremely tough and wearing it out with water is a slow process. Bank-blasting, using 3-inch drill-holes, is proving satisfactory in breaking up the clay.

Bessborough Lease.—Gus Boquist, lay-man. This is an underground operation employing three men drifting in the bench and up-stream.

Buster Lease.—E. Woodean, owner, is sinking a small shaft.

Williams Lease.—A. Smith, lay-man. This is an hydraulic operation employing four men and using one monitor in the creek-bed.

Evening Star, Bur-Min, Stephen Dyke, and Lucky Leases.—Two men are engaged on "lay" on each of these leases. They are all surface operations shovelling into sluice-boxes.

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

BIRCH CREEK.

Four groups of two men each are engaged in ground-sluicing on this creek.

RUBY CREEK.

Surprise Lake Mining Co., Ltd.—P. Matson and partners, lay-men. Five men, all partners, are engaged in this hydraulic operation.

WRIGHT CREEK.

Arctic Lease. Hodges and Moran, lay-men. This is an hydraulic operation employing five men. Very little water is available, there being only sufficient for four runs of one-half hour each, daily. Six other men are engaged on three separate leases ground-sluicing farther up-stream.

O'DONNEL RIVER.

Ethel M. Lease. Owned by N. Murphy and son. Four men are engaged on this property, which is an underground drifting operation in the bench. There has been considerable prospecting on this creek by various individuals, but none, so far, have struck any definite pay-streak.

OTTER CREEK.

Compagnie Francaise des Mines d'Or du Canada. Capital: 85,000 shares, 100 francs par. Walter Sweet, Manager; Sweet and Partners, Lay-men. This underground operation operated by lay-men employs eight men drifting up-stream. An option on this property has been taken by Walter Johnson & Company, San Francisco. The company has done a considerable amount of prospecting and sampling and at present is engaged in sinking a prospect-shaft about 1 mile up-stream from the present workings in order to do some further prospecting underground in that area. A layer of sand or silt, encountered at 103 feet in depth, was causing considerable difficulty. A drill was being set up in order to determine the thickness of sand before deciding on the method to be used in getting through it. The engineer in charge is Mr. Dorflinger.

MCKEE CREEK.

Hydraulic operations have been abandoned on this creek owing to deep overburden and lack of water. Three underground operations have been started by laymen. George Watts and four partners were engaged in cleaning up and sluicing tailings from the old hydraulic operations.

Boulder Creek.

Consolidated Mining and Smelting Co. of Canada, Ltd.—McLeod White, Manager. The company is operating an hydraulic mine, employing sixteen men working three shifts.

Fourth of July Creek.

Three groups of men are engaged prospecting underground in the benches on this creek.

Squaw Creek.

About twenty men were engaged in prospecting and ground-sluicing on this creek and approximately 150 oz. of gold was produced.

TURNAGAIN RIVER AREA.

Wheaton (Boulder) Creek.*

This creek is about 9 miles in length and runs into the Turnagain River from the south. The creek is about 45 miles east of the south end of Dease Lake, and the junction with the Turnagain is at approximately longitude 129°, latitude 58° 30′.

Boulder Creek Mines, Ltd. S. C. Barrington, Manager; Joe Walsh, Superintendent. Capital: 50,000 shares, no par value. The company owns the *Peacock*, *Amanda*, and *Philippon* leases. The operation on the *Peacock* uses a drag-line shovel with a ⅞-yard bucket on a 47-foot boom. Fifteen men were employed. Boulders on the surface were blasted and handled by bulldozer and those in the pit were hoisted out by the drag-line shovel. The depth to bed-rock, in what appears to be the trough, is about 25 feet. The gravel and clay are hoisted above creek-level to a raised flume which can be moved in any direction to suit dumping requirements.

[* Reference: Bulletin No. 2, 1940.]

Johnson, Ryan, and Elvira Leases. These creek leases are owned by J. Wheaton, of Telegraph Creek. Three lay-men, employing one other man, were working a ground-sluice cut in the creek-bottom on the *Elvira* lease. In the autumn two other lay-men were working on the east side of the creek on the *Elvira* lease and two on the *Ryan* lease.

[Reference: Bulletin No. 2, 1940.]

Roosevelt Lease. This creek lease, immediately up-stream from the *Peacock* lease, is owned by F. Bobner, of Juneau, Alaska. Bobner and his partner were attempting to reach bed-rock in a ground-sluice cut. The cut was abandoned and a 26-foot shaft was sunk in the creek-bottom without reaching bed-rock.

[Reference: Bulletin No. 2, 1940.]

Alice Shea Creek.

Sluice Box, Rainbow, Nugget, and Sunset Leases.—The four creek leases on Alice Shea Creek, a tributary of Wheaton, are owned by V. Shea, of Telegraph Creek. Shea employed three men during the summer and cleaned up about 300 feet along the creek on the *Nugget* lease.

[Reference: Bulletin No. 2, 1940.]

MANSON CREEK AREA.*

Lost Creek.

Dunsmore Gold Mines, Ltd.—Company office, 209 Northern Investment Building, Toronto, Ont.; B.C. office, 601 Bank of Toronto Building, Victoria, B.C. Capital: 350 shares, $100 par. This is the only underground operation in the area. Operations were suspended in the early summer and have not been resumed.

Lost Creek Placer Gold, Ltd. Company office, 736 Granville Street, Vancouver, B.C. Bert McDonald, Manager. Capital: 100,000 shares, $1 par. This company has been engaged all summer building a ditch and flume approximately 6 miles in length to bring 40 second-feet of water from Manson Creek. Twenty-

* Reference: Annual Report, 1936, Part C.

two men were employed and they anticipated getting water through before the end of the season.

Several groups of men were engaged "sniping" along the banks of Manson Creek.

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

GERMANSEN CREEK.

Venture Exploration Co. (East Africa), Ltd. Company office, Stanley House, Hardinge Street, Nairobi, Kenya Colony; B.C. office, Prince Rupert, B.C. A. A. Lawrie, Secretary; W. H. Eassie, Manager. Capital: 3,000 shares, no par value. This property was in full operation, running three pits, two of which are hydraulic and the third operated by drag-line shovel. Approximately 1,000,000 cubic yards of gravel was moved. Sixty men were employed.

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

Germansen Mines, Ltd. Company office, 789 Pender Street West, Vancouver, B.C. R. C. McCorkell, President; M. A. Manson, Secretary; A. A. McCorkell, Manager. Capital: 750,000 shares, 50 cents par. This company has been engaged in building a new ditch from the South Germansen River to the workings on Germansen Creek. No mining was done. Forty-five men were engaged in ditch and flume construction.

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

TOM CREEK.

Tom Creek Placers, Ltd.—Company office, 510 Hastings Street West, Vancouver, B.C. T. A. Kelley, President; Laura L. McGhee, Secretary; J. J. Warren, Manager. Capital: 250 shares, $100 par. This is a steam-shovel operation which worked two shifts for most of the season. Fourteen men were employed.

CARIBOO AREA.

BARKERVILLE-WELLS.

Lowhee Mining Co., Ltd. Company office, Rust Building, Tacoma, Wash.; mine office, Barkerville, B.C. C. W. Lea, President and General Manager; Paul Barker, Secretary-Treasurer; Henry Lea, Superintendent. Capital: 750,000 shares, $1 par; issued, 635,156. The company operates an hydraulic mine on Lowhee Creek, near Barkerville. An ample supply of water enabled these operators to put approximately 150,000 cubic yards of gravel through the sluice-boxes during 1939.

Barkerville Gold Mines, Ltd. Company office, Royal Trust Building, Vancouver, B.C. J. A. Wright, Secretary; C. A. McPherson, Superintendent. Capital: 200,000 shares, $1 par. The company operates the *Waverly Placers* on Grouse Creek, about 4 miles south of Barkerville. About four men and a No. 6 monitor are employed in cleaning up old workings. The monitor was operating under a head of about 100 feet.

French Creek Placers.—During 1939 a small crew of men in charge of G. Stevenson were attempting to locate the old French Creek channel by hydraulicking through the rim. Operations were terminated early in the season.

Guyet Placers. These placers, which are operated by Duncan McIntyre, of Barkerville, are located on the east side of Mount Guyet, about 6 miles southerly from Barkerville. In July, five men were employed and a 5-inch nozzle was operating under a head of 175 feet.

Alert Placers.—A. F. Curtis, Manager. This property is situated across Williams Creek from the town of Barkerville. Two men were doing development-work.

Lowhee Mining Co., Ltd. This company, with H. Lea as superintendent, was operating the *Red Gulch Placers* about 1 mile north-west of Wells, B.C. Shortly after July 12th the property was leased to J. J. Gunn, who operated on a small scale for the remainder of the season. The Lowhee Company employed an average of nine men on three shifts between two pits, and piped approximately 50,000 cubic yards of gravel through the sluice-boxes during the period of their operation.

Triple Hydraulic Placers.—This operation is located on Cooper Creek, a tributary of Sugar Creek, about 10 miles north-east of Wells. Three men, using a No. 2 monitor under a 100-foot head, were employed to do development-work on this property.

ANTLER CREEK.

Antler Gold Mines, Ltd.—This company conducted drilling operations during 1939 on ground leased on lower Antler Creek.

WELLS-STANLEY.

Ketch, Ltd. The company and R. MacDougall worked the *Ketch Placers* alongside the Quesnel–Barkerville Road, about 5 miles west of Wells. Using a No. 4 and a No. 5 monitor, with a No. 1 for clean-up, a crew of men, ranging from fifteen at high water to six at low water, were employed at this operation. A new pit was opened in the autumn and new No. 4 pipe-line and sluice-flume installed to operate it. The pipe-line is designed to utilize to best advantage the water available in the spring. Both pits will be operated and the water alternated from one to the other as required. The banks of the old pit are decreasing in height and those of the new pit are still low. A 10-oz. nugget was found in the old pit in 1939.

Dragon Creek Placers. This property, owned and managed by R. MacDougall, is located on Dragon Creek, about 5 miles northerly from the *Ketch Placers*. At the time of inspection, D. O. Smith was in charge of a four-man crew and was using a No. 2 monitor, but intended to change to a No. 4. A new pit has since been opened up-stream, but the lack of dump space for the tailings is proving troublesome.

Sangdang Placers. Owned and operated by Wm. Hong, of Barkerville. This property is located on Slough Creek benches, about a mile north of the *Ketch Placers*. As the benches were worked back from the creek this year, the banks were reduced from 80 to 30 feet in height and the head of water from an average of 150 feet to an average of 125 feet. A crew of fifteen men on three shifts was employed throughout the season, and a No. 5, No. 2, and a No. 1 clean-up monitor were used. About 8 acres of gravels and overburden averaging 60 feet in thickness were removed, considerable dead-work being done on the overburden. About 1,600 hours water instead of the usual 800 were available.

Montgomery Creek Placers. Owned and operated by Wm. Hong and located about 1 mile south of the *Dragon Creek Placers*. The pit here is in the development stage, and is being opened up by two men, using a No. 1 monitor. The banks are now about 65 feet high. A No. 2 pipe-line, dropping 100 feet in a distance of 1,400 feet, with a 30-inch intake and a 9-inch outlet, was installed. Five hundred feet of sluice-flume was also built.

Last Chance Placers.—Owned and operated by Wm. Hong and associates. This operation, located near Stanley, was finished in July, but further prospecting may be carried out on the benches.

Coulter Creek Placers.—Owned by Julius Powell and John Roth. This property is located about 2 miles west of the *Sangdang Placers*. Operating a small hydraulic plant with a crew of three men, about 20,000 yards were put through the sluice-boxes.

STANLEY-WINGDAM.

Donovan Creek Placers.—This operation is on the south side of the Wells–Quesnel Highway, about midway between Stanley and Wingdam. Magnus Sundberg, the owner and operator, was cleaning up preparatory to turning the property over to other interests. The deal later fell through.

Langford Placer Mines, Ltd. Company office, Saunders Avenue, Wells, B.C. H. B. King, Secretary; K. K. Langford, Manager. Capital: 100,000 shares, $1 par. The company is working the *Langford Placers*, a mechanical placer operation, located 7 miles north of the highway at Beaver Pass. After several seasons of extensive testing with a 6-inch aeroplane-drill, the best site to start operations was selected and production started late in 1939. The present plant con-

sists of a 50-horse-power caterpillar bulldozer, with an 8-foot blade, to move bench-gravels to a grizzly and into the sluice-boxes, which are lined with 60-lb. rails in 3-foot sections; a paramount centrifugal pump, operated by a 68-horse-power Deutz-Diesel, and capable of delivering 4,000 gallons per minute to the sluice-boxes from Tregillus Creek, against a head of 10 feet; and a 68-horse-power caterpillar Diesel, operating a drag-line scraper, to remove the tailings from the sluice-flume. The operating crew consists of foreman, three operators, sluice-tender, and blacksmith.

Fry's Placer. Held on a twenty-year placer lease by F. A. Oldfield and Thomas Fry, and operated by the latter, this hydraulic operation is located on Larsen Gulch, opening on Rucheon Creek, and is about 4 miles west of the *C.B.A. Placers.* Using a No. 2 monitor working under a 150-foot head, Mr. Fry was in charge of a crew of four men. This property is still in the development stage. A slide was slowly creeping into the pit from low banks on the south and east sides. Banks up to 80 feet high on the north side of the pit stood up well. The work to date has been in the upper gravels.

Operation of E. M. Falck.—Located on Kee Khan Creek, Beaver Pass Valley. This is an hydraulic and open-sluice operation, and water is obtained by means of a boomer-dam. About 4,200 yards of dirt was moved in 1939.

Hyde Creek Placers.—This is a small hydraulic operation near Beaver Pass Valley, operated by Dr. O. R. Hougen, of Mission City, B.C. It is still in the development stage and it is reported that 40,000 yards were moved in 1939. It was not inspected.

Wormald Placers. Company office, 718 Granville Street, Vancouver, B.C. A. M. Stamatis, President; Wilma M. Berry, Secretary. Capital: 100,000 shares, $1 par. The company operates a small hydraulic mine on Wormwold Creek. It is reported that 3,000 yards of gravels were moved by hydraulicking.

Consolidated Gold Alluvials of B.C., Ltd. Company office, Stock Exchange Building, Vancouver, B.C.; mine office, Wingdam, B.C. J. E. Thompson, President; R. B. W. Pirie, Secretary-Treasurer; E. E. Mason, General Superintendent. Capital: 5,000,000 shares, $1 par; issued, 3,753,728. The *Sanderson* mine at Wingdam, property of this company, was closed on April 29th and the workings allowed to fill with water. The abandonment of the mine was brought about by the failure by exploratory headings, to the north, to find pay-gravels before an additional ventilation raise to the surface had to be driven. During the period of operation, 52,435 yards of gravel, chiefly from scavenging operations on the outskirts of the earlier workings, were mined and treated. From this yardage 1,931 oz. of gold was recovered, the average value per yard being about $3.60. Scavenging operations and exploratory headings together accounted for a little over a mile of workings. Since the property closed, employees of the company have been allowed to carry on "sniping" operations on the company's property, and some are doing fairly well at this work.

QUESNEL-WINGDAM.

Jamieson's Placer.—Located on Gagen Creek, about 2 miles above its confluence with Lightning Creek. H. G. Jamieson, owner and operator, carried out drag-line operations on shallow creek and bench gravels with a small crew of men.

Slades Placer. This property is operated on an annual rental basis by Slade Placers, Limited; Maury Caldwell, Superintendent. With an average employment of six men and using a No. 4 and a No. 3 monitor about 75,000 yards were put through the sluice-boxes. A new pit was opened up. The banks were about 70 feet high, and the pressure-head 200 feet in the pits.

QUESNEL-PRINCE GEORGE.

Cariboo Cottonwood Placers. Company office, 470 Granville Street, Vancouver, B.C. J. W. Phillips, Manager. Capital: 250,000 shares, $1 par. This property is located about 7 miles up the Cottonwood River from the Prince George–Quesnel Highway at Cinema, 20 miles north of Quesnel. Since development-work started this year, 3 miles of ditch, 2½ feet deep and 11 feet wide at the bottom, and 2¾ miles of flume, 3 feet deep and 6 feet wide, have been completed. A bulldozer

moved some 120,000 yards of dirt in making grade for the ditch and flume. Two sawmills were erected and cut about half a million feet of lumber for the flume. Many miles of road were built to give transportation to and from the camps, mills, and flume. These roads are now impassable in many places and require gravelling. A shovel was recently rented from the *Bullion Placers* to finish the ditch as the mud proved too difficult for the bulldozers. During the latter part of October, November, and December, fifty-six men were on the pay-roll, but this number was reduced to thirty at the end of the year. Comfortable camps were established for the men.

Property of Jones, Burt, and Ayton.—At this property, located on the Cottonwood River, 7 miles below Cottonwood House, test-pits were sunk in shallow gravels by means of small "caissons."

Hixon Quesnelle Placers, Ltd. Company office, 470 Granville Street, Vancouver, B.C. F. K. Frost, Secretary. Capital: 50,000 shares, $1 par. The company owns and operates two placer leases on Hixon Creek, about 40 miles north of Quesnel. Brian Briscoe controls the stock and is in charge of operations. This year these operations merely consisted of hydraulicking upper gravels in an attempt to expose the pay-gravels. A new pit was opened where the pay-gravels were thought to be at shallow depth, but the lack of dump space makes the operations difficult. This could probably be overcome by breaking into the channel below the falls on Hixon Creek. Five men on one shift and a No. 4 monitor under a head of about 100 feet were employed.

Canamco Mining Co. Company office, 789 Pender Street West, Vancouver, B.C. H. D. Young, Secretary; E. B. Skeels, Manager. Capital: 100,000 shares, $1 par. The equipment of this company, consisting of a drag-line bucket and Ainlay bowl plant on a small dredge, was all moved to leases on the east bank of the Fraser River at Woodpecker. Some 78,000 yards are reported moved, but latterly operations have been confined to testing the ground by drilling. An average of seven men were employed.

QUESNEL-WILLIAMS LAKE.

Operation of A. P. Himmelman. A. P. Himmelman has a drag-line plant in operation on a large bench 15 feet above river-level on the left bank of the Fraser River, immediately up-stream from the Alexandria Ferry. At this point the depth of pay-gravel is about 11 feet and there are few boulders. The digging unit is a gasoline-operated boom drag-line, with bucket of ½ cubic yard capacity The recovery unit is mounted on skids and comprises a receiving hopper, a grizzly system, screening to ⅜ inch, and sloping tables covered with Brussels carpet overlain by expanded metal screen. This unit has several new features for the recovery of gold from river-benches in the Cariboo district. Wash-water is pumped from the river by a centrifugal pump of 800 gallons per minute capacity operated by a Fordson Diesel-engine. The capacity of the plant is stated to be 400 cubic yards per shift of eight hours, and a total of four men per shift are required for its operation.

QUESNEL RIVER.

Operations of H. Craig, Munn, and E. J. Reese. The property consists of an extensive bench flanking the north bank of the Quesnel River, 75 feet above river-level, somewhat down-stream from a point opposite the mouth of Buxton Creek, where a cable-ferry across the river has been constructed. Pay-gravel, in which are some large boulders, is from 10 to 15 feet thick and immediately overlies slum. On the steep bank of the river the receiving and washing bin, screening plant, and sluice-flume is constructed, and the oversize and tailings discharge into the river. The top of the plant is level with the bottom of the pay-gravel, and gravel is pushed to the plant by a 60-horse-power caterpillar tractor with Le Tourneau bulldozer attachment. This equipment permits an economic range of operation to within about 200 feet of the receiving-bin. Within this range the capacity of the plant is about 500 cubic yards per eight-hour shift. For conveyance of gravel outside this range it is proposed to employ a Fresno scraper. The sluice-flume is riffled with 20-lb. rails laid longitudinally on

2- by 4-inch sills. Wash-water is pumped from the river by centrifugal pump with 8-inch discharge-pipe operated by a 42-horse-power Diesel engine.

LIKELY.

Priority Mines, Ltd. L. S. Ferris, Manager. This hydraulic operation is located on Morehead Creek, about 3 miles below Morehead Lake. The property is still in the development stage and hydraulicking operations are confined to the upper gravels. The water is controlled by a series of small dams, and is used for ground-sluicing and for operating a medium-sized monitor under a head of 150 feet.

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

Bullion Placers, Ltd. Company office, 917 Vancouver Block, Vancouver, B.C. R. F. Sharpe, President and Mine Manager; H. Ray, Secretary-Treasurer. The company owns and operates the *Bullion* mine on the South Fork of the Quesnel River. It is estimated that 1,135,000 yards of gravel were piped during 1939 in the Bullion and South Fork pits. An average of forty-three men was employed, largely on maintenance-work along the ditch-lines.

Perseverance Gold Mines, Ltd.—L. O. Gosling, Manager. The company is operating the *Perseverance* mine on Blackbear Mountain, above Spanish Creek. A crew of four men were engaged in driving an adit through rim-rock to intersect a placer channel.

Lease of Wm. Johnson and Nigel Campbell.—This lease is located on the Cariboo (North Fork of the Quesnel) River, about midway between Keithley and Likely. With two hired men the partners have advanced an adit 70 feet in search of an old channel on the north bank of the river.

Quesnel Mining Co., Ltd. This company, of which J. G. G. Kerry, of the firm of Kerry & Chase, Montreal, is president, and Chas. S. Buck, manager, holds twenty-one placer-mining leases, situated on the south bank of the Cariboo River (formerly named the North Fork of the Quesnel River) and extending south of the river in the region contiguous to Spanish Creek. The property includes that formerly named the *Standard Group*. The property is 8 miles from Likely. The company's camp buildings are at Spanish Creek, beside the Likely–Keithley motor-road.

A report on this property may be obtained from the Department of Mines, Victoria; cost, 25 cents.

KEITHLEY.

Placer Engineers, Ltd. Company office, 504 Randall Building, Vancouver, B.C.; mine office, Keithley Creek, B.C. George Harrison, President; George V. F. Hudson, Secretary-Treasurer; E. Lang, Superintendent. Capital: 750,000 shares, no par value; issued, 541,452. The company is operating an hydraulic mine on Keithley Creek about 4 miles from the town of Keithley. The property is worked on a three-shift basis with a crew of twelve men. During the early part of the season two monitors were employed in last year's pit. This was later abandoned and one monitor employed in advancing a new pit, known as the China pit, towards the old *Onward* workings.

Burrard Placers, Ltd. Company office, 555 Burrard Street, Vancouver, B.C. B. Boe, Manager. Capital: 2,000 shares, $1 par; issued, 2,000 shares. At Pine Creek, 5 miles east of Keithley, the company employed a maximum of ten men and it is reported that 300,000 yards were hydraulicked.

Harvey Creek Mines, Ltd. Company office, 555 Burrard Street, Vancouver, B.C. At Harvey Creek, about 5 miles north-east of Pine Creek, part of the tailings-flume was buried by slides during the winter, and little work was accomplished during the early part of the season. A crew averaging five men was employed in ground-sluicing operations in an attempt to reach pay-gravels down-stream from the old operation, 200,000 yards of dirt being handled. This property is in the development stage.

Moore's Creek Dredging Co.—The Moore's Creek Dredging Company, of Boise, Idaho, leased directly or had options on ground on Swift River, Peters Creek, Antler Creek, and Cunningham Pass. Extensive testing operations were carried out in 1939.

Horsefly.

Leases of S. Johnson and Associates.

These leases are located on Black Creek, about 1 mile above its confluence with Horsefly River and 19½ miles from the town of Horsefly. In May, the partners had built 400 feet of flume, installed a pipe-line, and were operating a No. 4 monitor under a head of 86 feet. They were experiencing some difficulty with large boulders, many of which required blasting before they could be moved. The banks were then only 80 feet high and the channel proper had not been entered. The venture was later abandoned.

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

Nelson Area.

Hall Creek Placers.

This property, situated on Hall Creek, about 2½ miles above the Nelson–Salmo Highway, reverted to the owner, T. E. Levasseur, of Nelson, at the termination in 1938 of the operations of the J.D. Mining and Prospecting Company, Limited. The equipment still remains the property of this company. Several groups of leasers operated the mine spasmodically in the summer, renting the equipment from the above company and leasing the ground from the owner. No attempt was made to recover the black sands.

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

Nelson Placers, Ltd.

Situated on Forty-nine Creek, about 8 miles from Nelson, and operated by H. W. Robertson, of Nelson. Four men were employed during the season. Work was confined to small areas of gravel left by early operators. The equipment consisted of 4,000 feet of 2- by 2-foot lumber flume, 16- to 8-inch pressure-pipe, and two 4-inch monitors. Gravel was washed in standard sluice-boxes.

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

Pend-d'Oreille River.

Several small operations, conducted by one or two men, were active along the river throughout the season.

A. H. Green Placers.

The A. H. Green Company, of Nelson, did some preliminary work with the idea of investigating the possibility of bench-gravels on the south side of the Pend-d'Oreille River, about 1 mile below the Red Bridge. This work included the building of about 2 miles of road in order to be able to get machinery to the site, digging two or three shallow test-pits, and the building of a timber chute from the top of the bench to the flat just above the river. Equipment put on the ground included a ½-yard gasoline-shovel, Diesel tractor and bulldozer, and two trucks. The operators plan to excavate the gravel by bulldozer and shovel and convey it to the chute with the trucks. This chute will serve to carry it to the flat above the river, where it will be washed in standard sluice-boxes, the water being provided by pumping from the river.

Big Bend Area.

Boulder Lease, No. 202.

This property, situated on McCullough Creek, a tributary of the Goldstream, is owned and operated by C. M. Williams and D. M. Fulmore, of Revelstoke. This is a drifting operation in which there are about 300 feet of underground workings. The face of the drift, which has followed the bed-rock, is about 30 feet below the bed of the present creek. An interesting feature of the operation is the large amount of native lead which is collected in the sluice-boxes.

Hail Columbia Lease.

This property, situated on the Big Bend Highway, 62 miles north of Revelstoke, is owned and operated by Alex. McCrae and sons. Additional equipment installed this season includes 400 feet of wood-stave pressure-pipe and a single-drum gasoline-powered hoist. The gravel is ground-sluiced by booming.

LARDEAU AREA.

Universal Placer Lease. Situated on Lardeau Creek, about 1½ miles above Trout Lake. This operation was conducted by the Universal Placer Mines, Limited, with W. L. Baker in charge. An attempt was first made to work a section of the bed of Lardeau Creek by carrying the stream over it in a flume, but this was abandoned after the flume was carried out by high water. Subsequent efforts were directed to working the bed-rock gravels on the creek banks, the water for sluicing being pumped from the creek. Mechanical equipment included a 125-gallon-per-minute pump powered by a 2-horse-power gasoline-engine, a pump of 500-gallons-per-minute capacity powered by a Model T Ford engine, and a 4-horse-power Fairbanks-Morse power-winch.

CRANBROOK AREA.

Nero Placers. The *Nero, Reno, Zero,* and *Coronation* placer leases are held by J. Ewen and D. Oscarson. The camp is on the Moyie River, just west of the mouth of Nigger Creek and of the town of Lumberton. It is reached from Lumberton by 5 miles of road which follows along the north side of the Moyie River. Gold is being recovered from gravel mined from a buried channel of the river. Underground workings have crosscut the channel from rim to rim and the channel has been drifted for 200 feet along its length.

GREENWOOD AREA.

Trail and Baird Placer Lease. Situated on Boundary Creek, about 2 miles from Midway. Four men, with W. H. Trail in charge, were employed through the season on this lease. Bed-rock gravel along the creek banks was mined by sinking shallow pits which were kept dry by pumping. The gravel was washed in standard sluices.

ROCK CREEK AREA.

Jolly Creek Placers. Situated on Rock Creek, about 3 miles from Camp McKinney. V. J. Melsted and two partners were engaged in drifting parts of the old channel of Rock Creek which had not been touched in the early operations. About 600 feet of drifting and crosscutting was done in 1939.

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

BRIDGE RIVER AREA.

Arangee Mining Co., Ltd. With V. M. Germain in charge, this company is developing placer leases on Marshall Creek. These are located several miles to the north of the Bridge River Highway, about midway between Shalalth and Minto. About 3 miles of road was built over the existing trail up Marshall Creek, and a dam and pipe-line constructed.

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 situated about 50 miles east of Vancouver. Fireclay, firebrick, sewer-pipe, and common brick are produced at this plant. The fireclay deposits are at Kilgard and are worked by underground methods similar to coal-mining. Twelve men are employed underground. The production for the year amounted to 11,547 tons fireclay and 1,144 tons of shale.

GABRIOLA ISLAND.

Gabriola Shale Products, Ltd.—Charles T. DeLong, Manager. Operations were resumed for the season in June at this property and continued steadily until the middle of November, with a force of twenty-four men engaged. Brick is produced and shipped principally to Vancouver.

GYPSUM.

FALKLAND AREA.

Gypsum, Lime, and Alabastine, Canada, Ltd.

Company office, Paris, Ont.; B.C. office, 804 Richards Street, Vancouver, B.C. R. Haire, President; S. H. Reid, Secretary; Alex. Jessiman, Superintendent. Capital: 100,000 shares, no par value. The company owns and operates four gypsum quarries, situated on the north side of the Kamloops–Vernon Highway, at Falkland, longitude 119° 33′, latitude 50° 30′. The gypsum is transported from the quarries to the Okanagan branch of the Canadian National Railways by a 3,500-foot aerial tram. It is shipped to Port Mann, where the calcining and borax plants are located. Nos. 2 and 4 quarries were operated during the year. Twenty-three men were employed.

LIMESTONE.

KOEYE RIVER AREA.

Koeye River Quarry.

There are two small quarries owned and operated by Pete Christenson, on Koeye River, longitude 127° 52′, latitude 51° 47′, about 7 miles south of Namu, on Fitzhugh Sound. They supply the entire lime rock requirements of Pacific Mills, Limited, at Ocean Falls. Eight men were employed and a total of 12,642 tons was produced.

GRAND FORKS AREA.

Consolidated Mining and Smelting Co. of Canada, Ltd.—The company owns the *Fife* limestone quarry at Fife, longitude 118° 12′, latitude 49° 05′. Development included 160 feet of drifting and 160 feet of raising. About 24,000 tons of limestone was mined and shipped to the company's smelter at Trail. An average of eighteen men was employed.

TEXADA ISLAND.

Pacific Lime Co.—O. Peele, Manager. Work has been fairly steady throughout the year at the two quarries operated by this company at Blubber Bay. The plant produces quicklime, hydrated lime, and other limestone products. Twenty-six men are regularly engaged in the quarries.

B.C. Cement Co.—This company operates a quarry on the opposite shores of Blubber Bay from the Pacific Lime Company. The limestone from the quarry is shipped to the Bamberton cement plant. Robert Hamilton is in charge.

Van Anda Quarries.—Operated by F. J. Beale at Vananda. Work has been good here throughout the year, with an increase of production of limestone and limestone products. Twenty-seven men are employed.

VANCOUVER ISLAND.

B.C. Cement Co.—Office, Belmont Building, Victoria, B.C. Capital: 32,000 shares, $100 par. The company operates two limestone quarries, one at Bamberton, the other on Texada Island, and a cement plant at Bamberton. The total crew for the whole operation is more than 100 men.

STONE, SAND, GRAVEL.

VANCOUVER AREA.

BURRARD INLET.

Coast Quarries, Ltd.—T. Burrows, Superintendent. The quarries of this company are situated at Granite Falls, near the head of Burrard Inlet. The stone is used in general construction-work. From seven to ten men are employed.

NORTH VANCOUVER.

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

Cascade Sand and Gravel Co.—Company office, 470 Granville Street, Vancouver, B.C. W. J. Timlick, Secretary-Treasurer; W. A. McCullum, Manager. Capital: 1,000 shares, $100 par. Fifteen men are employed at this plant. General repair-work was carried out on the equipment.

B.C. Sand and Gravel Co.—Company office, 163 Hastings Street West, Vancouver, B.C. W. J. Morrison, President; G. E. McCrosson, Secretary; C. Eyre, Manager. Capital: 1,000 shares, $100 par. A new screening plant was erected. Five men were employed.

Road Materials Co.—Company office, 789 Pender Street West, Vancouver, B.C. A Ellis, Secretary and Manager. Capital: 100 shares, $100 par. Six men were employed at the plant and in the gravel-pit.

Gilley Bros. Quarry.—The plant and quarry of this company are situated at Silver Valley on the Pitt River. From twenty to thirty men are employed.

Maryhill Sand and Gravel Quarry.—Operated by Gilley Bros., Limited, and situated on the banks of the Fraser River. About sixteen men were employed. Plant and equipment kept in good condition.

NELSON ISLAND.

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

INSPECTION OF MINES.

BY

JAMES DICKSON.

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

Inspection District.	Mining Divisions in District.
Coast	Quatsino, Clayoquot, Alberni, Victoria, Vancouver, New Westminster, Yale, and Nanaimo.
Northern Interior	Lillooet, Ashcroft, Clinton, Quesnel, Cariboo, Peace River, and that portion of the Omineca east of the 123rd degree of longitude.
Interior	Similkameen, Osoyoos, Nicola, Vernon, and Kamloops.
East Kootenay and Boundary	Greenwood, Grand Forks, Trail Creek, Nelson, Slocan City, Slocan, Arrow Lake, Ainsworth, Lardeau, Revelstoke, Fort Steele, Windermere, and Golden.
Northern	Queen Charlotte Islands, Bella Coola, Stikine, Portland Canal, Skeena, Atlin, and that portion of Omineca west of the 124th degree of longitude.

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.

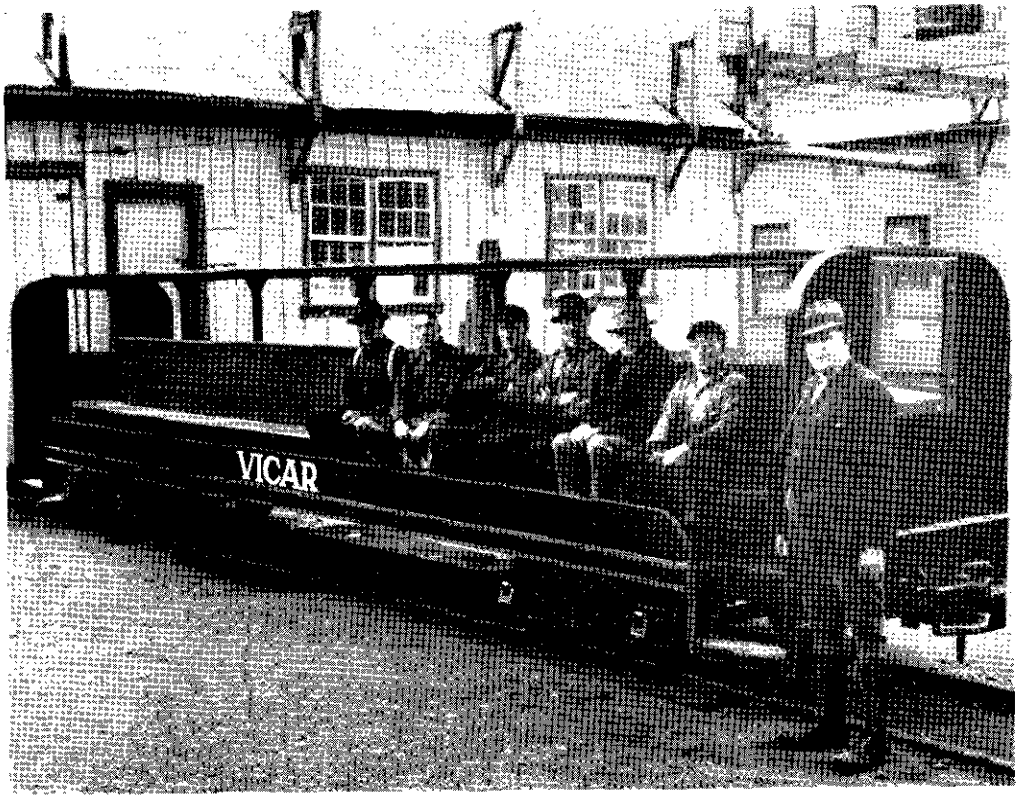
Richard Nichol	Nanaimo Station.
James L. Brown	Cumberland Station.
Alfred Gould	Princeton Station.
John T. Puckey	Fernie Station.

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

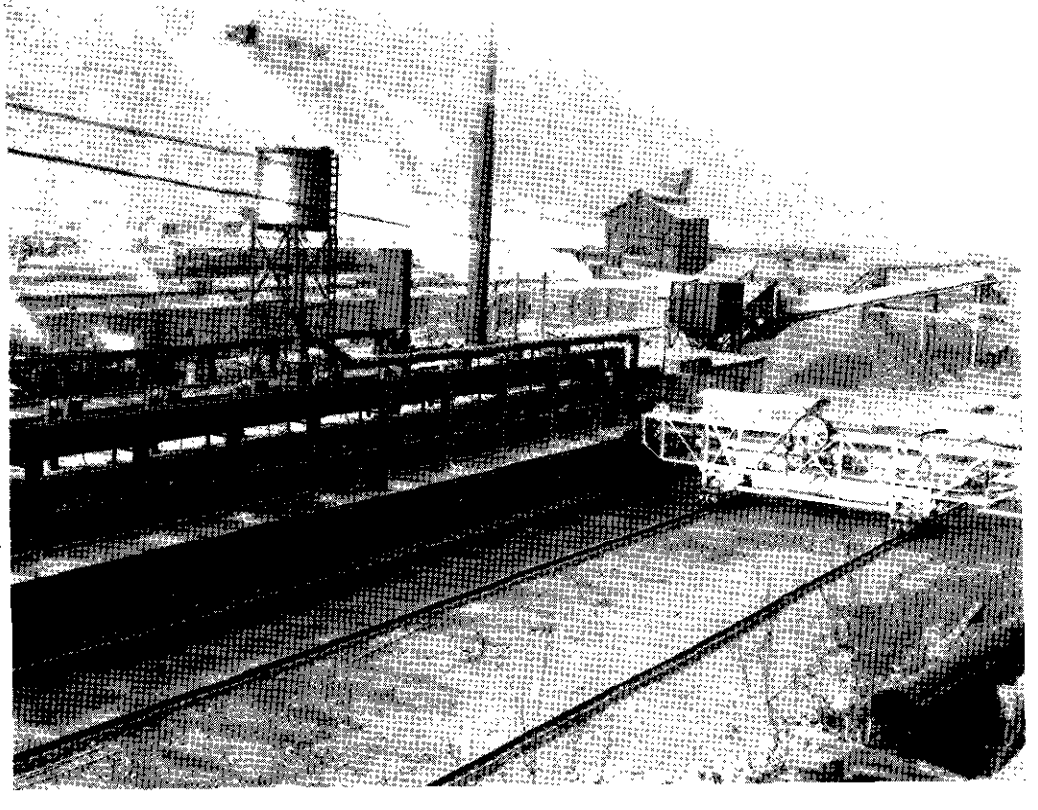
PRODUCTION.

The total tonnage produced by the coal mines of the Province for the year ended December, 1939, was 1,477,872 tons, being an increase of 168,444 tons or 12.8 per cent. over production of 1938.

The Coast District, which includes Vancouver Island, Nicola-Princeton, and the Northern Districts, produced 915,914 tons, an increase of 40,554 tons or 4.6 per cent. over 1938.



New passenger-car, built by the Britannia Mining and Smelting Company, Limited, for use at Britannia Mines.



Curran Knowles by-product coke-ovens with coke-pushing machine, right foreground, and bee-hive coke-ovens in background. Michel Colliery of the Crow's Nest Pass Coal Company, Limited.

Vancouver Island collieries produced 717,334 tons, an increase of 32,936 tons or 4.8 per cent. over 1938.

The Northern District produced 4,768 tons, an increase of 778 tons over 1938.

The Nicola-Princeton District produced 193,812 tons, an increase of 6,840 tons or 3.6 per cent. over 1938.

The East Kootenay District produced 561,958 tons, an increase of 127,890 tons or 29.4 per cent. over 1938.

The following table shows the output and *per capita* production daily and for the year of 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)	246,074	244	617	1.63	399	485	2.07	507
Comox Colliery (No. 8 mine)	81,403	204	219	1.82	372	193	2.07	422
Northfield Colliery	132,860	242	308	1.78	431	271	2.02	490
South Wellington (No. 10 mine)	82,595	247	230	1.45	359	199	1.69	419
Reserve Colliery	146,367	261	350	1.60	418	132	4.24	1,109
Lantzville Colliery	4,342	246	17	1.03	255	12	1.47	362
Fiddick mine	108	94	4	0.28	27	4	0.28	27
Chambers' mine	2,577	194	7	1.90	368	6	2.16	429
Beban's mine	17,464	203	56	1.53	312	35	2.45	499
Loudon's mine	30	19	2	0.79	15	2	0.79	15
Cassidy mine	1,710	190	2	4.50	855	2	4.50	855
Biggs' mine	692	190	2	1.82	346	2	1.82	346
Lewis' mine	840	273	3	1.02	280	3	1.02	280
Sunshine (Clifford) mine	272	119	1	2.28	272	1	2.28	272
Coalmont Collieries, Ltd.	74,857	194	164	2.35	456	91	4.23	822
Middlesboro Colliery	22,088	147	99	1.51	223	64	2.34	345
Granby Consolidated M.S. & P. Co., Ltd.	80,428	241	113	2.95	711	89	3.74	903
Princeton Tulameen Coal Co.	16,026	233	32	2.15	501	24	2.86	668
Black mine (Glover)	12	.....	2	.....	6	2	.....	6
Hat Creek Colliery	401	103	3	1.29	133	2	1.94	200
Bulkley Valley Colliery	4,675	205	12	1.90	389	8	2.84	584
Aveling Colliery	93	18	2	2.55	46	2	2.55	46
Coal Creek Colliery	103,375	158	152	4.30	680	113	5.79	915
Michel Colliery	458,583	244	579	3.25	793	425	4.42	1,079

Collieries of Vancouver Island Inspection District.

The output of Vancouver Island Collieries was 717,334 tons. Of this amount, 71,018 tons or 9.9 per cent. was lost in preparation for the market; 47,105 tons or 6.5 per cent. was consumed by producing companies as fuel; 611,615 tons was sold in the competitive market, of which 12,404 tons was taken from stock; thus 83.5 per cent. of the output was sold.

Of the amount sold in the competitive market, 570,730 tons or 93.3 per cent. was sold in Canada and 40,885 tons or 6.7 per cent. was sold in the United States.

Collieries of the Nicola-Princeton District.

Of the gross output of 193,812 tons produced by the collieries of the Nicola-Princeton District, 14,814 tons or 7.7 per cent. was consumed by producing companies as fuel and 178,998 tons or 92.3 per cent. was sold in the competitive markets in Canada.

Collieries of the East Kootenay Inspection District.

The output of the collieries in the East Kootenay District was 561,958 tons. Of this amount, 25,751 tons or 4.5 per cent. was lost in preparation for the market; 15,763 tons or 2.8 per cent. was used by the producing companies as fuel; 78,228 tons or 13.9 per cent. was used in making coke; and 442,526 tons was sold in the competitive

market. Of this amount, 384,706 tons or 86.9 per cent. was sold in Canada and 57,820 tons or 13.1 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 1935 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.
1935	East Kootenay District	407,110	819	497	614	663
	Coast District	780,858	2,152	363	1,531	510
	Whole Province	1,187,968	2,971	399	2,145	554
1936	East Kootenay District	470,606	606	776	459	1,025
	Coast District	875,865	2,208	396	1,556	563
	Whole Province	1,346,741	2,814	478	2,015	668
1937	East Kootenay District	459,136	628	731	462	972
	Coast District	985,551	2,525	390	1,824	540
	Whole Province	1,444,687	3,153	458	2,286	632
1938	East Kootenay District	434,068	693	626	467	972
	Coast District	875,360	2,269	386	1,621	540
	Whole Province	1,309,428	2,962	442	2,088	675
1939	East Kootenay District	561,958	731	768	538	1,044
	Coast District	915,914	2,245	408	1,629	562
	Whole Province	1,477,872	2,976	496	2,167	682

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, 1939.

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 1939.
	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)	220,059	5,380	.....	225,439	23,036	.....	8,163	31,199	12,264	1,700	.....	10,564	246,074
Comox Colliery (No. 8 mine)	71,663	1,699	.....	73,362	8,041	.....	.....	8,041	.....	.....	.....	.....	81,403
Northfield Colliery	99,710	17,241	.....	116,951	16,606	.....	10,935	27,541	12,772	1,140	.....	11,632	132,860
South Wellington (No. 10 mine)	50,117	.....	.....	50,117	.....	.....	1,042	1,042	2,582	34,018	31,436	.....	82,595
Western Fuel Corp. of Canada, Ltd.—													
Reserve mine	106,406	16,565	.....	122,971	20,139	.....	24,951	45,090	21,694	.....	.....	21,694	146,367
Lantzville Colliery	4,342	.....	.....	4,342	.....	.....	.....	.....	.....	.....	.....	.....	4,342
Fiddick mine	108	.....	.....	108	.....	.....	.....	.....	.....	.....	.....	.....	108
Chambers' mine	2,577	.....	.....	2,577	.....	.....	.....	.....	.....	.....	.....	.....	2,577
Beban's mine	12,254	.....	.....	12,254	3,196	.....	2,014	5,210	.....	.....	.....	.....	17,464
Loudon's mine	30	.....	.....	30	.....	.....	.....	.....	.....	.....	.....	.....	30
Cassidy mine	1,660	.....	.....	1,660	.....	.....	.....	.....	102	152	50	.....	1,710
Biggs' mine	692	.....	.....	692	.....	.....	.....	.....	.....	.....	.....	.....	692
Lewis' mine	840	.....	.....	840	.....	.....	.....	.....	.....	.....	.....	.....	840
Sunshine (Clifford) mine	272	.....	.....	272	.....	.....	.....	.....	.....	.....	.....	.....	272
Totals, Vancouver Island District	570,730	40,885	.....	611,615	71,018	.....	47,105	118,123	49,414	37,010	31,486	43,890	717,334
Nicola-Princeton District.													
Coalmont Collieries, Ltd.	64,080	.....	.....	64,080	.....	.....	10,777	10,777	.....	.....	.....	.....	74,857
Middlesboro Collieries, Ltd.	18,071	.....	.....	18,071	.....	.....	4,017	4,017	161	161	.....	.....	22,088
Granby Cons. M.S. & P. Co., Ltd.	80,428	.....	.....	80,428	.....	.....	.....	.....	.....	.....	.....	.....	80,428
Princeton Tulameen Coal Co.	16,026	.....	.....	16,026	.....	.....	.....	.....	.....	.....	.....	.....	16,026
Black mine (Glover Trust)	12	.....	.....	12	.....	.....	.....	.....	.....	.....	.....	.....	12
Hat Creek Colliery	381	.....	.....	381	.....	.....	20	20	.....	.....	.....	.....	401
Totals, Nicola-Princeton District	178,998	.....	.....	178,998	.....	.....	14,814	14,814	161	161	.....	.....	193,812
Northern District.													
Bulkley Valley Colliery	4,512	.....	.....	4,512	.....	.....	163	163	.....	.....	.....	.....	4,675
Aveling Colliery	101	.....	.....	101	.....	.....	.....	.....	8	.....	.....	8	93
Totals, Northern District	4,613	.....	.....	4,613	.....	.....	163	163	8	.....	.....	8	4,768
East Kootenay District.													
Coal Creek Colliery	69,611	30,930	.....	100,541	.....	.....	2,883	2,883	246	197	.....	49	103,375
Michel Colliery	315,095	26,890	.....	341,985	25,751	78,228	12,880	116,859	261	.....	.....	261	458,583
Totals, East Kootenay District	384,706	57,820	.....	442,526	25,751	78,228	15,763	119,742	507	197	.....	310	561,958
Coal.													
Grand totals for Province	1,139,047	98,705	.....	1,287,752	96,769	78,228	77,845	252,842	50,090	37,368	31,486	44,208	1,477,872
Coke.													
Crow's Nest Pass Coal Co., Ltd.—													
Michel Colliery	26,531	21,970	.....	48,501	.....	.....	.....	.....	402	3,106	2,704	.....	51,205
Total coke for Province	26,531	21,970	.....	48,501	.....	.....	.....	.....	402	3,106	2,704	.....	51,205

COLLIERIES OF BRITISH COLUMBIA—MEN EMPLOYED, 1939.

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.			
Canadian Collieries (D.), Ltd.—																																	
Comox Colliery (No. 5 mine)	21	9	30	181		181				102	36	138	166	51	217	15	12	27											24	24	485	132	617
Comox Colliery (No. 8 mine)	11	1	12	74		74				24	6	30	76	11	87	8	8	16													193	26	219
Northfield Colliery	12	2	14	155		155				66	19	85	15	6	21	23	10	33													271	37	308
South Wellington (No. 10 mine)	9	2	11	125		125				39	18	57	8	6	14	18	5	23													199	31	230
Western Fuel Corp. of Canada, Ltd.—																																	
Reserve mine	10	19	29	80		80				34	85	119	5	52	57	3	6	9											56	56	132	218	350
Lantzville Colliery	1		1	9		9				2	3	5		1	1														1	1	12	5	17
Fiddick mine	1		1	2		2	1		1																						4		4
Chambers' mine				5		5	1		1								1	1													6	1	7
Beban's mine	3	1	4	28		28					2	2	1	2	3	3	1	4											15	15	35	21	56
Loudon's mine	1		1	1		1																									2		2
Cassidy mine	1		1	1		1																									2		2
Biggs' mine				1		1	1		1																						2		2
Lewis' mine				2		2										1		1													3		3
Sunshine (Clifford) mine				1		1																									1		1
Totals, Vancouver Island District	70	34	104	665		665	3		3	267	169	436	271	129	400	71	43	114											96	96	1347	471	1818
Nicola-Princeton District.																																	
Coalmont Collieries, Ltd.	7	10	17	46		46				2	17	19	30	36	66	6	9	15											1	1	91	73	164
Middlesboro Collieries, Ltd.	5	1	6	32		32	12		12	15	14	29		12	12		8	8													64	35	99
Granby Cons. M.S. & P. Co., Ltd.	8	1	9	37		37	41		41		4	4	3	15	18		4	4													89	24	113
Princeton Tulameen Coal Co.	2	1	3	13		13	9		9		5	5		2	2																24	8	32
Black mine (Glover Trust)				1		1	1		1																						2		2
Hat Creek Colliery				1		1	1		1		1	1																			2	1	3
Totals, Nicola-Princeton District	22	13	35	130		130	64		64	17	41	58	33	65	98	6	21	27											1	1	272	141	413
Northern District.																																	
Bulkley Valley Colliery	1		1	3		3	3		3	1	2	3		2	2															8	4	12
Aveling Colliery				2		2																									2		2
Totals, Northern District	1		1	5		5	3		3	1	2	3		2	2															10	4	14
East Kootenay District.																																	
Coal Creek Colliery	5	2	7	57		57				12	13	25	38	21	59	1	3	4													113	39	152
Michel Colliery	15	10	25	259		259				32	41	73	119	100	219		3	3													425	154	579
Totals, East Kootenay District	20	12	32	316		316				44	54	98	157	121	278	1	6	7													538	193	731
Grand totals for Province	113	59	172	1116		1116	70		70	329	266	595	461	317	778	78	70	148											97	97	2167	809	2976

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

LABOUR AND EMPLOYMENT.

During 1939, 2,976 persons were employed in and about the coal mines of the Province, an increase of fourteen men over 1938.

Taking the average of all the mines in the Vancouver Island District, about 22 per cent. of the working-days was lost through lack of trade. In the Nicola-Princeton District the different collieries worked on an average of 68 per cent. of the working-days. In the East Kootenay District the average for the year was about 67 per cent.

The table on page 118 shows the number of persons ordinarily employed in and about the mines, distinguishing the persons and different classes employed underground and above ground, compiled from returns furnished by the owners.

FUEL-OIL COMPETITION.

During 1939 imports of crude oil for refining in British Columbia totalled 192,300,000 gallons; in addition to this, 28,000,000 gallons was imported duty free for use in ships' bunkers.

COMPETITION OF COAL PRODUCED OUTSIDE BRITISH COLUMBIA.

During 1939 the importation of coal into British Columbia consisted of 2,441 tons of bituminous coal and 1,785 tons of lignite coal from the United States. There were no other imports of coal during the year.

Alberta coal sold in British Columbia amounted to 239,227 tons. In addition to this, 68,871 tons of Alberta coke and 3,516 tons of Alberta briquettes were sold in this Province.

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

Year.	Short Tons.	Year.	Short Tons.
1930	227,385	1935	221,748
1931	193,060	1936	244,928
1932	136,188	1937	269,023
1933	119,026	1938	238,435
1934	123,968	1939	239,227

Of the 1,237,752 tons of British Columbia coal marketed, 87,034 tons was sold for domestic and industrial use in the Provinces of Alberta, Saskatchewan, Manitoba, and Ontario, and 197,232 tons was sold for railroad consumption in these Provinces; 8,073 tons was sold for use on U.S. railroads and 183,278 tons was sold for railroad use in British Columbia; 98,705 tons was exported to the United States and 222,932 tons was sold for ships' bunkers. The tonnage of coal used in the Province being 623,818 tons of British Columbia coal, 311,614 tons of Alberta coal, coke, and briquettes, and 4,226 tons of imported coal.

ACCIDENTS IN AND AROUND COAL MINES.

During 1939, 2,976 persons were employed in and around coal mines. Two fatal accidents occurred during the year as compared with ten for 1938.

The ratio of fatal accidents per 1,000 persons employed was 0.67 as compared with 3.37 for 1938. In 1937 the ratio was 3.17; in 1936, 2.84; in 1935, 1.67; in 1934, 2.07; in 1933, 0.97; in 1932, 2.21; in 1931, 1.22; and in 1930, 11.62. The average for the ten-year period being 3.34.

The number of fatal accidents per 1,000,000 tons produced during 1939 was 1.35; during 1938 the figure was 7.63; in 1937, 6.92; in 1936, 5.94; in 1935, 4.21; in 1934, 4.45; in 1933, 2.37; in 1932, 5.21; in 1931, 2.81; and in 1930, 28.64. The average for the ten-year period being 7.65 per 1,000,000 tons of coal mined.

The following table shows the collieries at which the fatal accidents occurred during 1939 and comparative figures for 1938:—

Name of Company.	Name of Colliery.	1939.	1938.
Western Fuel Corporation, Ltd.	No. 1 mine	....	1
F. Beban Lumber Co.	Beban mine	1	....
Coalmont Collieries, Ltd.	No. 5 mine	1	....
Coalmont Collieries, Ltd.	No. 4 mine	....	1
Crow's Nest Pass Coal Co., Ltd.	Coal Creek	....	3
Crow's Nest Pass Coal Co., Ltd.	Michel	....	5
Totals		2	10

The following table shows the various causes of fatal accidents in 1939 and their percentage of the whole, with corresponding figures for 1938:—

Cause.	1939.		1938.	
	No.	Per Cent.	No.	Per Cent.
By falls of roof and coal	1	50.00	3	30.00
By mine-cars and haulage	1	50.00	....	.....
By mine explosions	....	.....	3	30.00
By bumps	....	.....	3	30.00
Miscellaneous	....	.....	1	10.00
Totals	2	100.00	10	100.00

The following table shows the number of tons of coal mined for each fatal accident in their respective classes in the years 1939 and 1938:—

Cause.	1939.		1938.	
	No. of Fatal Accidents.	Tons of Coal mined per Fatal Accident.	No. of Fatal Accidents.	Tons of Coal mined per Fatal Accident.
By falls of roof and coal	1	1,477,872	3	436,476
By mine-cars and haulage	1	1,477,872	....	.....
By mine explosions	....	.....	3	436,476
By bumps	....	.....	3	436,476
Miscellaneous	....	.....	1	1,309,428
Totals	2	738,936	10	130,942

The number of tons mined per fatal accident during 1939 was 738,986 tons compared with 130,942 tons in 1938. The average for the ten-year period was 130,702 tons.

The following table shows the fatalities from various causes in coal mines during the year 1939 compared with 1938, according to Inspection Districts:—

District.	Number of Deaths from Accidents.					Total.	
	Falls of Roof and Coal.	Mine-cars and Haulage.	Mine Explosion.	Bumps.	Miscellaneous.	1939.	1938.
Vancouver Island	1	....	....	....	....	1	1
Nicola-Princeton	....	1	....	....	....	1	1
East Kootenay	....	....	....	....	....	....	8
Northern	....	....	....	....	....	....	....
Province (1939)	1	1	....	....	....	2	....
Province (1938)	....	....	....	....	....	....	10

RATIO OF ACCIDENTS.

District.	Accident Death-rate.			
	Per 1,000 Persons employed.		Per 1,000,000 Tons of Coal mined.	
	1939.	1938.	1939.	1938.
Vancouver Island	0.55	0.54	1.39	1.46
Nicola-Princeton	2.42	2.41	5.15	5.34
East Kootenay	.....	11.54	.....	18.43
Northern	.....	.....	.....	.....
Totals (1939)	0.67	.....	1.35	.....
Totals (1938)	.....	3.37	.....	7.63

The details regarding the occurrences of the fatal accidents in coal mines during 1939 are as follows:—

The fatal accident which occurred to Otis Barrett, driver, Coalmont Collieries, Ltd., on May 16th, was due to deceased being caught and thrown down on the floor by the first car, which was derailed, of a four-car loaded trip he was taking from a parting to the main slope. There were no witnesses to this accident and deceased was dead when found.

There was ample width and height on this level and there was so little grade that the horse had to pull the trip all the way. When the accident was discovered, the horse was uncoupled from the trip and standing 12 feet in front of it.

The fatal accident which occurred to Alexander Webster, miner, Beban mine, on October 17th, was due to a fall of coal in his working-place. This place was in disturbed ground with numerous slips in the seam and roof, and the coal fell from one of these slips ahead of the actual working-face.

Efficient spragging to meet the known conditions in this place would have averted this fatality.

EXPLOSIVES.

The following table shows the quantity of explosives used in coal mines during 1939, 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)	50,558	246,074	75,018	4.86	0.67
Comox Colliery (No. 8 mine)	26,900	81,403	52,200	3.02	0.51
Northfield Colliery	55,916	132,860	75,424	2.37	0.74
South Wellington (No. 10 mine)	37,300	82,595	44,038	2.21	0.84
Reserve Colliery	25,842	146,367	37,958	5.66	0.68
Lantzville Colliery	5,600	4,342	8,200	0.77	0.68
Fiddick mine	250	108	400	0.43	0.62
Chambers' mine	1,700	2,577	3,700	1.51	0.46
Beban's mine	14,000	17,464	23,000	1.24	0.61
Loudon's mine	20	30	15	1.50	1.33
Cassidy mine	450	1,710	1,100	3.80	0.41
Biggs' mine	300	692	400	2.30	0.75
Lewis' mine	700	840	1,000	1.20	0.70
Sunshine (Clifford) mine	125	272	150	2.17	0.83
Totals for district	219,661	717,334	322,603	3.26	0.68

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.
Coalmont Collieries	24,795	74,857	36,500	3.01	0.67
Middlesboro Collieries	4,950	22,088	7,725	4.45	0.64
Granby Consolidated M.S. & P. Co., Ltd.	16,950	80,428	19,900	4.74	0.86
Princeton Tulameen Coal Co., Ltd.	3,250	16,026	7,150	4.93	0.45
Black mine (Glover)	....	12	.....	.....	.....
Hat Creek Colliery	300	401	600	1.33	0.50
Totals for district	50,245	193,812	71,875	3.85	0.69

Northern District.

Bulkley Valley Colliery	1,700	4,675	2,500	2.75	0.68
Aveling Colliery	44	93	47	2.11	0.93
Totals for district	1,744	4,768	2,547	2.73	0.68

East Kootenay District.

Coal Creek Colliery	1	103,375	4	103,375.00	0.25
Michel Colliery	41,212	458,583	57,850	11.12	0.71
Totals for district	41,213	561,958	57,854	13.63	0.71
Totals for Province	312,863	1,477,872	454,879	4.72	0.68

Quantities of Different Explosives used.

	Lb.
Monobel of different grades	275,953
Permissible rock-powder	36,910
Total	312,863

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 1939, mining-machines produced approximately 921,225 tons or 62.3 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	19	9
Nicola-Princeton	....	24	....	24
East Kootenay	....	29	2	27
Totals	....	81	21	60

SAFETY-LAMPS.

There were 2,249 safety-lamps in use in the coal mines of the Province. Of this number, 215 were flame safety-lamps of the Wolf type and 2,034 were electric lamps of various makes, as follows: Edison, 1,974; Wolf electric, 60.

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)	40	291	40	291
Comox Colliery (No. 8 mine)	25	212	25	212
Northfield Colliery	22	292	22	292
South Wellington (No. 10 mine)	10	105	10	105
Reserve Colliery	12	190	12	190
Lantzville Colliery	2	12	2	12
Fiddick mine	2	4	2	4
Chambers' mine	2	10	2	10
Beban's mine	7	79	7	79
Loudon's mine	1	2	1	2
Cassidy mine	2	5	2	5
Biggs' mine	1	4	1	4
Lewis' mine	1	2	1	2
Sunshine (Clifford) mine	3	8	3	8
Totals for district	130	1,216	130	1,216

Nicola-Princeton District.

Coalmont Collieries	6	99	6	99
Middlesboro Collieries	8	68	8	68
Granby Consolidated M.S. & P. Co., Ltd.	6	93	6	93
Princeton Tulameen Coal Co.	1	34	1	34
Black mine (Glover)	1	2	1	2
Hat Creek Colliery	2	6	2	6
Totals for district	24	302	24	302

Northern District.

Bulkley Valley Colliery	1	9	1	9
Aveling Colliery	2	----	2	----
Totals for district	3	9	3	9

East Kootenay District.

Coal Creek Colliery	12	130	12	130
Michel Colliery	46	377	46	377
Totals for district	58	507	58	507
Totals for Province	215	2,034	215	2,034

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.

(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 twelve mines and underground at five.

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

Nature of its Use.	Aggregate H.P.
Above ground—	
Winding or hoisting	2,238
Ventilation	945
Haulage	366
Coal-washing	476
Miscellaneous	5,704
Total horse-power	9,729
Underground—	
Haulage	1,190
Pumping	1,330
Coal-cutting	.....
Miscellaneous	1,045
Total horse-power	3,565
Total horse-power above and below ground	13,294

Of the above amount, approximately 1,183 horse-power was operated as direct current and 12,111 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. In a number of instances where the methane content of the air on the face-lines tended to become too high the Inspectors prohibited the use of explosives until the outflow of methane decreased or sufficient additional ventilation was provided. In such cases the Inspector makes a further inspection before the use of explosives is again permitted.

All such instances were due to excessive methane outflows and none was due to the volume of the ventilation reaching the minimum of 100 cubic feet per man per minute set out by the "Coal-mines Regulation Act," General Rule 2. These instances were in Nos. 5 and 8 Mines, Comox Colliery; and No. 10 Mine, South Wellington.

METHANE DETECTION.

The Burrell Methane Detector was in general use throughout the year to detect the presence of methane in percentages less than could be detected by the flame safety-lamp.

During the year the M.S.A. Methane Detector was tried and approved for use in detecting small percentages of methane, and several are now in use at mines on Vancouver Island. By "small percentages of methane" is meant less than 1 per cent.

The standard flame safety-lamp still remains the chief practical means of detecting methane in the general working of the mine, and if all the information available from the use of the flame safety-lamp in the hands of an experienced fireboss or miner is given practical application the danger from methane can be kept at a minimum.

Although practically all workmen underground use the electric safety-lamp for their ordinary work, efforts were made during the year to have all applying for certificates of competency as coal-miners to have previous instruction in the care of the flame safety-lamp and its use as a methane detector. In addition, many of the older miners at different mines were given practical instruction on this point.

MINE-AIR SAMPLES.

Consistent sampling of mine-air was maintained at the various mines, this varying in the number of samples with the conditions obtaining. During the year 381 samples were taken, and of this number fifty-five were lost or destroyed in transit. The samples are analysed by the Dominion Department of Mines and the analyses reports not only form a valuable record but are a very definite aid to the Inspectors of Mines and mine officials in the work of estimating "gas-caps" on the flame safety-lamps when tests are made at time and place of sampling.

INSPECTION COMMITTEES.

With the exception of several small operations where only a few men are employed, all the mines in the Province had inspection committees appointed by the workmen under General Rule 37, section 101, "Coal-mines Regulation Act," in operation throughout the year.

COAL-DUST.

Sampling of dust as per the Regulations for Precautions against Coal-dust was well maintained at the different mines throughout the year and a total of 1,424 samples were taken; and where any sample showed less than 50 per cent. of incombustible matter steps were taken to have that part of the mine given further rock-dust treatment.

DANGEROUS OCCURRENCES.

On January 3rd a short circuit occurred in a transformer in the main pump-room at the bottom of No. 5 shaft, Comox Colliery; the transformer was destroyed but no further damage resulted, as the occurrence was discovered immediately.

On February 8th a small fire occurred on one of the long-wall faces at No. 5 mine, Comox Colliery, due to a persistent attempt being made to cut through a "nigger-head" encountered by the coal-cutting machine. Sparks of sufficient intensity and duration were produced to ignite gas being produced from the cut. This gas, and probably

some of the cutting, burned until workmen in the immediate vicinity, on their own initiative, coupled up a hose-line to a pump and extinguished the fire. This coal-cutting machine was driven by compressed air and there was no electrical apparatus in this area.

On February 14th, in No. 5 mine, Comox Colliery, a small fire occurred in a 75-horse-power electric haulage motor, due to the trip being derailed and causing an overload on the motor. The fire was extinguished by the application of the dry sand kept at all electrical installations for this purpose.

On March 4th, while the last cage of night-shift men was being hoisted in the Northfield shaft, the emergency brake of the hoist went into operation when the cage was half-way up the shaft and brought the cage to rest suddenly, with a considerable jarring of the men, although no one was injured. Careful inspection failed to reveal any defect. This electric hoist is fitted with overspeed and overwind preventive apparatus. Following this occurrence the overspeed was fixed at a maximum of 500 feet per minute.

On March 13th spontaneous combustion was discovered in the slope section of No. 4 mine, Coalmont Collieries. This section was sealed off and, later, flooded.

On March 19th, at Reserve No. 1 shaft, where one of the ropes had just been reconed, the hoistman, while operating the hoist to adjust new station-marks on the drum, omitted to reverse when one of the cages had been brought to the surface. When he again started the hoist this cage was drawn up to the rope-detaching apparatus at the overwind limit; the device operated efficiently and left the cage suspended on the safety-hooks. There were no men in the cage and no damage was done.

On April 7th spontaneous combustion was discovered in the inner heading of No. 4 mine, Coalmont Collieries. This section was sealed off. About 10 acres was enclosed by the fire seals, which remained undisturbed until the abandonment of the mine at the end of December.

On May 5th, in the Beban mine, advance precautionary drill-holes tapped a body of water in an area shown by the old plans of this prospect to be unworked ground. The men were immediately withdrawn from the mine until this water was drained off and the area of the unrecorded old workings determined. Some 4,000,000 gallons of water was drained through the bore-holes before the water stopped running, after which the barrier was cut through for investigation.

On May 15th, in No. 5 mine, Comox Colliery, a short circuit in a 20-k.v.a. transformer caused a fire which destroyed the transformer. No further damage resulted.

On June 6th an outbreak of fire, due to spontaneous combustion, was discovered in No. 1 South section, Reserve mine. All men were immediately withdrawn from the mine except a small crew to deal with the fire by sealing off the area. While this work was being carried on a slight explosion occurred in the area, but as the sealing was being carried on at some distance from the fire and the explosion did not extend to that point, no one was injured. Following this occurrence the fire-fighting crew was withdrawn until a thorough inspection was made, after which the work of sealing was resumed and completed without further trouble on June 11th.

On July 20th a water-pipe on the cooling system of an underground motor-driven compressor in No. 5 mine, Comox Colliery, broke and discharged water on to a 2,200-volt cable at a point where the cable had been spliced, causing a short circuit. The damage was slight as only some insulation was burned.

On September 8th the main haulage-rope on the Main slope, No. 5 mine, Comox Colliery, broke while hoisting a trip of coal-cars. A safety-car is in service on all trips on this slope, but the safety-car had just been uncoupled at the top of the slope when the rope broke. The trip was derailed by a safety-switch situated 100 feet below the top landing. A new rope was installed immediately. The miners are hoisted on this slope at the end of each shift.

PROSECUTIONS.

During 1939 there were four prosecutions made for infractions of the "Coal-mines Regulation Act," as follows:—

Date.	Colliery.	Occupation of Defendant.	Offence charged.	Judgment.
April 13	Canadian Collieries (D.), Ltd., No. 8 mine, Comox Colliery	Fireboss	Failed to make the required examination for the presence of gas before firing a shot	Fined $25 and costs.
May 6	Canadian Collieries (D.), Ltd., No. 5 mine, Comox Colliery	Timber-packer	Had a lucifer match in his possession while underground	Fined $5 and costs.
Oct. 25	Canadian Collieries (D.), Ltd., No. 8 mine, Comox Colliery	Fireboss	Fired a shot without having all approaches properly guarded	Fined $50 and costs.
Nov. 22	Coalmont Collieries, Ltd., No. 5 mine	Rope-rider	Failed to have a safety-drag on a trip of loaded cars	Fined $10 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 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. 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. The rescue-stations also serve as centres for first-aid lectures and training.

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. The training itself is strenuous work, and all candidates have to undergo a special physical examination before starting training and must be under thirty-four years of age.

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

Cert. No.	Name.	Where trained.	Cert. No.	Name.	Where trained.
1047	William Gilmour	Nanaimo.	1059	Cyril Hugh Poole	Cumberland.
1048	Hugh Marr Gilmour	Wellington.	1060	Thomas Somerville	Cumberland.
1049	Leonard Cooper	Nanaimo.	1061	John Queen	Bevan.
1050	James Wilson Dunn	Nanaimo.	1062	Peter Queen	Bevan.
1051	James Alexander Hamilton	Nanaimo.	1063	Walter Oakley	Bevan.
1052	John Robert Neen	Nanaimo.	1064	Thomas Harkins	Bevan.
1053	Wm. Henry Hamilton	Nanaimo.	1065	James Marshall	Bevan.
1054	Wilfred Hamilton	Nanaimo.	1066	Walter Bullock	Bevan.
1055	Andrew Dunn	Nanaimo.	1067	Arthur Dempster Hales	Bevan.
1056	Joe Crawley	Cumberland.	1068	John Fulla	Nanaimo.
1057	Andrew Harvey	Cumberland.	1069	Colin McArthur	Nanaimo.
1058	Harry Pollitt	Cumberland.			

MINE-RESCUE AND FIRST-AID WORK.

Mine-rescue teams carried on training at the mine-rescue stations at Nanaimo, Cumberland, Princeton, and Fernie, and the different Mine Safety Associations were active in promoting first-aid and mine-safety work during the year.

There are Mine Safety Associations at East Kootenay, Princeton, Vancouver Island, Britannia, Bridge River, and Portland Canal, and it is hoped that this work will extend to the Sheep Creek and Zeballos areas during 1940. The membership of these Mine Safety Associations consists of mine officials and working miners who are particularly interested in safety-work, and the Inspector of Mines for each district takes active steps to assist in every possible way to spread this work. The Mine Safety Associations are assisted financially by the Department of Mines, and at all the different centres competitions in mine-rescue work, safety, and first aid were held and materially resulted in an increasing number of miners being interested in working more safely themselves and in spreading safety education generally.

It may be added that while this safety and first-aid movement was originally started for the mining industry, these competitions have attracted men and teams from the logging camps, pulp industry, military units, and several other industries where large groups of men are employed.

In addition to male teams, large numbers of ladies', boys', and girls' first-aid teams take part, and these also help to spread the gospel of "safety first."

SUPERVISION OF COAL MINES.

During the year twenty coal companies operated twenty-seven mines, employing 2,167 men underground. In the supervision of underground employees there were eleven managers, nineteen overmen, 103 firebosses and shotlighters, a total of 133, or one official for every sixteen persons employed underground.

"COAL SALES ACT."

During the year a number of complaints in the Victoria and Vancouver areas were investigated. These complaints were either on the substitution of an inferior grade of coal for a superior grade or excessive slack in lump or nut coal.

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.
Ladysmith-Extension	No. 8 mine (Extension)	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. 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.
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 1939; the first on May 17th, 18th, and 19th, and the second on November 15th, 16th, and 17th.

The total number of candidates at the examinations were as follows: For Second-class Certificates, 3 (1 passed and 2 failed); for Third-class Certificates, 18 (7 passed and 11 failed); for Mine Surveyors, 2 (1 passed and 1 failed).

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

Second Class.—John H. Vaughan.

Third Class.—Muir Frame, William Hunchuk, Glyn Lewis, Thomas McCann, Lorne B. Perry, John Queen, and Daniel Chester.

Mine Surveyor.—Stanley J. Lawrence.

Harold Baird was granted a First-class Certificate without written examination, under section 42 (2) of the Act.

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, whether by hand or machinery.

Examinations are held regularly in all the 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 1939 there were 91 candidates for coal-miner's certificates; of these 80 passed and 11 failed to qualify.

In addition to the certificates granted above, substitute certificates were issued to those who had lost their original certificates.

The Board of Examiners desires to thank the different coal-mining companies for the use of their premises for holding the examinations when necessary.

The Inspector of Mines in each district has authority under the "Coal-mines Regulation Act" to grant, after a satisfactory examination, a provisional certificate as a coal-miner to applicants, which entitles the holder to follow the occupation of a coal-miner for a period not exceeding sixty days or until the date of the next examination before the Board.

GOVERNMENT MINE-RESCUE STATIONS.

NANAIMO.

BY

RICHARD NICHOL.

The equipment at this station consists of six sets of the Gibbs two-hour oxygen apparatus; six sets of the McCaa two-hour oxygen apparatus; twelve sets of the Burrell all-service gas-masks; two H.H. inhalators; one Sparklet resuscitator; and seventy self-rescuers. A sufficient supply of materials to maintain the above equipment in service is kept at all times.

An 85-horse-power truck is kept at this station to permit the immediate transportation of the equipment in case of emergency.

Trained teams from the different mines underwent a monthly practice and eleven new men took the full training course and obtained certificates of proficiency in this work.

During the year seventeen calls for oxygen from the Nanaimo hospital, Ladysmith hospital, and local medical practitioners were given immediate attention.

CUMBERLAND.

BY

JAMES L. BROWN.

The equipment at this station consists of eleven sets of the McCaa two-hour oxygen apparatus; twelve sets of the Burrell all-service gas-masks; one Sparklet resuscitator; one H.H. inhalator; and forty self-rescuers; with sufficient supplies to maintain the equipment in service.

During the year four trained teams carried out rescue training, and twelve new men underwent the full training course and obtained certificates.

Emergency calls for oxygen by the local hospital and medical men were attended to at once, 600 cubic feet being supplied in response to the various calls.

PRINCETON.

BY

ALFRED GOULD.

The equipment at this station consists of eleven sets of the McCaa two-hour oxygen apparatus; eleven sets of the Burrell all-service gas-masks; twenty self-rescuers; one H.H. inhalator; with sufficient supplies to maintain the above in service.

During the year the Instructor from this station made a number of visits to Copper Mountain and trained nineteen men in the use of the rescue apparatus. These men took the full training course and obtained certificates of proficiency in this work. In addition to the mine-rescue work a large number of men were given training in first-aid work.

Several calls from the local hospital for oxygen treatment during the year were given immediate attention.

FERNIE.

BY

J. T. PUCKEY.

The apparatus at this station consists of six sets of the Gibbs two-hour oxygen apparatus; eleven sets of the McCaa apparatus; twelve sets of the Burrell all-service gas-masks; one II.H. inhalator; and thirty-five self-rescuers; with sufficient supplies to maintain the equipment in service. There were no emergency calls from the mines during the year. Several calls for oxygen from the local hospital were given immediate response.

On April 19th an emergency call to administer oxygen to three men who had been rendered unconscious by carbon monoxide while repairing a vat at the Fernie brewery was received and given immediate response. The men had been using a charcoal-burner in the vat. All recovered after treatment with the H.H. inhalator and artificial respiration.

INSPECTION OF COAL MINES.

VANCOUVER ISLAND INSPECTION DISTRICT.

BY

JOHN MACDONALD AND E. R. HUGHES.

Western Fuel Corp. of Canada, Ltd. J. A. Boyd, President, Montreal, Que.; H. R. Plommer, Vice-President, Vancouver, B.C.; P. S. Fagan, Secretary-Treasurer, Nanaimo, B.C.; John Hunt, General Manager, Nanaimo, B.C.

Reserve Mine, Nanaimo.—Wm. Roper, Manager; T. J. Wood, Overman. This was the only mine operated by the above company during 1939 and is situated in the Cranberry district, 5 miles south of Nanaimo. Due to the development roadways in the "Rock Slope section" encountering faults and troubled ground in the early part of the year, it was decided to retreat with the pillars and recover all available coal in this district; as the bulk of the output came from this area, it was readily seen that the ultimate life of the mine was limited unless other means of augmenting production were discovered in the meantime. Unfortunately, an outbreak of fire in the No. 1 South section necessitated the erection of seals and isolating a number of pillars, thus reducing the anticipated total recovery and cutting short the life of the mine. From the beginning of the year until December 15th, the mine worked 261 days with an average production of 502 tons per day; during the latter half of December all efforts were concentrated on recovering material, this being completed and the mine permanently abandoned on December 31st.

The first sod was turned and sinking of the Reserve shafts began in July, 1910, the Douglas seam being reached at a depth of 1,060 feet in May, 1913, when labour troubles caused a suspension of operations. The seam at the point of contact was steeply inclined and, as development-work progressed, it was found advisable to come back up the shaft and drive crosscuts to intercept the seam at points more favourable for haulage and shaft-bottom facilities.

The ventilation in general was fairly good throughout the year, the quantities passing at the last inspection in December measured as follows: Rock Slope return—10,800 cubic feet of air a minute for the use of twenty-six men and three horses; Main return—30,000 cubic feet of air a minute for the use of fifty men and five horses. Thirty-eight samples of air were taken in and around the old workings and return airways and the analyses of these, together with frequent safety-lamp tests, showed the methane content in the various returns to be well under 1 per cent. To offset the danger of coal-dust, 78,000 lb. of crushed limestone-dust was distributed over 21,000 feet of roadways. One hundred and thirty-two samples of dust were collected, all of which were above the minimum standard of incombustible content as provided for by the Coal-dust Regulations. Regular inspections were made by the miners' "gas committee" who kindly furnished us with copies of all reports. The regulation report-books required to be kept at the mine were examined at all inspections and found in order. Two serious and fifty-nine minor accidents were reported from this mine, all of these being investigated and reported on in detail.

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.; John Hunt, General Superintendent, Nanaimo, B.C.; H. Baird, Assistant General Superintendent, Cumberland, B.C.

Northfield Mine.—A. Newbury, Manager; J. Sutherland, Overman. This mine is situated 4 miles north of Nanaimo and has railway connections with the Esquimalt & Nanaimo Railway and the Western Fuel Corporation's private lines with the bunkers and loading-wharves at Nanaimo, where the coal is shipped to the different markets. A description of the surface plant and method of working has appeared in previous Annual Reports of the Minister of Mines. A main pumping-station and transformer-vault were built in the vicinity of the shaft-bottom; these are constructed of steel and

concrete, are absolutely fire-proof throughout, and house the following equipment: In the transformer-station, there are three 75-k.v.a. Westinghouse Inerteen transformers for power usage and one 5-k.v.a. Inerteen transformer to take care of the lighting circuits; equipment in the pumping-station consists of two 5-inch 4-stage, 500-I.G.P.M. Gould pumps driven by two 125-horse-power 440-volt motors. A large first-motion hoist was also installed at the top of No. 5 Incline; this main haulage roadway having been completed during the year. From the main siding at the top of this incline, a drift was driven a distance of 300 feet to intercept the No. 3 Wellington seam and a new slope driven to reach the pillars left in this area when old No. 5 mine Wellington was abandoned; the north slope in these old workings has been repaired for a distance of 1,200 feet in the direction of Diver Lake. This mine is at present operating the Nos. 3 and 4 Wellington seams, from which a total of 145,440 tons of coal was produced over a period of 252 working-days. While a portion of this output has come from skipping and repairing roadways in old No. 5 mine, the bulk of the tonnage has been produced from very low long-wall faces where the coal is undercut by Anderson-Boyes coal-cutting machines. In all roadways and face-lines approaching in the general direction of abandoned areas, a total of 7,416 feet of advance and flank drilling was done to guard against the danger of accidentally contacting submerged workings. Although frequent back-brushing and repairs are required in this mine because of the low seams at present being operated and the constant crushing exerted on the roadways, working conditions in general have been found satisfactory in the course of inspection. The ventilation has been maintained at the usual high standard, the quantities passing at the last inspection in December measured as follows:—

No. 5 Incline split: 14,400 cubic feet of air a minute for the use of forty-six men and four horses.

Slope split: 26,250 cubic feet of air a minute for the use of fifty men and one horse.

Main north return: 42,500 cubic feet of air a minute for the use of ninety-six men and five horses.

Twenty-five samples of air were taken at the testing-stations in the return airways, the analyses showing the total methane content to be well under 1 per cent. Eighty-seven samples of dust were collected off the roadways where required, all of these being well above the minimum standard of incombustible content as set forth in the Coal-dust Regulations; 30,000 lb. of rock-dust was used in this connection to treat 12,600 feet of roadways. Regular inspections have been carried out by the miners' "gas committee," who always furnished us with copies of their reports. All report-books required to be kept at the mine were examined at all inspections and found in good order. Three serious and seventy-six minor accidents occurred during the year, all of which were investigated and reported on in detail.

No. 10 Mine, South Wellington.—Wm. Frew, Manager; Jos. Wilson, Overman. This mine is situated in the Cranberry district a short distance south of old No. 5 mine and operates the Douglas seam. Beginning as a prospect in May, 1937, it joined the producing list of mines in August, 1938, and is rapidly coming to the front as one of the main producing mines in the district, operating 237 days during the present year with an average production of 441 tons per day. Important additions to the surface plant consisted of a modern Ingersoll-Rand compressor with a capacity of 1,600 cubic feet of free air a minute and driven by a 300-horse-power 2,200-volt synchronous motor. A new Lidgerwood single-drum hoist with a rope-speed of 800 feet per minute and driven by a 200-horse-power 2,200-volt wound rotor induction motor was installed and began operating in May; the controls for this hoist consist of one 2,200-volt primary panel, one 2,200-volt reversing panel, and one 460-volt accelerating panel. Certain changes and improvements were also necessary at the tipple and mine yards to cope with the rapidly increasing output. During the latter part of the year, railway connections were made with the Esquimalt & Nanaimo Railway, over which road the coal is now hauled to Nanaimo instead of by truck as formerly. A La-Del troller-type fan, made by the La-Del Conveyor & Manufacturing Company of New Philadelphia, Ohio, U.S.A., was installed and began operating on December 9th. This is a high-pressure fan,

Model H-56, 5 feet in diameter, and driven by a 50-horse-power 440-volt motor; it is equipped with adjustable pitch aluminium alloy blades and a discharge chimney 15 feet in length. While it has a total rated capacity of 120,000 cubic feet of air a minute, it is at present operating on the first adjustment at a speed of 1,070 revolutions a minute and delivering 70,000 cubic feet of air a minute under a water-gauge of 3.6 inches. This is the first of this type of fan to be installed in British Columbia.

The Main and Diagonal slopes have been developed for a further 2,000 feet, and from these main roadways several levels and headings have been driven in each district, all operations to date being confined strictly to development. Since the installation of the new fan, the ventilation has been very good throughout the workings. It is divided into two splits, the quantities passing in each at the last inspection measured as follows:—

Main Slope split: 28,600 cubic feet of air a minute for the use of thirty-five men.
Diagonal split: 39,950 cubic feet of air a minute for the use of fifty men.
Main return: 70,000 cubic feet of air a minute for the use of eighty-five men.

Twenty-four samples of air were taken at the testing-stations in the return airways, the resultant analyses showing the methane content to vary from 0.5 to 1.8 per cent. in the general body of the air-currents; 100,000 lb. of rock-dust was used in treating 27,000 feet of roadways to offset the danger of coal-dust. Seventy samples of dust were collected off these roads; all of these being above the standard of incombustible content as stipulated by the Coal-dust Regulations. Working conditions have been satisfactory throughout the year, except for a period of four months when the presence of a visible gas-cap in the general body of the air in several places in the Diagonal district resulted in a suspension of blasting in this area. Following the installation of the new fan, ventilating conditions were greatly improved and blasting was again permitted, with the proviso that the requirements of General Rule 12 of the "Coal-mines Regulation Act" were strictly adhered to at all times. During the period this mine was operating within the 500-foot barrier adjacent to old No. 5 mine, 8,000 feet of advance drilling was done as a precautionary measure to guard against accidental contact with submerged old workings. Regular inspections were made by the miners' "gas committee," who always forwarded copies of all their reports. All report-books required to be kept at the mine were examined at all inspections and found in good order. Two serious and thirty-five minor accidents occurred during the year; all of which were investigated and reported on in detail.

Beban's Mine.

G. Frater, Overman. This mine is situated in the vicinity of old Extension No. 1 mine and is operating in an isolated portion of the Wellington seam which had been left in this area by former operators. The only addition to the surface equipment during the year was a coal-bunker of 40 tons capacity, which was built at the tipple for extra storage. The main development programme was confined to the Main slope district where all places were driven to the boundary pillar adjacent to old Extension No. 3 mine. An attempt was then made to sink a small shaft through the fault, but the ground was so badly broken and cut up that noxious gases leaked through from the old mine to such an extent that this project was abandoned. While this condition prevented a direct connection being made, the breaks in the strata were sufficient to take care of the drainage from this part of the mine, which was quite a problem, especially during the wet season, when a heavy inflow of surface water has to be handled. As a precautionary measure, while the workings were advancing in the general direction of old Extension Nos. 1 and 3 mines, 16,100 feet of advance drilling was done to guard against accidental contact with the old workings.

Although market conditions caused a suspension of operations at this mine during August and September, it operated fairly steady for the balance of the year, working 203 days and producing 17,064 tons. The ventilation has been generally good throughout the year, usually averaging around 16,000 cubic feet of air a minute for the use of twenty-six men and three horses. Twenty-eight samples of air were taken in the old workings and return airways, the resultant analyses showing a slight trace of methane passing in the Main return airway. Inspections were made regularly by the

miners' "gas committee," who furnished us with copies of all their reports. All report-books required to be kept at the mine were examined frequently and found in good order.

A fatal accident occurred in this mine when a miner was instantly killed by a fall of overhanging coal while loading at the face; this coal fell without warning from a slip in the roof. In addition, four minor accidents involving loss of time were investigated and reported on in detail.

Chambers' Mine. R. H. Chambers, Operator; Chas. Webber and Thos. McCann, Firebosses. This mine is located in the vicinity of old Extension No. 1 mine, all operations being confined to the recovery of a small area of outcrop coal left by former operators. An average crew of eight men worked 194 days and produced 2,887 tons of coal. The ventilation is produced by natural means and was satisfactory at all inspections. To guard against accidental contact with old workings, 500 feet of advance drilling was done while the faces were approaching abandoned areas. All report-books required to be kept at the mine were examined at all inspections and found in order. Two minor accidents involving loss of time were investigated and reported on in detail.

Lantzville Colliery. *No. 1 Mine.*—J. A. Challoner, Overman. This mine is situated on the shore-line of the Strait of Georgia, 9 miles north of Nanaimo, and operates the Wellington seam, which is reached at a distance of 270 feet from the surface by a slope dipping 30 degrees. This mine is operated on a co-operative basis with fourteen men employed underground and five on the surface. The coal-seam in this area varies from 24 to 30 inches in thickness and is mined by hand on a modified long-wall method. The mine worked 246 days during the year and 4,342 tons of coal was produced. The ventilation is produced by a small fan which was passing 18,000 cubic feet of air a minute for the use of fourteen men at the last inspection in December. Twelve samples of air were taken in the Main return airway and the analyses of these showed a slight trace of methane. Working conditions have generally been found fairly good at all inspections. No accidents were reported from this mine during the year.

Hydesville Mine. D. Caldwell, Fireboss. This prospect slope is situated on Lot 14, Wellington Division, and is being operated by P. Carr and associates on a co-operative basis. This roadway has been driven a distance of 164 feet from the surface since operations commenced in June, with the intention of developing a coal-seam presumably tapped by a bore-hole 120 feet deep which was drilled in this area some years ago. Working conditions at this prospect have been found fairly good at all inspections. No accidents were reported from this operation during the year.

Biggs' Mine. Jas. Biggs, Operator and Fireboss. This mine is situated in the Wellington area and is operating in a limited area of outcrop coal left by former operators. It was worked 190 days during the year and produced 692 tons of coal. The ventilation is produced by natural means and has always been found sufficient for all requirements, while working conditions in general have been found fairly good at all inspections. No accidents were reported from this mine during the year.

Loudon's Mine. G. Stewart, Fireboss. This mine is located in the Wellington district and, like other small mines in this area, all operations are confined to the recovery of isolated patches of outcrop coal which were left by former operators. This mine only worked nineteen days during the year and produced 70 tons of coal. Working conditions have been found satisfactory, the ventilation being produced by natural means and sufficient for all practical purposes. No accidents were reported during the year.

Lewis' Mine. T. and G. Lewis, Operators; G. Lewis, Fireboss. Operations in this mine are confined entirely to a small area of outcrop coal left by former operators in the vicinity of the old Jingle Pot slope. Two men working 273 days during the year produced 839 tons of coal. The ventilation is produced by natural means and has been generally good throughout the workings at all

inspections and working conditions found satisfactory. No accidents were reported during the year.

Fiddick Mine. J. Stewart and associates, Operators; J. Stewart, Overman. This mine is situated in the South Wellington area and operated ninety-four days during the present year with an output of 165 tons of coal. As occasion demands ventilation is produced by a small fan and has always been satisfactory at all inspections. Working conditions in general were fairly good during the above period. The main heading was prospected for a distance of 110 feet, but the seam gradually thinned out, with the result that operations were indefinitely suspended in the latter part of the year. No accidents were reported during the year.

Big Flame Mine. A. B. Richardson, Operator; N. McIntyre, Fireboss. This mine is situated in the South Wellington area and was operated 119 days, during which period 272 tons of coal was produced. This property was originally prospected by the Richardson Bros., and later leased to Wm. Clifford, who operated it for several months before finally relinquishing his lease in August; since then it has been operated by Mr. Richardson, who has continued with further prospecting in two different levels in an effort to locate the seam in this district. Working conditions generally have been good at all inspections. No accidents were reported during the year.

Neville Prospect. H. N. Freeman and associates, Operators; H. N. Freeman, Manager. This is a prospect slope intended to develop some outcrop coal left by former operators in the vicinity of old Extension No. 2 mine. Work was begun in the latter half of December, consisting of erecting a chute, coal-bunkers, etc., preparatory to commencing work underground. Four men were engaged at this property on a co-operative arrangement.

Nos. 3 and 4 Mines, Cassidy. J. McKellar and associates, Operators; Thos. Bullen, Fireboss. Operations at these mines have been directed to the recovery of small patches of outcrop coal left in this area by former operators. The mines worked 190 days and produced 1,663 tons, with an average crew of four men engaged. The ventilation is produced by natural means and has always been found ample for the mine requirements; working conditions in general have usually been found satisfactory at all inspections. No accidents were reported during the year. During December, No. 5 slope was started from the surface to reach some coal left in this area when the old Granby No. 2 mine was abandoned. It is anticipated that a comparatively large area of outcrop coal will be available from this new opening.

No. 8 Mine, Comox Colliery.* James A. Quinn, Manager; John S. Williams, Overman; A. W. Watson and James Weir, Shiftbosses; J. W. Smith, T. Sheilds, J. Queen, M. Frame, W. Johnstone, D. Morgan, and E. Surtees, Firebosses. The mine is situated in the vicinity of the Lake Trail road, 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 is the only one being operated at the present time; it lies at a depth of 700 feet. Before opening out on the long-wall advance method of work, a shaft pillar 1,000 feet in diameter was left and only narrow openings driven through it.

The mine resumed operations on February 20th, after having been inactive since December 12th, 1938. All development-work during the year has been done on the south side of the shaft. The main South level has been driven out 2,600 feet from the shaft. An incline off this level, starting from a point 450 feet from the shaft, has been driven 1,100 feet in a westerly direction. Airways have been maintained to keep pace with this development. At a point 1,500 feet from the shaft on the main South level, a new slope has been put down a distance of 300 feet; this will be continued to develop the field to the east. There are five long-wall faces in the mine, only three of which were in operation at the end of the year; these three walls have a total length of 1,300 feet of actively exposed face-line. The average thickness of the seam is 40 inches, with a 6-inch parting of shale; top coal is overlain with 4 inches of "bone." The cutting is done in the shale band by means of Anderson-Boyes long-wall machines; Hardiax post-type punching machines are used to cut the development places. Meco-type con-

* By E. R. Hughes.

veyers are used on the walls. Compressed air is used to operate the coal-cutters and conveyers. The roof conditions are not of the best and require close attention on account of the numerous slips encountered, together with cap-rock or false roof from 4 to 6 inches in thickness, which usually comes down with the coal.

The ventilation is produced by a Keith fan, but it has been apparent for some time that this fan is inadequate for future development and, in fact, it was realized during the latter part of the year that it is not capable of handling any further demands even in the present workings. This was demonstrated effectively at the beginning of December, when a heavy outflow of methane was encountered when the No. 2 wall contacted a fault. There was insufficient air passing up this wall to adequately dilute the methane content in the general body of the air-current in this split. Attempts to increase the quantity of air passing in No. 2 split by regulating other splits resulted in only a very moderate increase. This slight increase was not sufficient to adequately dilute the methane given off, and it was found necessary to prohibit all blasting in No. 2 split; this prohibition was still in effect at the end of the year. It was also necessary for a few days to prohibit the loading and hauling of coal on No. 2 level. Though the return airways of the mine are not, as yet, very extensive and the roadways in general are of sufficient size for the ventilation requirements of each split, there is a considerable amount of resistance on the long-wall face-lines, especially during the periodical squeezes to which these walls are subject. It is becoming increasingly evident that this is a potentially gassy mine, and for this reason it is essential that the area on long-wall face-lines be kept as large as natural conditions will allow. During the latter months of the year work was being done on the erection of a new fan; it is expected that it will go into operation during the month of January, 1940. The main air-current is divided into four splits and at the time of the last inspection the quantities measured were as follows:—

No. 1 split: 18,000 cubic feet per minute for the use of twenty men and two horses.

No. 2 split: 14,025 cubic feet per minute for the use of eight men and one horse.

No. 3 split: 9,000 cubic feet per minute for the use of twenty men and one horse.

No. 4 split: 14,300 cubic feet per minute for the use of thirty-five men and two horses.

Main return: 72,450 cubic feet per minute for the use of eighty-three men and six horses.

During the year 150,500 lb. of rock-dust were used in treating the roadways and face-lines of the mine. As an additional precaution against the coal-dust hazard, all main roadways have an adequate water-supply and the coal is subjected to a spray of water as it is discharged from the conveyer-pans. Two hundred and four 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 floor, roof, and sides of the mine roadways. Sixty-six samples of mine-air were collected during the year and sent to the Bureau of Mines, Ottawa, for analysis. The average daily output of coal during the month of December was 400 tons, with 180 men employed underground and twenty-four men on the surface. The workings were inspected each month by the miners' "gas committee," who kindly furnished copies of all reports of inspection. All report-books were examined periodically and were found to be in accordance with the regulations.

Two serious accidents occurred in this mine during the year, one of which was due to a fall of rock and the other due to the unloading of a stringer from a mine-car. In addition to the above there were seventy-three minor accidents in and around the mine, involving a loss of time varying from a few days to a few weeks.

To meet the increasing demand for power underground, an Ingersoll-Rand compressor having a displacement of 750 cubic feet of air per minute was installed in November; this is in addition to the original Ingersoll-Rand compressor which has a displacement of 2,100 cubic feet of air per minute and is driven by a 750-horse-power motor.

This mine was inspected on twenty-four occasions during the year.

No. 5 Mine, Comox Colliery.*

R. B. Bonar, Manager; John Christie and Irving Morgan, Overmen; T. Eccleston and W. Herd, Shiftbosses; T. Smith, L. Cooper, A. Jones, J. Brown, R. Littler (Sr.), W. Devoy, A. Williams, C. Williams, G. Harvie, C. O'Brien, A. Sommerville, J. Vaughan, A. Dunsmore, R. Walker, and T. Robertson, 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 of the shaft and are accessible by four slopes driven from the level of the No. 1 seam. All of the output is produced from long-wall faces and their accompanying development places. At the end of the year there were six active long-wall faces, having a total length of 1,950 feet of actively exposed face-line. Due to greater concentration of production there was, during 1939, a slightly higher output per twenty-four hours from these six walls than during 1938 from ten active long-wall faces. The average daily output of coal during the month of December was 1,064 tons, with 470 men employed underground and fifty-four men on the surface.

The long-wall advance method of working as employed at this mine causes a considerable amount of squeezing and crushing, which consequently necessitates a considerable amount of repair-work being done. A great deal of experimental work was done during the year in building rock pack-walls and solid cogs on the long-wall face-lines, with the intent of securing a greater degree of roof-control and for the purpose of minimizing the effects of the periodical squeezing to which the face-lines are subjected. Results to date are promising, but further efforts in this direction are required in order to lessen the destructive effect of long-wall advance on the mine roadways. The long-wall faces are equipped with Meco-type conveyers which carry the coal from the faces to the loading-points on the levels. A gate-end loader having a 20-inch belt was installed in No. 2 right level off No. 2 West slope and although it is still in the experimental stage it has proved quite satisfactory. Top brushing is being done in this level in conjunction with the gate-end loader and the resulting rock is packed on both sides of the roadway instead of being taken out of the mine. The mine as a whole is being laid out and developed with the view of using more gate-end loaders and stowing all rock brushing in the mine. All mining is done in the rock-bands, either in the centre of the seam or underneath, by means of Anderson-Boyes coal-cutting machines which mine the coal to a depth of 6 feet. In the development places, the cutting is also done in the rock-bands by means of Hardiax post-type punching machines; compressed air is used to operate the coal-cutters and conveyers.

A 500-horse-power electric hoist situated at the top of the Main slope, carrying 5,300 feet of 1⅛-inch rope, hauls all the coal from the various districts of the mine to the top of the slope. The slope is laid with heavy steel as a precaution against derailing of trips, which of a necessity must travel at a high rate of speed on such a long haul. A man-trip is run on this slope to bring the workmen out at the end of the shift. Additional equipment installed during the year includes a 75-horse-power electric hoist and six 20-k.v.a. 440-volt transformers; these are located on the Main slope near the bottom of the new air-drift. The transformer-house near the top of No. 2 West slope was increased in size and three additional 20-k.v.a. 440-volt transformers were installed to feed an extra 75-horse-power electric motor which was added to the No. 2 West district main hoist.

Six compressors, located underground at approximately 1 mile from the shaft-bottom, supply the compressed air required for the operation of the coal-cutting machines, conveyers, air-hoists, and air-pumps.

The ventilation of this mine continues to be of paramount importance. During August the No. 1 booster-fan was changed from blowing to exhausting, and in this manner serves to ventilate the left side split of No. 2 West section. The ventilation has shown a slight improvement, for although approximately the same amount of air is obtained in the No. 2 West and the No. 5 East slope sections as last year, the Main slope section shows a definite increase as compared with a year ago. Work is being continued on improving existing airways, the most notable instance being the relining of the main return for No. 5 landing to No. 4 level, a distance of 800 feet. This por-

* By E. R. Hughes.

tion of the return airway has been lined with steel-rail stringers and the old centre posts removed; when completed this should materially help the ventilation by reducing the friction in this most important part of the return airway. Two abandoned long-wall faces and several hundred feet of approaching roadways in the No. 2 West section were sealed off during December. This part of the mine was worked by the long-wall advance method, so that the seals could not be built in solid ground; whether the seals will, under these circumstances, be effective, remains to be seen. Due to the gassy nature of the mine, old abandoned roadways must of a necessity be either adequately ventilated or effectively isolated. The type of stopping now being erected to seal off abandoned parts is a considerable improvement on those erected in the past, and though they are more costly to build it is hoped that they will solve the problem of effective isolation. These new stoppings consist, first of all, of a 6-foot cog built solidly, then 6 feet of solid rock-packing, and finally a 12-inch wood-block stopping. This type of stopping was used to isolate the two long-wall faces already mentioned, a row of several similar stoppings was also built to isolate a portion of the abandoned No. 3 West section. It is hoped that this extensive sealing will have a beneficial effect in reducing the methane content of some of the return airways of the mine.

Rock-dust for the purpose of combating the coal-dust hazard is regularly applied. Roadways to the extent of 54,000 feet in length and face-lines totalling 235,000 feet in length were so treated, using a total amount of 485,700 lb. of rock-dust; where compressed air is available, rock-dust is distributed by an air-blower and in other places by hand. The coal coming off the conveyers at the bottom of the walls is sprayed with water and all Main slope trips are sprayed with water as they leave the different partings. Samples of mine-dust were collected each month from the different roadways as required and a total of 520 samples of this dust were analysed. Of these, only nine samples failed to be in keeping with the standard set by the Coal-dust Regulations; in these instances the roadways were again treated with rock-dust and further samples taken.

One hundred and five samples of mine-air were collected during the year and sent to the Bureau of Mines, Ottawa, for analysis; the resultant analysis providing a fund of useful information in checking on the quantities of methane given off from the faces and passing along the various returns. In addition to this, the analyses provide a record indicative of the possible future trend of methane emission for either the whole mine or for each separate split. An M.S.A. methane tester was purchased by the Canadian Collieries (D.), Ltd., and is used in conjunction with the flame safety-lamp to enable officials to check methane percentages in the various returns and the results are put on a chart in the mine office. In the live workings the air-current is divided into three main splits, and at the time of the last inspection the quantities measured were as follows:—

Main slope: 54,000 cubic feet per minute for the use of sixty-four men and three horses.

No. 2 West: 42,420 cubic feet per minute for the use of fifty men and three horses.

No. 5 East: 37,200 cubic feet per minute for the use of thirty-six men and four horses.

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

Nine serious accidents occurred in this mine during the year; four of which were due to haulage and the other five were due to falls of coal or rock. There were also 185 minor accidents which caused a loss of time varying from a few days to several weeks.

This mine was inspected on eighty occasions during the year.

NICOLA-PRINCETON INSPECTION DISTRICT.

BY

JOHN G. BIGGS.

The following coal companies operated in this district during 1939: The Coalmont Collieries, Limited; Middlesboro Collieries, Limited; Princeton Tulameen Coal Company, Limited; Granby Consolidated Mining, Smelting, and Power Company, Limited; and the Hat Creek Colliery.

Coalmont Collieries, Ltd.

Blake M. Wilson, President, Vancouver, B.C.; W. H. Malkin, Vice-President, Vancouver, B.C.; R. A. C. Douglas, Secretary, Vancouver, B.C.; D. McLeod, Treasurer, Vancouver, B.C.; George Murray, Superintendent, Blakeburn, B.C. The mining operations of this company are conducted at Blakeburn, B.C., on the North Fork of Granite Creek, at an elevation of 1,600 feet above and 4 miles by road from Coalmont, where the mine-tipple, screening plant, and power plant are located on a spur off the main line of the Kettle Valley Railway. The coal is transported from the mine over the mountain to the mine-tipple at Coalmont by means of an aerial tramway. The surface plant has been described in Annual Reports of the Minister of Mines.

No. 4 Mine.—No. 4 mine was permanently abandoned, due to exhaustion of the area, during the year.

No. 5 Mine.—Robert Murray, Overman; W. Valentine, A. McWhirter, F. Miller, F. Bond, and T. Bryden, Firebosses. This mine was developed by main and counter slopes driven from the outcrop on a pitch of 20 degrees for a distance of 2,100 feet, with levels off right and left at 500-foot intervals. The lower part of the area has been depleted, and during the year mining was limited to the extraction of pillars within 1,000 feet from the portal.

Chutes are used to convey the coal from the working-faces to the cars on the main levels. The roof is weak and requires more timbering than the average mine. Ventilation is produced by a 5-foot diameter Jeffrey Aerovane fan that provides 16,000 cubic feet of air per minute, which is well conducted through the workings.

During the year air-driven percussive cutting-machines were introduced, but have not proved successful with the conditions obtaining and are being discarded.

All underground employees use the Edison approved electric cap-lamp, and the Wolf flame safety-lamp is used by officials for testing for gas. No trace of methane was found during the year.

There is a resident physician at the mine and a well-appointed surgery, in addition to a qualified first-aid man to deal with emergencies.

One hundred and sixty men were employed at this mine at the end of the year. General conditions were found to be satisfactory at the different inspections.

Middlesboro Collieries, Ltd.

His Honour E. W. Hamber, President, Vancouver, B.C.; E. McDonald, Secretary, Vancouver, B.C.; Robert Fairfoull, Manager, Merritt, B.C. This colliery is situated 1 mile west of the city of Merritt and accessible by a branch line of the Kettle Valley Railway. Full descriptions of the surface and preparation plant have been published in Annual Reports of the Minister of Mines. Two mines, Nos. 2 and 3, are in operation.

Compressed air is used for the operation of mine hoists, pumps, and mining machines, and owing to the high inclination of the coal-seams raises are driven from the main haulage-levels through to the surface for mine ventilation.

No. 3 North.—A. E. Allen, Overman; G. C. Corbett, Fireboss. This mine is situated a short distance east of the portal of No. 2 mine and has been developed from the surface outcrop by a main slope that follows the inclination of the seam for a distance of 700 feet to No. 3 level at the foot of the coal-basin, and this level has been extended from each side of the slope a distance of 450 feet, with headings driven off the level to the surface that provide the ventilation of this mine.

The mine is small, the seam averages from 5 to 6 feet in thickness, and owing to its pitch the coal is transported from the headings to the main levels by chutes, where it is loaded into the mine-cars. Ventilation is produced naturally and is fairly good.

The mine is free from any trace of methane. The working-places were well timbered and a sufficient supply of suitable timber provided at all times for the use of the miners. The roads were well timbered and in good condition, and analysis of dust samples taken from the roadways show them to be in conformation with the requirements of the Coal-dust Regulations. Sixteen men are employed in this mine.

No. 2 South.—James Fairfoull, Overman; William Ewart, Thomas Rowbottom, and Andrew Dickie, Firebosses. This is the largest operation of the Middlesboro Collieries and has been developed by a main haulage-level driven from the surface for a distance of 5,000 feet. The seam is from 5 to 10 feet in thickness and has a high angle of inclination. Chute headings are driven from the main adit-level to the surface and materially assist in the general ventilation of the mine; while haulage slopes are driven across the pitch of the seam from the main adit-level to the foot of the basin, a distance of from 200 to 300 feet. The mine is operated on the usual pillar-and-stall system. At the last inspection in December, ventilation measured showed 19,000 cubic feet of air a minute passing into this mine for the use of forty-three men; temperature, 43° Fahrenheit; barometer, 27.49 inches. The air was fairly well conducted around the working-faces and the mine free from any trace of gas.

The working-places are well timbered and a sufficient supply of suitable timber is provided for the miners. The roads are well timbered and in good condition, and analysis of material taken from them showed them to be in conformation with the requirements of the Coal-dust Regulations.

The coal is generally mined by machines of the "post-puncher" type and the use of explosives is very limited, with a view to improving the grade of coal produced as much as possible. Approved electric head-lamps are used by the employees underground and flame safety-lamps are used by the mine officials for inspection purposes. Copies of the "Coal-mines Regulation Act" and Special Rules are well posted at this colliery. There are ninety-five men employed, fifty-nine underground and thirty-six on the surface.

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

N. L. Amster, President, New York; A. S. Baillie, Vice-President, Copper Mountain, B.C.; B. E. Perks, Secretary, Vancouver, B.C.; A. W. Seaton, Treasurer, Vancouver, B.C.; W. R. Lindsay, Superintendent, Allenby, B.C.; Thomas M. Wilson, Manager, Princeton, B.C.

This colliery is situated in the Bromley Creek area of the Princeton coal-basin, 6 miles from Princeton, and accessible by a good road that branches off the Hope–Princeton Highway. The coal is used for the operation of the large central steam-driven electric power plant located in Princeton at the side of the Similkameen River, and the electric power transmitted to the mine at Copper Mountain and the concentrator at Allenby for the operation of these plants.

The coal is transported from the screening plant at the coal mines by trucks having a capacity of 10 tons and dumped into large coal-bins situated on the north bank of the Similkameen River, 2 miles west of Princeton, where it is loaded into buckets and transported across the river to the large coal-bunkers at the central power plant by an aerial tramway. Electric power is used at the coal mines for operating a large two-stage belt-driven air-compressor, slope-hoist, mine-fan, and screening plant; also general lighting purposes.

No. 1 Mine.—A. McKendrick, Overman; A. Hilton, T. Lloyd, G. Gray, T. Cunliffe, and D. Jones, Firebosses. This coal-seam has an average thickness of from 5 to 6½ feet and a general pitch east of 25 degrees. The mine-workings are developed from two slopes known as the North and South diagonals. The North slope has reached a distance of 1,500 feet from the portal and the South slope a distance of 1,000 feet; the operations are conducted in the usual pillar-and-stall method and the roads driven 10 to 12 feet in width. There are four levels in operation on the north side of the mine and three levels on the south side. The work in the upper levels consists of pillar-extraction, and the lower levels are under development. Owing to the high inclination of the seam, chutes are in general use to transport the coal from the working-faces to the main levels.

Ventilation is produced by an electrically-driven mine-fan situated near the portal of the counter-slope, and during the last visit of inspection ventilation measured showed 16,000 cubic feet of air a minute passing into this mine for the use of forty-three men; the mine was free from methane and the air well conducted around the working-faces. The working-places are well timbered and a good supply of suitable timber is provided for the use of the miners. The roads were well timbered and in fairly good condition and, being wet, were free from dangerous coal-dust. The coal is mined by machines of the "post-puncher" type; the use of explosives is avoided as much as possible, with a view to producing a large percentage of the larger size coal.

No. 2 Mine.—S. McFagan, Fireboss. This is a new coal-mining operation commenced during the present year and located 800 feet east of the portal of No. 1 mine. This mine has been developed from the surface outcrop by an adit-level driven in the seam for a distance of 400 feet from the portal, at which point a diagonal slope has been driven to the dip a distance of 300 feet. The seam is 6½ feet in thickness and has a general pitch of 20 degrees; a heading has been driven through to the surface from the main level for the purpose of ventilation.

Edison electric head-lamps are used by the employees underground and flame safety-lamps of the Wolf type are used by the mine officials for inspection purposes. The General and Special Rules are well posted at these mines. There are 110 men employed.

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 and Robert Gourley, Firebosses. This mine is situated 1 mile west of Princeton. It was opened during 1935 and developed from the surface outcrop by a 17-degree haulage-slope that follows the pitch of the seam for a distance of 600 feet from the portal; there are four levels on each side. The mine is operated on the usual pillar-and-stall system and the working-places are 12 feet in width. The coal is mined by compressed-air machines of the "post-puncher" type, and is hauled from the mine by a 10-ton motor-truck to a loading-chute situated on the Kettle Valley Railway in Princeton; the local trade is supplied by the truck-drivers.

During the present year a 4-foot mine-fan has been installed at the portal of the return airway at this mine, and at the last inspection ventilation measured 30,000 cubic feet of air a minute passing into the mine for the use of twenty-five men; the air was well conducted around the working-faces and the mine was free from any trace of methane. The working-places are well timbered and a sufficient supply of suitable timber is provided for the use of the miners. The roads are well timbered and in good condition and, being wet, were free from dangerous coal-dust.

Power for the operation of this coal mine is provided by two Diesel units, the larger being used for the operation of a belt-driven, two-stage air-compressor having a capacity of 500 feet of free air a minute and the smaller unit and electric generator used for operating a mine-pump, slope-hoist, screening plant, and for lighting purposes. Edison electric head-lamps are used by the employees underground and flame safety-lamps of the Wolf type by the officials for inspection purposes. The General and the Special Rules are posted at the surface. This operation depends on local business and is seasonable; during the latter part of the year fifty men were employed.

Hat Creek Coal Mine.—L. D. Leonard, Superintendent. This is a small coal-mining operation situated in the Upper Hat Creek district, 24 miles north of Ashcroft. The workings consist of a crosscut through a large lignite deposit and a ventilation raise to the surface. A small amount of pillar-extraction has been done; during the year spontaneous combustion was discovered in this extracted area and same was sealed off; work was very intermittent and only a small tonnage was produced.

NORTHERN INSPECTION DISTRICT.

BY

CHARLES GRAHAM.

Bulkley Valley Collieries.

F. M. Dockrill, lessee and operator; A. H. Dockrill, Fireboss. The mine is situated 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 limited to the area served by the Canadian National Railways between Prince Rupert and McBride. Production for the year was 5,053 tons, an increase of 1,164 tons over 1938. There is little change in the underground conditions. The main slope has been advanced and some new places turned off. Only three working-places are required, working single shift, to take care of the market.

Methane gas was seen only once during the year in places which were temporarily abandoned; 4,000 cubic feet of air is furnished for the use of eight men. An average of twelve men are employed. Conditions generally were good.

Edgemount Development Syndicate.—This syndicate leased the Aveling property about 5 miles from Telkwa on the east bank of the Telkwa River, to Wilson and Blythman. These men mined 95 tons of domestic grade coal from the Betty seam and 18 tons of blacksmith coal from a small seam underlying the Betty. All coal produced was sold locally.

TATLOW AREA.

Several small seams of coal outcrop on the south bank of the Bulkley River about 4 miles east of Smithers. J. M. Wilson did some prospecting during the summer and in November commenced work on the construction of a small bunker. A gasoline-driven hoist was installed and a slope started on the No. 2 seam. The slope is down about 100 feet, showing the following section at the face: Shale roof; coal, 4 inches; shale, 7 inches; coal, 10 inches; shale floor.

The air-compressor from the anthracite mine, Glacier Creek, was moved to Tatlow and installed. No coal was shipped.

EAST KOOTENAY INSPECTION DISTRICT.

BY

H. E. MIARD.

The only active operations in the Crowsnest district were those of the Crow's Nest Pass Coal Company, Limited, at Coal Creek and Michel. At the latter place a development which may assume considerable importance with the passage of time and shall perhaps mark the beginning of a new era in the history of the coal-mining industry, in this part of the Province, was the construction of ten Curran-Knowles by-products coke-ovens. The plant in question is described briefly in the part of this report dealing with the Michel colliery.

Accidents entailing injuries to 129 employees were investigated in the course of the year, nineteen having occurred on the surface and 110 underground. Of these mishaps, twenty-two took place at Coal Creek and 107 at Michel. Classifying them in order of severity, we find that ten caused losses of time ranging between three and six days, eighty-six were responsible for disablement extending over periods varying from seven days to a month, and the effects of the remaining thirty-three were sufficiently serious to bring about losses of time exceeding thirty days in each case. On an occupational basis, the miners, who constitute 58.73 per cent. of the total number of employees, sustained 66.3 per cent. of the entire number of accidents. The proportion of accidents which could have been prevented through the exercise of ordinary caution remains too high.

As appropriately stated by J. M. Wolverton, Safety Engineer at the *Sullivan* mine, any local campaign for the promotion of industrial safety divides itself into three

periods. During the first, accidents are accepted fatalistically until it becomes glaringly obvious that some drastic measures have to be taken in order to eliminate this most costly of all forms of waste. In the second, the length of which varies with the skill and energy displayed by the champions of the cause and the receptivity of the others, the general apathy wanes and, finally, it is generally admitted that safety and real efficiency are inseparable; while the third is that in which both employer and employees fully understand that accidents can and must be anticipated and that dilatoriness in the application of preventive measures is the worst form of mismanagement. The fact that many accidents of the most common kind—head, finger, and toe injuries—can be avoided through the wearing of protective hats, gloves, and hard-toed boots, is being increasingly recognized, which is a hopeful sign.

There were no fatal accidents in or around the coal mines of the district during the year.

Crow's Nest Pass Coal Co., Ltd.

Hartley P. Wilson, President and General Manager; Thomas Balmer, Seattle, Wash., U.S.A., Vice-President; J. S. Irvine, Fernie, Secretary; A. A. Klauer, Fernie, Treasurer; William C. Whittaker, Mine Manager, Coal Creek; and Bernard Caufield, Mine Manager, Michel.

Coal Creek Colliery, No. 1 East Mine.—William C. Whittaker, Manager; John Caufield, Overman; Carmichael McNay, Shiftboss. This is the only mine at present operated at the colliery. The bumps encountered in the workings situated on the south side of the Coal Creek gulch have been frequently mentioned in these reports and, while some progress has undoubtedly been made towards a solution, they do still constitute the most harassing feature of the operations, from the managerial point of view. The problem is extremely complex, but the following points may be admitted " a priori ":—

Stresses acting externally and in any direction upon a mass of strata so confined that it is unable to yield immediately, either through fracturing, which implies an increase in volume, or through flowage, lead to the formation of internal stresses of equal intensity, but acting in the opposite direction, within the mass considered.

The internal forces thus set up may, in some cases, impart to the mass in which they are retained definite explosive characteristics, as proved by the outbursts of coal with which we are but too well acquainted.

If a rearrangement of such internal stresses, destroying the equilibrium existing momentarily within the mass, becomes possible, through fracturing of one of the strata involved, movement along a plane of fracture already established, or merely a decrease of the resistance offered in any direction, an elastic wave, of intensity corresponding to the magnitude of the stresses involved, may be initiated should the readjustment occur suddenly; the result being what is commonly known as a " bump." The violence of the ensuing shock varies with the importance of the internal stresses released, which, in turn, depends in some cases at least upon the length of time over which the readjustment may have been deferred.

The point of actual release of stresses may not coincide closely with that at which the destructive effects of " roadway " bumps are observed, the location of these being apparently governed by the amount of resistance to the passage of the resulting elastic wave offered by certain sections of the workings. Such resistance is undoubtedly presented by long, unbroken pillars, chiefly those paralleling the strike of the seam, and by large blocks of solid coal left in the midst of areas from which the coal has been partially extracted. This was the conclusion reached by the Commission appointed to investigate the disastrous phenomena of this kind experienced in the Fuveau district, in southern France.

Almost every important bump passes through three separate and often distinct phases. First, a wave-like ground tremor, then the main shock, as result of which pillars are crushed and floor material is forced up in the roadways, and, finally, an " end " phase often accompanied by minor shocks and audible roof-movements, which may last for several days, or even two or three weeks. The phases may take place concurrently, at least as far as perception by the human senses is concerned.

In the case of " face " bumps, the stresses released appear to have been stored in the coal-seam itself and in the immediate roof and floor. " Roadway " bumps occur at

some distance from the advancing faces, are much more violent and destructive than the face bumps, and evidently result from the release of stresses stored in an important zone of surrounding strata. A "live" load carried on the roadways, by which is meant the set of conditions under which the shale roof and floor flow out steadily into the openings from over or under the pillars—in other words, a mild form of creep—seem to afford a gradual release on stresses and may therefore indicate comparative safety on that score. Coal resists deformation more obstinately than do the shales usually found above and below [illegible]

The earth-waves accompanying bumps are often perceived on the surface but, occasionally, strong tremors felt there pass unnoticed underground. In at least one instance, the time relation between the occurrence of such surface shocks and that of a bump in some of the most distant workings was established with a considerable degree of precision by C. Stubbs, then manager at Coal Creek. On that occasion (February 8th, 1939) three strong tremors, separated by intervals of seven, and one and a half minutes, respectively, were felt and caused some alarm on the surface. Ninety seconds later a sharp bump, causing little actual damage, shook the upper part of the 26 West district, about 10,000 feet away from the portal. Some of the men scattered along the main entry felt shocks of varying intensity, but others did not perceive anything unusual. Two significant facts were brought to light in this case; i.e., the surface tremors preceded the bump by a considerable interval of time, and the shocks felt by the different observers were separate phenomena, for no earth-wave known would travel at a speed of little more than 100 feet per second.

There were four roadway bumps during the year, each causing more or less damage in the form of heaved-up floor, falls of roof-shale, and destruction of doors and stoppings. All took place in the 26 West district, short distances apart and comparatively near the live workings. They occurred on February 13th (under a thickness of cover of only 950 feet), June 16th, June 22nd, and August 10th. That of June 16th was remarkable in view of the fact that it failed to bring about any perceptible disturbance of the tracks. In the last case, one of a pair of places, paralleling the incline and driven for the purpose of forestalling the same bump, had advanced somewhat beyond the other, thus possibly inducing a "trigger effect" but, no doubt, the work already done exerted a moderating influence upon the intensity of the shock. Three miners, thrown off coal-benches on which they were working at the time, sustained more or less serious injuries. It is interesting to note that an American seismologist has recently advanced the theory that, in some circumstances, a "trigger effect" may be the time-determining factor in the occurrence of earthquakes; and it has long been thought here that certain earth-waves may exert an influence of the same kind in the case of bumps.

The *modus operandi* of accumulated ground stresses has been considered somewhat exhaustively in order to make clear the principle underlying not only the preventive measures adopted recently, but the present method of working as well. The latter has been described at some length in the report for the year 1938 and need not be discussed again. However, it may be pointed out that a cardinal principle of all methods of working intended to provide release for pent-up ground stresses—i.e., that all faces must advance in the same general direction—cannot be rigidly followed at the present time owing to the disposition of the workings.

Our present knowledge of the subject has progressed to the point at which the probable locality of future roadway bumps can be surmised with a reasonable degree of accuracy, but the time element remains unknown and probably always will retain its elusiveness. The preventive measures adopted consist in offering relief to the accumulated stresses elsewhere than in the places which it is intended to preserve. This is achieved through the driving of sacrifice roadways, paralleling those to be protected, thus weakening the outer edge of long pillars and providing space for the expansion of the more plastic measure. Such roadways have now been completed on the upper side of the main counter entry, immediately inby the area affected by the bump of September 20th, 1938, and on the south side of the 26 West incline. The fact that important stresses were released through the driving of both places could not be

doubted, ample proof of it being offered by the rapid heaving of the [illegible] floor and numerous small face bumps. In one case, it was found necessary to decrease the rate of advance, over the middle third of the distance covered, owing to extraordinarily active spalling and an abnormally high liberation of methane. Another sacrifice roadway will soon be completed, in part at least, on the south side of the main entry.

The maintenance of the inclines is rather onerous, the rapid heaving of the floor rendering repeated brushing of these roadways necessary, without it being possible to keep them in absolutely satisfactory condition over their entire length at any time.

As a considerable amount of dust is liberated in the course of mining operations, both at working-faces and at conveyer loading-points, frequent applications of inert dust to the roadways are necessary, more than 150,000 lb. of such material having been used in the course of the year for this purpose. The results of a small-scale experiment with calcium chloride are not yet known. From the admittedly incomplete data at present available on the subject, it would appear that the composition of the very fine and really dangerous coal-dust differs somewhat from that of the bulk of the seam, containing less ash and apparently a greater percentage of the volatile constituents.

The coal is mined with compressed-air picks and, in all except level development places, is loaded on conveyers. But for an occasional shot in roof-rock, no explosives are used and the total consumption of Polar Cxlite for the year amounted only to 1½ lb.

A considerable amount of methane is given off, this amounting to an average of 1,250,000 cubic feet per twenty-four hours and, in some parts of the mine, the flow of gas continues unabated for years after active operations have been suspended. Effective ventilation is therefore essential, particularly in the case of narrow work. On the few occasions on which the presence of methane in inflammable proportions was observed in working-places, it was found that some disarrangement of the bratticing was responsible and the objectionable conditions were speedily remedied. At the time of the last inspection, the total quantity of air circulating through the mine amounted to 74,300 cubic feet per minute, of which 19,300 passed through the 26 West district for the use of thirty men and three horses, and 21,200 to the 28 West section, for thirty-five men and five horses. The mine is ventilated by a 7- by 11-foot double-inlet Sirocco fan, driven by a 300-horse-power induction motor and maintaining a water-gauge of 2 inches.

Michel Colliery.—Bernard Caufield, Manager; William Chapman, Manager *pro tem.;* Walter McKay, Harry Adams, and Jas. Littler, Overmen. On October 23rd Mr. Caufield, while attending to his duties on the surface, sustained injuries sufficiently serious to incapacitate him for some time and Mr. Chapman, then overman in No. 3 mine, was placed temporarily in charge of the operations.

The outstanding addition to the surface plant was the battery of Curran-Knowles by-products coke-ovens put into operation towards the end of September. This installation, designed and erected by the Coal Carbonizing Company, of St. Louis, Mo., consists of ten ovens with a total capacity of 50 to 95 tons of coke per day (61 to 116 tons of coal), this being adjusted according to the kind of coke made and the demands of the trade. Construction-work began in April, as soon as weather conditions had become favourable, and the structure was ready for the preliminary heating on July 26th. The first oven was charged on September 6th and the last on the 28th, the plant being then operated at full capacity.

Each oven is 33¼ feet long, 8½ feet wide, and 42 inches high to the crown of the segmental arch forming the roof, in which two rows of four loading-funnels and the connection to the main gas-flue are provided. A door at each end permits the operation of the pusher, which is also used to rake the load after it has been dropped in the oven. The floor alone is heated, this feature eliminating one of the difficulties often experienced in the operation of retort ovens equipped with lateral flues. The gas, exhausted under a negative pressure varying between 5 and 7 inches of water, passes through the tar separators and is then stored in a gasometer from which it is drawn as required. Preheated air for combustion is supplied at a pressure ranging between 10 and 12 lb. per square foot, and the direction of the stream of burning gas is reversed automatically every 30 minutes. By varying the temperature, which is ascertained

by means of an optical pyrometer, and the length of treatment, coke meeting the different requirements of the domestic, foundry, and smelter trades can be produced at will.

The plant includes also a quenching installation, coke and sludge conveyers, a water-cooling tower, tar drying and storage tanks, and a separate coal-bin. Gas compressed to 125 lb. per square inch is used to drive a part of the machinery, this including the pusher and the charging-lorry. The power required for the operation of the plant is supplied by nine Buick internal-combustion engines (four spare ones being kept on hand in addition for instant replacement in case of breakdowns), and fifteen small a.c. motors with an aggregate horse-power of 140.

An average of 9 gallons of tar and 8,500 cubic feet of gas is recovered per ton of coal treated. A large percentage of the total gas produced, the calorific value of which varies between 460 and 520 B.T.U.'s per cubic foot, is required to heat the ovens, but the considerable surplus available is burnt under the colliery boilers, as much as 400,000 cubic feet per day having been utilized in this manner when the plant was operated at its maximum capacity. The tar has a high phenol rating and can be used directly as a timber preservative.

In addition, 225 ovens of the bee-hive type were operated throughout the year.

A 3,000-cubic-foot electrically driven, compound, low-pressure Bellis & Morcom air-compressor, brought from Coal Creek, was put in operation on August 14th, and a sludge dewatering screen was added to the cleaning plant.

No. 1 Mine.—Walter McKay and Jas. Littler, Overmen. This includes the greater part of the active workings, comprising those of Nos. 1 and "A" seams West, "B" seam, and Nos. 1 and "A" seams South, the last two forming the so-called Rock Tunnels section opened in 1938 through the extension of the cross-measures main adits, from which the lower section of "B" seam was also reached through a crosscut.

Mining operations were suspended in No. 1 seam West at the end of the year and, since then, all work there has been limited to the recovery of equipment, in which a crew of seven is engaged. A number of difficulties combined to render the operation unprofitable, among which the chief place may be assigned to the frail nature of the roof, which the extraction of pillars in the underlying No. 3 seam did not tend to improve; costly handling of the output, despite complete mechanization, and the presence of a considerable amount of refuse material in the coal as mined, all of which together constituted a problem defying solution. Late in the fall, separate ventilation had been provided for these workings by means of a single inlet 42-inch Sirocco fan, installed at an opening to the surface previously used as intake. When active operations were suspended, it was decided to use this equipment as an adjuvant to the main fan, thus relieving the latter of some of its load. This was done by re-establishing the former connection with the main return and allowing the new fan to draw air from it instead of from the main intake, an arrangement which appears to have worked very satisfactorily.

After being suspended for several months, development was resumed in "A" seam West and has been prosecuted vigorously throughout the remainder of the year. Up to the present time, all work has been limited to the driving of haulage-roads, airways and roadways delimiting panels, no systematic long-face extraction having yet been attempted. The seam presents features lending verisimilitude to the assumption that it corresponds to No. 1 in the Coal Creek series. It is the only one giving off methane in considerable quantity among those at present worked at Michel and the ventilation requires particular attention. No explosives are used. The coal is mined with compressed-air picks exclusively and, when development has progressed sufficiently, it is carried away by conveyers delivering it to a belt from which it is loaded in cars, on the main level. The roof is fairly strong in some parts of the workings, but, in the area recently penetrated at the western end of the section, it has been found rather weak. In the course of an inspection, methane in inflammable or nearly inflammable proportions was found at the face of three places, this evidently being due to the excessive length of bratticing carried at the time. The driving of a new airway, completed a short time thereafter, brought about a considerable improvement in the general conditions prevailing in this respect. The quantity of air circulating amounts to 20,500 cubic feet per minute for the use of fifty-three men and three horses.

A certain percentage of the coal from "B" seam being required in the mixture supplied to the ovens in order to maintain the quality of the coke, operations there are conducted with extreme activity, the comparatively small height of the coal somewhat complicating the task of maintaining the development-work sufficiently far ahead of the extraction. Otherwise, the chief difficulty encountered lies in the nature of the roof, in which the irregularities known to miners as "pot-holes" are extraordinarily numerous. However, the men working under it have developed the ability to control it with a surprising degree of success, although accidents due to falls of ground are still more frequent than one would wish to see them. In one section of the 4 West entry district, these unfavourable conditions were further complicated through the incidence of a series of small faults which rendered the usually weak roof still more treacherous.

The coal is mined with radial machines in the narrow work and with Anderson-Boyes chain coal-cutters at the long-faces. It has to be blasted in the former case, but falls behind the machine in the latter, in which all that is necessary is an occasional short hole into a block which has failed to break into pieces of conveniently handled size.

In previous years, some difficulty had been met in supplying an adequate volume of air to these workings, owing to the fact that the natural ventilation, due to important differences between the surface and underground temperatures, opposed the action of the fan to an appreciable extent. A remedy for this state of affairs was provided through the installation of a 4-foot Sheldon fan, driven by a 20-horse-power induction motor (the latter operated at only 20 per cent. of its rated capacity) at the separate intake serving the section, it being intended to act as a booster. At the time of the last inspection, 17,500 cubic feet of air per minute were supplied for the use of fifty men and five horses.

In the Rock Tunnels section, all operations were limited to development-work in Nos. 1 and "A" seams South, this consisting in each case in the driving of a main and counter entry. In this part of the mine, 10,900 cubic feet of air per minute were provided for the use of twelve men and two horses.

No. 3 Mine.—Harry Adams, Overman. The workings of No. 3 mine are divided into two widely separated sections, known as No. 4 and No. 12 Inclines districts respectively. The latter section is situated beyond a fault crossed by two rock tunnels, and its chief characteristic, beside the excellent quality of the coal, is that it presents much stronger dips than those met in any other part of the colliery at present in operation. All work is limited to the extraction of pillars. Where the coal is not mined with compressed-air picks it is undercut with radial machines, the greater part of the blasting being done on the night shift. The coal is carried away from the faces through chutes, or, in some cases, through a combination of chutes and conveyers, to the points at which it is loaded in cars. The transportation of supplies to the working-faces requires some ingenuity. The ventilation of this section has always presented some difficulty, the quantity circulating being comparatively small, but the volume of methane given off is inconsiderable and the percentage of it found in the return air never exceeded 0.3 per cent. A part of the return airway is in difficult ground and its maintenance is rather onerous.

The No. 4 Incline district was reopened in 1938, after having been abandoned for a number of years, in order to recover the pillars left there. Considerable work is entailed in the maintenance of roadways which, in most cases, are skipping former openings, or, from time to time, have to cross old places encumbered by heavy falls of roof. The ventilation is fairly good and the temperature of the workings, which was rather high when the section was re-entered, has been brought down to a normal reading.

The total volume of air supplied to the two districts amounted to 21,000 cubic feet per minute for the use of fifty-four men and seven horses.

No. 3 East Mine.—This part of the colliery has been sealed off for some years because of fire. Samples of the mixture of gases filling the area in question were taken at regular intervals and showed satisfactory conditions; i.e., low oxygen content (3 per cent. or less) and almost complete absence of combustible gases, only a trace of hydrogen having been found occasionally.

In the course of the year, 229 tons of limestone-dust were purchased for application to the roadways and working-places of the colliery in order to neutralize the coal-dust produced in the course of mining operations. Owing probably to the low temperature prevailing underground, the intake air loses moisture readily in summer and roof and ribs become decidedly damp, which tends to reduce the efficacy of the rock-dust at some points. This difficulty has not been experienced at Coal Creek.

Under the new arrangement of the general ventilation, the total quantity of air supplied to all the mines amounted to 140,600 cubic feet per minute, of which 107,100 passed through the main fan, which maintains a water-gauge of 2.9 inches, and 33,500 passed through No. 1 mine-fan under a water-gauge of 1.4 inches.

The total quantity of explosives used in the course of the year amounted to 41,212 lb., this consisting of 39,552 lb. of Polar Monobel No. 4 and 1,660 lb. of Polar Cxlite No. 2. Only one out of 57,850 shots missfired, which does undoubtedly constitute a remarkable performance.

INSPECTION OF METALLIFEROUS MINES.

BY

JAMES DICKSON.

PRODUCTION.

The output from the metalliferous mines for 1939 was 7,210,676 tons, a decrease of 166,415 tons from the tonnage of 1938. This tonnage was produced from 217 mines, of which ninety-nine produced 100 tons or more.

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

There were fourteen fatal accidents in and around the metalliferous mines and concentrators in 1939, being an increase of two over the figures for 1938. In addition to this, there were eight fatal accidents reported, as follows: Two prospectors, four surface placer-workers, and two men drowned. Of the two men drowned, one was trying to secure a line on a scow during a storm and one was drowned in the Fraser River at a placer property. There were no fatalities in the quarries of the Province.

There were 5,955 persons under and above ground in the metalliferous mines, and 996 persons in the concentrators in 1939. The ratio of fatal accidents per 1,000 persons employed was 2.01.

The tonnage mined per fatal accident during 1939 was 515,048 tons, compared with 614,757 tons during 1938. The tonnage mined per fatal accident during the last ten-year period was 384,761 tons.

The following table shows the mines at which fatal accidents occurred during 1939 and the comparative figures for 1938:—

Mining Division.	Mine.	No. of Accidents.	
		1939.	1938.
Alberni	Kavilah	1	—
Zeballos	Privateer	1	—
Vancouver	Britannia	5	3
Lillooet	Bralorne	1	—
Lillooet	Pioneer	—	1
Clinton	Vidette	1	—
Cariboo	Columbia Tungstens	1	—
Cariboo	Williams Creek	—	1
Similkameen	Copper Mountain	1	1
Osoyoos	Hedley Mascot	—	2
Nelson	Yankee Girl	1	—
Nelson	Ymir Consolidated	—	1
Greenwood	Old Granby Mine	1	—
Rossland	Le Roi	—	1
Fort Steele	Sullivan	1	1
Atlin	Polaris Taku	—	1
Totals		14	12

The following table shows the cause of, the percentage to the whole of the fatal accidents, and comparative figures for 1938:—

Cause.	1939.		1938.	
	No.	Percentage.	No.	Percentage.
By falling down chutes or shafts	1	7.14	4	33.33
Haulage	2	14.29	..	.....
By falls of ground	5	35.71	5	41.67
Shaft accidents	2	14.29	3	25.00
Slide of muck	3	21.43	..	....
Electric shock	1	7.14	..	.....
Totals	14	100.00	12	100.00

FATAL ACCIDENTS IN LODE MINES, PLACER MINES, PROSPECTING, AND QUARRYING.

There were twenty-two fatalities during 1939 in all phases of mining. Of these, fourteen occurred at producing metalliferous mines; two at producing placer operations; and six at prospecting and miscellaneous operations.

Ordinary care would have averted most of these fatalities, as few were due to abnormal or dangerous conditions, but were due to a dangerous method of doing routine-work.

Following are the details of the fatal accidents in lode mines:—

The fatal accident which occurred to George Stone, mucker, *Granby* mine, Phoenix, on January 1st, was due to deceased being struck by a rock while working in an open-cut on the surface. Thawing had dislodged some rocks, one of which struck him. Some men noticed the rocks moving and shouted a warning to Stone and others with him, but Stone was hard of hearing and did not get the warning as did the others, who took shelter. Stone died from his injuries on January 5th.

The fatal accident which occurred to R. W. Schrum, skip-tender, *Ymir Yankee Girl* mine, on January 22nd, was due to deceased being crushed between an up-going skip and a bulkhead. Schrum had signalled the skip away from the level below and had apparently boarded it. The riding of men is prohibited in this shaft and notices to this effect were posted at the different levels at the time of the accident. This fatality was definitely avoidable.

The fatal accident which occurred to Walter Newbury, crusherman, Britannia Mining and Smelting Company, Limited, on January 28th, was due to deceased being caught by a rush of ore following a hang-up in the crusher-raise. When the hung-up ore released itself it broke through three power-controlled gates and filled the crusher-chamber where Newbury was at work. Deceased knew of the hang-up, but it was anticipated that the gates would control the rush of ore.

The fatal accident which occurred to Eleott Hanson, miner, Copper Mountain, on April 17th, was due to a fall of ground in a stope. Deceased and his partner were engaged in bulkheading of a part of the stope when the ground fell; there was some preliminary warning of the fall and one man withdrew, but Hanson stayed and was fatally injured. He died on the following day.

The fatal accident which occurred to Hjalmer Carlson, miner, Vidette Gold Mines, Limited, on April 19th, was due to a fall of ground in a stope which caused a fracture of his hip and leg; pneumonia supervened and he died on May 5th.

The fatal accident which occurred to N. S. Monroe, mine foreman, Havilah Gold Mines, Limited, on April 20th, was due to deceased being thrown from the aerial tram to the ground, a distance of 20 feet, owing to the standing line being torn from a tower. He sustained a broken ankle and was taken to Port Alberni Hospital where he underwent several operations on his ankle under anæsthetics, and died on May 7th, apparently from pneumonia.

The fatal accident which occurred to Able R. Engstrom, miner, Privateer Mine, Limited, on July 10th, was due to deceased being carried down a stope when ore over a

hung-up chute suddenly released itself. Deceased was aware of this hung-up condition and of efforts being made to release it, but still attempted to cross over the hung-up ore to spit a round of holes. This fatality was definitely avoidable.

The fatal accident which occurred to Roy Graham, geologist, Britannia Mining and Smelting Company, Limited, on August 10th, was due to a fall of ground in a stope. Adjacent miners warned deceased that this part of the stope had not been barred down since blasting, but he ignored the warning and was instantly killed when some ground fell on him. This accident was definitely avoidable.

The fatal accident which occurred to David H. Haws, miner, Columbia Tungstens, Limited, on August 22nd, was due to deceased being crushed between the cage and the collar of the shaft. He had prepared some primers to take below and had laid them down near the collar of the shaft. After entering the cage and signalling to descend, he apparently attempted to leave the cage to recover the primers, and was instantly killed by the descending cage. This fatality was definitely avoidable.

The fatal accident which occurred to William D. Turnbull, mine foreman, *Sullivan* mine, Consolidated Mining and Smelting Company of Canada, Limited, on September 7th, was due to deceased being carried down a stope by a slide of ore while he and others were examining the place after blasting. His body was recovered the following day.

The fatal accident to Gustave Krusell, miner, Bralorne Mines, Limited, on September 9th, was due to a fall of ground from the hanging-wall side of a stope. Deceased and his partner had barred down this place shortly before the accident and had made it apparently safe, but the fall disclosed unforeseen slips from which the ground fell. Death was instantaneous.

The fatal accident which occurred to D. R. McIntosh, electrician, Britannia Mining and Smelting Company, Limited, on November 10th, was due to his being crushed by a cable-reel which fell from a flat car. Deceased and others were engaged in installing a cable in the 4,100 level and had the cable-reel mounted on a flat car which was being hauled by an electric locomotive, the cable being paid out as the train advanced. The cable snagged on the reel and dragged the reel off the flat car before the train could be stopped. McIntosh died two days later from his injuries.

The fatal accident which occurred to H. S. J. Peterson, miner, Britannia Mining and Smelting Company, Limited, on November 21st, was due to deceased falling down a raise. A small tool skip had fallen down a raise to a point where it was arrested by a little bench. Deceased started to attach the hoisting-rope to the skip when he was stopped and ordered to get a safety-rope for himself and another rope to secure the skip temporarily. He went to the trouble to get these safety-ropes and returned with them to the skip, but did not use either rope and started to work again on the skip, which slipped off the bench and carried deceased down with it. He was killed instantly. This fatality was definitely avoidable.

The fatal accident which occurred to Matte Uimonen, miner, Britannia Mining and Smelting Company, Limited, on December 3rd, was due to electric shock. Deceased was boarding an accommodation train of empty mine-cars for transportation out of the mine at the end of the shift when he contacted the trolley-wire carrying 550 volts. Artificial resuscitation was immediately applied and maintained for several hours, but he failed to respond. There was fully 3 feet of clearance between the top of the mine-cars and the trolley-wire. Ordinary care on the part of deceased would have prevented this fatality.

Following are details of the fatalities in placer-mining, prospecting, and miscellaneous operations.

The fatal accident which occurred to Emile Louis Rene, diver, at the Fraser Alluvial Dredging Company at Kanaka Bar on February 18th, was due to asphyxiation when a diving-suit he was using failed to function efficiently. At the time of his death he was searching the bottom of the river for a coil of rope that had fallen overboard from a scow. He was not an employee of the company.

The fatal accident which occurred to Reynold Dixon, labourer, *Edye Pass* mine, Porcher Island, on February 26th, was due to drowning. Deceased and his brother

went out in a rowboat in stormy weather to secure a scow that had broken loose. The rowboat was swamped and he was drowned.

The fatal accident which occurred to Joseph Koller, miner, Red Gulch Placers, Wells, on July 12th, was due to deceased being caught by a caving bank. He died from suffocation.

The fatal accident which occurred to James B. Acheson, pipeman, Acheson and Sons, Blackbird Lease, Atlin, on July 12th, was due to deceased being buried by a slide of ground.

The fatal accident which occurred to William H. Hess and Joseph Heaton, prospectors, Liberty Claim, Jessica, on July 14th, was due to blasting at the face of a short adit 30 feet from the portal. Reports of several shots were heard about 5 p.m. by people living about 1 mile from the prospect, but the accident was not discovered until a visitor called at the prospect the following afternoon. The cause of the accident can only be conjectured, but indications were that short fuses were being used. Several used fuses only 14 inches long were found in the prospect on investigation.

The fatal accident to Kenneth McPhee, prospector, Twenty-five Mile Creek, off Lillooet River, on December 6th, was due to suffocation and drowning. Deceased and his partner, William J. Wright, were mining the gravel under a 3-foot-diameter tree which they expected to fall in a certain direction. The tree fell in an unexpected direction and deceased was pinned down by one of the roots which caught his right ankle. Wright tried to free him, but water from their ditch flowed into the hole made by the uptorn roots where deceased was pinned, and Wright ran to a point some 40 feet away where the flow of water could be diverted, and then worked for half an hour in a further attempt to extricate McPhee, who had apparently drowned before the water could be diverted. Wright then ran to an Indian Reserve 1½ miles away and got the help of two Indians; it took the three men one hour to free the body.

DANGEROUS OCCURRENCES.

On January 1st, at the *Reno* mine, a snowslide completely demolished the upper story of the community hall and slightly damaged the bunk-house. By a fortunate chance the slide occurred at 5 p.m., when the whole crew was in the dining-room for dinner. This camp is now abandoned.

On March 1st, at Island Mountain Mines, a locomotive and train of cars ran off the end of the waste trestle which had sagged due to the settling of the dump. The train crew was able to jump clear and no person was injured.

On July 24th a skip-tender and helper in the Crown shaft, Bralorne Mines, Limited, loaded two 4- by 6-inch timbers, 14 feet long, on the cage, and gave a signal to hoist slowly. The timbers were not secured and caught on a wall-plate; the timbers broke and jarred the cage sufficiently to throw both men to the floor and injure them slightly. The hoisting-rope was not damaged.

On August 19th, in No. 1 shaft, *Pioneer* mine, one of the cross-head shoes broke and jammed the cross-head in the shaft. No other damage was done.

On November 2nd, at the *Molly Hughes* mine, New Denver, the high-pressure starting-bottle on a Gardner Diesel engine failed under a pressure of 280 lb., although designed for a pressure of 500 lb. This bottle was 60 inches long and 20 inches in diameter; the longitudinal seam was rivetted, but the ends were only dished and welded, and the weld at one end failed. The resulting explosion demolished part of the power-house roof, but no person was injured. This equipment was new.

During 1939 there were two prosecutions made for infractions of the "Metalliferous Mines Regulation Act," as follows:—

Date.	Mine.	Occupation of Defendant.	Offence charged.	Judgment.
February 16	Copper Mountain Mine	Chuteman	Went into a hung-up raise, contrary to Special Rule No. 53	Fined $10 and costs.
September 12	Bralorne Mine	Sinking contractor	Failed to keep an emergency ladder at the bottom of a sinking-shaft, contrary to General Rule 95 (*a*)	Fined $10 and costs.

EXPLOSIVES USED IN MINING.

During 1939 the explosives used in metalliferous mines and quarries in British Columbia consisted of 11,000,000 lb. of high explosives; 4,000,000 fuse detonators; 800,000 electric detonators, 77,000 delay-action detonators, 14,000 Primacord; and 26,000,000 feet of safety-fuse; so that approximately 5,000,000 shots were fired.

There was a double fatality due to explosives, and seven other men were slightly injured from various causes involving explosives. The double fatality was apparently due to the use of too short fuses, and the other injuries were due to improperly guarded shots and to men mistaking more distant reports for their own shots and returning too soon to the scene of blasting.

AIR-SAMPLING.

Air-sampling was carried on in the metalliferous mines after blasting and at the faces of long single drifts, to determine whether carbon monoxide was present and if the oxygen content of the atmosphere was sufficient.

In no instance were dangerous conditions found from above causes, but in a number of cases augmented ventilation was ordered.

DUST AND VENTILATION.

Considerable progress was noted in efforts during the year to reduce as far as possible the production of dust by the different mining operations of drilling, blasting, and ore-handling, by the use of the newer type drilling-machines, the generous use of water when drilling and at transfer and loading-chutes, and by as far as possible limiting the blasting to the period between shifts. The value of an adequate system of fan produced and controlled ventilation as a means of dealing with the unavoidably produced dust is receiving increased recognition each year, although the belief is still held by some mining companies that ventilating-fan installations are costly to install and expensive to operate, with the result that many mines still depend on natural ventilation with all its seasonal and daily variations, and frequent periods when the air is stagnant.

The following brief details regarding some presently operating ventilating-fans at mines in British Columbia should help to dissipate the idea that fan ventilation is expensive. If consideration is given to the general efficiency of underground operation it will be found that fan produced and maintained ventilation is a definite asset that more than repays its cost, entirely apart from the humanitarian view-point of giving better air to the underground men and lessening the silicosis hazard by reducing the dust-content of the air.

At the *Sullivan* mine of the Consolidated Mining and Smelting Company of Canada, Kimberley, there are three constantly-running fans producing the main ventilation for the mine; these fans are all situated on the surface and are operated on the exhaust system, but are all reversible. These fans circulate a total of 200,000 cubic feet of air per minute at a cost, for power, of $361 per month. They are Jeffrey Aerovane design, by the Jeffrey Manufacturing Company, Columbus, Ohio, and the following covers the main features of these installations:—

No. 1 Fan is 8 feet in diameter, two-stage, producing 100,000 cubic feet of air per minute against a 2.1-inch water-gauge; horse-power input at motor, 65.5; motor r.p.m., 690; fan r.p.m., 565; cost of fan, $2,772.80; starting compensator, $1,014; drive, $121; motor, $1,200; total cost, $7,200.

No. 2 Fan is 5 feet in diameter, centrifugal, double inlet, multibladed, with Texrope drive, and produces 65,000 cubic feet of air per minute against a water-gauge of 1.1 inches with 38.9 horse-power input at the motor; motor speed, 775 r.p.m.; fan speed, 1,190 r.p.m.; cost of fan, $2,512; motor and drive, $1,558.

No. 3 Fan is 4 feet in diameter, single stage, Texrope drive, and produces 35,000 cubic feet of air per minute against a water-gauge of 0.6 inch with 8 horse-power input at motor; motor speed, 775 r.p.m.; fan speed, 1,190 r.p.m.

The above installations were all adapted to already developed mine-workings and function very efficiently.

At the *Copper Mountain* mine of the Granby Consolidated Mining, Smelting, and Power Company, Limited, an axial-flow fan, designed by the Canadian Blower and Forge Company, was installed during 1939 in the Main level, No. 6, of this mine. This fan is 4.6 feet in diameter and cost $1,119 delivered at the mine. It has a capacity of 64,000 cubic feet of air per minute against a 3.25-inch water-gauge, but is at present producing 53,000 cubic feet against a 1.3-inch water-gauge with a 20-horse-power motor drive. As this fan is on the main haulage-level of the mine there is an air-lock with electrically-controlled doors which open and close automatically with the approach and withdrawal of the motor trains. The fan control is fitted with a non-overload device which keeps the motor at a constant speed to offset any effect produced by fluctuations due to natural ventilation. At full load the power cost to operate this fan is $2.14 per day.

At the No. 10 mine, Canadian Collieries (D.), Limited, Nanaimo, a La-Del troller fan, 7 feet in diameter, adjustable blade, axial-flow type, designed for an ultimate capacity of 120,000 cubic feet of air per minute at 8-inch water-gauge, was installed at the end of the year. This fan is on the surface and operated on the exhaust system. It is presently running at 1,150 r.p.m. and is passing 58,000 cubic feet per minute against a 3.75-inch water-gauge with a 41.5-horse-power motor input. This mine is in the course of development, and the speed and capacity of the fan will be stepped up to meet increased ventilation requirements. The blades of this fan are adjustable for higher quantities and pressures. The cost of this fan was $2,265 f.o.b. New Philadelphia; freight, duty, and sales tax, $1,354. The cost of power for operating the fan is $7.85 per day.

At the mines of the Britannia Mining and Smelting Company, Limited, a progressive system of general ventilation has been pursued to the extent that there are now eight modern fans in use with a total capacity of 350,000 cubic feet of air per minute. In the details given below different mines are mentioned, but all are connected parts of the one main operation.

No. 1 Fan, on 500 level, *Fairview* mine, is a 6-foot diameter single-stage Jeffrey Aerovane fan, directly connected to a 25-horse-power motor at 900 r.p.m., and delivers 48,400 cubic feet of air per minute against a 1.5-inch water-gauge. Cost of fan and motor f.o.b. factory, $1,572.

No. 2 Fan, 600 level, No. 5 mine, is a 5-foot diameter, two-stage Jeffrey Aerovane fan, belt-driven by a 40-horse-power motor at 1,200 r.p.m., and delivers 39,000 cubic feet of air per minute against a 1.1-inch water-gauge. Cost of fan f.o.b. factory, $995.

No. 3 Fan, 700 level, *Fairview* mine, is a 6-foot diameter, single-stage Jeffrey Aerovane fan directly connected to a 20-horse-power motor at 850 r.p.m., and delivers 40,000 cubic feet of air per minute against a 1.2-inch water-gauge. Cost of fan and motor f.o.b. factory, $1,487.

No. 4 Fan, 850 level, *Fairview* mine, is a Western blower fan, belt-driven by a 60-horse-power motor; fan and motor operating at 900 r.p.m., and produces 19,400 cubic feet of air per minute against a water-gauge of 1.25 inches.

No. 5 Fan, 2,200 level, *Bluff* mine, is a 6-foot diameter, two-stage Jeffrey Aerovane fan, driven by a 75-horse-power motor at 580 r.p.m. Speed of fan, 900 r.p.m.; delivers 70,000 cubic feet of air per minute against a 3-inch water-gauge. Cost of fan, $1,710 f.o.b. factory.

No. 6 Fan, 2,400 level, *Bluff* mine, is a 5-foot diameter, two-stage Jeffrey Aerovane fan, direct-driven by a 50-horse-power motor at 1,180 r.p.m., and delivers 45,000 cubic feet of air against a 3-inch water-gauge. Cost of fan and motor, $2,167 f.o.b. factory.

No. 7 Fan, 3,500 level, *Bluff* mine, is a 5-foot diameter, two-stage Jeffrey Aerovane fan, direct-driven by a 25-horse-power motor at 900 r.p.m., and delivers 32,000 cubic feet of air per minute against a 2.5-inch water-gauge. Cost of fan and motor f.o.b. factory, $1,872.

No. 8 Fan, 4,100 level, is a No. 8 Sirocco fan which is belt-driven by a 60-horse-power motor and delivers 8,500 cubic feet of air per minute through a 22-inch-diameter ventilating-pipe against a 12.5-inch water-gauge. The air is delivered to the face through 2,200 feet of 22-inch-diameter ventilating-pipe.

At Island Mountain Mines, Limited, a No. 85 Sturtevant Silent Vane fan is delivering 15,000 cubic feet of air per minute against a 3-inch water-gauge with a 10-horse-power motor drive; fan speed, 1,062 r.p.m.; cost of fan, $357 f.o.b. factory.

At Bralorne Mines, Limited, a No. 8 Sirocco fan, driven by a 40-horse-power motor, is installed to ventilate the new workings of the Crown shaft through a system of 15-inch-diameter ventilating-pipes under a water-gauge of 21 inches; this delivers 7,000 cubic feet of air to the faces.

The above information regarding the newer fans operating at the different mines was kindly supplied by the respective mining companies, and while by no means complete in detail, the salient points should be of much interest and service to those companies who, to date, have been satisfied to depend entirely on natural ventilation.

MINE-LIGHTING.

The use of the electric safety cap-lamp at the metalliferous mines in the Province increased during the year to the extent that over 3,000 of these lamps are now in use; only one of the larger mines continues the use of the carbide lamp. Two hundred and fifty of these electric lamps are of the Wheat type and approximately 3,000 are of the Edison type.

In no case where the electric lamp has been tried has there been a return to the carbide lamp formerly in general use.

FIRST-AID AND SAFETY WORK.

The training of men in first aid was well maintained at all the larger mines and in several districts where there is a group of the smaller mines, so there is a steadily increasing percentage of the total number of men employed who have taken the first-aid training. In many instances this first-aid training has been extended to classes for women, boys, and girls, so that this movement definitely makes for safety in the mining towns as well as in the mines.

Increased interest has been shown in safety-work at the larger mines by the established safety committees, which inspect the whole operation and discuss accidents with a view to preventing their recurrence.

The intimate knowledge of the mines in which they are employed enables the members of these safety committees to offer many practical suggestions towards greater safety, and they are in a position to take up current details with the mine management. Many of the points dealt with throughout the year are, by themselves, of apparently minor importance, but the analyses of accidents show that in many instances these apparently minor points become important factors in causing accidents.

These safety committees do much to further safety education, and general safety depends at least as much on this as on regulations; and the work of safety committees should be given every possible support.

INDEX.

K.

L.

M.

N.

W.

Y.

Z.

VICTORIA, B.C.:
Printed by CHARLES F. BANFIELD, Printer to the King's Most Excellent Majesty.
1940.

3,225-440-5129