ANNUAL REPORT

OF THE

MINISTER OF MINES

FOR THE

YEAR ENDED 31ST DECEMBER

1926

BEING AN ACCOUNT OF

MINING OPERATIONS FOR GOLD, COAL, ETC.

IN THE

PROVINCE OF BRITISH COLUMBIA.

PRINTED BY
AUTHORITY OF THE LEGISLATIVE ASSEMBLY.

VICTORIA, B.C.:
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1927.

To His Honour ROBERT RANDOLPH BRUCE,

Lieutenant-Governor of the Province of British Columbia.

MAY IT PLEASE YOUR HONOUR:

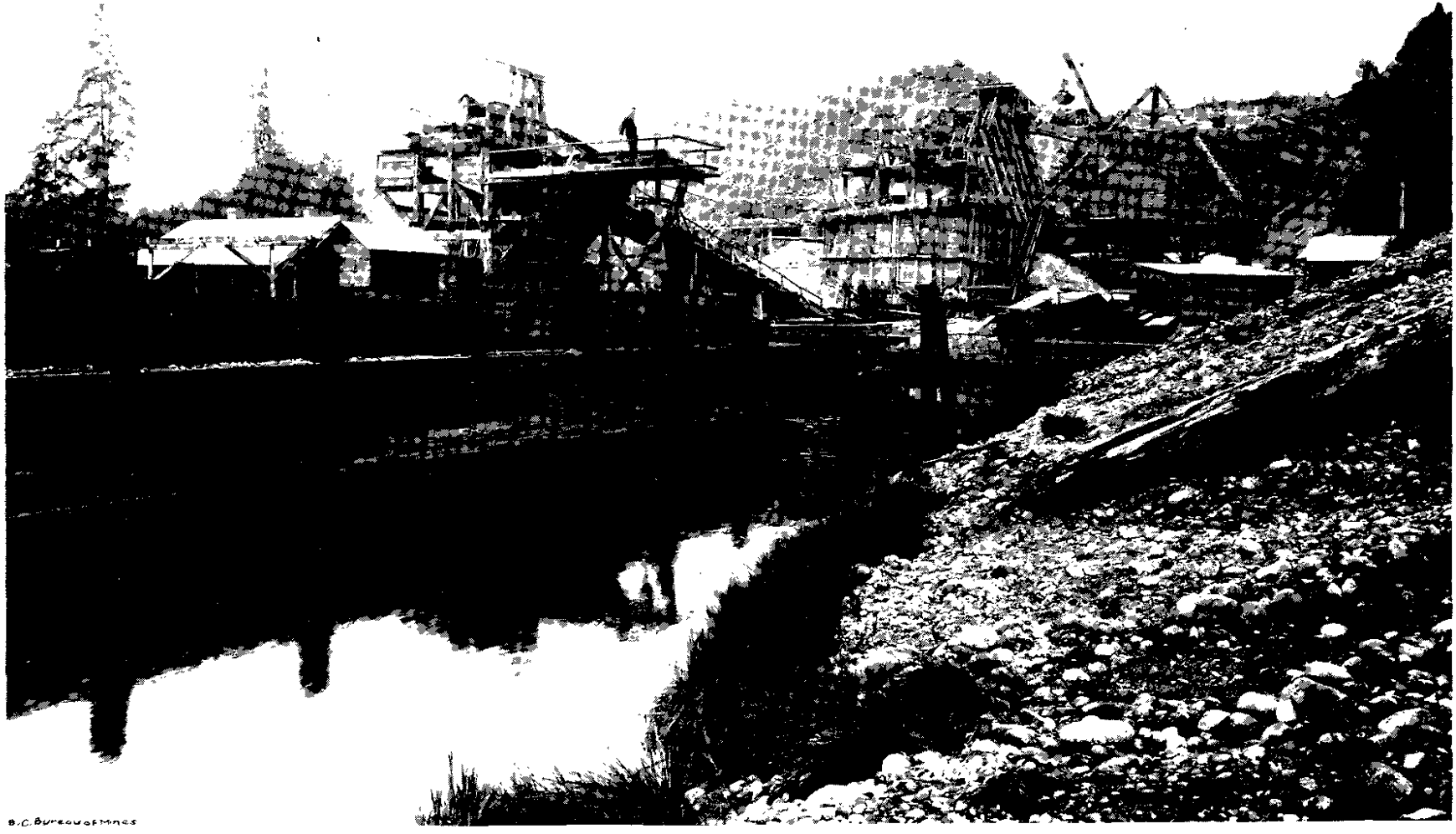
The Annual Report of the Provincial Mineralogist upon the Mining Industry of the Province for the year 1926 is herewith respectfully submitted.

WILLIAM SLOAN,

Minister of Mines.

Minister of Mines Office,

February 15th, 1927.



Deeks Gravel and Rock Company, Ltd.

To the Honourable William Sloan,

Minister of Mines.

SIR,—I have the honour to submit herewith my Annual Report on the Mining Industry of the Province for the year ended December 31st, 1926.

The statistical tables give the total mineral production of the Province to date and show by Districts and Divisions the output of the various metals and minerals for the year 1926, and comparative figures for previous years.

The reports of the Resident Mining Engineers give much information about the progress of mining, development, and prospecting throughout the Province. The reports of the Inspectors of Mines cover fully coal-mining in British Columbia.

I have the honour to be,

Sir,

Your obedient servant,

JOHN D. GALLOWAY,

Provincial Mineralogist.

Bureau of Mines, Victoria, B.C.,

February 15th, 1927.

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STATISTICAL REVIEW OF THE MINERAL INDUSTRY OF BRITISH COLUMBIA IN 1926.

By John D. Galloway, Provincial Mineralogist.

GENERAL SUMMARY.

The mineral industry of British Columbia in 1926 again surpassed all previous records in production. With an output valued at $67,188,842, gross profits approximating 25 per cent. of th gross value, and dividends of nearly $10,000,000, the year may be characterized as the most satisfactory and successful one in the history of mining in the Province.

With the exception of coal and gold, increased outputs of metals and minerals were made in all branches of the industry. The value shows an increase of $5,696,600, or 9.2 per cent., as compared with the 1925 valuation of $61,492,242, which was the previous high record year for the Province.

Since 1921—the year of an acute depression in the metal markets of the world—British Columbia has made impressive progress in increasing its mineral production each year. The value of the output for 1926 was nearly 2½ times that of 1921 and the yearly increase has been nearly $8,000,000 a year. The considerable increase in the value of the mineral production for 1926 has been made notwithstanding lowered average metal prices as compared with 1925. This shows a very satisfactory condition in the industry, with production steadily increasing regardless of fluctuations in the metal markets.

As would be expected, the tonnage of ore mined and treated in the Province also shows a considerable increase; 4,775,073 tons of ore was produced, as compared with 3,849,269 tons in 1925.

Since mining commenced in the Province in 1852 the total mineral production has been $988,108,470. It is interesting to note as showing the way in which mining has increased in recent years that over 50 per cent. of this total has been produced in the last twelve years.

A feature worthy of notice is the fact that British Columbia now is the leading silver-producing Province of Canada, having made a larger output in 1926 than Ontario, which for many years has been in the lead. British Columbia also continues to be the largest producer in Canada of lead, copper, and zinc.

The mineral industry of British Columbia, in so far as production is concerned, may be divided into three classes—metal-mining, coal-mining, and the production of structural materials and miscellaneous minerals. Of these, the first is by far the most important, with a production for 1926 valued at $51,863,534. This is followed by coal, with an output valued at $11,650,180, and structural and miscellaneous totalling together $3,675,128.

By value, the various products of the mineral industry produced in 1926 are ranked in the following order: Lead, copper, coal, zinc, silver, gold, structural materials, miscellaneous minerals. The quantities of lead, copper, zinc, and silver produced in 1926 were the highest in the history of mining in the Province.

Due to the steady expansion of the *Sullivan* mine in recent years, lead has easily maintained first place in the value of mineral products produced in the Province for the last three years. The British Columbia output of lead is now nearly 10 per cent. of the total world output and the present rate of production should at least be maintained for many years.

In 1926 copper reached second place, having a value of nearly $700,000 greater than coal. During the war years, due to a very high price for copper, the production of this metal assumed first rank in mining in the Province. Commencing in 1919, a heavy slump took place in both the quantity and value of the copper-output, but a steady improvement has taken place in recent years, with the result that the output of 89,339,768 lb. of copper in 1926 was the highest that has ever been made in the industry. Continued expansion of our copper-mining industry may be confidently expected.

Coal-mining has not been in a particularly flourishing condition in recent years, but the outlook now is better than for some time past.

The *Sullivan* mine is also mainly responsible for the increase in zinc production in the last three years, but other mines are also contributing in part. A larger production of zinc is expected in 1927, as the zinc-refinery at Trail is being enlarged to a capacity of 280 tons a day.

The silver production of the Province is obtained from many mines, the two largest contributors being the *Sullivan* and the *Premier*.

The decline in the price of silver may have some effect in possibly retarding future production in the Slocan district, where in many of the mines silver is the most important value in the ore. Approximately 80 per cent. of the silver production of the Province comes from mines in which the silver value is of less importance than the other metals, such as gold, copper, lead, and zinc, contained therein. While the decreased revenue from a lowered silver price is to be regretted for these mines, no material lowering of production in the future may be anticipated as a consequence.

During the last three years the Provincial production of gold (including placer gold) has averaged about $5,000,000 annually. No great increase is expected, but as much gold is recovered as a by-product of copper-mining the outlook is favourable for an increase from this source. There is also increased development activity in certain gold-quartz camps.

The increase in the value of structural materials to a total value of $3,342,545 is indicative of the increased building and general business activity of the Province. This is a branch of the mineral industry that from the point of view of raw materials is capable of unlimited expansion. As the market for these products is practically a local one, the industry can only grow with increases in the population and expanding business activity.

Another infant part of the mineral industry is the mining of miscellaneous minerals. The records show the output in 1926 to be $332,583, or over twice that of the preceding year. Attention is now being directed to the possibility of utilizing certain non-metallic minerals in connection with various manufacturing industries.

DEVELOPMENT.

As has been briefly outlined, the production record of the mineral industry during 1926 was very satisfactory. The outlook for 1927 is also excellent and there is but little doubt that another high record will be made. During recent years increased production in British Columbia has been largely through greater outputs from existing mines, particularly the *Sullivan* mine at Kimberley. Some further increase in rate of output may be expected from some of the larger mines during 1927, but not to such an extent as during 1925 and 1926. The encouraging feature, however, is the amount of important development that has been carried on in many parts of the Province during the last three years. The results of this will become apparent by increasing the output of minerals during 1927 and ensuing years.

While production figures give a clear view of the growth or decline of an industry, in mining it is necessary to consider other factors to visualize the true condition of the industry. Mining is a business in which only one crop is supplied by nature to be harvested. Nor, as in the case of timber reserves, can the crop be seen, measured, and its value estimated. The mineral wealth of a country as a rule is only gradually unfolded for man's use. Much patient seeking and searching, together with the expenditure of time and money, are necessary to discover and prepare mineral resources for exploitation. This exploitation is recorded in the production figures, and it must always be remembered that the faster mineral is produced the greater the necessity for intensive search to replace the deposits mined out.

In other words, a very definite indication of a healthy mining industry is the carrying-on of both prospecting and development of mineral properties. In this respect the present year has been a satisfactory one. Development has been carried on intensively and much success has been attained. It may be conservatively stated that the total known ore reserves of the Province at the present time are greater than at any previous time, notwithstanding the fact that nearly one billion dollars' worth of mineral has been extracted since mining commenced. Development has been general in all the mineralized sections of the Province and much information regarding this work will be found in the reports of the Resident Engineers.

It is believed that an average number of prospectors was out in the hills during the season of 1926. The most important new discovery reported was one 8 miles from Topley, which is a station 59 miles east of Smithers, on the Canadian National Railway. The showing has only been slightly developed as yet, but reports indicate that it may prove to be a large body of ore

of milling grade, with values mainly in silver and gold. It has been acquired under option by the Standard Silver Lead Company and will be extensively developed. Another property in the North-eastern District, which is not quite a new discovery but which received attention in 1926, is the *Ferguson* group, situated about 36 miles north-west of Fort Grahame, on the Finlay river. It is reported that the property has an exceptionally large surface showing of silver-lead-zinc ore.

An important new silver-lead discovery was that of the *Prosperity* group, adjoining the *Porter-Idaho*, Marmot river. This property has been bonded by the Premier Gold Mining Company, a substantial cash payment having been made.

An interesting experiment in scientific large-scale prospecting has been commenced by the Consolidated Company in searching for phosphate-deposits in East Kootenay. The company has announced that some success was attained in 1926 and that the work will be actively carried on in 1927.

If suitable phosphate-deposits are found, the company will enter the fertilizer-manufacturing business, utilizing the unused sulphur content of the *Sullivan* ore to make sulphuric acid for treatment of the raw phosphate. The success of these plans would mean a new industry for the Province.

METALLURGICAL PLANTS.

The metallurgical treatment of ores in British Columbia during 1926 kept pace with the increased production and general activity that characterized the year. Existing plants were enlarged, improvements in efficient practice were made, and new plants were constructed.

Of the metallic mineral production of $51,863,534, approximately 72 per cent. was produced as refined metals within the Province, 12 per cent. was produced for export as lead bullion and blister-copper, and 16 per cent. was exported as crude ore or concentrate. A small production of refined metals is made at the Trail smelter from imported ores, principally from the State of Washington, U.S.A.

In the Southern Interior of the Province practically all ore produced is concentrated, smelted, and refined within the Province. In the Coast district two large mines—the *Britannia* and *Premier*—ship the bulk of their production as concentrates to American smelters, although a part of the *Premier* output goes to the Granby smelter at Anyox. The Granby Company now mills and smelts all its own ore at Anyox, together with any custom ore obtainable. The final product at Anyox is blister-copper, which is a product containing 98 per cent. copper, together with the gold and silver contained in the ores treated. This blister-copper is exported to the United States for refining.

The Ladysmith Tidewater Smelters, Limited, is to be incorporated to carry out the plans of Herbert Carmichael and H. B. Thompson in connection with the reopening of a plant on the site of the old Ladysmith smelter. The British Metals Corporation of London, England, will be connected with the new company.

It is planned to purchase sulphide ores and concentrates at the Ladysmith plant. The sampling plant at the smelter is available for sampling ores. Plans for a concentrator and other equipment to handle ore purchased are expected to be carried out when necessary ore supplies are made available.

A subsidiary company will be formed to acquire and develop promising mineral properties. Alfred J. Coulls will represent the British Metals Corporation and act as ore-buying representative of the new company. All products of the Ladysmith plant will be handled by the British Metals Corporation.

New mills under construction in 1926 on the *Dunwell*, *Toric*, Duthie Mines property, and the *Coronation* are expected to be completed and production commenced in 1927. A further increase in capacity of the Anyox concentrator of the Granby Company to 3,000 tons a day is expected.

New mills or reconditioning of old ones are planned for the *Ruth-Hope*, *Lucky Jim*, and other properties in the Slocan district.

The *Sullivan* mill of the Consolidated Company at Trail was brought up to a capacity of 4,000 tons a day in December of 1926. Further expansion by the same company is now being made at the Trail plant, to cope with the heavy tonnage from the *Sullivan* mill and also custom ore and concentrates. An 80-ton addition is being made to the zinc-refinery, which will bring the capacity up to 280 tons a day early in 1927. A cadmium by-product plant is to be erected and the customs concentrator is to have its capacity doubled, when it will be capable of treating 600 tons a day.

An interesting development is the recovery of pyrite as a by-product in the milling operations of the *Britannia*. It is expected that an output of about 3,500 tons a month will be made in 1927 by this company. The product is sold to sulphuric-acid plants in British Columbia and the States for its sulphur content.

METAL PRICES.

Metal prices generally in the world's markets in 1926 were somewhat lower than during 1924. The following table shows comparative average yearly prices for the years 1924, 1925, *and 1926*:—

AVERAGE METAL-MARKET PRICES FOR 1924, 1925, AND 1926.

Year.	Silver (New York).	Copper (New York).	Lead.		Zinc.	
			London.	New York.	London.	St. Louis.
	Cents per Oz.	Cents per Lb.	Cents per Lb.	Cents per Lb.	Cents per Lb.	Cents per Lb.
1924	*66.78	*13.02	6.844	*8.09	6.706	*6.34
1925	*69.065	*14.042	*7.848	9.020	*7.892	7.622
1926	*62.107	*13.795	*6.7513	8.417	*7.4096	7.337

* Prices used in compiling total metal valuations in 1924, 1925, and 1926 Annual Reports.

About the end of September a serious decline commenced in the market price of silver and in a short time the price had declined to about 51½ cents an ounce. This shows a big drop from the average price in January of 67.79 cents an ounce. A recovery to 54 cents an ounce took place by the end of the year. The future of silver seems uncertain, with the possibility of the present low price-level being maintained for some time.

The prices of copper, lead, and zinc, while slightly below last year's averages, are high enough to yield satisfactory profits to the miners, and the market outlook for these metals is excellent. The present prices or higher are likely to be maintained indefinitely.

PROFITS OF MINING COMPANIES.

The following table shows the dividends declared by companies engaged in the mineral industry in the Province during 1925 and 1926:—

Company.	1925.	1926.
The Consolidated Mining and Smelting Co. of Canada, Ltd.	$3,238,054	$5,234,700
Premier Gold Mining Co.	1,600,375	1,600,437
Howe Sound Copper Co.*	467,189	1,736,133
Silversmith Mines, Ltd.	125,000	200,000
Wallace Mountain Mines, Ltd. (*Sally*)	59,400	.....
I.X.L.	21,600	.....
Bell	88,000	48,510
Belmont-Surf Inlet	312,500	437,500
Crow's Nest Pass Coal Co.	372,690	372,690
Clayburn Co.	20,000	44,000
Whitewater Mines, Ltd.	.....	25,000
Rosebery-Surprise Mining Co.	.....	25,000
Others	15,800	23,300
Totals	$6,320,608	$9,747,270

The amount of $9,747,270 shown above as distributed in 1926 by no means represents the total net profits earned during that year. In nearly all cases substantial sums are set aside from profits to the credit of surplus and reserve accounts. Profits accruing to private companies and individual mining enterprises as a rule are not given publicity as dividends, as is the case

* The Howe Sound Copper Company is the holding company for the *Britannia* mine in British Columbia and the *El Potosi* mine in Mexico. Dividends paid by this company are therefore derived from the profits on operation of both mines, so that only part of the dividends paid, as shown, can be credited to the *Britannia* mine.

with the large companies, so that no record of these profits, which in the aggregate are considerable, is available. Several companies made substantial profits in 1926, but did not declare any dividends.

The mineral industry of British Columbia is at the present time in a prosperous and healthy condition. The best evidence of this is to be seen in the keen interest in it now being shown and the ease with which capital is obtained for legitimate mining propositions.

The greatest needs of the industry at the present time are: (1) Widespread prospecting of the known mineralized areas by semi-trained men, with more careful and exact methods than have been employed in the past; (2) the testing of many dormant undeveloped mineral properties by companies strong enough financially to try out several in the hope of obtaining one profitable mine.

MINERAL PRODUCTION OF BRITISH COLUMBIA.

METHOD OF COMPUTING PRODUCTION.

The total mineral production of the Province consists of the outputs of metals, coal, structural materials, and miscellaneous minerals, valued at standard recognized prices.

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 1925 are again used in this Report.

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 off the metal prices. Apparent small decreases of production in some Divisions in 1925 as compared with 1924 have therefore been caused by the different methods of computation.

(2.) Gold-placer returns are received from the operators in dollars and the dollar value converted to ounces of placer gold at $17 an ounce, which is believed to represent the average value of placer gold throughout the Province.

(3.) The prices used in valuing the different metals are: For gold, the world standard price of $20.6718 an ounce; for silver, the average New York metal-market price for the year; for lead, the average London metal-market price for the year; for zinc, the average London metal-market price for the year; and for copper, the average New York metal-market price for the year. The silver and copper outputs of the Province are bought and sold on the basis of the New York metal-market prices of these metals and for this reason they are used. 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 and Montreal lead- and zinc-market prices differ materially from the London prices of these metals and are not properly applicable to valuing the British Columbia production.

(4.) This year a change has been made in computing coal and coke statistics. The practice in former years has 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 making this coke was credited as coal production. The result was that the coke-production figures were incomplete.

This year 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 mineral production. Coke-making is considered a manufacturing industry. As it is, however, of interest to the mineral 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 value of mineral production of the Province.

(5.) Structural materials are valued at the prices given by the producers.

(6.) Miscellaneous minerals are valued at the prices given by the producers.

STATISTICAL TABLES.

TABLE I.—TOTAL PRODUCTION FOR ALL YEARS UP TO AND INCLUDING 1926.

Gold, placer	$ 78,018,548
Gold, lode	126,972,318
Silver	80,787,003
Copper	209,967,068
Lead	106,976,442
Zinc	50,512,557
Coal and coke	284,699,133
Structural materials	48,248,431
Miscellaneous minerals, etc.	1,926,970
Total	$988,108,470

TABLE II.—PRODUCTION FOR EACH YEAR FROM 1852 TO 1926 (INCLUSIVE).

1852 to 1895 (inclusive)	$ 94,547,241	1912	$ 32,440,800
1896	7,507,956	1913	30,296,398
1897	10,455,268	1914	26,388,825
1898	10,906,861	1915	29,447,508
1899	12,393,131	1916	42,290,462
1900	16,344,751	1917	37,010,392
1901	20,086,780	1918	41,782,474
1902	17,486,550	1919	33,296,313
1903	17,495,954	1920	35,543,084
1904	18,977,359	1921	28,066,641
1905	22,461,325	1922	35,158,843
1906	24,980,546	1923	41,304,320
1907	25,882,560	1924	48,704,604
1908	23,851,277	1925	61,492,242
1909	24,443,025	1926	67,188,842
1910	26,377,066		
1911	23,499,072	Total	$988,108,470

Table III. gives a statement in detail of the quantities and value of the different mineral products for the years 1924, 1925, and 1926.

TABLE III.—QUANTITIES AND VALUE OF MINERAL PRODUCTS FOR 1924, 1925, AND 1926.

Description.	1924.		1925.		1926.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Gold, placer*.....oz.	21,037	$ 420,750	* 16,476	$ 280,092	* 20,912	$ 355,503
Gold, lode.....oz.	247,716	5,120,535	209,719	4,335,269	201,427	4,163,859
Silver.....oz.	8,341,768	5,292,184	7,654,844	5,286,818	10,748,536	6,675,606
Copper.....lb.	64,845,393	8,442,870	72,306,432	10,153,269	89,339,768	12,324,421
Lead.....lb.	170,384,481	12,415,917	237,899,199	18,670,329	263,023,937	17,757,535
Zinc.....lb.	79,130,970	4,266,741	98,257,099	7,754,450	142,876,947	10,586,610
Coal.....tons, 2,240 lb.	1,939,526	9,697,630	2,328,522	11,642,610	2,330,036	11,650,180
Coke.....tons, 2,240 lb.	30,615	214,305	75,185	526,295	†	†
Structural materials and miscellaneous minerals		2,833,672		2,843,110		3,675,128
Totals		$48,704,604		$61,492,242		$67,188,842

* Placer gold in 1925 and 1926 valued at $17 an ounce; in former years at $20.
† Coke not included in primary mineral production; coal used in making coke included in coal figures.

TABLE IV.—*Output of Mineral Products by Districts and Divisions.*

Names.	Divisions.			Districts.		
	1924.	1925.	1926.	1924.	1925.	1926.
North-western District (No. 1)				$11,012,170	$11,116,434	$11,069,032
Atlin, Stikine, and Liard	$ 153,122	$ 98,365	$ 234,936			
Nass River	5,024,242	5,977,875	5,853,804			
Portland Canal	4,952,955	4,170,310	4,678,739			
Skeena, Queen Charlotte, and Bella Coola	881,851	869,984	301,553			
North-eastern District (No. 2)				486,078	321,876	352,203
Cariboo and Quesnel	240,000	207,538	299,428			
Omineca and Peace River	246,078	114,338	252,775			
Central District (No. 3)				355,664	333,063	831,975
Nicola and Vernon	332,693	230,281	273,979			
Yale, Asheroft, and Kamloops	9,386	17,235	453,465			
Lillooet and Clinton	13,585	85,547	104,531			
Southern District (No. 4)				1,554,671	2,062,183	3,972,608
Grand Forks, Greenwood, and Osoyoos	748,486	893,985	668,165			
Similkameen	806,185	1,168,198	3,304,443			
Eastern District (No. 5)				21,952,774	33,982,941	36,704,484
Fort Steele	18,757,222	31,510,755	33,825,684			
Windermere and Golden	127,538	86,369	59,871			
Ainsworth	211,566	392,968	749,120			
Slocan and Slocan City	1,270,153	1,345,269	1,452,971			
Nelson and Arrow Lake	47,567	118,992	321,537			
Trail Creek	1,510,122	524,215	278,117			
Revelstoke, Trout Lake, and Lardeau	28,606	4,373	17,184			
Western District (No. 6)				13,343,247	13,675,745	14,058,540
Nanaimo, Alberni, Clayoquot, Quatsino, and Victoria (Vancouver Island)	9,428,015	8,832,823	8,613,205			
Vancouver and New Westminster (Mainland)	3,915,232	4,842,922	5,445,335			
Totals			$67,188,842	$48,704,604	$61,492,242	$67,188,842

TABLE V.—Yield of Placer Gold to Date.

1858	$ 705,000	1876	$1,786,648	1893	$ 356,131	1910	$ 540,000
1859	1,615,070	1877	1,608,182	1894	405,516	1911	426,000
1860	2,228,543	1878	1,275,204	1895	481,683	1912	555,500
1861	2,666,118	1879	1,290,058	1896	544,026	1913	510,000
1862	2,656,903	1880	1,013,827	1897	513,520	1914	565,000
1863	3,913,563	1881	1,046,737	1898	643,346	1915	770,000
1864	3,735,850	1882	954,085	1899	1,344,900	1916	580,500
1865	3,491,205	1883	794,252	1900	1,278,724	1917	496,000
1866	2,662,106	1884	736,165	1901	970,100	1918	320,000
1867	2,480,868	1885	713,738	1902	1,073,140	1919	286,500
1868	3,372,972	1886	903,651	1903	1,060,420	1920	221,600
1869	1,774,978	1887	693,709	1904	1,115,300	1921	233,200
1870	1,336,956	1888	616,731	1905	969,300	1922	364,800
1871	1,799,440	1889	588,923	1906	948,400	1923	420,000
1872	1,610,972	1890	490,435	1907	828,000	1924	420,750
1873	1,305,749	1891	429,811	1908	647,000	1925	280,092
1874	1,844,618	1892	399,526	1909	477,000	1926	355,503
1875	2,474,004						

Total.....$78,018,548

TABLE VI.—Production of Lode Mines.

Year.	Gold.		Silver.		Copper.		Lead.		Zinc.		Total Value.
	Oz.	Value.	Oz.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	
		$		$		$		$		$	$
1887	.....	.....	17,690	17,331	.....	.....	204,800	9,216	.....	.....	26,547
1888	.....	.....	79,780	75,000	.....	.....	674,500	29,813	.....	.....	104,813
1889	.....	.....	53,192	47,873	.....	.....	165,100	6,498	.....	.....	54,371
1890	.....	.....	70,427	73,948	.....	.....	.....	.....	.....	.....	73,948
1891	.....	.....	4,500	4,000	.....	.....	.....	.....	.....	.....	4,000
1892	.....	.....	77,160	66,935	.....	.....	808,420	33,064	.....	.....	99,999
1893	1,170	23,404	227,000	195,000	.....	.....	2,135,023	78,996	.....	.....	297,400
1894	6,252	125,014	746,379	470,219	324,680	16,234	5,662,523	169,875	.....	.....	781,342
1895	39,264	785,271	1,496,522	977,229	952,840	47,642	16,475,464	532,255	.....	.....	2,342,397
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	4,348,603	5,151,333	2,884,745	27,603,746	4,446,963	51,582,906	2,002,733	.....	.....	13,683,044
1902	236,491	4,888,269	3,917,917	1,941,328	29,636,057	3,446,673	22,536,381	824,832	.....	.....	11,101,102
1903	232,831	4,812,616	2,996,204	1,521,472	34,359,921	4,547,535	18,089,283	689,744	.....	.....	11,571,367
1904	222,042	4,589,608	3,222,481	1,719,516	35,710,128	4,578,037	36,646,244	1,421,874	.....	.....	12,309,035
1905	238,660	4,933,102	3,439,417	1,971,818	37,692,251	5,876,222	56,580,703	2,399,022	.....	.....	15,180,164
1906	224,027	4,630,639	2,990,262	1,897,320	42,990,488	8,288,565	52,408,217	2,667,578	.....	.....	17,484,102
1907	196,179	4,055,020	2,745,448	1,703,825	40,832,720	8,166,544	47,738,703	2,291,458	.....	.....	16,216,847
1908	255,582	5,282,880	2,631,389	1,321,483	47,274,614	6,240,249	43,195,733	1,632,799	.....	.....	14,477,411
1909	238,224	4,924,090	2,532,742	1,239,270	45,597,245	5,918,522	44,396,346	1,709,259	8,500,000	400,000	14,191,141
1910	267,701	5,533,380	2,450,241	1,245,016	38,243,934	4,871,512	34,658,746	1,386,350	4,184,192	192,473	13,228,731
1911	228,617	4,725,513	1,892,364	958,293	36,927,656	4,571,644	26,872,397	1,069,521	2,634,544	129,092	11,454,063
1912	257,496	5,322,442	3,132,108	1,810,045	51,456,537	8,408,513	44,871,454	1,805,627	5,358,280	316,139	17,662,766
1913	272,254	5,627,490	3,465,856	1,968,606	46,460,305	7,094,489	55,364,677	2,175,832	6,758,768	324,421	17,190,838
1914	247,170	5,109,004	3,602,180	1,876,736	45,009,699	6,121,319	50,625,048	1,771,877	7,866,467	346,125	15,225,061
1915	250,021	5,167,934	3,366,506	1,588,991	56,918,405	9,835,500	46,503,590	1,939,200	12,982,440	1,460,524	19,992,149
1916	221,932	4,587,334	3,301,923	2,059,739	65,379,364	17,784,494	48,727,516	3,007,462	37,168,980	4,043,985	31,483,014
1917	114,523	2,367,190	2,929,216	2,265,749	59,007,565	16,038,256	37,307,465	2,951,020	41,848,513	3,166,259	26,788,474
1918	164,674	3,403,812	3,498,172	3,215,870	61,483,754	15,143,449	43,899,661	2,928,107	41,772,916	2,899,040	27,590,278
1919	152,426	3,150,645	3,403,119	3,592,673	42,459,339	7,939,896	29,475,968	1,526,855	56,737,651	3,540,429	19,750,498
1920	120,048	2,481,392	3,377,849	3,235,980	44,887,676	7,832,899	39,331,218	2,816,115	47,208,268	3,077,979	19,444,365
1921	135,663	2,804,154	2,673,389	1,591,201	39,036,993	4,879,624	41,402,288	1,693,354	49,419,372	1,952,065	12,920,398
1922	197,856	4,089,684	7,101,311	4,554,781	32,359,896	4,329,754	67,447,985	3,480,316	57,146,548	2,777,322	19,231,857
1923	179,245	3,704,994	6,032,986	3,718,129	57,720,290	8,323,266	96,663,152	6,321,770	58,343,462	3,278,903	25,347,062
1924	247,716	5,120,535	8,341,768	5,292,184	64,845,393	8,442,870	170,384,481	12,415,917	79,130,970	4,266,741	35,538,247
1925	209,719	4,335,269	7,654,844	5,286,818	72,306,432	10,153,269	237,899,199	18,670,329	98,257,099	7,754,450	46,200,135
1926	201,427	4,163,859	10,748,556	6,675,606	89,339,768	12,324,421	263,023,937	17,757,535	142,876,947	10,586,610	51,508,031
Totals	6,153,515	126,972,318	129,170,534	80,787,003	1,280,951,781	209,967,068	1,913,714,856	106,976,442	758,195,417	50,512,557	575,215,388

TABLE VII.—PRODUCTION IN DETAIL OF THE

Districts and Divisions.	Year	Tons.	Gold—Placer.★		Gold—Lode.		Silver.	
			Ounces	Value.	Ounces.	Value.	Ounces.	Value.
				$		$		$
North-western District (No. 1)								
Atlin	1925	1,710	2,896	49,229	1,878	38,922	2,786	1,924
	1926	9,366	2,607	44,318	7,757	160,351	26,583	16,510
Stikine	1925		41	700				
	1926							
Liard	1925		441	7,500				
	1926		624	10,608				
Nass River	1925	1,168,695			7,484	154,708	390,964	270,012
	1926	1,217,927			7,906	163,431	409,470	254,310
Portland Canal	1925	168,798			118,469	2,448,967	2,892,046	1,652,066
	1926	267,140			124,207	2,567,582	3,082,503	1,920,661
Skeena	1925	78,640			35,086	725,291	21,273	14,692
	1926	26,769			11,128	230,036	6,927	4,302
Queen Charlotte	1925		4	70				
	1926							
Bella Coola	1925							
	1926							
North-eastern District (No. 2)								
Cariboo	1925		8,019	151,027				
	1926		10,059	170,993				
Quesnel	1925		2,995	50,911				
	1926		7,149	121,536				
Omineca	1925	842	269	4,560	121	2,501	85,888	59,319
	1926	1,861	59	1,000	439	9,075	239,053	148,469
Peace River	1925		177	3,000				
	1926		88	1,500				
Central District (No. 3)								
Nicola	1925	83					59	41
	1926	63			12	248	1,060	658
Vernon	1925		4	60				
	1926	1					51	32
Yale	1925	1	29	500	37	765		
	1926	320	29	500	59	1,220	16	10
Ashcroft	1925							
	1926		15	250				
Kamloops	1925		78	1,320				
	1926	1,795	18	302	125	2,584	133,815	83,108
Lillooet	1925	7,098	83	1,415	3,531	72,992		
	1926	10,500	29	500	4,580	94,677	807	501
Clinton	1925		95	1,620				
	1926		68	1,155				
Southern District (No. 4.)								
Grand Forks	1925	36					709	490
	1926	11			20	413	16	10
Greenwood	1925	1,773			53	1,096	480,822	332,080
	1926	3,016			166	3,432	408,562	253,745
Osoyoos	1925	50,914			19,426	401,570	2,710	1,872
	1926	60,358			16,280	336,537	11,353	7,051
Similkameen	1925	122,996	146	2,482	242	5,002	20,472	14,139
	1926	669,356	96	1,621	3,968	82,439	141,236	87,717
Eastern District (No. 5)								
Fort Steele	1925	1,117,615	262	4,449			3,106,682	2,145,630
	1926	1,193,931	29	500	321	6,636	4,942,364	3,069,554
Windermere	1925	1,276					39,262	27,116
	1926	606					20,356	12,643
Golden	1925		2	40				
	1926		13	221				
Ainsworth	1925	25,447			16	331	79,057	54,601
	1926	59,559			26	537	139,832	86,845
Slocan	1925	64,486			310	6,408	856,375	591,456
	1926	56,387			139	2,873	938,860	583,110
Slocan City	1925	862					9,458	6,532
	1926	26					1,136	705
Nelson	1925	6,723			723	14,946	1,652	1,141
	1926	18,780			6,671	137,902	52,152	32,390
Arrow Lake	1925							
	1926							
Trail Creek	1925	37,596			14,112	291,720	32,353	22,345
	1926	25,484			7,600	157,106	24,705	15,344
Revelstoke	1925		29	500				
	1926	9	29	500			143	89
Trout Lake	1925							
	1926							
Lardeau	1925	7					471	325
	1926	137			8	165	9,314	5,785
Western District (No. 6)								
Nanaimo	1925	68					71	49
	1926							
Alberni	1925							
	1926							
Clayoquot	1925							
	1926							
Quatsino	1925							
	1926							
Victoria	1925		6	109				
	1926							
New Westminster	1925							
	1926	1					109	68
Vancouver	1925	994,113			8,231	170,150	131,744	90,989
	1926	1,156,470			9,995	206,615	148,113	91,969
Totals	1925	3,849,269	16,479	280,092	209,719	4,335,269	7,654,844	5,296,818
	1926	4,775,073	20,912	355,503	201,427	4,163,859	10,743,556	6,675,606

★ Placer Gold is valued at $17 an ounce, which is believed to be a fair average for the whole Province.

METALLIFEROUS MINES FOR 1925 AND 1926.

COPPER.		LEAD.		ZINC.		TOTALS FOR DIVISIONS.		TOTALS FOR DISTRICTS.
Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	1925.	1926.	1926.
	$		$		$	$	$	$
								10,916,169
		1,140	90			90,065		
		46,648	3,149				224,328	
						700		
						7,500		
							10,608	
39,510,163	5,548,017	1,753	138			5,972,875		
38,686,513	5,336,804	2,876	194				5,754,739	
40	6	839,837	65,910	17,247	1,361	4,168,310		
1,036,113	142,932	643,061	43,415	42,503	3,149		4,677,739	
677,422	95,124					835,107		
104,512	14,417						248,755	
						70		
								533,452
						151,627		
							170,993	
						50,911		
							121,535	
		227,610	17,863			84,243		
		645,631	43,588	503,295	37,292		239,424	
						3,000		
							1,500	
								208,834
18,113	2,543					2,584		
8,170	1,127	2,995	202				2,235	
						60		
		91	6				38	
						1,265		
							1,730	
							250	
						1,320		
		130,667	8,822	174,530	12,932		107,748	
						74,407		
							95,678	
						1,620		
							1,155	
								3,239,904
		19,224	1,509			1,999		
							423	
		258,883	20,317			353,493		
35,342	4,876	180,495	12,186	1,339	99		274,338	
						403,442		
							343,588	
3,464,891	486,540					508,163		
17,752,253	2,448,924	6,598	445	5,525	409		2,621,555	
								32,396,327
1,696	238	227,306,993	17,839,053	92,164,850	7,273,650	27,263,020		
9,516	1,313	252,050,057	17,016,655	127,750,444	9,465,796		29,560,454	
		754,494	59,213			86,329		
		390,680	26,376	16,652	1,234		40,253	
						40		
							221	
		2,760,909	216,676	1,537,774	121,360	392,968		
		3,442,653	232,425	5,793,999	429,313		749,120	
		4,860,183	381,427	4,413,290	348,297	1,327,587		
		4,584,822	309,535	7,500,374	555,748		1,451,266	
		50,302	3,948	91,248	7,202	17,682		
							705	
		810,877	63,637	32,690	2,580	82,304		
1,341	185	856,303	57,812	1,056,026	78,248		306,537	
1,140,506	160,150					474,215		
751,486	103,667						276,117	
						500		
		4,573	309				899	
		6,985	548			873		
		35,786	2,416	32,260	2,390		10,756	
								4,568,848
2,747	385					434		
						109		
43	6						74	
27,490,854	3,860,266					4,121,405		
30,954,479	4,270,170						4,568,774	
72,306,432	10,153,269	237,899,199	18,670,329	98,257,099	7,754,450	46,480,227		
89,339,768	12,324,421	263,023,937	17,757,535	142,876,947	10,586,610		51,863,534	51,863,534

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

Year.	Tons (2,240 lb.)	Value.	Year.	Tons (2,240 lb.)	Value.
1836–1885	3,029,011	$ 9,468,557	1907	1,800,067	$ 6,300,235
1886	326,636	979,908	1908	1,677,849	5,872,472
1887	413,360	1,240,080	1909	2,006,476	7,022,666
1888	489,301	1,467,903	1910	2,800,046	9,800,161
1889	579,830	1,739,490	1911	2,193,062	7,675,717
1890	678,140	2,034,420	1912	2,628,804	9,200,814
1891	1,029,097	3,087,291	1913	2,137,483	7,481,190
1892	826,335	2,479,005	1914	1,810,967	6,338,385
1893	978,294	2,934,882	1915	1,611,129	5,638,952
1894	1,012,953	3,038,859	1916	2,084,093	7,294,325
1895	939,654	2,818,962	1917	2,149,975	7,524,913
1896	896,222	2,688,666	1918	2,302,245	11,511,225
1897	882,854	2,648,562	1919	2,267,541	11,337,705
1898	1,135,865	3,407,595	1920	2,595,125	12,975,625
1899	1,306,324	3,918,972	1921	2,483,995	12,419,975
1900	1,439,595	4,318,785	1922	2,511,843	12,559,215
1901	1,460,331	4,380,993	1923	2,453,223	12,266,115
1902	1,397,394	4,192,182	1924	1,939,526	9,697,630
1903	1,168,194	3,504,582	1925	2,328,522	11,642,610
1904	1,253,628	3,760,884	1926	2,330,036	11,650,180
1905	1,384,312	4,152,936			
1906	1,517,303	4,551,909	Totals	68,256,640	$259,025,533

* For all years to 1925 (inclusive) figures are net coal production and do not include coal made into coke. The 1926 figures are entire coal production, including coal made into coke.

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

Year.	Tons (2,240 lb.)	Value.	Year.	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			
1912	264,333	1,585,998	*Totals*	*4,393,255*	*$25,673,600*

TABLE X.—Coke and By-products Production of British Columbia, 1926.*

	Quantity.	Value.
Coal used in making coke, long tons	267,713	$1,338,565
Coke made in bee-hive ovens, long tons	93,953	
Coke made in by-product ovens, long tons	40,848	
Coke made in gas plants, long tons	42,468	
Total coke made, long tons	177,269	$1,437,666
Gas produced		1,009,613
Tar		50,035
Other by-products		45,772
Total production value of coke industry		$2,543,086

* Not primary mineral production.

TABLE XI.—PRODUCTION IN DETAIL OF STRUCTURAL MATERIALS, 1926.

District and Division.	Cement.	Lime and Limestone.	Building stone.	Riprap and Crushed Rock.	Sand and Gravel.	Pottery and Tile.	Clay.	Firebrick.	Face and Front Brick.	Red Brick.	Totals for Divisions.	Totals for Districts.
	$	$	$	$	$	$	$	$	$	$	$	$
North-western District (No. 1)												55,798
Atlin, Stikine, and Liard												
Nass River				1,000	1,000						2,000	
Portland Canal				1,000							1,000	
Skeena, Queen Charlotte, and Bella Coola		52,798									52,798	
North-eastern District (No. 2)												10,551
Cariboo and Quesnel		1,000		1,000	3,000						5,000	
Omineca and Peace River				1,000	4,551						5,551	
Central District (No. 3)												204,987
Nicola and Vernon		1,000	4,500	1,000	1,000					3,016	10,516	
Yale, Ashcroft, and Kamloops		1,000		121,000	69,271					3,200	194,471	
Lillooet and Clinton												
Southern District (No. 4)												10,666
Grand Forks, Greenwood, and Osoyoos					2,879					6,787	9,666	
Similkameen		1,000									1,000	
Eastern District (No. 5)												50,927
Fort Steele		1,000		6,000	1,000						8,000	
Windermere and Golden					19,397						19,397	
Ainsworth												
Slocan and Slocan City				1,000							1,000	
Nelson and Arrow Lake		1,000	4,000	5,000	5,000						15,000	
Trail Creek		1,000		1,000							2,000	
Revelstoke, Trout Lake, and Lardeau				4,530	1,000						5,530	
Western District (No. 6)												3,009,616
Nanaimo, Alberni, Clayoquot, Quatsino, and Victoria (Vancouver Island)	1,225,884	492,351	165,317	1,970	61,101	6,685				180,421	2,133,729	
Vancouver and New Westminster (Mainland)		4,900	900	151,097	162,103	259,444	13,239	178,975	102,823	2,406	875,887	
Totals	1,225,884	557,049	174,717	296,597	331,302	266,129	13,239	178,975	102,823	195,830	3,342,545	3,342,545

TABLE XII.—MISCELLANEOUS MINERALS: PRODUCTION BY MINERAL SURVEY DISTRICTS, 1926.

District.	Flux: Limestone and Silica.	Gypsum.	Arsenic.	Pyrite.	Sodium Carbonate.	Platinum.	Bentonite.	Iron, Bog.	Silicate of Alumina.	District Totals.
	$	$	$	$	$	$	$	$	$	$
No. 1	89,825			7,240						97,065
No. 2									1,900	1,900
No. 3		154,462			7,537					161,999
No. 4	26,758		11,262			4,258	150			42,428
No. 5		5,360		9,630						14,990
No. 6	13,601							600		14,201
Totals	130,184	159,822	11,262	16,870	7,537	4,258	150	600	1,900	332,583

TABLE XIII.

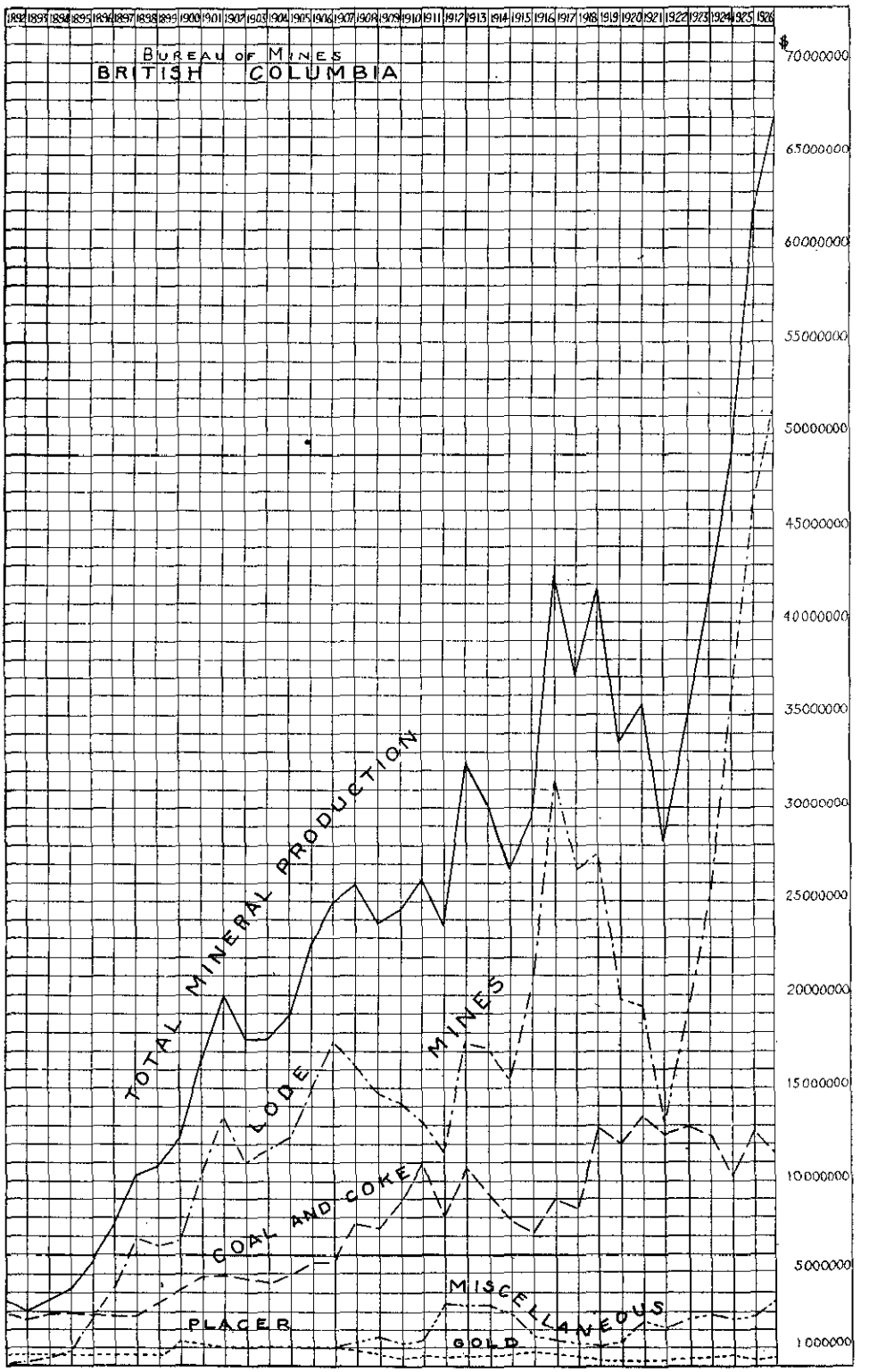
BUREAU OF MINES
BRITISH COLUMBIA
$
70000000
65000000
60000000
55000000
50000000
45000000
40000000
35000000
30000000
25000000
20000000
15000000
10000000
5000000
1000000
TOTAL MINERAL PRODUCTION
LODE MINES
COAL AND COKE
PLACER GOLD
MISCELLANEOUS

TABLE XIV.

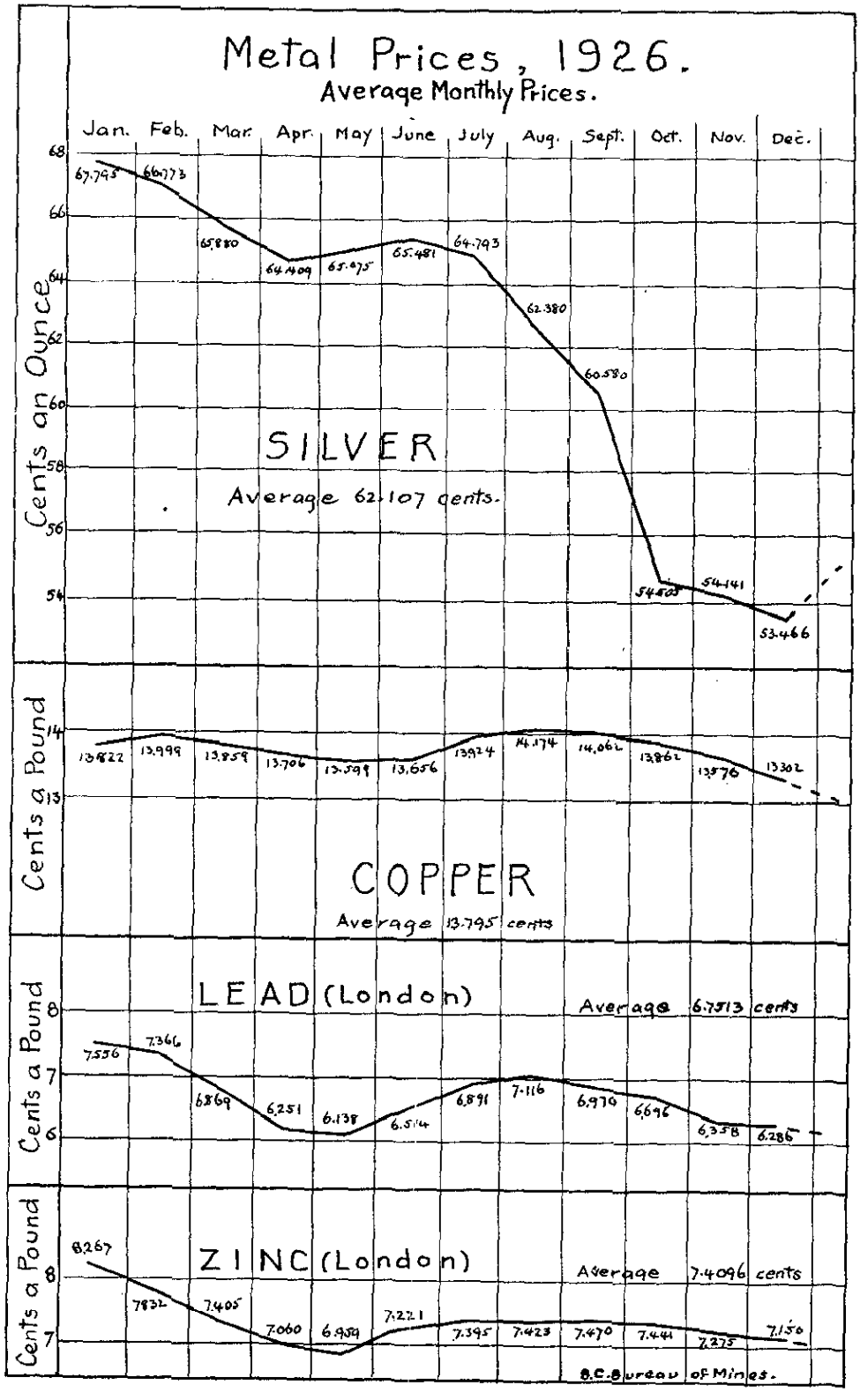
Metal Prices, 1926.
Average Monthly Prices.
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.
Cents an Ounce
67.795 66.773 65.880 64.409 65.475 65.481 64.793 62.380 60.580 54.803 54.141 53.466
SILVER
Average 62.107 cents.
Cents a Pound
13.822 13.999 13.859 13.706 13.599 13.656 13.924 14.174 14.062 13.862 13.576 13.302
COPPER
Average 13.795 cents
LEAD (London)
Average 6.7513 cents
7.556 7.366 6.869 6.251 6.138 6.514 6.891 7.116 6.970 6.696 6.358 6.286
ZINC (London)
Average 7.4096 cents
8.267 7.832 7.405 7.060 6.959 7.221 7.395 7.423 7.470 7.441 7.273 7.150
B.C. Bureau of Mines.

TABLE XV.

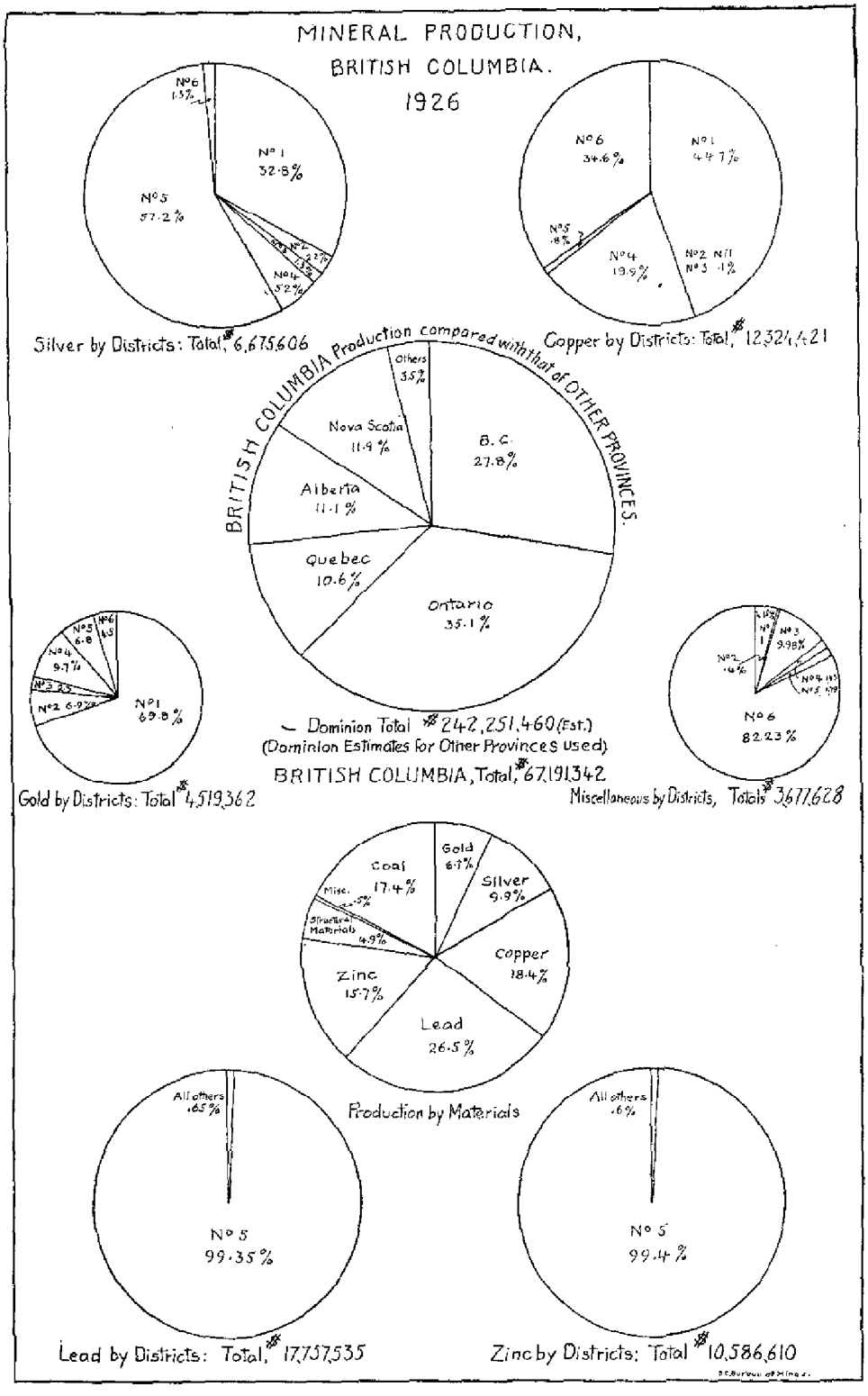
MINERAL PRODUCTION,
BRITISH COLUMBIA.
1926
Silver by Districts: Total $6,675,606
Copper by Districts: Total $12,324,421
BRITISH COLUMBIA Production compared with that of OTHER PROVINCES.
Dominion Total $242,251,460 (Est.)
(Dominion Estimates for Other Provinces used)
BRITISH COLUMBIA, Total $67,191,342
Gold by Districts: Total $4,519,362
Miscellaneous by Districts, Totals $367,628
Production by Materials
Lead by Districts: Total $17,737,535
Zinc by Districts: Total $10,586,610

TABLE XVI.—MEN EMPLOYED IN THE MINERAL INDUSTRY OF BRITISH COLUMBIA, 1926.

District.	Placer-mining.	Lode-mining.			In Concentrators.	In Smelters.	Coal-mining.			Structural Materials.		Miscellaneous Minerals.	Total.
		Under.	Above.	Total.			Under.	Above.	Total.	Quarries.	Plants.		
No. 1	112	698	410	1,108	98	180	.....	.....	.....	23	.....	13	1,534
No. 2	135	33	126	159	.....	.....	7	.....	7	2	.....	2	305
No. 3	43	59	47	106	3	.....	96	33	129	13	5	92	391
No. 4	4	223	187	410	168	.....	212	140	352	8	4	12	958
No. 5	5	833	700	1,533	385	2,281	962	469	1,431	23	.....	4	5,662
No. 6	.....	760	265	1,025	154	.....	2,480	923	3,403	424	315	1	5,322
Totals	299	2,606	1,735	4,341	808	2,461	3,757	1,565	5,322	493	324	124	14,172

TABLE XVII.—TONNAGE, NUMBER OF MINES, AND NET VALUE OF LODE MINERALS.

District.	Tonnage.	No. of Shipping Mines, 1926.	No. of Mines shipping over 100 Tons.	* Net Value of Lode Minerals produced.
No. 1	1,521,202	18	10	$ 8,978,950
No. 2	1,861	5	1	238,615
No. 3	12,679	10	3	166,496
No. 4	722,741	27	7	2,379,824
No. 5	1,360,119	76	33	23,084,201
No. 6	1,156,471	2	1	3,710,527
Totals	4,775,073	138	55	$38,558,613

* This value represents the return to the mine-owner after deducting transportation and treatment charges.

SUMMARY OF STATISTICAL TABLES.

In compiling the Statistical Tables for the 1926 Annual Report the same general arrangement has been followed as in previous years, but the order of the tables has been slightly changed and some new tables have been introduced.

Referring to the preceding Statistical Tables showing the mineral production of the Province, the following is a summary of their contents:—

Table I. shows the total gross value of each mineral product mined in the Province up to the end of 1926, aggregating $988,108,470. From this table it will be seen that coal-mining has produced more than any other separate class of mining, a total of $284,699,133; followed next in importance by copper at $209,967,068, and next in order is lode gold at $126,972,318, with lead in fourth place at $106,976,442.

Table II. shows the value of the total production of the mines of the Province from 1852 to 1895 (inclusive) and for each year from 1896 to 1926 (inclusive). The value of the total mineral production of the Province up to the end of 1926 was $988,108,470.

Table III. gives the quantities in the customary units of measure and the values of the various metals or minerals which go to make up the total of the mineral production of the Province for 1926, and also, for the purpose of comparison, similar data for the two preceding years.

The table shows that in 1926 there were substantial increases in the value of the outputs of silver, zinc, and copper, with small decreases in gold and lead, as compared with the figures for 1925.

Table IV. shows the proportions of the total mineral productions made in each of the various districts into which the Province is divided.

It will be noted that again this year the Eastern District has the honour of first place on the list, followed, in order of importance, by the Western, North-western, Southern, Central, and North-eastern Districts. The Western and Eastern Districts owe a considerable proportion

of their output to the coal-mines situated within their limits, whereas in the other districts the production is chiefly from metal-mining.

The Western District also derives a fair proportion of its production from structural materials, due to the larger cities therein; this year this amounted to $3,009,616, as shown in Table XI.

Table V. shows the statistical record of the placer mines of the Province from 1858 to 1926 and shows a total production of $78,018,548. The output for 1926 was $355,503, an increase, as compared with the previous year, of $75,411.

Table VI. relates entirely to the lode mines of the Province, and shows the quantities and values of the various metals produced each year since the beginning, in 1887, of such mining in the Province. The gross value of the product of these mines to date is $575,215,388; this figure includes the zinc production of 1909 and all subsequent years.

Table VII. gives the details of production of metalliferous mines of the Province for the years 1925 and 1926 and the divisions and districts in which such productions were made, showing the tonnage of ore mined in each district, with its metallic contents and the market value of the contained metals recovered in treatment.

The total tonnage of ore mined in the Province during the year 1926 was 4,775,073 tons, having a gross value of $51,508,031, and, with the placer gold, a total value of $51,863,534.

It will be noted that this metalliferous total shows the substantial increase of $5,383,307, or 11.5 per cent.

Table VIII. contains the statistics of production of the coal-mines of the Province. The total amount of coal produced to the end of 1926 was 68,256,640 tons (2,240 lb.), worth $259,026,533. Of this, 2,330,036 tons was produced in 1926, valued at $11,650,180. In these figures of coal production up to and including 1925 the coal used in making coke is not included, as such coal is accounted for in the figures of output of coke, but the 1926 figure includes coal made into coke.

More detailed statistics as to the coal production of the Province are given in the reports of the Inspection Branch.

Table IX. shows the production of coke from bee-hive ovens in the Province up to the end of 1925.

Table X. is a new table showing complete statistics of the coke industry of the Province. Commencing with 1926, coke will not be considered a primary mineral production, as the coal used in making coke is included and valued in the coal production total. The statistics of the coke industry are, however, given in this table, as they are believed to be of interest to the mineral industry.

Table XI. shows in detail the production of structural materials. The production in 1926 was $3,342,545, as compared with $2,680,072 in 1925. Rock used as flux by smelters does not appear in this table, but will be found in Table XII., "Miscellaneous Minerals."

Table XII. (formerly Table X.) shows the production of "Miscellaneous Minerals" by districts. This branch of the industry is small, but an increasing value of production may be expected in the future.

Table XIII. presents in graphic form the facts shown in figures in the tables, and demonstrates to the eye the rapid growth of mining in the Province, and also the fluctuations to which it has been subject.

From this table it will be seen that coal-mining increased steadily until 1909; from then until 1917 a decrease occurred, since which time progress was upward to 1920 and since then there has been a slight decrease.

The curve of lode production shows on the average a steady growth, but some marked interruptions have occurred; it is satisfactory that a substantial increase in production has occurred in the last five years. The total mineral production also shows a progressive increase, with, however, some large fluctuations.

Table XIV. shows graphically the metal prices for 1926.

Table XV. shows graphically the Dominion mineral production (preliminary estimates for all Provinces except British Columbia) in 1926 by Provinces, and the outputs by minerals and districts of the British Columbia production.

Table XVI. shows the total number of men employed in the mineral industry of the Province. This is the first year that an attempt has been made to gather statistics showing men employed in all branches of the industry. The figures are probably incomplete with regard to a number

of very small operators and leasers working intermittently, but the totals for the different branches indicate very closely the actual men employed.

Table XVII. shows the tonnages of ore and number of shipping mines for each district. A column in this table shows the net value of lode minerals produced by districts. This is the first year that statistics have been collected from which to compile such figures. The net value is the amount given by the mine-owner as being the money value received for his ore; it is the gross value less deductions for transportation, smelting, refining, and marketing charges on the contained metals.

The total net value of $38,558,613 is believed to be approximately correct, although the statistics obtained were not as complete as desired. In many instances small operators and leasers did not give a return of net value, and in all these cases the value was estimated.

REVIEW BY METALS AND MINERALS.

Gold.

Placer Gold. The recovery of placer gold for 1926 was $355,503, of which nearly all was obtained from the Atlin, Cariboo, and Quesnel Divisions. The output shows an increase, as compared with 1925, of $75,411, which is accounted for by increased productions from the Cariboo and Quesnel Divisions.

The Cariboo Division output was increased by a larger production from the Antler Creek dredge of the Kafue Copper Development Company, and in Quesnel Division the Cedar Creek Mining Company made a much larger output than in 1925.

Development and testing of placer properties was actively carried on in many parts of the Province during 1926, particularly in Atlin, Liard, Cariboo, Quesnel, and Similkameen Divisions.

Gold from Lode-mining. The value of lode gold produced in 1926 was $4,163,859, as compared with $4,335,269 in 1925, a decrease of $171,410, or about 4 per cent. Of the total, Portland Canal Division produced $2,567,582, or 61.5 per cent. The decrease in production as compared with 1925 was largely due to the closing in June of the *Surf Inlet* mine. The production of this property was approximately $500,000 less than in 1925. Small decreases in output were also made by the *Nickel Plate* mine and the Rossland properties of the Consolidated Company. These decreases were partially offset by increases in output from the *Engineer*, *Premier*, *Coronation*, *Copper Mountain*, and *Britannia* mines. The reopening of the *Yankee Girl* mine in Nelson Division also added to the gold production.

The following table shows the gold production by Mining Divisions for the years 1925 and 1926:—

Mining Divisions.	1925. Oz.	1926. Oz.
Portland Canal	118,469	124,207
Skeena	35,086	11,128
Osoyoos	19,426	16,280
Trail Creek	14,112	7,600
Nass River	7,484	7,906
Vancouver	8,231	9,995
Lillooet	3,531	4,580
Atlin	1,878	7,757
Nelson	723	6,671
Similkameen	242	3,988
All others	537	1,315
Totals	209,719	201,427

Silver.

The quantity of silver produced in 1926 was 10,748,556 oz., worth $6,675,606, an increase from the production of 1925 in quantity of 3,093,712 oz., or 39.3 per cent., and in value of $1,388,788.

This is the largest silver-output, both in quantity and value, that has ever been made in any year in the Province. The increased production was mainly due to a much larger output from the *Sullivan* mine, but small increases were also made by the *Premier*, *Hidden Creek*,

Copper Mountain, *Britannia*, and Duthie mines, and also the Slocan and Ainsworth Divisions, each with several shippers, showed increases as compared with 1925.

The *Sullivan*, while usually considered a lead-zinc mine, now has the distinction of being the largest silver-producer in Canada.

The market price of silver was well maintained until the last quarter of the year, when a heavy decline took place. The average price for the year was 62.107 cents an ounce, as compared with 69.065 cents in 1925. The average price for the last three months of 1926 was 54.037 cents an ounce, which clearly shows the sharp drop that took place.

The following table shows the silver production by Mining Divisions for the years 1925 and 1926:—

Mining Divisions.	1925. Oz.	1926. Oz.
Fort Steele	3,106,682	4,942,364
Portland Canal	2,392,046	3,092,503
Slocan	856,375	938,880
Greenwood	480,822	408,562
Nass River	390,954	409,470
Omineca	85,888	239,053
Vancouver	131,744	148,113
Trail Creek	32,353	24,705
Ainsworth	79,057	139,832
Similkameen	20,472	141,236
Kamloops	.....	133,815
Nelson	1,652	52,152
All others	76,799	77,871
Totals	7,654,844	10,748,556

Copper.

The amount of copper produced in 1926 was 89,339,768 lb., valued at $12,324,421. This represents, as compared with 1925, an increase of 17,033,336 lb., or 23.5 per cent., and an increase in value of $2,171,152, or 21.4 per cent. The increased production in 1926 was due to a much larger output from the *Copper Mountain* mine of the Granby Company and to some increase by the *Britannia* mine. The combined production of the *Hidden Creek* and *Outsider* mines of the Granby Company was very slightly higher than in 1925. The Granby Company at Anyox in 1926 produced from the *Hidden Creek* and *Outsider* mines 44.5 per cent. of the total copper-output of the Province and the *Britannia* mine 34.5 per cent.

The average price of copper for the year was 13.795 cents a pound, which compares with 14.042 cents for 1925.

The following table shows the production of copper by Mining Divisions for the years 1925 and 1926:—

Mining Divisions.	1925. Lb.	1926. Lb.
Nass River	37,878,408	38,686,513
Vancouver	27,490,854	30,954,479
Similkameen	3,464,891	17,752,253
Trail Creek	1,140,506	751,486
Portland Canal	1,631,755	1,036,113
Skeena	677,422	104,512
All others	22,596	54,412
Totals	72,306,432	89,339,768

Lead.

The amount of lead produced in 1926 was 263,023,937 lb., valued at $17,757,535. This represents, as compared with the previous year, an increase in quantity of 25,124,738 lb., or 10.5 per cent., but owing to a lower average market price for the metal, a decrease in value of $912,794. This is another high record output for lead-mining in the Province.

The increased output was mainly due to a larger production by the *Sullivan* mine, but small increases were made by various other properties.

The average London market price of lead in 1926 was 6.7513 cents a pound, as compared with 7.848 cents in 1925.

The following table shows the production of lead, according to Mining Divisions, for the years 1925 and 1926:—

Mining Divisions.	1925. Lb.	1926. Lb.
Fort Steele	227,306,993	252,050,057
Slocan	4,860,183	4,584,822
Ainsworth	2,760,909	3,442,653
Windermere	754,494	390,680
Portland Canal	839,837	643,061
Nelson	810,877	856,303
Greenwood	258,883	180,495
Omineca	227,610	645,631
All others	79,413	230,235
Totals	237,899,199	263,023,937

The Fort Steele Division continues to head the list, with 95.6 per cent. of the total output of the Province for the year, while Slocan produced 1.75 per cent. of the Provincial production. The large output from the Fort Steele Division comes mainly from the *Sullivan* mine, but it was augmented this year by the *Stemwinder* and *St. Eugene* mines. In Ainsworth Division the largest producer was the *Bluebell* mine and in the Slocan Division the *Silversmith* and *Lucky Jim* mines.

Zinc.

The quantity of zinc produced in 1926 amounted to 142,876,947 lb., valued at $10,586,610. Compared with the 1925 output, this is an increase of 44,619,848 lb., or 45.4 per cent., and an increase in value of $2,832,160, or 36.5 per cent.

The average London price of zinc for the year was 7.4096 cents a pound, as compared with 7.892 cents in 1925.

The largest increase was made by Fort Steele Division, where, in addition to a record production from the *Sullivan* mine, a considerable output was made by the *Stemwinder* and *St. Eugene* mines. Slocan and Ainsworth Divisions also made much larger outputs than in 1925.

The following table shows the production of zinc by Mining Divisions for the years 1925 and 1926:—

Mining Divisions.	1925. Lb.	1926. Lb.
Fort Steele	92,164,850	127,750,444
Slocan	4,413,290	5,793,999
Ainsworth	1,537,774	7,500,374
All others	141,185	1,832,130
Totals	98,257,099	142,876,947

Miscellaneous Minerals.

Iron.—A shipment of 100 tons of bog-iron ore was made from Alta lake to Vancouver. It was used as cleaning material and not as iron ore.

Platinum.—Platinum occurs in irregular and variable amounts in the placer deposits of the Tulameen and Quesnel River sections. Small amounts of crude platinum were recovered in placer operations on the Tulameen river, the output being estimated at $4,258.

Pyrite.—Shipments of pyrite, totalling $16,870, for the making of sulphuric acid, were made from the *Sullivan* mine to the Trail plant and by the *Hidden Creek* mine to Nicholls Chemical Company at Barnett. An increased production of pyrite is expected in 1927.

Arsenic.—From the arsenical-iron-gold concentrates of the *Nickel Plate* mine $11,262 worth of arsenic was recovered at the Tacoma smelter.

Gypsum.—Gypsum produced in 1926 was valued at $154,462, a large increase over that of any previous year. This relatively large output was made principally by the British Columbia Gypsum Company from its property at Falkland. A steady production is expected in the future by this company, which only started shipping in 1926.

Sodium Carbonate.—The production of sodium carbonate made in 1926 was valued at $7,537. The output was made by several shippers from small lakes in the Clinton Division. The mineral is shipped over the Pacific Great Eastern Railway for consumption in Vancouver and district.

Bentonite.—A small shipment of bentonite, valued at $150, was made from a deposit near Princeton. This was shipped to England by the Princeton Collieries Company.

Silicate of Alumina.—From a deposit near Williams Lake shipments of a refractory material, locally called kaolin, valued at $1,900, were made to Vancouver. This material was used as a refractory for furnace-linings and other purposes.

Coal.

The production of coal in 1926 was 2,330,036 long tons, which shows a decrease, as compared with 1925, of 114,256 tons.

Summarizing the Provincial production of coal, the following table shows the output:—

	1923.	1924.	1925.	1926.
Vancouver Island mines ..... tons, 2,240 lb.	1,574,663	1,486,332	1,412,757	1,293,175
Nicola-Princeton mines ..... "	227,393	226,455	175,474	187,153
Crowsnest mines ..... "	740,531	273,518	854,480	848,448
Northern District ..... "	400	1,228	1,581	1,260
Total quantity of coal mined ..... "	2,542,987	1,987,533	2,444,292	2,330,036

The greater part of the Provincial coal production is still being mined by three companies —the Crow's Nest Pass Coal Company of East Kootenay, the Canadian Collieries (Dunsmuir) and the Western Fuel Corporation of Vancouver island, which mined, collectively, 75 per cent. of the output.

Of the other collieries: In the Coast District, on Vancouver island, the Nanoose Collieries, Limited, produced 27,459 tons; the Granby Company, from its colliery near Cassidy, produced 167,286 tons; and King & Foster, conducting operations at the Old Wellington, made a production of 16,602 tons; and, in addition, the East Wellington Coal Company produced 43,474 tons. In the Nicola Valley section of the district the Middlesboro Colliery Company mined 43,474 tons; the Keystone Coal Company, Limited, produced 7,717 tons; the Princeton-B.C. Colliery Company, Limited, 813 tons; the Coalmont Colliery, 121,458 tons; the Tulameen Valley Coal Company, Limited, produced 13,225 tons; the Sunshine Coal Company produced 40 tons; and the Southern Okanagan Collieries, Limited, produced 426 tons.

In the Northern District the Telkwa Collieries, Limited, shipped 1,260 tons. This property for convenience has been included in the Coast District figures.

In the East Kootenay District, in addition to the Crow's Nest Pass Coal Company, which produced 729,849 tons, the Corbin Coals, Limited, produced 118,599 tons.

The collieries of the Coast District, including the Nicola-Princeton and Telkwa fields, are to be credited for 1926 with about 63 per cent. of the total coal-output.

The output of the collieries of the Province for 1926 was, as already stated, 2,330,036 tons, which includes 25,849 tons of coal added to stock.

Of this amount, there was sold for consumption in Canada, 1,534,749 tons; sold for consumption in the United States, 293,925 tons; sold in other countries, *nil;* making the total coal sales for the year 1,828,674 tons of 2,240 lb.

In addition to the coal sold, there was used by the Crow's Nest Pass Coal Company in the manufacture of coke 142,838 tons, and used under companies' boilers, etc., 176,786 tons; while 155,889 tons was lost in washing and screening.

The following table indicates the markets in which the coal-output of the Province was *sold*:—

Coal.	Coast District.	Crowsnest Pass District.	Total for Province.
Sold for consumption in Canada..... tons, 2,240 lb.	1,116,025	418,724	1,534,749
Sold for export to United States..... "	96,692	197,233	293,925
Sold for export to other countries..... "	.....	.....	.....
Total coal sales..... "	1,212,717	615,957	1,828,674

Collieries of Coast District.

The collieries of the Coast District, which includes those on Vancouver island and in the Nicola-Princeton fields and one small colliery in Omineca District, mined 1,481,588 tons of coal in 1926, in addition to which 12,129 tons was taken from stock, making 1,493,717 tons distributed from these collieries in 1926. This amount was distributed thus:—

	Tons.	Tons.
Sold as coal in Canada	1,116,025	
Sold as coal in United States	96,692	
Sold as coal in other countries	.....	
Total sold as coal		1,212,717
Used under companies' boilers, etc.		125,111
Lost in washing, etc.		155,889
		1,493,717
Less coal taken from stock		12,129
Gross output		1,481,588

The total coal sales of the Coast collieries for the year show, as compared with the sales of the previous year, a decrease of 64,730 tons, equivalent to about 5 per cent.

The coal sold in Canada by the collieries of the Coast District this year shows a decrease of 18,975 tons, or about 2 per cent. less than the preceding year; the amount exported to the United States was 45,755 tons less than the preceding year, a decrease of about 32 per cent.*

On Vancouver island six companies produced coal in 1926—the Canadian Collieries (Dunsmuir), Limited, the Western Fuel Corporation of Canada, Limited, the Granby Consolidated Mining, Smelting, and Power Company, the Nanoose-Wellington Collieries, Limited, the property operated by King & Foster, and the East Wellington Coal Company; the majority of these companies each operate two, or more, collieries. The combined output of the Island collieries was 1,293,175 tons.

In the Nicola and Princeton coalfields of the Coast District the Middlesboro Colliery Company produced 43,474 tons of coal; the Keystone Coal Company, 7,717 tons; the Princeton Colliery, 813 tons; the Coalmont Collieries, 121,458 tons; the Tulameen Valley coal-mine, 13,225 tons; the Sunshine Coal Company, 40 tons; and the Southern Okanagan Collieries, Limited, produced 426 tons. The total output of this portion of the sub-district was 187,153 tons.

The Telkwa Collieries produced 1,260 tons.

East Kootenay Coalfield.

There were only two companies operating in this district in 1926—the Crow's Nest Pass Coal Company, operating two separate collieries, which together mined 729,849 tons; and the Corbin Coal and Coke Company, which mined 118,599 tons; making an output for the district for 1926 of 848,448 tons of coal.

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* This paragraph appearing in the 1925 Report should read as follows:—
The coal sold in Canada by the collieries of the Coast District this year shows a decrease of 118,305 tons, or about 9 per cent. less than the preceding year; the amount exported to the United States was 3,435 tons more than the preceding year, an increase of about 2 per cent.

The amount of coal actually distributed was 810,470 tons, which, together with 37,978 tons added to stock, shows the total production of 848,448 tons.

The following table shows the distribution made of the coal of this district:—

	Tons.	Tons.
Sold as coal in Canada	418,724	
Sold as coal in United States	197,233	
Total sold as coal		615,957
Used by the Crow's Nest Pass Coal Co. in making coke		142,838
Used by the companies under boilers, etc.		51,675
		810,470
Plus coal added to stock		37,978
Gross output		848,448

STRUCTURAL MATERIALS.

The output of structural materials in 1926 was valued at $3,342,545, an increase of $662,473, or 24.7 per cent., as compared with 1925. This increased production reflects the greater building activity throughout the Province in 1926. It is believed that the statistics as presented are nearly complete, as returns have been received from practically all operators.

Approximately 90 per cent. of the total production of building materials comes from the Coast District and the larger part of this is marketed in the Coast cities.

Increases were made in 1926 as compared with the preceding year in the outputs of limestone, building-stone, crushed rock, pottery, and tile.

Building-stone.—The production of building-stone in 1926 was valued at $174,717. A considerable part of this production consisted of pulp-stones for use in pulp-mills.

Red Brick.—The production of red brick during 1926 was valued at $195,830. The price of brick given by the operators varies from $15 to $20 a thousand, depending on quality.

Firebrick.—The only company producing firebrick in the Province is the Clayburn Company, Limited, with a plant at Clayburn. The fireclay is found here as a bed occurring in bedded rocks of Eocene age. Shales, sandstone, and conglomerates, all but little consolidated, make up this sedimentary series. The shales are quarried or mined for brick-making and one bed is an excellent fireclay. Firebrick is the principal manufactured article produced by this company, but, in addition, considerable quantities of paving-brick, tiles, drain-pipes, fireclay blocks and shapes, and prepared fireclay are made.

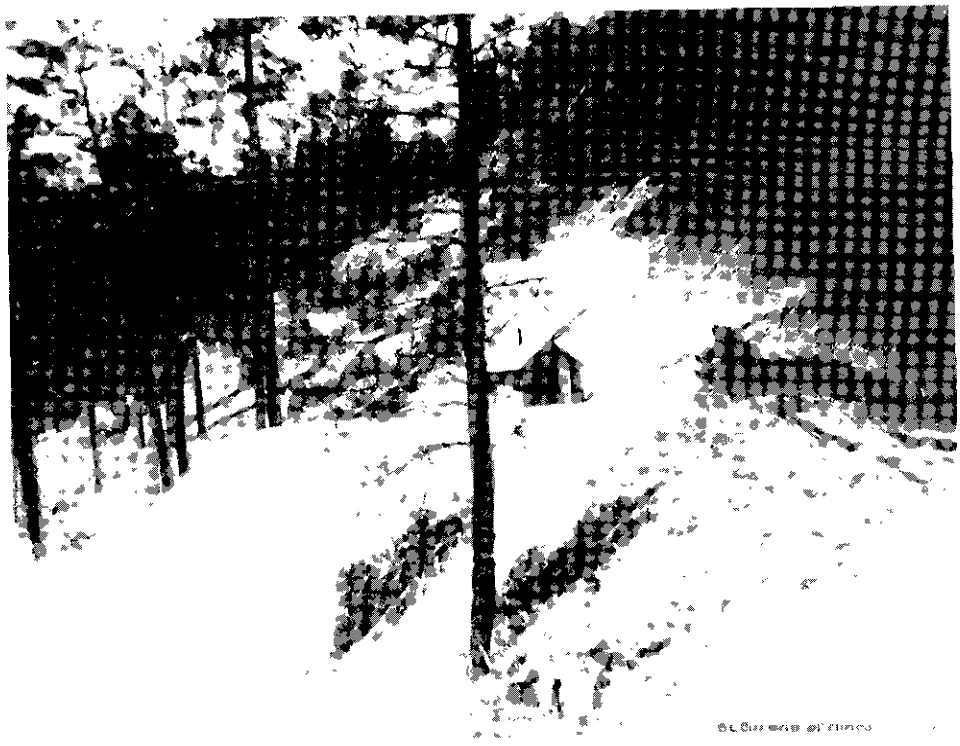
Lime.—The manufacture of lime is conducted in a small way at a large number of points in the Province, but only on the Coast has any attempt been made at more extensive operations. In the neighbourhood of Victoria, on Esquimalt harbour, two kilns are in operation. There are two plants on Texada island, where, at Marble bay and at Blubber bay, the limestone being used is of exceptional purity.

The production of lime and limestone for 1926 was valued at $557,049, as compared with $290,065 in 1925.

Sand and Gravel.—The sand and gravel production in 1926 was $331,302, as compared with $364,834 in 1925.

Crushed Rock.—The returns for crushed rock show an output valued at $296,597, as compared with $225,272 in 1925.

Windpass Mountain, North Thompson River.



Gypsum at Falkland, Kamloops M.D.

DEPARTMENT OF MINES.

VICTORIA, B.C.

HON. WILLIAM SLOAN - - - - - - *Minister of Mines.*
ROBERT DUNN - - - - - - - - *Deputy Minister.*
JOHN D. GALLOWAY - - - - - - *Provincial Mineralogist.*
D. E. WHITTAKER - - - - - *Provincial Analyst and Assayer.*
JAMES DICKSON - - - - - - - *Chief Inspector of Mines.*

HENRY DEVLIN, *District Inspector*, Nanaimo.
T. R. JACKSON, *District Inspector*, Nanaimo.
ROBERT STRACHAN, *District Inspector*, Fernie.
JOHN MACDONALD, *District Inspector*, Fernie.
JOHN G. BIGGS, *District Inspector*, Merritt.
THOS. J. SHENTON, *Dist. Inspector*, Prince Rupert.
H. H. JOHNSTONE, *Inspector*, Nelson.
JAS. STRANG, *Inspector and Examiner*, Victoria.
H. E. MIARD, *Inspector and Examiner*, Fernie.

Resident Mining Engineers.

GEO. A. CLOTHIER, No. 1 District, Prince Rupert.
DOUGLAS LAY, No. 2 District, Hazelton.
H. G. NICHOLS, No. 3 District, Kamloops.
P. B. FREELAND, No. 4 District, Grand Forks.
A. G. LANGLEY, No. 5 District, Revelstoke.
W. M. BREWER, No. 6 District, Nanaimo.

DEPARTMENT OF MINES.

Mining in British Columbia is administered for the Government by the Department of Mines through the Deputy Minister of Mines and under the direction of the Honourable the Minister of Mines. The Department has charge of all Government offices in connection with the mining industry and, except as may be otherwise provided by Statute, the administration of the laws with respect to all kinds of mining.

Under the "Mineral Act" the Province is divided into forty-two Mining Divisions. Over each of these Divisions there is a Mining Recorder and over groups of Divisions of varying sizes there are Gold Commissioners. Of Mining Recorders, inclusive of Sub-Mining Recorders, there are 121, and of Gold Commissioners, 25. These figures give an insight into the extensive provision which has been made to assure prospectors and mining men generally that, wherever they may find themselves within British Columbia's 370,000 square miles of territory, they at all times will be within reasonable reach of a Mining Recorder, or a Deputy Mining Recorder, or a Gold Commissioner ready to extend to them all the privileges to which they are entitled, as free miners, under the "Mineral," "Placer," or other Mining Acts.

A sketch of the respective duties of the above-enumerated officers may be of interest. The Gold Commissioner in many cases also is Government Agent and in the latter capacity may represent every department of public service. Under the mining laws he has all the powers of a Mining Recorder and sometimes discharges the duties of both offices. One of his responsible duties is the issuing of certificates of improvement in respect of mineral claims for which Crown grants are sought; another is the consideration and the granting or otherwise of placer-mining leases; and in addition he has quasi-judicial authority in regard to questions which arise from time to time under both the "Mineral Act" and the "Placer-mining Act." A Gold Commissioner may have one or more Mining Divisions under his supervision.

As to Mining Recorders and Sub-Mining Recorders, the Acts clearly explain their duties. They are the officials first looked for on the discovery and location of placer-ground or mineral claims. They must see that all records are properly made and that the order of priority is carefully observed in respect of the same. They issue Free Miners' Certificates and must see that a proper return of the same is made to the Department.

It is this comprehensive system of administration which, broadly speaking, constitutes the Department of Mines, headquarters of which, under the Honourable the Minister of Mines, are in Victoria. From the head office the activities of the officers in the different parts of the Province

are directed and co-ordinated. Care must be given the application of the mining laws to divergent problems in order that, whilst justice is accorded in all cases, in none are the vital principles underlying the Statute departed from. This is one of the most important of the duties of the Department functioning under the direct supervision of the Minister.

There also is the duty of administering the "Mines Development Act," 1916, under the terms of which the sum of $944,623.85 was expended in the construction and the maintenance of mine roads, trails, and bridges from May 31st, 1916, to December 31st, 1926. As a result, mines, found upon inspection by Government Mining Engineers to merit assistance, have benefited by the building of 625 miles of road and 1,002 miles of trail and the maintenance of 511 miles of road and 1,370 miles of trail. This means that a grand total of 3,508 miles of roads and trails have been opened and kept open in order that the development of mining might be facilitated. This, then, is another phase of the work of the Department, which maintains its touch with the field through six Resident Mining Engineers appointed under the "Mineral Survey and Development Act."

All who are interested in mining in British Columbia should make themselves acquainted with the "Mineral Survey and Development Act." It is interesting not only because of the appointment of Resident Mining Engineers over six Mineral Survey Districts, who are required to apply themselves constantly to the making of a survey of the mineral resources of their respective districts, to prepare a report each year dealing with their activities and observations, and to extend every possible assistance to mining men and prospectors. There are other features; perhaps the most important, in view of recent increased public financial support of mining enterprises, being contained in sections 16 and 17 of the Act. Briefly these sections make it necessary for a mining company to forward a copy of its prospectus to the Resident Mining Engineer of the district in which its mining property is situated. The Engineer's duty is to compare statements contained in the prospectus with the conditions as he knows them to exist on the ground. If he finds misstatements or discrepancies calculated to mislead an investor, the Minister is notified. He makes further investigation. The company may be communicated with and asked to withdraw the statements complained of; or, if the case is one that seems to demand more extreme measures, the Minister may authorize the public advertisement of the facts through the Provincial Gazette and the public press.

The foregoing will serve to convey a general idea of the activities of the administrative headquarters of the Department in Victoria and those branch offices situated in the large centres of population as well as in the most remote parts of the Province over which jurisdiction is exercised.

If you want information as to the mining laws of the Province—the most liberal and stable ever drafted—apply to the Department. If you are contemplating investment in the stock of a British Columbia mining company, do not fail to get the last Annual Report of the Minister of Mines. References to practically every mine or mining prospect in British Columbia are contained in these Annual Reports. If no such references were made last year, the desired information may have been given in the Annual Report of some previous year. It is possible that the slight trouble of asking for a search will be well rewarded. The Department is prepared to render this service on application.

Communications from anywhere in Canada, the United States, or South America, seeking either copies of Annual Reports or mining maps, or any other information concerning mining in the Province, will have immediate attention if directed to:—

HON. WM. SLOAN,
Minister of Mines,
Victoria, B.C.,
Canada.

Applications for information, as above set out, from Great Britain, or any other European country, will receive prompt attention by being referred to the Agent-General for British Columbia, British Columbia House, 1 and 3 Regent Street, London, S.W. 1, England.

INSPECTION BRANCH.

The Inspection Branch of the Department of Mines consists of a Chief Inspector, seven District Inspectors, two examiners, who are also Acting-Inspectors, and four Instructors in Mine-rescue Work.

The Inspectors have jurisdiction over both coal and metalliferous mines within the boundaries of their respective districts. Every part of all operating coal-mines are inspected at least once every month, and metalliferous mines as often as time will permit, generally once in every sixty days, to see that general conditions are good for the safety and health of the workmen employed, and that the Coal and Metalliferous Mines Regulation Acts are complied with.

The Mine-rescue Stations are under the jurisdiction of the Inspection Branch. Four are maintained at the principal mining centres for the purpose of supplementing, in case of need, the colliery installations of mine-rescue apparatus, and also for the purpose of training the holders of certificates in the use of mine-rescue apparatus. In cases of emergency these stations are available for the use of any trained corps of mine rescuers, duly qualified medical practitioners, or corps trained in the work of first aid to the injured, subject to the order of an Inspector. All certificated officials who are physically fit, and not less than 3 per cent., or such number as the Chief Inspector may deem sufficient, of the workmen at each colliery must be trained in the use of mine-rescue apparatus.

The examining boards for granting certificates of competency to coal-mine officials and coal-miners are under the jurisdiction of the Inspection Branch. The Chief Inspector and the two examiners form the board for coal-mine officials for the whole of the Province, and the two examiners and the District Inspector form the board for granting certificates to coal-miners within their respective districts.

A District Inspector may grant a provisional certificate to a coal-miner between examinations for a period not exceeding sixty days.

Blasting certificates of competency to miners at metalliferous mines are granted by the Inspectors of Mines.

A section of the Annual Report of the Minister of Mines contains the reports of the officials of the Inspection Branch.

GOLD COMMISSIONERS AND MINING RECORDERS.

Mining Division.	Location of Office.	Gold Commissioner.	Mining Recorder.	Sub-Recorder.
Atlin	Atlin	C. L. Monroe	C. L. Monroe	J. G. Garrett.
Sub-office	Telegraph Creek			H. W. Dodd.
Sub-office	Haines (U.S.)		(Com. for taking Affidavits)	Risdon M. Odell.
Sub-office	Juneau (U.S.)		Ditto	Harold E. Brown.
Stikine	Telegraph Creek	H. W. Dodd	H. W. Dodd	
Sub-office	Boundary	H. W. Dodd	H. W. Dodd	W. R. Overend.
Liard	Telegraph Creek	H. W. Dodd	H. W. Dodd	
Sub-office	Porter			Chas. H. Smith.
Sub-office	McDame Creek			Mike Larsen.
Sub-office	Fort St. John			F. W. Beatton.
Skeena	Prince Rupert	N. A. Watt	N. A. Watt	
Sub-office	Kitimat			C. M. Carlson.
Sub-office	Copper City			L. G. Skinner.
Sub-office	Terrace			L. H. Kenny.
Sub-office	Rosswood			Mrs. C. Warner.
Sub-office	Stewart (Portland Canal)			J. P. Scarlett.
Nass River	Anyox	N. A. Watt	R. M. McGusty	
Sub-office	Aiyansh	N. A. Watt		A. F. Priestly.
Sub-office	Alice Arm			Mrs. L. Cummings.
Portland Canal	Stewart	N. A. Watt (at Prince Rupert)	J. P. Scarlett	
Bella Coola	Prince Rupert	N. A. Watt	N. A. Watt	
Sub-office	Bella Coola			Brynild Brynildsen.
Sub-office	Bella Bella			
Sub-office	Ocean Falls			Geo. H. Hill.
Queen Charlotte	Queen Charlotte	N. A. Watt	John L. Barge	
Sub-office	Jedway			Isaac Thompson.
Sub-office	Masset			J. C. S. Dunn, M.D.
Sub-office	Lockeport			William Morgan.
Omineca	Smithers	Stephen H. Hoskins	Jas. E. Kirby	
Sub-office	Fort Grahame			H. Ravenal.
Sub-office	Finlay Forks			H. M. Gibson.

GOLD COMMISSIONERS AND MINING RECORDERS—*Continued.*

Mining Division.	Location of Office.	Gold Commissioner.	Mining Recorder.	Sub-Recorder.
Omineca—*Continued.*				
Sub-office	Fort St. James			Alex. C. Murray.
Sub-office	Manson Creek			W. B. Steele.
Sub-office	Telkwa			T. J. Thorp.
Sub-office	Prince George			Geo. Milburn.
Sub-office	Hudson Hope			J. L. Ruxton (Acting).
Sub-office	Fort St. John			F. W. Beatton.
Sub-office	Copper City			L. G. Skinner.
Sub-office	Terrace			L. H. Kenny.
Sub-office	Fort Fraser			J. D. Moore.
Sub-office	Pacific			T. H. McCubbin.
Sub-office	Hazelton			G. A. Wyman.
Sub-office	Burns Lake			L. Mulvaney.
Sub-office	Usk			Jas. L. Bethurem.
Sub-office	Tatla Landing			E. G. McCorkell.
Peace River	Fort St. John	S. H. Hoskins (at Smithers)	F. W. Beatton	
Sub-office	Prince George			G. Milburn.
Sub-office	Finlay Forks			H. M. Gibson.
Sub-office	Hudson Hope			J. L. Ruxton (Acting).
Sub-office	Pouce Coupe			Fred. Fraser.
Cariboo	Barkerville	L. J. Price	L. J. Price	Mrs. L. J. Price.
Sub-office	Quesnel	L. J. Price		E. C. Lunn.
Sub-office	Prince George	L. J. Price		Geo. Milburn.
Sub-office	McBride	L. J. Price		P. Carr.
Quesnel	Williams Lake	L. C. Maclure	L. C. Maclure	
Sub-office	Quesnel			E. C. Lunn.
Sub-office	Likely			A. B. Campbell.
Sub-office	Barkerville			L. J. Price.
Clinton	Clinton	R. J. A. Dorrell	R. J. A. Dorrell	
Sub-office	Williams Lake			L. C. Maclure.
Sub-office	S. Fork, Bridge River	W. Haylmore	W. Haylmore	W. Haylmore.
Lillooet	Lillooet	E. F. Little	E. F. Little	R. W. Melton.
Sub-office	S. Fork, Bridge River			W. Haylmore.
Kamloops	Kamloops	E. Fisher	E. Fisher	R. F. Ure.
Sub-office	Chu Chua			George Fennell.
Sub-office	Vavenby			A. McDonald.
Ashcroft	Ashcroft	E. Fisher (at Kam.)	W. C. Adams	Miss F. H. C. Wilson.
Sub-office	Lytton			W. Greenwood.
Nicola	Merritt	E. Fisher (at Kam.)	W. H. Boothroyd	
Yale	Yale	E. Fisher (at Kam.)		
Sub-office	Hope	E. Fisher (at Kam.)	D. A. Hazelton	Mrs. D. A. Hazelton.
Similkameen	Princeton	H. Beech	H. Beech	
Sub-office	Hedley			R. E. Baxter.
Vernon	Vernon	R. Ross Napier	R. Ross Napier	
Greenwood	Greenwood	S. B. Hamilton	S. B. Hamilton	
Sub-office	Vernon			
Sub-office	Rock Creek			Owen Wheeler.
Sub-office	Beaverdell			C. D. Collen.
Grand Forks	Grand Forks	Chas. Mudge	Chas. Mudge	
Osoyoos	Penticton	W. R. Dewdney	W. R. Dewdney	
Sub-office	Keremeos			L. H. Patten.
Sub-office	Hedley			R. E. Baxter.
Sub-office	Fairview			J. R. Brown.
Golden	Golden	G. E. Sanborn	G. E. Sanborn	H. C. Moore.
Windermere	Wilmer	G. E. Sanborn (at Golden)	E. M. Sandilands	
Fort Steele	Cranbrook	P. H. McCurrach	P. H. McCurrach	
Sub-office	Fernie			E. T. Cope.
Ainsworth	Kaslo	Ronald Hewat	A. McQueen	A. W. Anderson.
Sub-office	Howser			W. Simpson.
Sub-office	Trout Lake			Roy V. Jacobson.
Sub-office	Poplar			Arthur G. Johnston.

GOLD COMMISSIONERS AND MINING RECORDERS—*Continued.*

Mining Division.	Location of Office.	Gold Commissioner.	Mining Recorder.	Sub-Recorder.
Slocan	New Denver	Ronald Hewat (at Kaslo)	Angus McInnes	
Sub-office	Sandon			W. J. Parham.
Slocan City	Slocan	Ronald Hewat	T. McNeish	
Trout Lake	Trout Lake	Ronald Hewat	Roy V. Jacobson	
Nelson	Nelson	J. Cartmel	J. Cartmel	
Sub-office	Creston			H. W. McLaren.
Sub-office	Ymir			Wm. Clark.
Sub-office	Sheep Creek			Geo. Lecce.
Sub-office	Salmo			M. C. Donaldson.
Arrow Lake	Nakusp	J. Cartmel (at Nelson)	Walter Scott	
Sub-office	Vernon			R. Ross Napier.
Revelstoke	Revelstoke	Wynfield Maxwell	C. J. Aman	
Lardeau	Beaton	Wynfield Maxwell (at Revelstoke)	Ernest Roberts	
Trail Creek	Rossland	W. H. Reid	W. H. Reid	
Nanaimo	*Nanaimo*	*L. A. Dodd*	*L. A. Dodd*	
Sub-office	Ladysmith			J. A. Knight.
Sub-office	Alert Bay			Ernest H. Robinson.
Sub-office	Vananda			Leonard Raper.
Sub-office	Granite Bay			Henry Twidle.
Alberni	Alberni	A. G. Freeze	A. G. Freeze	
Clayoquot	Clayoquot	A. G. Freeze (at Alberni)	W. T. Dawley	
Quatsino	Quatsino	A. G. Freeze (at Alberni)	Ed. Evensen	
Victoria	Victoria	R. J. Steenson	R. J. Steenson	
New Westminster	New Westminster	F. C. Campbell	I. Wintemute	
Sub-office	Harrison Lake			L. A. Agassiz.
Sub-office	Chilliwack			Chas. J. Whittaker.
Vancouver	Vancouver	John Mahony	A. P. Grant	

OFFICE STATISTICS FOR MINING DIVISIONS.

NORTH-WESTERN DISTRICT (No. 1).

ATLIN MINING DIVISION.

REPORT BY C. L. MONROE, GOLD COMMISSIONER, ATLIN.

I have the honour to submit the office statistics of the Atlin Mining Division for the year ended December 31st, 1926.

Free miners' certificates (individual)	293
Free miners' certificates (company)	5
Placer records	8
Placer rerecords	85
Placer lease applications	10
Placer leases granted	4
Certificates of work (leases)	103
Leaves of absence	16
Bills of sale, etc. (placer)	10
Bills of sale, etc. (hydraulic)	11
Bills of sale, etc. (mineral)	32
Mineral records	40
Certificates of improvements	4
Certificates of work (mineral)	178
Filings	19

Revenue.

Free miners' certificates	$1,805 50
Mining revenue	6,915 40
Total	$8,720 90

STIKINE AND LIARD MINING DIVISION.

REPORT BY H. W. DODD, GOLD COMMISSIONER, TELEGRAPH CREEK.

I have the honour to submit the office statistics of the Stikine and Liard Mining Divisions for the year ended December 31st, 1926.

Free miners' certificates (individual)	320
Free miners' certificates (company)	2
Placer claims recorded	28
Placer claims rerecorded	15
Mineral claims recorded	31
Placer leases issued	26
Certificates of work (mineral)	16
Certificates of work (placer)	28
Assignments and bills of sale	21
Powers of attorney, etc.	102
Filings	21

Revenue.

Free miners' certificates	$1,694 50
Mining receipts	8,043 30
Total	$9,737 80

SKEENA AND BELLA COOLA MINING DIVISIONS.

REPORT BY NORMAN A. WATT, GOLD COMMISSIONER, PRINCE RUPERT.

I have the honour to submit the office statistics of the Skeena and Bella Coola Mining Divisions for the year ended December 31st, 1926.

Free miners' certificates	265
Mining receipts issued	178
Mineral claims recorded	94
Placer leases	2
Certificates of work (mining)	157
Certificates of work (placer)	2
Filings	24

Revenue.

Free miners' certificates	$1,447 75
Mining receipts	1,176 25
Total	$2,624 00

NASS RIVER MINING DIVISION.

REPORT BY R. M. MCGUSTY, MINING RECORDER, ANYOX.

I have the honour to submit the office statistics of the Nass River Mining Division for the year ended December 31st, 1926.

Free miners' certificates	210
Mineral claims recorded	195
Certificates of work (mineral)	443
Conveyances, etc.	114
Filings	33

Revenue.

Free miners' certificates	$1,332 25
Mining receipts	2,199 95
Total	$3,532 20

PORTLAND CANAL MINING DIVISION.

REPORT BY J. P. SCARLETT, MINING RECORDER, STEWART.

I have the honour to submit the office statistics of the Portland Canal Mining Division for the year ended December 31st, 1926.

Free miners' certificates (individual)	371
Free miners' certificates (company)	15
Mineral claims recorded	452
Certificates of work issued	1,012
Bills of sale, etc., recorded	257
Certificates of improvements recorded	75
Abandonments	2
Filings	90

Revenue.

Free miners' certificates	$ 3,299 00
Mining receipts	7,275 25
Total	$10,574 25

QUEEN CHARLOTTE MINING DIVISION.

REPORT BY JOHN L. BARGE, MINING RECORDER, QUEEN CHARLOTTE.

I have the honour to submit the office statistics of the Queen Charlotte Mining Division for the year ended December 31st, 1926.

Free miners' certificates issued	44
Mining records (locations) issued	8
Mining records (placer) issued	1
Certificates of work (quartz) issued	34
Certificates of work (placer) issued	6
Records entered	35
Records filed	2

Revenue.

Mining receipts	$383 25
Free miners' certificates	203 00
Total	$586 25

NORTH-EASTERN DISTRICT (No. 2).

CARIBOO MINING DIVISION.

REPORT BY L. J. PRICE, GOLD COMMISSIONER, BARKERVILLE.

I have the honour to submit the office statistics of the Cariboo Mining Division for the year ended December 31st, 1926.

Free miners' certificates issued	227
Mineral claims recorded	46
Certificates of work (mineral)	91
Placer claims recorded and rerecorded	35
Applications for placer leases	46
Placer-mining leases issued	43
Certificates of work (placer leases)	87
Powers of attorney recorded	14
Conveyances and agreements recorded	57
Leases in force	166

Revenue.

Free miners' certificates	$ 1,332 25
Mining receipts, general	11,925 69
Total	$13,257 94

QUESNEL MINING DIVISION.

REPORT BY L. C. MACLURE, GOLD COMMISSIONER, WILLIAMS LAKE.

I have the honour to submit the office statistics of the Quesnel Mining Division for the year ended December 31st, 1926.

Free miners' certificates issued (individual)	315
Mineral claims recorded	70
Certificates of work issued (mineral)	65
Placer claims recorded and rerecorded	10
Applications for placer-mining leases	66
Placer-mining leases issued	43
Certificates of work issued (placer)	86

Powers of attorney recorded	52
Conveyances and agreements recorded	34

Revenue.

Free miners' certificates	$ 1,838 00
Mining receipts, general	9,655 25
Total	$11,493 25

OMINECA MINING DIVISION.

REPORT BY S. H. HOSKINS, GOLD COMMISSIONER, SMITHERS.

I have the honour to submit the office statistics of the Omineca Mining Division for the year ended December 31st, 1926.

Free miners' certificates (ordinary)	565
Free miners' certificates (company)	5
Free miners' certificates (special)	1
Mineral claims recorded	584
Certificates of work recorded and issued (mineral)	633
Certificates of work recorded and issued (placer)	49
Placer claims recorded and rerecorded	14
Bills of sale, mining agreements, etc., recorded	170
Powers of attorney recorded	51
Mining documents filed	57
Certificates of improvements recorded and issued	2
Applications for placer-mining leases (Omineca)	35
Placer-mining leases issued (Omineca)	9
Applications for placer-mining leases (Peace River)	1
Placer-mining leases issued (Peace River)	1

Revenue.

Free miners' certificates	$ 3,183 50
Mining receipts	6,967 65
Total	$10,151 15

CENTRAL DISTRICT (No. 3).

LILLOOET MINING DIVISION.

REPORT BY E. F. LITTLE, GOLD COMMISSIONER, LILLOOET.

I have the honour to submit the office statistics of the Lillooet Mining Division for the year ended December 31st, 1926.

Free miners' certificates issued	133
Mineral claims recorded	86
Certificates of work	164
Placer claims recorded	1
Placer-mining leases issued	28
Placer-mining leases, certificates of work	28
Conveyances, etc., recorded	80

Revenue.

Free miners' certificates	$1,071 75
Mining receipts	4,154 33
Total	$5,226 08

CLINTON MINING DIVISION.

REPORT BY R. A. DORRELL, GOLD COMMISSIONER, CLINTON.

I have the honour to submit the office statistics of the Clinton Mining Division for the year ended December 31st, 1926.

Free miner's certificates	84
Mineral claims recorded	165
Certificates of work	90
Placer claims recorded	4
Leases issued	23
Bench leases in existence	23
Creek leases in existence	2
Dredging leases in existence	2
"Mineral Act," bills of sale, etc.	11
"Placer Act," assignments, etc.	17
Certificates of work (placer)	7
Notices to group	7
Filings	5
Leave of absence	1
Revocation of powers of attorney	2

Revenue.

Free miners' certificates	$ 382 25
Mining receipts, general	1,993 65
Total	$2,375 90

NICOLA MINING DIVISION.

REPORT BY W. H. BOOTHROYD, MINING RECORDER, MERRITT.

I have the honour to submit the office statistics of the Nicola Mining Division for the year ended December 31st, 1926.

Free miners' certificates	106
Mineral claims recorded	44
Certificates of work (mineral)	91
Certificates of work (placer)	17
Bills of sale (mineral)	13
Bills of sale (placer)	1
Agreements recorded (mineral)	2
Agreements recorded (placer)	3
Placer leases issued	22
Filings	1

Revenue.

Free miners' certificates	$ 421 00
Mining receipts, general	2,008 95
Total	$2,429 95

VERNON MINING DIVISION.

REPORT BY R. ROSS NAPIER, GOLD COMMISSIONER, VERNON.

I have the honour to submit the office statistics of the Vernon Mining Division for the year ended December 31st, 1926.

Free miners' certificates issued (individual)	292
Free miners' certificates issued (special)	4

Mineral claims recorded	100
Certificates of work issued (mineral)	89
Placer-mining leases in force	41
Certificates of work (placer)	49
Powers of attorney recorded	5
Conveyances and agreements recorded	25

Revenue.

Free miners' certificates	$1,381 25
Mining receipts, general	2,197 40
Total	$3,578 65

YALE MINING DIVISION.

REPORT BY D. A. HAZELTON, MINING RECORDER, HOPE.

I have the honour to submit the office statistics of the Yale Mining Division for the year ended December 31st, 1926.

Free miners' certificates (ordinary)	221
Free miners' certificates (company)	6
Mineral claims recorded	131
Placer claims recorded	13
Certificates of work (mineral)	164
Certificates of work (placer)	25
Placer leases in existence	34
Bills of sale recorded (mineral)	9
Bills of sale recorded (placer)	4
Powers of attorney	17
Filings	17

Revenue.

Free miners' certificates	$1,410 50
Mining receipts	2,292 10
Total	$3,702 60

ASHCROFT MINING DIVISION.

REPORT BY W. C. ADAM, MINING RECORDER, ASHCROFT.

I have the honour to submit the office statistics of the Ashcroft Mining Division for the year ended December 31st, 1926.

Mineral claims	108
Certificates of work	50
Free miners' certificates issued	106
Conveyances recorded	7
Records filed	2
Applications to group	8
Placer claims	4
Rerecords	2
Leaves of absence	4
Placer leases	7
Conveyances (lease)	1

KAMLOOPS MINING DIVISION.

REPORT BY E. FISHER, GOLD COMMISSIONER, KAMLOOPS.

I have the honour to submit the office statistics of the Kamloops Mining Division for the year ended December 31st, 1926.

Free miners' certificates (ordinary)	418
Mineral claims recorded	178
Mineral claims (partnership)	11
Placer rerecords	2
Placer leases issued	24
Certificates of work (mineral)	260
Certificates of work (placer leases)	12
Bills of sale	74
Powers of attorney	18
Filings	55

Revenue.

Mining receipts	$3,044 05
Free miners' certificates	2,041 50
Total	$5,085 55

SOUTHERN DISTRICT (No. 4).

GREENWOOD MINING DIVISION.

REPORT BY S. B. HAMILTON, GOLD COMMISSIONER, GREENWOOD.

I have the honour to submit the office statistics of the Greenwood Mining Division for the year ended December 31st, 1926.

Free miners' certificates	189
Locations (quartz)	140
Locations (placer)	2
Certificates of work	140
Certificates of work (placer)	1
Leases of reverted Crown-granted mineral claims	34
Bills of sale	17
Agreements	7
Filings	28
Miscellaneous	4

GRAND FORKS MINING DIVISION.

REPORT BY CHAS. MUDGE, MINING RECORDER, GRAND FORKS.

I have the honour to submit the office statistics of the Grand Forks Mining Division for the year ended December 31st, 1926.

Free miners' certificates	83
Records of locations	28
Certificates of work	61
Bills of sale	7
Filings	4
Certificates of improvements	1
Crown grants	2
Leases of reverted mineral claims	9

OSOYOOS MINING DIVISION.

REPORT BY W. R. DEWDNEY, GOLD COMMISSIONER, PENTICTON.

I have the honour to submit the office statistics of the Osoyoos Mining Division for the year ended December 31st, 1926.

Special free miners' certificates	2
Free miners' certificates (ordinary)	235
Locations (quartz)	116
Certificates of work	93
Conveyances	19
Agreement	1
Filings	17
Certificates of improvements	3
Leases of reverted claims	5

SIMILKAMEEN MINING DIVISION.

REPORT BY H. BEECH, GOLD COMMISSIONER, PRINCETON.

I have the honour to submit the office statistics of the Similkameen Mining Division for the year ended December 31st, 1926.

Free miners' certificates	333
Mineral claims recorded	147
Certificates of work (mineral)	246
Certificates of work (leases)	92
Bills of sale recorded (mineral)	33
Bills of sale recorded (leases)	47
Placer leases issued	90
Forfeited claims leased	25
Powers of attorney recorded	45

EASTERN DISTRICT (No. 5).

GOLDEN MINING DIVISION.

REPORT BY G. E. SANBORN, GOLD COMMISSIONER, GOLDEN.

I have the honour to submit the office statistics of the Golden Mining Division for the year ended December 31st, 1926.

Free miners' certificates (ordinary)	129
Free miners' certificates (special)	1
Mineral claims recorded	56
Placer leases issued	16
Certificates of work (mineral)	56
Certificates of work (placer)	5
Bills of sale, agreements, etc.	67

Revenue.

Free miners' certificates	$ 572 25
Mining receipts	2,221 50
Total	$2,793 75

WINDERMERE MINING DIVISION.

REPORT BY E. M. SANDILANDS, MINING RECORDER, WILMER.

I have the honour to submit the office statistics of the Windermere Mining Division for the year ended December 31st, 1926.

Free miners' certificates (ordinary)	99
Free miners' certificates (special)	2
Claims recorded (quartz)	108
Certificates of work (quartz)	120
Bills of sale, bonds, agreements, powers of attorney, etc.	74

FORT STEELE MINING DIVISION.

REPORT BY P. H. MCCURRACH, GOLD COMMISSIONER, CRANBROOK.

I have the honour to submit the office statistics of the Fort Steele Mining Division for the year ended December 31st, 1926.

Free miners' certificates	351
Locations (quartz)	829
Locations (placer)	3
Certificates of work (quartz)	1,054
Certificates of work (placer)	27
Leases (placer)	6
Bills of sale, agreements, etc. (mineral and placer)	750
Certificates of improvements	69
Leases of reverted Crown-granted mineral claims	16
Notices to group mineral claims, etc.	63
Applications under "Phosphate-mining Act"	53

Revenue.

Free miners' certificates	$ 2,640 20
Mining receipts, general	10,273 00
Total	$12,913 20

REVELSTOKE MINING DIVISION.

REPORT BY CHARLES J. AMAN, MINING RECORDER, REVELSTOKE.

I have the honour to submit the office statistics of the Revelstoke Mining Division for the year ended December 31st, 1926.

Free miners' certificates	158
Free miners' certificates (company)	1
Locations recorded	77
Certificates of work issued	158
Leases of Crown-granted mineral claims	24
Placer claims recorded	2
Groupings recorded	6
Bills of sale, agreements, and powers of attorney	22

Revenue.

Free miners' certificates	$ 951 50
Mining receipts (sundry)	1,262 00
Leases of forfeited Crown-granted mineral claims	575 00
Crown grants to reverted claims	746 00
Placer leases	207 00
Total	$3,741 50

LARDEAU MINING DIVISION.

REPORT BY E. ROBERTS, MINING RECORDER, BEATON.

I have the honour to submit the office statistics of the Lardeau Mining Division for the year ended December 31st, 1926.

Free miners' certificates issued	68
Free miners' certificates issued (company)	2
Certificates of work	121
Locations recorded	86
Bills of sale	10
Notices to group	23
Search of records	4
Copy of records	2
Filings	2
Revokement	1

Revenue.

Free miner's certificates	$ 537 75
Mining receipts	562 25
Total	$1,100 00

AINSWORTH MINING DIVISION.

REPORT BY R. HEWAT, GOLD COMMISSIONER, KASLO.

I have the honour to submit the office statistics of the Ainsworth Mining Division for the year ended December 31st, 1926.

Free miners' certificates	163
Mineral claims recorded	94
Certificates of work recorded	260
Bills of sale, agreements, etc.	35
Dredging leases issued	3
Leases of reverted Crown-granted mineral claims issued	86

SLOCAN MINING DIVISION.

REPORT BY ANGUS MCINNES, MINING RECORDER, NEW DENVER.

I have the honour to submit the office statistics of the Slocan Mining Division for the year ended December 31st, 1926.

Free miners' certificates	136
Claims recorded	46
Certificates of work recorded	89
Transfers	4

Revenue.

Total receipts	$5,014 90

SLOCAN CITY MINING DIVISION.

REPORT BY THOS. MCNEISH, MINING RECORDER, SLOCAN.

I have the honour to submit the office statistics of the Slocan City Mining Division for the year ended December 31st, 1926.

Free miners' certificates issued	50
Locations recorded	70
Certificates of work issued	63
Bills of sale and agreements	14
Notices to group	5

Revenue.

Free miners' certificates	$229 50
Mining receipts, general	377 55
Total	$606 55

TROUT LAKE MINING DIVISION.

REPORT BY R. V. JACOBSON, MINING RECORDER, TROUT LAKE.

I have the honour to submit the office statistics of the Trout Lake Mining Division for the year ended December 31st, 1926.

Free miners' certificates (individual)	49
Locations recorded (mineral)	73
Locations recorded (placer)	3
Certificates of work recorded	138
Bills of sale recorded	28
Notices to group	24

Revenue.

Free miners' certificates	$228 75
Mining receipts	655 00
Total	$883 75

NELSON MINING DIVISION.

REPORT BY J. CARTMEL, GOLD COMMISSIONER, NELSON.

I have the honour to submit the office statistics of the Nelson Mining Division for the year ended December 31st, 1926.

Free miners' certificates (individual)	491
Free miners' certificates (company)	4
Free miners' certificates (special)	1
Claims recorded (mineral)	392
Claims rerecorded (placer)	3
Certificates of work issued	400
Agreements of sale, transfers, etc.	142
Notices to group filed	40
Certificates of improvements issued	5
Leases of forfeited Crown-granted mineral claims issued	53

Revenue.

Free miners' certificates	$2,991 25
Mining receipts (general)	3,108 25
Mining receipts (lease fees, forfeited Crown-granted mineral claims)	1,325 00
Total	$7,424 50

ARROW LAKE MINING DIVISION.

REPORT BY WALTER SCOTT, MINING RECORDER, NAKUSP.

I have the honour to submit the office statistics of the Arrow Lake Mining Division for the year ended December 31st, 1926.

Free miners' certificates issued	48
Mineral claims recorded	33
Certificates of work recorded	16
Conveyances recorded	2
Options recorded	9

TRAIL CREEK MINING DIVISION.

REPORT BY W. H. REID, GOLD COMMISSIONER, ROSSLAND.

I have the honour to submit the office statistics of the Trail Creek Mining Division for the year ended December 31st, 1926.

Free miners' certificates (individual)	130
Free miners' certificates (company)	3
Free miners' certificates (special)	1
Locations	29
Certificates of work	71
Bills of sale	9
Notices to group	7
Leases of unworked Crown-granted claims	1

WESTERN DISTRICT (No. 6).

ALBERNI MINING DIVISION.

REPORT BY A. G. FREEZE, GOLD COMMISSIONER, ALBERNI.

I have the honour to submit the office statistics of the Alberni Mining Division for the year ended December 31st, 1926.

Mineral claims recorded	4
Certificates of work recorded	13
Free miners' certificates issued	38
Placer leases issued	3
Bills of sale	1
Leases of reverted Crown-granted claims	6

Revenue.

Free miners' certificates	$150 25
Mining receipts, general	257 75
Total	$408 00

CLAYOQUOT MINING DIVISION.

REPORT BY W. T. DAWLEY, MINING RECORDER, CLAYOQUOT.

I have the honour to submit the office statistics of the Clayoquot Mining Division for the year ended December 31st, 1926.

Mineral claims recorded	21
Certificates of work	18
Free miners' certificates issued	22
Notice to group	2

Revenue.

Free miners' certificates	$ 97 50
Mining receipts, general	122 75
Total	$220 25

QUATSINO MINING DIVISION.

REPORT BY ED. EVENSON, MINING RECORDER, QUATSINO.

I have the honour to submit the office statistics of the Quatsino Mining Division for the year ended December 31st, 1926.

Mineral claims recorded	1
Certificates of work	24
Bills of sale	1
Certificates of improvements	28
Notices to group on file	1
Free miners' certificates (ordinary)	28

Revenue.

Free miners' certificates	$128 25
Mining receipts, general	134 25
Total	$262 50

NANAIMO MINING DIVISION.

REPORT BY L. A. DODD, GOLD COMMISSIONER, NANAIMO.

I have the honour to submit the office statistics of the Nanaimo Mining Division for the year ended December 31st, 1926.

Free miners' certificates issued	141
Mineral claims recorded	156
Certificates of work	166
Bills of sale, etc., recorded	38
Placer leases issued	2

Revenue.

Free miners' certificates	$ 954 50
Mining receipts, general	1,638 75
Total	$2,593 25

VICTORIA MINING DIVISION.

REPORT BY R. J. STEENSON, GOLD COMMISSIONER, VICTORIA.

I have the honour to submit the office statistics of the Victoria Mining Division for the year ended December 31st, 1926.

Free miners' certificates issued (individual)	380
Free miners' certificates issued (company)	28
Free miners' certificates issued (special)	3
Mineral claims recorded	24
Certificates of work recorded	21
Placer claims recorded	4
Leases of reverted Crown-granted mineral claims	1
Powers of attorney recorded	4
Placer-mining leases	2

Revenue.

Free miners' certificates	$4,520 00
Mining receipts, general	1,495 51
Total	$6,015 51

VANCOUVER MINING DIVISION.

REPORT BY A. P. GRANT, MINING RECORDER, VANCOUVER.

I have the honour to submit the office statistics of the Vancouver Mining Division for the year ended December 31st, 1926.

Free miners' certificates issued	1,935
Free miners' certificates issued (company)	66
Special miners' certificates issued	5
Special company certificates issued	1
Quartz claims recorded	44
Certificates of work recorded	159
Surveys recorded as work	6
Notices to group and documents filed	25
Conveyances recorded	21
Powers of attorney recorded	6
Certificates of improvements recorded	11

Revenue.

Mining receipts	$ 631 30
Free miners' certificates	13,011 00
Total	$13,642 30

NEW WESTMINSTER MINING DIVISION.

REPORT BY I. WINTEMUTE, MINING RECORDER, NEW WESTMINSTER.

I have the honour to submit the office statistics of the New Westminster Mining Division for the year ended December 31st, 1926.

Free miners' certificates issued	205
Mineral claims recorded	132
Certificates of work issued	109
Conveyances, etc., recorded	26
Notices to group filed	8
Placer leases issued	1

Revenue.

Free miners' certificates	$ 983 50
Mining receipts	843 85
Total	$1,827 35

BUREAU OF MINES.

REPORT BY JOHN D. GALLOWAY, PROVINCIAL MINERALOGIST.

The permanent staff of the Bureau of Mines consists of John D. Galloway, Provincial Mineralogist; D. E. Whittaker, Provincial Analyst and Provincial Assayer; J. B. Adams, Laboratory Assistant; H. T. Nation, general office assistant; and H. Pearson, clerk.

The Bureau of Mines is a branch of the Department of Mines, which collects, compiles, and supplies to the public much technical information regarding mining and mineral properties in the Province. At the close of each year the Annual Report of the Minister of Mines is prepared by the staff of the Bureau under the supervision of the Provincial Mineralogist. This Annual Report contains detailed statistics of mineral production compiled by the Bureau, reports by each of the six Resident Mining Engineers on their respective districts, and the reports of the Inspection Branch. The reports of the Resident Engineers have also been printed as separate bulletins for the years 1924, 1925, and 1926. Special bulletins descriptive of mining are issued at intervals.

The Bureau has a well-equipped Assay and Analytical Laboratory. Mineral and rock samples are examined qualitatively without charge. This is done for the purpose of encouraging the search for new mineral-bearing areas and to assist prospectors and others by enabling them to have determined, free of cost, the nature and probable value of any rock they may find.

The Bureau also has an excellent and comprehensive collection of British Columbia ores and mineral samples on exhibit for the public in its Mineral Museum.

With greater activity in mining the work of the Bureau has increased considerably during recent years. The routine work of the office consists of supplying to the public much information regarding mining in the Province, directing prospectors to promising areas, supplying statistical information, interdepartmental reports, etc.

During the field season of 1926 the Provincial Mineralogist made a number of special examinations involving field-trips in the southern interior and coastal sections of the Province. A careful examination was made of the mineral properties in the vicinity of Greenwood.

During 1926 arrangements were made with the Dominion Bureau of Statistics whereby the British Columbia Bureau of Mines will in future collect all Provincial mineral statistics required by both Bureaus. By this arrangement the mine-owner is only required to fill out one form in duplicate instead of making two separate returns as heretofore.

An agreement has also been reached whereby the same average metal prices will be used by both Bureaus in valuing the outputs of metals. The chief divergence in the past has been in adopting different market quotations for lead and zinc, but in future the same prices will be used.

At the present time the practice of the Dominion Bureau is to use refinery and smelter production to arrive at the yearly output of metals; the British Columbia Bureau uses mine production figures. This of course causes a difference in the yearly quantities of metals produced as reported by the two Bureaus, but the variation is only slight. The method in use by the British Columbia Bureau of Mines has been followed for many years and was adopted in order to compile the mineral production for the Province by Mining Divisions and Districts. These detailed statistics of mineral production are shown in the Annual Reports of the Minister of Mines in comprehensive sets of tables. It is believed that the statistics as given, based on mine production, are informative and useful to those engaged in the mineral industry of the Province. No change in the present general system of statistics is therefore contemplated.

By the co-operation so far effected it is expected that the mineral statistics of the Province, as reported by the two Bureaus, will not differ in any marked degree. The work of collecting, compiling, and presenting mineral statistics is somewhat complex, in which many arbitrary rulings or methods must be used. Having accomplished a measure of co-operation between the Dominion and British Columbia Bureaus in regard to statistics, it is felt that a good start has been made and further adjustments will be arranged in the future.

The attention of prospectors and miners is drawn to the following definition of mineral contained in section 2 of the British Columbia "Mineral Act":—

> "'Mineral' means all valuable deposits of gold, silver, platinum, iridium, or any of the platinum group of metals, mercury, lead, copper, iron, tin, zinc, nickel, aluminium, antimony, arsenic, barium, bismuth, boron, bromine, cadmium, chromium, cobalt, iodine, magnesium, manganese, molybdenum, phosphorus, plumbago, potassium, sodium, strontium, sulphur, tungsten, fluorine, vanadium, radium, uranium, lithium, thorium, titanium (or any combination of the aforementioned elements with themselves or with any other elements), asbestos, emery, mica, and mineral pigments; but limestone, marble, clay, or any building-stone shall not be considered as mineral within the meaning of this Act."

Limestone, marble, clay, and building-stone are acquired under the British Columbia "Land Act."

It should be noted that in 1925, for purposes of administration, the mineral tricalcium phosphate was taken out of the "Mineral Act." Under the "Phosphate-mining Act, 1925," deposits of tricalcium phosphate may be acquired by the location of phosphate claims one square mile in area.

Geological Information.

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 Government and has proved of great benefit to the mining industry of the Province. Each year a number of geological parties are kept in the field and in the aggregate a vast amount of information is 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 this office is Dr. Victor Dolmage and the address is 512 Winch Building, Vancouver, B.C.

COAL ANALYSES.

In the 1920 Annual Report an extensive list of analyses of British Columbia coals was given. The list was first published in 1909, but was revised in the 1920 Report.

The following list is to be considered as supplementary to that published in 1920. It consists of samples taken by the Inspectors of Mines from the operating collieries of the Province, and shows the analyses of the different grades of coal as mined and prepared for sale at the various collieries of the Province. All analyses were made by the Government Laboratory.

TABLE OF ANALYSES OF BRITISH COLUMBIA COAL.

Sample No.	Date received.	Colliery.	Grade of Coal.	Proximate Analysis.							Coking Quality.
				Moisture.	Volatile Combustible Matter.	Fixed Carbon.	Ash.	Sulphur.	British Thermal Units.	Moisture Loss after 4 Days.	
	1926.	Canadian Collieries (D.), Ltd.—		%	%	%	%	%		%	
9301	Feb. 5	No. 5 South Wellington mine, Douglas seam	Washed pea	1.50	31.50	50.50	16.50	0.55	11,656	3.00	Good.
9302	,, 5	No. 5 South Wellington mine, Douglas seam	Washed nut	1.10	34.30	55.20	9.40	0.35	13,020	1.50	Good.
9303	,, 5	No. 5 South Wellington mine, Douglas seam	Washery fines	1.40	34.50	53.60	10.50	0.55	13,020	4.50	Good.
9304	,, 5	No. 5 South Wellington mine, Douglas seam	Lump	1.40	34.20	55.40	9.00	0.26	13,173	1.50	Good.
9305	,, 5	Extension mine, Wellington seam	Washery fines	1.30	34.60	57.10	7.00	0.46	13,485	1.50	Good.
9306	,, 5	Extension mine, Wellington seam	Washed pea	1.20	33.00	52.30	13.50	0.46	12,555	7.50	Good.
9307	,, 5	Extension mine, Wellington seam	Washed nut	1.40	33.80	54.90	9.90	0.40	12,710	3.50	Good.
9308	,, 5	Extension mine, Wellington seam	Lump	1.40	35.30	56.70	6.60	0.40	13,640	1.50	Good.
		East Wellington Coal Co.—									
9309	,, 5	Wellington seam	Washery fines	2.00	34.90	54.40	8.70	0.40	12,710	1.50	Good.
9310	,, 5	Wellington seam	Lump	2.00	34.80	54.70	8.50	0.50	12,865	1.00	Good.
9311	,, 5	Wellington seam	Washed pea	1.90	34.50	52.90	10.70	0.50	12,555	0.50	Good.
9312	,, 5	Wellington seam	Washed nut	2.00	35.10	52.70	10.20	0.50	12,710	0.50	Good.
		Canadian Collieries (D.), Ltd.—									
9313	,, 5	No. 4 mine, Comox district	Crushed lump	0.30	24.90	63.40	11.40	0.88	12,555	4.00	Good.
9314	,, 5	No. 5 mine	Crushed lump	0.40	30.60	56.50	12.50	0.54	12,555	1.00	Good.
9315	,, 5	No. 5 mine	Comox crushed nut	0.40	25.70	64.30	9.60	0.92	12,710	1.00	Good.
9316	,, 5	No. 5 mine	Comox pea	0.30	25.40	62.20	12.10	0.82	12,710	1.00	Good.
		Western Fuel Corporation, Ltd.—									
9317	,, 5	Wakesiah mine, Wellington seam	Lump, domestic	0.80	33.60	53.60	12.00	1.22	11,625	1.00	Good.
9318	,, 5	No. 1 mine, Newcastle seam	Lump, domestic	0.20	33.50	54.00	10.50	1.12	11,780	1.00	Good.
9319	,, 5	No. 1 mine, Douglas seam	Lump, steam	1.30	34.40	56.30	8.00	1.04	12,555	1.00	Good.
9320	,, 5	Reserve mine, Douglas seam	Lump, steam	0.80	32.40	58.80	8.00	3.62	12,245	3.00	Good.
9321	,, 5	Reserve mine, Douglas seam	Washed slack	1.10	32.10	53.30	13.50	1.10	11,780	.....	Poor.
9322	,, 5	Reserve mine, Douglas seam	No. 1 nut	1.20	33.30	56.00	9.50	0.90	12,245	1.00	Good.
9323	,, 5	Reserve mine, Douglas seam	No. 2 nut	1.10	31.00	54.50	13.40	3.92	11,625	1.00	Good.
9324	,, 5	Reserve mine, Douglas seam	Pea	0.70	32.50	53.40	13.40	1.00	11,780	1.00	Good.
		Crow's Nest Pass Coal Co.—									
9325	,, 5	Michel, No. 1 seam		0.90	21.50	72.50	5.10	0.40	13,640	3.00	Good.
9326	,, 5	Michel, No. 1 seam	Slack	0.70	20.80	68.40	10.10	0.40	12,865	4.00	Good.
9327	,, 5	Michel, No. 3 seam	Slack	0.60	19.30	70.40	9.70	0.70	12,710	3.00	Good.
9328	,, 5	Michel, No. 3 seam	Coal	0.70	19.70	74.10	5.50	0.90	13,795	3.00	Good.
9329	,, 5	Michel, No. 8 seam	Slack	0.60	22.00	73.00	4.40	0.60	13,640	.....	Good.
9330	,, 5	Michel, No. 8 seam	Coal	0.90	23.30	73.20	2.60	0.60	14,105	4.00	Good.

		Granby Consolidated M.S. & P. Co.—									
9331	Feb. 5	Cassidy	Washed pea and slack	1.10	31.10	52.80	15.00	0.50	11,780	9.00	Good.
9332	„ 5	Cassidy	Washed nut	1.10	33.10	56.80	9.00	0.50	12,865	3.00	Good.
9333	„ 5	Cassidy	Lump	1.50	30.70	57.30	10.50	0.50	12,555	2.00	Good.
9334	„ 5	*Cassidy*	*Washed middlings*	1.20	25.60	41.90	31.30	0.70	8,990	15.00	Poor.
		Telkwa Collieries, Ltd.—									
9335	„ 5	Goat Creek mine, No. 1 East level	Coking	0.80	28.20	62.60	8.40	1.80	13,020	3.50	Good.
9336	„ 5	Goat Creek mine, No. 2 East level	Coking	0.50	28.90	61.60	8.80	1.80	13,020	3.00	Good.
		Crow's Nest Pass Coal Co.—									
9337	„ 5	Coal Creek, from tipple	Market, screened	1.00	17.50	74.00	7.50	0.46	13,950	3.00	Good.
9338	„ 5	Coal Creek, from tipple	Market, run of mine	0.80	19.20	69.60	10.40	0.60	13,640	2.00	Good.
9339	„ 5	Coal Creek, from tipple	Market, slack	0.70	17.50	71.80	10.00	0.60	13,330	2.00	Good.
9340A	„ 5	Coal Creek, No. 1 East, No. 1 seam; full height of seam, Main level		0.70	19.40	74.90	5.00	0.80	14,260	0.50	Good.
9341	„ 5	No. 3 mine, No. 2 seam, No. 9 Right room, No. 3 slope; full height of seam, Main level		0.60	18.00	74.40	7.00	0.40	13,640	0.50	Good.
		Middlesboro Collieries, Ltd.—									
9342	„ 5	No. 1 seam		3.30	30.00	56.10	10.60	0.70	12,090	2.00	Fair.
9343	„ 5	No. 2 North seam (new prospect)		5.30	29.40	56.60	8.70	0.60	12,090	6.00	Poor.
9344	„ 5	No. 4 East seam		3.40	32.00	58.10	6.50	0.60	12,710	3.00	Fair.
9345	„ 5	No. 5 seam		4.90	31.30	56.80	7.00	0.70	12,555	4.00	Fair.
9346	„ 5	No. 6 seam		6.60	29.40	54.80	9.20	0.75	11,780	3.00	Poor.
9347	„ 5	No. 6 seam		4.10	30.10	51.50	14.30	0.40	11,160	2.50	Non-coking.
		Coalmont Collieries, Ltd.—									
9348	„ 5	No. 3 mine, Bottom bench, counter-level		6.00	26.60	54.20	13.20	0.40	11,470	6.00	*Non-coking.*
9349	„ 5	No. 3 mine, Upper bench, counter-level		5.20	29.70	58.50	6.60	0.30	11,780	1.00	Non-coking.
9350	„ 5	No. 4 mine, Upper bench, face of slope		5.30	30.10	57.00	7.60	0.28	11,780	.....	Non-coking.
9351	„ 5	No. 4 mine, Bottom bench, face of slope		5.60	29.60	57.20	7.60	0.30	11,780	1.00	Non-coking.
9352	„ 5	Keystone Coal Co., No. 6 mine		4.70	31.90	54.10	9.30	0.40	11,780	.....	Non-coking.
9353	„ 5	Sunshine Coal Co., Merritt		2.80	37.50	55.10	4.60	0.40	13,175	.....	Good.
		Tulameen Valley Coal Co., Princeton—									
9354	„ 5	Lower bench, face of main coal		15.50	30.60	49.20	4.70	0.30	10,540	2.00	Non-coking.
9355	„ 5	Top bench, face of Main level		15.90	29.90	49.70	4.50	0.33	10,540	3.00	Non-coking.
		Princeton-B.C. Colliery Co., Ltd.—									
9356	„ 5	Lower bench		16.40	28.50	49.70	5.40	0.40	10,540	3.00	Non-coking.
9357	„ 5	Top bench		15.20	28.50	47.10	9.20	0.70	10,075	3.00	Non-coking.
	1927.	Corbin Coal & Coke Co., Ltd.—									
9358	Jan. 25	No. 4, run of mine		1.20	18.30	66.10	14.40	0.06	11,880	.....	Poor.
9359	„ 25	No. 6, run of mine		0.80	17.10	67.70	14.40	0.30	12,245	1.00	Good.
9360A	„ 25	Washed coal, 4- by 1-inch		0.60	16.90	67.90	14.60	0.08	12,090	.....	Good.
9361	„ 25	¾-inch slack, unwashed		0.70	19.30	66.50	13.50	0.22	12,245	1.00	Fair.
9362	„ 25	Washed steam		0.30	17.40	68.00	14.30	0.12	12,400	1.00	Good.
		Corbin Coals, Ltd.—									
9363	„ 25	Washed steam, 1½-inch		0.50	20.10	64.40	15.00	0.13	12,090	5.50	Good.
9364	„ 25	Washed furnace, 4- by 1½-inch		0.60	19.00	67.00	13.40	0.12	12,245	2.00	Good.
9365	Feb.	Tulameen coal, J.D.G.		17.70	30.40	41.90	10.00	0.23	9,470	.....	Non-coking.
9366	„	Coke from Victoria Gas Works		3.00	3.40	70.20	23.40	0.75	10,307	.....	

ASSAY OFFICE.

REPORT BY D. E. WHITTAKER, PROVINCIAL ASSAYER.

During the year 1926 there were made by the staff in the Government Assay Office 4,895 assays or quantitative determinations and 414 analyses; of these the majority were for the Bureau 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	$ 367 50
Fees for assaying	254 93
Fees for assayers' examinations	75 00
Total cash receipts	$ 697 43

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

Attorney-General's Department	$ 317 00
Agricultural Department	840 00
Board of Health	340 00
Treasury Department	69 30
Forest Branch	1,535 00
Other departments	570 00
	$3,671 30
Value of work done outside of Mines Department work	$4,368 73

The value of gold melted during the year 1926 was $9,719.60 in 23 lots, as against $478.80 in 10 lots in 1925.

FREE DETERMINATIONS.

In addition to the above quantitative work, about 2,000 qualitative determinations, or tests, were made in connection with the identification and classification of rocks or minerals sent to the Bureau for a report; for these no fees were charged, as it is the established custom of the Bureau to examine and test qualitatively, without charge, samples of minerals sent in from any part of the Province, and to give a report on the 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 Bureau asks that the locality from which the sample was obtained be given by the sender.

EXAMINATIONS FOR ASSAYERS.

REPORT BY D. E. WHITTAKER, SECRETARY OF BOARD OF EXAMINERS.

I have the honour, as Secretary, to submit the Annual Report for the year 1926 of the Board of Examiners for Certificates of Competency and Licence to Practise Assaying in British Columbia, as established under the "Bureau of Mines Act," R.S.B.C. 1924.

A meeting of the Board of Examiners was held on May 22nd and on November 27th, 1926. Two candidates applied for examination on November 22nd, and one passed the examination on that date. The Board recommended that a certificate be issued to him. Four candidates applied for exemption under section 2, subsection (2), of the Act. The Board recommended that certificates be issued to three of the candidates.

In accordance with the recommendation of the Board, certificates have been duly issued by the Honourable the Minister of Mines to the four candidates.

LIST OF ASSAYERS HOLDING PROVINCIAL CERTIFICATES OF EFFICIENCY UNDER THE "BUREAU OF MINES ACT," R.S.B.C. 1924.

(Only the holders of such certificates may practise assaying in British Columbia.)

Under section 2, subsection (1).

Adams, J. B.....Victoria.
Archer, E. G.....Anyox.
Armstrong, N.....Vancouver.
Ayres, D. A.....
Austin, John W.....Vancouver.
Backus, Geo. S.....Britannia Beach.
Baker, C. S. H.....
Bajus, N. J.....Vancouver.
Barke, A. C.....
Beilby, E. B.....Vancouver.
Bernard, Pierre.....Monte Christo, Wash.
Bishop, Walter.....
Boulding, J. D.....Vancouver.
Broughton, F. W.....Vancouver.
Buchanan, James.....Trail.
Buehman, A. S.....Trail.
Campbell, Colin.....New Denver.
Carmichael, Norman.....New York.
Church, George B.....
Clarke, E. R.....Vancouver.
Cobeldick, W. M.....Scotland.
Collison, H.....Cobham, England.
Comrie, George H.....Vancouver.
Cotton, G. W.....Trail.
Craufurd, A. J. F.....Rossland.
Crerar, George.....
Crompton, S. V.....Vancouver.
Cruickshank, G.....
Davidson, J. R.....Vancouver.
Day, Athelstan.....Duncan.
Dedolph, Ed.....
Dockrill, Walter R.....Chemainus.
Dunn, G. W.....Rossland.
Farquhar, J. B.....Vancouver.
Fingland, John J.....Kaslo.
Gardner, C. S.....Victoria.
Grosvenor, F. E.....Vancouver.
Hamilton, Wm. J.....Anyox.
Hannay, W. H.....Trail.
Harsant, R. C. C.....
Hart, P. E.....
Hawkins, Francis.....Lake Hill.
Hawes, F. B.....Vancouver.
Hodgson, A. R.....Anyox.
Hurter, C. S.....Prince Rupert.
Irwin, George E.....Vancouver.
John, D.....Haileybury, Ont.
Kiddie, Geo. R.....California.
King, R.....
Kitto, Geoffrey B.....Victoria.
Lang, T. F.....Vancouver.
Langley, A. G.....Revelstoke.
Laucks, I. F.....Seattle.
Lee, Fred E.....Trail.
Lee, Geo. M.....
Ley, Richard H.....Victoria.
Levy, Frank.....
Lindsay, W. W.....Kimberley.
Locke, V. F.....Vancouver.
Longworth, F. J.....Boyds, Wash.
Manning, S. M.....Trail.
Martin, S. J.....
Marsh, Richard.....Spokane, Wash.
Marshall, H. Jukes.....Vancouver.
Marshall, William S.....Ladysmith.
Meale, Eric A.....East Helena, Mont.
Merrifield, T. T.....Trail.
Miles, Arthur D.....
Milne, A. S.....Vancouver.
Mitchell, Charles T.....Copper Cliff, Ont.
McCormick, Alan F.....Ruth, Nevada.
MacDonald, Alec C.....Vancouver.
MacDonald, J. S.....Vancouver.
McIntosh, J. H.....Bamberton.
McLellan, R. D.....Vancouver.
Morgan, Richard.....Trail.
Nicholls, Frank.....Norway.
Okell, S. E.....Vancouver.
Parker, Robt. H.....
Parsenow, W. L.....
Perkins, Walter G.....
Pickard, T. D.....Vancouver.
Pirrie, Noble W.....Victoria.
Poole, H. W.....Vancouver.
Prior, C. E.....Hedley.
Puder, H. F. H.....Vancouver.
Raht, K.....Trail.
Richmond, Leigh.....Duncan.
Robertson, T. R.....Vancouver.
Rodgers, Ch. B.....
Rogers, G. J.....Knutsford.
Rombauer, A. B.....Butte, Mont.
Schroeder, Curt A.....
Segsworth, Walter.....Toronto, Ont.
Shepherd, G. H.....North Vancouver.
Sharpe, Bert N.....
Sharples, H.....Vancouver.
Shore, J. T.....Vancouver.
Sim, Chas. John.....Monte Carlo.
Sloan, Wm.....Vancouver.
Snyder, Blanchard M.....
Steven, Wm. Gordon.....
Stimmel, B. A.....Trail.
Stockly, Galt.....Princeton.
Sundberg, Gustave.....Mexico City.
Tally, Robert E.....Spokane, Wash.
Taylor, E. S.....Vancouver.
Taylor, H. L.....Vancouver.
Teed, A. J.....Vancouver.
Thirkell, V. R.....Vancouver.
Thomas, Percival W.....Vancouver.
Tretheway, John H.....
Turner, H. A.....Vancouver.
Vance, John F. C. B.....Vancouver.
Van Agnew, Frank.....Siberia.
Vaughan-Williams, V. L.....California.
Wales, Roland T.....
Watson, Wm. J.....Ladysmith.
Watson, Thomas.....Vancouver.
Welsh, J. Cuthbert.....Butte, Mont.
Wells, Ben T.....
West, Geo. G.....Vancouver.
Wenerstrom, L. H.....Anyox.
Whittaker, Delbert E.....Victoria.
Widdowson, E. Walter.....Nelson.
Willemar, Douglas R.....Masset.
Williams, W. A.....Vancouver.
Williams, Eliot H.....
Williams, J. R.....Vancouver.
Wimberley, S. H.....Nevada, U.S.A.
Youngs, T. N.....Victoria.

Under section 2, subsection (2).

Archer, Allan.....
Blaylock, Selwyn G.....Trail.
Bissett, D. G.....Trail.
Bolton, George E.....Silverton.
Brennan, Charles Victor.....Britannia Beach.
Browne, R. J.....Rossland.
Browne, P. J.....Nelson.
Bryant, Cecil M.....Victoria.
Bryden, James.....Trail.
Burwash, N. A.....
Cavers, Thomas W.....
Clothier, George A.....Prince Rupert.
Cole, Arthur A.....Cobalt, Ont.
Cole, G. E.....Rossland.
Cole, L. Heber.....Ottawa, Ont.
Conway, E. J.....Vancouver.
Coo, Cecil William.....Toronto, Ont.
Coulthard, R. W.....
Cowans, Frederick.....
Dawson, V. E.....Trail.
Dempster, R. C.....Rossland.
Dempster, A. S.....Rossland.
Dixon, Howard A.....Toronto, Ont.
Eardley-Wilmot, V. L.....Ottawa.
Pellew-Harvey, Wm.....Vancouver.
Fotheringham, D. F.....Trail.
Galbraith, M. T.....
Gilman, Ellis P.....Vancouver.
Gray, Stanley.....
Green, J. T. Raoul.....Blairmore, Alta.
Guess, George A.....Toronto, Ont.
Harding, Wilson M.....
Heal, John H.....
Hearn, Roy D.....Trail.
Hilliary, G. M.....Idaho, U.S.A.
Howells, J. O.....Calgary, Alta.
Johnston, William Steele.....Lachine, Que.
Kaye, Alexander.....Vancouver.
Kendall, George.....Vancouver.
Kidd, G. L.....Edmonton, Alta.
Kilbourne, Geo. H.....Victoria.
Lathe, Frank E.....Montreal.
Lay, Douglas.....Hazelton.
Lewis, Francis B.....South Africa.
Mellish, Albert Henry.....Premier.
Merrit, Charles P.....
Murphy, C. J.....St. Catharines, Ont.
Musgrave, W. N.....England.
McArthur, Reginald E.....
McBean, K. D.....Trail.
McDiarmid, S. S.....
McGinnis, Wm. C.....Queen Charlotte Ilds.
McKay, Robt. B.....Vancouver.
McLellan, John.....Skidegate.
McMurtry, Gordon O.....
McNab, J. A.....Thompson, Nevada.
McPhee, W. B.....
McVicar, John.....Edmonton, Alta.
Maclennan, F. W.....
Moran, P. J.....Vancouver.
Newton, W. E.....Sandon.
Norrie, James P.....Kirkland Lake, Ont.
Oliver, Chas. E.....Vancouver.
Oughtred, S. W.....Ainsworth.
Outhett, Christopher.....Kamloops.
Pemberton, W. P. D.....Victoria.
Reid, J. A.....Cobalt, Ont.
Ritchie, A. B.....Nelson.
Roaf, J. R.....
Roscoe, Harold M.....Anyox.
Rose, J. H.....Thompson, Nevada.
Rutherford, R. C.....Trail.
Sampson, E. H. S.....Riondel.
Scott, John Mitchell.....Stewart.
Scott, Oswald Norman.....
Shannon, S.....
Sharpe, G. P.....Midland, Ont.
Shorey, P. M.....Trail.
Sloan, David.....Three Forks.
Stevens, F. G.....Mexico.
Stewart, A. G.....Vancouver.
Stroud, J. E. C.....Anyox.
Sullivan, Michael H.....Kellogg, Idaho.
Sutherland, T. Fraser.....
Sutherland, Wm.....Glasgow, Scotland.
Swinney, Leslie A. E.....
Thompson, W. K.....Trail.
Thomson, H. Nellis.....Anaconda, Mont.
Watson, A. A.....
Watson, Henry.....
Weir, William.....Anyox.
White, E. Grove.....Stewart.
Willis, F. S.....Trail.
Winslow, R. H.....Vancouver.
Wilson, Ridgeway R.....Victoria.
Workman, Ch. W.....
Wright, Richard.....Rossland.
Wynne, Llewellyn C.....
Yuill, H. H.....

Under section 2, subsection (3).

Carmichael, Herbert.....Victoria.
Galloway, J. D.....Victoria.
(Provincial Mineralogist.)
Harris, Henry.....Tasmania.
Hedley, Robt. R.....Vancouver.
Kiddie, Thos.....California.
Marshall, Dr. T. R.....London, England.
McKillop, Alexander.....Vancouver.
Pellew-Harvey, Wm.....London, England.
Robertson, Wm. Fleet.....Victoria.
(Provincial Mineralogist.)
(Retired Feb., 1925.)

PREVIOUSLY ISSUED UNDER THE "BUREAU OF MINES ACT, 1897," SECTION 12.

Thompson, James B.....Vancouver.

REPORTS OF RESIDENT MINING ENGINEERS.

"MINERAL SURVEY AND DEVELOPMENT ACT."

During the session of 1917 the Hon. the Minister of Mines brought in the "Mineral Survey and Development Act," which was passed on May 19th, 1917, and under the provisions of which the Province was divided into six Mineral Districts, to each of which there was appointed a Resident Mining Engineer with headquarters at a centrally located point in such district.

In the district to which he was appointed the Resident Engineer is expected to devote his whole time to the performance of the duties of his office, and to carry on continuously a mineral survey of his district, keeping records of the same and of the mining and mineral developments taking place, and at the same time to assist prospectors and others with such advice as may be necessary and may come within the scope of a mining engineer's work.

Aside from special reports which may be called for by the Minister, the Resident Mining Engineers are expected annually to make a comprehensive report covering all matters relating to mining, mine development, and prospecting that have occurred within the year in their respective districts.

These annual reports of the Resident Mining Engineers follow, and form the basis of the information given in respect to the mineral industry and its development within the Province.

The following are the six Mineral Districts into which the Province is divided, with the Mining Divisions included in each and the location of the permanent office of the district, with the name of the Resident Mining Engineer appointed to each district:—

The North-western Mineral Survey District (No. 1) shall consist of that portion of the Province contained within the following Mining Divisions, that is to say: Atlin, Stikine, Liard, Skeena, Nass River, Portland Canal, Bella Coola, and Queen Charlotte; and shall have its permanent survey station and office at the City of Prince Rupert. Resident Mining Engineer, Geo. A. Clothier.

The North-eastern Mineral Survey District (No. 2) shall consist of that portion of the Province contained within the following Mining Divisions, that is to say: Omineca, Peace River, Cariboo, and Quesnel; and shall have its permanent survey station and office at Hazelton. Resident Mining Engineer, Douglas Lay.

The Central Mineral Survey District (No. 3) shall consist of that portion of the Province contained within the following Mining Divisions, that is to say: Clinton, Lillooet, Kamloops, Ashcroft, Nicola, Vernon, and Yale; and shall have its permanent survey station and office at the City of Kamloops. Resident Mining Engineer, H. G. Nichols.

The Southern Mineral Survey District (No. 4) shall consist of that portion of the Province contained within the following Mining Divisions, that is to say: Similkameen, Greenwood, Grand Forks, and Osoyoos; and shall have its permanent survey station and office at the City of Grand Forks. Resident Mining Engineer, Philip B. Freeland.

The Eastern Mineral Survey District (No. 5) shall consist of that portion of the Province contained within the following Mining Divisions, that is to say: Golden, Windermere, Fort Steele, Ainsworth, Slocan, Slocan City, Trout Lake, Nelson, Arrow Lake, Revelstoke, Lardeau, and Trail Creek; and shall have its permanent survey station and office at the City of Revelstoke. Resident Mining Engineer, A. G. Langley.

The Western Mineral Survey District (No. 6) shall consist of that portion of the Province contained within the following Mining Divisions, that is to say: Nanaimo, Alberni, Clayoquot, Quatsino, Victoria, Vancouver, and New Westminster; and shall have its permanent survey station and office at the City of Nanaimo. Resident Mining Engineer, W. M. Brewer.

The attention of those engaged in mining is drawn to the following sections of the "Mineral Survey and Development Act":—

Provisions in Aid of Prospectors and Miners.

Sec. 10. Each Resident Engineer shall, so far as practicable, in and throughout his mineral survey district assist miners and prospectors in the manner following, that is to say:—

(*a.*) By giving information as to mineral indications and as to ground open for location as mineral claims or placer mines as a result of knowledge gained during the carrying-out of the mineral survey of his district:

(*b.*) By examining samples and applying such tests as may be possible on the ground or in his office and advising as to the nature of any mineral and as to the best available methods of analysis, sampling, assays, and test:

(*c.*) By forwarding samples to the Minister of Mines for further examination and tests whenever in his opinion such course is necessary or expedient:

(*d.*) By reporting to the Minister of Mines the location and approximate cost of such roads, trails, and bridges as in his opinion are reasonably necessary in order to render possible the development of any mineral resources; and

(*e.*) Generally, by giving such advice, information, and directions as may be of assistance to miners and prospectors within his district.

PROVISIONS FOR THE PROTECTION OF INVESTORS.

Sec. 16. Each Resident Engineer shall, upon receiving notice of any advertised or solicited sale of shares in any company or in any claim or mine or mineral property whatsoever, upon statements or terms not in accordance with actual facts and conditions, notify the Minister of Mines, who upon investigation may, if found necessary, give such notices, either personal or public, as may be necessary to prevent any injury to investors; and every notice given under this section by the Minister of Mines shall be absolutely privileged.

Sec. 17. (1.) Where a corporation, other than a private company under the "Companies Act," acquires an interest in, or title to, or engages in work on any mining property situate in a mineral survey district, it shall forthwith notify the Resident Engineer of that district, and file with him full particulars thereof, and shall also file with him, as soon as it is issued, a copy of every prospectus or statement in lieu of prospectus which is required by the "Companies Act" to be filed with the Registrar of Companies.

(2.) If a corporation makes default in complying with any requirement of this section, it shall be liable, on summary conviction, to a fine not exceeding twenty-five dollars for every day during which the default continues, and every director and every manager of the corporation who knowingly and wilfully authorizes or permits the default shall be liable to the like penalty.

NORTH-WESTERN MINERAL SURVEY DISTRICT (No. 1).

By George A. Clothier, Resident Mining Engineer.

INTRODUCTORY.

The North-western Mineral Survey District (No. 1) is comprised of eight Mining Divisions, as follows: Queen Charlotte, Bella Coola, Skeena, Nass River, Portland Canal, Stikine, Atlin, and Liard, aggregating approximately one-third of the total area of the Province. Its length, north and south, is about 700 miles, of which the northern portion, of about 400 miles, lies east of and behind the Alaskan panhandle and consequently, as yet, only accessible through Alaska. The southern portion, of about 300 miles, includes the Queen Charlotte group of islands, Coast islands, and eastwards to the summit of the Coast range, averaging from 60 miles to 90 miles from the Coast, and offers every possible advantage for prospecting and operating.

The general geological conditions are simple, dividing the district lengthwise into three great parallel mineralized zones or belts, striking north-west and south-east, extending the full length of the Province. For the purposes of this report I have termed the Coast range of granodiorite the "Central Belt" and flanking it on either side the "Eastern Contact Belt" and "Western Contact Belt" respectively.

Each belt has its characteristic minerals; thus, the Central Belt might be called the copper-belt, containing, as it does, such copper-deposits as the *Outsider*, on Portland canal; the *Hidden Creek* and *Bonanza* mines of the Granby Company at Anyox; and the *Marble Bay* and *Britannia* mines farther south. The Western Contact Belt produces mainly copper, but also contains many small gold-quartz veins such as found on Vancouver and Queen Charlotte islands and the outer islands along the Alaska coast. The Eastern Contact Belt is characterized by deposits of gold, silver, lead, and zinc ores, and their combinations, as exemplified in the *Engineer* mine and Atlin Silver Lead Mines, Limited, at Atlin; the *Premier*, *B.C. Silver*, *Big Missouri*, *Dunwell*, *Porter-Idaho*, *Independence*, and others in the Portland Canal district; the *Dolly Varden*, *Toric*, *La Rose*, and others in the Alice Arm district; the showings in the Kitsumgallum Lake section; and the deposits of the Ootsa and Whitesail Lakes area.

The Central Belt has, as yet, been the greatest value producer from its immense low-grade copper-deposits, due largely to its accessibility, but as transportation facilities are provided the *Eastern Contact Belt gives every indication of developing into the greatest mineral-producing* zone in the Province.

Each mineral-belt, and especially the flanking belts, presents complicated geological features, which are being more thoroughly investigated each year by the Geological Survey of Canada and others, so that now there are available authentic reports and maps of the more important areas.

The following list is given to enable the reader to procure such publications pertaining to this district: "The Unuk River Mining Region," by F. E. Wright, Summary Report, 1905, U.S. Geological Survey; Bulletin 347, U.S. Geological Survey; "The Atlin District," by D. D. Cairnes, Memoir No. 37; "The Portland Canal District," by R. G. McConnell, Memoir 32; "Geology of Graham Island," by J. D. MacKenzie, Memoir 88; "Salmon River District," by J. J. O'Neill, Summary Report, 1918; "Salmon River District," by S. J. Schofield and Geo. Hanson, Summary Report, Part A, 1920; "Eutsuk Lake District," by R. W. Brock, Summary Report, Part A, 1921; "Upper Kitsault Valley," Alice Arm, by Geo. Hanson, Summary Report, Part A, 1921; "Coast and Islands of British Columbia, between Burke and Douglas Channels," by V. Dolmage, Summary Report, Part A, 1921; "Geology and Ore Deposits of the Salmon River District, British Columbia," by S. J. Schofield and Geo. Hanson, Memoir 132; "Coast and Islands of British Columbia, between Douglas Channel and the Alaskan Boundary," by V. Dolmage, Summary Report, Part A, 1922; "Reconnaissance between Kitsault River and Skeena River, B.C.," by Geo. Hanson, Summary Report, Part A, 1922; "Reconnaissance between the Skeena River and Stewart, B.C.," by Geo. Hanson, Summary Report, Part A, 1923; "Prince Rupert to Burns Lake, B.C.," by Geo. Hanson, Summary Report, Part A, 1924; "Whitesail-Tahtsa Lakes Area, B.C.," by J. R. Marshall, Summary Report, Part A, 1924.

Note.—The above, except the first two, are Geological Survey of Canada reports, procurable from the Department of Mines, Ottawa, Canada, or from the Western office of the Survey, 509 Winch Building, Vancouver, B.C.

ROADS AND TRAILS.

The progress in mining is largely dependent upon the amount of trail and road construction; in fact, it is about as essential as prospecting and development work. Its great importance as a branch of mining is recognized by the Mines Department, and consequently much attention is given to the requirements of the prospector and operator in this respect. The "Mines Development Act" is without doubt fulfilling its intent. An appreciable increase in this work has been accomplished this year throughout the district.

In the Atlin country assistance was granted the Atlin Silver Lead Mines toward the construction of a new road, and a grant was also made for a winter trail from Engineer to Atlin for mail and emergency use.

In the Stikine and Liard sections the work of relocating and improving the old Telegraph Creek–Dease Lake pack-trail into a truck road was continued and good progress made. Of the total distance of 75 miles, about 55 miles are in serviceable condition for motor-truck and tractor haulage. The balance of 20 miles, on the Dease Lake end, is in fair condition in dry weather, but otherwise practically impassable for trucks. It is expected this will be completed next year, enabling trucks to make the trip to the lake in from six to eight hours, and reducing freight rates to such an extent that the interior country will have a chance for developing and operating.

In the Portland Canal district much work has been done; the *Dunwell* wagon-road was completed to the mine and its extension as a trail continued almost to the Emperor Mines property; the trail on the south side of Glacier creek was improved and bridges reconditioned; the Marmot River wagon-road was graded to the forks from tide-water; assistance was given the Dalhousie Mining Company towards construction of a trail to the property; a trail built up East Cascade creek to Long lake; the upper end of the *Big Missouri* trail was corduroyed; assistance was given toward the continuation of the *Premier* road through to the Bush Mines; the trail up the South fork of Marmot was continued from the upper side of the glacier to Magee pass; a reconnaissance was made for a trail from Meziadin lake north to the Dominion telegraph-line, and numerous other trail repairs.

In the Alice Arm country the Dolly Varden Railway was put in repair in the early spring; assistance was granted for the *La Rose, Blue Bell, Lone Maid, Copper Cliff, Homeguard,* West Creek, and *Silver Bow* trails, and for a trail up Roundy creek to the *Keystone* property.

Small grants were also made for a trail on Porcher island and a trail from Lockeport, Q.C.I., to the *Apex* property, also for a trail up Little Beaver river at Kitsumgallum lake and a short trail on Thornhill mountain, opposite Terrace.

About 20 miles of foot-trail were built from Kimsquit at the mouth of the Dean river toward Tesla mountain (via Sakumtha river), where some mineral-showings have been found.

PROSPECTING.

The reader is referred to last year's report, 1925, under the heading of "Prospecting," for a description of the more favourable and accessible sections of this district for prospecting and how to reach them.

A set of aeroplane pictures of a strip of country 10 miles wide, east from the summit of the Coast range, and from Stewart north to the Stikine river, a distance of about 150 miles, would be of inestimable value for distribution to prospectors, selection of trail routes, etc.

Prospecting has been keen throughout the district this year and approximately 800 claims have been recorded. This number must not be considered as new locations, as there are many relocations of claims in lieu of assessment-work.

Probably the record for speedy prospecting is that of the *Prosperity* group on Marmot river. Some of the claims were staked late in 1925 and two or three of them this year. This season about $8,000 worth of ore was shipped by the owners and this fall a 52-per-cent. interest was bonded for $125,000, with a cash payment of $20,000.

DEVELOPMENT.

This has probably been the most substantial year's development ever done in this district. There were fifty-five companies under active operation during the year, of which about twenty are working through the winter. In addition to this, work in excess of assesment was done on about fifty groups of claims. Government office statistics show that assessment-work was done on 1,850 claims and groups of claims.

The shallow cuts and inconclusive work done in the tunnel do not supply enough information to enable one to form any definite opinions regarding the probable extent or continuity of the deposit, which requires further superficial exploration.

The *Lead* group deposit occurs in a granodiorite sill which forms the base of some steep bluffs just above the cabin at about 5,800 feet elevation. Two short tunnels spaced a short distance vertically apart have been driven as crosscuts into the granite. At the time of the writer's visit in August a flat winze was being sunk at the inner end of the tunnel. The mineralization, consisting of veinlets and stringers of galena and pyrite and sparsely disseminated lead and iron sulphides, occur widely separated over a considerable width in a sheared and silicified zone in the granite. The mineralization dips flatly into the hill, approximating the dip of the schists which contact with the granite just above the workings. No samples were taken in the workings owing to the scattered character of the mineralization. A grab sample from a pile of material extracted from the winze in the upper tunnel assayed: Gold, 0.02 oz.; silver, 4.2 oz. to the ton; lead, 6.8 per cent.; zinc, 2.4 per cent.

Among other activities, the Evans Bros. put in a season at their claims on Whitefish creek. J. Angus continued work on his Hellroaring Creek property, and development of the *Brenda* group on Copper creek was continued under the direction of Dan McIntosh.

Placer-mining.

There was not a great deal of activity during the season in placer-mining, the principal operations being confined to Wildhorse creek, where W. A. Drayton had a small crew at work testing the gravels on the east side of the creek.

Gypsum.

Gypsum was mined by the Canada Cement Company near Mayook Siding on the Crowsnest Railway. It is reported that the Manitoba Gypsum Company intends to further develop its property near Wardner.

Phosphate.

The Consolidated Mining and Smelting Company carried on exploration of an extensive area of phosphate-bearing rocks in the vicinity of Michel. With reference to this work, S. G. Blaylock, general manager, states: "The phosphate-bearing rocks seem to be spread over a fairly large area. Some of the beds contain a fairly good percentage of phosphate and may be workable for the manufacture of fertilizer. If satisfactory methods can be worked out for treating this medium-grade material and markets can be obtained, there is sufficient phosphate to make a very large industry."

List of Shipping-mines in the Fort Steele Mining Division, 1926.

Mine.	Locality	Tons.	Character of Ore.
Sullivan	Kimberley	1,081,989	Silver-zinc-lead.
Stemwinder	Kimberley	28,241	Silver-zinc-lead.
Aurora	Moyie	1,690	Silver-zinc-lead.
St. Eugene	Moyie	86,992	Silver-zinc-lead.
Comet	Galloway	19	Copper.
Total		1,198,931	

SLOCAN MINING DIVISION.

The season's activities are reflected in the long list of shipping-mines which accompanies this report. The increase in production was greatly stimulated by the acceptance of milling-ore by the Consolidated Mining and Smelting Company at Trail, which benefited the large and small producer alike. The following résumé gives a brief outline of the most notable features of the season's mining activities in this famous Mining Division:—

The *Silversmith* mine, which still ranks first among the independent shippers of the district, started the year by making an exceptionally good showing, but shipments fell off towards the latter part and were suspended in December. The *Lucky Jim* produced a large tonnage and

There are several very attractive properties in this section and it looks as if the camp is due for a mining revival on its merits.

In the Kitsumgallum (Kalum) Lake section D. W. Davis and associates have been active on Beaver and Cedar rivers and on the *Bear* group on Maroon mountain. A considerable amount of development has also been done by individuals. The Northern Mining and Development Company opened up the *Golden Nib* claim on Thornhill mountain and shipped a car-load of ore to Trail. The same company was developing the *Beaver* group in that vicinity, but both properties are closed down for the winter.

On the Coast there is a surprising amount of prospecting and development being done in a small way.

On Porcher island the *Trixie* (Patterson) has shipped about 82 tons of ore this summer. The Wright claims adjoining are being developed by the owner. The Rowe claims on Pitt island have had two or three men working on them all summer. The *Cordila* group on Princess Royal island is again under development.

The *Pink Rose* group on Klekane inlet and the *Western Copper* group up the river from the head of Khutze inlet have had a little work done on them this year. The latter had considerable development ten years ago, but has been inactive since. (*See* Report.)

PRODUCTION.

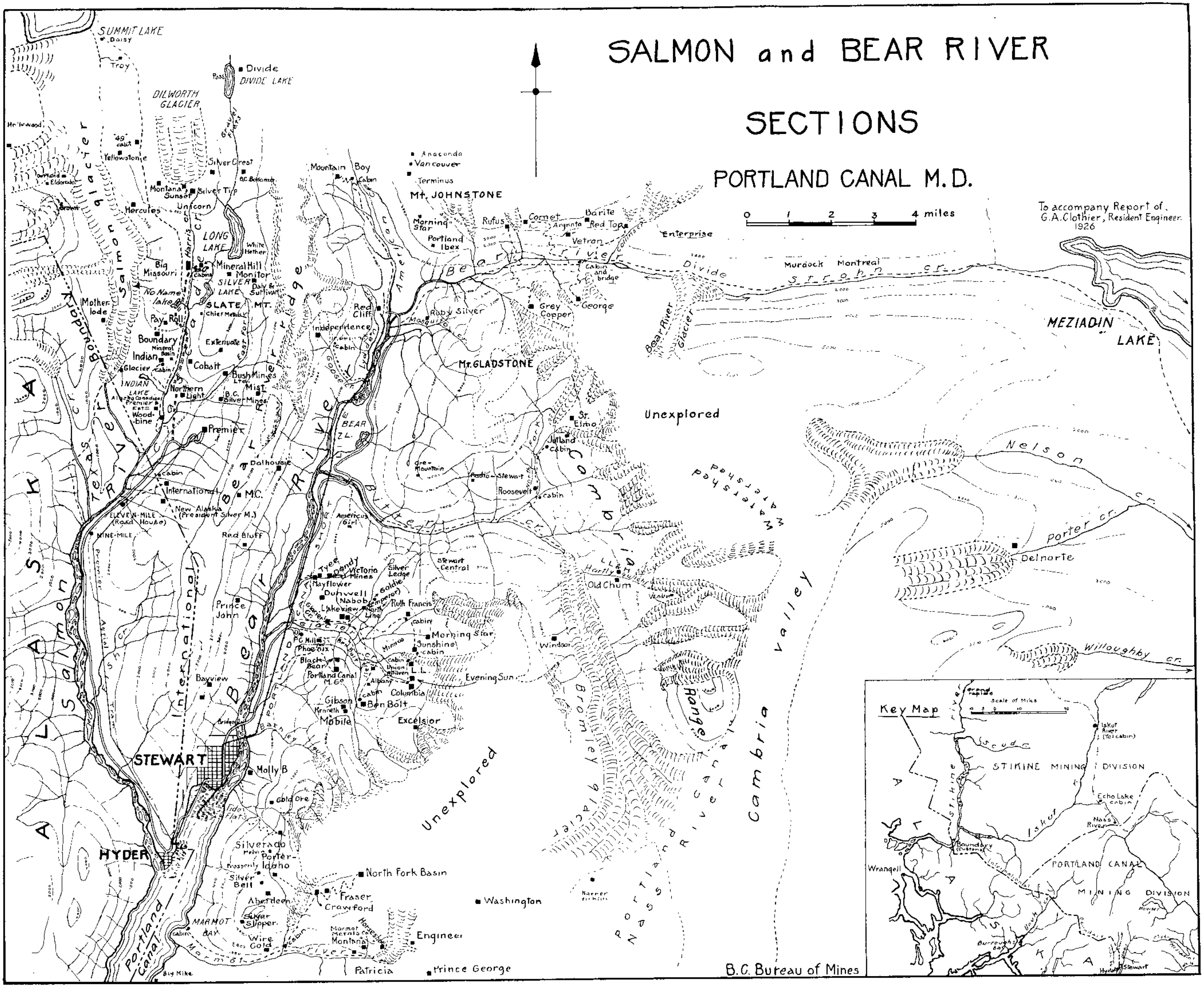
The following is a list of the shipping properties in No. 1 District and their outputs for the year 1926:—

Name.	Ore mined.	Gold.	Silver.	Copper.	Lead.	Zinc.
Atlin Mining Division—	Tons.	Oz.	Oz.	Lb.	Lb.	Lb.
Cherokee	162	25	21,551		46,648	
Engineer	9,204	7,732	5,032			
Portland Canal Mining Division—						
B.C. Silver	962	1,835	76,567			
Dunwell	200	121	4,633		61,419	42,503
L. & L. Glacier	57	5	8,598		14,400	
Outland	2		51		747	
Outsider	34,729			1,036,113		
Porter-Idaho	174	16	70,090		108,403	
Premier	230,987	122,228	2,920,492		443,088	
Prosperity	29	2	12,072		15,004	
Nass River Mining Division—						
Esperanza	54	10	5,735		528	
Golskeish	6,212	570	3,418			
Hidden Creek	1,211,619	7,316	393,206	38,686,513		
La Rose	42	10	7,111		2,348	
Skeena Mining Division—						
Belmont	26,650	10,854	6,604	94,940		
Drumlummon	7	4	188	8,907		
Golden Nib	30	48	42	665		
Trixie	82	222	93			
Totals	1,521,202	150,998	3,535,483	39,827,138	692,585	42,503

Compared with the production in 1925, there was a decline in the output of gold, but a substantial increase in the production of silver.

Quantity production is considerably in excess of 1925 and, notwithstanding the depression in the price of silver, the value of the total production was over $10,900,000.

Tonnage.—This is 103,359 tons over last year and is the first year that it has reached the 1,500,000-ton mark. This is due to the record tonnages of both the Granby and Premier Companies, more than offsetting the loss through closing-down of the Belmont-Surf Inlet Mines. The shipments of the smaller producers have increased over 1,500 tons. A forecast for next year from a tonnage standpoint is particularly encouraging. The Granby Company with its increased milling capacity will doubtless increase the mine tonnage. *Premier* has been mining about 20,000 tons a month for the past few months, which, if maintained, and there is every probability that it will be, will also swell the 1927 tonnage. The B.C. Silver is developing ore right along, giving every reason to expect a substantial increase in shipments next year. The *Dunwell*, with


SALMON and BEAR RIVER
SECTIONS
PORTLAND CANAL M.D.
0 1 2 3 4 miles
To accompany Report of G.A. Clothier, Resident Engineer. 1926
B.C. Bureau of Mines
Key Map
STIKINE MINING DIVISION
PORTLAND CANAL MINING DIVISION
STEWART
HYDER
MEZIADIN LAKE
Unexplored
Cambria Valley
Mt. JOHNSTONE
Mt. GLADSTONE
SLATE MT.
Portland Canal

its mill in operation, will require 100 tons a day. The *Toric* should be milling 50 tons a day for the greater portion of the coming year. The *Porter-Idaho* output is expected to be more than doubled. The *Engineer* mine will very probably have a greater production and the Atlin Silver-Lead Mines, with improved transportation from the mine to the lake, promises substantial shipments. All told, the outlook is very optimistic.

Gold.—Due to the closing-down of the Belmont-Surf Inlet property there is a decrease of 11,919 oz. gold. Though both the *Premier* and Granby Company have increased their outputs and some 7,700 oz. was produced from the *Engineer* mines, it was not sufficient to offset this loss. The *Engineer*, however, may be expected to develop an important yield of gold.

Placer-gold output is practically the same as last year, with very good prospects for an increased yield for 1927.

Silver.—This metal, with an increase of nearly 750,000 oz., has more than made up for last year's falling-off. The *Premier's* increase of about 600,000 oz. is the chief factor. Granby's output is 15,296 oz. greater than last year. The B.C. Silver comes in with 76,567 oz. and the *Porter-Idaho* takes an important position with 70,000 oz. With the *Dunwell*, B.C. Silver, *Toric*, Atlin Silver-Lead, and *Porter-Idaho* all at the producing stage, the future for silver in this district is distinctly bright.

Copper.—The Granby Company's production of 39,722,626 lb. of copper, of which 1,036,113 lb. came from the *Outsider* group, is slightly higher than that of last year and a record for the company. The enlargement of the milling capacity assures the maintenance of this output under normal operating conditions.

There are three sections in this district of prospective importance as copper-producers—the Rainy Hollow section; the area at the head of Bear river containing the *George* copper property; and the "copper-belt" on the west side of the Kitsault river, in the Alice Arm country.

Lead.—The output of about 700,000 lb. this year is indicative of the possibilities for this metal. It is widely distributed throughout the district, but is not a principal metal and will therefore assume importance only when a number of shipping properties are developed.

Zinc.—This, like lead, is well distributed, but there are areas with very attractive showings of straight zinc.

The district holds the position of producing approximately 75 per cent. of the lode gold, 33 per cent. of the silver, and 44 per cent. of the copper of the whole Province.

REVIEW BY MINING DIVISIONS.

The district will be reviewed under the main headings of the Mining Divisions, subdivided into sections as follows:—

Queen Charlotte Mining Division—Graham Island section; Moresby Island section.
Bella Coola Mining Division.
Skeena Mining Division—Coast section; Canadian National Railway section; Kitsumgallum Valley section; Lakelse Valley section.
Nass River Mining Division—Observatory Inlet section; Hastings Arm section; Alice Arm (proper) section; Kitsault River section; Illiance River section.
Portland Canal Mining Division—Portland Canal (proper) section; Georgia River section; Marmot River section; Bear River section; Meziadin Lake section; Salmon River section; Unuk River section.
Stikine Mining Division—Stikine River section; Iskut River section.
Liard Mining Division—Dease Lake section.
Atlin Mining Division—Taku Inlet section; Rainy Hollow section; Tagish Lake section; Atlin Lake section.

QUEEN CHARLOTTE MINING DIVISION.

Several properties have been examined by engineers this season, but there has been little activity, other than performing the necessary assessments and some prospecting.

Graham Island Section.

Black Sands. (*See* Report of 1925.) Nothing further has been done following the experimental work of the past two years by C. Cabrera. Laboratory tests show that a recovery of about 81 per cent. of the gold can be made by amalgamation and

cyanidation. Operating tests were made on the ground, but the information gained seems to have been inconclusive. The gold is in the black sands, but all black sands here do not carry gold and the values are therefore erratic, the sands assaying from *nil* to $9.43 a ton. Obviously, exhaustive and systematic sampling should be done before any plant is contemplated. The syndicate making the tests has taken sixty-one samples covering a staked area of 7,500 by 500 feet, or 3,750,000 square feet, or one test-hole and sample for each 61,480 square feet. Test-holes at intervals of 50 feet, or one for each 2,500 square feet, would be safer and would give 1,500 samples in place of sixty-one. I think that the erection of a plant before the ground is thoroughly sampled would be a very speculative undertaking.

South Easter. This originally consisted of three Crown-granted claims, owned by J. McLellan, of Queen Charlotte City, and J. J. Gordon, of Skidegate. Four claims were later added to the group, but I understand that the *South Easter* and *Beaconsfield* now constitute the group. The claims are situated about a mile from the Indian village of Skidegate, from which there is a fair wagon-road.

The general rock formation is diabasic, in which occur three quartz-filled fissures. The important one of these has been traced on the surface for 1,000 feet or more, averages in width about 8 feet, and carries gold values. In 1918 a considerable amount of development was done by Eastern parties. A small compressor was installed and a good camp erected. A shaft was sunk 100 feet on the vein and two drift-levels driven from it, one at 50 feet depth and the other at the bottom. At the 50-foot level drifts were run 50 feet to the west and 75 feet to the east, the latter showing good ore. On the 100-foot level 100 feet was drifted west and 250 feet east. The vein-filling on this level is soft and badly shattered, carrying little values.

A raise was put up from the east drift to tap the ore showing in the east drift on the 50-foot level, and demonstrated that the ore-body extended about 15 feet below the level, or 65 feet from the surface, and is about 5 feet in width. Work was stopped at this stage and no underground work has been done since. The owners have been doing some surface work each year.

Skidegate. This claim is situated on the Indian reserve at Skidegate and adjoining the *South Easter* group of claims (*see* report) at about 2½ miles from the wharf at Skidegate Indian village. The claim is owned by A. J. Gordon, of Skidegate. Very little surface work has been done, because of the heavy glacial wash, but a shaft has been sunk 22 feet. It was started in the vein near the foot-wall and consequently left the vein part way down, as the vein dipped opposite to expectations. There is said to be a mineralization on the surface 15 feet in width. It consists of iron pyrites, some galena, and a little chalcopyrite and zinc-blende in a quartz gangue. The values are mainly in gold; a sample across 30 inches on the foot is stated to have assayed $62 a ton and very high assays have been obtained from specimens.

The property is well situated and has sufficient mineralization and values to make it worth while investigating.

Moresby Island Section.

Blue Mule. This group consists of three claims—*Blue Mule, Paystreak Nos. 1* and 2—owned by McRae & Wiggs, of Queen Charlotte City, and situated on the west coast on the South arm of Kootenay harbour. It is about 30 miles south of the western entrance to Skidegate inlet and takes a day to get from Queen Charlotte City, where a boat can be procured for the trip. There is a good cabin at the beach and the veins and showings are about half a mile from tide-water.

The general rock formation is volcanic, in which are belts of bluish limestone. There are three veins on the property, filled with a breccia of quartz and country-rock, grading from a quartz-stringered country-rock to straight quartz. The quartz is more or less pyritized and the values are in gold, partly as free gold in both the quartz and pyrite and partly combined with the pyrite.

The upper vein is the strongest and has had the most work done on it, tracing it for nearly 1,000 feet and showing its width to vary from 1 to 4 feet. The vein has been stripped and open-cut in numerous places, many of which show free gold.

A Ross mill was installed under difficult conditions, but no satisfaction was attained with it. An attempt was made to mine a little ore from a surface cut and mill it, but this proved unsuccessful. I think that with an efficient small mill of some kind enough "pay" could be taken from the surface to further develop the property.

Star. There are six claims in this group, situated about 2 miles from Lockeport—namely, *Star, Roy, Rand, Imperial, Nellie L.*, and another, of which I have not the name. This is the old *Apex* group and is now owned by R. Morrison, Rand McDonald, and W. H. Watson, of Lockeport. A considerable amount of work had been done on the claims some years ago. There is a 300-foot tunnel on the *Star* claim and a 100-foot tunnel on the *Nellie L.* claim. I have not examined the property, but some fine chalcopyrite samples are shown by the owners. I judge the predominating mineral is magnetite, carrying some copper values with bunches of chalcopyrite in places. Some work was done by the owners this year in repairing the trail from the beach and also on the showings.

Swede. This group of eight claims is owned by Rogers, Pearson & Larsen, of Lockeport, and is situated just to the left of the entrance to Lockeport harbour. It is an old group of claims and considerable work has been done from time to time on it. The mineral-showing consists of an immense body of low-grade copper ore, consisting of chalcopyrite and bornite disseminated and in small veinlets and bunches throughout a diabase country-rock. Considerable stripping, open-cutting, and two tunnels constitute the work done. One tunnel is 170 feet long and the other 80 feet, both showing disseminated chalcopyrite and in the latter some disseminated bornite. With the bornite is associated a small amount of platinum and a trace of palladium, a sample assaying 20 cents in gold, 3.1 per cent. copper, 0.01 oz. platinum, and 1 oz. silver to the ton.

The property is ideally located on tide-water for working on any scale.

Copper Island. This island lies just outside of Jedway harbour. Several years ago A. Heino staked three claims, covering the island, and each season took out a few tons of good chalcopyrite ore, which he took to Tacoma in his own boat. The ore-zone or vein is a hornblende-belt 20 to 30 feet wide, extending the length of the island or about 1,400 feet. On the north end of the island a tunnel 150 feet long has been driven in a limestone-belt lying apparently on the foot-wall of the hornblende. There is considerable chalcopyrite scattered through the limestone as well as small bunches. From a point above the collar of the tunnel the hornblende-belt has been exposed at intervals by stripping and open-cutting to the south end of the island, showing, wherever broken into, disseminated bunches of chalcopyrite. A maximum depth on the ore of about 200 feet could be obtained without sinking.

A large body of low-grade ore is indicated by the showings. Diamond-drilling is obviously the proper way to prospect it.

Hope. Two claims—*Hope* and *Hope Fraction*—staked by Hugh McEachern, comprise the group. The claims lie about a mile from the head of Houston inlet. At about 200 feet elevation open-cutting has exposed a vein about 20 feet wide, composed of magnetite and limonite, with which are associated pyrite, pyrrhotite, and chalcopyrite. Across 10 feet, in one face, it assays 2.7 per cent. copper, with traces of gold and silver. Recent assessment-work has opened up a face of ore 6 feet wide, assaying 3.5 per cent. copper. Business information regarding the property may be obtained from W. Wilde, Jedway.

Copper Queen. J. S. McMillan is the owner of this group, situated just above Jedway harbour. I. Thompson, of Jedway, has been looking after the property and keeping up the assessments for a number of years. The first work done disclosed a 6-foot vein of magnetite, pyrite, and chalcopyrite on the surface. In 1908 a crosscut tunnel was driven 220 feet toward cutting the vein exposed on the surface, but failed in its objective. More recent assessments have opened a large body of low-grade disseminated chalcopyrite, which might meet the requirements of one of the larger companies.

Thunder. This group is situated on Collison bay, a few miles south of Jedway, and is owned by Ike Thompson, of Jedway. Three Crown-granted claims—*Thunder, Sadie*, and *Spade Flush*—constitute the group. The vein has been exposed on the surface at several points, but apparently is cut by numerous dykes, which do not appear to displace the vein in any way. The surface exposures show the vein to be from 6 to 10 feet in width, of practically solid magnetite, accompanied in places by chalcopyrite. An open-cut across the vein, directly over the tunnel, gave an average sample assaying 2 per cent. copper, 0.7 oz. silver, and $1 gold to the ton. Another open-cut 200 feet south assayed, across 6 feet, 1.5 per cent. copper, 0.8 oz. silver, and $1.20 gold to the ton.

About 200 feet vertically below the croppings a crosscut tunnel at 650 feet elevation was driven 273 feet, cutting the vein, and continued a further 60 feet. The vein shows in place on

the right-hand side of the tunnel and is indicated by small bunches of ore on the left or north side. A north drift was run 34 feet, but was apparently in a cross-dyke all the way. This was later continued, turning more to the west, and therefore in the hanging-wall from the ore-body showing on the surface at this point. A north drift of 34 feet was in ore, but, coming up against a dyke, was turned west on a small streak of ore evidently lying along the wall of the dyke. A survey of the surface showings and underground workings would likely clear up any difficulties in following the ore underground. A sample taken across 6½ feet at a point 30 feet on the north drift gave 2.6 per cent. copper, 3 oz. silver, and 80 cents gold to the ton.

Meal Ticket.

There are three claims in the group—*Meal Ticket*, *Treasure Vault*, and *Treasure Box*—which is owned by Geo. D. Scott, of Vancouver. The showings are about 3,500 feet from the beach and south of and adjoining the *Thunder* group. The country-rock is igneous. The showing is an 8-foot vein of magnetite and quartz, carrying considerable pyrrhotite and some pyrite and chalcopyrite. Stripping and open-cutting have exposed a portion of the vein about 200 feet in length, striking north and south, showing some shipping-grade chalcopyrite. This is a very favourable showing and well worth opening up. Probably another 150 feet depth could be obtained on the vein by crosscutting from the creek-level. A crosscut tunnel at the south end of the 200-foot exposed section of the vein shows the vein to be about 8 feet wide, carrying a good grade of copper ore. A small compresssor is necessary for development as the rock is so hard and tough that hand-work would be slow. There is a good chance for diamond-drilling from the creek-side, which is probably 150 feet lower than the outcrop.

Several ore-deposits of this type occur on Moresby island—namely, magnetite carrying small percentages of iron and copper sulphides—which will probably become profitable if the magnetite is ever utilized for the production of iron.

BELLA COOLA MINING DIVISION.

There has been a little prospecting done in this Division this year, resulting in about thirty claims being recorded.

On the reports of prospectors who have been in the Tesla Mountain section for several seasons, and judging from the ore samples brought out, recommendation was made to the Mines Department for a trail from tide-water to that section, an estimated distance of 35 miles. The sum of $3,000 was granted for this work, with which a trail was started from Kimsquit cannery at the mouth of the Dean river and built for 17 miles. From this point a foot-trail was blazed and slashed out the balance of the distance. Douglas Lay, Resident Engineer, District No. 2, in which district the section lies, made an inspection trip and on his report will depend the completion of the trail.

A number of claims were staked on the Snuitley river, about 7 miles up from South Bentinck arm, by P. Jacobson, who reports silver-lead showings. A specimen of ore sent in assayed $2.40 in gold, 26 oz. in silver to the ton, 3 per cent. copper, 12 per cent. lead, and 10 per cent. zinc. It is understood that some work is being done on the showings this winter.

SKEENA MINING DIVISION.

I think that during the past two years there has been a noticeable improvement in mining along the Coast and Coast islands. Certainly there are more assessments and general development-work than for several past years. Examinations by engineers have been made of several properties this season. The revival of interest in the old *Western Copper* group up from the head of Khutze inlet is a favourable omen. Development-work at the head of Klekane inlet, at Rivers bight, and on Pitt, Gibson, and Porcher islands is encouraging. The Kitsumgallum Lake and Terrace sections are making progress slowly but surely.

The one regrettable feature is the depletion of the property of the Belmont-Surf Inlet Mines, Limited, and the dismantling of the plant.

Coast Section.

Belmont-Surf Inlet Mines, Ltd.

(*See* previous Annual Reports.) This company has been operating since 1916, but depleted the ore-bodies in June of 1926, closed down and dismantled the plant. During 1926 26,650 tons of ore was mined and milled, yielding $276,453. The property has produced a total of 836,500 tons of ore, yielding

nearly $8,000,000, of which $1,437,500 has been paid in dividends, as follows: Up to and including 1924, $687,500; 1925, $312,500; 1926, $437,500; total, $1,437,500.

Western Copper. This group, which is owned by the Revenue Mining Company, Limited, includes forty-seven Crown-granted mineral claims, extending from tide-water at the head of Khutze inlet. The mineral-showings are about 5 miles up the Khutze River valley. The property is owned by Martin, Shannon & Mathers, of Vancouver. In the spring of 1925 it was bonded by E. W. Scully, who turned over his bond to the Khutse River Mining Company. This company was unable to handle it and I presume it reverted to the owners again, and was taken over in the spring of 1926 by the Revenue Mining Company, Limited. This company was incorporated on May 6th, 1926, with its registered office at 707-8 North Western Building, 509 Richards Street, Vancouver. It is capitalized for $500,000, divided into 500,000 shares at $1 par a share.

Prior to 1910 the property had been considerably developed. A standard-gauge light railway was built from tide-water to about 2½ miles up the valley. A camp was built at the foot of the hill below the vein-outcroppings. From this "lower camp" there is a trail up to the old camp at the eastern end of the vein-exposures. This trail consists, in places, of ladders and ropes and the climb is no pleasure-trip on a rainy day. The vein-croppings are at an elevation of about 2,000 feet, or 1,700 feet above the valley. From the old cabin, or its site, there is a trail west along the steep side-hill, following the vein all the way through to the *North Star* canyon, the west side of which is inaccessible. The extension of the vein westerly from the *North Star* canyon is reached by another trail from the lower camp. I did not go over this portion of the vein, as I understand the eastern portion has the better showings.

From the old camp-site the vein is exposed and followed by the trail for approximately half a mile to the *North Star* canyon, affording every opportunity for examination. The country-rock is granodiorite of the main Coast range. The vein is a fissure mainly filled with quartz and feldspar, mineralized with pyrite, but showing in places chalcopyrite and, in one small lens, chalcocite.

The vein strikes about N. 35° E. (mag.), paralleling the valley, and dips at from 26° to 32° south into the hill. Depth on the vein would therefore have to be obtained by sinking or cross-cutting to it.

The only reasonable place from which to start a tunnel would be at the most advantageous point along the top of the talus-slopes at the foot of the bluffs. This would be several hundred feet below the vein-croppings and it would therefore require at least 2,500 feet of tunnel to reach the vein for deep development and ultimately for a working-tunnel.

The best ore-exposure is where the vein crosses the bottom of the *North Star* canyon at 1,850 feet elevation, which is the lowest point on this east section of the vein. I believe that a crosscut tunnel was driven about 50 feet vertically below the cropping at this point, encountering the vein at about 145 feet, but showing little mineralization. My information is that this tunnel was driven in the winter and was reached over the snow up the canyon. It is only accessible in summer by going down the bluff on a rope. I had no rope. At this point, on the surface, the vein has been stripped and blasted off for a length of about 60 feet, of which there is a 10-foot section on the west side of the creek. Beyond this the vein can be seen in the west wall of the canyon for several hundred feet, but is inaccessible and apparently small.

The vein is from 2 to 5 feet wide, the 2 feet being apparently the width of the main fissure, for where over 2 feet wide it is caused by slabs of granite from the hanging-wall lying in the vein quartz. The chief minerals throughout the vein are pyrite and chalcopyrite, but in this particular cut there is a narrow lens of chalcocite, about 15 feet long and up to 4 inches thick, lying in the centre of the vein. The remainder of the mineralization here consists of small seams and patches of pyrite and a little chalcopyrite. The total width of mineral would not exceed 10 inches anywhere.

A sample of the chalcocite gave assay returns of $63 gold to the ton, 8 oz. silver to the ton, and 47 per cent. copper, and a few pieces of more or less leached and oxidized chalcocite gave $74 gold to the ton, 1.5 oz. silver to the ton, and 12 per cent. copper.

A sample of a number of pieces of heavily pyritized quartz showing chalcopyrite gave the best values—$764 gold to the ton, 14.8 oz. silver to the ton, and 6.5 per cent copper.

Going east along the vein-cropping for about 300 feet to the old blacksmith-shop, the vein changes to a foot or two of barren sugary quartz for a distance and then pinches down to about

6 inches of pyritized quartz, in which occur short lenses of solid pyrite up to 4 to 5 inches thick. This mineralization occurs in portions of the vein over a length less than 100 feet, and, unless very high grade, the ore is unimportant other than indicating places favourable for exploration-work. A sample of this class of ore—that is, heavily pyritized quartz showing no chalcopyrite—gave assays of $88 gold to the ton, 2.6 oz. silver to the ton, and 1 per cent. copper.

About 200 feet farther east from the old blacksmith-shop a tunnel 20 feet long, on the vein, shows only bull-quartz and diorite. Thirty feet farther along an open-cut shows the vein to have separated into a number of small stringers of barren quartz. Farther east another 50 feet an incline shaft on the vein shows a few inches of quartz on the hanging-wall and stringers of quartz through the country-rock for a width of 4 to 5 feet with no mineralization of any kind.

Another open-cut across the vein 50 feet farther east exposes 4 feet in width of barren mixed quartz and country-rock, and on the foot-wall a few inches of pyrite, which is worth sinking on.

A few hundred feet east of this cut the vein is stripped along the trail for a section about 50 feet long, showing about 18 inches in width of reddish quartz, in which can be seen an occasional patch of chalcopyrite, especially where there has been some oxidation. Small streaks of pyrite occur on either the hanging or foot walls. The total mineralization is unimportant, but probably a favourable place for exploratory work by sinking or otherwise obtaining a little depth on the vein.

Several hundred feet farther east considerable work has been done in breaking out the vein along the side-hill for a length of 60 feet. This discloses the greatest width between walls so far noted. It is composed of an upper or hanging-wall vein of barren, honeycombed quartz, due to the weathering-out of the feldspar, about 4 feet wide; then 3 feet of mixed quartz and granite carrying no mineral; then 3 feet on the foot-wall of heavily stained quartz from a 4-inch seam of solid pyrite lying on the foot-wall. At the lower or east end of this cut a 27-foot tunnel, starting in the central, quartz-granite portion of the vein, was driven across the vein to the hanging-wall, exposing mixed quartz and granite for 23 feet and 3 feet of barren white quartz on the hanging-wall. The 4-inch seam of pyrite on the foot-wall in this cut is another location for further exploration.

From this point for over 1,000 feet to its eastern extremity at the old camp the vein is exposed on the surface and by numerous open-cuts and short tunnels, nowhere showing anything but white quartz without mineralization.

There is, therefore, east of the *North Star* canyon, a length of exposed vein of probably 2,000 feet, in which there are four short sections showing some mineralization, the most promising one being in the canyon. No amount of ore has been developed, nor are the surface showings indicative of anything likely to develop into a large tonnage production; yet the values found in the heavy sulphides certainly warrant further exploration and give the property considerable prospective merit.

I would expect comparatively small lenses of high-grade ore which might make the operation of the property a very profitable enterprise.

I would suggest further drifting on the vein from the crosscut tunnel under the canyon showing and sinking on the other ore-croppings. If results are satisfactory a deeper crosscut tunnel could then be driven to the vein for more extensive exploration.

The old tramway from the beach up the river-valley is pretty well rotted out and beyond redemption. A new route was surveyed this season, giving a good grade for 5 miles to a point under the ore-croppings. Ore could be delivered from a permanent working-tunnel to the railway by aerial or other tram.

Pink Rose. (Formerly *Bolton* group.) There are eight claims in the group—*Copper Cliff*, *New Crown*, *Bella*, *Key*, *Pink Rose*, *Last Chance*, *Last Chance No. 2*, and *Bonanza*—owned by A. McLeod (address Butedale, B.C.) and associates. The claims are situated about 2 miles up the hill on the north side of Klekane inlet, about 1 mile from the head. There is a cabin on the beach from which a good jumper-road has been built by the owners to the upper cabin at 1,750 feet elevation.

The ore-showing on which the greater work has been done is of contact-metamorphic type, along the contact of the Coast Range granite with a belt of limestone. The work done here consists of an open-cut and a crosscut tunnel to the vein, about 30 feet below. The open-cut shows a width of 12 to 15 feet, in which are lenses and bunches of crystalline limestone, and the alteration products epidote, hornblende, garnetite, etc., all more or less mineralized with

chalcocite and bornite. A width of about 2 feet contains some sortable ore. The contact, though very irregular, strikes approximately east-west.

The tunnel, at 2,200 feet elevation, has been driven on a bearing of N. 10° W., cutting the vein at 65 feet from the portal, and continued 35 feet on the vein, demonstrating similar conditions to the surface. Farther west another granite-limestone contact has been traced for several hundred feet, showing a little mineralization, but, being along the course of a creek, it is difficult to open it up to any extent.

East of the main showing and possibly its continuation another vein has been traced, following down a deep gulch. A few open-cuts were put in on the lower end of it in the creek-bed, showing fair mineralization in places. The owners intend doing some further work on this vein farther up the gulch, where the cropping is on the side and therefore away from the creek-water.

I think that the extension of the drift in the upper tunnel would be the best development, for above it is the best surface showing exposed so far on the property.

Cordila. This group is owned by Cordila & Koski, of Butedale, and is comprised of the following mineral claims: *Royal, Right, Landslide, Mountain View, Counder,* and *Present.* The claims are situated about 2 miles up Rivers bight on an arm on the west side and about a mile up the hill from the cabin on the beach. The country-rock is granodiorite, in which occurs a small, sometimes pyritized, broken-up quartz vein in a wide shear-zone; the conditions are very similar to the *Surf Inlet* mine, except in the vein itself.

The property was bonded three or four years ago and had about 300 feet of tunnel driven on the vein, without encouraging results. Nothing has since been done on the property until this fall, when the owners cleaned out a caved-in portion of the tunnel and are continuing the drivage on the vein. Judging from surface indications and values and from the section of the vein exposed in the tunnel, the possibilities are not very attractive.

Paisley Point Mines, Ltd. This property was formerly owned by the Drum Lummon Mines, Limited, and has been described in previous reports. The company has a capitalization of $250,000, divided into 1,000,000 shares. The holdings consist of thirteen Crown-granted mineral claims on Drum Lummon bay, on the north side of Douglas channel, about 26 miles from Hartley bay, a port of call for the Union Steamship Company's boats. Work was resumed last year after the reorganization of the company and it was expected that sufficient capital would be forthcoming to proceed with the exploration of the property under efficient supervision. The sinking of a shaft in a promising part of the vein from the drift was started and an attempt made to get out some shipping-ore by sluicing the dump. Both of these plans were unsuccessful and the property has been idle during 1926.

Mineral Hill. This group, consisting of four mineral claims—*Mineral Hill Nos. 1, 2, 3,* and *Summit*—situated on Iron mountain up the Kitimat valley, about 8 miles from Kitimat Mission, is owned by Chas. Moore, of Kitimat Mission, and W. J. Goodwin. The *Mineral Hill* claims were staked in 1919, the *Summit* claim later, and all were Crown-granted this year. I understand that the showings are rather extensive ore-bodies of magnetite, carrying pyrite and some chalcopyrite. I have intended for some time to examine this property, but have not the time to make a special trip in the summer and the snow is generally on the ground when I am able to get down in the fall.

Rowe. Three mineral claims—*Starboard Watch, Canadian Girl,* and *Rio Costello*—constitute this group, which is owned by C. O. Rowe, Prince Rupert. The property is situated on the west slope of Noble mountain, Pitt island, about 1½ miles from the beach and at 950 feet elevation. The showing consists of a quartz vein occurring in a shear-zone in the granodiorite country-rock. The quartz is well mineralized with iron pyrites in bunches, in small parallel veins, and disseminated throughout the quartz. A short tunnel crossing the vein shows it to be from 4 to 6 feet wide, striking about north-south with the hill, and dipping from 40° to 50° into the hill. Some work was done on the property this year by the owner.

Standard. This group of five claims is situated on Gibson island and is owned by Frank St. Amour and associates, of Prince Rupert. The claims comprising the group are *Standard Nos. 2, 3, 4, 5,* and *6.* It is an old group and has had considerable exploratory work done on it from time to time, which has exposed a mineralized width of about 65 feet, consisting of bands of quartz and limestone, carrying copper values averaging from 1 to 1.5 per cent. Only the annual assessments have been done for the past several years.

Trixie. This group (known as the Patterson) consists of five claims, owned by Frank Patterson, of Refuge Bay, and situated about a mile up the hill from Welcome harbour on the north-west point of Porcher island. There are on the property a number of parallel quartz veins, varying in width from a few inches up to 2 feet, lying in granodiorite formation. The mineralization in the quartz consists of iron pyrites carrying good gold values. The ore, when hand-sorted to over 50 per cent. pyrite, assays over $100 a ton in gold. Each year a small tonnage of hand-sorted ore is shipped by the owner, this year amounting to 82 tons of roughly sorted ore shipped to Anyox, yielding $57 a ton in gold. Further development-work is being done by the owner.

I.X.L. There are four claims—*Klim, I.X.L., Nabob*, and *I.X.L. Fraction*—in this group, which is owned by A. E. Wright, of Prince Rupert. The group is south of and adjoining the *Trixie* group. The veins are pyritized, parallel quartz veins in granite, the same as on the *Trixie* group. Good gold values are obtained wherever the iron sulphides are found in the east-west veins. Development-work is being done on this group this winter. A centrally located small concentrator would serve both this and the *Trixie* group.

The claims covering the magnetite-iron showings on the north end of Pitt island and the east side of Porcher island are being kept in good standing by yearly assessments.

Canadian National Railway Section.

This includes all the country contiguous to the railway and the Skeena river from Prince Rupert to Terrace, a distance of 95 miles. In that distance there are 20 miles, from Prince Rupert east, of crystalline schists, and the remaining 75 miles is the Coast Range granodiorite; in all, not a very favourable formation for mineral deposition.

Autumn.—The only property on which anything is being done is the *Autumn* group of five claims—*Autumn No. 1, Autumn No. 2, Lottie, Happy*, and *Willington*—situated near Amsbury. The claims are owned by S. Alger, of Pacific.

Kitsumgallum Valley Section.*

It is interesting to note that this section was slightly prospected many years ago. A company known as the Eureka Copper Company was formed in Victoria to exploit the country around Kitsum-chi-lum lake on November 6th, 1863. The area proposed to prospect was a rectangle enclosing the whole lake. Owing to distance from transportation nothing further was done. The same company took up the entire north-west corner of Graham island for prospecting and mining in the same year.

This section, extending from Terrace, on the Canadian National Railway, north to Lava lake, a distance of about 40 miles, has only been prospected around Kitsumgallum lake. There is now a good wagon-road from Terrace to the south end of Kitsumgallum lake, a distance of about 20 miles. The east side of the valley is granodiorite formation, but from Amsbury to Terrace there is a belt of argillites, which extends north to Lava lake along the eastern border of the granodiorite, that should be a very favourable belt for prospecting.

The section around Kitsumgallum lake has had a fairly active season, both in prospecting and development work. A few tons of ore was shipped from two properties operated by D. W. Davis and associates.

Scenic. This group now consists of eight mineral claims—*Scenic, Log Cabin, Log Cabin Nos. 2, 3, 4*, and *5, Gully*, and another, of which I have not the name—staked and owned by John Garland, of Terrace. They are situated on Maroon mountain east of Kitsumgallum lake and reached by a good horse-trail 12 miles up Maroon creek, which empties into Kitsumgallum lake about half-way along its east shore. There is a comfortable small cabin on the claims at 4,000 feet elevation. The divide between Kitsumgallum lake and the Skeena valley is above the cabin at 4,500 feet, so that some of the claims lie on the Skeena slope at the head of one of the forks of Fiddler creek.

The general rock formation is sedimentary, intruded by many dykes striking, in general, with the sedimentaries, but smaller ones cutting the formation at any angle. There is a general dissemination of iron pyrites in the sedimentary rocks, and stringers of quartz slightly pyritized, on which the owner has put in a lot of useless time and work.

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* *See* Report by Geo. Hanson, Summary Report, Geological Survey of Canada, 1923, Part A.

There are two showings which I think warrant a little work. One of these is at 4,100 feet elevation on the Skeena slope, where an open-cut has been put in a silicified dyke about 6 feet thick, lying flatly in the sedimentaries. On the hanging-wall of this is a quartz vein about 8 inches thick, well mineralized with chalcopyrite. The remainder of the dyke is more or less mineralized with pyrite and chalcopyrite. Another showing along the divide shows a fairly well-defined vein of brecciated quartz and country-rock, mineralized with galena, zinc-blende, white iron, and chalcopyrite. This had just been broken into and looked more promising than the other exposures.

Bear. This group is also situated on Maroon mountain, on the south side, and near the head of Hall creek. There are five claims in the group; the *Bear*, *Cub*, and *Old Timer* claims are the original locations and the *Duplex No. 1* and *Duplex No. 2* have been later added. The showing is a quartz vein up to 4 feet in width, lying in a slaty, schistose rock, and mineralized with galena, zinc-blende, chalcopyrite, and iron pyrites, carrying fair gold and silver values and in places assaying high in gold.

Development consists of a lot of surface-stripping and open-cutting, tracing the vein for 600 to 700 feet, and a shallow shaft gaining a maximum depth of 20 feet on the vein. In 1925 a crosscut tunnel was driven 140 feet, cutting the vein at a depth of approximately 80 feet, showing it to be about 2 feet wide of milling-grade ore. In 1926 about 70 feet of drifting was done on the vein, both ways from the tunnel, exposing in places a good grade of milling-ore, the south drift face showing about a foot, well mineralized with pyrite, pyrrhotite, zinc, and galena, a sample of which assayed $14 in gold to the ton, 4 oz. in silver to the ton, 6 per cent. lead, and 10 per cent zinc.

The claims are under bond to D. W. Davis and associates, who propose to do some further work next spring.

Black Wolf Mining Co. This is an extra-provincial company, composed of Seattle and Eastern people, which I think has not been registered in the Province. The company has acquired from the original locators and owners the *Black Wolf* group, adjoining the *Black Bear* group on the south and containing the continuation of the *Black Bear* vein. There are five claims in the group—*Black Wolf Nos. 1, 2, 3, 4,* and *5*.

Last year considerable open-cutting and tunnel-work was done and some 300 sacks of ore was taken out as far as Kitsumgallum lake. Nothing further was done this year toward the development of the property, but further payments were met on the purchase price.

This property and the *Black Bear* are so intimately associated that they could be worked together very advantageously.

Goat. The seven claims comprising this group—*Goat, Kid, O.K. Fraction, Buck, P.M., He,* and *She*—are owned by G. F. Monckton, of Terrace, and associates. The claims are situated at about 4,500 feet elevation on the south side of Hall creek and just west of the *Black Bear* group. The showing is a small quartz-seam, from 2 to 6 inches thick, bedded with the argillite country-rock. It has been exposed along the face of the bluff for 100 feet or more. The quartz carries some galena and zinc-blende, but on account of its size and the limited length which it has been exposed it cannot be considered very promising. Similar showings have been found at different places on the claims, but do not give much evidence of enlarging to importance.

Marmot. There are three claims—*Marmot, Silver Grey,* and *Lakeview*—in this group, which is owned by A. Egan, of Terrace, and two partners. The claims are situated on the south slope of Goat mountain in sedimentary country-rock. A tunnel at 4,000 feet elevation has been driven 80 feet, of which the first 40 feet about parallels the vein. The last 40 feet turns to the left and some mineral showing in the face indicates the proximity of the vein. The proportionate values in the ore are about 30 per cent. lead and 5 per cent. zinc to about 14 oz. silver. There was a fair trail to the property, but it has not been very well maintained by the owners.

Douglas Creek.—More placer leases have been taken up on this creek and preparations will be made this winter to operate next season.

Glen No. 1. This claim is situated on Little Beaver river, on the west side of Kitsumgallum lake. The adjoining groups, the *Fisher* and *Brian Boru*, were under option to the Hopper-Davis Syndicate. Considerable work was done on a small quartz vein, lying in sedimentary country-rock, by way of surface-stripping and open-cutting for

a length of about 175 feet. This work exposed, in places, 18 inches in width of heavy sulphide ore, of arsenopyrite, zinc-blende, and a fair percentage of galena. It was therefore decided this spring to run a crosscut tunnel to obtain depth on the vein, and accordingly 173 feet of tunnel was driven, cutting the vein at 95 feet depth under the most promising of the outcrops. A drift of 15 feet was run on the vein. The work proved disappointing in that the vein did not show as well as on the surface in width or mineralization.

Assistance was granted by the Mines Department for the improvement of the trail up the Little Beaver to a very favourable prospecting area.

Silver Coin.

This property, consisting of two claims—*Silver Coin* and *Silver Dollar*—and situated on the Dominion telegraph-trail about 3 miles north of Cedar River Crossing, was under option this year to the Hopper-Davis Syndicate. It is an old property and considerable exploratory work has been done on it. Two long open-cuts and a 65-foot crosscut tunnel show a brecciated quartz and slate vein up to 20 feet wide in sedimentary country-rock. Two or three short lenses of high-grade ore, consisting of steel galena, grey copper, some zinc-blende, and a little antimony, were uncovered on the surface, but no mineralization was found underground in the intersection of the vein by the tunnel.

This spring D. W. Davis, who was in charge of the affairs of the syndicate, improved the old road and trail from the head of Kitsumgallum lake to Cedar River Crossing, a distance of 10 miles, so that a truck could make the trip in about two hours. A shaft was sunk on one of the lenses of high-grade ore from the surface to a depth of about 20 feet. The ore, which was about 10 feet in length on the surface, gradually pinched out to nothing on all sides. About 8 tons of ore was sacked and taken to Terrace for shipment and the option on the property was given up.

Hopper-Davis Syndicate.

This syndicate, under the business direction of D. W. Davis, and with J. M. Hoar supervising mining operations, has actively and efficiently worked on three properties in this section this year—*Glen No. 1* on Little Beaver river, *Silver Coin* group on Dominion telegraph-trail, and the *Black Bear* group on Maroon mountain. Headquarters were established at the head of Kitsumgallum lake. R. Farmin was in charge of the geological work, sampling, and assaying.

Late in the fall of 1926 another property was taken over, opposite Cedarvale, equipped with a good camp and supplies, and will be developed with a small crew throughout the winter.

D.W. Mines, Ltd.—This company was incorporated by D. W. Davis in November, with a capitalization of $1,000,000, divided into 1,000,000 shares of $1 each par value. The registered office of the company is Prince Rupert. The company takes over the operations of the Hopper-Davis Syndicate mentioned before.

Kalum Lake Mines, Ltd.—(*See* 1925 Annual Report.) This property, on the south-west end of Kitsumgallum lake, was closed down in September, 1925, and as yet has not resumed operations.

Other properties in the Kitsumgallum Lake section on which annual assessments have been done are described briefly as follows:—

Blue Grouse and Hunter.—(*See* 1918 Annual Report.) These are adjoining groups, situated about 18 miles up Cedar river from the head of Kitsumgallum lake. The showings are silver-lead. The owners are Oscar Olander, of Terrace, and partners.

Juneau (*Treadwell No. 2* group; *see* 1918 Annual Report), situated on the east side of Kitsumgallum lake. J. Belway Estate.

Jinny Jiggs and *Florence*, on the east side of Kitsumgallum lake, owned by Geo. Cobb, Terrace.

Lady group of five claims, situated on Maroon mountain, owned by L. Weeden.

Queen and Zinc.—The seven claims comprising this group were located and are owned by H. H. Jones. They are situated on Maroon mountain.

The *Motherlode* group (*see* 1923 Annual Report) on Maroon mountain.

Brian Boru group, Little Beaver river, adjoining the *Glen No. 1* claim.

Lakelse Valley Section.

This section refers particularly to Thornhill mountain, across the river from Terrace, and reached by way of the new steel bridge and auto-road to Lakelse lake.

Golden Nib. (*See* 1925 Annual Report.) This claim is situated at the foot of Thornhill mountain, opposite the 7-Mile post on the Lakelse wagon-road. The claim was bonded by O. P. Brown in 1925, who equipped it in 1926 with a jig-back tramway from the tunnel down to the foot of the hill. The showing consists of a quartz vein in sedimentary country-rock, in which on the surface is a section heavy in pyrite, carrying up to $70 a ton in gold values, depending on the percentage of pyrite. A tunnel driven about 100 feet on the vein below the croppings shows no mineralization to amount to anything, though the face is about under the surface ore exposure.

On completing the tramway, stoping was started on the surface and about 30 tons extracted and shipped. This about depleted the available ore and operations ceased. No returns of the ore shipped are available.

There are several properties in this section with considerable prospective merit which are worth looking over.

St. Paul Group.—(*See* 1925 Annual Report.) There are four claims in this group, which is situated on the summit of Thornhill mountain and is owned by Michaud Bros., of Terrace.

Society Girl Group.—This property adjoins the *St. Paul* group and contains the same vein. The owner is D. Mason, of Terrace.

Beaver Group.—(*See Lucky Seven* group, 1918 Annual Report.) There are four claims in this group, which is owned by Wm. Dahl, of Terrace. Some pockets of free gold yielding up to $2,000 have been found on this property.

Golden Penny.—This claim adjoins the *Golden Nib.*

Copper Queen.—This group of three claims is owned by Jack Bell, Terrace, and is situated at the head of Williams creek. (*See* 1925 Annual Report.)

NASS RIVER MINING DIVISION.

This Division extends from the mouth of Portland inlet north to the head of the Kitsault river, a distance of about 70 miles. The two mining centres are Anyox and Alice Arm. The Government recording office is at Anyox. There is a Government telegraph-office at Anyox and also one at Alice Arm. The Canadian National Coast-plying boats call at Anyox once a week and the Union Steamship Company's boat calls at Anyox and Alice Arm each week. There is also a tri-weekly launch service from Anyox to Alice Arm.

The town of Alice Arm, at the head of the arm of the same name, is the distributing centre of the Kitsault valley and tributary valleys, the Illiance river, and down Alice arm proper. The Dolly Varden Railway extends from tide-water at Alice Arm, 18 miles up the west side of Kitsault river to the *Dolly Varden* mine. Though the mine has been inoperative for the past three or four years, the Provincial Government maintains the railway for light traffic, such as hand-cars and gas-speeders, to enable prospectors and operators to get in supplies quickly and cheaply. From the upper end of the railway there is a first-class pack-horse trail to the head of the valley, 26 miles from Alice Arm, with branch trails up the main tributary streams. There are six bridges and two cableways crossing the Kitsault river at points most convenient for prospectors. There is also a first-class pack-trail for 16 miles up the Illiance river and fair trails up Lime and Roundy creeks.

During the summer there is a launch service once a week up the Nass river from Mill Bay (a port of call for the Union Steamship Company's boats) to Aiyansh. From Aiyansh roads extend through the Nass valley. There is a trail up the Nass river to Meziadin lake, thence to Stewart; a trail across to the Illiance river, thence to Alice Arm; a trail south to Kitsumgallum lake, following the Dominion telegraph-line, from the lower end of which there is a motor-road to Terrace, on the Canadian National Railway.

The Division is therefore exceptionally accessible for prospecting and operating, and transportation facilities are being improved and extended every year by the Mines Department.

It is the second largest producing Division in the Province, due to the immense copper-output of the Granby Company at Anyox, which has made a record production of over 38,000,000 lb. this year. The smaller producers are the *La Rose*, *Esperanza*, and *Golskeish*, the latter under operation by the Granby Company.

It was expected that the *Torie* would be on a producing basis this fall, but it will probably be June, 1927, before the concentrator is completed. The development of this property has no doubt been a great factor toward the restoration of mining confidence in this section.

An exhaustive examination was made of the *Dolly Varden* holdings early in the season by Dr. Slocum, who later extended his investigations to the whole Alice Arm section.

The bonding of four groups of claims, north of the *Dolly Varden*, in the "copper-belt" by Vancouver interests may have far-reaching results. Preparatory work by way of crosscutting is being carried on this winter.

Activities on the Kitsault river, on the North fork of the Kitsault, on McGrath mountain, and on Roundy creek indicate the revival of mining in this deserving Division.

Observatory Inlet Section.

Granby C.M.S. & P. Co., Ltd.

The company's big copper plant at Anyox has been in continuous operation throughout the year and has made its greatest production since being "blown in" in 1914. The concentrator last year was treating about 1,200 tons of ore a day. This year additions to the grinding machinery and improvements throughout have brought the plant up to an average of about 1,650 tons for the whole year. Early in 1927 it will have reached its objective capacity of between 2,800 and 3,000 tons a day.

A new sintering plant has been installed this year, which is being tuned up. It and the old plant improved will handle all the concentrates and confine all production to the company's own plant, instead of shipping a portion of the concentrates to Tacoma as heretofore.

The total tonnage mined this year from the company's *Hidden Creek* mines was 1,211,619 tons, an increase of about 40,000 tons over last year. Of this, 604,398 tons was smelted at the company's Anyox smelter. The remainder of 602,015 tons was milled, producing 52,840 tons of concentrates, a concentration ratio of a little over 11 into 1. Of the concentrates, 19,569 tons was smelted at the company's plant and 33,271 tons sent to Tacoma. The total production from the *Hidden Creek* mines was 7,316 oz. gold, 393,206 oz. silver, and 38,686,513 lb. copper.

In addition to this, there was shipped from the *Outsider* on Portland canal, operated by the Granby, 34,729 tons of ore, yielding 1,036,113 lb. copper, and from the Golskeish Mines, Limited, property, also worked by the Granby Company, 6,212 tons, yielding 570 oz. gold and 3,418 oz. silver.

The increase over last year of the combined *Hidden Creek* and *Outsider* mines was: 83,090 tons of ore mined, 319 oz. gold, or a little over 4 per cent.; 15,296 oz. silver, or about 4 per cent.; and 212,463 lb. copper, or nearly 5 per cent.

This year the output of the coke plant is as follows:—

Coke (short tons)	45,750
Gas (thousand cubic feet)	751,832
Tar (imperial gallons)	371,923
Tar paint (imperial gallons)	4,885
Ammonium sulphate (pounds)	468,350
Ammonia liquor (pounds contained ammonia)	126,564
Motor-fuel (imperial gallons)	50,066
Light oil (imperial gallons)	62,707
Creosote (imperial gallons)	225
Benzol forerunnings (imperial gallons)	2,230
Napthalene (pounds)	16,000

There was a total of 1,133 men employed, distributed as follows:—

Mining—		
Hidden Creek	393	
Golskeish	12	
Outsider	37	
		442
Concentrating		49
Smelting		180
Coke plant		23
Mechanical and draughting		166
Docks and transportation		58
Power		53
Townsite and hospital		101
Offices, stores, and warehouses		61

The personnel of the staff remains unchanged, as follows: Chas. Bocking, general manager; W. R. Lindsay, general superintendent; G. M. Lee, smelter superintendent; John Swanson, mine superintendent; George Leslie, coke-plant superintendent; W. B. Maxwell, concentrator superintendent; and C. M. Bagwill, chief accountant.

Hastings Arm Section.

This is the north branch of Observatory inlet.

Saddle. This claim is situated on the mountain west of the head of the arm; it was staked and is owned by Chas. Clay, of Anyox. In the fall of 1926 it was taken under bond, after examination by W. S. Harris, by the Northern Prospecting and Development Company, Limited, which was incorporated in 1924 with a capitalization of $25,000, divided into 250 shares, with its registered office at New Hazelton.

The mineralization consists of pyrite and galena, carrying good gold and silver values, in a quartz gangue. The country-rock is volcanic and within a short distance of the Coast Range granite. The vein is about 4 feet wide and has been traced on the surface by open-cuts and pits for 300 feet, showing ore all the way. The vein is divided into 2 feet of quartz carrying little or no mineral and 2 feet of ore which will average 42 per cent. lead, 38 oz. silver, and $7.20 in gold to the ton. There is no zinc showing on the surface.

No depth has been obtained as yet and, as the showing is on a flat bench, sinking will have to be done on the vein to obtain depth. The showings are at an elevation of about 4,000 feet overlooking Hastings arm and therefore ideally situated.

Alice Arm (Proper) Section.

This includes the country contiguous to the waterway, Alice arm, the east branch of Observatory inlet.

Mayflower. There are, I believe, eight claims in these holdings, four above the two claims of the old Molybdenum Mining and Reduction Company and four below them, from the cabin down to the beach. The general rock formation is sedimentary, the ore occurring in a series of parallel veins, striking N. 20° W. (mag.) and dipping between 60° and 70° W. Dykes parallel the quartz veins and just above the upper tunnel a wide belt of quartz and feldspar cuts across the strike of the veins. The fissuring continued through it, on which a tunnel has been driven for 45 feet. The veins are said to be found above the granitic rock and traced for some distance. A small ore-sorting house has been built here and a few tons of shipping-ore sorted from this tunnel and taken down to the cabin at the head of the old tramway.

About 65 feet vertically lower, another tunnel was driven in earlier operations. The first 25 feet is a crosscut to a quartz-seam, which was then drifted on for about 100 feet. This is a parallel vein to the one exposed in the upper tunnel. A crosscut was driven, cutting the west vein, but apparently it was not recognized, as the crosscut was continued and no work done on it. The vein on this level shows a width of about 2 feet, of which 6 inches is soft gouge on the foot-wall and the remainder a more or less quartzy filling, showing some galena and zinc.

This vein can be traced up the creek-bed from the cabin at 1,100 feet elevation to the upper tunnel at 1,500 feet elevation and beyond that for another 1,000 feet. Ore carrying good values in gold, silver, lead, and zinc is found in small lenses at different places. With such continuity and mineral indications, I think some work is warranted in drifting both in the top tunnel and on the same vein in the tunnel below it.

There is a good trail up from the beach and a good cabin at the old workings.

Keystone Mining Co., Ltd. *This company was incorporated in 1923 with a capitalization of $200,000,* divided into 200,000 shares; the registered office is in the Birks Building, Vancouver. The company's holdings consisted of the *Sunset* group (*see* 1922 Annual Report) of seven claims on Roundy creek—*Sunset Nos. 1* and *3*, *Crackerjack*, *Mollie Darling*, *45*, *Violet*, and *Storm King*—staked and owned by G. W. Morley, of Alice Arm, and partners. I understand that eight more claims have been added to the holdings this summer. The claims are at an elevation of about 2,300 feet and about 1½ miles from tide-water in an air-line.

This year work was started in May under the direction of Rowland King, mining engineer, of Spokane, Wash., with R. E. Griffith in charge at the property. The first work was repairing

the trail from Silver City to the claims so that pack-horses could get through with supplies. Two buildings were added to the camp, making a bunk-house, cook-house, and office, with accommodations for twelve men and cook.

The mineralization consists of pyrite, galena, and zinc-blende, carrying silver values, in a gangue of quartz. There are several of these quartz veins in a shear or fissure zone, about 50 feet wide, lying along the contact of argillite and the Coast Range granite.

About the end of June what is called the "Bowyer tunnel" was started at an elevation of 2,020 feet and driven about 400 feet, following a fairly well-defined quartz vein in the argillites. A number of small lenses or bunches of good ore were encountered, but the vein is badly leached and broken up in this formation so close to the surface. The bearing of the vein indicates that it will enter the granites in a short distance, where it is expected that more stable conditions and values will be found.

Two crosscuts, 17 and 25 feet, were driven from the tunnel, making the total season's work about 440 feet done by hand-work on a bonus-payment system. Altogether it has been a very creditable season's work. The company expects to resume work in the spring of 1927 as soon as trail conditions will permit.

Illiance River Section.

The zinc-showings on McGrath mountain have had considerable attention this season. Rowland King, M.E., of Spokane, who was directing the operations of the Keystone Mining Company on Roundy creek, made a complete compass survey of the claims and showings on the mountain, besides doing a lot of sampling.

Sunrise. There are eight claims in this group, consisting of *Sunrise*, *Silver Band*, *Lucky Strike*, and *Tip Top*, comprising the old *Silver Band* group, to which have been added the *Agnes*, *Blue Bird*, *Silver Tip No. 1*, and *Silver Tip No. 2*. The group is owned by G. W. Morley and associates. Exploration has been under the supervision of E. Ashton, one of the partners, who has done very creditable work in tracing and exposing the veins.

The general rock formation is sedimentary, with a general strike of about N. 40° W. (mag.), but badly distorted in places. There are numerous dykes, which as a rule conform with the strike of the sedimentaries. The veins all lie in the sedimentary belts and apparently are associated with porphyry containing secondary lime.

On the *Sunrise* and *Silver Band* claims ore has been exposed in several places. On Surprise creek an open-cut in a cross-vein, which strikes at about right angles to the main vein above and dips to the north, exposes an ore-shoot about 4 feet wide that will assay over 20 per cent. zinc. Above this showing, at 3,700 feet elevation, is another good showing of zinc, but there has been some faulting at this point. About 200 feet farther up the hill, on the creek, there is a cropping showing a mineralized width of about 30 feet, which is about half slate. A sample across 12 feet here gave 24 per cent. zinc. From this the vein is exposed at intervals along its general strike of about N. 40° W. (mag.) for a couple of claim-lengths, showing the vein to be from 2 to 6 feet wide, one cut showing about 7½ feet of good-looking zinc ore. Along the same zone, croppings have been found on the most northerly claim, the *Blue Bird*. Wherever exposed the veins show milling-grade ore.

The veins consist of quartz mineralized chiefly with sphalerite, a little galena occasionally, and small values in both gold and silver. It would therefore be a straight zinc proposition. The property would seem to have considerable prospective merit and to be worthy of some development.

Standard. As mentioned in the 1925 Annual Report, this group of four claims, owned by Miles Donald, of Alice Arm, was exploited by the Granby Company. Considerable exploratory work was done, but the property did not fulfil the requirements of the company. It is claimed that the extension of this vein has been found several claim-lengths higher up on the mountain.

Other claims on McGrath mountain show about the same class of ore, but nothing greater than assessment-work has been done on them. The growing demand for zinc will no doubt make McGrath mountain worth close investigation.

Other properties in this Illiance River section worthy of attention and the year's Annual Report in which descriptions may be found are: *Bellevue* group, 1920 and 1921; *Silver Bell* group, 1918; *Monarch*, 1919.

Kitsault River Section.*

This section includes the Kitsault River valley and tributary valleys, from tide-water at the town of Alice Arm to the head of the river, a distance of about 26 miles. It is one of the best-mineralized sections in the Province, has had enough development to expose some very attractive prospects, and is steadily progressing on its merits. The outlook for the coming year is the most optimistic this section has had for several years.

Wolf. This Crown-granted claim, situated right at Alice Arm, is owned by John Stark and is under bond to J. Fiva, who has been developing it. The showing is a quartz vein, bedded in sedimentary formation, and is from 12 to 14 inches wide, showing in places high silver values. No ore has been shipped this year; the work has been confined to driving a crosscut tunnel of 155 feet to the vein and about 100 feet of drifting on the tunnel-level, showing about the same as on the surface.

Esperanza. This property is one of the oldest locations in this district, from which small tonnages have been shipped for several years, aggregating probably $100,000. High silver values occur in a quartz vein in small lenses and bunches. The country-rock is sedimentary. The profits have not been large because of the erratic occurrences of high-grade ore, necessitating a great deal of dead-work. The property has only been worked on a small scale by hand. The installation of a small compressor, whereby some systematic, deeper development could be accomplished, and the addition of a small concentrator might make this a profitable property. Fifty-four tons of ore was shipped.

Alice Arm-La Rose Mining Co., Ltd. This company was incorporated in 1920 with a capitalization of $1,000,000, divided into 1,000,000 shares. The registered office is Prince Rupert. The holdings consist of four mineral claims—*Britannia*, *Britannia Nos. 1* and *3*, and *St. Elois* situated on Paul Klayduc creek, about 2 miles from the railway, with which it is connected by a first-class horse-trail. The owners have made several small shipments of high-grade silver ore, and this year 42 tons was sorted and shipped, which netted the company about $100 a ton, mainly in silver.

Last year a crosscut was driven to the vein, which was then drifted on to a point under the old surface shaft and a raise then put through to the bottom of it. The drift on the tunnel-level is in a broken-up horizon of the vein, showing no mineral. However, ore was encountered about 20 feet up the raise and continued, more or less, through to the shaft, in places showing a foot of high-grade ore, accompanied by a foot or more of milling-grade ore. I have not been in the raise since it was completed and stoping started, but the results obtained of 42 tons shipped does not seem to be over-encouraging, in so far as profits for the further development of the property are concerned.

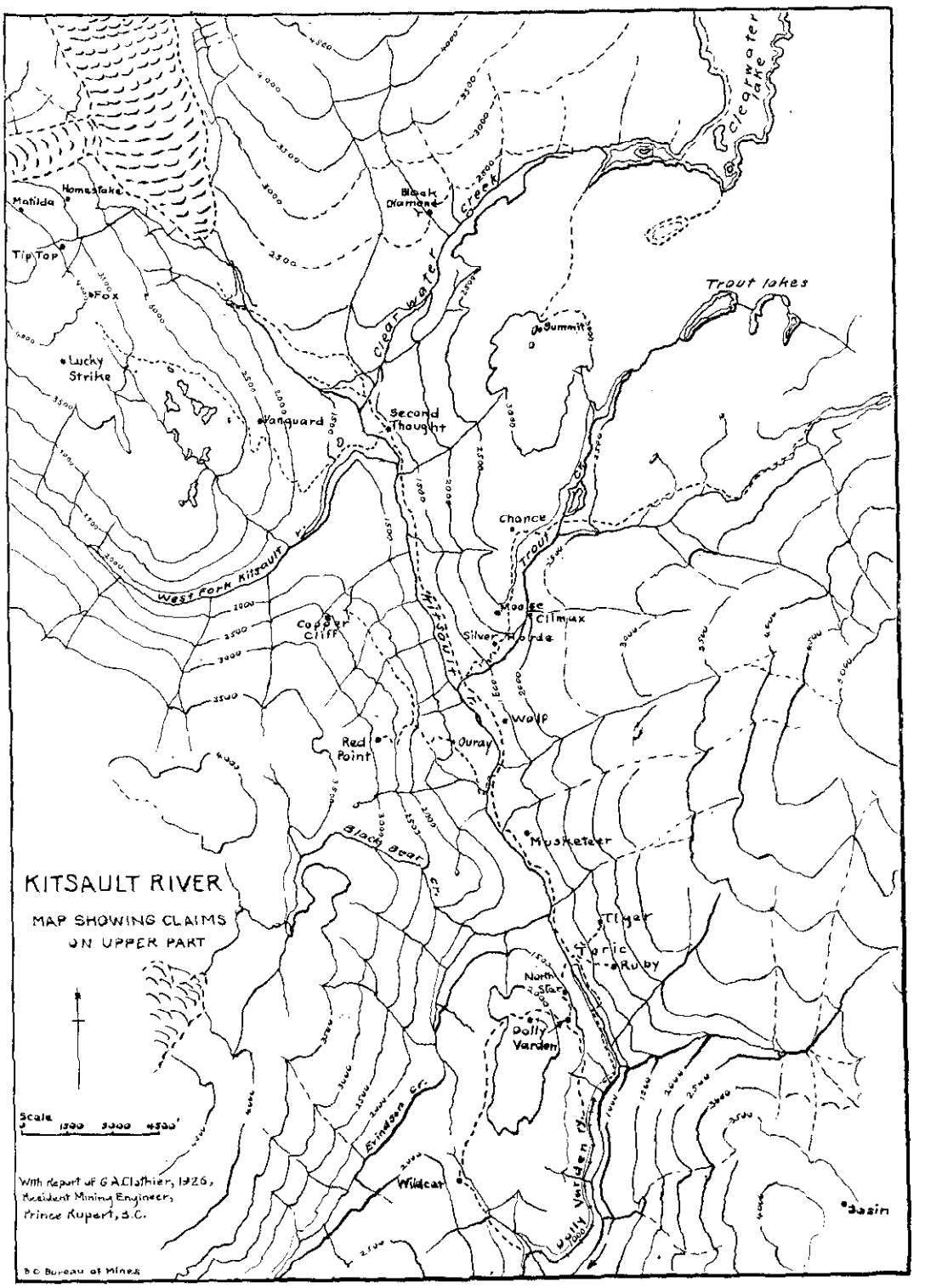
Any greater depth on the vein would have to be obtained by driving another crosscut tunnel from the surface, as the water-flow in the vein would prohibit sinking. Operations have been under the capable supervision of Miles Donald, one of the original owners of the property.

Speculator No. 2. This claim, owned by Jas. Calvin, of Alice Arm, and partners, adjoins the *La Rose* on the south and contains the extension of the *La Rose* vein. A shaft has been sunk to a depth of 30 feet on the vein, showing up to 2 feet in width of ore, carrying good values in native and ruby silver.

Kitsault-Eagle Silver Mines, Ltd. (*Eagle* group.) This company was incorporated in April, 1926, with a capitalization of $500,000, divided into 500,000 shares, with its registered office in the Standard Bank Building, Vancouver. W. G. McMorris is the managing director. The holdings of the company consist of three groups of mineral claims: The *Eagle* group of six claims—*Eagle*, *Eagle Nos. 2*, *3*, *4*, *Eagle No. 1 Fraction*, and *Eagle Fraction*—situated on the north side of Paul Klayduc creek; the *LeRoy* group of fourteen claims—*LeRoy*, *Anna Condon*, *Mountain View*, *Mountain View Nos. 2* and *3*, *Discovery*, *One Below Discovery*, *June*, *Summit*, *Canyon Nos. 1*, *2*, *3*, *4*, and *5*—situated on the North-east fork of the Kitsault river about 8 miles from Alice Arm; and the *Silver Cord* group of two claims—*Silver Cord* and *Silver Cord No. 2*—situated on the east side of the North-east fork of the Kitsault river.

On the *Eagle* group a good log cabin was built at 1,500 feet elevation and the trail improved from the railway up to the camp; a crew of four men was employed. Considerable prospecting of the ground was done and several open-cuts put in at long intervals, resulting in tracing a

* G. Hanson: Summary Reports, 1922, Part A, and 1923, Part A, Geological Survey, Canada.


KITSAULT RIVER
MAP SHOWING CLAIMS
ON UPPER PART
Scale
0 1000 2000 4000'
With report of G.A. Clothier, 1926,
Resident Mining Engineer,
Prince Rupert, B.C.
B.C. Bureau of Mines
Clearwater Lake
Black Diamond
Creek
Clearwater
Trout lakes
Summit
Matilda
Homestake
Tip Top
Fox
Lucky Strike
Vanguard
Second Thought
Chance
Trout
West Fork Kitsault R.
Kitsault R.
Moose
Climax
Silver Horde
Copper Cliff
Wolf
Red Point
Ouray
Black Bear Cr.
Musketeer
Tiger
Toric
Ruby
North Star
Dolly Varden
Erindegan Cr.
Wildcat
Dolly Varden R.
Basin

Porter-Idaho Pack-train, Portland Canal M.D.

Thibert Creek at Mouth of Berry Creek.

quartz vein about 10 feet wide for the length of two claims or more. The predominating country-rock is sedimentary. The vein is composed of about 5 feet in width of quartz and calcite and 5 feet or over of quartz and country-rock.

There is little or no mineralization showing in the lower cuts, but the higher openings look a little more encouraging. I understand that later prospecting still higher on the vein produced some very good values. It is a strong, well-defined vein and deserving of some prospecting.

The *LeRoy* and *Silver Cord* groups I have not examined. The company has had a small crew on each property this season, but only the work on the *Silver Cord* is being continued through the winter.

On the *LeRoy* group a great deal of surface work was done by way of stripping and open-cutting and a drift 100 feet long was run on the *Discovery No. 1* vein. W. S. Bacon, mining engineer, examined this group in the fall and has expressed himself as being very favourably impressed with the extent of the mineralization, surface values, etc. Assay values on the vein drifted on are given as running from $25.20 to $54.86 a ton in gold, silver, lead, and zinc.

On the *Silver Cord* group a vein stated to be from 4 to 30 feet wide has been traced the length of the two claims forming the group. In October a tunnel was started following the ore along the hanging-wall. At the end of the year it had been advanced to 105 feet, gaining about the same footage in depth from the surface. Samples from this tunnel show a high zinc content, up to 29 per cent., with a little silver and gold.

The company is to be commended for its aggressive work this year. Improvements to the trail and a bridge across the North-east fork of the Kitsault river will be recommended to the Department of Mines toward assisting the development of this section.

Zorka. This group consists of the following claims: *Zorka*, *Zorka No. 1*, *Zorka No. 2*, *Standard*, *Midnight No. 1*, and *Midnight No. 2*, situated on the Dolly Varden Railway, about 13 miles from Alice Arm, and owned by A. Serbich. The country-rock in this vicinity is sedimentary. Two tunnels have been driven; one at the level of the railway-track is in 38 feet and another about 10 feet lower, below the railway, has been driven 20 feet. The track-tunnel has been driven along the south side of a 5-foot porphyry dyke striking S. 28° W. and dipping about 75° N.W. About 2 feet north of this dyke there is a hornblende-porphyry dyke about 2 feet wide paralleling it. On the north side of the hornblende dyke a small section of a vein about a foot wide is exposed, dipping north-east and cut off by the smaller dyke, on the other or south side of which and between the two dykes is a small faulted section of the vein. No vein could be found on the south side of the larger dyke. The upper or track tunnel shows a small streak of lightly pyritized quartz showing a trace of chalcopyrite.

The lower tunnel lies north of both dykes and follows a couple of streaks of calcite carrying chalcopyrite. The vein at the track-level shows about a foot of heavy sulphides of iron and copper and is fair-looking ore. Little depth could be obtained other than by sinking on the vein on the north side of the dykes, as it is only a few feet down to the river. I therefore think the best prospecting would be toward picking up the vein south of the dykes above the track-tunnel.

Ouray. The original claims were the *Ouray* and *Bertha Fraction*, staked in 1916 by Egan & Carpenter. I do not know whether any other claims have been added to the group or not by the present owners, S. Dumas, of Alice Arm, and partners, D. Robertson and C. A. Egan. The claims are situated on the west side of the Kitsault river, adjoining the *Wolf* group of the *Dolly Varden* properties. The trail to the *Copper Cliff* group above crosses the showings at 1,500 feet elevation.

The country-rock is grey andesite. The vein has been opened up along the edge of a bench for several hundred feet by numerous open-cuts and stripping. These exposures of the vein show it to be at least 4 feet wide, striking about north-south and dipping easterly, and therefore lying with the slope of the hill. The vein-filling is quartz and calcite, mineralized with pyrite, chalcopyrite, and galena, with possibly a trace of grey copper, though I could not be certain. The percentage of mineral would make it a good milling-ore. Some depth on the vein could be obtained by crosscutting from the bench below, but from there sinking on the vein would be necessary.

In the absence of any of the owners I was not sure of the location of the west line of the *Wolf* group, but it must be comparatively close to the line of croppings of the *Ouray* vein, in which case, with the vein dipping toward the *Wolf* ground, it might restrict the vein on this

ground. Considering its location, etc., it is a promising showing. A new cabin is under construction.

Lucky Strike.

There are eight claims in this group, owned by W. McLean, J. Hauber, and partners, of Alice Arm. The claims are *Lucky Strike* and *Lucky Strike Fraction*, *Rambler*, *Sunnyside*, *Porcupine*, *Cascade Fall*, *Silver Crown*, and *Siren*, situated north from the West fork of the Kitsault river. On the *Rambler*, the south claim, a tunnel has been driven across a vein, striking N. 28° W. (mag.), showing its width to be 16 feet of a breccia of slate and grey rock, cemented with feldspar, calcite, and quartz, which are liberally sprinkled with pyrite and chalcopyrite, and assaying from $2 to $5 a ton in gold. Ribs of sulphide in the decomposed surface rock would assay up to 7 or 8 per cent. copper, but the whole would average low because of so much oxidation. Sufficient depth to get below surface effects might show lenses of good ore and a fair average value. This shear-zone has been traced north for over 600 feet, but, as the surface along the vein is comparatively level, depth on the vein could be obtained only by sinking.

On the *Porcupine* claim, just north of the cabin, an open-cut exposes a vein similar to that on the *Rambler*, badly broken up on the surface. It is from 10 to 12 feet wide and shows considerable pyrite and chalcopyrite. About 200 feet east of this showing another vein has been uncovered, striking N. 70° E. toward the above-mentioned parallel veins. This vein is also a shear-zone, stands perpendicularly, is from 10 to 12 feet wide, and consists of quartz and calcite heavily mineralized with pyrite and chalcopyrite, with a little galena and zinc-blende showing in places. About 4 feet on the west wall is exceptionally well mineralized with pyrite and chalcopyrite. Altogether this is an attractive ore-exposure and warrants deeper exploration. Unfortunately the ground is so flat here that depth could not be obtained by tunnelling.

Pieces of the general run of mineralized quartz assayed to obtain the proportionate values gave $2.40 in gold, 8.6 oz. in silver to the ton, and 2 per cent. copper. There are several isolated croppings on the flat that have not been traced anywhere.

On the *Lucky Strike* claim, at 3,800 feet elevation, is the largest showing on the group. A trench across another brecciated vein shows its width to be 20 feet. Like the others, the vein gangue is quartz and calcite cementing the country-rock fragments, the whole well mineralized with pyrite, chalcopyrite, and also showing some galena and zinc-blende. The owners claim assays from here of 3 oz. gold and 65 oz. silver to the ton. The open-cut gives a depth of about 8 feet, but the vein is still full of oxidized seams.

On the strike of the *Lucky Strike* and *Cascade Falls* croppings an open-cut and shallow shaft at 4,300 feet elevation exposes a width of several feet of decomposed material, in which are ribs of stibnite and arsenical iron, with specks of galena and zinc-blende. This cropping is on the West Fork slope and strikes N. 70° E. A grab sample for possible silver values gave a trace of gold and 0.4 oz. silver to the ton. Still farther north on the *Lucky Strike* claim, at 4,600 feet elevation, an open-cut shows 12 feet in width of brecciated grey country-rock, quartz, feldspar, and calcite, in the centre of which there is about 2 feet of calcite well mineralized with chalcopyrite. It is a strong, well-defined vein in grey andesite. A number of slate-croppings can be seen on the higher ground to the top of the mountain.

Judging from the ore-exposures on these claims and farther north on the *Vanguard* and *Homestake* groups, it would appear that in this copper-belt there are two series of parallel shear-zones, one striking with the range at about N. 28° W. (mag.) and the other at N. 70° E. (mag.), with such strong mineralization in each zone that their intersections should be most interesting.

These claims have been staked for a number of years and the owners have done a very creditable amount of work, but of course inadequate toward opening up the property to any extent. The property warrants investigation. This ground lies south-west of and above the *Vanguard*, now under bond to Vancouver interests.

Red Point, Copper Cliff, Vanguard, and Homestake.

These groups lie in the copper-belt* on the west side of the Kitsault river, extending north from Evindsen creek, just north of the *Dolly Varden*, to the West arm of Kitsault glacier. The four groups have recently been bonded by Vancouver interests and a 500-foot crosscut tunnel is being driven this winter by contract on the *Red Point*. The *Red Point* and *Copper Cliff* may be described as containing a wide belt of disseminated pyrite, chalcopyrite, and pyrrhotite, in which are gash-veins of more concentrated mineralization.

* Hanson, George: Summary Report, 1921, Part A., G.S.C.

The *Vanguard* group (*see* 1918 Annual Report) of four claims is owned by Morris Peterson and the Strombeck Bros. and is situated about 4 miles north of the *Dolly Varden*. There is a good cabin at the workings, at 2,900 feet elevation, reached by a good horse-trail and bridge across the Kitsault from the main Kitsault trail at the *Second Thought* cabin.

There is an exceptionally fine surface showing of chalcopyrite at 3,000 feet elevation, striking S. 70° W. (mag.) and dipping about 62° to the north. A tunnel was driven underneath this on a bearing of S. 20° W. (mag.), cutting the vein at 50 feet from the portal, where it shows a little pyrite. The vein was then drifted on toward the surface showing with little or no improvement. The main tunnel was then continued 12 feet to make sure that the proper vein had been cut.

This year driving was resumed in the drift and at the time of my examination was in 50 feet from the tunnel. At about 12 feet from the present face chalcopyrite came in on the north side of the main seam or "vein." This side is about 2 feet wide, of sulphides, of which 1 foot is solid chalcopyrite. On the left, south side, the filling is 4 feet wide to the perpendicular "hanging-wall" and is mainly calcite, in which are small lenses and veinlets up to 2 inches wide of chalcopyrite, altogether a very promising-looking face.

I understand that under the present bond terms a long crosscut tunnel will be driven to obtain a considerable depth under the good surface showing.

The *Homestake* group (*see* 1918 Annual Report) consists of four claims owned by A. Davidson, of Alice Arm, and is situated, at a general elevation of 3,500 feet west of the lower end of Kitsault glacier, 26 miles from Alice Arm. The general rock formation is the greenish andesite or andesite breccia of the copper-belt.

There is a wide shear or breccia zone, up to 50 feet in places, running the full length of the claims, in which are several siliceous parallel veins, mineralized with pyrite, chalcopyrite, galena, and zinc-blende. The general strike of the mineralization is roughly east-west (mag.). It has been exposed across its full width by several open-cuts, showing a fair amount of mineral, but evidently low grade. Two or three small veins carrying more chalcopyrite have been exposed. These strike at N. 70° E. and improve the mineralization in the main zone at the intersections.

Considerable work was done while the property was under bond to the Consolidated Homestake Mining and Development Company, now operating the *Toric* group. The work, however, was insufficient to be conclusive in any way. The width and continuity of the mineral-zone and its favourable location for mining I think warrant its considerable exploration in the hope of obtaining at least milling values. There is a good wide trail to the property that can be used as a winter road.

Kitsault River Mining and Development Co., Ltd.

(*See* 1925 Annual Report.) This company has a $1,000,000 capitalization, divided into 1,000,000 shares, with its registered office in Alice Arm. There are eight claims in the holdings, situated adjoining the *Homestake* group up the hill. The available funds have been well expended, but lack of capital has curtailed this year's work. It would seem to have about the same prospective merits as the *Homestake*—the possible development of an ample tonnage of milling-ore.

Climax.

The two claims of this group, the *Climax* and *Climax No. 2*, have had considerable prospecting done on them by the owner, Oller Besner, of Prince Rupert. They are situated on Trout creek, adjoining the *Moose* and *Silver Horde* groups. There is a good horse-trail from the main Kitsault River trail to the camp. The country-rock is grey tuff, locally called the silver formation.

The main work is a tunnel at 2,350 feet elevation, 50 feet long, on the foot-wall and a crosscut 24 feet at the end of the tunnel showing a cross-section of the vein, which at this point is 21 feet wide. The gangue of the vein is quartz, with andesite, mineralized with pyrite, galena, and zinc-blende, the pyrite fairly well disseminated and the galena and zinc in small bunches. Patches show ruby silver. The average values are low, but faulting, characteristic of this region, may be expected, along which the secondary silver enrichment may make very high-grade ore. I think the width of the vein and mineral indications justify further development.

Moose.

(*See* 1921 Annual Report.) There are five claims in the group, situated adjoining the *Climax* and about 3½ miles from the terminus of the Dolly Varden Railway. The owners are Miles Donald, of Alice Arm, and associates. As no work has been done since 1921 the reader is referred to the Report of that year.

Silver Horde. A. Davidson, of Alice Arm, and partners own the four claims comprising this group. The showings are similar to the *Moose* and *Climax;* that is, a pyritized quartz, carrying low values in galena, zinc-blende, and scattered silver sulphides. This property, with the *Moose*, *Climax*, and *Chance* groups, would make a good combination for extensive exploration.

Tiger. (*See* 1918 Annual Report.) Ed. Pickett, the owner, staked the two claims in the group, *Tiger* and *Lion*, in 1916 and since then has done a considerable amount of prospecting and development work on them. The *Del Norte Fraction* was added to the group this year. The claims are situated north of and adjoining the *Toric* group on the east side of the Kitsault river.

The general rock formation, according to Geo. Hanson, is a hard, grey, fine-grained tuff. The showing is a quartz vein up to 12 to 14 feet wide mineralized generally with pyrite, but in places showing a little galena and zinc-blende, with which is associated a little ruby silver and flaky native silver on the seams. A diamond-drill hole south of the tunnel showed 5 feet of 60-oz. silver ore in Block B and up to 200 oz. silver to the ton across a width of 5 feet in Block C.

Two sets of faulting have evidently occurred—namely, a vertical western movement and afterwards a shear to the south and east—resulting in several blocks of the vein being shifted first to the west and then to the south-east. The crosscut tunnel crossed the main vein just on the fault-line, and a drift to the south on the hanging-wall, driven since, shows good ore in places. The tunnel apparently passed to the left of and under the first block below the main vein; the next block was crossed in a lean place and the lowest block is to the left of the tunnel. The owner has driven four drift-cuts from the tunnel and has picked up two of the displaced ore blocks. There would seem to be a good chance of opening up ore-bodies averaging milling grade.

Consolidated Homestake Mining and Development Co., Ltd. (Toric Mines, Limited.) (*See* 1925 Annual Report.) This company has been developing the *Toric* group of four claims for the past two years. The claims—*Toric*, *Angelo*, *Moose*, and *Lamb*—were surveyed this year and Crown grants obtained in March. Application has been made to change the name of the company to the Toric Mines, Limited, and to increase the capitalization of the company from $500,000, divided into 100,000 shares, to $625,000, divided into 125,000 shares. The registered office of the company is in the Credit Foncier Building, Vancouver. A. C. H. Gerhardi is the managing director and Geo. N. Joy is secretary-treasurer.

The work underground in 1926 consisted of a drift 70 feet in length from the No. 1 crosscut east. This has been in the ore-body all the way, in places showing spectacular ore carrying ruby and native silver, the whole averaging good milling-ore. A crosscut will now be driven from the end of this drift to the hanging-wall of the ore-body.

The main work of the season has been the construction of a 50-ton concentrator at the mine with a crushing capacity of 100 tons in twenty-four hours. The structure, including tramway and snow-shed, ore-bin, crusher plant, and main building, is completed and the machinery partially installed. It was expected that the plant would be in operation late in the fall, but the delayed delivery of machinery prevented this and operations were closed down for the winter, to be resumed as early in the spring as transportation conditions will permit.

The flow-sheet of the concentrator is simple, consisting briefly of: Mine-run ore to 260-ton ore-bunker; to 10- by 9-inch Blake jaw-crusher; to 18-inch conveyor-belt to 240-ton crushed-ore bin; automatic feed to 30- by 14-inch Traylor rolls; to 14- by 3-foot Dorr classifier; undersize (80-mesh) to two No. 6 Wilfley tables; oversize to 5-foot by 22-inch Hardinge mill to barrel amalgamator; the discharge back to classifier.

While there has been no vertical work done to prove actual "ore in sight," the horizontal development surely indicates an immense tonnage of ore averaging a fair milling grade. By a little selective mining the grade of the mill-feed may be raised until the milling capacity is able to handle the lower-grade ore.

Mr. Gerhardi states that the finances of the company are in a very satisfactory condition. I see no reason to doubt that this property, continued under efficient management, will become a very important producer and prove a profitable undertaking.

PORTLAND CANAL MINING DIVISION.

This Division includes the country north of Pearce island, in Portland inlet, on the east side of Portland canal (the west side is Alaska), to the summit of the range between Portland canal and Observatory inlet, and north to Mount Brown, from which point northwards it takes in the whole drainage area of the Nass river. The northern portion, though over the Bear River divide, is included in this Division, for the reason that it is reached by way of Stewart, where the Government office is located.

Stewart, at the head of Portland canal, is the distributing centre of the Division. It is the most northerly seaport in British Columbia and therefore the logical outlet for all the Northern Interior country. There is a Government telegraph-office at Stewart and a radio-office in Hyder, on the Alaska side. Stewart has a weekly boat service by both the Canadian National and Union Steamship Companies.

Salmon River valley has been provided with a good auto-road to the *Premier* and *B.C. Silver* mines, a distance of 17 miles. This is continued as a wide trail through to the upper valley of the Salmon river, branch trails making all parts of the valley accessible.

The Bear River valley has a wagon-road from tide-water to the junction of American creek, a distance of 14 miles. The Portland Canal Short Line Railway, built by Sir Donald Mann in 1910–11, is entirely out of commission. The wagon-road is now only passable for 8 miles, but it is hoped that the connecting portion at Muddy gulch will be built this year. From American creek the main Bear River trail continues from the end of the wagon-road over the Bear River divide and down to Meziadin lake. A reconnaissance was made this summer toward the extension of the trail from Meziadin lake north to Telegraph Creek. Branch trails up the different tributaries to Bear river make the whole valley very accessible.

The Marmot River valley transportation facilities have been greatly improved by the construction of a wagon-road from tide-water to the forks, about 3½ miles. It will have to be gravel-surfaced before being serviceable for hauling. From the forks pack-trails have been built up both forks of the river. A float and approach thereto has been built by the Federal Government on Marmot bay. It has not been as serviceable as desired on account of lack of room on the approach for pack-horses. It will have to be enlarged to meet the requirements of trucks when used on the new road.

As predicted last year, this has been an exceptionally busy mining year throughout this Division, each section (which *see*) contributing its share to the general progress.

The district has been further favoured by the survey of the Bear River section by the Dominion Geological Survey under the able supervision of Geo. Hanson.

Much construction and improvements of roads and trails has been done this year in this Division. The recognition of this as an all-important factor in building up the mining industry and the policy of the Mines Department in furnishing assistance to prospectors and operators under the "Mines Development Act" have had a very beneficial effect.

PORTLAND CANAL SECTION.

This includes the country bordering Portland canal on its east side from Pearce island to its head at Stewart, and is a portion of the Portland Canal Mining Division, with which it should not be confused.

Outsider. There are eight claims in this group—*Elsie, Tunnel Fraction, Copper King, Regina, Hope, Brown, Summit,* and *Constance Fraction*—situated at Maple bay, about 35 miles down the canal from Stewart. It is the old *Brown-Alaska* group, equipped and operated in 1916, shipping a low-grade siliceous copper ore to the Hedley smelter. It is now owned by Martin Woldson and associates, of Spokane, Wash., and operated on a royalty basis by the Granby Consolidated. In 1926 it produced 34,729 tons of ore, yielding 1,036,113 lb. copper.

Big Mike. There are six claims in the group—*Big Mike, Patsie, Molly O, Paddy Doyle, Sally,* and *Danny Doyle*—staked in 1925 by Mike Milesovich, John D. McDonald, and H. Wilkinson, of Stewart. The claims are situated on the east shore of Portland canal, about 5½ miles south of Stewart. The country-rock is granodiorite of the Coast range. The mineralization is mainly pyrite, together with some galena and zinc-blende in a quartz vein which averages about a foot in width. The vein has been exposed in two places; at the lower point a tunnel has been driven a short distance on the vein just

above high-tide mark. Spots in the vein here show native gold, but a sample from the vein at the face gave no values. Probably 50 feet above the tunnel a few shots have been put in, showing the vein to be a few inches wide and showing some galena. A sample of this assayed $32 in gold to the ton and a trace of silver.

It is certainly a handy location, but whether it can be worked profitably or not of course depends on the mineralization, the extent of which can only be determined by work.

Georgia River Section.

This is the valley of the Georgia river, which empties into Portland canal on the east side, about 18 miles down from Stewart. There is a fair foot-trail for about 10 miles up the river from its mouth.

M.J.

The only property examined in this section was the *M.J.* group. It is owned by Jas. Lydden, of Stewart, and consists of six claims—*L.J. Nos. 1* and *2*, *M.J. Nos. 1* and *2*, and *Little Pat Nos. 1* and *2*—situated about 3½ miles from the beach. The showings are quartz veins occurring in a quartz diorite or granodiorite formation. The quartz is mineralized with pyrrhotite and chalcopyrite. A sample of the heavy sulphides assayed only a trace in gold and 0.6 oz. in silver to the ton, but 12 per cent. copper. There are apparently two or more veins.

The lower exposures are at 2,100 feet on the *L.J. No. 1* claim, where a couple of open-cuts have been put in about 100 feet apart and the vein stripped between, showing its strike to be N. 60° W. and dip about 75° N.E. The lower of these cuts shows 18 inches of nearly solid chalcopyrite.

The upper showings are on the *M.J. No. 1* claim at 2,350 feet, here showing a foot or more well mineralized with chalcopyrite, standing perpendicularly along a ridge of granodiorite containing epidote, striking N. 30° W. Little work has been done, but the mineralization crops for about 100 feet. These showings are in themselves worth opening up and indicate a worthy area for close prospecting.

North Country Mining Co., Ltd.

This company was incorporated in November, 1923, with a capitalization of $2,000,000, shares at $1 par value each. The registered office is in Vancouver. The holdings of the company consist of the *Gloria* group of twelve mineral claims, owned by the Gloria Mining Company, Limited, and situated at the head of Georgia river and Bull Dog creek, about 3 miles from Portland canal in an air-line. There is nothing but an old foot-trail to the property as yet.

The general rock formation is igneous, probably a coarse quartz diorite, in which are many basic dykes running in a general east-west direction.

Three tunnels have been driven on the property under the supervision of A. Linke, who was the original staker. The lower tunnel just above the old cabin has been driven 60 feet, but does not show any mineralization of importance. At 3,150 feet, or 250 feet above the new camp, a tunnel has been driven 250 feet in granodiorite. There was no mineral of any kind showing and Mr. Linke explained that its objective was the cutting of "ledges" ahead. These ledges are quartz-porphyry dykes, along the walls of which are found bunches of mineral consisting of galena, sphalerite, and pyrite. Higher up, at 3,400 feet, another tunnel had been driven 230 feet, in which an occasional patch of mineral was found. This is also being driven toward cutting "ledges" ahead.

The undertaking has had the favourable report of the company's engineer and I understand that work will be confined to driving one tunnel. Assistance toward getting some sort of trail to that area will be recommended.

Several groups of claims have been staked in this area. D. A. McDonald, at the head of Bull Dog creek, has opened up a couple of small veins at an elevation of about 3,000 feet, which show some solid galena, assaying 35 oz. silver to the ton, 50 per cent. lead, and $4 a ton in gold. He built a foot-trail down Bull Dog creek to tide-water this season, making his claims accessible.

Marmot River Section.

This has been a very active section this year and some very high-grade ore has been shipped. The outstanding discovery of the season has been made in the *Prosperity* property lying above and adjoining the *Porter-Idaho*. This and another group adjoining the *Porter-Idaho* on the north have been acquired by the Premier Gold Mining Company, which will commence development in the spring of 1927.

Sterling Silver Lead Mines, Ltd.

This company was incorporated in March, 1925, with a capitalization of 2,500,000 shares at $1 par value each, with its registered office in the Pemberton Building, Victoria. The company acquired on option twenty-two claims in the Marmot section, including the *Wire Gold* group of four claims, *Forks* group of two claims, *Dwyer* group of three claims, *Fraser* group of seven claims, *Mountain View, Mountain Boy* and *Mountain Top* claims, *Crawford* claim, and *Elizabeth* and *Grand Canyon No. 1* claims; all situated between the North and South forks with the exception of the *Wire Gold* group, lying below the forks. The organization is under the management of Tom Campbell, Stewart.

Difficulties in financing arose and I understand that the company and holdings have been taken over by the International Metals Exploration Company, a Seattle organization, with offices at 912 Hoge Building, Seattle, Wash. This company is registered in British Columbia, with office at 622 Standard Bank Building, Vancouver. The authorized capital is $495,000, fully paid up. T. S. Waltemeyer is secretary of the company. It is stated that development-work will be commenced early in the spring of 1927.

Porter-Idaho Mining Co., Ltd.

(*See* 1925 Annual Report.) This company was incorporated in January, 1925, with a capitalization of $2,000,000, divided into 4,000,000 shares, with its registered office in Stewart. The company's property is comprised of the following mineral claims: *Gem of the Mountains, Lucille, Slide, Nettie L., Prickly Heat, Sunday,* and *Never Sweat,* situated west of the glacier at the head of North fork of Marmot river and staked by Clay Porter and associates. There are four mineralized zones or veins on this property in volcanic formation; one, containing two veins, strikes east and west; the other three strike north-easterly and south-westerly. Last year the two easterly of the north-south veins produced all the ore shipped and work was resumed on them again this year, but the ore-shoots encountered by hand-mining were few and not sufficiently productive to make steady shipments. All these veins are highly oxidized on the surface and contain only short shoots of sulphides and carbonates, which constitute the shipping-ore. Later in the summer the west vein was discovered and proved a life-saver, so far as shipping-ore was concerned. Shipments were started in September and continued until snow fell. In that time 174 tons of ore was shipped to Trail, yielding 16 oz. gold, 70,090 oz. silver, and 108,403 lb. lead, the value of which was $48,801.

Last year a crosscut tunnel had been driven, cutting the two veins in the east-west zone. Early this year, during the winter, some 500 feet of drifting was done on one of these veins east to the intersection of the middle vein of the north-south series. This work showed that the oxidation still persisted at that depth below the surface of over 100 feet. No ore of shipping grade, except by sorting, was found, but the indications are that an ample tonnage of milling-grade ore could be developed to warrant a mill.

During the year 1,311 feet of development was done—885 feet drifting, 65 feet of winze, and 161 feet of crosscutting.

Another lower crosscut tunnel has been started, and up to the end of the year about 200 feet had been driven, to cut the east-west shear at a depth of 450 feet on the dip of the veins. It is expected this work will be through by April 1st. Drifting can then be done on the east-west veins to the intersections of all three of the north-south veins, which in turn can be drifted on at a depth which should be under the surface oxidation.

If the extent of mineralization and values at the depth of this new work come up to expectations, as indicated by all the surface exposures and what deeper work has been done, this will make one of the great mines of the district.

Clay Porter, the original staker and owner, is still managing director, ably assisted by Joe Moran, mine foreman.

Prosperity.

This consists of the seven claims—*Prosperity, Prosperity Fraction, Tea Pot Dome, Honest John, View, Gargoyle Fraction,* and *E.X.*—situated above and adjoining the *Porter-Idaho* ground. The claims are owned by F. R. and L. E. Jancowski, Eli Watland, G. D. Davis, and Geo. Mehlfeld, and have recently (1927) been bonded to the Premier Gold Mining Company. During the season of 1926 the vein on which the *Porter-Idaho* was mining was traced up the hill into this ground. The owners opened up the vein, which shows in places a width of 5 feet of solid galena, assaying around 500 oz. silver to the ton. Sacking ore was started late in the fall and 29 tons was shipped out before the snow came,

giving smelter returns of 2 oz. gold, 12,072 oz. silver, and 15,004 lb. lead, or about $250 a ton. The property is readily reached by the *Porter-Idaho* trail.

Melvin. This group of four claims—*Melvin*, *Donald*, *Melvin No. 1 Fraction*, and *Melvin No. 2 Fraction*—is owned by Della and N. H. Stevens, of Hyder, Alaska. The claims adjoin the *Porter-Idaho* property on the north. This group has also been bonded by the Premier Gold Mining Company, Limited.

Marmot Metals Mining Co., Ltd. (*See* 1925 Annual Report.) This company was incorporated in 1925 with a capitalization of $1,500,000, divided into 3,000,000 shares. The registered office is at Stewart. The company's property consists of the *Montana* group of five claims and the *Horseshoe* claim, situated on the north side of the South fork of the Marmot river, about 4 to 5 miles from the beach. A considerable amount of development was done last year on the *Montana* group, but this year's development has been confined to the *Horseshoe* claim, overlooking the north branch of the Marmot glacier, which has to be traversed to reach the camp and showings, making a very unserviceable trail for the time being. The camp is at 3,300 feet elevation, or 1,200 feet above the glacier at the foot of the mountain.

The general rock formation is volcanic, but the mineral-showings consist of zinc-blende replacements in a wide limestone-belt, which can be plainly seen from the glacier on the abrupt end of the mountain. The limestone-belt is from 200 to 300 feet wide, distinctly faulted laterally into four blocks, the second block from the summit containing the main mineral-showings so far as yet known.

The work done this year consists of a number of open-cuts in the zinc-blende croppings and a tunnel driven 30 feet toward getting under a big cropping. This, I am informed, was encountered later and developed a very satisfactory ore-body. One cut, about the centre of the lime-mass, shows a width of 15 feet, averaging 17 per cent. zinc, which occurs in bunches and parallel veins and carries small values in gold and silver, though in places up to $20 a ton in gold has been obtained.

Another cut on the northern border of the limestone at its contact with schistose porphyry shows a width of mineralization of 12 feet. Lower on this contact a tunnel has been driven about 50 feet, opening up an ore-shoot which crops about 50 feet above. Other cuts have been put in at different places in the limestone.

These surface showings certainly indicate ore-bodies of great prospective importance, but not enough development has been done as yet to give certain evidence of the extent of the limestone and consequently the extent of the ore-bodies. The property is under the superintendency of Angus McLeod.

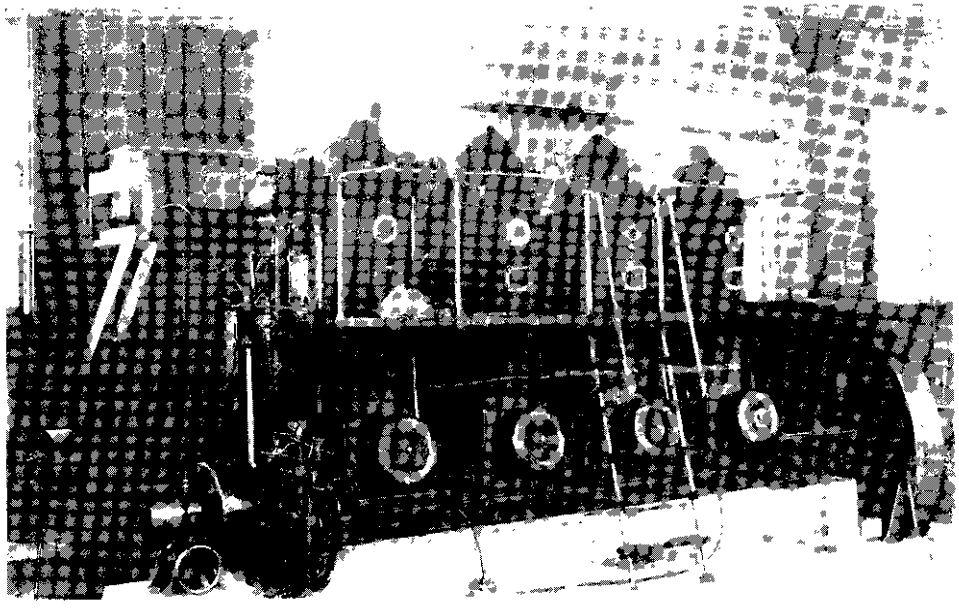
Washington. These claims are situated at the head of the South fork of Marmot river, on the north side, about 7 miles from tide-water. The group consists of the seven claims—*Ellen*, *Ruth*, *Vivian*, *Carrie*, *Black Bear No. 1*, and *Castle Hill*—owned by R. E. Lundvall, the original staker, and Captain Donald and associates. This year assistance was granted by the Mines Department for the construction of a trail from the north side of the glacier up to the property at 3,550 feet elevation, enabling pack-horses to reach the camp.

The general rock formation is the immediate contact north of the Coast Range granodiorite, therefore consisting of more or less broken up sedimentaries and volcanics. The work done up to the time I was on the property in September consisted of a 240-foot tunnel, the objective of which was to intersect certain surface showings, from which high-grade silver ore has been obtained.

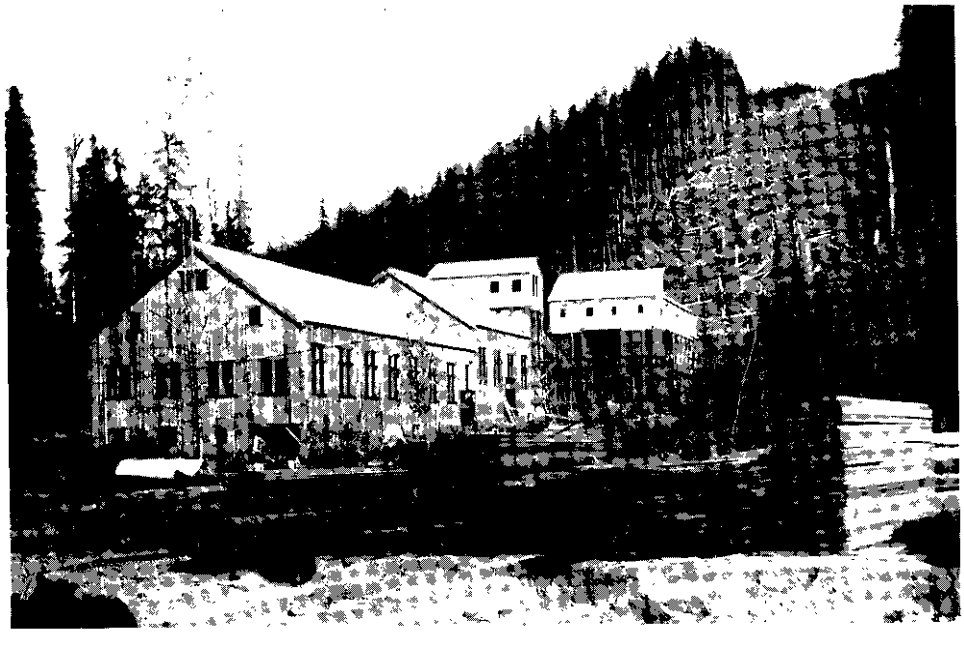
Winter camps were later constructed, and I am informed that the tunnel is being continued throughout the winter, on the recommendation of the engineer representing the interests furnishing the development funds.

Ficklin-Harner. This group comprises seven claims—*High Grade Nos. 1*, *2*, and *3*, *High Grade Extension No. 1*, *High Grade Extension No. 2*, *Apex Nos. 1* and *2*—owned by H. Ficklin and W. Harner, of Stewart. The property is situated beyond the *Washington* group at the head of Magee pass. The upper showings are at 5,200 feet elevation. There is now a good trail to the *Washington* camp, beyond which is glacial wash for about half a mile to the glacier, which thence provides a fine horse-trail to the camp.

Volcanic rocks form the predominating formation, with small included belts of sedimentaries, in which, or along which, occur the mineralizations in a quartz-calcite gangue. Two veins have been discovered on the claims.



Dunwell Mines, Ltd.—Mill Engine.



Dunwell Mines, Ltd.—Concentrator.

The upper vein occurs along the contact of a sedimentary belt with the enclosing volcanic rock and can therefore be readily traced along the surface. The vein varies in width from 2 to 6 feet and is badly decomposed on the surface and to any depth as yet obtained in prospecting-work. It strikes in general about east-west (mag.) and dips about 45° north on the surface, where it may be flatter, due to surface pressure. The chief mineralization is pyrite, though some small seams of galena occur, carrying high silver values. On the hanging-wall there appears to be about a foot of pyritized quartz, which carries fair values in gold. On the west end a short crosscut tunnel was driven under the open-cut above, but failed to pick up the vein because of its flat dip. The lower vein, at 4,950 feet elevation, strikes N. 60° E. (mag.) and dips about 45° to the north. It also occurs in a belt of sedimentaries and is from 10 to 12 feet wide. Like the upper vein, it is badly decomposed, with ribs of quartz well mineralized with pyrite and, in places, chalcopyrite. A sample of the quartz disseminated with fine- and medium-grained pyrites from this vein assayed $52 a ton in gold and 3.6 oz. silver to the ton. Similar ore from the upper vein, except that the pyrite was coarser, gave $1.20 in gold and 1 oz. silver to the ton. Altogether this is a rather attractive prospect.

Bear River Section.

This includes all the Bear River valley and tributaries thereto from Stewart to Meziadin lake.

This portion of the district has had a very active and, in general, a very satisfactory mining year, notwithstanding the fact that several companies have been unable to procure the necessary funds for the continuation of development-work. This is not surprising, nor necessarily discouraging, when one considers the number of incorporations that have been made during the past two or three years.

The development and equipment of the *Dunwell* has practically reached the production stage, which will mean much to Stewart and the valley. The *L. & L.* has been developing all season. The *Albany* has started and will operate throughout the winter. The Dalhousie Mining Company's property has improved with prospecting this season and has a very favourable outlook. The *Independence* has recently been examined and financed and is now under development. The *George* copper property in the upper end of the valley continues to improve. The *Red Top*, *Argenta*, *Rufus*, and others, on the upper Bear river, have prospective merit.

Silverado Mines, Ltd.

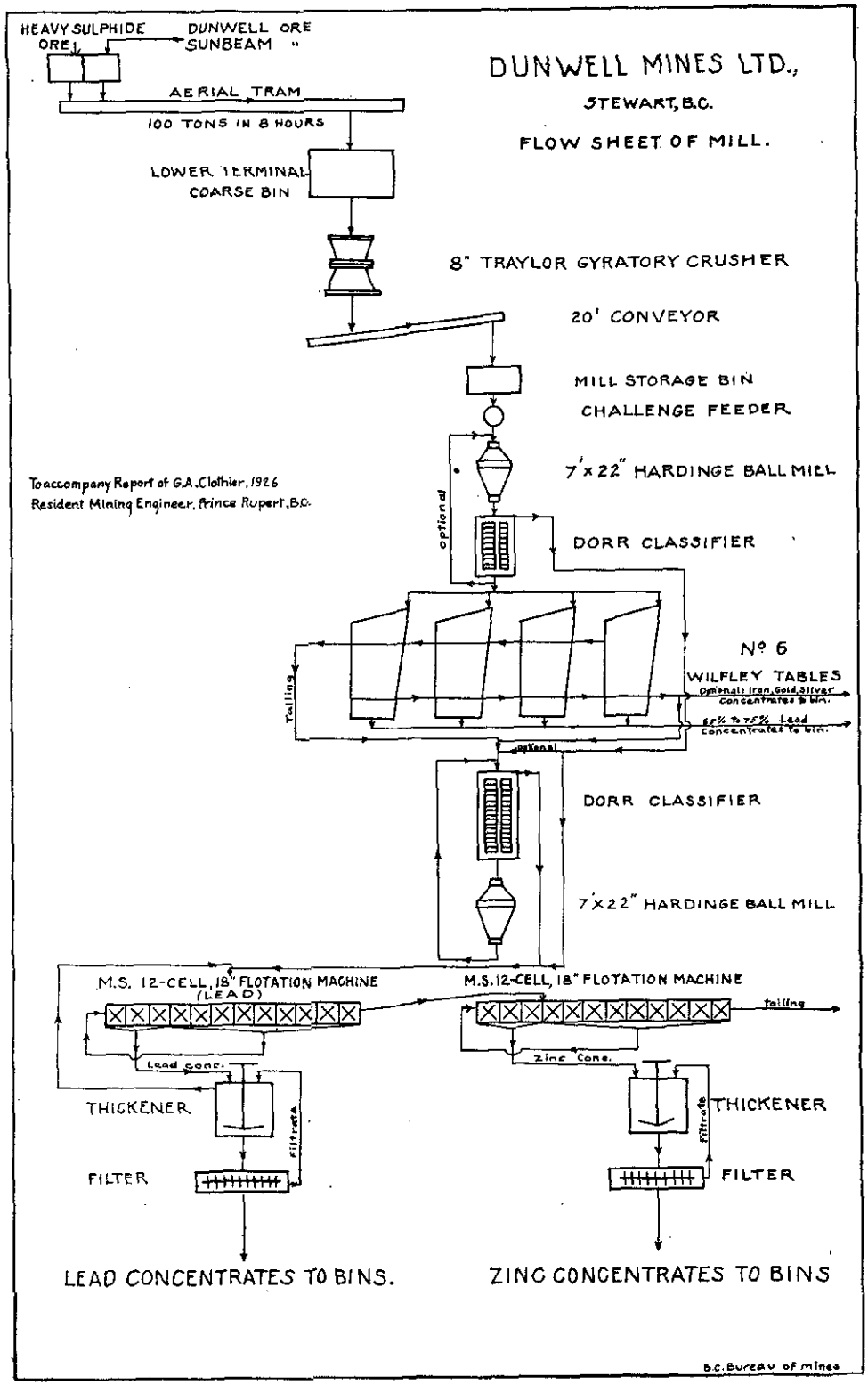
(*See* 1925 Annual Report.) This company was incorporated in 1924 with a capitalization of $500,000, divided into 500,000 shares. The registered office is in the Pemberton Building, Victoria. There are nineteen Crown-granted mineral claims in the company's holdings. Last year a great deal of prospecting and development work was done on the lower showings and very promising results were reported. It was decided to drive a 400-foot tunnel, which would attain about 165 feet depth on the surface showings. About 100 feet of this tunnel was driven up to the end of 1925. This year the drivage was continued until the depletion of funds. The property has been under the supervision of John Stewart.

Dunwell Mines, Ltd.

(*See* previous reports.) The company was incorporated in 1922 and is a specially limited reorganization of the Nass River Lands, Limited, which was incorporated in 1913. The capitalization of the present company was $350,000, divided into 350,000 shares, which was increased in 1925 to $700,000 with 700,000 shares, and further increased in 1926 to $1,000,000 with 1,000,000 shares. The head office of the company is that of the Stewart Land Company, Limited, Pemberton Building, Victoria. The affairs of the company are administered by Robert Stewart, general manager, with Matthew Little engineer in charge at the mine.

The work in 1925 consisted mainly of the surface exploration of the *Sunbeam* claim, containing the northward extension of the *Dunwell* veins. The surface exposures, showing high-grade silver ore, give every reason to expect important ore-bodies. In 1926 a crosscut tunnel was driven about 450 feet, which cut the *Sunbeam* vein at a vertical depth of approximately 200 feet. The vein here was found to be small and low grade. A little drifting was done on it, but did not disclose anything of importance. This work was closed down for the more important work of tramway and concentrator construction.

The ore-bodies in the mine, from the fourth level up, were opened up and made ready for stoping on the completion of the mill. There is well over a year's supply of mill-feed in sight in the mine. Deeper development is proceeding below the No. 4 level by sinking.


HEAVY SULPHIDE ORE
DUNWELL ORE
SUNBEAM "
DUNWELL MINES LTD.,
STEWART, B.C.
FLOW SHEET OF MILL.
AERIAL TRAM
100 TONS IN 8 HOURS
LOWER TERMINAL
COARSE BIN
8" TRAYLOR GYRATORY CRUSHER
20' CONVEYOR
MILL STORAGE BIN
CHALLENGE FEEDER
7'x22" HARDINGE BALL MILL
To accompany Report of G.A. Clothier, 1926
Resident Mining Engineer, Prince Rupert, B.C.
optional
DORR CLASSIFIER
No 6
WILFLEY TABLES
Optional: Iron, Gold, Silver
Concentrates to bin.
65% to 75% Lead
Concentrates to bin.
Tailing
optional
DORR CLASSIFIER
7'x22" HARDINGE BALL MILL
M.S. 12-CELL, 18" FLOTATION MACHINE
(LEAD)
M.S. 12-CELL, 18" FLOTATION MACHINE
Tailing
Lead conc.
Zinc Conc.
THICKENER
Filtrate
THICKENER
Filtrate
FILTER
FILTER
LEAD CONCENTRATES TO BINS.
ZINC CONCENTRATES TO BINS
B.C. Bureau of Mines

The aerial tramway from the mine, No. 4 level, to the mill, about a mile in length, has been completed. The concentrator, designed and constructed by L. C. White, of Birch, Hershey & White, is completed and the machinery is being installed as received. It is expected that milling will commence early in the spring of 1927. The mill and new power plant are situated on the flat at the old Portland Canal Mining Company's concentrator, and therefore on the main road about 4 miles from the dock at Stewart.

The flow-sheet of the mill is not complicated and is roughly as follows: The mine-run ore goes to the upper tramway-terminal double-compartment bins, one side for heavy sulphide ore and the other for general milling-ore. From these bins the ore is delivered to the lower tramway-terminal storage-bin at the head of the mill by aerial tramway, having a capacity of 100 tons in eight hours; thence to an 8-inch Traylor gyratory crusher and by conveyor-belt to the mill storage-bin. The ore is then delivered by a Challenge feeder to a 7-foot by 22-inch Hardinge ball-mill in closed circuit with a Dorr classifier, the overflow going to the flotation-cells and the remainder to four No. 6 Wilfley tables. The tables make a 65- to 75-per-cent. lead concentrate and possibly an iron concentrate carrying values in gold and silver. The tailings are reground in a Hardinge ball-mill and go to a 12-cell M.S. flotation-machine, making a lead concentrate, to thickener, to filter to bins. The tailings from the first machine go to another 12-cell machine, making a zinc concentrate.

Two shipments of mine-run ore were made early in the year. The first lot of 98 tons assayed 0.65 oz. gold to the ton, 23.8 oz. silver to the ton, 19 per cent. lead, and 15.9 per cent. zinc; and the second lot of 102 tons assayed 0.55 oz. gold to the ton, 24.8 oz. silver to the ton, 19.6 per cent. lead, and 17 per cent. zinc. It seems quite fitting that the Stewart Bros., who founded the town of Stewart, should "bring in" a mine within a short distance of it.

Victoria Mines, Ltd.

(*See* 1925 Annual Report.) This company was incorporated in 1924 with a capitalization of $500,000, divided into 500,000 shares, with its registered office in the Winch Building, Victoria. A little more development was done in 1926 by way of extending the crosscut tunnel, which has for its objective the cutting to the northward extension of the *Dunwell* vein, which has been traced up to the line between the two properties. The work has not yet succeeded in finding the vein.

L. & L. Glacier Creek Mines, Ltd.

(*See* 1925 Annual Report for sketch-map, and previous reports.) This company was incorporated in 1924 with a capitalization of $250,000, divided into 1,000,000 shares; the registered office is at 414 Pender Street West, Vancouver. Application has now been made to change the name to L. & L. Consolidated Mines, Limited. The company's holdings consist of three claims at the head of the North fork of Glacier creek. Last year the upper tunnel was extended and a raise driven to it from the No. 2 tunnel, a distance of 70 feet, in ore the greater part of the way. Some stoping was done above the upper tunnel and 57 tons of ore shipped, from which the smelter returns were $112 a ton, mainly in silver values. Difficult transportation conditions made shipping too expensive and consequently it was decided to go ahead with development in 1926 instead of trying to ship. A tunnel, No. 3, was started just above the glacier, 100 feet vertically lower than the No. 2. The first 30 feet is a crosscut to a cross-vein, which is then drifted on for 70 feet to the main vein, which has then been drifted on for 200 feet, making about 300 feet of underground work for the summer season.

It is estimated that the face of the lower tunnel is about vertically under the mouth of the No. 2 tunnel. The last 15 feet in No. 3 tunnel shows signs of ore, which may be the downward extension of the short ore-shoot at the mouth of No. 2 tunnel. No shipping-ore was found in the cross-vein. The work has been under the supervision of H. Thomey.

Further assistance toward building the trail to this property was obtained, but unfortunately, due to a misunderstanding on account of a change of road foreman, the money was expended on the lower end of the trail, where, though necessary, it was not so urgent as the requirements of the upper end.

Rush Columbia Mines, Ltd.

This company was incorporated last year with a capitalization of $1,500,000, divided into an equal number of shares, with its registered office in the Winch Building, Victoria. The company's property includes nine claims adjoining the *L. & L.* group and served by the same trail. The stock became involved in litigation and consequently nothing has been done on the property. This has now been settled and some mining may be done.

Allenby Mining Co., Ltd.

This company was incorporated in 1925 with a capitalization of $900,000, divided into 900,000 shares. The property consists of three claims situated on the South Fork of Glacier creek—*Albany*, *Raven*, and *Lucky Boy*—owned for a number of years by J. Watkins, of Stewart. Last year a good cabin was built on the trail at 1,700 feet elevation and therefore accessible with pack or saddle horses.

Some open-cutting was done at and above the trail and below the trail down to the South fork of Glacier creek. One cut at the cabin shows a foot or more of solid pyrite, carrying some galena and a little zinc-blende. A sample of this assayed $4 in gold to the ton, 10 oz. silver to the ton, 17 per cent. lead, and 4 per cent. zinc. About 25 feet below this a tunnel was driven 15 feet to the vein; then 65 feet on it, showing it to be about 2 feet in width of brecciated slightly mineralized quartz and country-rock. The bunch of solid sulphides above does not show in the tunnel.

Below this, to the creek, are several cuts which do not show anything of importance. On the north bank of the creek, just below the falls, is a cropping of a vein about 6 feet or more in width, heavily mineralized with pyrite, zinc-blende, and galena. A few pieces of this were assayed to obtain general values. The assay, which is not to be considered an average, gave a trace of gold, 7.2 oz. silver to the ton, 24 per cent. lead, and 34 per cent. zinc. A short tunnel has been driven on this showing and it looks well worth further work.

There are several other showings which, in the absence of any one familiar with the property, I did not see. However, from my brief examination I judge the property has considerable merit.

The company has an aggressive directorate, which appointed E. A. Haggen as consulting engineer. Company affairs were straightened out and work resumed on the showings late in the fall of 1926. A contract was let for 200 feet of tunnel to be driven during the winter under the supervision of Angus McLeod.

Goldie.

This group is comprised of six claims, situated above the Emperor Mines ground and on the summit between Glacier and Bitter creeks. The claims are owned by Wm. Tooth, of Stewart, and associates and reached by way of the Emperor Mines trail. The general rock formation is sedimentary, intruded by many dykes, striking in a north-south direction. In the fractured slates are small quartz veins running in all directions and sometimes mineralized with pyrite, galena, and zinc. The showing is a slate-belt, probably 30 feet wide, lying between two dykes. Open-cuts along up the side-hill show small bunches and veinlets of mineral and mineralized quartz, but not enough to make ore. At 4,000 feet elevation another dyke cuts diagonally across the two dykes and includes slate. Subsequent shearing along the argillite-belt has broken the cross-dyke, so that the vein carries on through it. At this particular place galena was deposited, filling the vein for the width of the cross-dyke, about 18 feet. No mineralization of importance has been found on either side of it. In following the vein through the dyke 18 sacks of galena ore was sorted out and shipped, giving returns of 80 per cent. lead and 85 oz. silver to the ton.

The cut is so close to the surface that there is no stoping-ground above, and on account of the gently sloping nature of the ground any depth would have to be gained by sinking. As the vein and mineralization is only a few inches thick the outlook is not promising.

Emperor Mines, Ltd.

(*See* 1925 Annual Report.) This company was incorporated late in 1924 with a capitalization of $1,500,000, divided into 1,500,000 shares. The registered office is in the Standard Bank Building, Vancouver. No mining has been done since the big vein was cut early last winter. The mineralization consists mainly of pyrite in a brecciated quartz and greyish medium-grained rock about 20 feet wide. An independent sampling is said to have averaged $12 a ton, or about a border-line milling-ore. A small vein showing some pyritization was encountered about 200 feet from the big vein. Short drifts were run each way; in the north drift the vein opened up to about 5 feet in width of promising-looking mineralization.

It is one of the best-equipped small properties in the country and is just at the interesting stage where all dead-work has been done and the exploration of the vein can be proceeded with. An average of $12 a ton across 20 feet would seem to be sufficiently encouraging to attract development capital.

Ruth and Francis.

There are four claims in this group, owned by Jas. Nesbitt and Andy Archie, of Stewart. The claims are *Ruth*, *Francis*, *Copper King*, and *Little Johnny*, situated on the North fork of Glacier creek, about 4 miles from the main wagon-road at Glacier Creek bridge. There is a horse-trail from the road

through to the *Sunshine* group above this, which has been improved to a first-class wide trail with wagon-road grade as far as the Emperor Mines, Limited. It is the intention to continue the improvement of the trail each year. The camp is at 3,450 feet elevation. The general formation is the Bitter Creek argillites.

On the *Ruth* claim a tunnel has been driven 61 feet, following a small vein of mixed quartz and slate. The first 31 feet is on a bearing N. 40° E. (mag.) and from there the vein trends to the left on a N. 10° E. strike to the face. The ore is on the hanging-wall of the vein all the way. At the bend in the vein there is a length of 9 feet along the wall of solid antimonial lead, assaying: Gold, 40 cents a ton; silver, 31.6 oz. to the ton; lead, 15 per cent.; zinc, 18 per cent.; and antimony, 8.3 per cent. The ore has been broken into only a foot or two along the 9-foot exposure and it would be interesting to know whether the hanging-wall bends here or continues on the strike of the vein indicated in the first 30 feet of tunnel. Holes have been put in along the right side of the tunnel, showing ore on that side to the face which is of mixed quartz and slate.

About 200 feet farther south on the vein, and about 60 feet vertically lower, another tunnel is being driven on the vein and is now in about 80 feet, which has encountered some bunches of nice ore. It has not yet reached a cross-dyke and accompanying vein, showing on the surface about 25 feet south of the mouth of the upper tunnel.

I think the owners would be well advised to do some work in the solid ore in the upper tunnel and prove whether it is worth while drifting far in the lower tunnel.

Ore Mountain Mining Co., Ltd. (*See* 1925 Annual Report.) This company was incorporated in December, 1924, with a capitalization of $1,000,000, divided into 1,000,000 shares; the registered office is in the Pemberton Building, Victoria. The holdings consist of six claims, situated north of the mouth of Bitter creek, on the east side of Bear river. They extend from the valley up to 4,750 feet elevation. In the fall of 1925 some work was done on a small galena-bearing vein high up on the mountain. A tunnel was driven about 60 feet, demonstrating that the vein split up and disappeared. Winter work was then started on a crosscut tunnel near the camp. The first 30 feet is in greenstone; then a belt of low-grade pyritized siliceous argillite 20 feet wide was cut, the remainder of the tunnel being in barren argillite. As no further depth could be obtained here in drifting on the mineralized belt, it was decided to drive another crosscut tunnel from the west side of the hill at an additional depth of 125 feet. It is estimated that it will require 360 feet of tunnel to reach the mineral-belt cut in the first tunnel. At the beginning of October 170 feet had been driven in greenstone.

The grade of ore cut in the upper tunnel and the none too encouraging surface showings make the driving of such a length of tunnel a rather doubtful and hazardous undertaking. The work is being well and economically done with the aid and supervision of George Young and Henry Unwin, the original owners of the property.

Little Wonder. There are eight claims in this group, owned by Paul Suppelca and Herb Hunter, of Stewart. The claims are situated on Blackcurrant creek, south of Mosquito creek, and are reached at present from the Ore Mountain Company's camp by a 2-mile foot-trail along the side-hill. The predominating rock formation is greenstone, intruded by many dykes, and including belts of argillite, within or near which are mineralizations of zinc-blende, pyrite, and galena in a quartz-calcite gangue. The general trend of the argillite-belts is east-west, but in places they swing to almost north-south.

The argillite-belt carrying the showings is from 10 to 15 feet wide, overlain on the hanging-wall side by a 10-foot feldspar dyke, above which are more indications of mineralization. At one place, at 3,400 feet elevation, there is a 2-foot vein of mineralized quartz and calcite on the contact of the argillite and volcanics, showing 3 or 4 inches of solid sulphides next to the volcanic rock. The showings indicate that the area is worth while prospecting along the argillite-volcanic contact.

Dalhousie Mining Co., Ltd. This company was incorporated in 1925 with a capital of $1,000,000, divided into 1,000,000 shares, with registered office in the Permanent Loan Building, Victoria. The company's holdings include the *Dalhousie* and *Rock of Ages* groups, situated on the west side of Bear river, opposite Bitter creek. There are eight claims in the *Dalhousie* group, owned by Geo. Cameron, of Stewart, and Al. Pratt, while in the *Rock of Ages* group there are eight claims, owned by D. A. Munro, of Stewart. Nothing was done last year except the partial construction of a very difficult trail from the valley to the showings. This year the trail was completed and a good camp built at 2,700 feet elevation.

The general rock formation is greenstone (McConnell's Bear River formation) intruded by many light-grey, fine-grained dykes, striking into the hill at about N. 45° W. On the *Dalhousie* group there are two "iron veins" and a "copper vein," on each of which a little work has been done.

The No. 1 iron vein strikes into the hill at S. 80° W. and dips from 50° to 55° to the south. Two open-cuts have been put across this vein at 2,575 and 2,650 feet elevations respectively. A tunnel has been started at the lower cut on the hanging-wall side. Below the lower cut the bluffs are very precipitous and the vein has not been traced any lower. At the lower cut the mineralization shows a width of 20 feet or more and appears to run in bands diagonally across the vein. The mineralization is a heavy pyrite, with which is associated some chalcopyrite, in a siliceous gangue. Samples across from 8 to 15 feet in width gave $12 a ton in gold, silver, and copper values, which would make fair milling-ore. The upper cut shows a vein-width of 9 feet of well-pyritized siliceous gangue that would concentrate probably 4 or 5 into 1.

The No. 2 iron vein strikes N. 40° E. and stands almost perpendicularly. An open-cut on it in the big canyon shows some pyrite, but better ore was found just above the camp, where the vein runs out of the hill. I understand that a little later work at this point showed better ore. Considerable time was given to surface prospecting and trail-building. Discoveries of good ore were made higher up, which future work may prove important.

On the *Rock of Ages* group, at 4,000 feet elevation, there is an outcrop of siliceous greenstone carrying zinc-blende and galena across a width of at least 20 feet, which will probably prove wider when broken into. It strikes due north-south (mag.) and dips westerly at about 75°. There appears to be considerably more galena on the hanging-wall side. An independent sampling gave $12 a ton across 25 feet in gold, silver, lead, and zinc. This vein is certainly worth opening up. Farther north a cropping of another vein shows native silver, but not enough work has been done to indicate the width or continuity of the showing.

Altogether the season's work has put the property in much better condition for operating and improved its prospective merit. Operations have been under the able direction of George Cameron.

Independence Gold Mining Co., Ltd.

(*See* 1925 Annual Report.) This company was incorporated in 1924 with a capitalization of $1,500,000, divided into 1,500,000 shares; the registered office is at Stewart. The property consists of six claims situated on Goose creek, staked and owned by Sam and Jack Fitzgerald, under whose supervision development-work has been carried on. The equipment consists of a good camp and a small compressor plant. Over 600 feet of tunnel has been driven, supposedly on No. 2 vein, which crops at an elevation of 3,500 feet, or about 500 feet above the tunnel. Ore was encountered in places in the tunnel, the last 80 feet to the face being in a continuous shoot of ore. A crosscut shows the vein to be 16 feet wide, which it is claimed will average $12 a ton. The vein in the present face (October 1st) is about 4½ feet wide. A lot of lateral work has been done in crosscutting, which probably would have been used to better advantage in drifting on the vein. Over 1,000 feet to the north of the tunnel vein are Nos. 3 and 4 veins, on which a little work has been done and which warrant further exploration.

A few hundred feet south of the tunnel another vein, termed the "Bunk-house vein," has been open-cut in two places, exposing a vein-width of 6 feet. The mineralization is identical with the other veins, consisting of pyrite with some galena and zinc-blende in a quartz-calcite-jasper gangue. This is a strong vein showing milling-grade ore and also warrants opening up.

My impression of the property has always been that it will develop an ample tonnage of milling-grade ore to make a concentrating plant a profitable undertaking. In the fall of 1926 a controlling interest in the company was obtained by American interests, who, under the terms of the agreement, will undertake a comprehensive development of the property.

Terminus Mines, Ltd.

(*See* 1924 Annual Report.) This company was incorporated in 1924 with a capitalization of $1,000,000, divided into 1,000,000 shares. The registered office is in Victoria. The holdings consist of six claims, situated on the east side of American creek at 3,400 feet elevation, about 5 miles from the wagon-road. There is a good horse-trail to the property. Briefly, the country-rock is greenstone agglomerate in which there are numerous parallel feldspar dykes. The mineralization occurs on either side of a small dyke, which has been intruded into a shear in one of the feldspar dykes, and consists of pyrite, galena, zinc-blende, some chalcopyrite, and tetrahedrite. A 50-foot shaft has been

sunk on this showing and drifts driven about 40 feet each way from the bottom. Later a cross-cut tunnel 370 feet long was driven, cutting the vein and dyke at 330 feet. A drift was driven 20 feet south on the dyke and a raise put up to the south drift from the bottom of the shaft. There is also a 70-foot drift north from the tunnel showing little mineralization.

The work in 1926 was done by H. Hayward, who drove ahead a little on each of the shaft drifts and the north tunnel drift. Both faces of the shaft drifts are much improved, the south face showing a vein-width of about 4 feet, of which 18 inches is good ore, 4 to 6 inches of high grade, and the remainder heavily oxidized material.

The north drift from the tunnel previously showed only the vein seam, but a little work has exposed about 18 inches of promising-looking vein, consisting mainly of heavily oxidized vein material in which are several stringers of high-grade ore. This face is well worth driving ahead. The comparatively small amount of work done this season has greatly improved the possibilities of the property.

Anaconda.—The *Anaconda Nos. 1, 2,* and *3,* staked in 1924 by B. G. Raymon and partners, are situated north of and probably adjoining the claims of the *Vancouver* group on American creek. The owners claim to have some silver-lead ore showings, but I have not been on the ground.

Vancouver Mines, Ltd.—(*See* 1925 Annual Report.) This company was incorporated in 1925 with a capitalization of $1,000,000, divided into 1,000,000 shares, with the company's registered office in the Vancouver Block, Vancouver. The property comprises twelve claims, nearly surrounding the *Terminus* group. Nothing has been done since incorporation but assessment-work.

George Gold-Copper Mining Co., Ltd.

(*See* 1918–19 Annual Reports.) This company was incorporated in 1925, having a capitalization of 1,500,000 of $1 shares, with its registered office in the Pemberton Building, Victoria. The holdings consist of sixteen mineral claims, situated on the south side of Bear river, 6 miles up from the end of the wagon-road. There is a first-class horse-trail from the wagon-road up the valley and a branch trail to the property. A saddle-horse may be ridden from Stewart to the camp at 2,100 feet elevation, a distance of about 20 miles. The general rock formation is volcanic with few intrusions. The mineralization is pyrite and chalcopyrite in a quartz gangue.

Three veins have been discovered—namely, the "green," "white," and "blue" veins. The "green" vein is the highest on the mountain, at about 4,800 feet elevation, and may prove to be the continuation of the north branch of the "blue" vein. It has not been opened up to any extent, but apparently is from 3 to 5 feet wide, well mineralized with sulphides of iron and copper for a length of 250 feet. The "blue" vein has had a great deal of surface work done on it by way of open-cutting, trenching, and shallow pits, tracing it as a continuous ore-body for about 500 feet going east, where it splits up, the northern vein continuing for another 250 feet and the southern fork for over 100 feet, so far as traced. This vein will average 6.5 feet wide, there being 12 feet of good ore at the juncture of the forks. It dips at 65° S. I judge it will average 4 per cent. copper, besides carrying appreciable gold values and a little silver. It is certainly a splendid surface showing, with a fine opportunity for development by drift-tunnelling at almost any desired depth.

The "white" vein is east of the "blue" vein and below the "green" vein about 200 feet. It has been exposed at intervals by several open-cuts, over a length of nearly 500 feet easterly to the big gulch, from a point about 300 feet east of the "blue" vein. Whether or not it extends through to the "blue" vein has not been determined. This vein has also a fine surface showing of chalcopyrite, several cuts showing a width of vein up to 10 to 12 feet, in which there are from 18 to 40 inches of 12 to 16 per cent. copper ore. Altogether I think the property is one of exceptional merit.

Montreal.

There are eight claims in this group—*Montreal Group Nos. 1, 2, 3, 4, 5, 6, 7,* and *8*—located on the north side of Beaver creek by Jas. Douville, Frank Reva, and H. McHugo, of Stewart. The claims adjoin the *Murdock* on the east and are about 3 miles down the creek from the Bear River divide. There has been a good horse-trail right through to Meziadin lake, but the portion over the summit, where it is underlain by ice, is always unreliable. Also a distance of 2 miles east of the summit, where the trail switches over to the south side of the river, is in bad condition. The owners have a new cabin on the property at 1,800 feet elevation, reached by following up the creek-bed east of Cottonwood camp.

The country-rock is greenstone of the Bear River formation. The lower mineral-showing is about 50 feet below the cabin and consists of a belt, which from its appearance may be quartz porphyry or greywacke, about 50 feet wide in the country-rock. The belt strikes about N. 40° W. and dips about 75° W. In it are small veins and bunches of mineral consisting of zinc-blende and pyrrhotite, with lesser quantities of galena and chalcopyrite. The mineralization would constitute a very small proportion of the whole. On the foot-wall side there is a network of small unmineralized quartz stringers. Two short tunnels have been driven in this belt, one practically on the hanging-wall, in the face of which is a 6-inch vein of mineral paralleling the hanging-wall. The other is about 20 feet from the foot-wall greenstone in the quartz-stringered porphyry. Small bunches of mineral occur, but nothing as well defined as the 6-inch vein in the other tunnel. The mineral itself carries good values, up to $60 a ton, I was informed, but there is not enough of it to be of importance in this location. It is not a very prepossessing showing in itself, but might justify further prospecting along this belt. About 100 yards east of this a small vein of sulphides, zinc-blende, galena, and pyrite, from 1 to 3 or 4 inches wide, has been exposed for a few feet. A little work should be done on it to see if it improves.

West of the first showing, and up the east side of the creek at 1,900 feet elevation, there is a belt or vein-dyke of quartz from 10 to 20 feet wide striking diagonally across the creek-gulch at N. 20° W. Patches of mineral occur in the decomposed rock bordering this dyke. Only a shot or two has been put in and it might be worth while to break into the main quartz-body. This is apparently a good prospecting area.

Other properties in the Bear River section and the year of the Annual Report in which they have been described are as follows: Argenta Mines, Limited, 1925 (*Vetron* and *Comet*, 1920); Bayview Mining Company, Limited, 1925 (*Bayview*, 1922); *Enterprise*, 1925; *Gold Cliff*, 1925; Lakeview Mines, Limited, 1925; *L.L. & H.*, 1920; *Mayflower*, 1925; *M.C.*, 1923; Mimico Mines, Limited, 1925 (*Mimico*, 1922); *Mountain Boy*, 1919; Phoenix Silver Mines, Limited, 1925; Prince John Mining Company, Limited, 1923; Radio Stewart Mines, Limited, 1925; *Red Top*, 1925; Ruby Silver Mines, Limited, 1924; Rufus Silver-Lead Mines, Limited, 1924; *Sunshine*, 1919; *Tyee*, 1921; Union Silver Mines, Limited, 1925; *Windsor*, 1924.

Salmon River Section.*

This section comprises the Salmon River valley and tributaries thereto, above the British Columbia-Alaska boundary-line, at 13 miles up from tide-water. There is a good auto-road from Stewart to the *Premier* and *B.C. Silver* mines, from which trails branch to the different areas and properties.

The year has been an important one in this section. The *B.C. Silver* has been definitely proven; the Sebakwe and District Mines, Limited, has penetrated to the *Premier-B.C. Silver* mineral-belt and found ore, though low grade; the old standby, the *Premier*, has paid its annual $1,600,000 in dividends without much apparent effort; the *Big Missouri* management is seriously considering a concentrator; prospects in the upper valley are improving (such as the *Silver Tip* and *Outland-Silver Bar;* and the *Premier Extension* has been bonded and may get some development. All told, the valley has made very material progress since last year.

Premier Gold Mining Co., Ltd. Incorporated in 1919 with a capitalization of $5,000,000, divided into 5,000,000 shares. The first dividend, amounting to $400,000, was paid in 1921, since which time they have increased to $10,150,000, which includes $1,600,000 paid in 1926. The outstanding feature of the *Premier* operations for the year was the completion early in March of the new 200-ton unit of the mill. This unit, along with the old mill, brings the rated capacity up to 400 tons in twenty-four hours, but for the past few months it has been handling about 430 tons a day. This naturally called for a much greater mine production than last year. The total ore milled amounted to 122,152 tons, an increase of 66,448 tons, or 119 per cent., over 1925 figures. The total concentrates increased from 6,357 tons to 19,997 tons. A different character of concentrate has been made owing, primarily, to the closing-down of the cyanide department. More iron has been picked up in order to keep tailing losses down, and as a result the ratio of concentration has advanced from 11.4 to 16.4. Milling costs have been materially reduced.

* Geology and Ore Deposits of Salmon River District, British Columbia, Memoir 132, by Geo. Hanson and S. J. Schofield.

PREMIER GOLD MG. CO.

PREMIER, B.C.

FLOW SHEET.

PREMIER MILL.

PRIMARY CRUSHING

- Mine Bins 3-100 Ton Bins
- Belt Conveyor-26"-"A" 10 H.P. Motor
- Apron Feeder 42" 6 H.P. Motor
- Blake Crusher 30"x18" to 4 ins. 50 H.P. Motor
- Belt Conveyor 22"-"B" 10 H.P. 350 Ft. per min.
- Suspended Magnet
- Grizzly 2 ft wide 4 ft long 1 in. openings use optional
- Belt Conveyor 20" 10 H.P. 350 Ft. per min.
- Deflecting Gate feed to tram
- Gyratory Mill Bin
- Conveyor Belt "C" 20" to Trambins 10 H.P. 350 Ft. per min.
- Belt Feeder 20" 5 H.P. Motor

FINE CRUSHING TO 1 IN

- Gyratory Crusher McCully. 6" to 1" 60 H.P. Motor
- Bucket Elevator 14"
- Belt Conveyor 20" 5 H.P. Motor 250 Ft. per min
- Marcy Mill Bin
- Hardinge Mill Bin
- Belt Feeder 20" 5 H.P. 6 Ft per min
- Soda & Zanthate Tank 5 Ft. Diam x 10' 24 Hrs Supply
- Water Supply Tank constant head using mine water
- Mechanical Oil Feeder
- Hardinge Ball Mill 6x36" 150 H.P. Motor short chain drive
- Dorr Classifier 6x20 Model "D" 5 H.P. 20 Mesh overflow

FINE GRINDING & TABLE CONC. #2 MILL

- Allen Sand Cone 4'6" Type 4-0
- Wilfley Sand Pump 2" 10 H.P. Motor
- Premier Sand Distributor
- 8 Deister Plato Sand Tables
- Wilfley Sand Pump 2" 5 H.P.
- Wilfley Sand Pump 2" 10 H.P.
- Surge Box 4'
- Allen Sand Cone 4'6" Type 4-0
- Allen Sand Cone 4'6" Type 4-0
- Wilfley Sand Pump 10 H.P.
- Wilfley Sand Pump 20 H.P.
- A.C. Tube Mill 5'x8' 75 H.P. direct connected
- Wilfley Sand Pump 2" 10 H.P.

#2 FLOTATION MACHINES

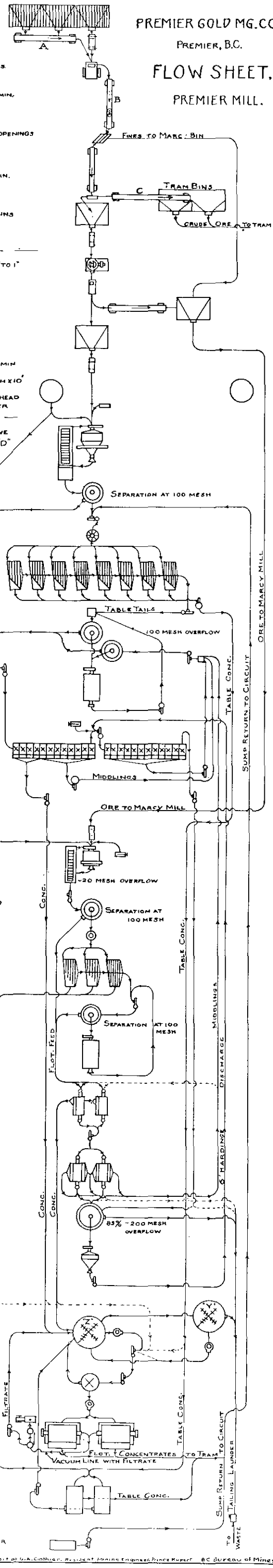
- Mechanical Oil Feeder
- Wilfley Sand Pump 4" 20 H.P.
- 2 M.S. Sub A. Flotation Mach. 75 H.P. per machine
- Wilfley Sand Pump 2" 5 H.P.
- Wilfley Sand Pump 2" 5 H.P.
- Wilfley Sand Pump 2" 5 H.P.
- Wilfley Sand Pump 4" 20 H.P.
- Conveyor Belt Feeder 18" 25 Ft. per min
- 64½ Marcy Ball Mill belt driven
- Dorr Classifier 4' Model "C"
- Mechanical Oil Feeder
- Krogh Tailing Pump 3" belt driven
- Allen Sand Cone 4'6" Type 4-0
- Premier Sand Distributor
- 3 Wilfley Sand Tables #6
- Wilfley Sand Pump 4" 20 H.P. Motor
- Allen Sand Cone 4'6" Type 4-0
- Tube Mill 4'x8' belt driven

#1 MILL FINE GRINDING & TABLE CONC. #1 MILL 200 H.P. MOTOR

- 2-K&K Flotation Machines 12' single spitz
- Krogh Tailing Pump 3" belt driven
- 2-K&K Flotation Machines 12'0 double spitz 25 H.P. #1 machine
- Allen Sand Cone 8' Type 4-0
- Hardinge Ball Mill 6'x16" 50 H.P. Motor short chain drive
- Wilfley Sand Pump 2" 10 H.P.

THICKENING & FILTERING CONCENTRATES #REGRINDING FLOT. TAILS #1 FLOTATION

- Dorr Thickener "Z" 30'
- Dorco Pump No 4
- Dorr Thickener "Y" 30'
- Dorco Pump No 4
- Wilfley Sand Pump 3" 25 H.P. Motor
- Wilfley Sand Pump 2" 10 H.P. Motor
- Dorr Thickener 18' 5 H.P. Motor with 40' mechanism
- Dorco Pump No 4
- Oliver Filter 5'4" x 4' face
- Oliver Filter 5'4" x 6' face
- Vacuum Pumps. Moisture Traps
- Dewatering Pump
- Krogh Tailing Pump 3" 10 H.P. Motor
- 2 Table Conc. Bins 4'x4'x12'
- Automatic Tail Sampler ⅛ H.P. Motor
- Sump
- Krogh Tailing Pump 4" 10 H.P. Motor ----- Alternatives.



With Report of W.A. Clothier, Resident Mining Engineer, Prince Rupert B.C. Bureau of Mines

Shipping-ore sent to Tacoma and Granby was maintained at practically the same tonnage as 1925. The total ore mined in 1926 amounted to 230,987 tons, an increase of 62,430 tons, or 37 per cent., over last year. The grade of the ore remained about the same. There was produced during the year: Gold, 122,228 oz.; silver, 2,920,492 oz.; increases of 3,780 oz. and 556,936 oz. respectively over last year and the greatest production since the company's record output in 1922.

Underground mining had to be stepped up to meet the requirements of the new mill and development-work was proportionately speeded up to keep pace with this programme. During the year 8,691 feet of drifts and raises and 9,409 feet of diamond-drilling were done, bringing the total underground work up to 7.89 miles and the diamond-drilling to 14.11 miles. With this increased tonnage, together with improved mining methods, costs have been materially reduced and lower-grade ore can now be handled.

Diamond-drilling and development-work have blocked out considerable new tonnage and the total broken and unbroken reserves are practically the same as at the end of last year, in spite of the fact that over 230,000 tons of ore was mined.

The new power-house units were completed early in the year and an additional 360-horse-power Fairbanks-Morse Diesel engine, direct-connected to a 300-k.v.a. generator, was installed. This brings the total horse-power in engines up to 1,980. In addition to this there are available during the wet season 1,096 horse-power from water-wheels. The operation of these power units has been very satisfactory and remarkably low costs are obtained from them. All oil used in the Diesel engines, as well as fuel-oil for heating purposes, is brought up over the tramway from the dock, making a very low transportation cost.

The tramway operated 90 per cent. of the total time, travelling 49,400 miles. It hauled 137,047 tons of ore and concentrates and 6,389 tons of freight, including oil. This performance indicates that aerial transportation in rough and snowy countries is much cheaper and more satisfactory than by rail.

New construction was limited to the building of a steel-sharpening shed, 36 by 40 feet, at Camp 4. A storage-shed, 100 by 50 feet, and a new concentrate-bunker at the tramway-head were constructed, enabling the shipping of concentrates in bulk instead of in sacks as heretofore.

Altogether the *Premier* has had a very successful year, the output has been increased, costs cut, and the resultant net operating profits increased, evidencing the efficiency of the operating organization.

The staff personnel remains the same: Dale L. Pitt, general manager; Bert F. Smith, assistant manager; Hector McDonald, mine superintendent; and W. Asselstine, concentrator superintendent.

B.C. Silver Mines, Ltd. (*See* 1925 Annual Report.) Incorporated in 1919 with a capitalization of $1,500,000, divided into 1,500,000 shares, with its registered office in the Pacific Building, Vancouver. The Company's holdings consist of two groups of claims, one group adjoining the *Premier* ground on the north and the other group adjoining it on the south. The north group, containing the north-easterly extension of the *Premier* ore-zone, has received all the development-work.

Early in 1925 ore was struck in a diamond-drill hole from the No. 3 (lower) level, at about 1,500 feet along the ore-zone from the *Premier* line. The No. 3 level was then driven to this ore-body and on it for 200 feet. Further diamond-drilling indicated another ore-body about 100 feet from the first one.

This year the underground work consisted of 1,427 feet of drifting, 1,492 feet of crosscutting, 1,332 feet of diamond-drilling, 290 feet of raising, and 130 feet of sinking. The first (or "C") ore-body was drifted on another 100 feet, making its total length 300 feet. The average width exceeds the width of the drift. The general run of the ore is good milling grade, with wide streaks of high-grade in it.

About 80 feet north-west of "C" another parallel ore-body, called "D," was encountered by diamond-drilling and this year drifted on for 300 feet, proving over 5 feet in width of good-grade milling-ore. Ore-bodies "C" and "D" appear to come together at the north end, forming a body of ore 60 feet in width.

A 2-compartment raise was put through from No. 3 to No. 2 level, a distance of 265 feet. A 2-compartment shaft is being sunk from No. 3 level in "C" ore-body and at 160 feet No. 4 level will be driven. The shaft is now down 130 feet. It is from this work that the major portion of the ore shipped this year has been taken.

Diamond-drilling has demonstrated that the vein extends back 450 feet toward the *Premier*, which opened up ore at that level near the *B.C. Silver* boundary. It would therefore seem reasonable to expect similar ore-bodies in the intervening 1,000 feet.

Surface improvements for the year include a 1,050-cubic-foot compressor direct-connected to a 180-horse-power oil-engine; an oil-storage tank of 50,000 gallons capacity; electric locomotive for underground haulage; compressed-air hoist; a 2-cylinder single drum for shaft from No. 3 level; an enlarged bunk-house, assay office, and central heating plant.

The staff remains the same: C. A. Banks, general manager; C. B. North, superintendent; and H. A. Gould, secretary.

Sebakwe and District Mines, Ltd.

This is an English company, registered in the Province in February, 1926, with *an authorized capital of £200,000. Its head office in the Province is 612 Pacific* Building, Vancouver. It acquired the old Bush property from the National Silver Mines, Limited, for a share consideration, for the purpose of prospecting it for the extension of the *Premier-B.C. Silver* ore-zone. Early in the year a camp and compressor plant were installed and work started on a crosscut tunnel. Early in December this had been driven 1,000 feet, encountering a vein at this distance from the portal. The average values are as yet not commercial, but the vein is strong and looks promising. The company is under the management of C. A. Banks, with C. B. North as superintendent.

Extenuate Gold Mines, Ltd.

This is the new name of the old Portland Canal Goldfields Syndicate, Limited, incorporated in 1924 with a share capitalization of $100,000, divided into 400,000 shares at 25 cents each. Class "A" consisted of 300,000 shares of preferred stock and Class "B" 100,000 shares of common stock. Notices were sent calling for a meeting of the common- and preferred-stock shareholders on June 7th, 1926, to convert all preferred shares to common shares. The property of the new company consists of the *Extenuate* group of eight claims—*X-10-U-8, X-10-U-8 Nos. 2, 3, 4, 5,* and *6, Three,* and *Extra*—situated on Slate mountain and adjoining the Bush Mines on the north. It is about 2 miles north from the *Premier* ore-zone, which strikes in a north-easterly direction; consequently the prospectus statement that "the property is in close proximity to and on a line with the *Premier*" is misleading, in that it gives the public a wrong impression of its position.

Comparatively little work has been done on the property since the incorporation of the company in 1924. About 30 feet of tunnel was driven that season and there has been only a man or two on the claims each season since. Late this fall a camp was constructed and an outfit taken in for winter work.

Though the ore is very low grade, there is always the possibility of developing a sufficient tonnage of milling-ore to make it a commercial undertaking.

Chief Metals Co.

This is an extra-provincial company with an authorized capital of $125,000 and registered in the Province in 1924, with its registered office in Stewart. The stock of the company is held mainly in Seattle. The company holdings consist of the *Start* group of four claims—*Start Nos. 1, 2, 3,* and *4*—situated on the west slope of the north end of Slate mountain. There is a branch trail to the camp from the *Big Missouri* trail, on the east side of Silver lake. Emil Davis, who is in charge of the work, states that about 190 feet of drift-tunnel has been driven on a vein from 4 to 6 feet wide, mineralized with galena and zinc-blende and of good milling grade.

Big Missouri Mining Co., Ltd.

In July, 1925, the Standard Mining Corporation bonded the *Big Missouri* property from Dan Lindeborg, the original staker and owner. This is an extra-provincial company with an authorized capital of $250,000, fully paid, and registered in the Province in September, 1925. The Big Missouri Mining Company, Limited, was then incorporated with an authorized capital of $5,000,000, fully paid, and registered in the Province in December, with its office at 626 Pender Street West, Vancouver, and took over the *Big Missouri* bond from the Standard Mining Corporation. Work was started under the supervision of Pat Daly, who had been instrumental in interesting the corporation in the property. Later the development of the property was placed under the able direction of H. Townsend, mining engineer, under whose instructions considerable ore was blocked out underground and a great deal of surface prospecting done by means of open-cuts and shallow pits, resulting in the location of several new ore-bodies.

Since October 1st, 1926, Mr. McVichie, a mining engineer of Salt Lake City, has had charge of development-work and has confined his efforts to blocking out ore. His objective is to put

sufficient ore in sight by spring to justify the construction of a 100-ton concentrator. There is no doubt that considerable success has already been met with in the development of ore and that the known ore-showings awaiting development give the property great prospective importance.

Silver Tip Mining Co., Ltd.

(*See* 1925 Annual Report.) Incorporated in 1925 with a capitalization of $1,000,000, divided into 1,000,000 shares, with its registered office at 323 Sayward Building, Victoria. The *Silver Tip* group of five mineral claims—*Bella Coola, Good Hope, May P.J., Silver Leaf,* and *Lady Bird No. 2*—on Silver creek, in the upper Salmon valley, constitutes the company's holdings. Last season a great deal of surface prospecting was done and a crosscut tunnel driven 30 feet toward cutting the very promising-looking vein on Porphyry creek, on the *May P.J.* claim. This season the same commendable practice of surface prospecting was continued, resulting in the discovery of a strong quartz vein striking north-south and two smaller veins striking east-west.

The farthest south of the east-west veins, named the "No. 1 Clegg," shows some fine high-grade ore on the surface. Early this spring a tunnel was started toward the vein from its north side. When in 45 feet a crosscut was run to the vein a distance of 33 feet, cutting a fairly well-mineralized vein averaging about 50 oz. silver across the face. The main tunnel was then continued toward the vein a total distance of 115 feet. The face had just encountered rose quartz, the same as on the surface, when work had to be closed for the season. This is a promising showing and, if I may offer a suggestion, the vein should be now drifted on until its intersection with the big north-south quartz vein is reached.

About 300 feet north of the "No. 1 Clegg" another vein was found on the surface ("No. 2 Clegg") and about 20 feet of tunnel driven on it. The vein widens from a few inches on the surface to 18 inches in the bottom of the tunnel and shows seams of good ore worth further attention later. Another east-west vein ("No. 3 Clegg") 75 feet north of "No. 2 Clegg" was not worked this year.

The big quartz vein is heavily overburdened with glacial wash, but was stripped and open-cut in three places this season. The biggest cut is opposite the "No. 2 Clegg" vein and here shows mineralization across 16 feet which is said to assay 18 oz. silver. About 200 feet north of this, near the end line of the *Bella Coola*, another cut exposes the same vein very sparsely mineralized. While the owners of the *Sunset No. 1* above opened up a showing of ore from which high silver values were obtained, it is hard to decide whether it is the same vein or not.

The crosscut tunnel (in 30 feet) on the *May P.J.* was extended to 232 feet, where weather conditions necessitated quitting. It is estimated that another 20 feet will encounter the Porphyry Creek vein.

The season's work was well carried out by Jack Clegg, who was in charge, and has materially improved the favourable outlook of the property. Both pieces of work, the "No. 1 Clegg" tunnel and the *May P.J.* crosscut tunnel, are at a very interesting stage and should by all means be continued.

Sunset.

This group consists of five claims—*Sunset Nos. 1, 2,* and *3, Jitney Fraction,* and *Sun Fraction*—situated on the south-west slope of Dilworth mountain and owned by W. Hobill, of Stewart, and partners. The group was bonded in 1919 by the Salmon River Silver Mines, Limited, but nothing was done toward development and the company was struck off the register in July, 1923, the claims reverting to the owners.

This year a showing of ore was opened up on the *Sunset No. 1* claim about 100 feet from the north end line of the *Bella Coola* claim of the Silver Tip Mining Company, Limited, property. The vein is about 2 feet wide and appears to be in a fracture diagonally across a belt contained between two dykes. If such is the case it would not be more than 20 feet in length and therefore not of great importance. The ore is good grade, assaying $90 in gold and silver. As nearly as I could judge, the only relation it has to the north-south vein on the *Bella Coola* is that it lies in the same belt, but the *Bella Coola* fracture is parallel with the dykes and therefore more continuous. The swinging of the dykes to the left on the *Sunset No. 1* cuts off the *Bella Coola* vein. It might be as well to look for other mineralized cross-fractures in the same belt.

Silver Crest Mines, Ltd.

(*See* 1925 Annual Report.) Incorporated in 1919 with a capitalization of $500,000, divided into 2,000,000 shares at 25 cents each. The holdings consist of the *Silver Hill* group of eleven Crown-granted mineral claims, situated on the south-east slope of Mount Dilworth, adjoining the *Silver Tip* on the north. The rock formation may be briefly described as being slates, on the upper portion of the claims,

overlying volcanic tuffs and quartz porphyries which are exposed on the lower end of the property, the whole intruded by numerous dykes of all ages and types, some of which are mineralized and some are not. The area is termed by Hanson the "Belt of Dykes."

The minerals are zinc-blende, galena, chalcopyrite, and silver sulphides, the main values being in silver. The minerals occur by themselves in small discontinued stringers or in small quartz stringers, in some places cutting across the containing dyke and in other cases paralleling the wall of the dyke. Numerous open-cuts have been put in where the mineralization shows on the surface.

A tunnel has been driven nearly 300 feet, obtaining a depth of about 80 feet under the most promising of the surface exposures, but the mineralization was disappointing. In driving this tunnel by contract last winter some ore was encountered. A sample submitted by the contractors gave high values in gold and silver, but subsequent work proved that the strike was unimportant.

The work done during the summer consisted of a crosscut started from a point about 100 feet in from the portal of the tunnel and driven to cut a dyke showing some small seams of ore on the surface. I have no information as to the result of this work.

Northland Mining Co., Ltd.

(*See* 1925 Annual Report.) Incorporated in 1925 with a capitalization of $1,500,000, divided into 1,500,000 shares. Its registered office is in the Dominion Bank Building, Vancouver. The company acquired the *Troy* group of nine claims, situated on the east side of the north end of Salmon River glacier. They are reached by a rather poor horse-trail from the *Forty Nine*. This spring about 700 feet of diamond-drilling was done under the direction of A. E. Haggen, the company's consulting engineer. The findings of this work did not prove at all encouraging and operations ceased. I am informed that the property has been returned to the original owners.

The company has now taken on the *Bank* group of nine claims, adjoining the *Forty Nine* on the north, and promoting this group under the name of the "Forty Nine Extension." I have not examined the property and have no information as to the mineral-showings on it. It will be examined as early in the spring as possible.

Outland Silver Bar Mines, Ltd.

Incorporated in 1920 with a capitalization of $500,000, divided into 500,000 shares, its registered office being in the Bank of Nova Scotia Building, Vancouver. The company's holdings consist of nine claims and a fraction, situated on the west side of Salmon River glacier just south of the West fork. This group was staked in 1919 by E. H. Bartholf and the company organized by him and F. C. Outland. In 1922 C. L. Hibbard acquired Mr. Bartholf's interest and the property has since been developed by Messrs. Hibbard and Outland, the latter's address being 607 Lowman Building, Seattle, Wash.

The ore occurrences appear in what is termed by Hanson the "Belt of Dykes," the general rock formation being sedimentary. So far as could be seen in a snow-storm, the mineralization here, consisting of a fine-grained galena, zinc-blende, and pyrite, and probably grey copper, occurs in a wide siliceous belt heavily impregnated with pyrite. A short tunnel cutting under the pyritized cropping or capping shows across its face bands of fine-grained galena and zinc-blende, assaying, it is stated, up to $60 a ton. What impressed me was the indefinite width of the mineralization, as apparently the ore extends into both sides of the tunnel. Similar ore is exposed 100 feet vertically lower and I think a little prospecting would locate it at the foot of the bluffs at the edge of the glacier at 3,100 feet elevation, which is about 300 feet below the upper showing.

I am sorry that weather conditions did not permit of a more thorough examination, as there are higher showings from which smelter-test shipments of a few tons have been made, assaying up to $164 a ton. The showings seen certainly justify the intention of the company to install a small compressor plant in the spring and proceed with a more extensive plan of development.

Munro.

This group of seven claims—*Munro*, *Munro Nos. 1*, *2*, *3*, *Big Chief Nos. 1*, *2*, and *3*—is situated on the west side of the Salmon River glacier about a mile below the *Outland-Silver Bar* property. It is also reached by crossing the glacier from the foot of the opposite mountain, under the *Hercules* property. The route from the toe of the glacier is becoming more uncertain each year, as the glacier recedes and consequently becomes more broken up. The claims were staked in 1921 and owned by J. E. Munro, Pat McBride, and A. N. McDonald, of Stewart. The general country-rock is sedimentary, dipping flatly to the west.

The mineralization consists of galena and grey copper, carrying high silver values in bedded quartz veins of a few inches in width. There are two veins on the property; the upper one, being under snow at the time, I did not see. Considerable work has been done on the lower one, which lies at 2,350 feet elevation, or about 100 feet above and paralleling the glacier. It lies almost horizontally and has been exposed by stripping and two tunnels. The mineralization, where found, is high grade, but too meagre and uncertain to be of much prospective value.

Premier Extension Gold Mining Co.

This is an extra-provincial company incorporated at Ottawa and registered in the Province in 1923, with its office in the Winch Building, Vancouver. It has an authorized capital of $4,000,000, fully paid up. The company's holdings consist of the *Vancouver* group of ten claims and the *Woodbine*, *Woodbine Fraction*, and *Kitchener*, acquired from H. McGuire, of Stewart. The claims are situated on the west side of Cascade creek and adjoin the Premier Gold Mining Company's property on the west. Considerable work has been done on the property during the past two or three seasons. (*See* short report under Alaska Canadian Consolidated Gold Mines, Limited, 1925 Annual Report.) I am informed that the holdings have now been bonded by Calgary interests, who plan an extensive development-work in the spring.

Other properties in the Salmon River section that have been reported on and the year of such report are as follows: B.C. Bonanza Mines, Limited, 1925; *Boundary*, 1918; Eldorado Gold Mines Consolidated, Limited, 1925; Forty Nine Mining Company, Limited, 1920; *Glacier*, 1920; Hercules Mines, Limited, 1920; Hollywood Mines, Limited, 1925; Indian Mines Corporation, Limited, 1923 and 1924; *Mineral Basin*, 1925; Mineral Hill Mines, Limited, 1922; *Pay Roll*, 1918; *Unicorn*, 1925; White Heather Mines, Limited, 1925; *Yellowstone*, 1923.

Unuk River Section.

The reader is referred to the 1920 Minister of Mines' Report for a short article on this section. I have not heard of any prospecting in that area during 1926. Though geological conditions and therefore mineral potentialities are identical with the Salmon and Bear River valleys, lack of transportation is prohibitive so far as prospecting is concerned.

STIKINE AND LIARD MINING DIVISIONS.

These two Divisions comprise the northern portion of the Province, except the Atlin Division, and have an area of about 70,000 square miles.

The Stikine Division is the drainage area of the Stikine river, which empties into the Pacific ocean near Wrangell, Alaska. The Liard Division is the drainage area of the Liard river, which flows into the Mackenzie river at Fort Simpson, and therefore lies on the Arctic slope. Both the areas are reached by boat up the Stikine river from Wrangell to Telegraph Creek, the head of navigation. From Telegraph Creek to Dease lake a good truck-road is being completed and the distance of 75 miles can now be made in seven to ten hours. From Dease Lake is a waterway to the north and pack-trails to the interior.

This season has been the most active for many years, but freighting charges are a very serious handicap yet for the heavy equipments that are now necessary for profitable mining.

I was greatly impressed this year with the possibilities for dredging and hydraulicking on the old creeks, such as Dease, Thibert, and McDame, and believe that there will be a heavy production of gold from the extensive benches on these creeks that have hardly been touched by the hand-mining of the early days. Besides these creeks, there are many on which bed-rock has not been reached and gravel benches not been prospected. Some system of Government assistance by drilling should be worked out along the lines of maintaining a drill or two that could be supplied to operators at a nominal rental, or else the ground drilled by the Government and leased to operators on a royalty basis.

More prospectors were in the field in 1926 than ever before and a surprising amount of development-work is being done. The production of 624 oz. gold this year, while not great, is indicative of the increasing interest in the country. While the majority of this came from Gold Pan creek, there was some from Dease, Thibert, McDame, Masador, and Palmer creeks and Clearwater river, showing that diverse parts of the country are being prospected.

Figures obtained from the Barrington Transportation Company show that there are about 500 white men wintering in the interior beyond Telegraph Creek. I would strongly emphasize the necessity of the completion of the Telegraph Creek–Dease Lake wagon-road in 1927.

Stikine River Section.

A number of prospectors have been in the Clearwater River area, going into its headwaters by a trail up Shakes creek, which trail should be improved. Some good ore from the area around the Devils Elbow on the Stikine river was brought out.

A start should be made toward building prospecting-trails up the larger tributaries of the Stikine, as all this country is along the Eastern Contact Belt and consequently one of the best-mineralized sections in the Province. This section is comparatively easy of access.

The Geological Survey of Canada had a party under F. A. Kerr on the Stikine section this season.

Clearwater River.

S. Barrington, of the Barrington Transportation Company, and associates, of Wrangell, have taken over the *Jackson* and other leases on the North fork of Clearwater. In the fall of 1926 a road was built from the Stikine river, just above Clearwater river, to the *Discovery* claim, a distance of about 2 miles, to permit of taking in a Keystone drill as soon as spring opens. The ground will be thoroughly tested during the 1927 season.

F. Cronholm, who has been developing the Hollywood Mines Company property in the Salmon River section, has also taken up two leases on the North fork of the Clearwater and optioned three more, which he plans to prospect next season. Several leases are being worked by individuals. Altogether there is a new outlook for this area.

Dease Lake Section.

Gold Pan Creek.

Five outfits were working on the creek during 1926 season, two of which were cleaning bed-rock.

On *No. 3 Below*, Swafford was trying to reach bed-rock. He did not take out any gold.

No. 1 Below.—The four partners, R. Brunn, Chas. King, Jim Herdman, and, part of the time, Wm. Brady, cleaned up 168 oz. for the season's work, practically working out this claim.

On *Discovery*, Grady and Ford, the discoverers of the creek, with two men, Nesbitt and Matteo, recovered 262 oz. from bed-rock.

On *14 Above*, Albert Dease took out 5 oz.

From *17* to *26 Above*, Moody and Vickery, working on *No. 21*, took out 40 oz. Mr. Vickery is on the creek all winter trying to get to bed-rock.

On *33 Above*, Geo. Drapich had been working earlier in the season, taking out only about 8 oz.

Palmer Creek.

Several prospectors were working on this and other creeks in the Muddy River country, but very little returns were had.

Dease Creek.

This creek empties into Dease lake at Laketon, on the west side, about half-way between the head and Porter Landing at the foot.

Dickinson Gold Mining Co., Ltd.

Incorporated in the State of Washington with an authorized capital of $25,000 and registered in the Province in December, 1923. The holdings consist of a lease on four claims at the mouth of Dease creek from the Dease Creek Syndicate. Last year lumber was sawn on the ground and a drag-line scraper outfit installed at the mouth of the creek. When I was there in July a hole had been dug 30 to 40 feet wide, over 100 feet long, and about 15 feet deep. It was found impossible to make any further headway because of the accumulated boulders in the bottom of the pit. A clean-up was therefore made, which returned about 10 oz. gold.

The question of the drainage of the pit was discussed. The lake-level was ascertained to be 18 feet below the surface of the pit, which would necessitate a 1,500-foot ditch and gain little or no more depth below the pit. It was decided to try a centrifugal pump, but I do not know whether it was successful or not. The drag-line scraper is clearly not a success where working under water.

The company has a good camp at Laketon and was employing about twenty-four men, some of whom were getting out logs up the lake. Mr. Theis, the vice-president of the company, was on the ground during operations.

H. Coles Leases.—These are situated about 2 miles up from the mouth of Dease creek and contain some good bench ground. An option was taken this fall on this ground by Mr. Bryant, J. Grant, and associates, of Wrangell, who intend testing it in the spring of 1927.

Lease 103.—This is situated about 3 miles up the creek and owned by Tom Bryan. An 8-inch pipe-line, with a 3-inch monitor, was being installed this summer by the owner to work a promising gravel bench. He estimated that it would probably be the spring of 1927 before the plant would be ready for business.

Dease Creek Mines Corporation.

Incorporated in Seattle with an authorized capital of $50,000, of which $15,000 is paid up, and registered in the Province in December, 1923. Its registered office in the Province is Telegraph Creek and in Seattle at 114 East Fifty-fifth Street. The company's holdings consist of leases Nos. 136 to 142, inclusive, on Dease creek. Under the efficient supervision of J. B. Blick a good camp and equipment has been assembled 8 miles up the creek, where sluicing will commence. A road was built from Dease lake to the camp, a distance of 10 miles, over which two tractors have been hauling all season. A sawmill on the ground made the lumber for all the camp buildings, flume-lines, sluices, etc. A cableway was strung across the river at the camp to get pipe-line, monitors, and other supplies over to the point where hydraulicking will be carried on.

An upper camp, about a mile above the main camp, was also established to accommodate the construction of a 2,600-foot ditch, 6 feet across the top and 4 feet on the bottom, and 2,400 feet of flume, to the pressure-box above the lower camp. A steel pipe-line 36 inches in diameter at the penstock, reducing to 14 inches at the monitors, will furnish water under high pressure (I have not the exact figure) for two 7-inch monitors at the pit. I understand that everything is in readiness for a start in the spring.

The company estimates at least ten years of operating on benches, from which sufficient gold has been taken to indicate very profitable returns. This has all the earmarks of a sound, well-managed enterprise.

Thibert Creek.

This creek empties into the lower end of Dease lake at Porter Landing.

On Deloire creek, a tributary of Thibert creek, Geo. Ball and the Finn Bros. have done a lot of work in trying to reach bed-rock and have met with all kinds of difficulties and disappointments. A drain was started two years ago at the lower end of the creek and driven 2,000 feet without gaining sufficient depth to reach bed-rock. This was abandoned and shaft-sinking tried in different places, only to be driven out by quicksand or water. An Empire drill was being taken into the property by dog-team when I was there in July, but I have no information as to the results obtained. It is an ideal situation for a small hydraulicking plant and would not be an expensive installation, as there is a wagon-road from the lake.

Mosquito Creek.—This flows into Thibert creek about 14 miles up from its mouth. H. S. Gibson *et al.*, of Seattle, have taken over George Adsit's lease near the mouth of the creek and staked three adjoining ones above. Last year the ground was drilled, giving results satisfactory to the operators. Lumber was whipsawn and a sawmill built, driven by water-power. Logs were being brought to the mill this summer to make lumber for the construction of 5,000 feet of flume to procure water from a lake above for hydraulicking purposes. The operators have a comfortable camp and are very optimistic of success.

The trail from the end of the wagon-road at Adams camp to Mosquito creek, about 7 miles, is badly in need of relocating and repairs, so that pack-horses may get through to the camp.

Dease Creek Syndicate.

The syndicate owns thirteen leases on Thibert creek, extending from about half a mile above Deloire creek for over 4 miles up the south side of the creek. The first hydraulicking plant was installed on this ground in 1901, but found inadequate to handle the gravel. Later a larger plant was put in and several thousand dollars cleaned up each year, but never enough to make the enterprise a profitable one. In 1919 the property, which had lain idle for some years, was taken over by the Dease Creek Syndicate under the management of George Adams, an Atlin hydraulic operator, who in two seasons' operations realized that the water-supply was insufficient for the amount of gravel to be handled. Work has therefore not been resumed, pending the construction of a pipe-line to bring water from upper Thibert creek adequate for requirements.

I have been over the ground two or three times and, judging by the amount of gold that has been recovered from places where the old channel has been reached, I believe that the property

has great prospective value. Operating conditions are perfect, as the old channel is some 60 feet above the present river, providing ideal dumping-ground the full length of the leases. I would strongly recommend it for investigation.

Beady Creek.—This flows into the Dease river from the east, about 3 miles below Porter Landing. Mr. Kincannon and two partners are driving a tunnel into a high gravel-bank, on the theory that there is an old channel of the creek in that direction. A tunnel has been driven about 60 feet and will be continued with the hope of hitting rim-rock. As some gold was taken from Beady creek in this vicinity in the early days there may be possibilities.

McDame Creek.

This creek flows into Dease river from the north about 80 miles below the Dease lake. The Dease river is a good waterway to McDame, with the exception of 4 or 5 miles just after it leaves the lake. This stretch is winding, shallow, and full of snags; also at Cottonwood rapids the channel is full of great boulders, which makes the down-trip extremely dangerous for loaded scows. If the snags and sweepers from the bank were removed from the upper stretch and the boulders blasted out of the rapids it would improve the river 100 per cent. This work could be done in the late fall or early spring during extreme low water and would not require a heavy expenditure if properly handled.

Pendleton Gold Mining Co., Ltd.

Incorporated in the State of Washington with a capitalization of $500,000, divided into 500,000 shares. It was registered in the Province in 1920, with its head office in Victoria. The company's property consists of lease No. 69 at China bar, 11 miles up McDame creek from its mouth. In 1924 a wagon-road was built by the company from McDame, the Hudson's Bay Company's post, and 45 tons of outfit taken in. This consists of a drag-line scraper, which with flume, dump-box, and sluices were installed on the ground.

The plant was put into operation in 1926 and a pit about 25 feet wide, 75 feet long, and 15 to 20 feet deep was dug in the river-bar on the west side of the creek. As in the case of the Dickinson Mining Company operating a similar outfit at the mouth of Dease creek, it was found impossible to get the gold with the scraper working under water, so a clean-up was made, yielding 21 oz. gold. This resulted in the whole outfit being moved down the creek to the lower end of the lease and a drain-ditch started for the purpose of unwatering the pit at the upper end. About 500 feet of ditch was dug without encountering any gold until about the last 50 feet. Here a pay-streak a few inches in thickness was cut, lying flatly, with a slight dip away from the present river-channel and about 10 feet below the surface. Good pannings were obtained from this streak, the results of which were broadcasted, and most extravagant and misleading statements made.

The facts are that it is very doubtful if the ditch is on company ground for some distance; that the pay-streak is not on bed-rock; that there is no gold in the gravel above the pay-streak nor below it, so far as gone; that the ground has never been tested by drilling, nor, so far as I could learn, has bed-rock ever been reached on this lease; therefore no authentic data on which to base valuations.

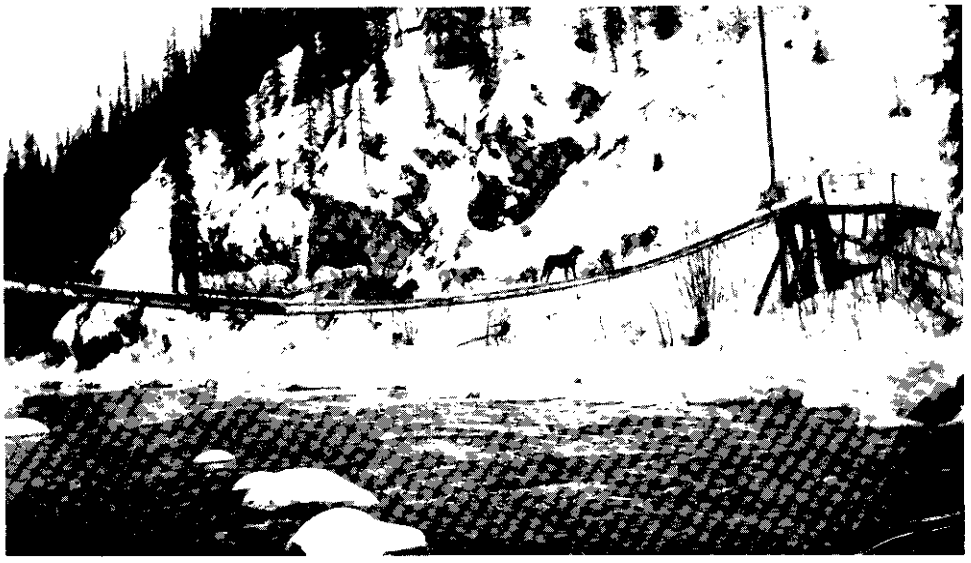
I think it is ground with favourable possibilities, as demonstrated by the rest of the creek. The drag-line scraper has proven useless for undrainable ground; therefore dredging would seem to be the only solution, but the ground should be tested by drilling first.

Standard Mining Corporation.

A State of Washington incorporation with an authorized capital of $250,000, fully paid up. It was registered in the Province in September, 1925, with its head office in the London Building, Vancouver. This spring, under the direction of B. J. O'Reilly, a Keystone drill was taken in to McDame creek and operated on ground on the west side of McDame creek above the Pendleton lease. There is a series of high gravel benches on either side of the creek, probably representing different levels of the creek before reaching its present bed, and possibly containing the channel of the old river.

At the base of these benches, where rim-rock is exposed, some of the richest diggings were worked in the early days. Hydraulicking was of course undeveloped at that time, and consequently, as work was extended into the bank, the overburden became too heavy to remove by methods then used, nor was the ground rich enough for drift-mining.

The company has acquired under option nine leases, on which drilling was started the first week in July and continued through until late in the fall. No information is available as to the



Nakina River, Atlin M.D.

Telegraph Creek-Dease Lake Road, Stikine River.

results of this work. If satisfactory, it will mean much not only to McDame creek, but the areas in the surrounding country where conditions are similar.

Godfrey Leases.—These are situated about 13 miles up McDame creek, or about 2 miles above the Pendleton camp, on the east side of the creek. A considerable amount of work has been done from year to year without getting anywhere. A flume and hydraulic outfit were put in some years ago and a little ground worked out, but no gold of any account was found. This year Charles Hewitt, an old-time mining man in the Province, has taken charge of the work and will drive a tunnel into the high gravel-bank on the belief that an old river-channel will be found. This work will be of great value to this side of the creek, for should the theory prove correct and "pay" found there is plenty of ground to be worked.

Crawford Lease.—This is owned by Crawford & Wheaton and is situated at the mouth of the First North fork of the creek, at the old town of Centreville, which was a live camp about fifty years ago. This year lumber was whipsawn and a flume over 200 feet long built to bring water from the creek above to the top of a high gravel-bank, which it sluices down to the boxes and flume below, which are 300 feet long to obtain dumping-room. By this temporary method about 20 oz. gold was taken out in 1926 from the top gravel, bed-rock of course never having been reached. These two men are planning on installing a small hydraulicking outfit and the chances are favourable for making a success of it.

Wing Leases.—I did not get up to this property, which is about 30 miles up McDame creek. D. L. Wing and partners have installed a small hydraulicking plant and I understand have been working under difficult conditions. Their output this year was only about 20 oz. gold.

From the foregoing it will be seen that there has been a very appreciable amount of development being carried on on this creek and, in fact, throughout the whole Dease Lake country. The drilling operations of the Standard Corporation will decide the question as to whether there are workable values in the big gravel benches. Should the results prove favourable it will not only warrant big operations on McDame creek, but will indicate great possibilities throughout this section, where similar conditions exist.

ATLIN MINING DIVISION.

This Division comprises the north-western corner of the Province and is, especially around the lakes, one of the finest countries out-of-doors in the summer season.

Prospecting has been neglected in preference for placer-mining, but operations on the properties of the Engineer Gold Mines, Limited, and Atlin Silver-Lead Mines has revived interest in lode-mining. Ore freight rates are very reasonable over the White Pass & Yukon Railroad to Skagway, but due to high incoming-freight rates operating costs are high. Winter operating conditions are difficult.

Placer production has been about normal this year ($44,318), but operations on Pine, Ruby, and Otter creeks give promise of a substantial increase in output for the future.

Spruce creek continues to be the main producer, but is becoming more and more handicapped on account of lack of drainage facilities for the workings farther up the creek.

There is some prospecting each year on other creeks, but nothing of any importance has been reported. From the old records of O'Donnel creek, and the facilities for working it, I wonder that it has not been seriously investigated before now.

Time would not permit of my going into the Atlin country this season and I am therefore indebted to C. L. Munroe, Gold Commissioner at Atlin, for information.

Taku Inlet Section.

This section is the drainage area of the Taku river, which empties into the head of Taku inlet, which in turn opens up into Stephens passage, about 16 miles south of Juneau, Alaska. The inlet is about 18 miles long to the mouth of the river, at Bullard's ranch, from which it is about 10 miles to the Alaska-British Columbia boundary-line.

The Taku river is navigable for small gas-boats to the confluence of the Nakina and Inklin rivers, and from there up the Nakina for another 10 miles, by canoe or river-boat, to the mouth of the Sloko river, flowing in from the north. From the Sloko there is an old Indian trail along the north side of the Nakina to Silver Salmon river, which it follows up to the Dominion telegraph-line. The telegraph-line may be followed through to Atlin lake or there is a trail to

O'Donnel creek, from which point there is a good auto-road to Atlin. The total distance is approximately 90 miles.

The eastern border of the Coast Range granites, where the Eastern Contact Belt is entered, is about 10 miles east of the boundary-line. This area, on the same mineral-belt, is therefore about 55 miles south of the *Engineer* mine on Tagish lake and 230 miles north of the Stewart country at the head of Portland canal. The same geological conditions obtain here as in the producing sections of this mineral-belt, making it a very favourable area for prospecting. One property, the *Tulsequah Chief* group (*see* 1923 Annual Report) on the Tulsequah river, which flows into the Taku river about 28 miles from its mouth, had some development-work done on it in 1923 by the Alaska Juneau Mining Company, but it did not meet the company's requirements.

The only activity this year that I know of was about 40 miles up the Nakina river, where A. DeRoux, of Juneau, with whom is associated Mr. Sheidley, of Kansas City, has been establishing camps, building trails, and otherwise preparing to explore some placer-ground near Silver Salmon creek.

Rainy Hollow Section.

This is the drainage area of the Chilkat river and its tributary, the Klehini, which empties into the head of Chilkat inlet. The section is reached by way of Haines, on the west side of Chilkoot inlet, just above the head of Lynn canal. The Alaska Road Commission has built a first-class truck-road from Haines to the British Columbia-Alaska boundary, a distance of 44 miles. From there to Rainy Hollow is 12 miles, through which there was at one time a fairly good road, but which has now become impassable.

There are a number of groups of claims in this section, notably the *Maid of Erin*, which has had a lot of development-work done on it before the Alaska section of the road was fit for freighting. The showings are copper ores, bornite and chalcocite, occurring as replacements in limestone. (*See* 1921 Annual Report.) There are promising showings of galena and zinc-blende on other properties.

About 2 miles from Pleasant camp (at the Boundary) the *Stampede* has been located by "Stampede John" Stenbraten. This is an old group, formerly owned by Saucier & Goddard, of Haines, Alaska, on which a quartz vein showing some free gold occurs in granite formation.

The section undoubtedly warrants the expense of putting the 12 miles of road in good condition.

Tagish Lake Section.

Engineer Gold Mines, Ltd. (*See* 1924–25 Annual Reports.) Incorporated in the State of Delaware with a capitalization of $1,000,000 and in May, 1924, was registered in British Columbia. The company's holdings consist of the *Engineer* group of seven claims, situated on the east side of Tagish lake near the south end. The development and equipment of the property during the past two years has entailed a very heavy expenditure. I did not examine the mine during 1926 and am therefore not in a position to draw any conclusions as to the results of the year's development-work. I understand that the winter programme will include the sinking of the shaft a further 500 feet on the "E" vein, which vein has so far proven the most reliable one on the property. During the summer 9,204 tons of ore was milled, producing $162,473, which includes returns of concentrates shipped.

Gleaner Consolidated Gold Mines, Ltd.—Incorporated in 1922 with a capitalization of $1,000,000, divided into 4,000,000 shares of 25 cents each, with its registered office in the Union Bank Building, Vancouver. A comprehensive plan of development-work was laid out for the property, which adjoins the *Engineer* up the hill, and carried out during the winter and early summer of 1926, when operations ceased. I have no information as to results obtained nor of the plans of the company.

Kirkland Gold Mines, Ltd. Incorporated in 1925 with a capitalization of $1,000,000, divided into 2,000,000 shares, with its registered office in Victoria. This group of six claims adjoins the *Engineer* on the south, along the lake, and has identical conditions. Contrary to expectations, only necessary assessment-work was done this year. It is evident that the development of this area will depend upon the success of the *Engineer*.

Happy Sullivan. There are three claims in this group—*Crackerjack*, *Gold Hill*, and *Gold Bullion*—situated about 1½ miles up Goat creek, which empties into Tagish lake a short distance above the *Engineer*. There is a big quartz vein about 22 feet in width exposed on the surface, carrying small values in gold and silver. I understand

that samples of free-milling gold ore were brought in from prospecting-work on the claims this summer.

Spokane. This group is situated on Big Horn creek, which empties into Tagish lake opposite Golden Gate, and is composed of three claims—*Spokane, Mohawk,* and *Edwin*—owned by Horace Fraser *et al.*, of Atlin. Some little work has been done on the claims, consisting of three tunnels and some surface work, showing a quartz vein 2 to 10 feet wide, sparingly mineralized with iron pyrites. A grab sample taken from a small dump at the highest tunnel assayed $15.20 gold to the ton and ½ oz. silver.

Other properties in this section and the Minister of Mines' Report in which they are described are as follows: *Big Horn*, 1921; *Brown*, 1918; *Callaghan*, 1918; *Copper Island*, 1918; *Laverdiere*, 1918; *Rupert*, 1918; *Venus*, 1918; *Genus Extension*, 1918; and *White Moose*, 1918.

ATLIN LAKE SECTION.

Atlin Silver-Lead Mines. (*See* 1924 and 1925 Annual Reports.) There are in this group twenty-four claims and fractions, owned and operated by J. M. Ruffner, of Atlin. The claims are situated on Vaughan mountain, about 10 miles up Fourth of July creek and 14 miles by wagon-road from Atlin. Briefly, the country-rock is granite, which has been intruded by a number of parallel dykes, which apparently have formed weakness lines for subsequent shearing and mineralization. These fissures are up to 20 feet in width and filled with a soft, heavily oxidized material, in which are ribs of quartz, mineralized with pyrite, zinc-blende, galena, arsenopyrite, ruby and native silver, carrying values in gold and silver.

A great deal of work has been done on the different veins, Nos. 2 and 4 receiving the most attention. This has mainly been in the endeavour to get below the intense surface oxidation. Last year the property was under lease to the Federal Mining and Smelting Company, whose engineers planned and directed the work, which was carried out by the owner, J. M. Ruffner. Under this arrangement about 250 feet of drifting was done on No. 4 vein at 4 A tunnel, which was in about 70 feet. This work exposes an ore-shoot about 100 feet long, averaging about 3 feet in width, with an average value of $2 gold to the ton, 25 oz. silver to the ton, and 5 per cent. lead. Later work in an open-cut, 4 AA, above this tunnel and beyond the present face exposed some very fine ore, which will be further developed.

In the meantime No. 2 vein had been traced down the hill and by a series of trenches at 2 X a very encouraging showing of ore was exposed. Work was then concentrated here and a cross-cut tunnel driven 39 feet diagonally across the formation, cutting a vein at 25 feet from the portal, and continuing another 14 feet through a dyke to the granite. A 15-foot drift on the vein had been driven, the face showing about 2½ feet of high-grade ore. Up to the end of last year the drift had been extended over 100 feet, following the granite which it encountered in a short distance, and showing a little ore all the way.

I did not have time to get into the property in 1926, but my information is that the Federal people continued this drift to about 400 feet from the portal. At about 300 feet in a shoot of high-grade ore 4 feet wide was encountered and drifted on for 12 to 15 feet, when it narrowed down to about the same conditions as the balance of the drift. The face was at about 400 feet when the company's engineer examined the work and concluded that the results did not warrant further work by the company, and recommended withdrawal, which was carried out.

Mr. Ruffner then decided to crosscut at the 300-foot point, where the short shoot of high-grade had been drifted through, and found that the high-grade vein lay to the left. After satisfying himself of this he turned the main drift to the left from the face at 400 feet and again crosscut the vein and ore-body. This has now been drifted on and proven for a length of 225 feet, with a width of from 13 to 21 feet.

A winze was sunk 50 feet at the 300-foot station and the ore-body crosscut from the bottom of the winze. Here it is stated to be 21 feet wide; six sectional samples across the 21 feet, taken by the manager, Mr. Ruffner, gave an average of about $46 to the ton in gold, silver, lead, and zinc values, the gold and silver values greatly predominating. This certainly seems to constitute a real ore-body.

About 162 tons of ore was shipped this summer, which netted about $80 a ton after deducting freight and treatment rates. One car-load lot of 36 tons netted $118.40 a ton.

Assistance was granted this fall by the Mines Department toward the building of 8 miles of new road on the north side of Fourth of July creek from the mine to the main wagon-road.

I believe this has been graded to within 1½ miles of the lake and that motor-trucks were taken through to the mine in the fall of 1926. It is expected that work at the mine will be continued throughout the winter and that a substantial tonnage will be delivered at the lake for boat shipment in the spring. Mr. Ruffner is to be commended for his perseverance on this property under adverse conditions and circumstances.

Mallory's Claims.

These are the *Rambler*, *Gambler*, *Big Canyon*, *Big Canyon No. 2*, *Big Canyon No. 2 Extension*, and *Big Canyon Extension*, owned by John Mallory, of Atlin, Ellen Mallory, and John Cunningham. The claims are situated on Vaughan mountain, along Crater and Vulcan creeks, and adjoin the Atlin Silver-Lead Mining Company's claims on the south-west. On the *Big Canyon* the Crater Creek canyon cuts and exposes a mineralized vein or dyke for a width of from 25 to 30 feet. The hanging-wall portion of the vein for a width of 8 to 10 feet is a breccia of quartz and dyke rock, very slightly mineralized and becoming more quartzose toward the centre of the vein, which is the best mineralized. The foot-wall section is practically straight dyke-rock.

At 3,900 feet elevation a tunnel was driven 170 feet on the ore, which occurs in parallel bands, bunches, and small veinlets. A few tons sorted from the tunnel and open-cut above averaged about 27 per cent. lead and 50 oz. silver to the ton. An independent sampling of the tunnel gave an average of 11.4 oz. silver across 6 feet for a length of 70 feet.

Another vein north of this, just below the forks of Crater creek, follows the north bank of Vulcan creek. A shallow shaft and a couple of open-cuts show a well-defined fissure, between granite walls, from 8 to 12 feet wide. It is intensely oxidized. A sampling of the shaft gave 15 oz. silver to the ton across 6 feet. It is a well-defined vein and the values would suggest gaining further depth.

These two veins are presumably veins Nos. 6 and 7 appearing on Ruffner's claims farther up the mountain. They are worth further exploration.

Ogdad Mining Co., Ltd. (Imperial).

This company was incorporated in June, 1923, with a capitalization of $1,500,000, divided into 1,500,000 shares. The registered office is 601 London Building, 626 Pender Street West, Vancouver. The company's holdings consist of eleven Crown-granted mineral claims and four surveyed claims, as follows: *Nanaimo*, *Lucky Liverpool*, *Paris Exhibition*, *Unknown*, *Nimrod*, *Imperial*, *Sultana Fraction*, *Transit Fraction*, *Kitchener*, *Independence Fraction*, *Ida E.*, *Princess Pat*, *Pilot*, *Observer*, and *R.A.F.*, situated on Munro mountain about 5 miles from Atlin. The main road from Atlin to Discovery runs along the base of the hill within a short distance of the claims. Mining conditions are perfect.

The old *Imperial* group of four claims was reported on in the Minister of Mines' Report of 1918, page 95, under the heading "Munro Mountain." All the work done on the company's property is on these original claims and consists practically of two tunnels. The upper one is a crosscut of 20 feet from the surface to the vein, which was then drifted on 20 feet to the east and 160 feet to the west. In the west drift an ore-shoot 50 feet long was exposed and stoped through to the surface for feed for a 5-stamp mill situated at the foot of the hill. The mill-feed is said to have averaged around $7 to the ton in free gold.

About 100 feet below this tunnel another was driven as a crosscut to the vein, of 110 feet. Short drifts were run each way on the vein, showing it to be up to 8 feet in width of quartz, very much shattered and oxidized, and carrying only traces of gold and silver. The following samples were taken:—

No.	Width.	Location.	Gold.	Silver.
	Inches.		Oz.	Oz.
1	....	Broken quartz from two open-cuts on surface, west of stope	0.90	0.3
2	20	Across east face, upper tunnel, 6 inches quartz, balance oxidized	0.02	Trace
3	6	Quartz, west face, upper tunnel	0.06	0.2
4	22	Quartz, 10 feet back from west face, upper tunnel	0.02	Trace
5	20	Quartz, 20 feet back from west face, upper tunnel	0.02	Trace
6	16	Quartz, at top of west end of 8-foot winze, upper tunnel	0.02	0.1
7	10	Quartz, at bottom of east face of winze, upper tunnel	0.04	0.4
8	20	Quartz, 33 feet east of east end of winze, half-way along stope	1.68	0.4
9	24	Broken-up quartz, 20 feet from east face, lower tunnel	Trace	Trace
10	18	Quartz, west face, lower tunnel	Trace	Trace

Little values appear to be left at any place in the old workings. However, the upper tunnel continued west might encounter another ore-shoot such as was stoped out. Also the driving of the lower tunnel, where less oxidation and shattered conditions are to be expected, would be good development.

PLACER-MINING.

Spruce Creek.—There were about a dozen operators on this creek during the season, who cleaned up a total of $13,785, Smith and Carlson being the heaviest producers, with $3,750.

McKee Creek.—George Adams, hydraulicking on this creek, had the largest individual clean-up in the district, with $10,255.

Otter Creek.—The Mines d'Otter Creek Company, under the management of Henri Maluin, took out $9,500 this season, which is pretty well up to former years. It is claimed that true bed-rock has never been reached on this creek, all the gold having been obtained from rim and a false bed-rock. Examinations of the creek have been made during the past two years, supposedly with the idea of starting operations down at the mouth of the creek at Surprise lake and working into bed-rock at that level.

Birch Creek.—H. P. Pearce cleaned up $800.

Boulder Creek.—Gus Anderson took out $2,128.

Ruby Creek.—The Placer Gold Mines Company reached bed-rock this season after driving a 1,100-foot tunnel. Good values were found on bed-rock and $1,904 taken out. This work, on the lower end of the company's leases, will give access to several years' working-ground and next season should see something like the old production. Operations have been under the able supervision of Chas. Leonard, assisted by C. Titus.

E. Turnquist has been working above the company's ground, endeavouring to get to bed-rock through the lava-flow which covers the gravel, practically from the company's line up the creek. He cleaned up in December, getting $1,808, which is decidedly encouraging for the upper creek.

On Wright creek Frank Brown and Fred Boran took out $1,936, and on O'Donnel river N. Murphy recovered $400 and T. Prpich took out $610.

Pine Creek.—In 1925 the Discovery Mining and Power Company, Limited, installed an hydraulicking plant on this creek under the supervision of Andrew Sostad. (*See* 1925 Annual Report.) Operations were commenced under the same management on July 1st, 1926, and with three monitors, two in the pit and one stacking tailings, over 600,000 cubic yards of top gravel were sluiced. When operations closed down on November 10th about 490 feet of 4- by 4-foot sluice-boxes were put in. The gold recovered amounted to only a few ounces, but nothing is expected from the top gravels for some distance yet, nor is a great deal expected from bed-rock for some distance after it is reached. About twenty-eight men were employed.

INDEX OF ALL MINERAL CLAIMS, GROUPS OF CLAIMS, AND COMPANIES IN THE NORTH-WESTERN DISTRICT (No. 1) CONTAINED IN THE ANNUAL REPORTS OF THE MINISTER OF MINES FROM 1917.

Name.	Location.	Annual Report.	Further Reference.
Aberdeen group	Marmot river	1923	
Aeroplane claim	Moresby island, Q.C.I.	1918	
Alaska Canadian Consolidated Gold Mines	Salmon river	1925	Premier Extension Mining Co., Ltd.
Albany Mining Co., Ltd.	Glacier creek	1925	
Alder island	Queen Charlotte islands	1922	
Alexander group	Seymour inlet	1917	
Alder island	Alice arm	1922	
Alice Arm-La Rose Mining Co., Ltd.	Alice arm	1925	La Rose group.
American Mining and Milling Co.	Salmon river	1922	
Americus Girl group	Bitter creek	1925	
Anglo-Belgian Mines, Ltd.	Alice arm	.....	Devlin Zinc group.
Argents Mines, Ltd.	Bear river	1925	Vetron and Comet groups.
Atlin Silver-Lead Mines	Atlin	1922 to 1925	Big Canyon and Ruffner groups.
August group	Stikine river	1919	
Autumn group	Amesbury, C.N. Rly.	1923	
Aztec group	Bear river	1920	Dalhousie Mining Co., Ltd.
Bald Mountain group	Porcher island	1916, 1920, 1922	International Copper Co.
Barite Gold Mines, Ltd.	Bear river	1924, 1925	

INDEX OF ALL MINERAL CLAIMS, GROUPS OF CLAIMS, AND COMPANIES—*Continued.*

Name.	Location.	Annual Report.	Further Reference.
Basin group	Alice arm	1924	
Bayview group	Bear river	1919, 1920	Bayview Mining Co., Ltd.
Bayview Mining Co., Ltd.	Bear river	1925	Bayview and Gold Cliff groups.
B.C. Bonanza Mines, Ltd.	Salmon river	1925	Spider group.
B.C. Silver Mines, Ltd.	Salmon river	1919 to 1925	
B.C. Verde group	Portland canal	1921	
Bear group	Kitsumgallum lake	1920, 1923	Black Bear group, Chiro Mining Co.
Bear River Mining Co., Ltd.	Bear river	1917	
Beaver group	Terrace, Thornhill mt.	1924	Lucky Seven group.
Belmont-Surf Inlet Mines, Ltd.	Surf inlet	1917 to 1925	
Bellevue group	Illiance river	1920, 1921	Alice Arm Holdings Co., Ltd.
Beverley group	Alice arm	1923	
Big Canyon and Ruffner groups	Atlin	1921	Atlin Silver-Lead Mines.
Big Horn group	Atlin	1921	
Big Missouri group	Salmon river	1917 to 1920	Big Missouri Mining Co., Ltd.
Big Missouri Mining Co., Ltd.	Salmon river	1925	Big Missouri group.
Black Bear group	Alice arm	1919, 1920	Esperanza group.
Black Bear group	Kitsumgallum lake	1925	Bear group.
Black Diamond group	Alice arm	1918, 1922	
Black Bear claim	Stewart, Glacier creek	1924	
Black Wolf group	Kitsumgallum lake	1921	Black Wolf Mining Co., Ltd.
Black Wolf Mining Co., Ltd.	Kitsumgallum lake	1925	Black Wolf group.
Blue Bell group	Terrace	1922	Copper Queen group.
Blue Grouse group	Kitsumgallum lake	1918	
Blue Mule group	Moresby island	1920, 1922, 1923	
Blue Ribbon group	Alice arm	1921	Kitsault River Mining and Dev. Co., Ltd.
Bolton group	Klekane inlet	1922	Pink Rose group.
Bonanza claim	Alice arm	1918	
Boundary group	Salmon river	1918	
Brian Boru group	Kitsumgallum lake	1925	
Brown group	Atlin	1918	
Brown group	Salmon river	1925	
Bunker Hill group	Alice arm	1925	
Bush Mines, Ltd.	Salmon river	1918, 1919	National Silver Mines, Ltd.
Callaghan group	Atlin	1918	
Camalachie claim	Alice arm	1918	
Canyon claim	Alice arm	1924	
Cape Nome claim	Alice arm	1918	
Cariboo group	Alice arm	1921	Lynx group.
Carpenter group	Alice arm	1918	
Carpenter group	Hastings arm	1922	
Cassiar Dredging Co.	Dease lake	1924	
Central group	Alice arm	1919, 1922	Homeguard group.
Chance group	Alice arm	1923	Last Chance group.
Chief Metals Co., Ltd.	Salmon river	1925	
Chiro Mining Co., Ltd.	Kitsumgallum lake	1924	Bear group.
Clearwater river	Tributary, Stikine river	1925	
Climax group	Alice arm	1918, 1925	
Columbia group	Alice arm	1918	
Collison bay	Moresby island, Q.C.I.	1918	
Comet group	Bear river	1920	Argenta Mines, Ltd.
Consolidated Homestake Mining and Development Co.	Alice arm	.....	Homestake and Toric groups.
Copper group	Kitsumgallum lake	1918	
Copper Cliff group	Alice arm	1918	
Copper Island	Moresby island, Q.C.I.	1918, 1919	
Copper Island	Atlin	1918	
Copper King group	Glacier creek	1918	
Copper Queen group	Terrace	1925	Blue Bell group.
Copper Queen group	Moresby island, Q.C.I.	1919	
Cordilla group	Princess Royal island	1922	
Cornerstone group	Atlin	1924	
Crawford group	Swanson bay	1923	Millbank group.
Cronholm-Bartholf Mines, Ltd.	Salmon river	1923	Hollywood Mines, Ltd.

INDEX OF ALL MINERAL CLAIMS, GROUPS OF CLAIMS, AND COMPANIES—*Continued.*

Name.	Location.	Annual Report.	Further Reference.
Dalhousie Mining Co., Ltd.	Bear river	1925	Aztec group.
Dandy group	Glacier creek	1921	Victoria Mines, Ltd.
Dardanelles group	Terrace	1918	
David Copperfield group	Alice arm	1919	
Dease Creek Mines Corporation	Dease lake	1924, 1925	
Dease Syndicate	Dease lake	1924	
Delnorte group	Meziadin lake	1922	
Deloire creek	Dease Lake section	1923, 1925	
Devlin Zinc group	Alice arm	1925	Anglo-Belgian Mines, Ltd.
Dickinson Mining Co., Ltd.	Dease lake	1924, 1925	
Discovery Mining and Power Co., Ltd.	Atlin (Pine creek)	1925	
Dolly Varden Mines, Ltd.	Alice arm	1917 to 1920, 1922	
Drum Lummon Mines, Ltd.	*Douglas channel*	1917 to 1920, 1922 to 1924	*Paisley Point Mines, Ltd.*
Dunwell claim	Glacier creek	1920	Dunwell Mines, Ltd.
Dunwell Mines, Ltd.	Stewart	1922 to 1925	Dunwell claim.
Eagle claim	Porcher island	1919	
Early Bird	Moresby island	1918	
Ecstall river	Skeena river	1917, 1918	
E.F.G.H. group	Terrace	1918	
Eldorado Gold Mining Co., Ltd.	Salmon river	1923	Eldorado Gold Mines Consolidated, Ltd.
Eldorado Gold Mines Consolidated, Ltd.	Salmon river	1925	Eldorado Gold Mining Co., Ltd.
Eilen group	Shuttle islands, Q.C.I.	1921	
Emperor Mines, Ltd.	Glacier creek	1924, 1925	
Engineer group	Marmot river	1921	
Engineer Mine	Atlin	1918	Engineer Gold Mines, Ltd.
Engineer Gold Mines, Ltd.	Atlin	1924, 1925	Engineer mine.
Enterprise group	Bear river	1925	
Esperanza group	Alice arm	1923, 1924	Black Bear group.
Evening Sun and Columbia claims	Glacier creek	1919	Rush Columbia Mines, Ltd.
Excelsior and Eagle claims	Glacier creek	1919	
Fisher group	Kitsumgallum lake	1925	
Forty Nine group	Salmon river	1918 to 1921	Forty Nine Mining Co., Ltd.
Forty Nine Mining Co., Ltd.	Salmon river	1923, 1925	Forty Nine group.
Fox claim	Alice arm	1918	Kitsault River Mining and Dev. Co., Ltd.
Fraser group	Marmot river	1919	Sterling Silver Lead Mines, Ltd.
Galena Farm group	American creek	1925	
George Copper Mines	Bear river	1917 to 1919	George Gold Copper Mining Co., Ltd.
George Gold Copper Mining Co., Ltd.	Bear river	1925	George Copper Mines.
Georgia River Mining Co., Ltd.	Georgia river	1917, 1922	Guggenheim group.
Gibson group	Bear river	1919	Mobile group.
Glacier claim	Alice arm	1918	
Glacier group	Salmon river	1920	
Glacier Creek Mining Co., Ltd.	Glacier creek	1924	
Gleaner Consolidated Gold Mines, Ltd.	Atlin	1918, 1925	
Glen No. 1 claim	Kitsumgallum lake	1925	
Gloria Mining Co., Ltd.	Portland canal	1922	North Country Mining Co., Ltd.
Gold Bug group	Pitt island	1922	Rowe group.
Gold Cliff group	Bear river	1925	Bayview Mining Co., Ltd.; Pacific Mines, Petroleum, and Dev. Co.
Gold Cup group	Kitsumgallum lake	1924	
Golden Nib claim	Terrace	1925	Iron Hat claim.
Golden Penny claim	Terrace	1920	
Goldie group	Glacier creek	1925	
Gold Ore Mining Co., Ltd.	Bear river	1925	
Gold Pan creek	Dease lake	1924, 1925	
Golskeish Mines, Ltd.	Anyox	1920	

INDEX OF ALL MINERAL CLAIMS, GROUPS OF CLAIMS, AND COMPANIES—*Continued.*

Name.	Location.	Annual Report.	Further Reference.
Graham Island black sands	Graham island, Q.C.I.	1923 to 1925	P.B.C. Mines Co.
Granby Cons. M.S. and P. Co., Ltd.	Anyox	1917 to 1925	
Grey Bird claim	Stikine river	1919	
Grey Copper group	Bear river	1917	Stewart High Grades, Ltd.
Guggenheim group	Georgia river	1918	Georgia River Mining Co., Ltd.
Hanna group	Anyox	1922	
Happy Sullivan group	Atlin	1918	
Hercules Mines, Ltd.	Salmon river	1918, 1920, 1923	
Hibernian group	Rainy Hollow	1918	
Hollywood Mines, Ltd.	Salmon river	1925	Cronholm-Barthelf Mines, Ltd.
Homeguard group	Alice arm	1924	Central group.
Homestake claim	Moresby island	1923	
Homestake group	Alice arm	1918, 1921	Consolidated Homestake Mining and Dev. Co., Ltd.
Hope group	Moresby island, Q.C.I.	1918	
Hunter group	Kitsumgallum lake	1918	
Idaho group	Marmot river	1921, 1923	Porter-Idaho Mines, Ltd.
Imperial group	Atlin	1918	Munro mountain.
Ikeda Mines, Ltd.	Moresby island, Q.C.I.	1918, 1919	
Independent group	Bear river (Goose creek)	1919, 1921	Independence Gold Mining Co., Ltd.
Independence Gold Mining Co., Ltd.	Bear river (Goose creek)	1923 to 1925	Independent group.
Independent group	Alice arm	1918, 1919	
Indian Mines, Ltd.	Salmon river	1917, 1918, 1920, 1922	Indian Mines Corporation, Ltd.
Indian Mines Corporation, Ltd.	Salmon river	1923 to 1925	Indian Mines, Ltd.
International group	Salmon river	1918	
International Copper Co., Ltd.	Porcher island	1917, 1919	Bald Mountain group.
Iron Duke group	Moresby island, Q.C.I.	1918, 1922	
Iron Hat claim	Terrace	1918, 1920	Golden Nib claim.
Iskut Mining Co.	Iskut river (Stikine river)	1917, 1919	
Jenny Jiggs and Florence claims	Kitsumgallum lake	1925	
Jitney group	Porcher island	1917	
Jones group	Moresby island, Q.C.I.	1918	
Juneau group	Kitsumgallum lake	.....	*See* Treadwell No. 2 group.
Jutland group	Bitter creek	1919	
Kalum Lake Mines, Ltd.	Kitsumgallum lake	1924, 1925	Portland Mining Co.
Kent claim	Alice arm	1918	
Keystone Mining Co., Ltd.	Alice arm	1923	Sunset group.
Kirtland group	Atlin	1918	Kirtland Gold Mines, Ltd.
Kirtland Gold Mines, Ltd.	Atlin	1925	Kirtland group.
Kitchener group	Seymour inlet	1917	
Kitsault River Mining and Development Co., Ltd.	Alice arm	1925	Matilda, Fox, Tip Top claims and Blue Ribbon group.
Lady group	Kitsumgallum lake	1925	
L. & L. group	Glacier creek	1919	L. & L. Glacier Creek Mines, Ltd.
L. & L. Glacier Creek Mines, Ltd.	Glacier creek	1924, 1925	L. & L. group.
Lakeview group	Glacier creek	1918 to 1920	Lakeview Mines, Ltd.
Lakeview Mines, Ltd.	Glacier creek	1924, 1925	Lakeview group.
Lakeview group	Atlin	1918	
La Rose group	Alice arm	1918, 1919	Alice Arm-La Rose Mining Co., Ltd.
Last Chance group	Alice arm	1918, 1919	Chance group.
Little Joker group	Salmon river	1917	Mineral Hill group.
L.L. & H. group	Bitter creek	1920	
Log Cabin group	Kitsumgallum lake	.....	Scenic group.
Lone Maid group	Alice arm	1922, 1923	
Lone Star group	Alice arm	1918	
Lucky Seven group	Terrace	1918, 1920	Beaver group.
Lucky Strike group	Alice arm	1922	
Lucy O'Neill group	Kitsumgallum lake	1921	
Lynx group	Alice arm	1921	Cariboo group.
Lyon group	Alice arm	1924	
Mahood Mines, Ltd.	Salmon river	1920	

INDEX OF ALL MINERAL CLAIMS, GROUPS OF CLAIMS, AND COMPANIES—*Continued.*

Name.	Location.	Annual Report.	Further Reference.
Maid of Erin group	Rainy Hollow, Atlin	1918, 1921	
Mammoth group	Porcher island	1917	
Maple Bay group	Portland canal	1918, 1921	
Marmot group	Kitsumgallum lake	1918	Sunlight group.
Marmot Metals Mining Co., Ltd.	Marmot river	1925	Montana group.
Martin & Shannon group	Khutze inlet	1925	Western Copper group.
Matilda claim	Alice arm	1924	Kitsault River Mining and Development Co., Ltd.
Mayflower group	Bear river	1918, 1925	
M.C. group	Bear river	1922, 1923	
Meal Ticket group	Moresby island, Q.C.I.	1918	
Millbank group	North of Swanson bay	1924	Crawford group.
Mimico group	Glacier creek	1922	Mimico Mines, Ltd.
Mimico Mines, Ltd.	Glacier creek	1925	Mimico group.
Mineral Basin group	Salmon river	1925	
Mineral Hill group	Salmon river	1918, 1919	Little Joker group.
Mineral Hill Mines, Ltd.	Salmon river	1922	Little Joker and Mineral Hill groups.
Mineral Hill group	Kitimat	1925	
Mobile group	Bear river	1921 to 1923	Gibson group.
Molly group	Bear river	1918	
Molybdenum group	Canadian National Rly.	1918	
Monarch group	Alice arm	1918, 1919, 1921	
Montreal group	Bear river	1925	
Montana Fractions	Salmon river	1923	
Montana group	Marmot river	1919, 1922	Marmot Metals Mining Co., Ltd.
Moose group	Alice arm	1918 to 1920	
Morning group	American creek	1925	
Morning Star group	Glacier creek	1923	
Mosquito creek	Dease lake	1925	
Motherlode group	Kitsumgallum lake	1920	
Mountain Boy group	American creek	1919	
Munro group	Salmon river	1922	
Munro mountain	Atlin	1918	Imperial group.
Murdock group	Bear river	1925	
Musketeer group	Alice arm	1918 to 1920	
Nabob group	Glacier creek	1923	
National Silver Mines, Ltd.	Salmon river	1925	
Nome and Yukon claims	Alice arm	1923	
Naname claim	Alice arm	1923	
North Country Mining Co., Ltd.	Portland canal	1923	Gloria Mining Co., Ltd.
Northern Mining and Development Co., Ltd.	Terrace	1925	Golden Nib and Beaver claims.
North Fork Basin claim	Marmot river	1919, 1924	Sterling Silver Lead Mines, Ltd.
Northland Mining Co., Ltd.	Salmon river	1924, 1925	Troy group.
North Star claim	Alice arm	1918, 1919	
N.P. Iron Mines	Terrace (Copper river)	1918	
Oakwood group	Terrace	1925	
Ore Mountain Mining Co., Ltd.	Bear river	1925	
Outland Silver Bar group	Salmon river	1922, 1925	
Outsider group	Portland canal	1918, 1919, 1921, 1922	
Pacific Mines, Petroleum, and Development Co., Ltd.	Bear river	1924	Gold Cliff group.
Paisley Point Mines, Ltd.	Douglas channel	1925	Drum Lummon Mines, Ltd.
Palmer creek	Dease lake	1925	
Patricia group	Marmot river	1921, 1922	
Patterson group	Porcher island	1917, 1919 to 1925	
Pay Roll group	Salmon river	1918	
P.B.C. Mines Co.	Graham island	1924	Graham Island black sands.
Pendleton Gold Mining Co., Ltd.	Dease Lake section	1924, 1925	
Phoenix Silver Mines, Ltd.	Bear river	1924, 1925	
Pine creek	Atlin	1925	Discovery Mining & Power Co.
Pink Rose group	Kiekane inlet	1924	Bolton group.
Placer-mining	Atlin	1917 to 1925	

INDEX OF ALL MINERAL CLAIMS, GROUPS OF CLAIMS, AND COMPANIES—*Continued.*

Name.	Location.	Annual Report.	Further Reference.
Portland Mining Co.	Kitsumgallum lake	1922	Kalum Lake Mines, Ltd.
Portland Canal Mining Co., Ltd.	Glacier creek	1924	
Portland Ibex group	American creek	1925	
Porter-Idaho Mines, Ltd.	Marmot river	1924, 1925	Idaho group.
Premier Extension Gold Mining Co., Ltd.	Salmon river	1923, 1925	Alaska Canadian Consolidated Gold Mines, Ltd.
Premier Gold Mining Co., Ltd.	Salmon river	1919 to 1925	Salmon Bear River Mining Co., Ltd.
Prince John group	Bear river	1917 to 1919	Prince John Mining Co., Ltd.
Prince John Mining Co., Ltd.	Bear river	1923	Prince John group.
Prince George group	Marmot river	1921	
Producer group	Moresby island, Q.C.I.	1918, 1919	
Ptarmigan group	Terrace	1918	St. Paul group.
Queen and Queen Frac.	Alice arm	1923	
Queen and Zinc group	Kitsumgallum lake	1925	
Radio Stewart Mines, Ltd.	Bitter creek	1925	
Rainy Hollow section	Atlin Mining Division	1918, 1921	
Red Bluff group	Alice arm	1922	
Red Top group	Alice arm	1919, 1920, 1925	
Rex claim	Alice arm	1924	
Rowe group	Pitt island	1925	Gold Bug group.
Ruby group	Alice arm	1919, 1921	
Ruby Silver Mines, Ltd.	Bear river	1924	
Rufus group	Bear river	1922	Rufus Silver Lead Mines, Ltd.
Rufus Silver Lead Mines, Ltd.	Bear river	1924	Rufus group.
Rupert group	Atlin	1918	
Rush-Columbia Mines, Ltd.	Glacier creek	1925	Columbia and Evening Sun claims.
Ruth and Francis group	Glacier creek	1918	
Salmon Bear River Mining Co., Ltd.	Salmon and Bear rivers	1917, 1918	Prior to Premier Gold Mining Co.
Salmon River High Grades, Ltd.	Salmon river	1925	
Salmon River Motherlode Mining Co.	Salmon river	1920	
Salmon River Silver Mines, Ltd.	Salmon river	1920	
Saloomt group	Bella Coola	1922	
Scenic group	Kitsumgallum lake	1922	Log Cabin group.
Second Thought group	Alice arm	1918, 1921	
Shuttle island	Moresby island, Q.C.I.	1919	
Silverado group	Bear river	1920 to 1922	Silverado Mining Co., Ltd.
Silverado Mining Co., Ltd.	Bear river	1925	Silverado group.
Silver Bar Mining and Development Co., Ltd.	Alice arm	1923	
Silver Band group	Alice arm	1918	Now Sunrise group.
Silver Bell group	Alice arm	1918	
Silver Bell claim	Alice arm	1918, 1919	
Silver Bell group	Portland canal	1925	
Silver Crest Mines, Ltd.	Salmon river	1919, 1920, 1924, 1925	
Silver Cliff group	Alice arm	1918	
Silver Coin group	Kitsumgallum lake	.....	*See* Silver Dollar group.
Silver Dollar group	Kitsumgallum lake	1921	Silver Coin group.
Silver Horde group	Alice arm	1918, 1924	
Silver Leaf group	Alice arm	1924	
Silver Ledge Mining Co., Ltd.	Glacier creek	1925	
Silver Star group	Alice arm	1918, 1919	
Silver Slipper Mining Co., Ltd.	Portland canal	1925	
Silver Tip Mining and Development Co., Ltd.	Salmon river	1920	Silver Tip Mining Co., Ltd.
Silver Tip Mining Co., Ltd.	Salmon river	1925	Silver Tip Mining and Dev. Co., Ltd.
Snowflake group	Terrace (Copper river)	1918	
Society Girl	Terrace	1918	
South Easter Mining Co.	Graham island, Q.C.I.	1918, 1919	
Speculator No. 2 claim	Alice arm	1925	
Spoder group	Salmon river	1919, 1920	B.C. Bonanza Mines, Ltd.

INDEX OF ALL MINERAL CLAIMS, GROUPS OF CLAIMS, AND COMPANIES—*Continued.*

Name.	Location.	Annual Report.	Further Reference.
Spokane group	Atlin (Big Horn creek)	1921	
Standard group	Gibson island	1917	
Standard group	Alice arm	1918, 1922, 1925	
Standard Mines Corporation	Salmon river and Dease lake	1925	Big Missouri, McDame creek.
St. Elmo group	Bitter creek	1919	
Sterling Silver Lead Mines, Ltd.	Marmot river	1925	
Stewart group	Kemano river (Gardner canal)	1917, 1922	
Stewart Central Mines, Ltd.	Bitter creek	1925	
Stewart Consolidated Gold Mines, Ltd.	Bear river (Dease lake)	1925	
Stewart High Grades, Ltd.	Bear river	1925	Grey Copper group.
Stikine group	Stikine river	1919	
St. Paul group	Terrace	1925	Ptarmigan group.
Summit group	Alice arm	1923	
Sunlight group	Kitsumgallum lake	1920	Marmot group.
Sunshine group	Glacier creek	1918, 1919, 1925	Now Sunshine Mining Syndicate.
Superior Mines, Ltd.	Glacier creek	1925	
Surprise group	Terrace	1925	
Swede group	Lockeport, Q.C.I.	1918 to 1921	
Taku River section		1923	
Terminus Mines, Ltd.	American creek	1924, 1925	
Theda Bara and Bebe Daniels claims	Alice arm	1924	
Thunder group	Moresby island, Q.C.I.	1918	
Tiger group	Alice arm	1918, 1919	
Tip Top claim	Alice arm	1918	
Toric group	Alice arm	1918, 1919, 1921, 1923 to 1925	Consolidated Homestake Mining and Dev. Co.
Treadwell No. 2 group	Kitsumgallum lake	1918	
Trouble Frac.	Alice arm	1918	
Troy group	Salmon river	.....	*See* Northland Mining Co., Ltd.
Tulsequah Chief claim	Taku river	1921	
Unicorn group	Salmon river	1919, 1925	
Union Silver Mines, Ltd.	Glacier creek	1925	
United Metals group	Alice arm	1918, 1919	
Unuk River section		1920 to 1925	
Vancouver Mines, Ltd.	American creek	1925	
Vanguard group	Alice arm	1918, 1922	
Venus group	Carcross, Y.T.	1918	
Venus Extension group	Carcross, Y.T.	1918	
Vesuvius claim	Stikine river	1919	
Verona group	Alice arm	1921	
Vetron group	Bear river	1920	*See* Argenta Mines, Ltd.
Victoria claim	Rainy Hollow	1918	
Victoria Mines, Ltd.	Glacier creek	1924, 1925	Dandy group.
Vimy Ridge group	Hastings arm	1922	
War Dance group	Alice arm	1919	
Washington group	Marmot river	1921	
Wells claims	Surf inlet	1920	
Western Copper group	Khutze inlet	1925	Martin & Shannon group.
Whale Channel Mines, Ltd.	Princess Royal island	1919, 1920	
White Heather Mines, Ltd.	Salmon river	1925	
White Moose group	Atlin	1918	
Wild Cat group	Alice arm	1918	
Windsor group	Bitter creek	1924	
Wire Gold group	Marmot river	1924	Sterling Silver Lead Mines, Ltd.
Wireless claim	Moresby island, Q.C.I.	1918	
Wolf group	Alice arm	1918	Dolly Varden Mines.
Wolf claim	Alice arm	1925	
Wright group	Porcher island	1925	
Yankee Boy claim	Alice arm	1918	
Yellowstone group	Salmon river	1918, 1923	
Yukon and Nome claims	Alice arm	1923	

NORTH-EASTERN MINERAL SURVEY DISTRICT (No. 2).

By Douglas Lay, Resident Mining Engineer.

INTRODUCTORY.

The North-eastern Mineral Survey District consists of Omineca, Cariboo, Quesnel, and Peace River Mining Divisions, and occupies a large portion of Northern British Columbia, having an area of nearly 100,000 square miles. The northern, western, and southern boundaries of this district are the arbitrary boundary-lines of the Mining Divisions, but these, where practicable, always follow the watersheds of the country. The eastern boundary is the British Columbia-Alberta boundary-line. The western boundary is roughly 100 miles from the Coast, while the northern and southern boundaries are about 200 miles from the respective Provincial boundaries.

For descriptive purposes in this report the district is reviewed under the main headings of the Mining Divisions, subdivided into sections, as given below. As far as practicable, a section is named after the chief town or place therein. It will be obvious where this is not the case.

Omineca Division—Skeena section; Hazelton section; Smithers section; Telkwa section; Houston section; Topley section; Burns Lake section; Sibola section; Manson section; Fort Grahame section.

Cariboo Division—Barkerville section; Prince George section.

Quesnel Division—Quesnel section; Likely section; Keithley section; Horsefly section.

Peace River Division.

A general description of the geographic, geologic, and topographic features of the district was given in the Annual Report of the Minister of Mines for 1917. In the following table is given a list of the more important reports on this district, in addition to which numerous references can be found in the Summary Reports of the Geological Survey and the Annual Reports of the British Columbia Department of Mines.

List of Reports on District.

Name of Author.	Publication.	Year.	Page.
Dr. Geo. Dawson	Geological Survey of Canada	1875	233
Dr. Geo. Dawson	Geological Survey of Canada	1876	17
Dr. Geo. Dawson	Geological Survey of Canada	1879	Pt. B
Dr. Geo. Dawson	Geological Survey of Canada	1888	73B
Amos Bowman	Geological Survey of Canada	1887–8	Pt. C
R. G. McConnell	Geological Survey of Canada	1894	5C
W. Fleet Robertson	Minister of Mines' Report	1905	89
W. Fleet Robertson	Minister of Mines' Report	1906	101
W. Fleet Robertson	Minister of Mines' Report	1908	66
W. Fleet Robertson	Minister of Mines' Report	1911	95
W. Fleet Robertson	Minister of Mines' Report	1912	65
W. W. Leach	Geological Survey of Canada, Summary Report	1906	35
W. W. Leach	Geological Survey of Canada, Summary Report	1907	19
W. W. Leach	Telkwa River and Vicinity, Geological Survey	1907	.....
W. W. Leach	Geological Survey of Canada, Summary Report	1908	41
W. W. Leach	Geological Survey of Canada, Summary Report	1909	61
W. W. Leach	Geological Survey of Canada, Summary Report	1910	91
G. S. Malloch	Geological Survey of Canada, Summary Report	1911	92
R. G. McConnell	Geological Survey of Canada, Summary Report	1912	55
G. S. Malloch	Geological Survey of Canada, Summary Report	1912	69
G. S. Malloch	Geological Survey of Canada, Summary Report	1912	103
C. F. J. Galloway	Minister of Mines' Report	1912	118
W. M. Brewer	Minister of Mines' Report	1914	101
John D. Galloway	Minister of Mines' Report	1914	176
J. D. MacKenzie	Geological Survey of Canada, Summary Report	1915	62
Chas. Camsell	Geological Survey of Canada, Summary Report	1915	70
John D. Galloway	Minister of Mines' Report	1916	134
John D. Galloway	Minister of Mines' Report	1917	86
John D. Galloway	Minister of Mines' Report	1918	107

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Name of Author.	Publication.	Year.	Page.
B. R. MacKay	Summary Report, Part B, Geological Survey	1918	39
J. J. O'Neill	Memoir 110, Geological Survey	1919	.....
B. R. MacKay	Summary Report, Part B, Geological Survey	1919	36
John D. Galloway	Minister of Mines' Report	1919	96
J. C. Gwillim	Oil Survey, Peace River Dist., Dept. of Lands	1920	.....
John D. Galloway	Minister of Mines' Report	1920	79
John A. Dresser and Edward Spieker	Oil Surveys, Peace River Dist., Dept. of Lands	1920	.....
Leopold Reinecke	Memoir 118, G.S.C.	1920	.....
F. H. McLearn	Summary Report, Part B, G.S.C.	1920	1
R. W. Brock	Summary Report, Part A, G.S.C.	1920	81
John D. Galloway	Minister of Mines' Report	1921	89
W. A. Johnston	Summary Report, Part A, Geological Survey	1921	59
John A. Dresser	Oil and Gas in Peace River, Summary Report	1922	.....
John D. Galloway	Minister of Mines' Report	1922	95
W. A. Johnston	Summary Report, Part A, Geological Survey	1922	68
W. L. Uglow	Summary Report, Part A, Geological Survey	1922	82
F. H. McLearn	Summary Report, Part B, Geological Survey	1922	1
John D. Galloway	Minister of Mines' Report	1923	95
George Hanson	Summary Report, Part A, Geological Survey	1923	29
John D. Galloway	Minister of Mines' Report	1924	85
George Hanson	Summary Report, Part A, Geological Survey	1924	19, 38
M. E. Hurst	Summary Report, Part A, Geological Survey	1924	44
J. R. Marshall	Summary Report, Part A, Geological Survey	1924	47
John D. Galloway	Summary of Mining Operations, Jan. 1st to Aug. 31st, British Columbia Department of Mines	1925	.....
Douglas Lay	Minister of Mines' Report	1925	118
John D. Galloway	Summary of Mining Operations, Jan. 1st to Oct. 31st, British Columbia Department of Mines	1926	.....
George Hanson	Summary Report, Part A, Geological Survey	1925	.....

GENERAL SUMMARY.

A brief explanation of the form followed in compilation of the annual report of this district seems advisable. Under the heading "General Summary" the aim is to give first a concise but comprehensive statement embodying in a few paragraphs the salient features of the year. Next follows an amplification of the foregoing, under appropriate headings, but without any detail. In this portion of the report special mention is made of any matters of particular interest, such as "Prospecting," "New Discoveries," and so forth. Lastly follows the detailed report under the headings of the various Mining Divisions.

The present year has witnessed marked progress in both lode- and placer-mining and some advance in coal-mining. An optimistic outlook is engendered not merely because the production in all branches of mining for 1926 showed a marked improvement over that of the previous year, but also because of new discoveries.

Discoveries have been made, or have been brought to light, during the year which possess the earmarks of importance—namely, a mineralization of essentially silver and gold values near Topley, on the Canadian National Railway; a deposit of galena on the Ingenika river; and mica of exceptional size on Mica mountain, near Fort Grahame. The first two mentioned are replacement deposits. The last mentioned has not yet been inspected, but information concerning it comes from reliable sources. All these will be more fully referred to in the body of the report, but it might be here stated that, so far as interested capital is concerned, the Topley discovery is the most important of the year in this district.

It is gratifying to record the active development-work carried on. Several companies, entering this district for the first time, have instituted steady development campaigns. Among these may be mentioned British Canadian Silver Corporation, Limited; Cassiar Crown Mining Company; Porcupine Goldfields Development and Finance Company, Limited; and Governor Davis, of Washington, D.C., in the lode-mining field, and the Consolidated Mining and Smelting Company of Canada, Limited, in the placer-mining field. A large number of small-scale operations have been carried on at various points of the district.

So far as actual lode-mineral production is concerned, Duthie Mines, Limited, is in a class by itself, contributing about 90 per cent. of the total.

Highly satisfactory results have been gained by the Cedar Creek Mining Company, operated under contract by B. Boe. Another very gratifying feature of this year's placer operations is the number of areas which have been or are being drilled to determine dredging possibilities.

In the class of non-metallic minerals a good start has been made. The General Holding Company, of Edmonton, has had a force of between ten and twelve men employed in developing its mica properties on Mica mountain, near Fort Grahame. Also a deposit of silicate of alumina has been opened up by B. A. Cunliffe on Borland mountain, near Williams Lake, and a shipment of approximately 120 tons has been made to Vancouver.

The Peace Canyon Mining and Transportation Company is engaged in developing the Gething coal leases near Hudson Hope, on the Peace river.

In the investigation of the Tesla Mountain mineral area south of Eutsuk lake a new pass through the Coast range from Dean channel to the interior was brought to light. The existence of this pass was apparently previously known to trappers only.

Keen interest has been evinced during the season by field engineers, especially in connection with the new discovery at Topley.

A very important deal was consummated towards the close of the season, whereby an option on the *Red Top* group, the new discovery at Topley, was taken by the Standard Silver-Lead Mining Company.

Generally speaking, while the recent slump in silver is unfortunate, there are sound grounds for the belief that this district will witness important developments in the near future.

Of considerable importance to the district is the recent reduction in freight rates on ores to the Trail smelter. The rate on ore valued at $30 a ton is now $6.50 a ton from Smithers to Trail. This rate rises to $7.50 a ton in the case of $50 ore and is $10 a ton in the case of $100 ore. This rate was announced by the Canadian National Railways as being effective from August 2nd. This reduction, taken in conjunction with the fact that the Consolidated Mining and Smelting Company of Canada now accepts concentrating-ores, is of signal service to the mining industry.

The writer desires to express his thanks to the prospectors, operators, and mining men of the district for the many courtesies extended.

Lode-mining.

Steady operations were carried on by Duthie Mines, Limited, at the *Henderson* mine on Hudson Bay mountain. Shipments of lead-zinc ore of high silver content were continued at the rate of between 150 and 200 tons a month, and reached a total for the year of 1,678 tons. An active development campaign is also in progress. Shipments were also made from the following properties: *Silver Cup*, Nine-mile mountain, Hazelton, 60 tons (silver-lead-zinc); New Hazelton Gold Cobalt Mines, Limited, Rocher Déboulé mountain, Hazelton, 25 tons (gold-arsenic); *Fiddler* group, Knauss creek, Dorreen, 97 tons (gold, with small values in silver and lead).

Active development was carried on at the Schufer property, Hudson Bay mountain, by the British Canadian Silver Corporation, Limited; the Cassiar Crown Mining Company on Grouse mountain; at the mica properties on Mica mountain, near Fort Grahame, by the General Holding Company. All these have employed crews of from ten to twelve men.

An option was secured during the summer by Henry Lee Messner, representing New York interests, on several properties in the Babine mountains—namely, the Babine Silver King Mining Company (sixteen claims), *Hyland Basin* group (six claims), *Victoria* group (six claims), *Little Joe* group (seven claims), and *Silver Saddle* group (twenty-three claims). Small-scale operations were started on these properties.

Towards the end of the year options were secured on the *Red Top* group, Topley, by the Standard Silver-Lead Mining Company; on the *Seven Sisters* group, Seven Sisters mountain, Cedarvale, by D.W. Mines, Limited; on a number of claims surrounding the *Red Top* group, Topley, by Porcupine Goldfields Development and Finance Company, Limited. In the last two cases winter quarters were erected and development commenced.

Among other properties which were the scene of considerable small-scale activity may be mentioned *Silver Cup*, *Sunrise*, and *American Boy* (all on Nine-mile mountain, Hazelton).

W. S. Harris and Al. Harris, of the Northern Prospecting and Development Company, were in charge of the first two mentioned, and H. A. Harris carried on development under contract at the last mentioned. At the *Valhalla* and *Kleanza* groups (Usk), at the *Cordillera* group (Usk), and at the *Venus* group (Mineral hill) a certain amount of development beyond assessment-work was carried out.

At the *Red Top* group, Topley, which has attracted so much attention, F. H. Taylor, the discoverer, employed two men, besides himself, constantly from date of discovery in June until the end of October. Valuable development-work was accomplished. On the *Killarney* claim, in Brian Boru basin, Rocher Déboulé mountain, John Creagh, the owner, displayed great energy in building a new trail and cabin, besides much development-work. At the *Brunswick* group, Rocher Déboulé mountain, the owner, J. Miller, worked all last winter on his property and intends doing so this winter. Single-handed, he is erecting a small aerial tram to facilitate ore shipment.

In the Cariboo and Quesnel Mining Divisions considerable interest has been evinced in the quartz veins. In the Quesnel Mining Division, on Black Bear creek, there are a number of wide quartz veins containing in places lenses of galena. An attempt is being made by P. Harrington to hand-sort and ship a galena product. On Yanks peak Talbot & Larsen worked all season on their gold properties.

Placer-mining.

Cariboo and Quesnel Mining Divisions.—A feature of placer-mining was the operation of the Kafue Copper Development Company's dredge on Antler creek. A number of unfortunate accidents occurred earlier in the season, but later on the dredge was digging a portion of the creek, which is very rich, and which the "old-timers" were unable to drift. It is stated that in one month $38,000 was recovered.

The results obtained by B. Boe, operating the property of the Cedar Creek Mining Company under contract, were distinctly spectacular. The rich ground encountered was immediately below or north-west of the "Nugget Patch." It is stated that in one week 651 oz. gold was recovered, one nugget weighing 17 oz. This property is operated by the "pump hydraulic" system.

So far as hydraulic operators were concerned, good water-supply was available for the spring run, but cold weather in September greatly curtailed the fall run. Chief among this class are the John Hopp Mines on Lowhee creek and the *Kitchener* on Keithley creek. Each piped off about 600,000 cubic yards.

The Consolidated Mining and Smelting Company of Canada started work in October, with a force of men under R. B. Shelledy, on the H. C. Carry leases, upper Antler creek.

A large number of small operators at various points displayed their usual energy. In certain cases considerable ingenuity has been shown in constructing efficient plant with makeshift material and limited means. These small operations are frequently of real value in indicating what can be done by larger judicious expenditure of capital.

Omineca Mining Division.—In February, 1926, with the joint aid of the Departments of Mines and Public Works in improving the trail, G. W. Otterson endeavoured to get to Manson creek from Vanderhoof with seven sleighs loaded with new placer-mining machinery, hauled by a Fordson caterpillar tractor. Unfortunately, owing to the very mild winter and early melting snow, it was not possible to get farther than about 100 miles north of Vanderhoof. The machinery had to be left at that point, and it is understood that when fall snow permits the expedition will start again. Another attempt was made by J. Ogilvie during the summer to haul equipment in wagons over this route to Manson creek. No word has come to hand as to what success was met with.

Coal-mining.

With the aid of the Department of Mines, a number of improvements were made during the year to the road between the Goat Creek Colliery of Telkwa Collieries, Limited, and Telkwa, a distance of 5½ miles. This enables shipments to go forward by motor-truck instead of by sleighs as heretofore, and, it is hoped, will enable the colliery to operate the year round. A small force of men on development yields sufficient coal to supply the local market. The output for the year was 1,260 long tons.

The Peace Canyon Mining and Transportation Company, Limited, is engaged in developing the Gething coal leases at the Rocky Mountain canyon on the Peace river. The Dominion

Government has, it is understood, promised assistance in clearing the channel in the canyon up to the company's bunkers, and when this is done it is hoped that it will be possible to commence shipments to Peace River, which is served by the Edmonton, Dunvegan & British Columbia Railway.

Production.

Lode Mineral.—The following is a list of the shipping properties in District No. 2 and their outputs for the year 1926:—

Name.	Ore mined.	Gold.	Silver.	Lead.	Zinc.
	Tons.	Oz.	Oz.	Lb.	Lb.
Henderson	1,678	283	232,875	611,136	503,295
Fiddler group	97	81	446	7,259	.....
Silver Cup	60	.....	5,700	27,000	.....
Hazelton View group	25	75	.....	.....	.....
Seel	1	.....	32	236	.....
Totals	1,861	439	239,053	645,631	503,295

Placer.—The placer output of the district for the year 1926 was 17,355 oz. gold, valued at $295,028, as compared with $210,098 in 1925.

Non-metallic Minerals.—A shipment of 120 tons of silicate of alumina to Vancouver was made from a deposit on Borland mountain, near Williams Lake, by B. A. Cunliffe.

Coal.—The output of coal was 1,260 long tons, all from the Telkwa Collieries, Limited.

Roads and Trails.

Very generous assistance was given during the year by the Department of Mines in connection with the construction of roads and trails at all points of the district.

While the most sympathetic attitude is evinced by the Department of Mines in the matter, applicants are urged to bear in mind that funds available under the "Mines Development Act" are comparatively small, having regard to the demands upon them. Further, while new and promising sections in this district have been opened up during the year as the result of assistance given, there are many other promising sections throughout the Province generally. All such are entitled to, and must receive, due consideration.

Among the major items in connection with grants for roads and trails may be mentioned the following:—

Peace River Mining Division.—Road to coal property of Peace Canyon Mining and Transportation Company.

Omineca Mining Division.—Trail to General Holding Company's mica property on Mica mountain, Fort Grahame; sleigh-road from Vanderhoof north towards Manson Creek; Nine-mile Mountain road from Hazelton; road from Smithers to Hudson Bay mountain (Duthie Mines road); road from Telkwa to Telkwa Collieries, Limited; trail from Kimsquit towards Tesla mountain.

Cariboo Mining Division.—Hixon Creek road; Cunningham Creek road.

Quesnel Mining Division.—Road from Likely to Cedar Creek; main road, Likely to Keithley.

In the majority of cases expenditures were for repairs or improvements to existing roads or trails.

In addition to the foregoing, assistance was given in connection with numerous trails throughout the district.

New Discoveries.

In so far as they have been examined, a full report of all new discoveries will be found in the body of this report. Mention of them is here made to facilitate reference.

The most important discovery of the year is the *Red Top* group at Topley, a mineralization of essentially silver and gold values. The deposit of galena at the *Ferguson* group, on the Ingenika river, and H. Ravenal's discovery of mica on Mica mountain are also to be considered as important. Besides these may be mentioned a showing of tungsten ore (scheelite) at the *Red Rose* group, Rocher Déboulé mountain. There has also been reported the discovery of a

bed of volcanic ash 7 miles from Engen (a station on the Canadian National Railway about 12 miles west of Vanderhoof). This has not been examined.

PROSPECTING.

In the Annual Reports for the years 1917, 1921, and 1923 very full general information will be found on the subject of prospecting, likewise a detailed account of the physiographic and geologic features of the district. These reports should be carefully studied by those interested. Information of the utmost value will also be found in "Geology and Economic Minerals of Canada," by G. A. Young, published by the Geological Survey of Canada. The discovery at Topley is an outstanding example of what may be found in areas more immediately adjacent to transportation. The importance of thoroughly prospecting such before going farther afield has been very frequently mentioned in these reports, and it is desired to again emphasize this.

It is highly advisable to take immediate advantage of the clues afforded by the developments and discoveries of the past season, which clearly indicate the importance of two regions, namely:—

(1.) That portion of the Nechako plateau lying between Babine lake, from Newman peninsula to the south end and the Canadian National Railway, an area of upwards of 2,000 square miles.

(2.) The Pre-Cambrian strip in the Rocky Mountain trench in the centre of which is Fort Grahame, on the Finlay river.

Both regions are important, but the first mentioned possesses the enormous advantage of comparative nearness to transportation, and is, moreover, approximately level. The second mentioned is very severely handicapped by its great distance from a railway-line and entire absence of communication facilities, other than existing waterways, which leave much to be desired.

Too much attention must not be paid to the exact definition of boundaries as given above. Promising indications must naturally be followed. Thus, in No. 1 area for some distance north of the lake would appear to be promising, likewise perhaps also for a certain distance south of the railway-line.

No. 1 area is composed largely of Tertiary volcanic rocks with some sediments and intrusions of batholithic rocks. It is a plateau lying at an elevation of about 3,000 feet and dissected by numerous dry gullies and some creeks, but not to any great depth. It is in many regions, as near Topley, heavily overlain by glacial drift, which probably reaches a depth of 30 or 40 feet in places, and perhaps may be even deeper. It should be understood that the western boundary of the Nechako plateau, north of the Canadian National Railway, is given very closely by a line drawn due north through Houston to the 55th parallel of north latitude, which parallel forms the northern boundary of the plateau, which extends easterly to the Rocky mountains. The *Red Top* group near Topley is well within the plateau.

It would appear highly advisable to prospect the region within, say, 10 miles of the *Red Top* group intensively, in the hope of discovering a similar showing. While this region is heavily overlain with glacial drift, there are creeks and gullies which should be sought for the same kind of rock in which the *Red Top* mineralization occurs. It may be useful to remember that the trend of mineralization is approximately N. 45° W. (mag.), but of course the width is quite unknown. In this more or less local search for a particular kind of rock, in contradistinction to a general search throughout the entire region described, one fact is worth noting. Andesite and baser volcanic rocks outcrop to the east and south of the *Red Top* group, wherefore it may be assumed that the sought-for rock is most likely to be found to the west and north of the *Red Top* group. For this reason, Mackaboy creek, about 1 mile east of Perow and perhaps 6 miles west of Topley, is a good starting-point, as rocks are well exposed on both sides. It might also be noted that batholithic rock (granodiorite) outcrops on the *Beaver Dam* group, on the West fork of Findlay creek. This group is also known as "Findlay's Discovery."

Considering the question of a general prospecting of the entire area described: Access to the region is given by two wagon-roads, which run from Canadian National Railway points in a northerly direction to Babine lake, one from Topley to the mouth of the Fulton river and the other from Burns Lake. A boat or canoe obviously affords a ready means of examining the south and north shores of the lake.

The prospector should consider the outcrops of batholithic (granitic) rocks as his beacon-lights, for it is in the vicinity of the contact of such with the volcanics that mineralization is

most likely to be found. Much time, therefore, should be saved by a fairly rapid preliminary prospecting with a view to locating such batholithic intrusions as are not already known. The finding of any such should of course be followed by a closer search in the more immediate vicinity for actual showings of mineral. During the preliminary search a sharp outlook should be kept for any exposures of the same kind of rock in which the *Red Top* mineralization occurs. Prospectors will do well to first of all have a look at the exposures of this rock on the *Red Top* group.

The mantle of glacial drift must not deter close search, because the country has been heavily glaciated and only the stumps of mountains are left, which are largely covered with drift. From such outcrops of batholithic rocks as are known it seems entirely reasonable to suppose that if the mantle of drift were removed a region of general geologic promise would be disclosed. But very obvious or prominent outcrops must not be expected and more than casual scrutiny will be required. This region would also appear to offer a field for electrical prospecting.

It will be helpful to enumerate the localities in the region where outcrops of batholithic rocks are known to occur. The largest known outcrop is at the south end of the lake, extending from the north shore for some considerable distance inland. About half the surface of Silver island (about 9 miles from the south end of the lake) is composed of a dark-green coarsely crystalline diorite. Outcrops of batholithic rock are also said to occur on the north shore of the lake at various points between the south end and Wright's bay. McDonald island (about 12 miles north-west of Wright's bay) is largely composed of batholithic rock. There is also an outcrop on the extreme western border of the Nechako plateau, about 20 miles due north of Houston and a few miles back from the south shore of the lake. Finally, there is the outcrop previously mentioned on the *Beaver Dam* group, somewhere about 3 miles west of the *Red Top* group. It should be understood, of course, that these eruptive batholithic rocks are to be regarded as the sources of mineralization in the region.

It may also be of assistance to mention the points in the area at which showings of mineral are known to occur, in addition to Topley.

On Newman peninsula (chalcopyrite and zinc-blende); on McDonald island (copper minerals); opposite Marble point, some 3 miles back from the shore of the lake (galena); on Silver island (Silver Island Mining Company, silver minerals); on Anderson creek (Taltapin Mining Company, silver-lead-zinc); *Lakeview* group (formerly *Three Lakes* group),.5 miles north of Knockholt (chalcopyrite); just south of Decker Lake, *Golden Glory* and adjoining claims (chalcopyrite, with some zinc-blende). Somewhat south of the described region, but in one well worth prospecting, are the *Silver Queen*, *Diamond Belle*, and *McLean* groups in the vicinity of Owen lake, 28 miles south-west of Houston. The minerals on these three last-mentioned properties are chalcopyrite, zinc-blende, and galena.

In brief, here is an area, reasonably adjacent to transportation, containing numerous outcrops of batholithic rocks, which is likely to well repay the persistent search necessary owing to the mantle of glacial drift. It is also worthy of note that it contains, from all accounts, an ideal site on the Fulton river for the development of hydro-electric power of very considerable amount.

It is not a digression to remark that black-flies and mosquitoes are particularly bad in this region, especially during the period June 15th to August 10th. Prospectors are warned not to come into this region without a plentiful supply of "fly dope." A fly-proof tent is likewise essential.

A detailed account of the No. 2 area—namely, Pre-Cambrian strip near Fort Grahame—and of the means of ingress and egress will be found under "Fort Grahame Section." It is here merely desired to point out that it is a very promising region in which to prospect for lead-zinc deposits, mica, and probably for asbestos also. There is also a large area to the west and south-west of this strip which is obviously to be considered as of great general geologic promise. Unfortunately this region is very severely handicapped owing to its inaccessibility and lack of transportation facilities. Indeed, under present conditions, the operation of a base-metal mine would appear to be well-nigh hopeless. It is of course quite possible that development of a base-metal property might disclose such promise as to warrant, in conjunction with other considerations, railway transportation. Indeed, the prospects of discovering a large surface showing of galena and zinc-blende are distinctly hopeful, owing to the analogy between this area

and that in East Kootenay, which has produced the famous *Sullivan* and other lead-zinc mines of that district.

The outlook, so far as the operation of a mica-mine under present conditions is concerned, is much more promising. The product to be shipped out is relatively light and recent discoveries demonstrate that prospects of discovering mica of commercial grade are distinctly good. Mica discoveries so far have been on Mica mountain, just west of the Finlay river in the more immediate vicinity of Fort Grahame, in biotite mica-schist interbanded with gneissic rocks.

Freight and Smelting Rates.

The attention of prospectors and all interested is especially drawn to the fact that highly favourable railway freight and smelting rates now prevail. Particulars of the recent reduction of railway freight rates is given in the "General Summary" at the commencement of this report. In connection with the fact that the Consolidated Mining and Smelting Company of Canada, Limited, now accepts concentrating-ores, information as to the method of settlement will be found on page 120 (bottom of page) of the 1925 Annual Report.

The smelting schedule for lead ores is especially favourable in the case of ores of high silica or lime content and of low sulphide content, containing main values in precious metals. In such cases the smelting rate generally works out at about $5 a ton. In certain cases special rates are quoted, as, for instance, the ore from the *Fiddler* group, Dorreen. This ore consists essentially of quartz, with small percentages of galena and blende and main values in gold. Calculated strictly according to schedule, the smelting rate would be $4.75 a ton. A flat rate of $3 a ton was recently given the operators by the Consolidated Mining and Smelting Company of Canada, Limited. This rate is believed to constitute a low record for lead ores.

It is evident, therefore, that both in transportation rates and smelting rates every encouragement is being given to the mining industry. It is hoped that these favourable conditions will be the means of stimulating many prospectors and small-scale operators to make an effort to ship. Many small high-grade properties can be operated by the owners far more cheaply than by a company.

Note re "Gross Value."

It is apparent that statements setting out the "gross value" of ores expressed in dollars and cents are the cause of much misunderstanding and erroneous ideas. It is quite natural for those unfamiliar with ore valuation to assume that by deducting the combined freight and smelting rates (usually known fairly closely) from "gross values" the net value of the ore to the owner is arrived at. Such is far from being the case. Almost without exception, statements showing "gross values" are computed on the basis of New York lead quotations and St. Louis zinc quotations, and are mainly of use for statistical purposes. They can very rarely indeed be applied in ore valuation. In this country smelting and treatment rates are based upon London lead quotations less 1¼ cents a pound in the case of lead ores, and upon London spelter quotations less 2½ cents a pound in the case of zinc ores. Further, it must be borne in mind that smelting rates also depend upon analyses; each ore differs in this respect; consequently the smelting rate varies in each case.

In the case of concentrating-ores it is usually only possible to make an intelligent guess at values until an actual milling test has been made, because it cannot be foretold with accuracy what respective percentages of precious metals present will be found in each class of concentrates made, and the value of precious metals expressed in dollars and cents depends upon the class of concentrate containing these precious metals.

Statements showing *ultimate* gross values, such as those referred to, might properly be qualified by the endorsement: "For statistical purposes only. Not to be used for ore valuation." Those wishing to have values shown in percentages and ounces to the ton on assay certificates, translated into dollars and cents, are advised to communicate with the Resident Engineer.

Addresses.

During the winter addresses are usually given at various centres throughout the district on matters connected with developments and prospecting, for the purpose of disseminating information helpful to prospectors and others interested in mining in the district.

OMINECA MINING DIVISION.

Skeena Section.

Zymoetz (Copper) River.

Dardanelles. This property, situated on the Zymoetz river (or Copper river, as it is locally known), 14 miles from Copper City, is owned by A. Carmichael, who reports favourable results from the season's work. An account of this property will be found in the Annual Reports for the years 1914, 1918, and 1921.

Snowflake. This property is situated at the head of the Kitnaiakwa river, some 40 miles from Copper City. The owner, J. Gabriel, reports having worked on his property during the year. An account of this property will be found in the Annual Report for the year 1921.

Vanarsdol.

Silver Bow. This group is situated on Kleanza mountain at an elevation of about 2,000 feet, and was the scene of a discovery of a small vein of mixed galena and blende, of good silver grade, last year. Since then the owners, W. E. Vanmeter and A. Clore, have sunk a shaft 25 feet deep, with unfortunately disappointing results, the more solid sulphides showing near the surface becoming more scattered and finally pinching out almost entirely at the bottom, at which point a crosscut was run out from the hanging-wall a distance of 16 feet. There is every indication that slight faulting has taken place, and that if the shaft were continued downwards with a slight offset to the hanging-wall of perhaps 8 feet, vein and ore might be picked up again. The owners were advised to do this, but it is not known whether they did so or not. A description of this property will also be found in the Annual Report for 1925.

Terrace. This group, owned by Geo. Little, is situated on the south side of the Skeena river, about 1½ miles from Vanarsdol, on the slope of Kleanza mountain facing the river. Showings are at an elevation of approximately 1,400 feet, or 1,150 feet above the river. The property lies just south and somewhat below the *Silver Bow* and *Silver Cliff* groups, which latter again lie just south of and below the *Valhalla* group. The foregoing all lie at or in the immediate vicinity of the contact of the Coast Range granodiorite with the volcanics of the Interior. The showings on the *Terrace* group lie wholly within the coastal batholith.

At the time of inspection (in March) there was exposed at an elevation of some 1,400 feet, by means of a small shaft and surface-stripping, a quartz vein some 18 inches in width, fairly well mineralized with galena and blende. The strike of the vein is N. 35° W. (mag.), with flat dip of from 20° to 30° to the north-east. Some 50 feet or so vertically below this exposure a crosscut tunnel is run from the surface a distance of 75 feet in batholithic rock with the view of penetrating the vein. The latter had not been met with and the crosscut had been discontinued at the time of inspection. A draw within a very short distance of the crosscut would appear to render crosscutting unnecessary at this horizon, inasmuch as the vein must cross this draw, if it exists. The side of the draw should be prospected to ascertain this latter point.

Samples taken of selected pieces of galena and zinc-blende showing on the surface disclosed low silver values. Assays were as follows:—Selected piece of zinc-blende: Gold, trace; silver, 0.4 oz. to the ton; lead, 0.5 per cent.; zinc, 50 per cent. Selected piece of galena: Gold, trace; silver, 5.2 oz. to the ton; lead, 28 per cent.; zinc, 10 per cent.

A region of general geologic promise, nearness to transportation, and low elevation are factors which justify search by the owner for other and more encouraging showings of mineral. It is strongly advised that no deep development be attempted until the surface has been more thoroughly prospected. The vein already exposed might well be followed up, if possible, on the surface in the hope that mineralization will be more favourable at some other point. An excellent small cabin has been erected by the owner on the property.

Usk.

Cordillera.—On this property, owned by the Kitselas Mountain Copper Company, a drift was run south on the No. 2 blind vein for 100 feet, with, it is stated, promising results.

Valhalla.—Under the supervision of J. Willman, four men were employed at this property during the summer and some 42 feet of drifting was accomplished.

On the *Lucky Jim*, *Marcena*, and *Diadem* groups a certain amount of work was carried out by the respective owners. For descriptions of these properties *see* Annual Reports for the years 1923 and 1925.

Chimdemash Creek.

The owners of the *Silver Chloride* group in the O.K. range, E. Drake and J. Hamblet, report promising results from the year's assessment-work.

On the *Silver Basin* and *Silver Crown* groups J. D. Wells, owner, performed assessment-work, as did also A. A. Stewart on the *Coffee Pot* group. Descriptions of the three last-mentioned properties will be found in the Annual Reports for 1923 and 1925.

Legate Creek.

There are mineral-showings of promise on various properties at the head of this creek. A fairly full description of these will be found in the Annual Report for 1925. Pacific, a divisional point on the Canadian National Railway, is the town from which all Legate Creek properties may be readily inspected. An excellent pack-trail 12 miles in length, with a grade of but little over 100 feet of rise to the mile, leads to the head of the creek from the south side of the Skeena river, which is crossed by ferry.

No developments of importance have been reported during the present year. It is understood that the *Zona May* group was inspected by representatives of the Hooper-Davis Syndicate.

Seven Sisters Mountain.

Seven Sisters. This group, owned by Steve Young and distant 8 miles from Cedarvale, on the Canadian National Railway, was taken under option late in the season by D.W. Mines, Limited. Governor D. W. Davis, of Washington, D.C., is president; Frank F. Maxwell, of Washington, D.C., is secretary-treasurer; and S. W. Taylor, of Prince Rupert, B.C., is assistant secretary. With the aid of the Department of Mines, improvements were made in connection with the trail from Cedarvale. Winter quarters to accommodate a small force of men were erected on the property and preparations were made to operate all winter.

A description of this property will be found in the Annual Report for 1925. There is disclosed on the surface mineralization of nice clean galena with pyrite, pyrrhotite, and zinc-blende, showing high silver values in the galena. This augurs well for future development and the type of mineralization is such that it may be expected to continue to considerable depth.

Fiddler Creek.

Fiddler. Work at this property was resumed during September by J. W. Tredway with a force of three men. Operations were confined entirely to stoping from the surface above No. 1 tunnel and shipping a hand-sorted product. Unfortunately, after barely two months' work, operations had to be suspended owing to the bad condition of the wagon-road entirely preventing hauling. In this short space of time, with a force of only four men in all, the small aerial tram on the property was overhauled and equipped with a steel cable, and upwards of 100 tons of hand-sorted ore was mined, hauled to Dorreen, and shipped. A commendable achievement and an example of what the owners of many properties can accomplish.

The character of this ore is essentially quartz with small percentages of galena, zinc-blende, and a very little copper pyrites. The principal values are in gold. Smelter returns of the first car shipped (35 tons dry weight) showed the following assay results: Gold, 1.28 oz. to the ton; silver, 5.3 oz. to the ton; lead, 6.1 per cent; zinc, 3.8 per cent. Returns of remaining cars are not known at present. The very favourable smelting rate of $3 a ton flat was given by the Consolidated Mining and Smelting Company of Canada. A full account of this property will be found in the Annual Reports for the years 1916 and 1925.

HAZELTON SECTION.

It is a matter for very keen regret that the *Silver Standard* mine remains inoperative year after year, in spite of its very favourable situation and the favourable metal markets and freight and smelting rates now prevailing. While the writer is unable to write from first-hand knowledge, competent opinion will undoubtedly support the view that this property is likely to

well repay intelligent development. Its idleness is undoubtedly a real loss to the district and it is to be hoped that 1927 will witness the resumption of operations.

Frequent mention of properties in the Hazelton section will be found in previous Annual Reports. In the 1914 Annual Report is a very clear sketch-map. A very full account, with numerous maps, is also to be found in Memoir 110 of the Geological Survey, by J. J. O'Neill.

Nine-mile Mountain.

Small-scale operations were carried on at the *Silver Cup*, *Sunrise*, and *American Boy* properties under the direction of W. S. Harris and associates.

Silver Cup. Operations comprised stoping, development-work, and erection of a small aerial tram 1,900 feet in length from No. 2 tunnel to the camp. The ore shipped was obtained from the foot-wall of No. 1 tunnel and also from an intermediate level 34 feet (on the pitch of the vein) below No. 1 tunnel. Development-work comprised the connection of the intermediate level with Nos. 1 and 2 tunnels by raises.

Sunrise. Development-work has been carried on at this group, consisting of the driving of a crosscut tunnel to penetrate the main surface showing at a depth of about 250 feet. This crosscut has been driven a distance of 400 feet and it is proposed to continue it another 300 feet. A small portable gasolene-driven air-compressor has been taken to the property for the purpose of continuing the crosscut with an air-drill. Al. Harris is in charge of operations, which will be continued during the winter.

American Boy.—The main shaft on this property was sunk a distance of approximately 50 feet to the 300-foot level. The work was carried out by H. A. Harris under contract.

Rocher Déboulé Mountain.

New Hazelton Gold Cobalt Mines, Ltd.—Resulting from development-work carried out last year, 25 tons of ore was packed down from this property and shipped during the summer. No actual mining operations were undertaken.

Brunswick. This group, owned by J. Miller and situated at the head of Balsam creek, was described in the 1925 Annual Report. Since then no actual mining operations have been undertaken, the owner having devoted his energies to the construction of an aerial tram 750 feet in length to facilitate shipment of ore he has sacked up. Erection of the tram has involved a considerable amount of excavational work to accommodate the terminals. As usual, the owner is working hard this winter. The erection of an aerial tram single-handed during the winter on Rocher Déboulé mountain calls for the display of no small amount of ingenuity and perseverance in the face of hardship. Much credit is due J. Miller.

Red Rose. A reported showing of tungsten at this property was inspected during the year. It is situated on the north side of Balsam creek, above and adjoining the *Brunswick* group, and is owned by C. Ek and C. Peterson. The main vein, which in its lower horizons carries gold-copper values, apexes on a shoulder of the mountain at an elevation of approximately 6,400 feet, wholly in granodiorite. The vein at this elevation is at least 12 feet in width, striking N. 75° W. (mag.) and dipping south-west at about 45°. It has been exposed at two or three points over a length of perhaps 600 feet, the exposures being all at approximately the same level. Both sides of the mountain shoulder mentioned are steep and the vein passes completely through it. Where exposed at the apex the vein consists essentially of quartz. At two points, about 500 feet apart, the quartz showed quite appreciable amounts of wolframite and scheelite, but it appeared to occur in bunches and its was impossible to assign any definite width to the occurrence. A sample of selected piece of quartz showing tungsten minerals assayed 5.2 per cent. of tungstic oxide. Exposures are insufficient to form an opinion as to commercial possibilities. It is noteworthy, however, that the *Red Rose* main vein in its upper horizons can be developed by drifts from the surface. The highest tunnel in the old workings is at 5,700 feet approximately.

Full accounts of the older workings will be found in the Annual Report for 1914, and in Memoir 110, by J. J. O'Neill, published by the Geological Survey.

MacDonald Properties. The *Black Pilot*, *Long and Deep*, *Squire*, and *Katherine* claims are situated at the headwaters of Porphyry creek and are owned by Dan MacDonald. They are distant from Hazelton about 17 miles and are reached by a branch trail near the top of Mud Creek hill on the Hazelton–Smithers main road.

The first three mentioned claims are on the north side of Porphyry creek and the *Katherine* is on the south side of this creek. All are situated in the immediate vicinity of the contact of the granodiorite batholith with the volcanics of the Hazelton series. Injection tongues from the batholith outcrop on the *Black Pilot*. In one of these tongues were noted small veinlets, about an inch or so in width, of arsenopyrite.

On the *Black Pilot*, at an elevation of 5,000 feet, a shaft is sunk at an angle of about 20° in a northerly direction (mag.) to a depth of 45 feet, following an iron-stained seam about 2 feet in width. The country-rock is andesite. The owner expected that values in tin would be found in this seam, but assays of samples taken both by the owner and writer failed to show any tin or any values in gold or silver. Assay of a sample of arsenopyrite taken from a veinlet in one of the batholithic tongues referred to assayed: Gold, 0.18 oz. to the ton; silver, 0.03 oz. to the ton.

It might be mentioned that traces of tin were found in ore from the *Delta* group on this mountain by J. J. O'Neill, and it is quite possible that similar traces might be found at other points, but this would appear to be purely a matter of scientific interest.

On the *Katherine* claim there is exposed at an elevation of 3,900 feet on the steeply sloping south bank of Porphyry creek a shear-zone about 6 feet wide in andesite. The strike is N. 45° E. (mag.), with steep north-westerly dip. The filling is mainly country-rock with seams of barytes and very small amounts of zinc-blende. Some selected pieces of the latter assayed: Gold, trace; silver, 1.5 oz. to the ton; zinc, 9 per cent. At the request of the owner this sample was assayed for tin, but showed no trace of this metal.

None of the showings on these claims is very encouraging. At the same time the region is undoubtedly of general geologic promise.

Brian Boru. This group consists of nine claims, of which two are Crown-granted, and is owned by J. Creagh and J. Dunbar. It is situated at the head of Brian Boru creek, Rocher Déboulé mountain, and is distant between 11 and 12 miles from Skeena Crossing Station on the Canadian National Railway. The property is reached by following the Rocher Déboulé wagon-road up from Skeena Crossing for a distance of about 6 miles at which point a trail some 4½ miles in length follows Brian Boru creek up to J. Creagh's cabin, which is situated at an elevation of 3,860 feet on the South fork of Brian Boru creek. This cabin and upwards of 2 miles of new trail, which diverges from the old trail near the forks of the creek, were constructed this year by J. Creagh. This cabin is situated at a convenient point, whence the *Brian Boru* group and the newly discovered *Killarney* claim can be readily inspected.

Brian Boru creek has two forks of approximately equal length, which unite to form the main creek about 1½ miles from their heads. At the head of each fork is a glacial cirque or basin. These two basins, which are known respectively as the North and South basins, immediately adjoin and are separated only by a comparatively narrow spur which runs out from the main mountain. The two forks of the creek are likewise known as the North and South forks respectively, and it may be noted that formerly a cabin was constructed at the head of the North fork, up which a trail was built. This camp has now been abandoned in favour of the more convenient South Fork cabin and route thereto described.

The most important mineral-showing on the property has been exposed by natural agencies on the steep south slope of the North basin in the stratified volcanics. A red-stained band of rock, averaging perhaps some 10 feet in width, extends in a north-easterly direction for some hundreds of feet and forms a prominent feature of the landscape. The sides of the basin are precipitous in places and access to the mineralization cannot be gained at all points. Where accessible, the mineralization appears to consist largely of massive zinc-blende and pyrrhotite, shown by assay to be of low silver content. At an elevation of 5,250 feet there is exposed a width of 4 feet of solid zinc-blende and pyrrhotite and iron pyrites, a sample of which was found to assay: Gold, trace; silver, 5.2 oz. to the ton; lead, *nil;* zinc, 20 per cent.

The strike of this mineralization is north-easterly and the dip to the north-west at flat angles, not over 10° in places. Close to the point at which the above sample was taken a crosscut has been run a distance of 30 feet, passing through the mineral and for some distance into the foot-wall.

The rocks composing this spur have been classified by the Geological Survey as "stratified fine- and coarse-grained volcanics, with some flows." The mineralization appears to occur either at or near the contact of andesitic volcanics with rhyolitic volcanics, the former occupying the

upper portion of the spur and the latter the lower portion. The latter appear in places to be sparsely pyritized over considerable widths, but the trend of mineralization is indefinite. In this region, at an elevation of 4,900 feet, a sample of rhyolitic volcanic rock was taken over a width of 8 feet, which assayed: Gold, trace; silver, 2 oz. to the ton. At 4,800 feet elevation a tunnel has been run a distance of 75 feet in the rhyolitic volcanic in a southerly direction without disclosing anything of importance.

On the north slope of the South basin there is another exposure of zinc-blende at an elevation which suggests, as the owner thinks likely, that it may be the apex of the vein exposed in the North basin and above described. This is a point worth bearing in mind by examining engineers. It may be noted that this mineralization occurs within about half a mile of outcropping granodiorite.

Time did not permit of inspection of certain other ore-exposures in the South basin, which have apparently no connection with that above described and which are understood to be of relative minor importance. One small vein at an elevation of 5,275 feet in the South basin was, however, inspected. It occurs in andesitic volcanics, strikes N. 50° E. (mag.), dipping northerly, and is exposed by an open-cut. A sample of picked ore assayed: Gold, trace; silver, 21 oz. to the ton; lead, 12 per cent.; zinc, 8 per cent. It is said that this vein can be traced on the surface for a considerable distance. It is stated that there are exposures of arsenopyrite on this property. Time did not permit of inspection.

The *Brian Boru* group exhibits a strong exposure of zinc blende-pyrrhotite ore of low silver content, and as such is commended to the attention of examining engineers. The property is reasonably accessible to the Canadian National Railway, possesses abundance of mine-timber, and a useful mine water-power can be developed on Juniper creek. Mention of this property, and also maps, will be found in the Annual Report for 1914 and also in Memoir 110 of the Geological Survey.

Killarney. The discovery on this claim was made by the owner, J. Creagh, during 1926. Exposures are within a few minutes' walk of the cabin on the South fork of Brian Boru creek. At an elevation of 4,125 feet on the left bank of the South fork of Brian Boru creek a number of open-cuts have been made by ground-sluicing what may be described as a steeply inclined muskeg fairly well timbered. These cuts extend over a distance of several hundred feet and disclose a superficial deposit of clay about 2 or 3 feet thick, which probably results from decomposition of underlying volcanics. Practically all cuts show small pieces of float consisting mainly of zinc-blende, pyrrhotite, pyrite, and a small amount of galena. The appearance of the float suggests that it has not travelled far and may come from a replacement deposit. Positive evidence of any mineral in place is so far lacking, but further work may disclose such and is clearly warranted. The volcanics outcrop in this region above timber-line, the strike being N. 80° W. (mag.). It is just possible that a replacement following the bedding-planes may exist below in the region being prospected, and the owner might bear this in mind.

One piece of float consisting of pyrrhotite and pyrite was found to assay: Gold, trace; silver, 2 oz. to the ton. Another piece, showing zinc-blende, assayed: Gold, trace; silver, 2 oz. to the ton; lead, *nil;* zinc, 9 per cent.

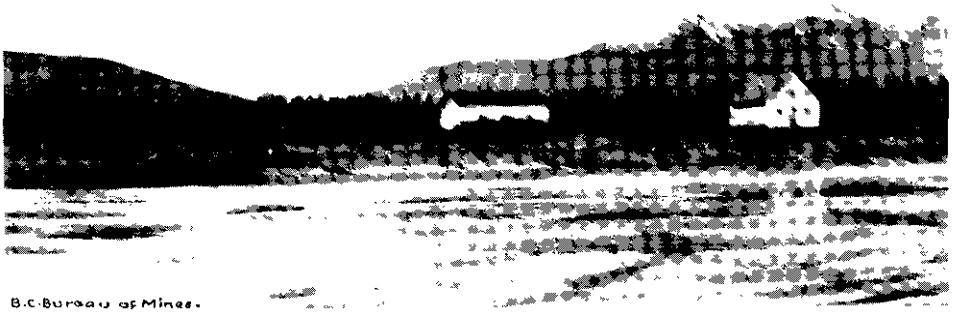
It is remarkable that this discovery should ever have been made in such a region. There appear to be no indications whatever pointing to the likelihood of its existence. It seems only possible to ascribe it to intuition on the part of the owner, to whom much credit is due for accomplishing much work single-handed.

Thoen Basin.

This basin is distant some 30 miles from Hazelton in the Babine mountains. Some work was done on the *True Fissure* group, owned by Gordon McLennan and J. A. Rutherford. Promising showings of galena and zinc-blende with high silver values are reported. A full description of Thoen basin will be found in the Annual Report for 1921.

Smithers Section.

This section has been added to the report this year. It includes all properties which are normally tributary to the town of Smithers, a divisional point on the Canadian National Railway, and situated on Hudson Bay mountain or in portions of the Babine mountains. These properties were formerly all included in Telkwa section.



Fort Grahame, B.C.

Sakumtha Pass, Kinsquit-Tesla Lake Route.

Hudson Bay Mountain.

The continued successful operation of the *Henderson* mine by Duthie Mines, Limited, has acted as a great stimulus to mining operations generally in the district. Active development of the Schufer property by the British Canadian Silver Corporation with a force of about twelve men was commenced in May and carried on until the fall, when operations were suspended for the winter.

Henderson. An average force of about forty men has been employed by Duthie Mines, Limited. Shipments for the year total 1,678 tons. An active development campaign has also been carried out, which has mainly comprised sinking a winze to a depth of 158 feet below the Compressor level, and running two intermediate drifts therefrom at points 32 feet and 131 feet respectively below the Compressor level. These distances are measured along the pitch of the vein. The winze was sunk between No. 2 and No. 3 chutes on the Compressor level; that is, at the south-western extremity of the ore region. Intermediate drifts follow the vein north-easterly. The upper intermediate had advanced a distance of 240 feet and the lower intermediate a distance of 185 feet at the end of October. The winze for the first 30 feet or so down to the level of the upper intermediate drift disclosed promising ore. The vein then flattened to 40° for the next 40 feet, then again steepened to about 60°, and mineralization improved. For the last 60 feet sunk ruby silver was persistent, although the percentage of sulphides present was not heavy. The bottom of the winze showed a promising appearance—a vein-width of 5 feet, with ruby silver quite prevalent in a somewhat sparse sulphide mineralization, the foot-wall being andesite and hanging-wall rhyolite; appearances suggested replacement mineralization at the contact of the two volcanics.

In the upper intermediate drift, in the region more immediately below No. 6 chute on the Compressor level, extremely rich ore was encountered; in one place a width of 10 inches of virtually solid ruby silver assaying several thousand ounces a ton in silver.

In the lower intermediate drift, so far, only the Fault Plane vein has been uncovered, and the foot-wall of this drift is being investigated to discover the Main vein.

As the result of developments to date, the conclusion arrived at by the management is that at the horizon of the Compressor level two veins have their junction at or near No. 6 chute, the Main vein and the Fault Plane vein. These veins diverge in a north-easterly direction. The Main vein is the foot-wall vein, with a steep, almost vertical, dip; the Fault Plane vein is the hanging-wall vein, with a much flatter dip. Ore in the former is very much better than that in the latter and stoping has been entirely confined to the Main vein.

It is evident that the method of ore occurrence at this property requires close study. The ore is "frozen" to the walls and filling and does not lend itself to stripping; consequently, until such time as a concentrator is warranted and in operation, excessive sorting by hand and slow mining are necessitated.

Schufer. This property, owned by P. Schufer and associates, is under option to British Canadian Silver Corporation, Limited. It is situated on the north-eastern slopes of Hudson Bay mountain at the head of Toboggan creek and is distant by wagon-road and trail about 9½ miles from Smithers. A good motor-road leads from Smithers to the commencement of the trail, a distance of about 5 miles.

Reference is invited to accounts of this property in the Annual Reports for 1916 and 1918. It is unnecessary to repeat in detail descriptive matter contained therein.

Important mineral-showings on this property occur on the *Iron Vault* claim. The country-rock is essentially volcanics of the Hazelton series, in which occur one or more beds of crystalline limestone. In the more immediate vicinity is an extensive outcrop of intrusive batholithic rock, determined as quartz diorite by the Geological Survey. Mineral occurrence is of two kinds:—

(1.) Bodies or lenses of zinc blende-pyrrhotite ore of low silver content outcrop strongly in a limestone-bed. The average width of the limestone-bed is about 60 to 65 feet.

(2.) A vein carrying in places galena and zinc-blende of very good grade in silver. This vein, striking N. 65° E. and dipping at about 60° to the south-east, crosses the limestone-bed, and on the surface, in the limestone, shows an outcrop of zinc blende-pyrrhotite dipping, like the vein, at about 60° south-east; whereas other outcrops of zinc blende-pyrrhotite dip north-east.

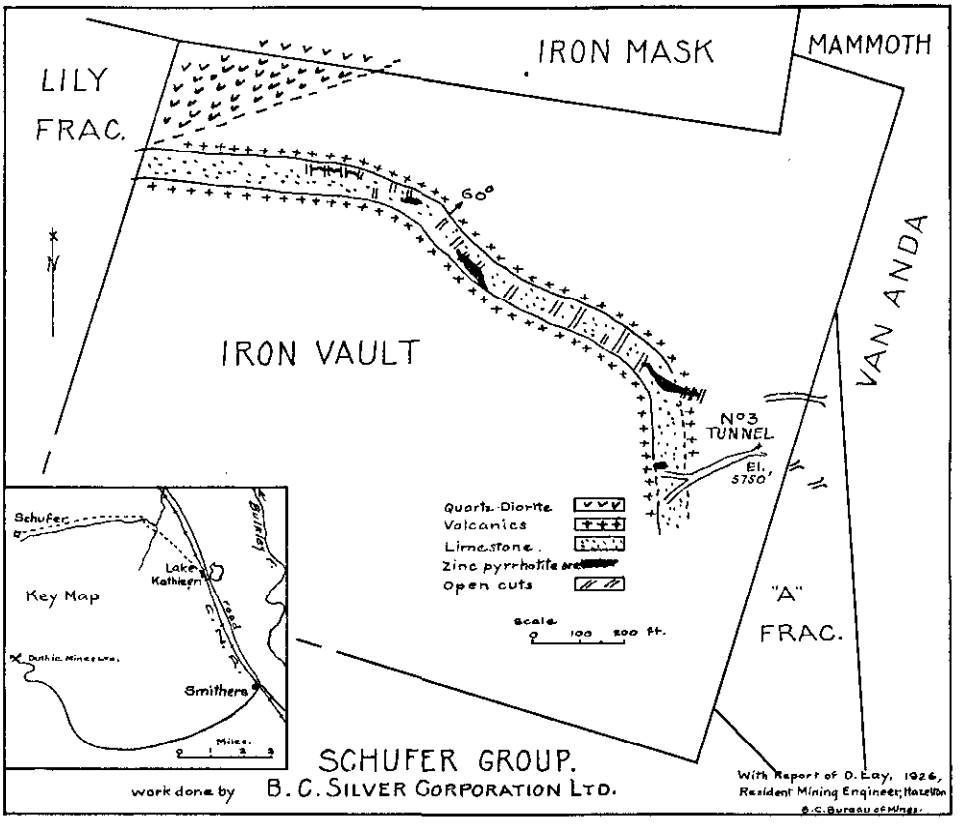
Development-work undertaken by British Canadian Silver Corporation had a twofold object:—

(1.) To ascertain the behaviour of the vein above mentioned in the limestone-bed below the zinc blende-pyrrhotite outcrop, by continuing No. 3 tunnel onward, more especially in the hope of striking shipping-ore.

(2.) To ascertain the continuity of the zinc blende-pyrrhotite outcrops by surface-trenching.

With the first objective in view, some 180 feet of drifting and crosscutting were carried out in No. 3 tunnel. The management states that there was evidence of considerable faulting and movement in the tunnel, and that the limestone encountered in the tunnel was considerably narrower than that on the surface. Early fall snows rendered it necessary to suspend operations for the winter, but it is understood that immediately before stopping a body of sulphides was encountered in this tunnel.

So far as the second objective is concerned, a large number of open-cuts on the surface demonstrates that the zinc blende-pyrrhotite ore seems likely to occur in lenses, although these



reach a width in places of between 15 and 20 feet. Unfortunately any great continuity, near the surface at any rate, was not proved.

It seems most unfortunate that the most promising ore met with in the tunnel should have been encountered at the very end of the season, when adverse climatic conditions rendered cessation of operations imperative. Reference to the accompanying map prepared from a map kindly supplied by Douglas H. Rae, superintendent, will elucidate the text.

Silver Lake.

This group consists of two claims, the *Silver Lake No. 1* and *Silver Lake No. 2*, owned by L. S. McGill and P. Schufer, and is situated at an elevation of approximately 6,650 feet and adjoining the Schufer property. On the *Silver Lake No. 2*, at an elevation of 6,650 feet, there is exposed in volcanic slide-rock a width of 3 feet of vein-matter striking N. 75° E., dipping southerly into the mountain, showing some pieces of nice clean galena. A sample of selected pieces assayed: Gold, 0.2 oz. to the ton; silver, 97 oz. to the ton; lead, 68 per cent. Proof is wanting that this vein-matter is in place, but, if not, it

probably has not travelled far. Further work in the slide-rock is required at the point of exposure. In the near vicinity is an exposure of crystalline limestone striking N. 10° W. (mag.) and dipping westerly.

On the *Silver Lake No. 1*, at an elevation of 6,475 feet, there is exposed by an open-cut and short tunnel some narrow fissures in red andesite which show copper-stains and a little bornite. It is stated that a shipment of a few tons of ore showing native silver was made from this property some years ago, when it was named the *White Heather*.

Last Chance. This group consists of four claims, owned by O. Hanson and associates, and adjoins the Schufer property. At an elevation of 5,400 feet a tunnel has been run a distance of 75 feet in the volcanic country-rock, the evident objective being the probing in depth of an exposure of chalcopyrite, pyrite, and magnetite, some 4 feet in width, about 25 feet above the tunnel. The tunnel discloses no mineral of importance and is run on a bearing of N. 15° W. (mag.), and may be in the foot-wall of the mineral disclosed above. A sample of selected pieces of the mineral showing above the tunnel assayed: Gold, trace; silver, 2 oz. to the ton; copper, 2.5 per cent. A short distance from the tunnel an open-cut some 30 feet in width discloses some irregular fracturing in the volcanic country-rock, showing a mineralization similar to that noted above. While the fractures in themselves seem irregular, the zone as a whole appears to have a possible trend of N. 75° W. (mag.). Reference to this property will also be found in the Annual Report for 1918.

Canadian Citizen. This property, situated within 2 miles of Smithers on the wagon-road to Duthie Mines, Limited, on the south-eastern slope of Hudson Bay mountain, is now owned by C. Stoughton and Ira Mitchell. A considerable amount of additional open-cutting has been done during the year. A description of the property will be found in the Annual Report for 1925.

Pine Ridge. This group consists of four claims on the south-eastern slope of Hudson Bay mountain, situated at a low elevation within 1½ miles of Smithers. It is owned by H. C. Wade. Mineralization, mode of occurrence, and country-rock are very similar to corresponding features of the *Canadian Citizen* above mentioned, which latter property lies but a short distance to the south. At an elevation of 2,150 feet several open-cuts in red andesite disclose copper-stains and a little copper pyrites. A width of 2 feet, striking approximately due north and south (mag.), was sampled, and found to assay: Gold, trace; silver, 1.2 oz. to the ton; copper, 1 per cent.

Glacier Gulch. This group is owned by S. F. Campbell and G. E. Loveless and is situated on the north side of Glacier creek, close to Lake Kathlyn glacier at the head of the last-named creek. The property is distant about 6 miles from Smithers, but a short distance from the end of the Lake Kathlyn Coalfield road. The main showings on the property are situated on the steep sides of the creek at an elevation of 2,960 feet, about 500 feet vertically above the bed of the creek. Mineralization consists mainly of zinc-blende, with small amounts of galena, and also pyrrhotite and pyrite. The mineralization follows the jointing and bedding planes of the volcanics of the Hazelton series and occurs in immediate proximity to the coal-bearing measures of the same series, the latter being uptilted sharply against the former. In one place mineralization extends over a width of between 5 and 6 feet and for a length of 20 feet, but is somewhat sparse. As a matter of interest, it might be mentioned that within a few feet of this exposure occurs a seam of highly carbonaceous schistose slate in the coal-measures. Both exposures occur in a draw and pieces of float from each are to be found side by side, the "black-jack" of the one being curiously like the compressed carbonaceous matter of the other.

A sample of selected ore from this property assayed: Gold, 0.26 oz. to the ton; silver, 2 oz. to the ton; lead, trace; zinc, 26 per cent. It is to be noted that gold values are quite appreciable.

Trixie. This claim, owned by F. Castell, is situated on the north-eastern slope of Hudson Bay mountain, on an unnamed creek flowing into Toboggan lake about 1 mile east of Evelyn. A very feeble mineralization, showing slight copper-stains occurring in decomposed sheared andesite, is exposed on the east bank of the creek for about 200 feet at an elevation of 2,105 feet. A sample of the more promising portion showed no values. A piece of siderite taken from another place was found to contain 10 per cent. zinc and 3 per cent. manganese, these two metals existing presumably as carbonates.

Vancouver.

This group, consisting of four claims and owned by F. Castell, is situated on Miller creek, on the central eastern slope of Hudson Bay mountain, and lies below the *Cascade* group. Workings are on both sides of the creek. A zone in the purple andesite breccia forming the country-rock is mineralized along lines of shearing with small amounts of galena, zinc-blende, pyrite, and a very little copper pyrites. The trend of the mineralized zone is N. 45° W. and dip about 45° to the south-west. On the east side of the creek a drift just above the creek-level, at an elevation of 2,375 feet, follows the mineralized zone for a distance of 93 feet, at which point a crosscut shows the width mineralized to be 18 feet. Unfortunately, however, this hopeful appearance did not continue, and the drift, although advanced another 115 feet approximately, showed only scattered amounts of mineral. The face appears somewhat more promising and the owner is advised to do a little more work. A crosscut at the face, for example, to establish proof that both walls of the mineralized zone have been uncovered, might be helpful. Likewise a crosscut between the first crosscut and the present face.

On the west side of the creek some crosscutting has been done to intercept the continuation of the mineralized zone, but only slight mineralization has been disclosed.

In addition to the properties on Hudson Bay mountain more particularly mentioned in this report, the respective owners of the *Evelyn*, *Yukon*, *Empire*, and *Groundhog* groups performed some work on these properties.

Discovery of Realgar.—Of interest is the fact that Paul Teckoles reported the discovery of realgar on the extreme south-eastern flanks of Hudson Bay mountain, in the vicinity of Seymour lake. The samples brought in to the Hazelton office were undoubtedly realgar. Another sample sent by Paul Teckoles direct to the Bureau of Mines assayed: Gold, *nil;* arsenic, 2 per cent. This mineral has not previously been known to exist in this district. This discovery has not yet been inspected, but samples to date indicate that it is of scientific interest rather than of commercial significance.

Liberal assistance was rendered by the Department of Mines during the year towards improvements to the road from Smithers to Hudson Bay mountain, generally known as the "Duthie Mines road."

Driftwood Creek.

An option was secured during the summer by Henry Lee Messner on several properties in this vicinity—namely, the *Silver King* group (sixteen claims), now owned by the Babine Silver King Mining Company, *Hyland Basin* group (six claims), *Victoria* group (six claims), *Silver Saddle* group (twenty-three claims), and *Little Joe* group (seven claims). Small-scale operations were started on these properties in August and continued until the fall, when, it is understood, operations were suspended for the winter on all properties except the *Silver King* group.

All the foregoing properties in the Babine mountains are reached by a motor-road about 10 miles in length to Holland's ranch from Smithers. Then follow 4 miles of sleigh-road, followed by approximately 5 miles of trail to the head of Driftwood creek, where is situated the *Silver King* group. A branch trail from this group leads to the remaining properties. Aid was given by the Department of Mines towards improvements in connection with the Driftwood Creek trail, and also towards constructing a trail up Little Joe creek from "Cronin's sleigh-road," thus affording an outlet from this property for any shipments to Telkwa.

Silver King.

Work was carried on at this property last winter with a force of four men and considerable development has been accomplished during the year. Descriptive matter contained in the Annual Reports for 1925 and previous years will not be repeated in this report. A crosscut tunnel run practically at the level of the floor of the basin has been continued a distance of 262.5 feet, accomplishing its immediate objective—namely, the penetration of the downward continuation of the vein, followed by an adit-drift at a level approximately 25 feet vertically above the crosscut. This latter drift is on the Main vein, which strikes N. 85° W. (mag.) and dips north at about 42°. The bearing of the crosscut is N. 8° W. (mag.). In running the crosscut, apart from mineralized seams of minor importance, the South vein, showing about 10 inches of quartz with sulphides, striking N. 60° E. (mag.) and dipping to the south, was struck at 207 feet. The Main vein foot-wall was reached at 258 feet and apparent hanging-wall at 262.5 feet. At the point of penetration a width of 1.5 feet of mixed galena, zinc-blende, with grey copper and native silver, was disclosed. At the end of the

crosscut a drift was run west a distance of 115 feet and east a distance of 74.5 feet. In the west drift, at 30 feet west of the crosscut, a diverging stringer was followed a distance of 15 feet north and ran into a band of quartz about 3 feet in width, more or less parallel to the Main vein. At 89 feet west of the crosscut another diverging stringer was followed a distance of 39 feet north.

The rich ore encountered at the point of crosscutting the Main vein apparently pinched out in both directions, and the length of ore-shoot at this horizon, it is understood, would not exceed about 35 feet. As a result of this drifting 105 sacks of ore, say 3½ tons, was obtained by hand-sorting. The cullings would also yield concentrating-ore. The amount of the latter is somewhat indeterminate. Samples were taken to get an idea of grade in precious metals and no undue importance must be attached to widths. Mineralization appears to be "bunchy" rather than continuous, and, as might be expected from the presence of much native silver and grey copper, values vary within very wide limits. Obviously, while the grab sample of the sacked ore is not by any means an accurate sample, nevertheless it gives a reasonably close idea of what can be done by hand-sorting this character of ore. Samples taken were as follows:—

Description.	Gold.	Silver.	Lead.	Zinc.
	Oz. per Ton.	Oz. per Ton.	Per Cent.	Per Cent.
Grab sample of 105 sacks of ore	0.40	84.0	2.0	4.0
In East drift from Main crosscut—				
15 feet east of crosscut, across 8 inches	0.16	5.5	3.0	4.0
34 feet east of crosscut, across 12 inches	0.34	5.5	.....	4.0
Face of drift, across 3.5 feet	Trace	2.6	.....	.....
Picked sample of ore showing at 54 feet east	1.20	935.0	.....	6.0
In West drift from Main crosscut—				
25 feet west of crosscut, across 7 inches	0.50	59.0	.....	5.0
In crosscut at 30 feet west of Main crosscut, across 8 inches	0.32	24.0	0.6	4.0
In crosscut at 89 feet west of Main crosscut across 9 inches	0.40	52.0	4.0	6.0
In Upper adit-drift—				
25 feet from portal, picked ore	0.16	105.5	1.0	11.0
100 feet from portal, picked ore	1.40	327.0	2.0	13.0
Sample of stringer on Republic claim	Trace	4.0	8.0	.....

The topography is such that only a very thin cover overlies the East drift from this crosscut. Moreover, appearances rather suggest that the ore met with in the drifts from the crosscut may be the top of an ore-lens. The objective would now appear to lie in probing this matter by sinking in the ore disclosed.

When seasonal conditions permit, some surface-trenching a considerable distance east of the crosscut, where the ground rises, might disclose some hopeful mineralization in the vein system, which could be followed, if appearances warranted, by drifting. The advisability of ascertaining by survey the possible position of the *Hyland Basin* vein on *Silver King* ground is also indicated.

Hyland Basin. Reference is invited to the Annual Reports for 1925 and previous years. On this group, at or near what appears likely to be the junction of two veins, there is exposed on the surface over a length of approximately 70 feet a very promising band of mixed galena, zinc-blende, and quartz of an average width of 1.5 feet. Grey copper and copper-stains are also in evidence. A sample was taken of pieces of broken ore lying in a pile alongside the open-cut, which assayed: Gold, 1.42 oz. to the ton; silver, 440 oz. to the ton; lead, 22 per cent.; zinc, 13 per cent. Such can, of course, only be regarded as an indication of the kind of values to be expected in selected ore. Nevertheless, the ore is of undoubted high grade in precious metals.

Some considerable distance from this surface showing one short crosscut and one adit-tunnel approximately parallel to the vein strike have been run. The latter is approximately 190 feet in length and crosscuts have been run from it to penetrate the vein. Some crosscutting was, it is understood, carried out in the long adit in the fall of 1926, but the vein was not struck.

The obvious objective at this property is the exploration of the surface showing described, which could readily be accomplished by sinking a shaft in it from the surface.

Silver Saddle. This group comprises a considerable amount of ground lying north of the *Victoria* group and between the latter and Cronin creek. No very impressive surface showings were seen on this group. It is, however, stated that there are some showings of promise, but time did not permit of inspection. Just north of the *Victoria* group there is exposed in andesite country-rock, close to the contact of the latter with argillites, a vein 15 inches in width showing quartz and arsenopyrite. A picked sample of this assayed: Gold, 0.60 oz. to the ton; silver, 10 oz. to the ton.

Victoria. A full description of this property will be found in the Annual Report for 1918. This property suffers, unfortunately, from the fact that there is at present no outlet for shipping ore. It lies in a basin and any ore shipped at present would have to be packed for a considerable distance uphill.

Two of the veins show very considerable strength and one, the Main vein, shows mineral at various points over a length of about 2,000 feet, although mineralization is not continuous for this distance. The property presents certain points of resemblance to the Babine Bonanza Company's property (Cronin's mine). The grade of the ore in silver is quite good. At one point in the bottom of the tunnel run on the Main vein grey copper is in evidence. A picked sample of this ore assayed: Gold, 1.30 oz. to the ton; silver, 1,064 oz. to the ton. A sample taken of galena from the face of the tunnel assayed: Gold, 0.16 oz. to the ton; silver, 69 oz. to the ton; lead, 13 per cent. A sample of float from this property, where it extends into the *Little Joe* basin, assayed: Gold, 0.30 oz. to the ton; silver, 230 oz. to the ton. The grade of the sulphides in precious metals is therefore likely to be good in any ore-shoot encountered. The topography lends itself to advantageous crosscutting to the Main vein at a point about 150 feet below the present adit-tunnel. It is understood that a crosscut has been started at this point which should reach the vein in a favourable region judging from exposures on the surface above and in the tunnel.

It is somewhat of a problem to provide an outlet for transportation of ore from this property, as appearances generally suggest that it may develop into a producer of concentrating-ore rather than of ore which can be shipped direct. One solution might be afforded by constructing a road in a north-easterly direction to connect with Cronin's road and so with Telkwa, a distance of perhaps 25 miles. In any case only development could justify the expense necessary.

Little Joe. A description of this property will be found in the Annual Report for 1925. Subsequent development comprises the sinking of a winze and a further advance of the main drift. At the time of inspection, at a point 130 feet from the portal of the tunnel, a winze had been sunk a depth of 27 feet in the flat-dipping vein (dip 25°), the ore being continuous and the width at the bottom varying from 6 to 12 inches. A sample across a width of 8 inches at the bottom of the winze assayed: Gold, 0.34 oz. to the ton; silver, 126 oz. to the ton; copper, 6 per cent.

The main drift had been advanced to a point 170 feet from the portal, representing an advance of 5 feet, and was in progress at the time of inspection. It was mentioned in the 1925 Annual Report that the drift at the then face was apparently in the foot-wall, but on resumption this year no difficulty was experienced in again picking up the vein. A width of between 9 and 18 inches of ore was present in the face of the drift. A sample of this across 18 inches assayed: Gold, 0.10 oz. to the ton; silver, 20 oz. to the ton; copper, 0.2 per cent. The character of mineralization is essentially grey copper with small amounts of galena and zinc-blende in a quartz vein.

On the surface, some considerable distance from the working-tunnel and about 200 feet vertically above the latter, another promising quartz vein, a few inches in width, had been discovered at the time of inspection. A picked sample of this assayed: Gold, 2.3 oz. to the ton; silver, 94 oz. to the ton; copper, 3 per cent.

Harvey Property. An account of this property will be found in the Annual Reports for 1918 and 1925. It is understood that C. G. Harvey, one of the owners, has worked constantly all the season and that he expected to get out a shipment of ore at the end of the year. With this in view some assistance towards trail repairs was given by the Department of Mines.

Telkwa Section.

This section includes only those properties which are normally tributary to the town of Telkwa, and comprises Grouse mountain, Mineral hill, Dome mountain, Hunter basin, Howson basin, and Telkwa River properties.

Grouse Mountain.

The most important feature of developments in the Telkwa section during the year was the resumption of work on August 1st by the Cassiar Crown Mining Company (formerly Cassiar Crown Copper Company) at its property on Grouse mountain. A great deal of preliminary work, apart from purely mining operations, in the shape of erection of bunk-house, installation of power plant, and so forth, has been carried out and a considerable amount of underground development accomplished. W. G. Harris, superintendent, is to be congratulated upon quickly and successfully overcoming the many difficulties and obstacles inherent to re-establishment.

Cassiar Crown Mining Co.

Reference to the accompanying map, which also shows geology by J. D. Mackenzie, Summary Report, 1915, Geological Survey, will elucidate study of the text. Likewise, reference to previous Annual Reports will be found useful. It will be noted that the company has under option the *Lakeview* claim, owned by Louis Schorn. Mineralization is essentially zinc-blende with a certain amount of copper pyrites which occurs in sheeted zones in the water-lain tuffs, which are intruded by a number of igneous dykes, with which the mineralization is associated.

Underground work has comprised the advancement of the south-west drift from No. 2 crosscut tunnel, from the position shown on the map to the region more immediately below the very promising ore met with in No. 1 tunnel, which is 95 feet vertically above No. 2 tunnel. Some 200 feet of drifting had been accomplished by the early part of November and the drift was then in progress. In the course of drifting it was stated that mineralization was continuous and in one place a width of 4 feet of ore was met with, but in view of the strong showing on the level above, the No. 2 level did not show the expected mineralization. Inspection was made during November and a few weeks later word was received from the management that a width of 6 feet of good ore had been struck, which augurs well for future progress.

Prior to starting mining operations a small two-story bunk-house and a small office were erected. A small power plant was also installed to operate a small compressor. This consists of a 25-horse-power Fairbanks-Morse engine, using distillate oil, which costs 32 cents a gallon at the mine. This drives a 10- by 10-inch belt-driven Fairbanks-Morse air-compressor of a capacity of 135 cubic feet of free air a minute, compressing to 100 lb. a square inch pressure. One 2¼-inch mounted jackhammer air-drill is used in the mine. The cost of drifting is $17 a foot. The theoretical consumption of the 25-horse-power engine at full load is 3½ gallons of distillate an hour.

Rainstorm.

This group consists of five claims, owned by L. H. McLean and F. Dobie, adjoining the property of the Cassiar Crown Mining Company on the north. Mineralization is that characteristic of the vicinity—namely, zinc-blende, iron pyrites, and a little chalcopyrite, following the bedding-planes of andesitic breccias and tuffs and striking N. 50° E. (mag.). The main point of exposure shows a width of 23 feet, although mineralization is not heavy at all points of this width. A picked sample assayed: Gold, trace; silver, 0.2 oz. to the ton; lead, trace; zinc, 13 per cent.

Solo.

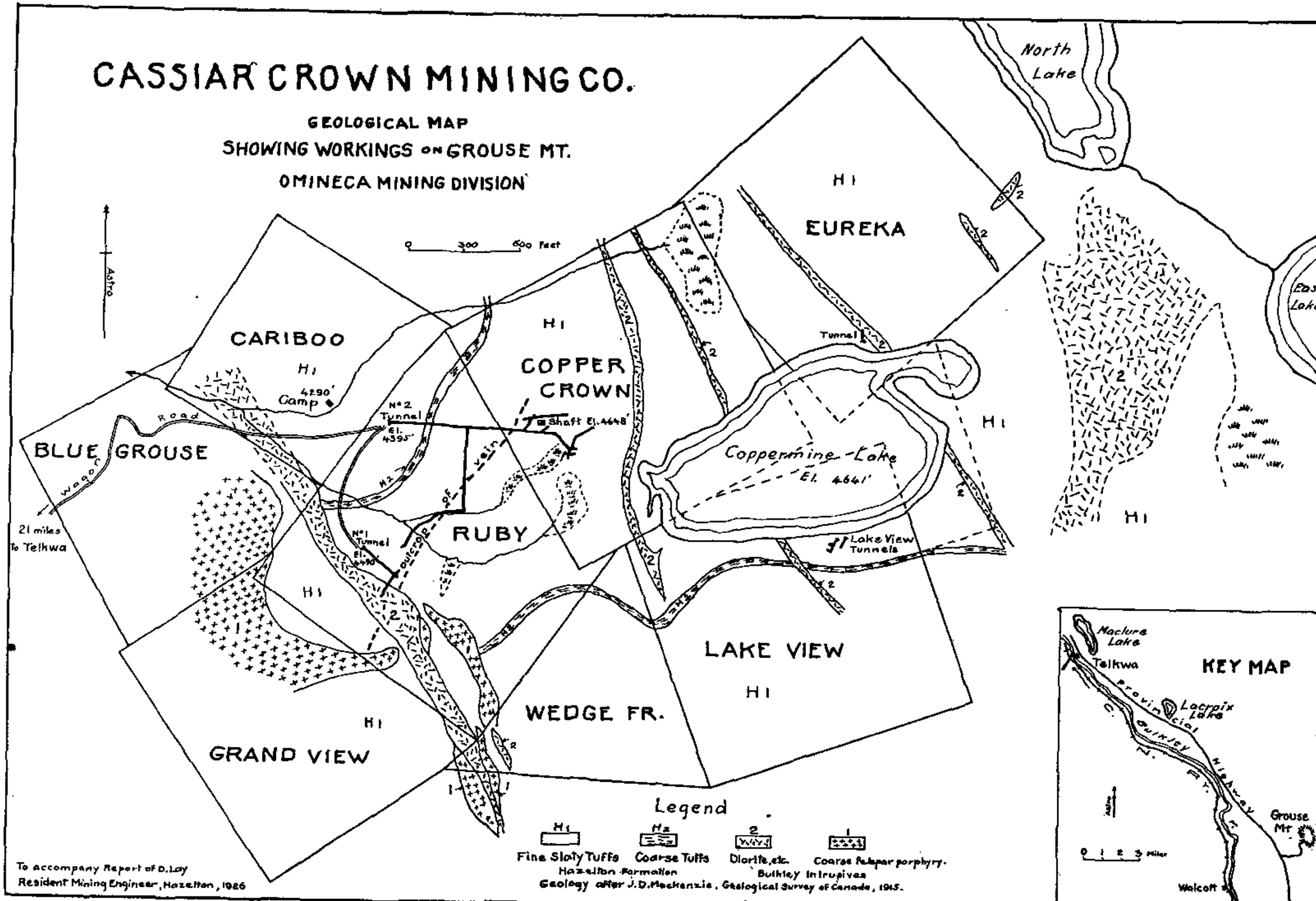
This claim, owned by L. H. McLean, is on the north-eastern slopes of Grouse mountain, overlooking Fish lake. The main showing consists of a silicified seam a few inches in width, showing zinc-blende mainly, together with a little chalcopyrite and iron pyrites, which follows the bedding-planes of the enclosing andesite country-rock. A sample of the best ore showed noteworthy gold values and assayed: Gold, 0.30 oz. to the ton; silver, 2.2 oz. to the ton; lead, trace; zinc, 26.5 per cent.

On the *Cornu Copia* and *Black Fox* properties some work was done by the respective owners.

Note.—Prospectors having claims on the north-eastern slopes of Grouse mountain might do well to follow up any indications and generally prospect in a north-easterly and easterly direction, towards the Nechako plateau, and are referred to remarks under "Prospecting" in this report.

Mineral Hill.

Mineral hill adjoins Grouse mountain on the south. Like the latter, the characteristic geologic feature is the number of igneous batholithic intrusions in the volcanic, sedimentary, and


CASSIAR CROWN MINING CO.
GEOLOGICAL MAP
SHOWING WORKINGS ON GROUSE MT.
OMINECA MINING DIVISION
0 300 600 Feet
Astro
North Lake
East Lake
EUREKA
CARIBOO
COPPER CROWN
BLUE GROUSE
RUBY
LAKE VIEW
WEDGE FR.
GRAND VIEW
4290' Camp
No 2 Tunnel El. 4395'
Shaft El. 4448'
No 1 Tunnel El. 4490'
Tunnel
Coppermine Lake El. 4641'
Lake View Tunnels
Wagon Road
21 miles To Telkwa
Legend
Fine Slaty Tuffs
Coarse Tuffs
Hazelton Formation
Diorite, etc.
Coarse Felspar porphyry.
Bulkley Intrusives
Geology after J. D. Mackenzie, Geological Survey of Canada, 1915.
To accompany Report of D. Lay
Resident Mining Engineer, Hazelton, 1926
KEY MAP
Maclure Lake
Telkwa
Lacroix Lake
Provincial Highway
Bulkley R.
C. N. Ry.
Grouse Mt.
Walcott
0 1 2 3 Miles

tufaceous formation. Of especial prominence is a large outcrop of quartz-feldspar pegmatite on the *Venus* group, of more or less elliptical shape, the major axis of which trends about N. 55° E. (mag.) and which is crossed approximately at right angles at the lower portion of the outcrop by a diorite dyke striking N. 35° W. (mag.). The latter passes close to the *Venus* shaft on the upper side of it, while the quartz-feldspar pegmatite outcrop is within 150 feet of the shaft. On the *Mickey* group, which lies above the *Venus* group, is a large outcrop of the feldspar-porphyry dyke, 40 to 50 feet in width, striking S. 55° E. (mag.), which crosses Grouse mountain. Outcrops of hornblende porphyry also occur on the *Mickey* group. These igneous intrusions have undoubtedly been the causative influence in the mineralization.

The Government ranch, distant 21 miles from Telkwa by the main Provincial highway, is the point from which Mineral Hill properties can be readily reached. The ranch is just at the base of the mountain and the *Venus* group shaft is within half a mile of the ranch.

Mickey. This group is owned by E. and B. Hoops, F. Mapleton, and J. Bussinger and consists of six claims. The most important mineralization occurs on the *Suprema* claim, where two quartz veins occur about 30 feet apart. The lower vein, varying in width from a few inches up to 1.5 feet, has been exposed by an open-cut and shallow shaft, which latter was filled with water at the time of inspection. The vein shows galena, zinc-blende, copper-stains, and a noticeable amount of grey copper. The strike is N. 35° W. (mag.) and the dip easterly at about 30° to 35°. The country-rock is andesite. About 30 feet distant horizontally and higher up the hill is another quartz vein about 2 feet in width sparsely mineralized with small amounts of galena and zinc-blende, dipping in the same direction but at a steeper angle—about 50°.

The depth of the shaft is stated to be about 18 feet. The altitude of the collar is 4,025 feet. A sample of the best mineral showing in the upper vein assayed: Gold, trace; silver, 4.6 oz. to the ton. A sample of the best ore showing at the collar of the shaft assayed: Gold, 0.04 oz. to the ton; silver, 150 oz. to the ton; copper, 6 per cent.; lead, 2 per cent.; zinc, 30 per cent. The owners are advised to sink the shaft a little farther, even although, as they stated, appearances in the bottom were not as favourable as at the collar.

Other showings were inspected on this property, but none call for any special comment. In view of the near-by igneous intrusions the geology of this group is promising.

Venus. This group is owned by A. S. Miller, M. E. Lablanc, and J. Bussinger and adjoins on the lower side the *Mickey* group. Operations this year have been confined to sinking a shaft (previously sunk to 34 feet) a further depth of about 32 feet. This shaft, the collar of which is at an elevation of 2,640 feet, is in the near vicinity of igneous intrusions which have been described in the prefatory notes to this section. A vein averaging from 3 to 4 feet in width, showing a mineralization consisting of sparse amounts of galena, zinc-blende, and copper pyrites carrying quite good silver values due to grey copper, is exposed on the surface by open-cuts on either side of the shaft for a length of about 275 feet. The country-rock is either argillaceous quartzite or a water-lain tuff. Vein-filling is in part quartz and in part country-rock. At the time of inspection the shaft had reached a depth of 66 feet. Quite a promising mineralization is disclosed for the first 40 feet and then it becomes very sparse. The strike of the vein is N. 35° W. (mag.) and the pitch 60° easterly.

A sample from a few tons of ore piled at the collar of the shaft assayed: Gold, 0.04 oz. to the ton; silver, 147 oz. to the ton; copper, 6 per cent.; lead, 14 per cent.; zinc, 36 per cent.

Inasmuch as the shaft is such a short distance from the outcrop of quartz-feldspar pegmatite, it is suggested that the vein be uncovered near the latter. Very little work would be involved, as the distance is only 150 feet and there is only grass and a few inches of soil to remove to expose the underlying country-rock.

Other mineral-showings occur on this group, of which the following are the most important: At an elevation of 3,100 feet and upwards of a mile in an easterly direction from the main shaft a mineralized zone is exposed in andesite. Walls are not clearly defined, but width appears to be about 25 feet. Mineralization consists mainly of chalcopyrite and iron pyrites. A shaft, full of water, is stated to be sunk to a depth of 40 feet. It is also stated that some years ago a shipment was made from here of 20 tons of ore which assayed 17 per cent. copper and 6 oz. silver to the ton.

About 500 feet vertically above the last-mentioned exposure an open-cut exposes three small veins intersecting with a development in the smallest of specular hæmatite, copper-stains, and

probably some grey copper. A sample from this stringer assayed: Gold, trace; silver, 48 oz. to the ton. Some further work should be done at this point.

In the outcrop of quartz-feldspar pegmatite, already referred to, at an elevation of 3,125 feet, there is exposed by an open-cut a quartz vein about 4 feet wide showing a slight mineralization with arsenopyrite. The vein strikes N. 25° W. (mag.) and dips westerly. A sample of this vein showed only a trace of gold and 1 oz. silver to the ton.

Telkwa River.

Big Four. This group is situated between Milk creek and the Telkwa river. Work was done during the year by Alexander Chisholm, the owner. This consisted of 30 feet of sinking, the owner reports, being the continuation of a shaft sunk from the surface on a flat-dipping vein. It is stated that at the bottom of the shaft, between 50 and 60 feet from the collar, a vein 3 feet wide is exposed, of which a width of 1.5 feet is quartz and the remaining width is mainly galena. A sample of the latter taken by the owner assayed: Gold, trace; silver, 2 oz. to the ton; copper, trace; lead, 34 per cent.; zinc, 3 per cent. It was not possible to inspect this group, but a description will be found in the Annual Report for 1917.

Telkwa Mines. A request was received from the president of Telkwa Mines, Limited, which has been inoperative for many years, to inspect the *Duchess* and *Contention* groups, situated in Howson basin. It is regretted that it was quite impossible to do so. At the only available time the Resident Engineer went to Telkwa with the intention of making an examination, but had to abandon the idea owing to snow in Howson basin. Reference is invited to the very full information on this property appearing in the Annual Report for 1917.

TOPLEY SECTION.

This section has been added to the report this year. It includes all properties tributary to Topley, lying on the Nechako plateau north and south of the Canadian National Railway line. Topley is a station on the Canadian National Railway 58 miles east of Smithers and 32 miles west of Burns Lake. There is a small settlement here and two hotels—Covington's Hotel and McCrea's Hotel. B. McCrea has, in addition, a well-equipped store and a large stock, and can supply anything the prospector is likely to require.

A general account of the topographical and geological features will be found under "Prospecting" in this report and further details below.

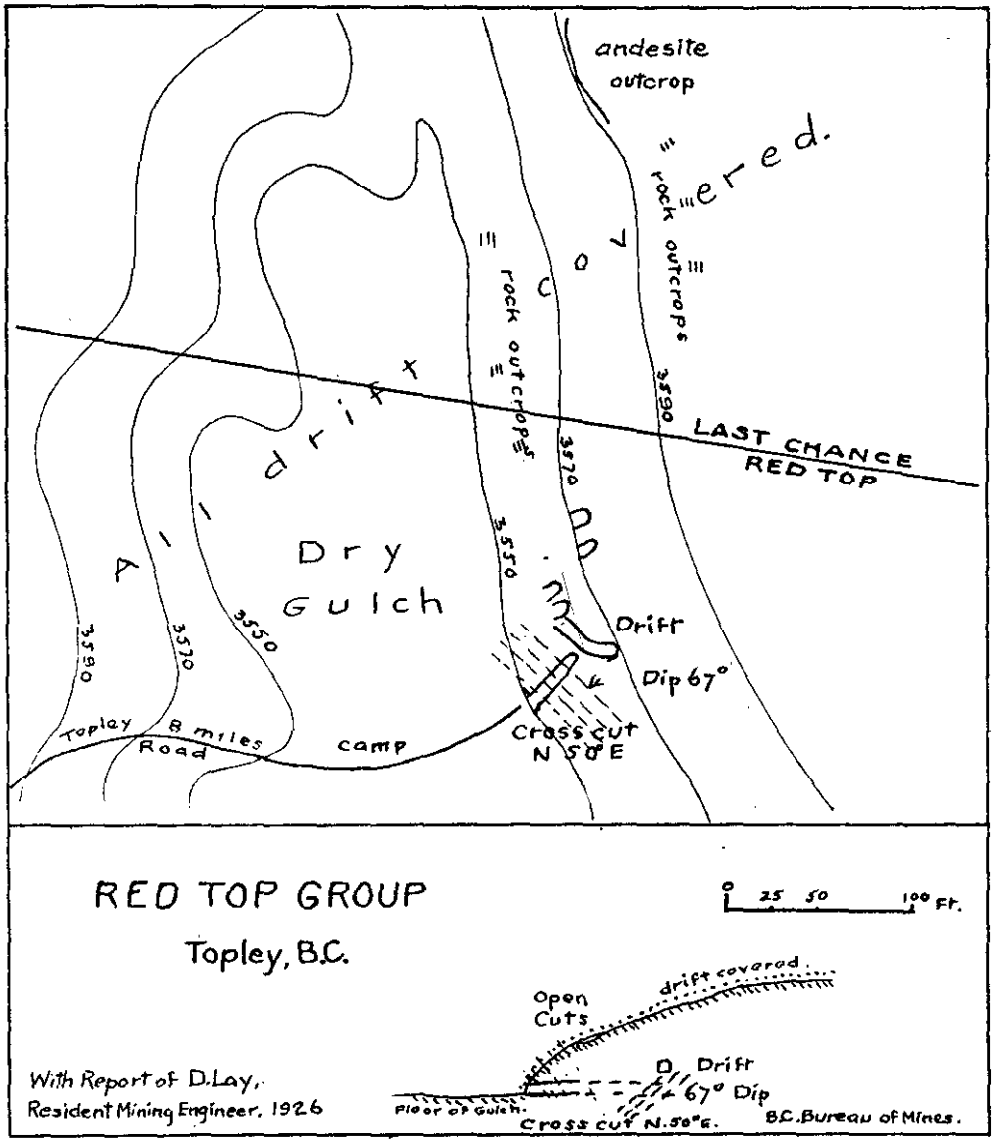
Red Top. This group, consisting of five claims and owned by F. H. Taylor and Wesley Banta, was located on June 7th, 1926. It lies at an elevation of 3,550 feet, about 1,400 feet above Topley, from which it is distant by wagon-road 8 miles. A wagon-road runs from Topley to the mouth of the Fulton river on Babine lake, a distance of about 28 miles. From this main road a branch road about 1 mile in length leads to the group, which lies almost due north of Topley.

Possessing many unique features and from the beginning showing every sign of the likelihood of real importance and possible magnitude, the discovery attracted much attention at an early date. During the months immediately following the date of discovery the group was examined by engineers of all the more important operating companies in the Province and by some from outside points.

The property is situated outside the mountain system proper on the Nechako plateau and about 15 miles east of the western limit of the latter. Particulars of the boundaries of the Nechako plateau are given under the head of "Prospecting." It is in a region covered with a thick mantle of glacial drift and with very few and small exposures of country-rock and practically none of mineral. To the discoverer, F. H. Taylor, much credit is due. His attention was attracted in the first instance by finding small pieces of float on the surface, and by digging down he discovered the mineralized decomposed rock-outcrop.

The region is composed largely of volcanic rocks, intruded in places by batholithic rocks. The nearest observed intrusion of the latter is about 3 miles north-west of the *Red Top* group, where granodiorite outcrops on the *Beaver Dam* group. The topography is flat, a rolling plateau dissected by numerous dry gulches which on the average are 30 or 40 feet deep, and some creeks, which have cut down to upwards of 100 feet in places. Findlay creek, which flows in a south-west direction about 3 miles south of the *Red Top* group, is the most important one. The

elevation of the plateau in the vicinity of this group is about 3,500 feet. About 1 mile to the east lies Black mountain and about 2 miles to the south-east is Huckleberry mountain. Both these mountains have typical rounded glaciated summits, which have an elevation of about 5,000 feet. Mineralization consists of iron pyrites and arsenopyrite, with a little galena and zinc-blende. The country-rock in which the ore-body occurs is a rather peculiar one.



Samples were taken covering the entire range of exposures on the surface and in the tunnel and submitted to Dr. Victor Dolmage, of the Geological Survey, for determination. His report is as follows:—

"All of the specimens, even the one from the tunnel, are completely altered from their original condition, unless the original rock was a dolomite, which seems unlikely in view of the geology of the general district. The analysis showed about 22 per cent. MgO, from which I conclude that there is probably much dolomite or magnesia, or both.

"The minerals which I have now identified are calcite, quartz, dolomite, zoicite, talc, sericite, and feldspar. All of these minerals, except the feldspar, are secondary, and the feldspar is present in only small amounts.

"It is quite impossible to tell from the specimens what the rock was originally, but in view of the geology of the district and the presence of a small amount of feldspar, it seems likely that it was some kind of a volcanic rock. The rounded areas filled with calcite might have been amygdules. I have never seen so much secondary calcite and dolomite in an altered volcanic rock, and in his observations on rock alterations Lindgren does not mention any such case. I might add that there is nothing to suggest what kind of volcanic rock the original was."

Chemical analysis of the above samples made in the laboratory of the Bureau of Mines, Victoria, gave the following results:—

	No. 2197A.	No. 2198A.	No. 2199A.
	Per Cent.	Per Cent.	Per Cent.
Gold	Trace	.....	Trace
Silver	Trace	.....	0.4
SiO_2	44.4	63.2	50.8
Al_2O_3	2.3	2.0	1.0
Fe_2O_3	7.1	9.7	8.0
$CaCO_3$	20.4	11.8	17.0
$MgCO_3$	17.5	5.1	15.3

Sample No. 2197A was taken in the crosscut tunnel; sample No. 2198A was taken from a surface exposure just south of the crosscut tunnel; sample No. 2199A was taken from a surface exposure about 325 feet north of sample No. 2198A. As has been mentioned, the range of exposures is extremely limited and extends over a range of about 300 feet or so only in a northerly and southerly direction. In an east-and-west direction the mantle of glacial drift covers the rock except in one or two places where a few square inches are exposed.

Commenting upon the analyses, the Provincial Mineralogist says: "These analyses show a most peculiar rock. It is safe to say that it is a volcanic of some nature profoundly altered with secondary production of lime, dolomite, and silica."

In brief, these facts demonstrate that the rock is not a rock type, and, further, that the existence of secondary rock minerals is widespread. The logical inference is that justification exists for hoping that the occurrence of valuable ore-minerals will be likewise widespread.

Unaltered specimens of this rock obtained from the crosscut tunnel show a white siliceous rock with a distinct yellowish-green cast of colour, due to extensive development of epidote. On the surface the rock appears as a tufaceous-like, fissile, heavily iron-stained rock, with an extensive development of calcite. It weathers and disintegrates where heavily mineralized, forming earthy material. The discovery was made on the side of a small gulch about 30 or 40 feet in depth, where weathering and disintegration had resulted in the formation of the earthy material described to a depth of 2 or 3 feet, and extending from the solid portions of the rock to the grass-roots. This property was inspected a few days after discovery, and a fair sample taken at this time of the earthy material was found to assay: Gold, 0.2 oz.; silver, 27 oz. to the ton; lead, trace. In this earthy material were found pieces of float, subangular, about half the size of a man's fist. These, when broken open, were seen to consist of unaltered primary sulphides with no sign of oxidation. They were not included in the sample above mentioned, because it was perceived that they might not have resulted from the underlying rock, but might have travelled some distance, although probably not far. Two such pieces of float were assayed separately. One consisted of almost entirely iron pyrites and arsenopyrite, with a very little galena and zinc-blende, and assayed: Gold, 0.7 oz. to the ton; silver, 275 oz. to the ton; lead, 2 per cent. The other piece showed a mineralization of mainly galena and assayed: Gold, 0.84 oz. to the ton; silver, 387 oz. to the ton; lead, 36 per cent. Such high assays have not been even approached by any taken from the crosscut tunnel and their significance and importance will be fully discussed later.

At a point about 300 feet to the north of the discovery a small outcrop, a few square feet in area, of the tufaceous-like (on the surface only) mineral-bearing rock occurs, but samples of this showed only traces in precious metals. At a few points between 300 and 500 feet in an easterly

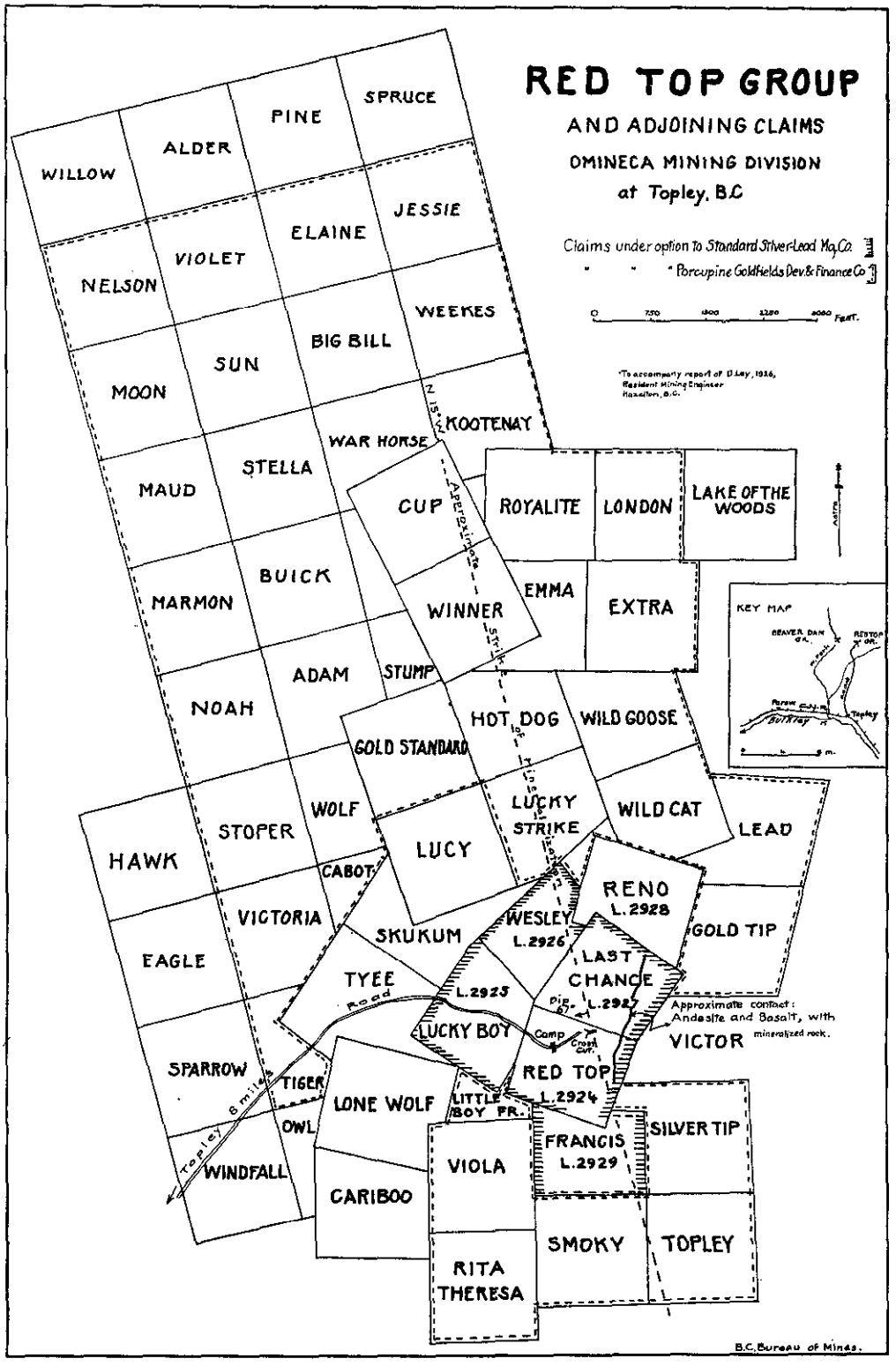
direction occur one or two very small exposures, some not over a square foot in size, of the same rock in immediate proximity to prominent outcrops of porphyritic andesite and basalt. The line of contact of the mineral-bearing rock and the andesitic and baser volcanics appears to strike about N. 10° E. (true). If the crosscut tunnel were continued in its present direction for 500 feet it would probably strike the contact. Inasmuch as amygdaloidal basalt outcrops in Finlay creek about 3 miles due south of this property, it is likely that any surface outcrop of the mineral-bearing rock should be looked for west and north of this group rather than east or south of it, although it may extend south some distance. It may of course underlie the baser volcanics. From such scanty field evidence as was available it seemed likely that the trend of the mineralization was about N. 15° W. (true), and accordingly early in July a crosscut tunnel was started at the bottom of the gulch (elevation 3,550 feet) on a bearing N. 75° E. (true); that is, at right angles to the assumed strike of the mineralization.

Such data as are available to date indicate that early ideas in this respect are probably approximately correct. It should be understood that the cover over this tunnel does not exceed about 25 feet, which will be about the maximum depth it can gain, but as a preliminary piece of development it has afforded a very valuable insight into the mineralization. The face at 57 feet from the portal is just under the mineralization struck in the first main open-cut on the surface and this mineralization has just been passed through. A few feet ahead of this on the surface another open-cut discloses another mineralized band, so that the total width of the mineralized zone to date may be taken to be 65 feet. Simultaneous with the advancement of this crosscut, the original open-cut on the surface, which is only a few feet above the back of the crosscut, was continued as a drift for a total distance of 50 feet following the mineral, just a few feet below the surface. The floor of the crosscut is in solid rock from the portal inwards, but the tunnel is not wholly within solid rock until a point about 30 feet from the portal is reached. Owing to the topography the tunnel does not gain depth very rapidly, and, as has been explained, the rock is weathered and disintegrated to an earthy material in this region, which is some 3 feet in thickness and extends upward to the grass-roots. Beyond noting that a good mineralized band was passed over just at the portal of the tunnel, assays taken during the first 30 feet can hardly be taken to represent conditions as they exist underground, in place. During the earlier stages of crosscutting the fines resulting were used as road-ballast immediately in front of the portal, so that a representative grab sample could be readily taken from the road. Such a sample assayed: Gold, 0.10 oz.; silver, 8 oz. to the ton. A sample of a pile of picked fines assayed: Gold, 0.16 oz.; silver, 13 oz. to the ton. A sample of fines in place at 18 feet from the portal assayed: Gold, 0.20 oz.; silver, 13 oz. to the ton. During the first 18 feet samples of rock from the lower part of the tunnel assayed a trace in gold and from 0.4 to 2 oz. silver to the ton. At 30 feet from the portal mineralization throughout the rock became much more prevalent, and an enriched band some 3 feet in width was passed through at 40 feet from the portal; mineralization continued to 50 feet from the portal, when another enriched band with very definite walls, 3 feet 9 inches in width, was passed through. The band at 40 feet, 3 feet wide, assayed: Gold, 0.20 oz.; silver, 19.5 oz. to the ton; lead, *nil*. The band at 50 feet, 3 feet 9 inches wide, assayed: Gold, 0.20 oz.; silver, 16 oz. to the ton; lead, 0.5 per cent.; zinc, 2 per cent. A channel sample taken from the wall of the crosscut between points 31 feet and 54 feet from portal and representing a width of 23 feet assayed: Gold, 0.13 oz.; silver, 7.8 oz. to the ton; lead, trace; zinc, 2 per cent.

The last band encountered in the crosscut was very clearly defined and was followed a short distance—8 feet—in an easterly direction. Its strike appeared to be more nearly true north and south than that recorded (N. 15° W.) as being the probable trend of the mineralization as a whole; its dip is 67° W. (true).

In regard to the drift run just above and near the face of the crosscut, this is in shattered oxidized country-rock. It should be noted, however, that primary sulphides were prevalent and there is no "zone of oxidation," so far as the mineralization is concerned, other than the purely superficial effects of surface waters and atmospheric agencies. A grab sample of the large pile of fine material resulting from the running of this drift assayed: Gold, 0.16 oz.; silver, 7 oz. to the ton; lead, *nil*. A sample taken across a width of 1.5 feet representing primary sulphides in place assayed: Gold, 0.4 oz.; silver, 12 oz. to the ton; lead, *nil*.

A grab sample taken of the shipping-ore representative of the accumulation of such from drift and crosscut assayed: Gold, 0.5 oz.; silver, 50 oz. to the ton. A sample of the best ore showing in the crosscut assayed: Gold, 0.56 oz.; silver, 91 oz. to the ton.


RED TOP GROUP
AND ADJOINING CLAIMS
OMINECA MINING DIVISION
at Topley, B.C.
Claims under option to Standard Silver-Lead Mg. Co.
" " " Porcupine Goldfields Dev. & Finance Co.
To accompany report of D. Ley, 1926, Resident Mining Engineer Hazelton, B.C.
KEY MAP
Topley
B.C. Bureau of Mines.
WILLOW
ALDER
PINE
SPRUCE
NELSON
VIOLET
ELAINE
JESSIE
MOON
SUN
BIG BILL
WEEKES
MAUD
STELLA
WAR HORSE
KOOTENAY
CUP
ROYALITE
LONDON
LAKE OF THE WOODS
MARMON
BUICK
WINNER
EMMA
EXTRA
NOAH
ADAM
STUMP
HOT DOG
WILD GOOSE
GOLD STANDARD
HAWK
STOPER
WOLF
LUCKY STRIKE
WILD CAT
LEAD
CABOT
LUCY
RENO L.2928
VICTORIA
SKUKUM
WESLEY L.2926
GOLD TIP
EAGLE
TYEE
LAST CHANCE
L.2925
L.2927
Approximate contact: Andesite and Basalt, with mineralized rock.
LUCKY BOY
VICTOR
SPARROW
TIGER
RED TOP L.2924
LONE WOLF
LITTLE BOY FR.
OWL
FRANCIS L.2929
SILVER TIP
WINDFALL
VIOLA
CARIBOO
SMOKY
TOPLEY
RITA
THERESA

To sum up the conclusions from developments to date:—

(1.) In the rock classified by the Geological Survey as a volcanic of some kind profoundly altered there occurs a mineralized replacement zone some 65 feet in width, but there appears every reason to anticipate a greater width. In this occur enriched bands and indications point to the likelihood of its being possible to profitably mine comparatively wide zones, and development may disclose a low-grade milling property of magnitude.

(2.) Mineralization consists of iron pyrites and arsenopyrite, mainly, with subordinate amounts of galena and zinc-blende; values are essentially in gold and silver.

(3.) The encountering of unaltered primary sulphide float, assays of which have been given, *showing extremely high silver values is to be regarded as of importance.* Referring to the list of assays given, it will be seen that no such silver assays have been duplicated underground or on the surface in place. It is therefore inferred that justification exists for entertaining the hope that the source of such rich sulphides will be found on the property; further, this rich float showed no signs of having travelled very far. It is also evident from the topography that this float cannot have come from a source south of the point at which it was found; it must have come from the north. Such rich sulphides may of course exist only in a narrow seam and their importance is quite probably subordinate to that of the larger zone of ore of milling grade. At the same time it is well to follow up all clues.

The rock in which the mineralization occurs should core well and the wisdom of a campaign *of diamond-drilling, preceding or following some preliminary excavational development-work, is* clearly indicated. In the absence of such and in the present state of development it is not possible to make more than an intelligent guess as to the future.

One cannot fail to be impressed by the many favourable conditions which surround this property. Attention is especially drawn to the fact that about 20 miles distant in a due-north direction at the outlet of Fulton lake the Fulton river falls almost vertically a distance of about 50 feet, making an ideal condition for the development, at comparatively low cost, of hydro-electric power. While this has not been inspected, from all accounts the power available is quite large. Moreover, a highly favourable feature is the fact that the waters of Fulton lake are warm, tending to greatly minimize, if not to entirely eliminate, ice troubles in winter.

Nearness to transportation, low elevation, hard rock permitting wide unsupported excavations and shrinkage-mining methods, near-by source of water-power and timber are features which, considered in conjunction with mineral possibilities, combine to make this property an unusually attractive prospect.

Towards the end of the year a lease and bond on this property was taken by Standard Silver-Lead Mining Company (former operators of the well-known *Standard* mine at Silverton, Slocan district). The manager, W. H. North, very kindly outlines contemplated preliminary development as follows:—

"Our plan of development is to sink 150 feet and crosscut and drift on this level, and if the showing here warrants it we will then go an additional 150 feet. We have sent in a 320-cubic-foot Sullivan air-compressor."

Porcupine Goldfields Development and Finance Co., Ltd.—In November this company, by in part optioning and in part direct staking, acquired a large rectangular block of claims surrounding the *Red Top* group. The position is clearly shown on the map. Operations were started in the region south of the *Red Top* group with a small crew of men in November, following up signs of mineralization by open-cuts and surface prospecting generally. Winter quarters to accommodate a small force were also erected.

Beaver Dam. This group consists of six claims, owned by George Findlay and E. E. Orchard. It is situated at an elevation of 3,335 feet on the West fork of Findlay creek and is distant about 3 miles in a north-westerly direction from the *Red Top* group. In this region the creek has cut down through the plateau to a depth of about 75 feet just at the contact of the granodiorite batholithic rock with basic volcanics. The actual line of contact approximately parallels the creek and occurs just at the top of the right bank of the creek, while on the left bank occurs a boss of granodiorite of undetermined extent. The contact phase of the batholith appears to be a quartz porphyry, which near the contact is pyritized and also shows a considerable amount of iron-stain. Near such a contact development of some iron oxides frequently takes place, but such mineralization does not infer that commercial values are likely. *At one point of the contact a phase of the batholithic rock certainly has points of*

superficial resemblance to the mineralized rock of the *Red Top* group and might easily be mistaken for it. A sample of this rock assayed: Gold, *nil;* silver, *nil.* At another point of the contact a sample of the mineralized batholithic contact assayed: Gold, *nil;* silver, *nil.*

The geology of this group is certainly promising and the surface should be closely prospected.

Kylling & McCrea Properties.

This group lies south of Huckleberry mountain and considerably east of the wagon-road to Babine lake, from which a trail leads to the property. Outcrops of volcanic rocks, mainly breccias, are fairly numerous and at certain points are pyritized to some considerable extent. A sample at one of the more heavily pyritized spots assayed: Gold, *nil;* silver, *nil.*

Wade Property.

Mackaboy creek flows into the Bulkley river about 1 mile east of Perow, which is about 6 miles due west of Topley. Mackaboy creek has cut down somewhat deeply, perhaps 150 feet in places, through the plateau and affords a good geologic section. About 2½ miles up the creek from Perow on this group there is exposed on the steep banks of the creek a rock slightly pyritized, resembling the *Red Top* group rock, in which the replacement mineralization occurs on that property. Underlying this is a bed of volcanic breccia containing fragments of argillite, quite heavily pyritized in places with veinlets of fine-grained iron pyrites and showing barite. Higher up the creek are exposed argillites also pyritized. These pyritized beds of argillite and breccia were said to carry gold values, but samples failed to disclose more than traces of precious metals. It was noted that a very large percentage of the boulders in the creek, some of very large size, consist of feldspar-prophyry rock of unmistakable appearance, in which the light-coloured feldspar crystals of rectangular shape are 1½ inches or so in length and stand out prominently in the almost black ground-mass. This creek should be followed upwards in an effort to discover this feldspar porphyry in place, because with it are associated on Grouse mountain and Mineral hill the mineralization in those regions. Likewise the rock resembling the *Red Top* rock should be followed on both sides of the creek. The region of this group is well worth close prospecting.

Lakeview.

This group (formerly the *Three Lakes* group) is owned by E. Wilson, of Telkwa. It is situated in the foot-hills of the Babine mountain just at the western extremity of the Nechako plateau. It is distant about 5 miles from Knockholt Station on the Canadian National Railway (13 miles west of Topley). The claims are on the south slope of a small hill rising about 750 feet above three small lakes at its base. The elevation of the lakes is 3,175 feet.

At an elevation of 3,700 feet there is exposed by four open-cuts and a shallow shaft, extending over a length of about 300 feet, a heavy mineralization of specular hæmatite showing copper pyrites. The stained country-rock is apparently rhyolite. The mineralization will average close to 10 feet in width and strikes due north and south (mag.), dipping westerly. Perhaps 50 feet vertically below this exposure, on a branch mineralization diverging at about 45°, a shaft has been sunk which is now filled with water. It is stated to be 50 feet in depth, with drifts run therefrom at the bottom.

Somewhat over 1,000 feet in a northerly direction, at an elevation of 3,725 feet, there is exposed over a length of 150 feet by open-cuts (two shafts about 15 to 20 feet deep are also sunk at this point, but were filled with water at the time of inspection) a similar mineralization to that mentioned above, of which it is probably the continuation. This occurs in the immediate vicinity of volcanic breccia and rhyolite. The mineralization is about 10 feet in width, of which at one point a width of 6 feet is fairly solid specular hæmatite, with a considerable amount of copper pyrites and copper-stains. A sample taken across this width of 6 feet assayed: Gold, trace; silver, 2 oz. to the ton; copper, 4 per cent.

The topography is such that depth could readily be gained by crosscutting from the surface, and it is unfortunate that precious-metal values are low, as the mineralization is strong.

Burns Lake Section.

Kathleen Jane.

This group, owned by G. B. Stanton and M. A. Moore, is situated at the east end of Tchesinkut lake and about 2 miles from the north shore. Amygdaloidal andesite on the banks of Canyon creek shows at various points small fractures with development of specular hæmatite. The amount of the latter mineral is in any case small and samples showed no values in gold or silver. One sample showed 1 per cent. zinc. Such

Otterson's Tractors at Vanderhoof.

Red Top Mine at Topley.

mineralization is common in this rock and in many cases, as in this instance, has no commercial significance.

Golden Glory, Golden Glory No. 1, Silver Glance, Blue Diamond.

These claims are situated on Reed creek, which flows into Decker lake on the south side opposite the settlement of Decker Lake. The first two mentioned are owned by W. Reed and R. H. Gerow and the last two mentioned by J. C. McLean and D. M. Gerow. A visit was paid to the properties, but unfortunately the tunnel on the *Golden Glory*, where the main showing is exposed, was caved at the time so that the visit was largely abortive. The claims are distant somewhat over a mile from the lake. Reed creek, flowing easterly, has cut down to a depth of between 150 and 200 feet in the region in which these claims are situated, exposing on both sides the volcanic rocks. On the *Blue Diamond* and *Silver Glance* a sparse mineralization of copper pyrites and a little zinc-blende was noted at one or two points. On the *Golden Glory*, in the tunnel which was caved at the time of inspection, there is said to be a good showing of copper pyrites carrying good silver values.

Taltapin Mining Co., Ltd.

A full description of this property appears in the Annual Report for the year 1920. More recent developments are mentioned in the Annual Report for 1925. This property, in so far as the state of the workings permitted, was examined in 1925. A shaft and workings therefrom, being at that time under water, could not be examined. Likewise a vein known as the High Grade vein could not be examined, because Anderson creek was flowing over the exposure, which is at the bottom of a steep cliff, and it was impossible to get anywhere near it.

This year the Resident Engineer went to Burns Lake for the purpose of inspecting the property, but was informed that the shaft was full of water and could not be inspected. An effort was made to arrange with the company for an inspection later in the season. Owing to no further word being received from the company and the shaft not being unwatered no further examination was made. Last year all the more important surface exposures were pointed out to the Resident Engineer. With the exception of the High Grade vein, these were examined and sampled. At that time there were exposed a number of sparsely mineralized quartz veins showing no commercial ore, with comparatively flat dip, varying in width from a few inches up to 4 feet and possibly wider if walls were exposed. Three tunnels, two of them connected underground, had been run from the creek-level on certain of the veins. The total drifting amounted to about 200 feet. Such disclosed a sparse mineralization similar to that observed on the surface.

Mineralization showing is essentially galena and zinc-blende, with small amounts of copper pyrites, iron pyrites, arsenopyrite, and a little grey copper. The mineralization being too sparse to take samples across definite widths, samples of selected mineral were taken from the best exposures, purposely to ascertain the content of precious metals. The results were as follows:—

Description.	Gold.	Silver.	Copper.	Lead.	Zinc.
	Oz. per Ton.	Oz. per Ton.	Per Cent.	Per Cent.	Per Cent.
Selected sample from surface, vein No. 2.....	Trace	1.0	.....	2.0	4.0
Selected sample from surface, vein No. 1.....	Trace	2.0	Trace	1.0	2.0
Selected sample from vein No. 3.....	Trace	1.6	1.8	Trace	1.0

At the time of inspection in 1925 the Resident Engineer was informed that a shipment of some 4 tons of hand-sorted ore was made from the High Grade vein and was shown a pile of ore stated to be the cullings from hand-sorting. The pile of ore would be about 1 ton in weight; a grab sample of this pile assayed: Gold, 0.04 oz.; silver, 16 oz. to the ton; copper, 1.5 per cent.; lead, 9 per cent.; zinc, 16 per cent.

The Resident Engineer was informed that the shaft had been sunk at that time to a vertical depth of 90 feet and that at 30 to 35 feet below the collar a mineralized vein was passed through. With the idea of penetrating this vein, a crosscut was run west at the bottom of the shaft for a distance of 70 feet without crosscutting it. It is possible that the crosscut was not continued far enough, as no particulars are to hand as to dip of vein.

While cutting out a pump-station at the bottom of the shaft, another vein, not exposed on the surface, was penetrated, which was said to show a width of 3 feet of good ore, and it was stated at that time that it was the intention to drift on the last-mentioned vein before sinking

farther to intercept the downward continuation of the High Grade vein, which it is to be noted was the objective sought by sinking this shaft. At the collar of the shaft was a small pile of ore, which it was stated had resulted from the ore struck at the bottom of the shaft. This was seen to be essentially zinc-blende with some galena, a little chalcopyrite, and iron pyrites. A sample of it assayed: Gold, trace; silver, 3.6 oz. to the ton; copper, 1 per cent.; lead, 3 per cent.; zinc, 27 per cent.

It is understood that this year there have been accomplished "50 feet of tunnelling and sinking." Assuming that this is correct, likewise the statement made at the time of inspection last year as to the underground development, the total underground workings amount to a length of about 210 feet, of which the major portion must be in country-rock. It is clear that no appreciable reserves of ore have yet been proven on this property.

Sibola Section.

Whitesail Lake.

The owners of all the groups described below are C. V., W. H., and J. E. Harrison, A. Thomas, and J. Michelsen. All these groups are situated on the north slopes of Chikamin mountain.

Sunset. This group is situated on the south shore and about 17 miles up Whitesail lake. At the level of the lake the slopes of Chikamin mountain rise up sharply to 75 or 100 feet at this point. The country-rock is classified by the Geological Survey as water-lain tuffs. Small seams of quartz with zinc-blende strike, with the enclosing country-rock, N. 40° W. (mag.), dipping at steep angles. The greatest observed width of any seam was 20 inches. At the level of the lake a tunnel has been run as a drift on one narrow seam a distance of 50 feet; at the end is a crosscut 110 feet long which cuts two other small seams.

A seam 4 inches in width in the drift assayed: Gold, 2.4 oz. to the ton; zinc, 54 per cent. A seam in the crosscut, 4 inches in width, 15 feet in, assayed: Silver, 1.2 oz. to the ton; zinc, 40 per cent. Another seam in the crosscut, 6 inches in width, 85 feet in, assayed: Silver, 1.2 oz. to the ton; zinc, 30 per cent. All samples showed a trace of gold. These showings are not of commercial importance.

About 900 feet farther up the lake, at another point about 30 feet above the lake-level, there is exposed a mineralized seam showing a little zinc-blende and galena. A picked piece of the galena, taken to ascertain silver grade, assayed: Gold, 0.04 oz.; silver, 56 oz. to the ton; lead, 60 per cent.; zinc, 16 per cent. This showing, or the near-by region, might merit a little attention on the part of the owner.

Monarch. This group (formerly *Silver Tip* group) is situated on the south shore, about 3 miles up the lake from the *Sunset* group. From a landing at this point a trail about 1½ miles in length leads up to the showings. At an elevation of 1,150 feet above the lake (lake is 2,725 feet above sea-level) a tunnel some 95 feet in length, partly drift and partly crosscut, follows a seam of galena and zinc-blende about 1.5 feet in width a distance of 40 feet from the surface. At this point the tunnel, previously run on a bearing S. 35° E. (mag.), bends more easterly, presumably because of pinching of mineral in former direction, becoming for the next 30 feet a crosscut, finally penetrating a sheared zone showing a width of 9 inches of compact galena and zinc-blende. After exposing this mineral the tunnel was swung off at right angles for another 25 feet, with the object, it is stated, of again cross-cutting the mineral-seam first followed from the surface. A cave-in at the end of the tunnel prevents access to face.

The country-rock is classified by the Geological Survey as a water-lain tuff. Mineralization is a shear-zone replacement and consists essentially of compact galena and zinc-blende, with a little copper pyrites and arsenopyrite. At the portal of the tunnel is a pile of hand-sorted ore of perhaps 20 or 30 tons, showing mainly galena. A sample taken in the tunnel across the 9 inches of mineral in the crosscut assayed: Gold, 0.14 oz.; silver, 76 oz. to the ton; lead, 48 per cent.; zinc, 12 per cent.

Some 300 yards above this tunnel and perhaps 100 yards from the cabin on the property, at an elevation of 3,925 feet, some open-cuts expose a seam, 1.5 feet in width, of galena, zinc-blende, and arsenopyrite, with a little copper pyrites; this strikes about due east and west (mag.) and dips northerly. Some 25 feet away is another smaller parallel seam. The owner is advised to dig a trench between these two parallel seams to ascertain if there is any more mineral in

between. About 50 feet away up the hill is another compact seam of galena and zinc-blende 8 inches in width. Some more trenching in this region would be advisable.

Shamrock. This group (formerly *Nickel Plate* group) lies above the *Monarch* group. On it there occurs a narrow vein, the greatest observed width of which was 27 inches, which is remarkably persistent for 2,000 feet or more and is said to continue over the summit of Chikamin mountain down on the slope facing Eutsuk lake. The country-rock is classified by the Geological Survey as silicified water-lain tuff. The vein strikes about N. 68° W. (mag.) and the dip is almost vertical or slightly to the north-east. Exposures by open-cuts and short tunnels are frequent and were followed on the surface between elevations of 5,100 and 5,900 feet. Almost all exposures of the vein show mineral. The mineralization is essentially galena and zinc-blende, with a little copper pyrites and iron pyrites. The vein-filling is quartz.

At 5,130 feet elevation a tunnel 10 feet long exposes a width of 10 inches of mineral assaying: Gold, trace; silver, 11 oz. to the ton; lead, 2 per cent. At 5,165 feet elevation an open-cut exposes a width of 20 inches of mixed sulphides and quartz assaying: Gold, trace; silver, 9 oz. to the ton; lead, 1 per cent.

At 5,175 feet elevation an open-cut partly filled with water showed the best exposure noted, consisting of a width of 24 inches of fairly compact sulphides. Only a width of 14 inches could be sampled owing to water, but the remainder of the width looked just as good. The sample across 14 inches assayed: Gold, 0.10 oz.; silver, 43 oz. to the ton; copper, 2.5 per cent.; lead, 26 per cent.; zinc, 14 per cent.

At 5,300 feet elevation a width of 27 inches of quartz showed a seam 10 inches in width of compact sulphides assaying: Gold, 0.10 oz.; silver, 47 oz. to the ton; lead, 24 per cent. At 5,250 feet elevation there is exposed by open-cut over a length of 20 feet a width of 18 inches of mixed quartz, galena, and zinc-blende. At 5,400 feet elevation a width of 6 inches of quartz and sulphides is exposed.

At 5,575 feet elevation there is exposed a width of 15 inches of quartz somewhat sparsely mineralized. At 5,625 feet elevation a foot in width of quartz slightly mineralized is exposed. At 5,900 feet, the highest showing inspected, a tunnel is driven on the vein for 15 feet and exposes two small stringers of galena 2 or 3 inches in width. Both vein and mineralization are persistent, but silver values are unfortunately not very high.

Grizzly.—This group is situated on the south slopes of Chikamin mountain, facing Eutsuk lake, and, it is stated, covers the ground in which the *Shamrock* vein continues. Time did not permit of inspection.

Sweeney Mountain.

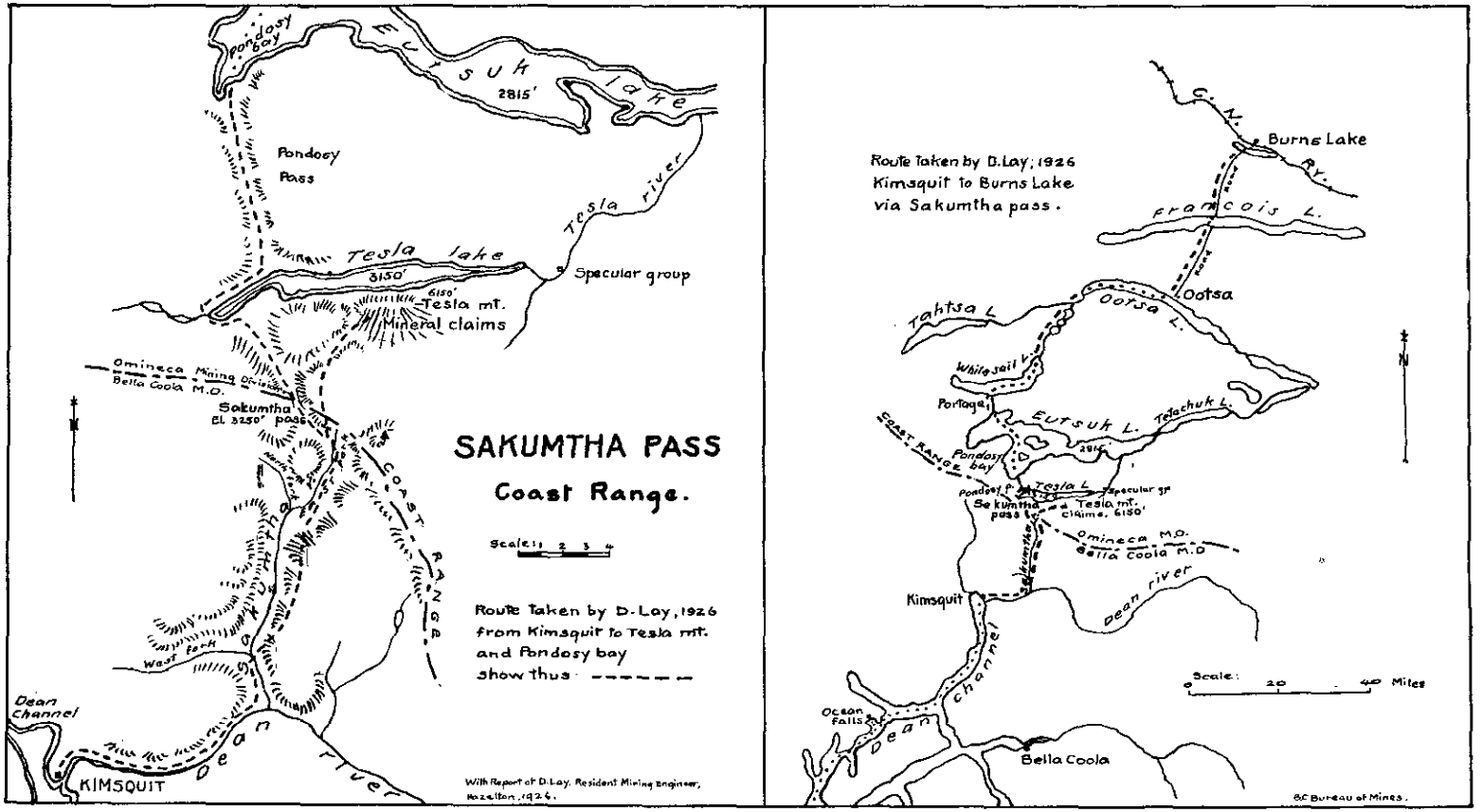
Emerald. This well-known property, owned by W. Sweeney and associates, was examined by field engineers of operating companies during the year. Being in the vicinity in June, the Resident Engineer made what proved to be an abortive attempt to inspect it and the *Oriental* group on Sibola mountain. An ascent of the summit of Sweeney mountain was made, but much snow and dense clouds rendered inspection impossible.

Much information on the Sibola section and an excellent map will be found in the Annual Report for 1916. Also in Summary Reports, Part A, of Geological Survey, for the years 1920 and 1924.

Tesla Lake Region.

This region lies in the extreme south-western portion of the Sibola section of the North-eastern Mineral Survey District. Referring to the map, it will be seen that Tesla lake lies some 8 miles south of Eutsuk lake and extends for a length of about 15 miles in an east-and-west direction. Tesla lake is about 1¼ miles in width at its widest point and is situated at an elevation of approximately 3,100 feet. Tesla mountain lies immediately south of Tesla lake and the precipitous northern sides of the mountain rise sharply from the south shore of the lake to a height of some 3,000 feet above the latter. The elevation of the summit of the mountain was found by aneroid to be 6,150 feet. The region embraces a portion of the eastern contact-zone; that is to say, the contact of the Coast Range batholith with the volcanics and sedimentaries of the Interior.

Inspection of this region was made in 1926 because of reports received at the end of 1925 of the existence of promising mineral-showings on Tesla mountain. It was reported also that it was entirely feasible to construct a trail, about 35 miles in length, from Kimsquit, on Dean


Pondosy bay
Eutsuk lake
2815'
Pondosy Pass
Tesla river
Tesla lake
5150'
6150'
Tesla mt.
Mineral claims
Specular group
Omineca Mining Division
Bella Coola M.D.
Sakumtha pass
El. 3250'
SAKUMTHA PASS
Coast Range.
Scale: 1 2 3 4
COAST RANGE
Route Taken by D. Lay, 1926 from Kimsquit to Tesla mt. and Pondosy bay show thus ------
West fork
Dean Channel
Dean River
KIMSQUIT
With Report of D. Lay, Resident Mining Engineer, Hazelton, 1926.
Route Taken by D. Lay, 1926
Kimsquit to Burns Lake
via Sakumtha pass.
C. N. Ry.
Burns Lake
Francois L.
Ootsa
Ootsa L.
Tahtsa L.
Whitesail L.
Portage
Eutsuk L.
Tetachuk L.
Coast Range
Pondosy bay
2815'
Tesla L.
Specular gp.
Sakumtha pass
Tesla mt. Claims, 6150'
Omineca M.D.
Bella Coola M.D.
Kimsquit
Dean river
Dean Channel
Ocean Falls
Bella Coola
Scale: 0 20 40 Miles
B.C. Bureau of Mines.

channel, through a new pass in the Coast range to Tesla mountain. Aid was sought from the Department of Mines in constructing this trail. In view of the known general geologic promise of the region, and of the fact that the only other route into the region was over a trail from Bella Coola, a distance of 180 miles, requiring a ten-day trip with pack-horses, aid was granted by the Department of Mines towards construction of the new trail from Kimsquit. At the end of the season only some 17 miles of trail had been completed, although the remainder of the distance to Tesla mountain, about 15 miles, has been thoroughly cruised and partially brushed out.

In inspecting the region a start was made from Kimsquit and the route followed was approximately that of the completed trail. But at the time the trip was made only some 15 miles of trail were completed and the route through had not been cruised. Moreover, this region has not yet been surveyed; consequently the objective was not reached without somewhat hard travel in rugged country. Very fortunately, the Government survey party in charge of F. C. Swannell was at the time engaged in surveying the region around Tesla lake, having gone into this region following the trail from Bella Coola earlier in the year. It had been previously arranged that the party with the Resident Engineer would endeavour to meet the survey party at the east end of Tesla lake on July 22nd.

A start was made from Kimsquit on July 19th, but in spite of hard travelling it was not possible to effect the meeting until July 23rd. Especial thanks are tendered to F. C. Swannell and his party for many courtesies extended on this occasion.

From Kimsquit, at the mouth of the Dean river, on Dean channel, the trail to Tesla mountain follows the old Dean River trail for about 12 miles to the junction of the Dean and Sakumtha rivers. It then follows the Sakumtha river for a further 3 miles, crossing this river just below the mouth of the West fork. Thereafter the Main and East forks of the Sakumtha river are followed for a further 10 miles approximately. Near the headwaters of the East fork the trail leaves the river and follows a defile on the right bank, which leads into a pass extending through the heart of the Coast range in a north-westerly direction for some 7 miles to Tesla lake.

The elevation of the southern end of the pass was found to be 3,250 feet above sea-level, according to aneroid barometer. The pass is a wide flat-bottomed valley with much meadow land. The drainage is northerly towards Tesla lake, the elevation of which is about 3,100 feet. The Tesla Mountain trail continues in the pass for about 3 miles, and then leaves it, angling up the mountain-slopes on the east side for perhaps 7 miles to the objective. The new pass just described will be known as the Sakumtha pass.

It is also to be noted that there is another pass through the mountains between Tesla and Eutsuk lakes, almost opposite the end of the pass just described. By continuing the trail in the latter through to Pondosy bay on Eutsuk lake an easy way of reaching Burns Lake Station on the Canadian National Railway will be opened up. From Eutsuk lake, Ootsa, on Ootsa lake, is readily reached by motor-boat, with one short portage between Eutsuk and Whitesail lakes. Between Ootsa lake and Burns Lake Station there is a regular motor-stage service.

It will be appreciated that distances onward from Kimsquit mentioned herein can only be regarded as close approximations at best. It is apparent, however, that with very small expenditures a wonderful route can be readily opened up, giving access from the Pacific to the Great Lake district of the Interior with steamboat connections at one end and railway connections at the other. A route, moreover, which offers a rare combination of diversity of travel, grandeur of scenery, and big game and fishing attractions. There appear to be no difficulties whatever in the way of road or trail construction. In brief, the approach to the Sakumtha pass is some 25 miles in length to the south end of the pass, with a total rise as mentioned of 3,250 feet in this distance. Thereafter the distance of perhaps 15 miles to Pondosy bay, Eutsuk lake, is to all practical intents and purposes level, although there is an actual fall of about 435 feet in this distance.

Tesla Mountain Mineral Claims.

General Geology.—Tesla mountain itself appears to consist largely, if not entirely, of volcanic rocks, mainly andesitic, with others of baser composition. Strike was observed to vary from N. 45° E. (mag.), with north-westerly dip, to due north and south (mag.), with easterly dip. The angle of dip might average 45°. Very little time was available for general examination of the country and had to be devoted practically entirely to the examination of certain mineral-showings. It was noted that volcanics first make their appearance just north of the West fork

of the Sakumtha river, south-west of which point the country-rock is entirely Coast Range granodiorite. Granodiorite also outcrops on the south shore of Tesla lake, towards the east end of the lake. Development of red jasper in the volcanics was observed at several points in the region near Tesla mountain.

Dolly D. This claim is owned by J. Schafer and is situated on the south slopes of Tesla mountain. At an elevation of 5,250 feet there is exposed a silicified mineral-zone about 12 feet wide, striking N. 65° W. and dipping steeply to the north. The hanging-wall is amygdaloidal andesite and the foot-wall volcanic conglomerate. The mineral-showing is a little malachite and copper pyrite. A sample was taken across the best portion of the exposure, 4 feet in width, which assayed: Gold, trace; silver, trace; copper, 1.5 per cent. The exposure is entirely due to natural agencies.

Chalcopyrite. This claim is owned by P. Gadsden and is situated on the north slope of Tesla mountain. At an elevation of 5,530 feet there is exposed by open-cut a silicified zone, which appears to follow the strike and dip of the enclosing andesite country-rock. The strike of the latter is due north and south (mag.) and dip 45° to the east. Scattered chalcopyrite and some copper-stains show over a width of 8 feet 6 inches. A picked sample of this was taken, which assayed: Gold, trace; silver, 1.6 oz. to the ton; copper, 5.5 per cent.

Some 300 feet to the west are exposed two other mineralized zones showing a very little galena and some small amounts of barite. These also appear to follow the strike of the andesite country-rock. No work whatever has been done on them. The owner is advised to do a little work at the points showing galena.

Tetrahedrite. This claim is owned by G. A. Young. At 5,750 feet elevation on the north slopes of the mountain a quartz vein about 12 inches in width is exposed by natural agencies in andesite country-rock. The quartz shows copper-stains and is well mineralized with grey copper. Another small vein 2 or 3 inches in width, with similar mineralization, occurs a few feet from the first mentioned. Examination was rendered difficult owing to the very steep slope. The strike of the veins is N. 80° E. (mag.) and the dip southerly at about 45°. The length of the exposure could not be determined owing to inaccessibility, but the 12-inch vein seems to be exposed for not less than 100 feet, but whether equally well mineralized at all points of this length could not be ascertained. A sample across the 12-inch vein was taken which assayed: Gold, trace; silver, 133 oz. to the ton; copper, 4.2 per cent.

General Remarks.—Actual showings of mineral on Tesla mountain are somewhat disappointing. Where there is promise of any material width the values are low and in the only case where values were promising the width is small. It must, however, be remembered that no appreciable amount of work has been done on any exposure.

The grave difficulties under which prospectors in this region have worked will be understood when it is explained that until completion of the trail from Kimsquit the only way of getting to Tesla mountain is by trail from Bella Coola to the east end of Tesla lake, a distance of 180 miles and ten days' journey with pack-horses. On arrival at the east end of the lake supplies have to be transferred to raft and poled up the lake to the foot of Tesla mountain. A trail has been constructed up the mountain by P. Gadsden at his own expense, for which he is entitled to much credit. It is hoped that when the trail from Kimsquit is completed more activity will take place in this region.

Specular. This group is situated on the north side of Tesla river. The name of the owner is C. W. Frank. It is said to be a very old location. The main exposure is on the banks of the Tesla river, about 2 miles below the lake. At this point the banks rise up sharply to a height of about 100 feet above the river. There is exposed in andesitic volcanics, which form the steep banks of the river, a silicified mineralized zone 12 feet in width, of which a width of 4 feet is more heavily mineralized than the remainder. The minerals showing are specular iron, chalcopyrite, and copper-stains. The zone conforms in dip and strike with the country-rock, striking N. 45° W. (mag.) and dipping at 72° to the south-west. The cliff-like exposure is apparently largely the result of natural agencies aided by open-cutting and extends from the river to the top of the bank.

A sample taken of picked pieces of chalcopyrite assayed: Gold, trace; silver, 3 oz. to the ton; copper, 5.8 per cent. A sample taken of the best ore showing immediately above the river assayed: Gold, trace; silver, 0.8 oz. to the ton; copper, 0.4 per cent.

The mineralization is strong and of good width and it is unfortunate that values are so low. Doubtless the zone continues on the south side of the river. If so, it should be exposed on the banks on this side. The owner might with advantage look for it here to ascertain if any more promising values are indicated.

Manson Section.

It was not possible to visit this section during 1926, but it is hoped to do so in 1927. Very little information has been secured concerning this section and this is given at the commencement of this report under "Placer-mining."

It might also be mentioned that Lee Tong, a Chinaman, who is said to be managing a Chinese company operating on Vital creek, brought into Hazelton one lot of gold (at least 100 oz.) which was remarkable for its coarseness and even size of the individual pieces. In fact, it appeared as if it had been screened and all fines rejected. This gold was very much coarser than the average run of gold in the Cariboo district, each piece being practically a small nugget.

Fort Grahame Section.

Fort Grahame, a small settlement at which there is a Hudson's Bay Company's post, is situated on the Finlay river, some 65 miles above Finlay Forks. It lies approximately in the centre of a narrow strip of Pre-Cambrian formation, which extends some 125 miles to the north and south and between 15 and 25 miles east and west of the river systems, which have their courses in the Rocky Mountain trench.

The geology is thus described by G. A. Young in "Geology and Economic Minerals of Canada," published by the Geological Survey:—

"Along the Finlay and Omineca rivers in and near the Rocky Mountain trench are considerable areas of gneissic and schistose rocks accompanied by crystalline limestone. Some of the rocks are deformed igneous rocks, but the bulk of the strata are of sedimentary origin, are in large part evenly bedded, and conform in dip with overlying much less metamorphosed sediments. The overlying younger beds consist of slates and quartzites with a basal conglomerate, and in places have a thickness of 4,000 feet. These are succeeded upwards by a thick limestone group, which in places rests directly on the much metamorphosed lowest assemblage. The gneissic and schistose rocks have been correlated with the Shuswap strata of southern British Columbia and as such were considered to be of early Pre-Cambrian age. The overlying limestone strata are presumed to be of Cambrian and perhaps later age; the clastic beds beneath may be Cambrian or late Pre-Cambrian or possibly contain representatives of both ages."

This region is of particular promise from a mineral standpoint, more especially because the Pre-Cambrian area in East Kootenay, occupying a precisely similar position in the Rocky Mountain trench, has produced the famous *Sullivan* and other well-known lead-zinc mines of that district. There are many remarkable points of similarity, both geologic and topographic, which coupled with the mineral-showing in the northern area justify the hope that another *Sullivan* may be found in the latter area. Prospects in this region are hopeful not only in regard to lead-zinc deposits, but also in regard to mica and probably also asbestos. Unfortunately the fact that the region is so remote from transportation does not encourage active prospecting. Indeed, under existing conditions, while a certain amount of development might be accomplished, it is well-nigh hopeless to contemplate the active operation of any properties other than gold or mica, and even such must incur high cost of production.

Fort Grahame has recently come into prominence because of the operations of the General Holding Company, of Edmonton, at its mica properties on Mica mountain, distant some 6 miles from the settlement, and where also a discovery of muscovite mica crystals of exceptional size was made this past summer by H. Ravenal, and also because of the fact that good surface showings of lead ore exist on the *Ferguson* group on the Ingenika river, about 45 miles distant.

It should be understood that it is not only this comparatively small Pre-Cambrian strip which offers mineral promise. To the west and south-west of the latter there is a very large area known to be of great general geologic promise.

Means of Access and Cost of transporting Supplies.

Fairly full information is given in the hope that it may be of use to those who may contemplate any operations in the district. Waterways form the only channels of communication at present, the district being devoid of roads.

Two alternative routes are available for getting in supplies to Fort Grahame:—

(1.) From Prince George, on the Canadian National Railway, by motor-truck to Summit lake; thence via Crooked, Pack, Parsnip, and Finlay rivers to Fort Grahame, a total distance of about 245 miles.

(2.) From Edmonton by Edmonton, Dunvegan & British Columbia Railway to Peace River; thence by stern-wheel steamer to Hudson Hope; thence across a 14-mile portage; thence continuing by boat up Peace and Finlay rivers to Fort Grahame, a total distance of 738 miles.

Of these routes, the former is preferred, because it is down-stream all the way to Finlay Forks, but it is open to the objection that it is only open for six weeks of the year, during late spring and early summer, for conveyance of more than a few hundred pounds of freight. Moreover, the hazard of navigation is very considerable during the open high-water period mentioned, when small scows with a maximum safe load of 3 tons can be used. This route cannot be used for shipping material out—ore, for example.

The latter route (2) is up-stream all the way, and there are two rapids—the Parle Pas and Finlay rapids—up which boats have to be lined. Scows cannot be taken up at present. On the other hand, it is the only route by which large quantities of material can be shipped out and it is open in normal years for at least five months. Moreover, in improving this route by blasting out a channel in the Finlay and Parle Pas rapids at low water lies the only hope, short of a railway, of materially improving transportation conditions, because the cost of an arterial road is out of all proportion to the advantages gained.

Gordon F. Dickson, manager of the General Holding Company, has kindly supplied figures as to cost of getting in supplies for his company, which are given herein and which represent minimum costs prevailing; that is to say, the cost of transporting comparatively large quantities of freight in 3-ton scows from Prince George to Fort Grahame. The costs applying to 32½ tons of freight taken in to Fort Grahame from Prince George during 1926 were as follows:—

Motor-trucking, Prince George to Summit lake, 30 miles, 1 cent a pound; Summit lake to Finlay Forks, 150 miles, 5 cents a pound; Finlay Forks to Fort Grahame, 65 miles, 1.7 cents a pound; total, 7.7 cents a pound.

If Edmonton is the outfitting base, the total cost from Edmonton will be 9.3 cents a pound, as the railway freight on L.C.L. lots of average mine freight is 1.6 cents a pound from Edmonton to Prince George.

Regarding the alternative route, from Edmonton via Peace River, until the upper Peace River channel at Finlay and Parle Pas rapids is effectively cleared, by blasting at low water, so as to permit of the operation of a small stern-wheel steamer or high-powered motor-boat between Peace River portage and Fort Grahame, it will not be possible to take up or down any material quantity of freight without incurring heavy risks and expense.

Assuming that the channel is cleared at the points mentioned, the following cost is estimated by Gordon F. Dickson, manager of General Holding Company:—

Incoming Freight.—Rail, Edmonton to Peace River (Edmonton, Dunvegan & British Columbia Railway), 322 miles, 1.05 cents a pound; steamer, Peace River to Hudson Hope, 242 miles, 3 cents a pound; portage, 14 miles, 0.75 cent a pound; upper portage to Finlay Forks, 95 miles, 2.50 cents a pound; Finlay Forks to Fort Grahame, 65 miles, 1.75 cents a pound; total, 9.05 cents a pound.

Outgoing Freight.—Fort Grahame to Finlay Forks, 1 cent a pound; Finlay Forks to portage, 2 cents a pound; over portage, 0.75 cent a pound; Hudson Hope to Peace River, 0.75 cent a pound; handling charge at Peace River, 0.20 cent. a pound; Peace River to Edmonton (car-lot), 0.39 cent. a pound; total, 5.09 cents a pound.

It is possible to ship out under present conditions small quantities of freight—say, shipments of mica, for example—at costs approximating to the above, although there is very considerable hazard.

Motor-trucking Costs.—It has been urged that if a trunk motor-road were constructed onwards from the Vanderhoof–Fort St. James existing road to Manson Creek, thence to Finlay Forks, thence to Fort Grahame, a total distance of about 285 miles from Vanderhoof to Fort Grahame, relief would be afforded. It is not difficult to demonstrate that the advantages gained are not by any means commensurate with the expenditure involved.

The cost of transport by motor-truck over good roads varies in the North-eastern Mineral Survey District from 22 cents a ton-mile to 42 cents a ton-mile where large quantities of freight

General Holding Company—Mica at Fort Grahame.

Ravenal's Mica Claim, Fort Grahame.

are concerned. The former figure is exceptionally low and maintains between Pouce Coupe, in the Peace River Mining Division, and Grande Prairie, in Alberta, a total distance of 90 miles in level country over exceptionally good roads. Assuming that a road was constructed between Vanderhoof and Fort Grahame, the cost of which might amount to $500,000, motor-trucking costs between these points could not be less than 30 cents a ton-mile or a total of 4¼ cents a pound. But a base-metal mine ships out in the form of ore at least 8 tons for every ton of miscellaneous freight shipped in. It is estimated that by improving Peace River channel, at vastly less cost than that of constructing the road mentioned, the cost of shipping ore from Fort Grahame to Edmonton would be about 5 cents a pound. The cost of trucking over the proposed road might quite easily amount to this.

Comparison between Cost of Transport by Motor-truck and Cost of Transport by Railway.—Cost of railway transport of miscellaneous mine freight may be taken to average about 6 cents a ton-mile for L.C.L. lots and 2½ cents a ton-mile for car-load lots. Freight rates on ores are very much less than this. For example, the freight rate on ore from Smithers to Trail, a distance of about 1,000 miles, averages only ¾ cent a ton-mile. It has been pointed out that motor-trucking costs over any contemplated northern road would be 30 cents a ton-mile.

It must therefore be apparent that no base-metal mining operations can take place on any large scale in this, or any other remote, region unless a railway forms the main transportation artery. Present conditions will be very sensibly ameliorated by clearing the Peace River channel as indicated, and the outlook for mica-mining operations will be rendered much better. At the same time there can be no real expansion, nor can the active development of base-metal properties take place, until a railway passes through the heart of the region.

Mica.

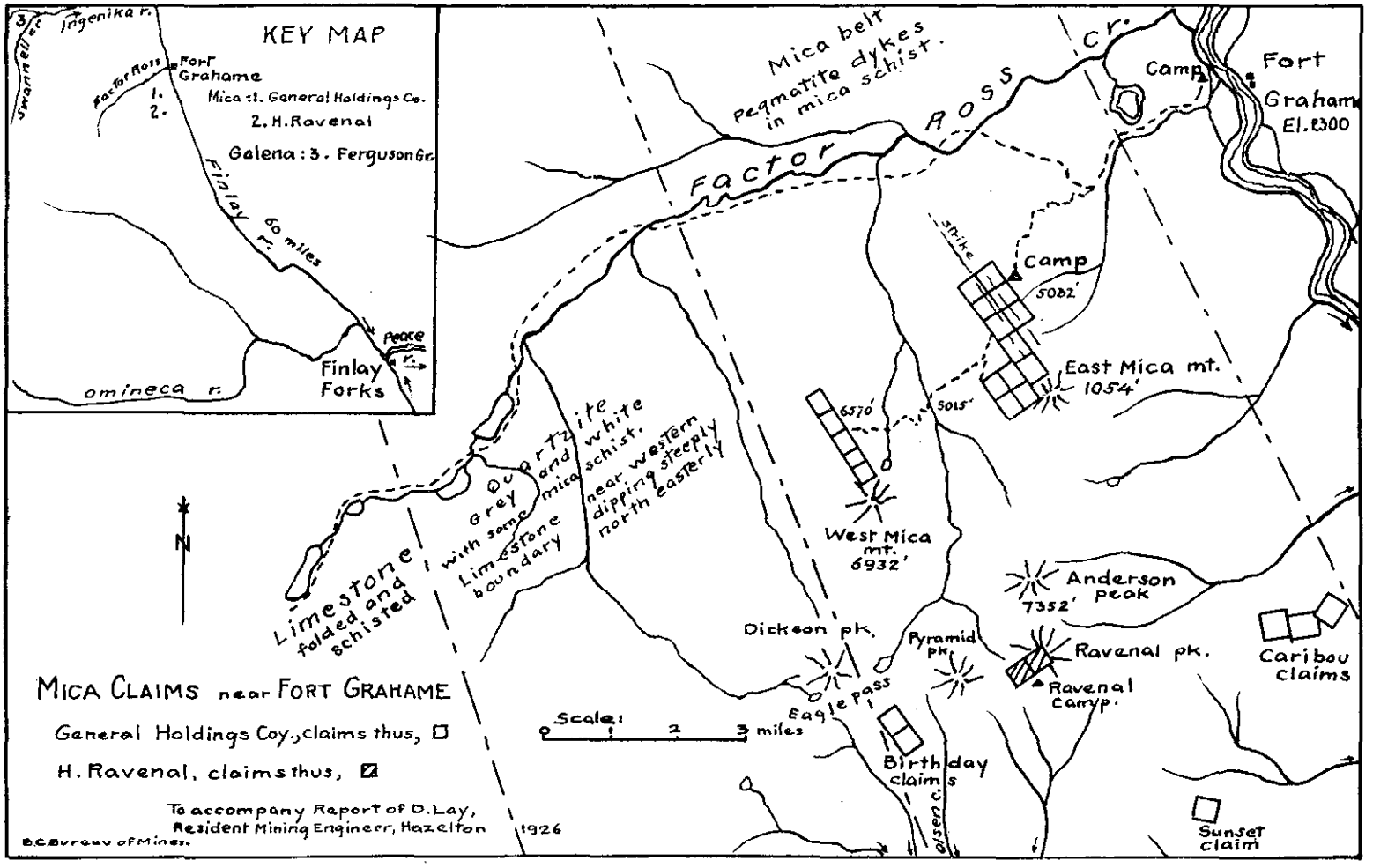
General Holding Co.

This company is incorporated under the laws of Alberta; head office, 701 Tegler Building, Edmonton; president, Major A. C. E. Anderson; manager, G. F. Dickson; secretary, J. Scott. The company owns twenty-three mineral claims on Mica mountain disposed in five groups, as well be seen from map prepared by G. F. Dickson, over an area about 8 miles long and 5 to 6 miles wide. Mica mountain lies about 7 miles south-west of Fort Grahame (elevation 2,215 feet), its summit being somewhat over 7,000 feet above sea-level. It is divided into two portions, known as West Mica mountain and East Mica mountain, by Mica creek, which flows northerly. From this creek the mountain-sides rise precipitously for 2,000 or 3,000 feet.

The claims are situated at altitudes of between 5,400 and 6,800 feet, considerably above timber-line, which is about 5,200 feet. A trail some 7 miles in length leads to the main camp, situated at an elevation of 5,400 feet on East Mica mountain, where the main workings are located.

Geology.—Mica mountain is composed largely of highly metamorphosed gneissic rock, of probable Pre-Cambrian age, which in places has the character of a gneiss and in places that of a schist showing both biotite and muscovite. The entire mountain-mass evidently consists of a large percentage of mica. The occurrence of commercial mica is found in pegmatite dykes, which have a general north-west and south-east trend, southerly dip, and which vary in width from 2 to 14 feet or even more. The pegmatite is composed of muscovite, feldspar, and quartz. The strike of the dykes conforms with that of the planes of schistosity. The dip is southerly, at angles of between 25° and 55°, as observed on the surface. There appears to be a tendency of the largest crystals of mica to concentrate near the walls of the dykes over a width of between 2 and 3 feet in this region. The largest observed crystals were upwards of 5 inches square. All crystals showed much surface weathering.

Development.—A very large amount of surface prospecting has been performed by this company, which for the past two years has employed a force of between fifteen and twenty men at times and a winter force of about twelve men. In 1925 a 32-horse-power gasolene-engine and small compressor were installed and excavational development commenced with a compressed-air drill (Sullivan 2¼-inch). This development comprised crosscutting with a view to penetrate at a depth of 130 feet a pegmatite dyke exposed on the surface on East Mica mountain. The elevation of the crosscut is 5,500 feet. At the time of inspection (in May) the crosscut had advanced a distance of 385 feet, considerably beyond the point at which the dyke should have been penetrated, but the objective had not been reached. Finally a raise was put up from the end of the crosscut


KEY MAP
Ingenika r.
Swannell r.
Factor Ross
Fort Grahame
1.
2.
Mica: 1. General Holdings Co.
2. H. Ravenal
Galena: 3. Ferguson Gr.
Finlay r.
60 miles
Peace r.
Finlay Forks
omineca r.
Mica belt
Pegmatite dykes
in mica schist.
Factor Ross Cr.
Camp
Fort Graham
El. 2300
Strike
Camp
5082'
East Mica mt.
10544'
6570'
5015'
West Mica mt.
6932'
Quartzite
Grey and white
with some mica schist.
Limestone boundary
near western
dipping steeply
north easterly
Limestone
folded and
schisted
N
Anderson peak
7352'
Dickson pk.
Pyramid pk.
Ravenal pk.
Ravenal Camp.
Caribou claims
Eagle Pass
Scale: 0 1 2 3 miles
Birthday claims
Olsen c.
Sunset claim
MICA CLAIMS near FORT GRAHAME
General Holdings Coy., claims thus,
H. Ravenal, claims thus,
To accompany Report of D. Lay,
Resident Mining Engineer, Hazelton
1926
B.C. Bureau of Mines.

and connected with a shaft sunk simultaneously in the surface exposure. This disclosed the rather astonishing fact that at about 40 feet below the surface the dyke continues downward at right angles to the original dip. This was most unfortunate, as the reasonable expectation was of course entertained that the completion of the crosscut would reach a zone free from surface weathering and that actual shipments of mica might shortly thereafter be made. Moreover, it was important to ascertain the depth of the weathered mica-zone. Incidentally progress both in sinking and raising was impeded owing to the great quantity of water encountered. The manager states that the dyke appears to be going down strongly on its new dip (which may of course again change at a still lower horizon) and carries a good percentage of mica, although this is weathered as might be expected from the open nature of the vein. Owing to bad weather in September operations had to be suspended for the winter but will be resumed in the spring of 1927.

Equipment.—The company has erected very good camp buildings sufficient for a crew of about twelve men on East Mica mountain. There is also installed a Gardner 6- by 7-inch belt-driven compressor, capacity 160 cubic feet of free air a minute, driven by a 32-horse-power Climax 4-cycle gasolene-engine. Sullivan Water Leyner 2¼-inch machine-drills are used underground.

The company's base camp is situated on the west bank of the Finlay river about a quarter of a mile above Fort Grahame, which is the receiving-point for all supplies transported via the river system from outside points. From this camp supplies are taken to the mine by pack-horses, of which the company owns fourteen. Transportation equipment comprises one motor-boat with 20-horse-power Kermath engine (4-cylinder), one scow with 20-horse-power Miller 4-cylinder, four 3½-horse-power Evinrude engines and one 5-horse-power engine, seven scows, and two boats.

The company also has acquired 70 acres of agricultural land some 4 miles below Fort Grahame, which last year yielded 22 tons of hay. It is the intention to grow sufficient agricultural produce for requirements. Under existing conditions it is difficult to provide a sufficiently anti-scorbutic diet in winter.

Quality of Mica and Prospects.—As to the quality of the mica, no doubt whatever appears to exist as to its being excellent, comparing favourably with the best grades of imported Indian mica. It is quite unnecessary to enlarge upon this aspect, which has been fully inquired into and reported upon by Professor J. A. Allan, of the University of Alberta. (*See* Second Annual Report on the Mineral Resources of Alberta, 1920, by J. A. Allan.)

As to commercial possibilities, prospects are distinctly encouraging, although development so far has necessarily been almost entirely superficial. The result of the excavational development now in hand will be awaited with interest. Operations in such a remote region are necessarily carried on under many difficulties and the cost is high. Fortunately mica-mining, unlike metal-mining, does not necessitate any expensive treatment plant to yield a marketable product, and, moreover, the value of the product in relation to its weight is very high. The management is to be congratulated upon overcoming many difficulties and the operation of this company is of signal service to the district.

Ravenal Property. This is a discovery made during the summer by H. Ravenal subsequent to the visit of the Resident Engineer to the district and has not been inspected. It is situated on Mica mountain, about 6 miles south of the General Holding Company's main camp. The manager of the latter has inspected it and reports the exposure as showing very fine sheet mica, although of course in weathered condition. It is situated at a high elevation, but can be developed by an adit drift-tunnel. It is evident from photographs that the mica crystals are of quite exceptional size. The exact situation of the property is shown on the map.

Lead.

A remarkably fine surface showing of galena occurs on the Ingenika river, about 45 miles distant from Fort Graham, on the *Ferguson* group. This group consists of five claims—*Trout Lake No. 1*, *Bluebell No. 1*, *Bluebell No. 2*, *Ferguson*, and *Muir*—owned by J. Ferguson. The property is now under option to the Selkirk Mining Syndicate, Limited Liability, with headquarters at 214 Campbell Building, Victoria. C. W. Frank is manager of the syndicate and Charles McKay is secretary. This syndicate plans to carry out development of the property early in 1927. This will consist of surface work, stripping and crosscutting the ore-zones. The

claims are situated about 20 miles up the Ingenika river from its confluence with the Finlay river. They are on the south side of the river and distant from it about 1½ miles by good trail.

On an elevated plateau-like surface, some 500 feet vertically above and south of the Ingenika river, occur several knolls which rise between 200 and 300 feet above the plateau. The whole region has been subjected to intense glaciation and the Ingenika river in this region has evidently cut down through a valley filled with glacial drift; terraces of resorted gravel, which might be worth prospecting for placer gold, occur some hundreds of feet above the present river-bed.

On one of the knolls referred to, which is composed of limestone, is situated the *Ferguson* group. The size of the top of this knoll, which is fairly flat and covered with much vegetation, is approximately 220 yards by 45 yards. The limestone-beds strike north-westerly and dip north-easterly in general at angles varying between 25° and 35°. At one point the limestone-beds dip in the opposite direction to this, which suggests folding and the development of a synclinal-anticlinal structure. Bands of the limestone up to 25 feet in width as measured on the surface are mineralized very heavily in places with galena, a small amount of zinc-blende, a little copper pyrites, and a heavy stain of ferric oxide. There are certainly three such bands, possibly four, and in addition one less heavily mineralized. A very severe handicap to examination, especially if one is pressed for time, is the fact that very little has been done in the way of open-cutting to expose critical points. These bands appear generally to conform with the bedding-planes of the limestone, although one or more exposures may be fissures which cut across the limestone-beds. The heavy stain of ferric oxide mentioned also tends, in the absence of further development, to mask matters. These exposures are on top of the knoll and extend down one side to some extent, the difference between the highest and lowest exposure, as determined by aneroid barometer, being about 100 feet. The distance apart of these bands on the surface is between 75 and 88 feet. Assuming a dip of 30°, therefore, the actual width of the bands would be about 12 feet and their distances apart about 40 feet. This is on the assumption that all are inter-bedded. Should this not be the case, the true width may more nearly approach 25 feet and the distance apart will be greater than 40 feet. It is to be noted that one band and the containing limestone dips in the opposite direction to the others. Assuming more or less intense folding with the development of an anticlinal structure, this band and one of the others might be one and the same.

The scanty exposures and limited time rendered it impossible for the writer to form anything like an accurate idea of the length of the more leady portions of the bands. At present such lengths are limited and determined by the size of the knoll. Further, the difference in elevation between the point of highest and lowest exposure is small, only 100 feet approximately. There were said to be no exposures at the base of the knoll, but a close examination of the region more immediately surrounding the base of the knoll is regarded as being of much importance, with a view to pick up the continuation of a band or bands on the plateau. After some preliminary surface prospecting, diamond-drilling could be undertaken with advantage both on the knoll and at the base. There seems every likelihood that a very considerable tonnage of lead ore of low silver grade is contained in the knoll itself and there may be underlying beds of ore not exposed on the surface. But in the nature of things, the knoll not being large, the tonnage therein is limited. Consequently much depends upon proving existence of ore beyond the confines of the base of the knoll and in depth.

It is apparent that glory-hole or quarrying methods of mining could be applied to the knoll itself, and, further, that if in the future the question of smelting *in situ* is a matter for consideration a self-fluxing mixture is available and a low zinc content.

There appear to be sound grounds for entertaining the idea of the likelihood of the existence of an ore-body of magnitude in this region owing to the points of resemblance to the East Kootenay region containing the famous *Sullivan* mine. There is geographic, geologic, and topographic relationship. Mineralogically, however, there is no similarity between this ore and the *Sullivan* ore. The former shows no pyrrhotite and crystallization is comparatively coarse; it is therefore an ore which would probably be amenable to water-concentration. It has certain points of resemblance to the *North Star* ore, a neighbour of the *Sullivan*. It is perhaps not foreign to the matter to state that the writer some twenty-seven years ago inspected the *Sullivan* mine, having at that time to report upon the smelting and concentrating possibilities. The *Ferguson* group merits the most careful and searching scrutiny with a view to determining the

advisability of a little immediate surface work, followed by diamond-drilling. The costs of operation in this region have been fully dealt with in the preface to this section.

The property is 20 miles distant from the Finlay river. Under existing conditions—in fact, unless a railway is constructed connecting Finlay Forks or Hudson Hope with existing railway-lines—actual production from this property can hardly be considered. Hope in any immediate diamond-drilling lies in proving the existence of ore-bodies of such dimensions that this fact *considered in conjunction with other factors affecting the question would be considered sufficient* to justify the construction of a railway running through this northern country.

The elevation of the Ingenika river immediately below the claims was found by aneroid to be 2,450 feet; that of the base of the knoll 2,950 feet; that of the summit of the knoll 3,150 feet.

The following sample was taken across what appeared to be the best exposure of ore, and represents a surface width of 25 feet: Gold, trace; silver, 8 oz. to the ton; lead, 16 per cent.; zinc, 4 per cent. A sample taken across a width of 3 feet of the portion containing most galena assayed: Gold, trace; silver, 12.2 oz. to the ton; lead, 32 per cent.; zinc, 3 per cent.

The following samples were shown to the Resident Engineer by the owner as being a number taken by the engineer of an important operating company who examined the deposit a few years ago and who is well known to the writer. These samples represent various exposures, but give an excellent general idea of the showings:—

Description.	Gold.	Silver.	Lead.	Zinc.
	Oz.	Oz.	Per Cent.	Per Cent.
Across 10 feet	Trace	14.0	26.1	7.7
Across 17 feet	Trace	8.6	25.0	8.0
Across 2.5 feet	Trace	21.4	52.8	2.1
Across 9 feet	Trace	Trace	.....	13.6
Cube galena	Trace	25.0	75.2	1.5

Lookout Mountain.—Two near-by mountains were climbed in order to gain an idea of the surrounding formation. Lying immediately south of the *Trout Lake* group knoll and but a few hundred yards away is Lookout mountain. The rounded summit was found to have an elevation of 3,500 feet. On the summit was an "erratic" of granodiorite, probably 2 tons in weight, with particularly sharp edges, convincing proof that the continental ice-sheet overrode the *Ferguson* knoll. Another feature of interest on this mountain is the existence of what may be termed a "glacial pot-hole." On one side near the summit chemical action in the limestone, of which the entire mountain is composed, has evidently formed a shaft of square cross-section about 6 by 6 feet in size, which extends downward to great but undetermined distance. The collar of this natural shaft has been "pot-holed" conspicuously, evidently by glacial streams. The strike of the limestone-bedding is north-easterly and dip westerly at about 25° or 30°.

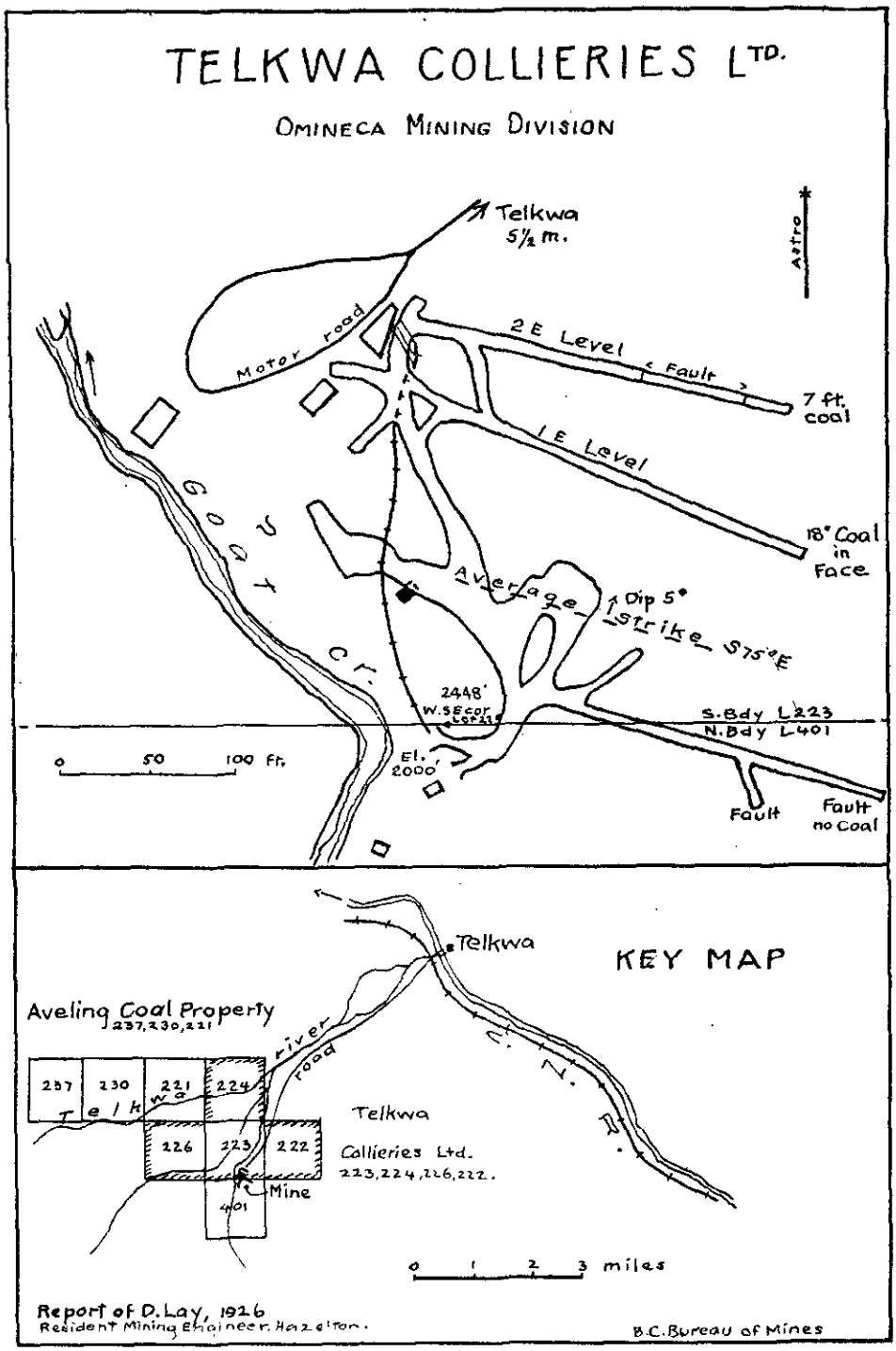
Ingenika Crag.—This mountain is situated on the north side of the Ingenika river, immediately opposite J. Ferguson's camp on the south side. The sides of the mountain fronting the river have a peculiar furrowed appearance. An ascent was made up to rock-exposures to ascertain their composition and the reason for the furrowing. The country-rock was seen to be composed of interbedded highly metamorphosed schistose limestone and a hornblende-schist. The furrows are presumably due to the more ready weathering of the limestone. The strike of the formation is N. 75° E. (mag.) and dip about 10° north-west.

Peculiar Flotation Phenomena on Ingenika River.—The waters of this river are extraordinarily clear. At the time of inspecting this region the water was rising, and it was noted that the sands on the banks, consisting of apparently clean quartzose particles with a fair amount of black sand, were floating on the surface of the water in quite large quantities. Time was entirely lacking to study the reason; possibly it is due to some film on the particles, but it appeared to be an entire reversal of the principles upon which the oil-flotation process depends.

Coal.

In the 1924 Annual Report will be found a list of the various coal areas of the district and a list of reports thereon.

This year about the same output of coal was made as in 1925, but it seems reasonable to anticipate a considerable increase during 1927 owing to the growing demands of the local market.


TELKWA COLLIERIES LTD.
OMINECA MINING DIVISION
Telkwa 5½ m.
Astro
Motor road
2 E Level
Fault
7 ft. coal
1 E Level
18" Coal in Face
GOOSE CR.
Average Dip 5°
Strike S75°E
2448'
W.S.E. cor Lot 213
S.Bdy L223
N.Bdy L401
0 50 100 Ft.
El. 2000'
Fault
Fault no Coal
KEY MAP
Telkwa
Aveling Coal Property
237, 230, 221
river road
C.N.R.
237
230
221
224
226
223
222
T e l k w a
Telkwa Collieries Ltd.
223, 224, 226, 222.
Mine
401
0 1 2 3 miles
Report of D. Lay, 1926
Resident Mining Engineer, Hazelton.
B.C. Bureau of Mines

The entire output comes from Telkwa Collieries, Limited, the president and general manager of which is J. McNeil, Telkwa. Aid was given by the Department of Mines towards improving the road between the colliery and Telkwa. It is now a good motor-road and a small force will be employed at the colliery the year round, instead of during winter months only as heretofore, as it is now possible to haul at all seasons of the year with motor-truck.

The output for the year was 1,200 long tons as compared with 1,581 long tons in 1925.

Telkwa Collieries, Ltd.

The property of this company consists of Lots 222, 223, 224, and 226, each lot being 1 square mile in area. A sketch-plan of the property accompanies this report.

In the year 1918 operations were started at the Mud Creek Colliery and continued until 1922, when they were suspended. During this period a total tonnage of 3,961 long tons of coal was shipped. This colliery was not examined by the writer, and this report deals solely with the company's colliery on Goat creek, and more especially its economic aspects.

The geology of the district is fully described in the bulletin by W. W. Leach, "The Telkwa River and Vicinity," published by the Geological Survey.

Goat Creek Colliery.—As will be seen from the map, this colliery is situated at the extreme south end of the property and approximately in the centre. It is distant 5½ miles by a good motor-road from Telkwa. The steepest grade on this road does not exceed 6 per cent. Present plans contemplate the operation of this colliery with a small force of about six men the year round, which should result in an annual output of about 5,000 tons, which it is hoped the local market between Prince George and Prince Rupert will absorb. There are bunkers of 30 tons capacity on the railway siding at Telkwa and bunkers at the mine of 90 tons capacity. A motor-truck can make the round trip between mine and railway bunkers within the hour. Surface buildings comprise boiler-house with 8-foot by 42-inch vertical boiler for operation of duplex steam-pump, with wash-room attached, log cabin bunk-house, cook-house, blacksmith-shop, store, and stable; all of about sufficient capacity to accommodate a force of about six men.

Workings.—At an elevation of 2,000 feet (elevation of Telkwa is 1,666 feet) there is exposed on the east bank of Goat creek a seam of clean coal having an average width of somewhat over 7 feet. The surface exposure is upwards of 200 feet in length. The average strike of the seam is about N. 75° W. (true), with a dip between 5° and 7° to the north-east. The coal-measures are soft and imperfectly lithified, and consist of grey clay shales and sandstones and carbonaceous shales with clay ironstone nodules. They belong to the Skeena series of Lower Cretaceous age.

Operations at this colliery commenced in the year 1923, the seam being developed by two adit-tunnels close together. Early development consisted essentially of one main slope, with branches therefrom. The more systematic scheme of development subsequently carried out, and now in progress, will be apparent from the map. This consisted of putting an air-shaft through to the surface for ventilation, the driving of three levels eastward following the strike to delimit the profitable coal area in an eastward and northward direction, and more especially to furnish coal. Reasons for keeping away from Goat creek on the west will be obvious. The roof of the explored area to date is only about 30 feet below the surface. Having regard to this fact and the soft nature of the measures overlying the coal, the earlier operations did not proceed with sufficient caution, with the result that the workings caved from the surface at one spot. The roof of the seam is a grey clay shale which stands up reasonably well, but it is evident that no liberties can be taken in mining. Farther to the east the hill rises quite steeply, so that there is prospect of stronger cover.

Of the three levels driven eastward, it will be noted that the most southerly is not driven on the company's property. It was a good piece of development nevertheless. At its extremity coal was abruptly terminated by a fault, with, it is stated, an apparent downthrow. The cross-cut run south from this level at the point shown on the map, a distance of 30 feet, likewise encountered a fault terminating the coal. Again, a short tunnel run in from the surface at a point some 150 feet south of the main working-tunnel also shows the coal to be abruptly terminated. These workings appear to demonstrate that in a southerly direction extensive interruption is to be expected, although no trouble may be experienced in again picking up the coal. This point, however, does not concern Telkwa Collieries, Limited. What is important to the latter is the eastward and northern extension of coal. At the time of inspection in August the faces of all eastward levels, with the exception of No. 2 East, were inaccessible owing to

water, but it is stated that the face of No. 1 East level showed disturbance and a width of 1.5 feet of coal only. No. 2 East level showed at the face, 124 feet east of Main slope, evidence of approaching disturbance, although the seam was holding its normal width. Shortly after date of inspection, at 130 feet east the coal was faulted; a distance of 60 feet was then driven through the fault and the full width of the seam, approximately 7 feet, was again picked up, and the last advice received was that that width of coal had been maintained for a distance of 30 feet. This is highly satisfactory and indicates that no difficulty should be experienced north and south of this level within the company's ground in picking up the coal at points east of the fault, which seems to have, as far as can be judged at present, an approximately north-and-south strike. The downthrow experienced on No. 2 East level was about 9 feet, it is stated. Further, to the east much thicker cover is being rapidly approached; consequently in this region there appears to be no likelihood of removal of measures due to any surface erosion, such as may have taken place at some points south of this company's holdings.

Present operations will focus on Nos. 1 East and 2 East levels, which will be advanced with crosscuts between them, the idea being to develop the ground to the east and incidentally keep up a sufficient output of dry coal, these workings being drained into a sump at the end of the Main slope. Ventilation will be secured by natural means by putting in a brattice in the Main slope between No. 1 East level and the air-shaft, thus causing the air-current between shaft and adit-tunnel to pass through the workings mentioned. The bearing of No. 1 East level was found to be S. 68° E. (true); that of No. 2 East level S. 78° E. (true).

All mining operations are carried on by hand, auger-drills being used for drilling. Cars of coal are hauled from mine to bunkers by a horse.

Width of Seam and Nature of Coal.—The seam has an average width of somewhat over 7 feet and is remarkably clean, there being a width of only some 6 inches of bone, which occurs about 18 inches from the bottom. Measurement of the seam at the working-face in crosscut from No. 2 East level in August was as follows:—

Top	66 inches of clean coal.
	6 inches of bone.
Bottom	15 inches of clean coal.
Total width of clean coal	81 inches.

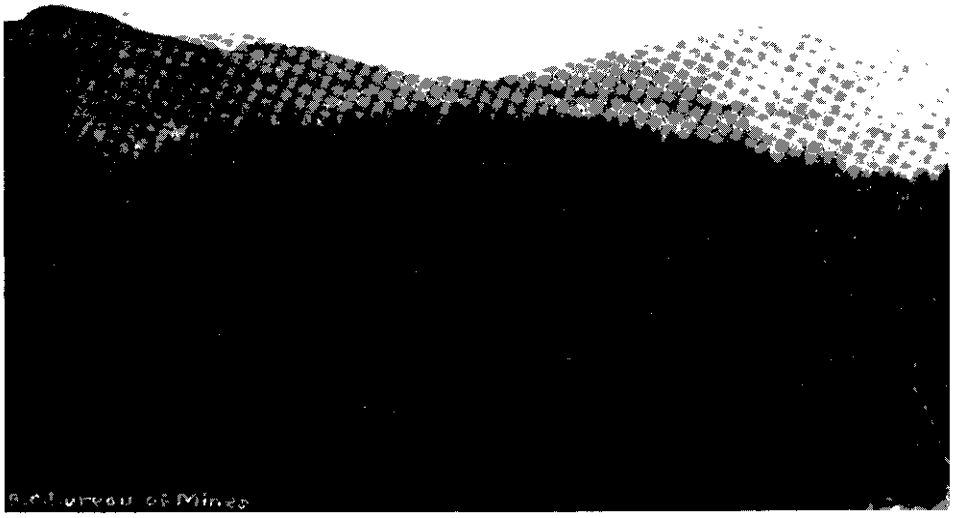
The nature of the coal is a coking bituminous coal, as will be seen from the following analysis of samples taken of the above 81 inches of coal: Moisture, 1.1 per cent.; volatile combustible matter, 24 per cent.; fixed carbon, 63.9 per cent.; ash, 11 per cent.; B.T.U., 13,385.

It is to be noted that the above percentage of ash is rather higher than average samples from this mine, which usually run under 10 per cent. However, it might be noted that this is not higher than the average ash content of other coals being mined in the Province. An interesting comparison of British Columbia coals is given on pages 314 and 315 of the Annual Report for 1925.

The physical properties of Telkwa coal are good. It is hard, scarcely blacking the hands when handled, stands transportation well, and is in every respect a good general-purpose coal. The coal is loaded with forks at the mine-face, the lump being supplied for domestic purposes and the fines forming blacksmith-coal.

Tonnage of Proved Coal.—Referring to the map, it will be seen that the area proved by excavational development to date of inspection is approximately 280 feet by 240 feet, or, say, 1½ acres. Allowing 100 tons of coal per inch of thickness per acre and an average thickness of 81 inches of coal, we have a total of 100 by 81 by 1½, or 12,150 tons of coal. Of this, there had already been extracted up to January 1st, 1926, 3,144 tons (long). Making some allowance for extension beyond the confines of the proved area, it seems reasonable to assume that there is 10,000 tons of recoverable coal in sight. In this connection it is to be especially noted that the recent picking-up of the coal-seam east of the faulted region is satisfactory, and it seems most probable that development will shortly indicate that a far more liberal estimate is allowable. However, in this region, in the absence of positive delimitation of coal, calculations as to tonnage in sight should be made with caution.

In view of the old adage, "a colliery well bored is half won," it might be urged that it would be well to delimit the coal area by drilling from the surface at various points. This would be of great assistance, but it is doubtful if the expense is justified at present. The general aspect



Ferguson's Property on Ingenika River.

Peace River Canyon.

of the coal situation and the question of market are the dominant factors which must control the policy to be adopted. There is no market at present for more than 5,000 tons of coal annually, and it is to be noted that excavational development is taking place at a profit and at a sufficiently rapid rate in view of the limited market. Conditions may change of course. A strong demand for coke in the north, for example, might justify expansion, but the latter should not be contemplated without careful study of the situation. It is therefore deemed that the policy followed by the management is wise and should be continued for the present. To make a profit is of course the aim and essence of this policy.

The Skeena Development Syndicate, Ltd. (London, England).

This syndicate owns the property formerly known as the Aveling coal property, situated on the north side of the Telkwa river, 7½ miles by good wagon-road from Telkwa. It is readily accessible and the quality of the coal—bituminous—is excellent. A full report will be found in the Annual Report for the year 1921. The location of the property, consisting of Lots 221, 230, and 237 (1,920 acres), is shown on key-map. The representative is F. B. Chettleburgh, of Telkwa, who has been doing some prospecting on the property during the season with the object of determining the relationship of the various outcrops.

Zymoetz (Copper) River Coalfield.

This property is now controlled by the Yorkshire & Pacific Trust Company, of Vancouver, of which F. B. Chettleburgh is the local representative. Some prospecting was done by the latter on the property during the season of 1926. The property is described in the Annual Reports for the years 1914 and 1922.

Lake Kathlyn Coalfield.

This coalfield, situated on the central eastern slopes of Hudson Bay mountain, is distant some 2½ miles by good road from Lake Kathlyn Station on the Canadian National Railway and some 5½ miles from Smithers, a divisional point. The cabin at the foot of the exposures can be reached in half an hour by car from Smithers.

The most important portion of the coalfield is that covered by Licences 11172 and 11198; that is, Section 16 and half of Section 8 and half of Section 17, which two latter half-sections adjoin each other, and Section 16, the total area being 2 square miles. The co-owners are George H. Ballard and Frank X. Frank. By agreement British Columbia Anthracite, Limited, has acquired the right to mine coal, paying for the same on a royalty basis.

Geology.—The coal-seams occur in the Hazelton formation of Jurassic age, an exception to the usual mode of occurrence of coal in this district—namely, in the Skeena series of Lower Cretaceous age. The coal-measures consist of highly carbonaceous slates and highly metamorphosed sandstone, virtually quartzite.

The measures are situated in immediate proximity to Lake Kathlyn glacier, and are sharply uptilted at angles approaching 60° against the central eastern slopes of Hudson Bay mountain and are abruptly terminated at their upper end by the Hazelton volcanics. The measures are exposed on both sides of the lower portion of the glacial cirque, the upper portion of which is still occupied by Lake Kathlyn glacier. The lower portion of the cirque takes on the form of a deep gorge, some hundreds of feet in depth and width, abruptly terminated at its upper end by a vertical rise to the end of the glacier. On either side of the latter a glacial stream issues, forming two waterfalls many feet in height. The latter unite at the bottom to form Glacier creek. The whole setting constitutes a scene of great natural beauty. The trend of the gorge is north-east and Glacier creek flows in this direction. The gorge exposes not only the coal-measures, but also the termination of the latter by the Hazelton volcanics. The latter dip south-west at an angle of about 30° to 35°. The strike of the line of contact appears to be about N. 35° W. (true), but little different from the strike of the coal-seams, which is N. 45° W. (true), but the latter dip north-easterly.

While the coal-measures are exposed on both sides of the gorge, outcroppings of true coal occur on the south side only, although a seam of highly carbonaceous slate was found on the north side of the gorge at an elevation of 3,000 feet, similar seams of which occur on the south side. The former occurs within a few feet of a mineralization of zinc-blende in the volcanics. Pieces of each are to be found together, the black-jack of the one being curiously like the compressed carbonaceous matter of the other, which shows minute seams of anthracite.

Rocks forming the coal-measures were found to outcrop at points about 1 mile apart, measured along the strike. Their extent is quite possibly greater than this. No attempt was made to delimit the area of the coal-measures by field observations, which, except near the creek, are rendered difficult owing to dense vegetation and glacial drift.

Coal-seams.—These strike N. 45° W. (true) and dip at angles varying from 45° to 60° north-east. They consist in part of true semi-anthracitic coal and in part of highly metamorphosed carbonaceous slate. Pronounced schistose structure and slickensiding are characteristic features, just what might be expected having regard to the regional metamorphism caused by the near-by intrusion of the igneous core of Hudson Bay mountain.

All important outcrops occur on the south side of Glacier creek and within a vertical range of 500 feet.

As determined by aneroid barometer, the elevation of the more important showings was as follows:—

	Feet.
Lake Kathlyn Station	1,650
Coal Camp	2,450
Forge seam	2,490
Ballard seam	2,675
Ten-foot seam	2,750
Three Tunnels seam	2,800
Frank seam	2,950

Of the above, by far the most important are the Ballard seam and the Frank seam. The coal, as will be seen from the analyses given, is rather remarkable in the respect that the moisture indicates a lignitic coal, whereas fixed carbon and volatile matter place it in the semi-anthracitic class.

The workings consist merely of one tunnel run a distance of 40 feet on the Forge seam, which does not show any commercial possibilities, and also a tunnel 70 feet in length on the 4-foot Ballard seam. It is also understood that three short tunnels were originally run on the Three Tunnels seam, but these were caved at the time of inspection. With the exception of these workings, it should be understood that all exposures are purely surface exposures at points virtually in the same vertical plane passing through all seams. The thickness of the strata in which the seams occur is between 500 and 600 feet. The glacial cirque forms a huge natural crosscut in the measures.

Forge Seam.—This seam, which is at an elevation of 2,490 feet, is the uppermost one geologically. It consists of highly metamorphosed graphitic material and some true coal, the total width being 5 feet, but offers no hopeful commercial possibilities. The strike is N. 45° W. (true) and the dip 45° north-east.

Ballard Seam.—The elevation of this seam is 2,675 feet. A tunnel 70 feet in length has been run on it, which has a width of 4 feet at the portal and 3 feet 6 inches at the face. A width of 3 to 4 inches of bone is continuous from portal to face. On the hanging-wall side of this seam, distant 35 feet, is another seam 2 feet in width of schisted coal-like material, and between it and the Ballard seam there occurs another small seam of similar material. Only the Ballard seam would appear to have any commercial possibilities. The strike of this seam is N. 55° W. (true) and the dip 50° north-east. The following samples were taken:—

Description.	Moisture.	V.C.M.	F.C.	Ash.
	Per Cent.	Per Cent.	Per Cent.	Per Cent.
Across 4 feet, 20 feet in from portal	9.9	2.8	66.6	20.7
Across 3.5 feet at face	10.6	3.3	71.8	14.3

Bone was excluded from both samples. The calorific value of the first sample was 13,300 B.T.U. It will be noted that this seam shows a very distinct tendency to improve in quality in depth.

Ten-foot Seam.—This seam, which is at an elevation of 2,750 feet, consists of mixed bone and schistose coal and was not sampled.

Three Tunnels Seam.—The elevation of this seam is 2,800 feet. Three short tunnels were originally run on it, but all were caved at the time of inspection and the only exposure open to inspection was that over the face of the central tunnel. This shows a width of 4 feet, consisting of 18 inches of schistose coal, 24 inches of bone, and a few inches of coal on the foot-wall. So far as can be judged, similar seams occur on both hanging- and foot-wall sides, separated from the central seam in each case by about 10 feet of country-rock.

Frank Seam.—This seam, which is at an elevation of 2,950 feet, contains the best coal-showing and it is particularly unfortunate that it should be split up into a number of different seams separated by bands of slate. While a total width of 86 inches of coal is exposed at this point, it is split up as follows in a total width of 271 inches:—

On the hanging-wall	26 inches of coal.
	20 inches of slate.
	20 inches of coal.
	84 inches of slate.
	12 inches of coal.
	48 inches of slate.
	22 inches of coal.
	33 inches of slate.
On the foot-wall	6 inches of coal.
Total	271 inches.

This seam is exposed merely by open-cut on a very steep slope. It appears to strike N. 30° W. (true) and dips 60° to the north-east.

From the analyses below given it is apparent that the 22-inch seam on the foot-wall side is radically different from that of any other seam on the property. The following samples were taken of the Frank seam:—

Description.	Moisture.	V.C.M.	F.C.	Ash.
	Per Cent.	Per Cent.	Per Cent.	Per Cent.
Seam 22 inches wide on foot-wall	12.5	7.0	74.3	6.2
Seam 22 inches wide on foot-wall (selected pieces)	6.9	10.7	79.2	3.2
Seam 20 inches wide in middle	15.1	10.0	56.8	18.1
Seam 26 inches wide on hanging-wall	12.9	9.1	54.9	23.1
Seam 26 inches wide on hanging-wall (selected pieces)	14.0	8.9	63.9	13.2

A sample of 50 or 60 lb. weight of picked pieces of coal from this 22-inch foot-wall seam was burnt in a small domestic coal-stove. Except that it was a little more difficult to kindle than Welsh anthracite, its behaviour was entirely satisfactory. It exhibited the usual characteristics of anthracite, giving a hot fire, with little or no smoke, and a very short flame. It could be described as a good commercial grade of anthracitic coal. In physical appearance the coal bears but little resemblance to anthracite. It shows pronounced schistose structure, crumbles readily, and there is much development of free carbon so that it soils the fingers. While its burning qualities are good in the lump, it would not stand handling well.

Commercial Possibilities.—In connection with analyses of samples it is only fair to point out that, with the exception of those from the Ballard seam, they are all surface samples and therefore an improvement in depth is to be expected. Further, samples taken in the tunnel on the Ballard seam do afford some indication of an improvement in this respect. With the exception of the 22-inch portion of the Frank seam, all samples show a high ash content.

As to the question of available tonnage, it has already been pointed out that all exposures are in the same vertical plane, practically speaking. Obviously, therefore, in the absence of

further development, excavational or drilling, no statement as to tonnage can be made, nor can even an intelligent guess be made. There does not appear to be any evidence of local faulting.

As far as cheap mining facilities and transportation are concerned, Lake Kathlyn coalfield is well situated. Transportation is already provided; there is abundance of mine-timber on the property and near-by water-power can be rendered available. Further, the topography is highly favourable to cheap extraction to a depth of about 500 feet vertically below the highest coal-outcrop by a crosscut adit-tunnel. The length of such required to penetrate all seams would be about 600 feet. Alternatively, any individual seam can be followed inwards by a drift from the surface. Of the individual seams, the most hopeful prospects are offered by the Ballard and Frank seams, of which the latter is badly split up.

Market.—An all-important question for any coal prospect is that of market. There is this essential difference between coal and metal mining: In the latter case there is no such thing as competition; in the former case your neighbour is your competitor. In the interior of northern British Columbia the possible market for coal, unless the fuel is of quite exceptional quality, is extremely limited at present and purely local.

Conclusion.—It is considered that the owners or a syndicate fully informed as to the facts must do further development-work before more than a guess at commercial possibilities can be made. Development either in the form of crosscutting, drifting, or diamond-drilling should have as its objectives the proving of the seams in depth to the lowest horizon at which it is possible to win coal by an adit-tunnel, likewise development of, at any rate, one seam at points a considerable distance apart along its strike. One thing is certain, this property is a prospect, not a mine.

PEACE RIVER MINING DIVISION.

A trip was made through the Peace River Mining Division by the Resident Engineer on the return from Fort Grahame section of the Omineca Mining Division.

A full account of the topographic and geologic features of the Peace River Mining Division will be found in the Annual Report for 1923. Full particulars of routes into this Division, and cost of transporting supplies thereto, will be found in the Annual Report for this year under "Fort Grahame Section."

The main object of the visit in 1926 was the inspection of the developments recently accomplished by the Peace Canyon Mining and Transportation Company, Limited, which is engaged in operating the Gething coal leases at the Rocky Mountain canyon.

A short stop was made at the mouth of the Carbon river, where C. G. Jones has a ranch. An intimate local knowledge of the Carbon River coal-showings is possessed by C. G. Jones (address, Carbon River, B.C.), who is available as guide to those interested in this coalfield. Particulars of the latter will be found in the 1923 Annual Report.

Some small-scale activity in placer-mining along the bars of the Peace river was evident at the time of the visit in May. Later in the season it is understood that R. R. Hedley and associates were engaged in investigating placer-mining possibilities in this district.

The Peace Canyon Mining and Transportation Company, Ltd.—The president of the company is George Aylard and the manager and secretary-treasurer is Leslie Aylard; office at Hudson Hope, B.C. This is a private company operating the Gething coal leases, consisting of 40 square miles of ground on both sides of the Peace river at the Rocky Mountain canyon.

This coalfield is very fully reported upon by Dr. F. H. McLearn, of the Geological Survey (Summary Report, Part B, 1922), and also by John D. Galloway in the Annual Report for 1923. Since these reports were written a new seam 7 feet in thickness was discovered two years ago. This outcrops at water-level, 2 miles below the canyon on the south side of the river, and what is probably the same seam is visible at one point in the canyon on the north side of the river. Development-work on this seam consists of two tunnels about half a mile apart, one 25 feet and the other 60 feet in length. In spite of a determined attempt, involving some 24 miles of travel, to inspect these new workings, the idea had to be abandoned after getting to the head of the canyon on the north side of the river. Owing to the very stormy weather prevailing it was found to be quite impossible to cross the river.

Particulars relating to this seam were furnished by the manager. It is between 200 and 300 feet below the Grant seam. There are five benches in the seam. These were sampled

separately by the manager and samples analysed by the Department of Mines with the following results:—

No.	Moisture.	V.C.M.	F.C.	Ash.
	Per Cent.	Per Cent.	Per Cent.	Per Cent.
1	0.6	17.04	79.0	3.0
2	0.6	16.90	80.0	2.5
3	0.6	17.20	75.4	6.8
4	0.9	14.10	82.5	2.5
5	0.6	19.60	75.8	4.0

These analyses indicate a high-carbon bituminous coal of similar high quality to that of the other seams of this field.

Present plans centre on the extraction of coal from the Grant seam, which outcrops on the north bank of the river in the lower part of the canyon, and which has already been opened up by an adit-tunnel and cross-drifts therefrom at the river-level. (Refer to sketch in 1923 Annual Report.) The Dominion Government has promised assistance in clearing the river-channel up to coal-bunkers, which will be situated on the banks of the river. When this is done the large stern-wheel steamer "D. A. Thomas," now plying on the Peace river as far up as Hudson Hope, will be able to get up to the bunkers and take scows of coal to Peace River, a terminal point of the Edmonton, Dunvegan & British Columbia Railway. The coal company has installed a small sawmill and lumber to construct bunkers of 300 tons capacity has already been sawn. A haulage-way from mine adit to bunkers has also been graded. At the time of inspection the company was engaged in constructing a branch wagon-road from the portage road (between Hudson Hope and head of canyon) to its property, a distance of about 9 miles, and in connection with which a grant was given by the Department of Mines. When this road is completed good means of transporting supplies from Hudson Hope will be afforded, the distance from the latter place being 15 miles.

It is unnecessary to enlarge upon the fact that this coal is of quite exceptional quality and an ideal fuel for almost every purpose except coke-manufacture, or that the extreme regularity of the measures indicates ideal mining conditions. While the carrying-out of the contemplated plans outlined will leave the company with transportation only during the open season of the river—somewhat over five months of the year—nevertheless the position will be very much better than it is now. It is also reasonable to anticipate that the quality of the coal will become much more widely known and sought after.

CARIBOO MINING DIVISION.

The placer production for the year of the Cariboo Mining Division was $170,993, as compared with $151,627 for 1925.

The chief contributor was the Kafue Copper Development Company's dredge operating on Antler creek. Hydraulic operators had a very poor fall run owing to severe weather in September, and the large operator, John Hopp Mines, on Lowhee creek had much dead-work to accomplish. For these reasons the yield from hydraulic mines is less than usual.

A gratifying feature of placer-mining was the amount of Keystone-drilling undertaken at various points to determine dredging possibilities. A considerable amount of interest was manifested in lode-mining.

Prince George Section.

The name of this section has been changed since last year from "Fort George section" to "Prince George section." It includes all properties normally tributary to Prince George, a divisional point on the Canadian National Railway and an important centre.

Largeasse. This group, owned by Louis Behn and P. Dessauve, is situated 4 miles west of Prince George. On the banks of Winchester creek there is exposed a quartz vein, 2 feet in width, in graphitic shale country-rock. The vein strikes N. 25° E. (mag.) and dips south-easterly. Samples of the quartz showed only traces of gold and silver.

Government Creek.

Rush. This group consists of four claims and is owned by T. Rush, J. Peters, and associates. It is situated on a small tributary of Government creek and is reached by a short branch road and trail from the main Prince George–Quesnel road. In graphitic shale country-rock there is exposed a quartz vein on the surface, striking N. 60° W. (mag.), dipping north-east, which shows small bunches of galena and zinc-blende. An adit-tunnel has been run a distance of 20 feet and at the end a winze is sunk 30 feet, at the bottom of which is exposed a small seam of galena and zinc-blende 3 inches in width, a sample of which assayed: Gold, 0.10 oz.; silver, 41.5 oz. to the ton; lead, 21 per cent.; zinc, 3 per cent. A drift 40 feet in length at the bottom of the winze fails to disclose anything of importance. The mineral-showing hardly warrants any further following up in depth at this point.

Hixon Creek.

Ceyanne. This group (formerly *Belmont* group), owned by E. Hann and J. Strbac, is situated on Hixon creek, about 4 miles above the junction of Government and Hixon creeks. On the left bank of the creek a tunnel has been run a distance of 135 feet in highly oxidized decomposed rock, classified by L. Reinecke, of the Geological Survey, as quartz-sericite schist, in which occur numerous quartz stringers. It was stated that values occur in both country-rock and quartz stringers. Samples were taken of the country-rock from face to portal and also a composite sample of the stringers. Both samples showed only traces of gold and silver.

Placer Lease No. 2118. This lease is owned by E. Hann and J. Strbac and is situated on Hixon creek, about 1½ miles above the old gold stamp-mill. On both sides of Hixon creek in this region the country-rock is a gneissic rock shading into a mica-schist and bears a very strong resemblance to the gneissic rocks on Mica mountain, Fort Grahame section, and may be of the same age. The creek-gravels overlie at one point a wide band of white clay, which is undoubtedly decomposed pegmatite, the muscovite crystals therein being quite coarse. The width of the white clay cannot be determined, as it is covered with gravels except where exposed by sluicing. It is stated that coarse placer gold occurs in this clay to a depth of several feet. A shaft, full of water at the time of inspection, was said to be sunk a distance of 16 feet in the white clay and it was stated that coarse gold was encountered for a distance of 13 feet. A sample panned from the top of the white clay certainly showed some nice coarse gold. Further work will doubtless throw some additional light on the matter.

This is an interesting discovery and well merits following up. The nature of the country-rock suggests the possibility of mica of commercial size being found, and it would seem worth prospecting with this end in view. The owners of this lease live in their cabin on Hixon creek all the year, trapping in winter and placer-mining in summer. They have shown much industry in the way of ditching and flume construction, whipsawing all the lumber required, and are entitled to much credit.

Granite Mining Co.—The property of this company is situated at North point on the Fraser river. An occurrence of scheelite was reported as existing on this property, but inspection was impossible. Galena-showings in this region are described by L. Reinecke on page 106 of Memoir 118 of the Geological Survey.

BARKERVILLE SECTION.

Antler Creek.

Kafue Copper Development Co.'s Dredge.—Actual dredging operations were commenced on March 1st, but two unfortunate accidents, sinking of the dredge and breaking of the spud, entailed a delay of over two months. However, in the early summer rich ground, which had not previously been drifted, was met with and good results were obtained for the remainder of the season. At the time of inspection the dredge was digging a 67-foot bank, 51 feet below water-level and 16 feet above. The average height of bank has been between 55 and 57 feet.

Consolidated Mining and Smelting Co. of Canada, Ltd.—This company commenced operations in October on the H. C. Carry leases on upper Antler creek with a force of five men, R. B. Shelledy being in charge. At the time of inspection work had just been started and comprised reopening the old workings previously run in the old channel at this point.

Guyet Lease. This lease is situated on the right bank of Antler creek, about three-quarters of a mile above Pleasant Valley creek, and is owned by J. Wendle, C. M. Edwards, Commander J. H. Clegg, and Commander L. E. R. Booth. This was originally worked by a man called Guyet, who discovered evidence of a high run of gold apparently crossing Antler creek at this point in a more or less northerly and southerly direction. On the east side of Antler creek an old drift, now caved, is said to follow the old channel for 120 feet, with crosscuts run from rim to rim. While promising values were obtained, it is stated, they were not high enough for drift-mining, while offering good possibilities for hydraulic mining. Present plans therefore focus on piping the gravels at this point. Guyet originally blazed the course of the supposed line of this run, which he deemed to parallel Antler creek southerly to a point about opposite Wolf creek, when it may again cross Antler creek.

A No. 2 Monitor, with flume, penstock, and pipe-line (18 to 9 inches), has been installed and everything is in readiness for the spring run. It might be noted that on the same supposed channel, about three-quarters of a mile above the Guyet lease, Butts & Tisdale are working.

Lowhee Creek.

Hopp Mines. This, the chief hydraulic mine in the district, has not experienced a good year. Operations comprised piping to a point somewhat above the old reservoir and were hampered by necessity of handling the old dam-timbers. Much trouble was also experienced owing to excessive wear of the steel plates in the flume. These, it is to be noted, are not manganese steel, but merely high-carbon steel with a small percentage of manganese. Doubtless manganese-steel plates would have given good service. The management contemplates trying steel rails next year.

The piping season was short, from May 1st to July 28th, followed by two months of shortage and an intermittent fall run. Some 600,000 cubic yards of gravel was piped off during the year. Operations in 1927 will be awaited with interest, because the limit of drifting by the old-timers seems to have been reached, and it is hoped that virgin ground will be encountered to the summit.

Emory Gulch.

D. McIntyre and M. Schilling obtained a "lay" from John Hopp Mines on some ground here and, it is reported, did fairly well. Unfortunately a most regrettable automobile accident resulted in the untimely death of Mr. Schilling.

Williams Creek.

Hurdy. This is a real-estate claim situated on the right bank of Williams creek opposite Mink gulch. It is owned by E. W. Giddings and H. Rivers. The objective is the piping-out of the right bank of Williams creek at this point, which it is stated had formerly been tried with promising results, but the attempt was abandoned owing to insufficient water-pressure. Great energy has been displayed by the present owners, who within two months of acquiring the claim had installed a No. 2 Monitor, with 800 feet of 11-inch pipe, constructed a penstock, and cleared out about 1 mile of ditch, taking water from Williams creek. The penstock is situated so as to give a head of 145 feet at the nozzle. The channel is supposed to be about 300 feet wide and 800 feet long. Unfortunately dumping facilities are poor. The owners propose installing a drag-line hook operated by a gasolene donkey-engine for removal of boulders. Piping will be commenced in the spring.

Shepherd Creek.

Rees's Leases. R. D. Rees owns one creek and one bench lease on Shepherd creek. Present operations focus on the north side of Shepherd creek just about opposite the end of Downey Pass creek and consist of piping the gravels in this region, which is overlaid by a thickness of about 4 feet of peat. The channel here is about 150 feet wide and bed-rock slopes downwards north, thereby rendering it impossible to follow much farther north, the only present outlet for tailings being south into Shepherd creek. The owner at present is compelled to pipe only those places on the rim which are sufficiently high to afford grade for tailings-discharge. "Pay" is throughout the gravel with concentration in certain layers. Many rounded nodules, some spherical, of arsenical iron pyrites and galena are of common occurrence. Samples of the former failed to show more than a trace of gold. The

gravels are evidently of considerable depth at some points, a shaft sunk 32 feet having failed to reach bed-rock. The gold in main, while fairly coarse, is much worn.

There are indications pointing to the possible continuation of this channel to 8-Mile lake, and possibly some connection with the gravels of the Thistle pit on the south shore of the lake. If so, the yardage will be very considerable. It is clear that this region should be tested by Keystone-drilling. The owner has one scheme whereby an outlet for tailings would be afforded by running a tunnel 550 feet in length in the right bank of Shepherd creek (to avoid slide-rock) and upraising at the end in gravel. The end of the tunnel would be between 90 and 100 feet below the outlet of the present pit. While such is feasible, the wisdom of drilling this ground first is apparent. Water for this property is obtained from Shepherd creek.

Harrington's Leases.

These leases, owned by Mrs. E. W. Harrington, are three in number, two of which are situated above and one below the property of R. D. Rees. The two former are situated in the comparatively flat country at the headwaters of Shepherd and Martin creeks, which flow in opposite directions, the former north-easterly and the latter south-westerly. These leases have only recently been staked and no work has been done on them so far as could be ascertained.

Valley Creek (Big Valley Creek).

Valley creek (or Big Valley creek, as it is more commonly known) is one of the more accessible untested possible dredging areas. Fifteen dredging leases, covering a length of 8 miles of the creek between 9-Mile lake and Sugar creek, are owned by J. Wendle, Laurent Muller, and associates. A trip was made for several miles down the valley to get an idea of the salient features. Valley creek has its source in 9-Mile lake, empties into the Willow river, and occupies a valley from 500 to 1,000 feet or so in width, trending north-west and south-east some 24 miles in length. A road some 12 miles in length (the last 3 miles of which are somewhat out of repair) leads from Barkerville to the upper end of the ground covered by the leases.

The upper part of the valley is wide, over 1,000 feet in most places. Much is meadow land, with sparse growth of jack-pine timber in places. The northward-flowing tributary creeks, Coffee, Stewart, and Sugar creeks, have all been worked for placer, either by drifting or hydraulicking. It is stated that four drill-holes were put down in the valley between Coffee and Stewart creeks some twelve years ago. The first three holes, it is stated, were all less than 40 feet and presumably reached bed-rock. Values shown were about 10 cents a yard. The fourth, about the centre of the valley, was 80 feet deep and is stated to have shown values of 24 cents a cubic yard.

Some 5 miles below the source of the creek there is a canyon, below which the valley narrows to 400 or 500 feet, about which width continues to the end of the leases. Just below the canyon is *Big Valley* mine. Some thirty years ago a shaft is stated to have been sunk at this point 38 feet to rim-rock, and a crosscut was driven out towards the centre of the valley for a distance of 100 feet, when it broke through into gravel, in which it was continued for another 100 feet, striking rim-rock again, when the tunnel was directed up-stream. The pump being unable to cope with the water, further work was discontinued. The gravel taken from the tunnel is said to have averaged $2 a cubic yard.

There can be no question as to there being an immense yardage of gravels in the portion of the valley covered by the leases. There are other features also which indicate that it is well worth while drilling a few cross-sections by way of preliminary, followed by more thorough drilling if promising results are yielded. It is only by drilling that those features can be ascertained which will determine its suitability for dredging. It is commended to those interested as being worthy of investigation. It is readily accessible. A tractor Keystone drill could with very little expense on the road be got to the upper end of the valley. The flat topography thereafter should enable the drill to be got to lower points without any difficulty.

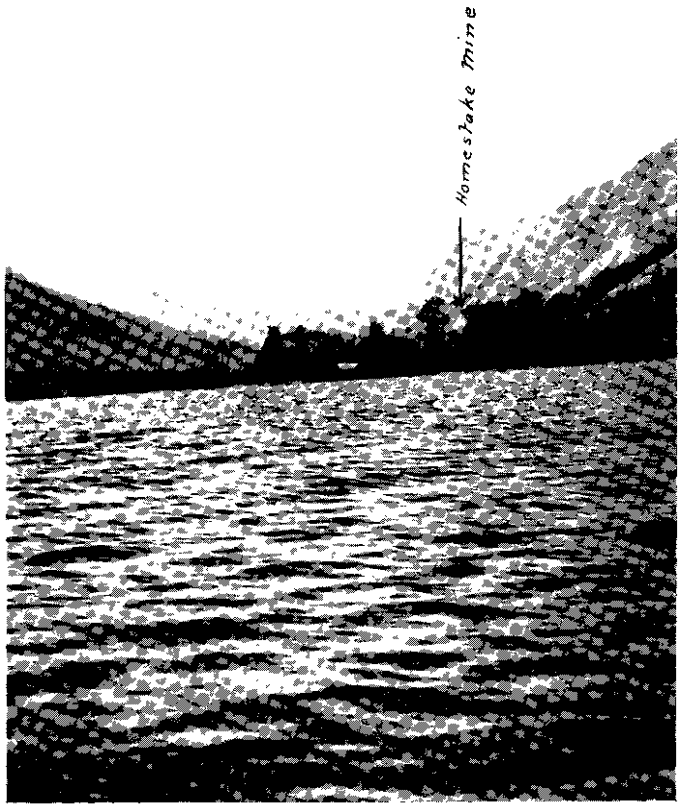
Eight-mile Lake.

Cornish & Ross worked at their hydraulic property at 8-Mile lake all the season.

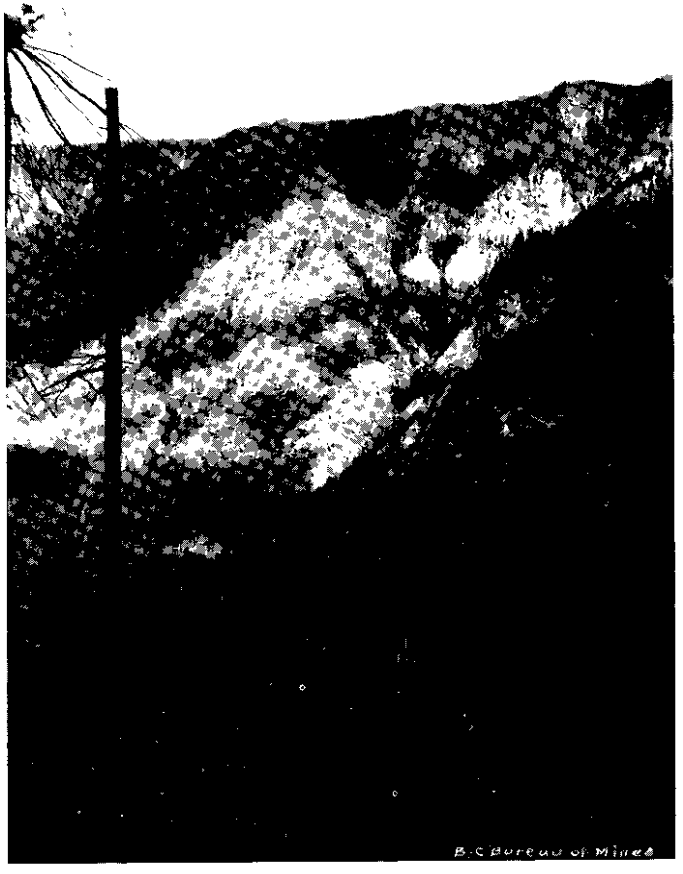
Slough Creek.

Ketch.

This claim, situated at the mouth of Devil's canyon, is owned by W. Houser, Mrs. E. L. Houser, and R. McDougall. This claim is probably on the same run as the *Point* claim below on Slough creek. It is stated that promising results



Squaam Bay, Kamloops M.D.



Homestake Mine, Kamloops M.D.

were obtained during the season, indicating an extension eastwards towards Burns creek. The plant consists of a No. 2 Monitor, 600 feet of 24-inch, 11-inch, and 9-inch pipe. Water is obtained from Olally and Burns creeks, a small slough forming a reservoir. The head of water at the nozzle is 90 feet.

Two Chinese companies are operating on Slough creek below the *Ketch*, one at the *Point* claim and the other farther down.

On Coulter creek Julius Powel has been working all season.

Devil's Lake Creek.

El Dorado. This claim and two adjoining creek leases are owned by J. Rolin, Nels M. Hansen, and J. P. Friis. An interesting and successful attempt was made to drain a small lake on this property in Devil's canyon, in the bed of which it is hoped gold will be found. Previous operators have in past years attempted this, but have for various reasons failed. Previous attempts consisted in running a tunnel in rim-rock at a point about 60 feet vertically below the surface of the lake, and for a distance of some 285 feet presumably to a point vertically below a small shaft sunk to a depth of 23 feet at the edge of the lake. Attempts to hole through failed and might have been due to many reasons, which there was neither opportunity nor occasion to determine.

The present owners, wisely keeping their workings as far as possible in solid rock, after levelling, raised up in rim-rock some 20 feet back from the face of the tunnel some 22 feet, drifted a few feet only out of rock, and managed to drive a bar through into the bottom of the shaft, and finally sections of 10-inch pipe. An open-cut was then made from the lake to the bottom of the shaft on the surface, and it was hoped that the 10-inch pipe would afford sufficient vent. Owing to repeated chokings with debris the drift from the top of the raise was finally carried through to the shaft. This was the stage when the property was last inspected and there appeared to be no reason why any further difficulty should be met with. Presumably it had been established by sounding that the depth of the small lake was but little, if any, below that of the bottom of the shaft. It is stated that in drifting from the raise a carbonized tree-trunk was encountered.

Mining operations were in charge of Henning Bergquist, who carried matters out in a thoroughly capable and miner-like manner. The result of the investigation of the bed of the little lake next season will be awaited with interest.

Lightning Creek.

Cariboo Eagle Mining Co., Ltd. This company, a new venture, is a limited liability partnership, the partners being J. P. Houser (manager), J. P. Friis, Nels Hansen, and Mrs. Gertrude Murphy. The property consists of three leases on Houseman creek, more commonly known as Eagle creek, a south-flowing tributary of Lightning creek, about 4 miles above Stanley. In the sixties the surface gravels at the mouth of the creek were worked. More recently Otto Muller followed by drifting a channel diverging east of the present creek under heavy cover. Slum, it is stated, finally prevented farther advance. Present operations centre on piping off the entire bank.

Work done during 1926 comprised construction of flume, 700 feet of 16-inch and 9-inch pipe, setting-up of No. 2 Monitor, construction of a short water-flume and penstock, and clearing out of ditch. Water is taken from Eagle creek and the available head is 140 feet. About 100 feet vertically above the penstock two small lakes form a very convenient natural reservoir. Everything has been prepared in readiness for the spring run. The general layout of plant is good and reflects credit on those concerned.

Beaver Pass.

The possibilities of Beaver pass as a dredging area have long been discussed, especially as there are grounds for the belief that originally Lightning creek flowed along this valley to Willow river.

Eleven dredging leases, owned by H. J. Gardner (3), E. Falk (1), M. Sunberg (1), A. Wallinder (2), G. Carlson (2), and F. Chapman (2), extending in a north-west direction along the valley from the limits of H. J. Gardner's ranch, were taken under option by G. Carlson, of Duluth, Minn., in the fall of 1926 and Keystone-drilling operations under the management of A. Wallinder were started in October. A. F. Brown is in charge of actual drilling.

A trip was made along the valley as far as Oro Fina creek, a distance of some 9 miles from Beaver Pass House. The valley is upwards of a quarter of a mile in width and is to a large extent occupied by meadow and marshy land, with a very small amount of timber. On both sides the tributary creeks, notably Hyde and Oro Fina creeks on the west and Baldhead and Rouchon creeks on the east, were the scenes of placer activity in the early days, likewise many of the benches. The latter are even now receiving attention, E. Falk meeting with promising results on a bench on the south side of the valley just opposite Oro Fina creek.

No question can be entertained as to the huge yardage of gravel, and the area possesses the earmarks of promise, but drilling alone can disclose those data which determine whether it is suitable for dredging enterprise. At the time of inspection in October a force of eight men was employed in road-construction and in getting drill into position at Baldhead creek. Assistance in connection with the road was given by the Department of Mines. The outcome or drilling operations will be awaited with great interest.

Lightning Creek.

Caribou Mining Co.

This company, whose office is in Erie, Pennsylvania, controls four leases, including the Yeates claim and McPhail lease, lying between Lightning and Sovereign creeks, and covers the ground immediately opposite the old *Bonanza* mine on Lightning creek and extends as far east as Mosquito creek. The latter is about 1½ miles below Wingdam. The property is readily reached by branch road and trail leading off the main Quesnel–Barkerville road. The McPhail pit was formerly opened on the left bank of Lightning creek opposite the old *Bonanza* mine, and considerable piping was done here before acquisition by the present holders, who have been engaged in superficial prospecting.

This pit is commonly thought to be opened on a high run of Lightning creek. Operations were suspended here originally, it is stated, mainly because of the inadequate water-supply derived from Mosquito creek. It is stated that a tunnel was originally run in a distance of over 100 feet on the left bank of Mosquito creek in promising gravel, which is thought to represent an old channel. The portal of the tunnel was visited, but it was not possible to get in as it was badly caved. A very considerable outlay will be necessary to get water on this property; therefore the wisdom of preliminary drilling is apparent in order to determine whether such expense is justified. Drilling should be the first step. To get a drill on the ground a bridge across Lightning creek will be required, but this latter is not a very serious matter and will entail no material expense. The company apparently entertained the idea of getting an Erie steam-shovel for digging a water-ditch and using it subsequently for excavating gravel. It will be evident from the foregoing remarks that this policy is not considered advisable until testing is done by drilling.

Small-scale operations were also carried on by G. R. Shaw and H. Eden respectively on their leases above Stanley, and by J. Williams on the Ah Quick claim.

On Donovan creek, a north-flowing tributary of Lightning creek, M. Sunberg discovered a high run above the old pit at this point and is reported to have done very well during the season.

H. Jones and associates are testing a possible high run of Lightning creek on the right bank about 450 feet vertically above the creek close to Wingdam. Several shafts have been sunk in glacial drift, two of them to bed-rock. Nothing of importance had been found up to the time of inspection in October, when active prospecting was still in progress.

Lightning Creek Gold Gravels and Drainage Co., Ltd.—An excellent résumé of this company's operations from the earliest times to 1923 will be found in the Annual Report for that year. Since that time no mining of the deep gravels has been carried on. Sale of the property by public auction was ordered in Supreme Court on December 20th last by Mr. Justice W. A. Macdonald, the same to take place on June 7th, 1927.

Swift River.

Gold Dredging Syndicate, Ltd.

The manager of this syndicate, M. M. Kerr, states that the "Rowe Circulating Dredge" (refer to Annual Reports for years 1924 and 1925) was in operation for two months, but failed to function satisfactorily as a dredge. The ground owned by this syndicate consists of two creek leases on Swift river, about 5 miles above Cottonwood. The manager states that as a result of preliminary drilling it was

estimated that 5,000,000 cubic yards of an average value of 40 cents a yard were contained in this ground. It seems singularly unfortunate that with ground of this character there has been a hitch in recovery.

Fraser River Section.

Tertiary.

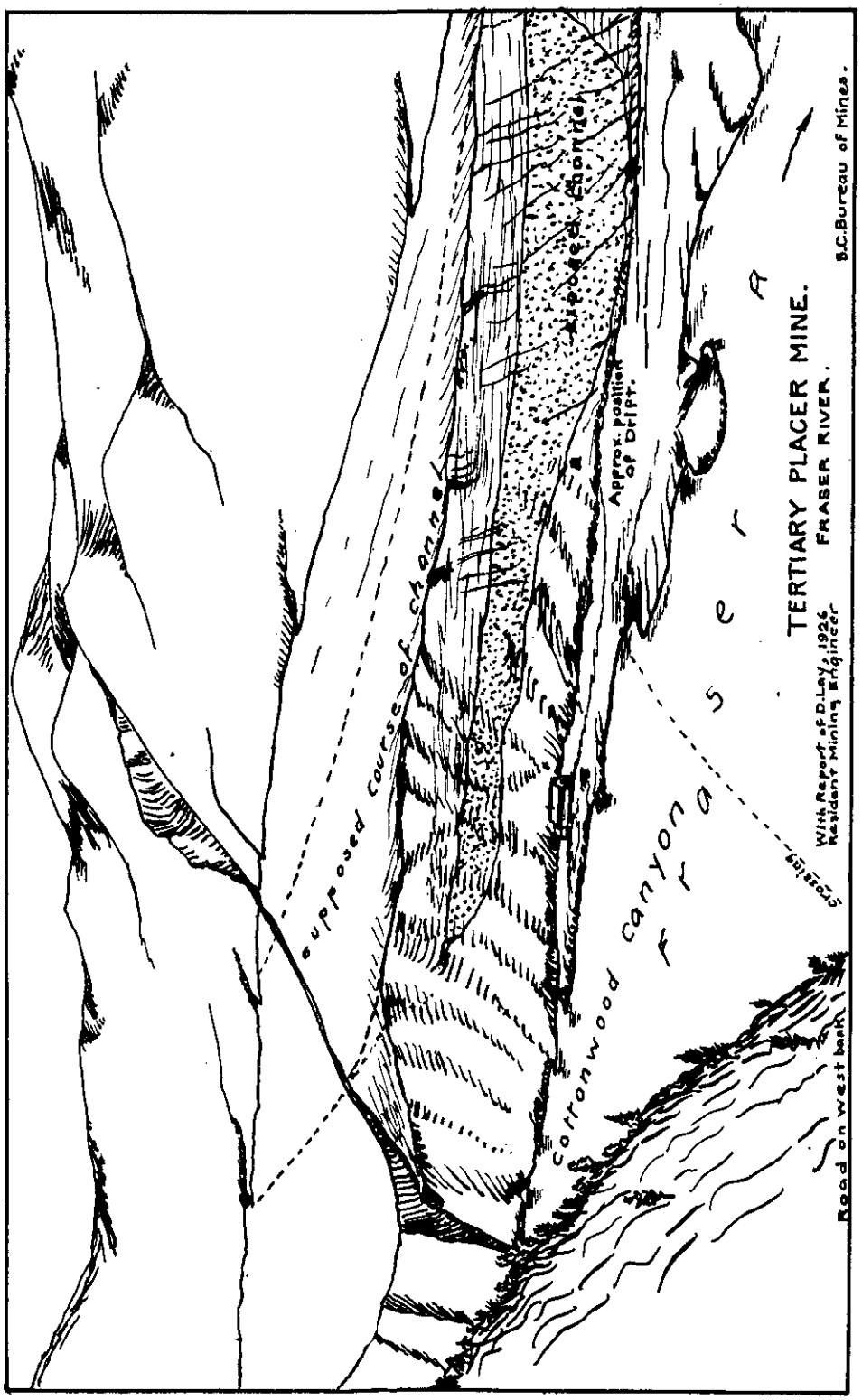
This property is now operated by a partnership headed by Donald D. Fraser. It is situated on the east side of the Fraser river in Cottonwood canyon and is distant about 16 miles by road from Quesnel. From the latter place a point on the west side of the river immediately opposite the mine can be readily reached by car and the river crossed by boat kept at the mine. At this point the Fraser river has cut obliquely through an old channel, the gravels of which are exposed on both sides of the present river. Work has been concentrated almost entirely in following the portion of the channel on the east side northwards. The length of the oblique exposure on the east side is about 1,100 feet, but the true width is probably about 900 feet. But the gutter is on the left rim, and it is in the gutter that mining has been carried on, values being too scattered on the right rim to admit of profitable extraction. The channel has to date been followed upwards a distance of 1,500 feet by adit-tunnel. For the last 400 feet the pay-streak has averaged about 12 feet in width, prior to which it was about 50 feet. There is practically a bed-rock concentration of gold, although gravels for a few feet up contain small values. The overlying cover is about 120 feet thick in the region hereto mined, but gets thicker farther ahead. The gravel is tightly cemented, almost a conglomerate, and shows an entire absence of signs of oxidation. Carbonized driftwood is of very frequent occurrence.

The gravel stands up well in mining, even without timber for some distance, provided that no surface water percolates through. There is a seam of sand and silt about 7 feet up from bed-rock, and whenever even a little surface water percolates through, trouble is manifested at once. As the value of the gravels does not exceed between $1.50 and $2 a ton when wet ground is met with, it is considered cheaper to turn the drive into solid bed-rock, and follow in this until conditions improve, rather than to go to the expense of the heavy timbering required to continue the drift. For about the last 100 feet surface waters have given some trouble and the tunnel is in bed-rock for this distance.

The gravel is mined with compressed-air machine-drills. By use of 60-per-cent. dynamite it was ascertained that the gravels are disintegrated sufficiently to free the gold, which is recovered by sluicing in the ordinary way. The sluicing-flume is installed at the portal of the tunnel and a small boiler for the operation of a steam-driven air-compressor. Originally the company operating this property installed a crushing and milling plant, but the necessity for this was entirely eliminated by the simple expedient of using 60-per-cent. dynamite as above described, and the plant has been discarded long since.

The cost of driving in the gravel is given by D. D. Fraser as $34.50 for 5 feet of advance, which yields about 25 tons of gravel; that is to say, the cost for a ton of gravel yielded is about $1.25; as the minimum yield of gold is $1.50 a ton no wide margin is left for any contingencies such as bad ground.

Very careful records are kept by D. D. Fraser, and he finds that whenever the grade of the bed-rock deepens, the pay-streak gets narrower and poorer, widening and improving when the grade flattens. The grade varies from 1.1 to about 7 per cent., the rise being of course in a northerly direction. He states that about 3,000 feet ahead of the present workings there is an outcrop of comparatively soft diorite porphyry, in which a flat gradient may be expected and therefore better values and a wider pay-streak. Further, the nature of the gold being coarse (some pieces have adhering particles of quartz), a fairly local source is therefore indicated. There is known to be a gold-bearing region on Hixon creek, which lies about 18 miles north, and it is argued that prospects should be more hopeful as these are approached. These arguments are doubtless not without sound reason, and there is a certain promising speculative feature connected with running the tunnel ahead. But some tangible proof of conditions in the channel ahead is obviously required before any capital outlay connected with improving existing plant is justified. It is stated by D. D. Fraser that some 3 miles ahead of the present workings a small tributary creek flows into the Fraser river from the east, exposing this ancient channel. It would appear that some investigation of the channel at this point would be useful and also some Keystone-drilling. D. D. Fraser is to be congratulated upon the careful records he has kept and


TERTIARY PLACER MINE.
FRASER RIVER.
With Report of D. Lay, 1926
Resident Mining Engineer
B.C. Bureau of Mines.
Supposed course of channel
Approx. position of Drift.
Cottonwood canyon
Fraser
Road on west bank

the maps he has prepared (one of which is reproduced in this report), all of which very greatly tend to economize the time of an examining engineer, by whom they will be heartily appreciated.

KEYSTONE-DRILLING.

Keystone-drilling to determine dredging possibilities was carried on by different operators at several points. Besides that undertaken in Beaver pass, mention of which has already been made, a large number of holes were drilled by the Kafue Copper Development Company in Cunningham pass and some on Antler creek. A. F. Brown drilled four holes, total footage being 229 feet, on his creek leases in Cunningham pass. G. A. Dunlop and associates drilled eighteen holes on Pine and Summit creeks. The results of the foregoing are not known.

LODE-MINING.

Island Mountain.

C. J. Seymour Baker, who owns the property formerly held by the Island Mountain Mining Company, has been engaged in a survey of the claims and general prospecting and employed a force of three or four men for some weeks. He has also been busy investigating the question of treatment of ores and black sands.

Proserpine Mountain.

An account of properties on this mountain will be found in the Annual Reports for the years 1918, 1922, and 1925. Attention is drawn to the fact that the late Dr. Uglow made a particular study of the Barkerville vein system. Excerpts from his report, which make mention of promising surface showings on this mountain, will be found in the Annual Report for 1922. It is pointed out, further, that no work on these showings has been carried out on the lines which Dr. Uglow unmistakably indicates are most likely to meet with success.

Cow Mountain.

Rainbow. A full account of this property will be found in the Annual Reports for 1924 and 1925. This year the owner, A. W. Sanders, has been engaged in further prospecting and panning gold from the small rich veins on this property. He has uncovered additional showings in the region immediately adjoining the present workings.

Cunningham Creek.

Homestake. A full account of this group will be found in the Annual Report for 1925. The owners, J. H. Campbell and J. P. Delhanty, state that they have exposed by open-cutting some more galena, which appears to be a parallel seam to that discovered last year.

Black Jack Gulch.

Leviathan. This claim is one of six record and two real-estate claims which comprise the *Black Jack* group, owned by F. J. Tregillus and T. Blair. A large quartz vein was uncovered on the *Leviathan* claim this year by the owners in Black Jack gulch, about 400 yards up the gulch from the Barkerville–Richfield road. On the right bank of the gulch a vein is exposed 48 feet in width striking N. 50° W. (mag.), with a slight dip to the north-east, which follows the bedding of the enclosing schist country-rock. On the foot-wall is a width of 8 feet of quartz and on the hanging-wall a width of 4 feet. Within the vein a number of seams of quartz cross diagonally from wall to wall. The rest of the filling is schist. Samples were taken of the cross-seams of quartz and also of the quartz on the walls, but no values were shown beyond traces of gold and silver. A sample taken of selected portions of the most decomposed schist within the vein assayed: Gold, 0.14 oz.; silver, 0.08 oz. to the ton. It is possible that this vein is a continuation of the British Columbia Mining and Milling Company's vein, and that the *Steadman* vein on Williams creek is again the continuation of the *Leviathan* vein. As Dr. Uglow points out, in the case of the interbedded veins, the most hopeful place for ore is at the points of junction with the north- and south-striking veins.

Westport. This is another claim belonging to the *Black Jack* group. In Black Jack canyon, alongside the wagon-road, is exposed a well-mineralized vein of quartz. A sample taken across a width of 2 feet, this being the best-looking portion, was found to assay: Gold, 1.9 oz.; silver, 0.5 oz. to the ton. Such a showing in such an accessible

place appears to be well worth following up. In the Annual Report for 1922 will be found an account of the *Black Jack* property by Dr. Uglow.

QUESNEL MINING DIVISION.

The placer production of the Quesnel Mining Division for the year was $121,535, as compared with $50,911 in 1925; a marked increase, due to the success gained by the Cedar Creek Mining Company, operated under contract by B. Boe.

Considerable interest was manifested in galena-mining possibilities on Black Bear creek, notably by P. Harrington and associates.

V. L. Eardley Wilmot, of the Dominion Department of Mines, was engaged in further examination of the deposits of diatomaceous earth in the vicinity of Quesnel.

A start was made in the non-metallic minerals with the shipment of 120 tons of silicate of alumina by B. A. Cunliffe from a deposit recently opened up near Williams Lake.

Quesnel Section.

Construction of the new bridge over the Quesnel river at Quesnel this year afforded illustrations of the natural resources of the Province. Excavations in the south bank of the river for the concrete abutment disclosed an extensive deposit of lignite, although not of commercial grade. Where exposed at this point the deposit consists of layers of lignite and clay, the total thickness being in the neighbourhood of 45 feet. A drill-hole was put down in the bed of the river by the Department of Public Works, which disclosed continuation of lignite with clay-seams to a depth of about 70 feet and making the total thickness of the deposit 118 feet.

Another interesting feature of the bridge-construction was the recovery of the gold from the coarse and fine aggregate prior to concrete-making. To John McDougall, an old placer-miner (about whom, incidentally, appears an interesting article in *Engineering and Mining Journal* of September 6th, 1919), credit is due for seizing a golden opportunity. Abundant material for coarse and fine aggregate for concrete was available at the bridge-site in the form of the river-gravels. For the washing and sizing of these a small plant was erected on the banks of the river, and J. McDougall at once perceived that by placing some riffles in the launder conveying the wash-water and fine aggregate some gold would be secured without additional cost. He accordingly asked permission to do so, which was granted, and he had the satisfaction of cleaning up, as he stated, between $2 and $3 a day, without much labour. A considerable quantity of black sand (possibly platiniferous) was recovered with the gold.

Cariboo Gold Platinum Extracting Co., Ltd.—For particulars of this company refer to Annual Report for 1925. The president, S. J. Marsh, informed the Resident Engineer that owing to inability to secure funds this company had been compelled to dissolve.

Likely Section.

Cedar Creek.

Cedar Creek Mining Co., Ltd.

This property is operated on a royalty basis under contract by B. Boe. Work was carried on last winter on the *Sheridan* lease in the underground workings, where an area about 200 feet long by 100 feet wide was drifted. In March of this year "pump hydraulic" operations were resumed immediately adjacent to the "Nugget Patch" on the lower side—that is, the west side. Very shortly thereafter, phenomenally rich "pay" was encountered and in nine months, it is stated, 4,700 oz. of gold was recovered. The total thickness of overlying material on bed-rock (amygdaloidal andesite) at this point is not over 20 feet, of which all but about 2 or 3 feet immediately over bed-rock is glacial. Gold occurs in the 2 or 3 feet immediately above bed-rock and in the cracks and crevices of the latter to a depth of 1½ to 2 feet. The gold is all coarse and nuggety. One nugget weighing 17 oz. was recovered. At the time of inspection, while the limits of the "pump hydraulic" set-up had been reached and most of the bed-rock cleaned, nevertheless, picking in the bed-rock and panning of gravels standing in the bank disclosed the richness of the ground. It is of interest to record the fact that last summer three pans were taken from this patch, yielding respectively 49, 35, and 28 oz. gold. H. Jones, of Wingdam, a survivor of the old-timers of the sixties, and himself one of the original partners in the famous *Van Winkle* claim on Lightning creek, stated that, even in the palmy days of the Cariboo, pans yielding about $1,000

in gold were about the richest on record. It is of interest also to record the fact that a prospect-pit sunk by a previous operator within 5 feet to the south of the very rich ground struck last summer, and down to bed-rock, failed to find any encouraging gold values. The rich ground will of course be followed with "pump hydraulic." The gravel is tight and dynamite is used occasionally. The company is also erecting a new impounding-dam for water-storage, 160 feet long by 20 feet high. The company employs a force of about twenty-four men.

Platt & Lyne Leases.

These leases immediately adjoin the property of the Cedar Creek Mining Company on the north-east. They are now controlled by E. T. Fitzsimmons, who has been operating them, employing from two to five men, for the past three seasons. This year several pits were sunk on the Platt lease and one on the Lyne lease. Sinking was also attempted in the "Big Channel" on the Platt lease, but owing to water had to be abandoned. Some prospecting was also carried out on the Fitzsimmons lease, which adjoins the Platt lease on the north-east and extends on both sides of Cedar creek. It is understood that nothing of importance was disclosed as a result of operations in 1926.

Cedar Creek Delta.

At the time of inspection in October a drill had been hauled on to the ground and it was understood that A. M. Whiteside was to commence drilling the delta as soon as a drill crew could be procured. D. L. McElroy and J. Thom were employed prospecting.

Spanish Mountain.

J. Lyne worked all season on his lease. It is understood that further work was also done on the Oliver & McDiarmid lease immediately adjoining. Time did not permit of inspection.

North Fork of Quesnel River.

It is very necessary to bear in mind that in the case of many of the deposits which exist in the form of banks hundreds of feet in height on the Quesnel river the great mass of material may be merely glacial debris, in which no commercial gold values are to be expected. In such cases there is usually a top layer of gravel a few feet only in thickness, which represents the resorted and enriched gravel formed as the river cut down through the mass, and this may be the only profitable portion of the entire deposit. There may be several benches more or less immediately below one another at intervals, or they may occur tandem fashion. "Pay" will be confined probably to a thickness of a few feet in each bench. Shallow surface prospecting in such cases merely indicates a *superficial* occurrence. In certain exceptional cases there may be grounds for inferring that a tributary creek represents the source of local enrichment, but that is not the rule. The wisdom of adequate examination and prospecting, or testing to sufficient depth, before capital expenditure is made on a water system must be apparent.

Quesnel Gold Mining Co.

An account of previous operations will be found in the Annual Reports for 1924 and 1925. At the point at which the monitor was set up last year bed-rock was found to be close to the surface and the gravels therefore very thin, although it is stated they carried satisfactory values. Accordingly the company is prospecting the lower portion of its leases, running a bed-rock tunnel in the right bank of the river close to the old *Victoria* pit. A tunnel was also run about 110 feet into the bank at a point about 1,000 feet up-stream from the *Victoria* pit. No values were disclosed.

Matthias Gold Mining Co.

For previous account refer to 1925 Annual Report. This company was unfortunate enough to lose its cook-house by fire and to further augment trouble a reservoir-dam burst, owing, it is said, to the work of beavers. The pit opened appears to show a superficial bench containing "pay" values a few feet in thickness overlying glacial debris. The company has been engaged for the latter portion of the season in prospecting about half a mile below the present pit, where a number of surface pits have been sunk over quite a large area and which, it is stated, show in the great majority of cases good values.

Small-scale Operators.—Among these may be mentioned: W. Farrell, on the south bank just below Spanish creek; W. Westenhiser and A. Pearson, on lease adjoining Matthias Gold Mining Company; F. Bendtsen, on the south side of the river just above the old North Fork bridge, whose lease has been examined by E. C. Annis, consulting engineer; by W. J. Hill and J. Shaw, on their respective leases just above Quesnel Forks.

Altamen Mines, Ltd.—This is an Edmonton company which has been carrying on some prospecting under the supervision of E. C. Annis at 2-Mile flat, 2 miles below Quesnel Forks. Time did not permit of inspecting this, but it is said nothing of importance resulted.

South Fork of Quesnel River.

McGregor-Girdwood Leases.

These are two adjoining bench leases on Big Wheel flat, 3 miles from Likely by wagon-road, owned by A. E. McGregor, J. B. Girdwood, M. Turpin, and H. Thurborn. The depth of gravel where exposed on the river-bank is about 50 feet, bed-rock being also exposed just at the river-level. Immediately on bed-rock is a thickness of from 2 to 6 feet of blue gravel containing much pyrites, which is said to average about $1.50 a cubic yard. This is overlain by a stratum of clay and silt and on top is a thickness of upwards of 45 feet of coarse gravel. The whole bank is said to average about 35 cents a cubic yard. For testing purposes, A. E. McGregor devised and set up at the river-level an ingenious small pump hydraulic. An old Cadillac car-engine runs a 4-inch centrifugal pump, which delivers water to a monitor through a 4½-inch canvas hose. The monitor is made up of 4-inch pipe and reducer coupling 4 to 2 inches. The following details of performance are given by A. E. McGregor: The engine at 940 r.p.m. consumes ⅘ gallon gasolene an hour and 1 gallon of cylinder-oil in twenty-four hours. The pump delivers 60 cubic feet of water a minute, moving 40 yards of gravel in eight hours with three men employed.

Nelson-Furler Lease.

This lease adjoins the McGregor-Girdwood leases on the down-stream side, where bed-rock outcrops at higher points above the river. A tunnel about 9 feet long has been run in just above rim-rock, about 40 feet above the river. It is said that values shown were between 55 and 60 cents a yard. Some considerable distance back from the river-bank the owners are at present sinking a shaft, which is now down 40 feet.

The bench on which the foregoing leases are situated is known as Big Wheel flat and was the scene of much activity in the early days and was very rich. A pertinent paragraph appears in the Annual Report for 1902 by W. Fleet Robertson, then Provincial Mineralogist:—

"In the earlier days very large amounts of gold were obtained from the bars in this part of the river, among which the most famous were the Dancing Bill gulch bar, French bar, and Big Wheel flat. The character of the river would indicate that these bars were not formed by, nor was the gold derived from, the gravels washed down the channel of the main stream, but that they owe their origin to gravels carried down by the creeks from higher levels on the hill-sides and concentrated to a certain extent; in short, they are derived from the sides of the river and not directly from up-stream."

There appear to be sound grounds for Keystone-drilling the area covered by the foregoing leases, with a view to determine yardage and average values.

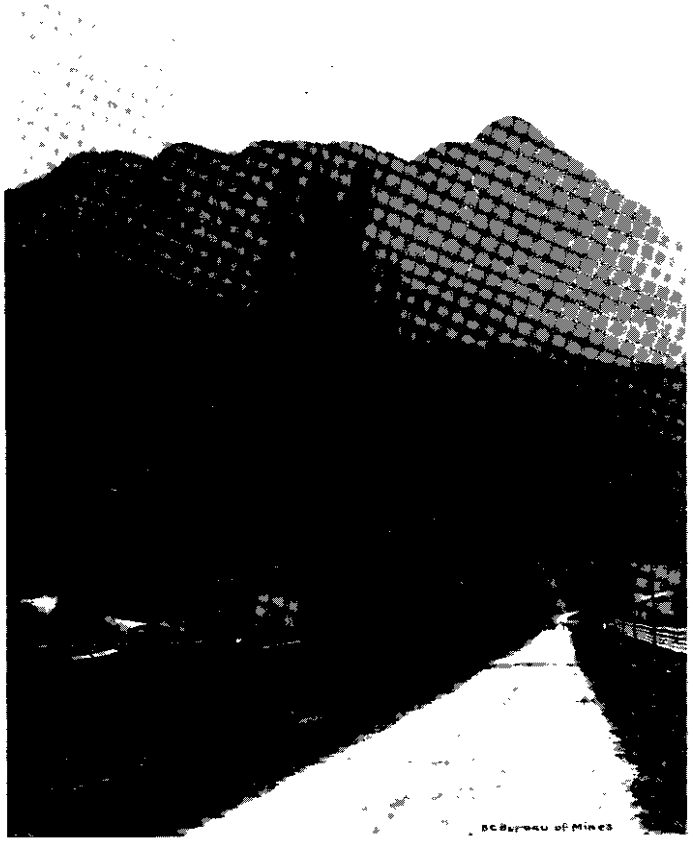
Rose Gulch.

T. W. S. Taylor and J. S. Macdonald have two bench leases at this point. In this region, about 150 feet above the present river-level, are two benches one above the other, which were both extensively worked by ground-sluicing in the early days. Present owners have installed a small hydraulic plant, taking water from Rose lake, and giving a head of 70 feet. They are now working at the lowest part of the lower bench, and there appear to be prospects of an extension for perhaps 700 or 1,000 feet. Bed-rock consists of sharply dipping conglomerates, slates, and sandstone. The gravel is shallow, some 8 or 9 feet of "chicken-feed" overlying the "pay" of perhaps 18 inches which lies immediately upon bed-rock.

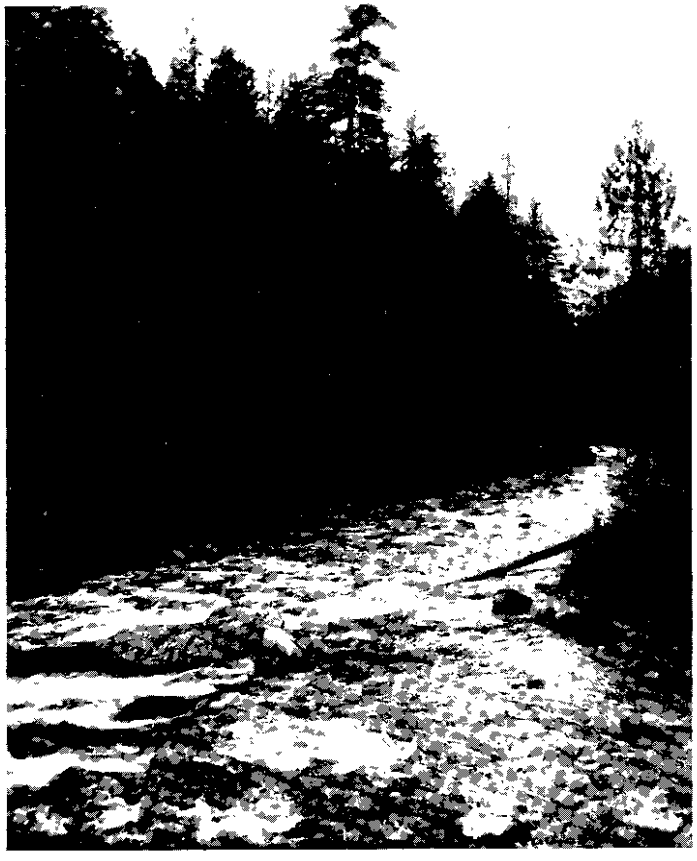
Bullion.

An option on this famous property was secured during the year by Ross, Holland & Ulch. The pit was cleaned out with a view to completing the upraise from the tunnel previously run under the centre of the pit from the river. The water from Bootjack lake was diverted into Morehead lake and repairs were made to the water system at various points. The operators are naturally subjected to the very severe handicap occasioned by the state of repair into which this huge plant has fallen owing to disuse for a long period. Plans also embrace running a tunnel from Jawbone creek to tap Morehead dam-water, which would eliminate a long portion of flume.

Among other small-scale operators may be mentioned: C. Lackie, on his leases on Quesnel lake (*see* 1925 Annual Report), and Fred. Tasse, on his lease on Grain creek, 35 miles up Quesnel lake from Likely.



Mount Ida, Salmon Arm, Kamloops M.D.



Seymour Creek, Kamloops M.D.

KEITHLEY SECTION.

Kitchener.

This property is described in the Annual Reports for the years 1921, 1922, 1923, 1924, and 1925. Operations during the year were conducted under the management of K. C. Laylander, and comprised opening up a new pit, about half a mile above the former pit, also Keystone-drilling of areas delineated previously by magnetometric survey. The drilling of thirty-two holes proved, it is stated, the correctness of the magnetometric indications. Hydraulicking was impeded by shortage of water since July, but the total yardage piped off was in the neighbourhood of 645,000 cubic yards.

Small-scale Operators.—Among these may be mentioned: W. Bleuveldt, on Duck creek, just below the south end of Cariboo lake, and J. Hodgson, at the mouth of Harvey creek on Swamp river.

LODE-MINING.

Black Bear Creek.

Considerable interest was manifested during the year in the lead content of the quartz veins of Black Bear creek and the more immediate vicinity. Characteristic of many of the veins of the Cariboo and Quesnel Mining Divisions is the occurrence of galena with the other sulphides, and frequently the galena occurs in small lenses or "bunches," so that quantities varying from a few hundred pounds to a few tons can be selected by hand without much difficulty so as to give a product high in lead content.

From one such lens from a vein on the *Black Bear No. 1* and adjoining claims P. Harrington and associates sorted out during the summer between 10 and 15 tons of nice clean lead ore. This is the largest lens of galena which has so far been found, but from an examination of this property and neighbouring claims there would appear to be no grounds for anticipating bodies of such size as to enable the veins to be worked for their galena content *alone*. Were transportation close at hand, it is quite likely that the prospector-owner would be able to mine and ship such lenses at a profit, because the silver content of the Black Bear Creek galena seems to be distinctly higher than galena found in the Barkerville area, for example. On Black Bear creek the galena seems to carry about 2 oz. silver to the unit of lead. An ore assaying 50 per cent. lead and 100 oz. to the ton would yield at present prices (London lead, 6 cents a pound; silver (New York), 55 cents an ounce) a gross smelter value of $95 a ton. Allowing a treatment rate of $8 a ton, such ore would net at the smelter $87 a ton. The nearest railway point is Williams Lake, on the Pacific Great Eastern. Assuming a railway freight rate of $8 a ton from Williams Lake to Trail, the value at Williams Lake would be $79 a ton. Likely is distant 65 miles from Williams Lake and the present motor-truck rate between the two places is $40 a ton. Black Bear creek is distant by indifferent road and trail about 9 miles from Likely and ore has to be packed out for nearly half this distance. It is said that the present cost of packing and trucking from Black Bear creek to Williams Lake is $45 a ton, which would give a net value of $34 a ton to this grade of ore at the mine. Assuming that a wagon-road was built through up Black Bear creek, giving road transportation of 75 miles through to Williams Lake, motor-trucking costs even for large quantities of ore would not be less than 40 cents a ton-mile, or a total of $30 a ton.

The quartz veins of this creek are certainly of impressive size, but there is yet to be afforded any exposure showing appreciable gold values, apart from such as are contained in galena and iron pyrites, which represent a very small proportion of the whole vein. Of course very little development has as yet been done. There are many quartz-showings, but none has been followed up for any distance. In most cases the exposures are inadequate to determine whether the vein is interbedded or cuts across the enclosing country, except in the case of the *Black Bear No. 1* and adjoining claims, where the vein seems to be interbedded. In this case a crosscut had been run from wall to wall, so that it was easy to sample, but no values in precious metals beyond mere traces were found except in the galena.

So far there is not disclosed any evidence of the cross-veins, which are a feature of the Barkerville vein system, but no steps have as yet been taken to look for them. The quartz vein exposed at Black Bear Creek falls on the *Dial* claim is at least 50 feet wide and is evidently not fully exposed, but mineralization is very sparse and only a little galena shows. The vein on the *Black Bear No. 1* is at the point of crosscutting 43 feet in width. An account of the prospects visited follows:—

Black Bear No. 1 to No. 4. These four claims are owned by J. C. Holsclaw and are under lease for a term of fifty years to P. Harrington, John Harrington, and Richard Gladney. They are situated about 2 miles up the creek from the mouth and are distant by road and trail about 10 miles from Likely. At an elevation of 3,300 feet on the right bank of Black Bear creek there is exposed a wide quartz vein interbedded in the enclosing sericite-schist country, striking N. 80° W. (mag.) and dipping at about 45° to the south-west. At this point the vein more or less parallels the creek and the hanging-wall is within a few feet of the surface. It is exposed by open-cut for a distance of 34 feet along the strike and a crosscut has been run a distance of 43 feet, exposing the apparent foot-wall. Nice clean galena was found immediately on the hanging-wall, but had been all mined at the time of inspection. A short winze had been sunk to a depth of 6 feet at the eastern end of the open-cut and showed small bunches of galena. From this open-cut 10 to 15 tons of ore was extracted, which was being sacked. A grab sample of the best ore assayed as follows: Gold, 0.06 oz.; silver, 144 oz. to the ton; lead, 76 per cent. A sample taken in the crosscut of the most promising portion of the vein, representing a width of 21 feet, assayed: Gold, trace; silver, 0.4 oz. to the ton; lead, *nil*. The vein in the crosscut shows bands of quartz and schist and some iron pyrites. Another crosscut about 25 feet vertically below the above workings has been run a distance of 35 feet, of which the last 25 feet shows banded quartz and schist and a very little galena. This crosscut is somewhat west of the open-cut above.

Dial, Dial No. 1, and Highland Mary. These claims are owned by C. Burns, P. Burns, C. Macdonald, and W. Isbester and are situated about half a mile below the *Black Bear No. 1* and adjoining claims described above. At the falls in the creek there is exposed a quartz vein at least 50 feet in width, with the walls not fully exposed. The creek runs over the vein. The country-rock is silicified quartz-schist. The strike is N. 65° E. (mag.) and the dip almost vertical. It is sparsely mineralized, but shows in places a little galena. A sample of picked galena assayed: Gold, 0.02 oz.; silver, 43 oz. to the ton; lead, 40 per cent.

Silver King, Silver Queen, and Star. These claims are owned by M. Donohue, J. W. Johnson, and F. Kaiser, and are situated at an elevation of 4,750 feet on the right bank of Black Bear creek. There are only two or three exposures and it is difficult to determine whether the vein is interbedded. The strike seems to be N. 85° E. (mag.). The country-rock is a graphitic, thinly-bedded shale; the bedding lies very nearly horizontal. Where exposed the vein is fairly well mineralized with galena and iron pyrites. A sample of the picked galena assayed: Gold, 0.20 oz.; silver, 104 oz. to the ton; lead, 50 per cent. A sample of mixed galena, iron pyrites, and decomposed quartz assayed: Gold, 0.02 oz.; silver, 11 oz. to the ton; lead, 6 per cent.

Among others working on Black Bear creek whose properties, both quartz and placer, it was quite impossible to visit may be mentioned: P. Burns, on the *Likely;* R. Nelson, on the *Bonnie Doone;* C. Burns, on the *Mars;* and the properties of R. Owens, D. Dobson, A. Morrison, F. Hemmington, and G. R. Bagshaw.

Silver King and Silver Queen. These two claims, owned by A. Sutherland and G. Matthews, are situated on the right bank of the river, about 3 miles below Spanish creek. About 150 feet above the river in the steep banks there are exposed in the thinly-bedded shale country-rock some interbedded quartz veins, showing in one or two places some galena and iron pyrites. Very little work has been done as yet. A sample of picked galena assayed: Gold, 0.02 oz.; silver 29 oz. to the ton; lead, 40 per cent.

Keithley Section.

Peacock. This claim is owned by W. Bleuveldt and is situated on Duck creek, close to the main Likely–Keithley road and about 2½ miles from Keithley. At an elevation of 3,100 feet there are exposed in silicified quartz-schist country-rock on the banks of Duck creek several quartz veins not exceeding 2 or 3 feet in width slightly mineralized with galena, zinc-blende, and iron pyrites. These strike N. 10° E. (mag.), dipping east at a steep angle. A sample of picked pieces of galena, zinc-blende, and iron pyrites assayed: Gold, 0.02 oz.; silver, 24 oz. to the ton; lead, 42 per cent.; zinc, 6 per cent. A noteworthy feature of this property is a prominent outcrop of what appears to be a silicified green mica-schist, which

Dr. E. Poitevin, of the Geological Survey, has identified as being mariposite, a silicate of aluminium, potassium, and magnesia and water.

Non-metallic Minerals.

Silicate of Alumina Deposit on Borland Mountain.

This property is owned by G. H. Turner and B. A. Cunliffe and is situated on Borland mountain, on the Chilcotin road, about 4 miles distant from Williams Lake, on the Pacific Great Eastern Railway. A shipment of 120 tons was made this year to the British Columbia Refractories, Limited, of Vancouver, for use in the manufacture of high-temperature cement. The deposit is exposed immediately alongside the road by a cut and short tunnel in the bank, the latter being about 10 feet in height; about 100 yards higher up the road is a larger cut made by the Department of Public Works for the purpose of getting an underlying cream-coloured, iron-stained shale for road ballast. The deposit is bedded. Unfortunately the owners were away at the time of inspection and the tunnel was barricaded.

The exposure immediately alongside the road is quite small and quite inadequate to form an idea of the extent of the deposit. The upper portion of the deposit is grey in colour, of sandy, pulverulent texture; this is underlain by a more compact type, merging into a grey-coloured shale.

Chemical analysis of the former gave the following results: Silica, 69.6 per cent.; alumina, 26.9 per cent.; ferric oxide, trace; magnesia, 0.4 per cent.; and of the latter: Silica, 76.2 per cent.; alumina, 14 per cent.; ferric oxide, 1 per cent.; magnesia, 2.2 per cent.

No tests as to refractory qualities have been made as yet by this Department, but the analysis indicates that the percentage of fluxing impurities is low and refractory qualities should therefore be good. The analysis of a sample, taken by the owners of the particular portion of the deposit they are using, by G. S. Eldridge & Co. gave the following results: Silica, 71.8 per cent.; alumina, 18.82 per cent.; ferric oxide, 0.86 per cent.; lime, 0.18 per cent.; magnesia, 0.16 per cent. It is understood that the owners have had samples of this material tested by the University of Washington.

CENTRAL MINERAL SURVEY DISTRICT (No. 3).

By H. G. Nichols, Resident Mining Engineer.

INTRODUCTORY.

General.

The Central Mineral Survey District (No. 3) includes the seven Mining Divisions of Kamloops, Clinton, Lillooet, Ashcroft, Yale, Nicola, and Vernon.

The district covers an area of approximately 44,000 square miles, or, roughly, one-third of the territory of the mainland of southern British Columbia lying between the 53rd and 49th parallels of north latitude.

The headquarters of the district are located at Kamloops, a growing city of 5,500 inhabitants, situated at the junction of the North and South Thompson rivers. Other towns, with a population of over 300, serving as centres of supply within the district are Vernon, Merritt, Hope, Lillooet, Lytton, Ashcroft, Clinton, Salmon Arm, Armstrong, and Enderby.

The district is served by six lines of railways, including main lines and branches, as follows: Canadian Pacific Railway from Hope to Three Valley, 276 miles; Canadian National Railway from Hope to Canoe River, 360 miles; Kettle Valley Railway from Hope and Spences Bridge to Brookmere, 124 miles; Canadian National Railway branch, Kamloops to Kelowna, 116 miles; Canadian Pacific Railway, Sicamous to Okanagan Landing, 51 miles; Pacific Great Eastern Railway, Alta Lake to Williams Lake, 237 miles.

This is a total of 1,164 miles of railway within the district. There is also a total distance of about 300 miles of navigable lake waterways. Government roads within the district total 4,126 miles and there is a large and steadily increasing number of roads and trails to serve the especial needs of the mining industry.

Twenty grants for the assistance of prospectors in this direction were made by the Department of Mines during the year.

Geology.

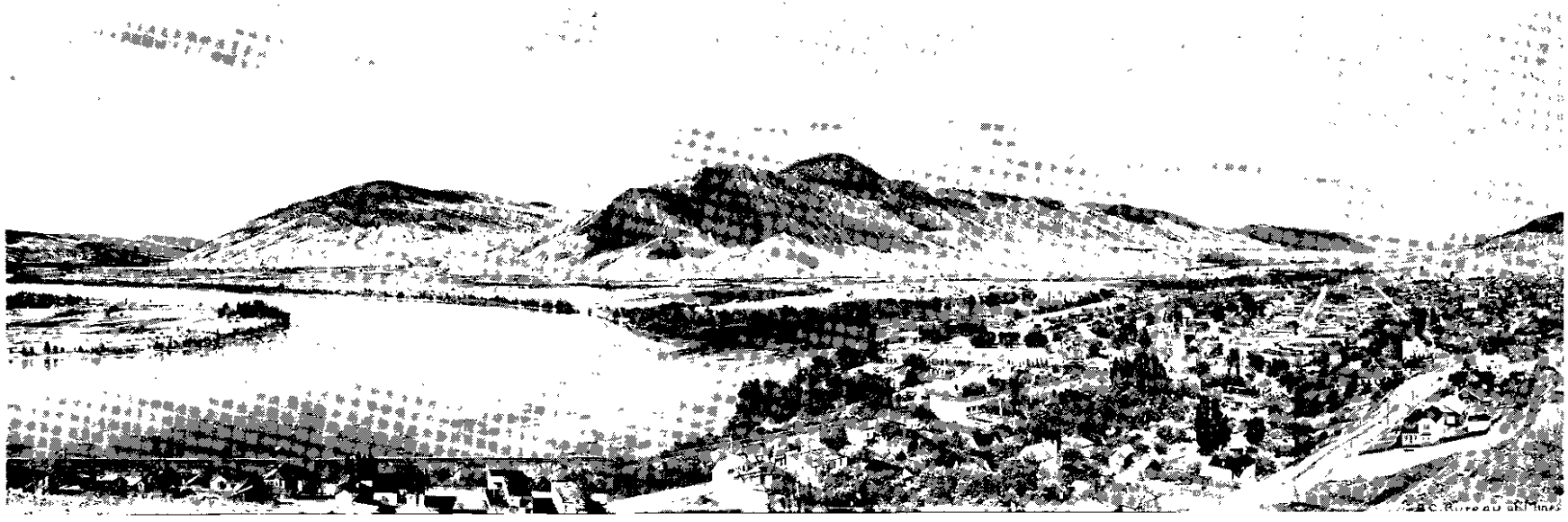
The following remarks upon the general geology of the country in which the Central District is situated are made with a view to a fuller understanding of the grounds upon which its claims are based, to be regarded as a mineral area. Broadly speaking, the entire area covered by the district is mineral-bearing country; it lies within the mineralized belt of the Western Cordillera, of which the Rocky Mountain and the Coast ranges are the physiographical boundaries on the east and on the west.

From a geological view-point this north-west, south-east geosyncline, with which the Province of British Columbia is identified to a large extent, may be subdivided into two main belts on either side of a shore-line of ancient rocks (Shuswap terrain) that form the eastern boundary of the seas under which the succeeding formations were laid down; and this shore-line lies at a distance of about 100 miles to the west of the Rocky mountains. Between this line and the Pacific ocean is the belt known as the western geosyncline, a belt which includes the whole distance between Oregon and Alaska and possesses characteristic features that entitle it to be considered as a unit. It contains great thicknesses of sedimentary and volcanic rocks that have been subjected to a series of earth-movements, with thrusts mainly directed from the west; and to intimately related intrusions of batholithic rocks, which are the prime agencies of metallic mineralization in British Columbia.

It may be conceived that these latter formations acted to some extent as a buffer between the thrusts and intrusions that built up the Coast Range batholith on the west and the shield of ancient rocks on the east. They are, for the greater part, folded, sheared, and mashed, and erosion has only occasionally exposed the batholithic rocks by which they are intruded.

The Central Mineral Survey District comprises a portion of the Coast Range member of the Western Cordillera; a section of the ancient rocks on the east; and about one-half of its total area is occupied by the intruded zone of rocks last mentioned. These in turn are covered in part by later flows of Tertiary lavas.

In so far, therefore, as ultimate possibilities for the discovery of metallic minerals are concerned, the district forms an integral part of the mineralized belt in which the great deposits of copper, lead, zinc, gold, and silver have been found elsewhere in the Province, and it offers every inducement to the pursuit of prospecting and development.



Kamloops, B.C., at Confluence of North and South Thompson Rivers.

Mineralization is widespread throughout the Central District. Metallic minerals, which include those of copper, lead, zinc, gold, silver, iron, antimony, arsenic, nickel, molybdenum, and mercury, occur under a variety of conditions, dependent, to a large extent, upon the relationship of the deep-seated intrusions to the present surface; and, in addition, there are important deposits of non-metallics, including gypsum, soda, fullers' earth, diatomaceous earth, epsomite, magnesite, and clay, related to the plateau conditions that are represented over wide areas; and of coal.

PROSPECTING.

The renewal of activity that was noted in 1925 has been maintained during 1926; new recruits have been added to the large number of prospectors working in the district and much useful work has been done. This work, which included investigations of new areas, has been fairly well distributed over the whole of the district, and it was not possible to visit many of the prospects from which encouraging reports have been received. The value of the work which the prospectors are doing cannot be overestimated, and the present opportunity is taken to give assurance of the intention to further every legitimate interest to the fullest extent within the powers of the Department. Many gratifying evidences of the desire for co-operation have been met with and are appreciated.

Although it may be admitted that, in general, the work of exploration and prospecting within the greater part of the Central District, and more especially within the section of Interior Plateau country, is not subject to some of the disadvantages attaching to more mountainous and inaccessible portions of the Province, there are certain handicaps to the prosecution of such work, which are, it is believed, responsible for the fact that the development of the southern interior of the Province has not been more rapid. These handicaps are in relation to the conditions of mineralization noted under the heading of "Geology," which point to the necessity for search at deeper horizons in those sections, constituting an important part of the whole district, where the mineralizing intrusives are not exposed at the surface. In a large number of cases all that the prospector working over the surface can do is to get indications, and no depth to which he can carry his work is calculated to improve his prospect to any apppreciable extent. Under these circumstances, it must be felt that, should some method of subsoil prospecting, electrical or otherwise, be suitable to the detection of underlying ore-bodies of the character indicated, there are outstanding opportunities for its utilization within the area of the Central District.

The keen interest that is being taken in the mineral possibilities of the district was reflected by the large number of investigations that were made by examining engineers representing established operating companies, such as the Britannia Mining and Smelting Company, Limited; the Porcupine Goldfields and Finance Corporation, Limited; the Victoria Syndicate, Limited; and others.

Mention may be made here of the number of placer-workings in the district. These are mostly small-scale operations and their importance is not to be gauged altogether by the yield of placer gold. The man with the gold-pan is the best missionary that the mining industry possesses, and his work in attempting to trace the gold to its source and in calling attention to its wide distribution is bound to exercise, as it has done in the past, a stimulating effect upon prospecting.

A comparison of the statistics of the years 1925–26 is as follows:—

Divisions.	Claims recorded.		Certificates of Work.	
	1925.	1926.	1925.	1926.
Kamloops	175	191	265	272
Clinton	139	169	102	97
Lillooet	90	87	188	192
Ashcroft	181	112	65	50
Yale	158	144	171	189
Nicola	63	66	71	108
Vernon	123	100	52	138
Totals	929	869	914	1,046

DEVELOPMENT.

The particular features that were noted in the 1925 report in connection with developments have acquired greater prominence as a result of the operations carried on in 1926, and other promising areas are to be added to the list.

There has been marked progress in the Bridge River, Pemberton, Adams Lake, and Seymour Arm areas, and some attractive prospects have been outlined elsewhere by recent work, particularly in the Kamloops, Yale, and Vernon Mining Divisions.

In the Bridge River gold camp the *Pioneer* has reached the standing of a mine; it is developed to a depth of 600 feet and has an ore reserve valued at a gross amount of approximately half a million dollars. Values have been found to improve with depth and the present outlook is sufficiently assured to warrant new equipment on an enlarged scale. It is hoped that the encouragement afforded by the successful results of operations at this mine may influence the development of adjoining properties along lines of a broader policy than has yet been put into effect. The camp is one that calls for the utilization of natural facilities in the best interests of the whole, and a policy of vigorous development of the entire system of these gold-quartz veins is justified. The camp is deserving of investment on a bigger scale than has been represented by the limited operations that have been conducted up to the present time, and affords promise of making good return on the capital that would be involved in its development. Diamond-drilling has been commenced on the *Coronation* ground and a small mill has been installed; the erection of another mill on the *Lorne* property is in contemplation.

In the Pemberton area prospectors have accomplished some good work, and the tunnelling operations carried out by the Federal Mining and Smelting Company on the *Li-li-kel* property, although inconclusive, have influenced the decision to continue its development; another tunnel at a still lower level and on a more promising section of the vein-fissure is to be driven.

On both the *Eva* and *Silver Bell* groups underground development has afforded encouraging evidence of better values to be obtained with depth; on the former, in particular, the anticipation that good bodies of copper ore might be found in the strongly marked zone of shearing that traverses the property have been fulfilled in the discovery of one such lens of ore during the past season.

On the *Gold King* group work was confined to the surface; the property was the subject of examination by the engineers of the Britannia Mining and Smelting Company, Limited, and it is understood that plans for its further development have been arranged.

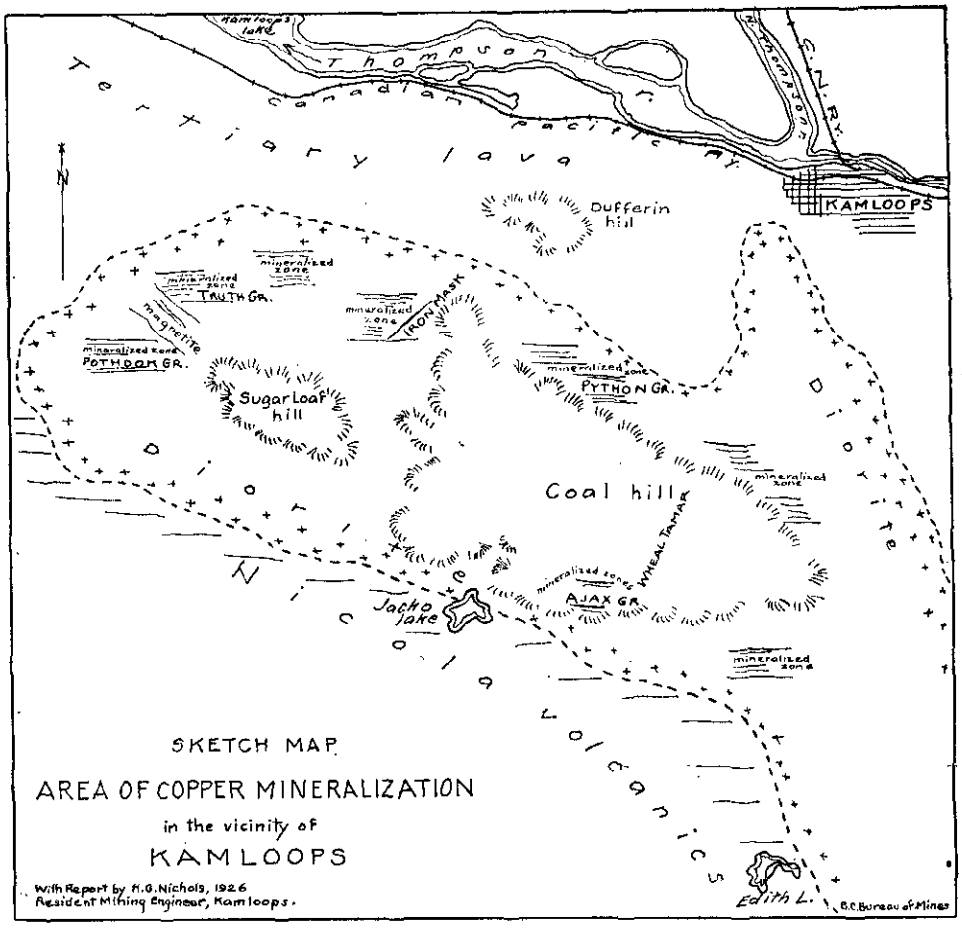
In the Adams Lake area the *Homestake* mine entered the producing class; 1,775 tons of silver-lead ore was shipped to Trail and development-work on a limited scale has thrown some interesting light upon the vexed problem of the ore occurrence. Shipments are being continued.

In the Seymour Arm area Cotton Belt Mines, Limited, has completed the work of camp construction and equipment and the company is now carrying on prospecting and development. A total amount of 3,300 feet of diamond-drilling was done during the season and tunnelling-work on the most attractive section of the persistent ore-zone is in hand. The chief disability under which this prospect has suffered by reason of the difficulties of transportation, etc., has been overcome by the energetic management and the thorough investigation of this interesting ore-body now appears to be assured.

In the Kamloops Mining Division other promising developments are to be noted in connection with the low-grade copper-deposits near Kamloops and with the mines and prospects in the northern area.

The outstanding feature of the area of copper mineralization is that it is identified with the body of a mass of diorite about 3 miles wide that extends from a point south of Knutsford to Cherry bluff on Kamloops lake, a distance of about 16 miles. This stock is overlain for about 3 miles of its length, north-west of the Ashcroft road, by more recent Tertiary formations; it is intensely fractured and the mineralization occurs in zones of this fracturing that traverse it from east to west. Within this mass of diorite there are inclusions of bodies of the intruded formations, which appear to have influenced the direction of the fracturing in their neighbourhood and to interrupt the channels along which the mineralization has spread. The *Iron Mask* ore-bodies occur under such conditions and the development of this mine, which is being actively prosecuted, is calculated to throw considerable light upon the possibilities of production of the area in general. There is a large tonnage represented in the several mineralized zones and their exploitation as a future source of supply is to be anticipated.

The renewal of operations at the *Windpass* mine at Chu Chua, with the prospect of early production, the continuance of development-work at the *Smuggler* mine at Birch Island, and favourable results obtained by prospectors at several localities are features of encouragement in connection with the development of the northern section of the country, tributary to the North Thompson river above Barriere.



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In addition to the reports of the Resident Mining Engineers that are published in the Annual Reports of the Minister of Mines, general information relating to the district is to be found in the following publications:—

Author.	Title.	Publication.
G. M. Dawson	Southern British Columbia	C.G.S.: Report of Progress, 1877–88.
G. M. Dawson	Mineral Wealth of B.C.	C.G.S.: Annual Report, 1887–88, Vol. 3, Part 2.
G. M. Dawson	Kamloops Map Area	C.G.S.: Annual Report, 1894, Part B.
J. McEvoy	Notes	C.G.S.: Summary Report, 1895, page 37A.
R. A. Daly	North American Cordillera	C.G.S.: 1912.
R. A. Daly	Geology of the Cordillera	C.G.S.: Guide Book No. 8, Part 2.
R. A. Daly	Golden to Kamloops	C.G.S.: Memoir No. 68.

The following list of references to areas and mineral-deposits within the district are arranged alphabetically in relation to the subject-matter:—

Author.	Subject.	Publication.
W. S. McCann	Bridge River Map Area	C.G.S.: Memoir No. 130.
C. W. Drysdale	Bridge River Area	C.G.S.: Summary Report, 1915.
C. W. Drysdale	Bridge River Area	C.G.S.: Summary Report, 1916.
V. Dolmage	Chilco Lake and Vicinity	C.G.S.: Summary Report, 1924, Part A.
D. B. Dowling	Coal Areas	C.G.S.: Memoir No. 69, page 280 *et seq.*
C. Camsell	Copper Mountain, Gun Creek	C.G.S.: Summary Report, 1918, Part B.
C. Camsell	Coquihalla Map Area	C.G.S.: Summary Report, Part B.
C. Camsell	Coquihalla Copper	C.G.S.: Summary Report, 1909, page 113.
C. Camsell	Coquihalla Copper	C.G.S.: Summary Report, 1908, page 63.
C. E. Cairnes	Coquihalla Area	C.G.S.: Summary Report, 1922, Part A, page 88.
C. E. Cairnes	Coquihalla Area	C.G.S.: Memoir No. 139.
C. Camsell	Diatomaceous Earth, Clay, and Magnesite along Route of P.G.E. Railway	C.G.S.: Summary Report, Part B.
N. L. Bowen	Fraser River below Lytton	C.G.S.: Summary Report, 1912.
L. H. Cole	Gypsum in British Columbia	Mines Branch, 1913, page 91 *et seq.*
B. R. MacKay	Hat Creek Coal	C.G.S.: Summary Report, 1925.
C. W. Drysdale	Highland Valley Area	C.G.S.: Summary Report, 1915.
C. E. Cairnes	Hillsbar Gold Group, Yale	C.G.S.: Summary Report, 1923, Part A.
A. M. Bateman	Lillooet to Chilco Lake	C.G.S.: Summary Report, 1912.
A. M. Bateman	Lillooet Map Area	C.G.S.: Summary Report, 1912.
L. Reinecke	Lillooet to Prince George	C.G.S.: Memoir No. 118.
C. Camsell	Lillooet Mining Division	C.G.S.: Summary Report, 1911.
C. Camsell	Mercury Deposits of Kamloops Lake	C.G.S.: Summary Report, 1918, Part B.
V. L. Eardley-Wilmot	Molybdenum	Mines Branch, 1925, page 32 *et seq.*
C. W. Drysdale	Molybdenum, Lillooet	C.G.S.: Summary Report, 1916.
C. E. Cairnes	Nickeliferous Mineral Deposit, Emory Creek, Yale	C.G.S.: Summary Report, 1924, Part A.
W. L. Uglow	North Thompson Valley	C.G.S.: Summary Report, 1921, Part A.
C. E. Cairnes	Pemberton Area	C.G.S.: Summary Report, 1924, Part A.
Bruce Rose	Savona Map Area	C.G.S.: Summary Report, 1912.
R. A. Daly	Shuswap Lake Area	C.G.S.: Summary Report, 1911.
C. Camsell	Skagit Valley Area	C.G.S.: Summary Report, 1911.
C. W. Drysdale	Thompson River below Kamloops Lake	C.G.S.: Summary Report, 1912.

SUMMARY.

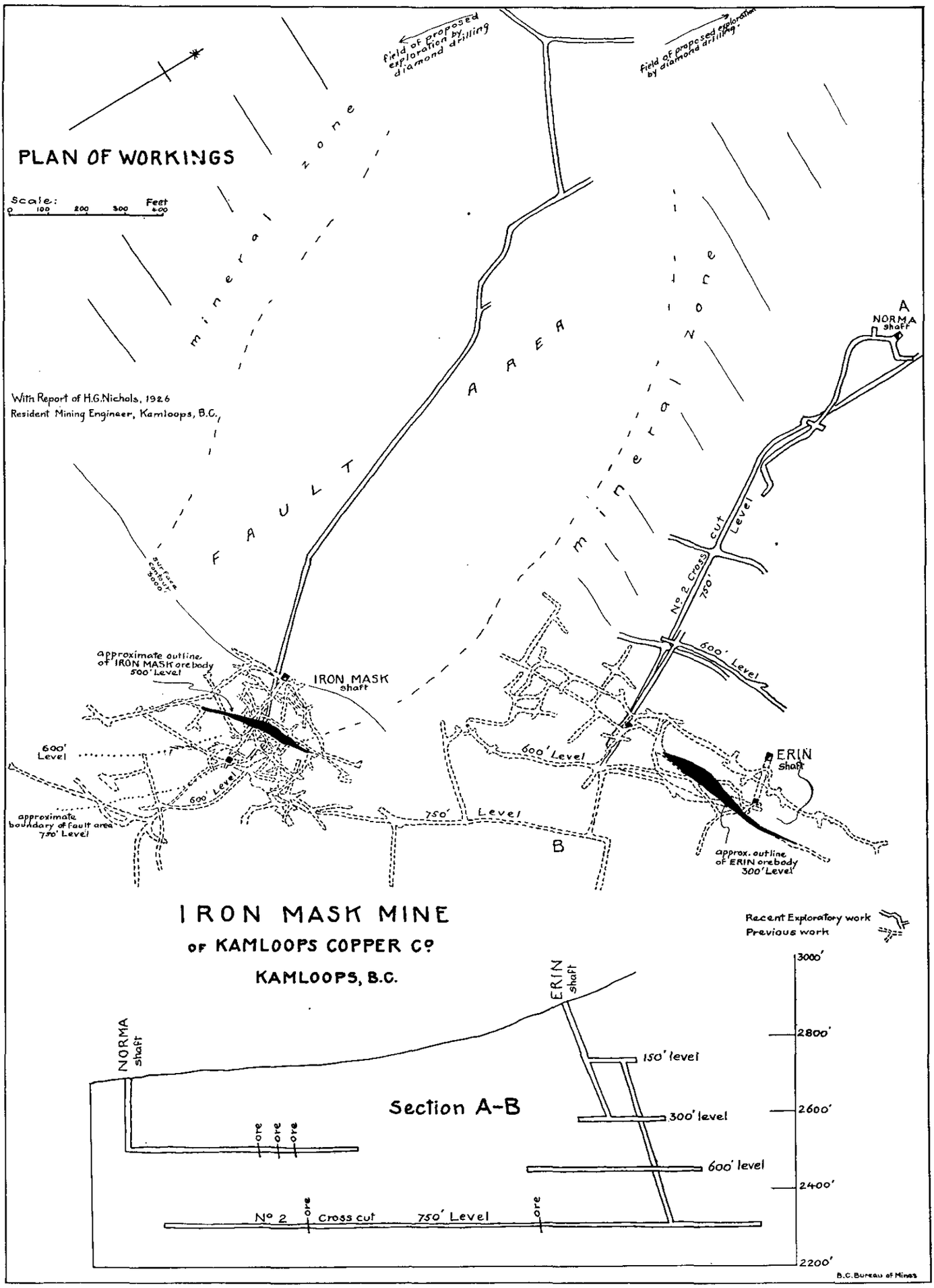
The area covered by the Central District forms an integral part of a mineralized belt. The mineral production of the district is increasing, but has not yet reached a stage commensurate with its extent and promise. Large areas are yet unexplored and excellent opportunities exist for prospecting. The following sections are recommended in particular:—

(1.) West of the Fraser river between Hope and Seton lake.
(2.) West of Okanagan lake between Penticton and Douglas lake.
(3.) The eastern section of the Vernon Mining Division.
(4.) The Pemberton area.
(5.) West of the North Thompson river from Chu Chua to north of Mahood lake.

It is believed that the district will take its place as one of the foremost producing areas of the Province and but awaits the impetus of initial success for the realization of this position.

KAMLOOPS MINING DIVISION.

Iron Mask. This property is situated at a distance of about 6 miles south-west from the city of Kamloops. The ore-deposits occur in a stock of diorite which is intruded into the Nicola formation; this stock of diorite is about 16 miles long and 3 miles wide. The *Iron Mask* property is of particular interest as it may be considered to afford the key to the solution of problems relating to a number of deposits of copper in this same area. For the greater part these deposits are low grade; they occur in zones of shearing and fracturing in the diorite and have an east-west direction.


PLAN OF WORKINGS
Scale:
0 100 200 300 Feet
600
Field of proposed exploration by diamond drilling
Field of proposed exploration by diamond drilling.
mineral zone
FAULT AREA
mineral zone
With Report of H.G.Nichols, 1926
Resident Mining Engineer, Kamloops, B.C.
A
NORMA shaft
No. 2 Cross cut
750' Level
600' Level
IRON MASK shaft
approximate outline of IRON MASK orebody 500' Level
600' Level
600' Level
750' Level
approximate boundary of fault area 750' Level
B
ERIN shaft
600' Level
approx. outline of ERIN orebody 300' Level
IRON MASK MINE
OF KAMLOOPS COPPER Co
KAMLOOPS, B.C.
Recent Exploratory work
Previous work
ERIN shaft
NORMA shaft
150' level
300' level
600' level
Section A-B
ore
ore
ore
No 2 Cross cut 750' Level
ore
3000'
2800'
2600'
2400'
2200'
B.C. Bureau of Mines

The ore-bodies of the *Iron Mask* property, which have been worked to a depth of 750 feet below the surface, strike north-east and south-west. The ore-shoots were approximately 175 feet long and varied from 5 to 30 feet in width. A considerable tonnage that ranged from 4 to 9 per cent. copper was mined in previous years. The *Iron Mask* ore-body was found to terminate against a wide zone of shearing, both on the 600- and 750-foot levels.

Examination of the rocks of which this wide zone is composed shows that it was originally a very basic olivine basalt and the suggestion is indicated that it represents a mass of included material that has been "stoped" around by the intrusive diorite. This rock is greatly sheared and altered with the development of serpentine, and it is believed that its presence was responsible for the localization of the fractures in which the ore-bodies occur.

At a number of places in the old workings there are indications of intersecting seams having the east-west strike which is the normal direction of the ore-zones within this area, and recent work has been devoted to the location of these "main ore-channels."

The "fault" zone crosses the *Iron Mask* bodies in a north-west direction and, following the hypothesis outlined above and on the assumption that the included mass of rock which has interrupted the normal course of the mineralization may terminate abruptly in depth, extensive prospecting has been done in the likely area to the north.

This work was commenced by sinking a shaft at a distance of over 2,000 feet to the north-west of the old workings, from which it was proposed to crosscut back, paralleling the fault-zone on its eastern side. A heavy flow of water was encountered in this shaft and the work was resumed from the lower levels of the old workings.

During 1926 about 3,000 feet of tunnelling has been done on the 600- and 750-foot levels, and on the former horizon a body of ore has been picked up which agrees approximately with the calculated position for an east-west ore-body. Drifting on this ore-body has been commenced. A seam of high-grade ore about 14 inches wide has been opened up, with the promise of from 4 to 5 feet of ore of milling grade. An interesting feature of this occurrence is that there is an alteration in the gangue in two different sections of the ore-zone, from gypsum to calcite.

On the 750-foot level, and also to the east of the fault-zone, another ore-body having the same east-west strike has been crosscut and drifted on. So far as development has proceeded, this ore-body is shown to be about 120 feet long and 3 feet wide, with an average content of about 3½ per cent. copper, occurring as chalcopyrite in a gangue of gypsum.

These discoveries cannot be considered to be of great economic value in themselves, but they are held to be sufficiently encouraging to warrant further work; an active campaign of diamond-drilling is therefore to be initiated, with a view to proving the continuance of these "main ore-channels" to the west and to determine the extent in depth of the included mass which constitutes the fault-zone.

It only remains to add that there is a considerable tonnage of oxidized ore still left in the old workings, and several outcroppings of such ore in the immediate vicinity of the mine lend weight to the anticipation that further bodies of ore may be discovered.

Through the courtesy of the manager, A. E. Wallinder, a plan of the workings accompanies this report.

Copper Creek Cinnabar.

Some desultory work has been carried on at this property on the north shore of Kamloops lake during the year. This work has been devoted to the extraction of some high-grade ore from the small Rosebush ore-shoot, and five flasks of quicksilver have been retorted from it. A certain amount of prospecting has also been carried on to investigate the possibilities of low-grade production, and it is believed that the future prospects of the property are to be considered in this relation.

An examination of the property was made during 1926 by V. L. Eardley-Wilmot, mineral technologist of the Mines Branch of the Dominion Department of Mines. It was ascertained that, in addition to the knife-blade seams of cinnabar which are found ramifying throughout a large area of soft, decomposed rock, there is also a certain amount of native quicksilver disseminated in it. Bulk samples were taken for testing in the laboratories at Ottawa, and should it be found that the occurrence of this native quicksilver is of sufficient importance it is possible that a new outlook may be provided for these properties.

Homestake.

As stated in the Annual Report for 1925, this mine, situated near Squaam bay on Adams lake, was reopened in August of that year. In past years this property attracted attention mainly on account of the notable bodies of silver-

bearing barite which are found outcropping in the Pre-Cambrian schists. These bodies of barite lie conformably with the bedding-planes of the formation, which have a flat dip, and in previous work a crosscut had intersected a seam of high-grade silver-lead ore lying in the hanging-wall country-rock. Samples of this seam taken at different times had indicated a silver content of approximately 80 oz. to the ton.

An option was acquired by W. J. Bell and associates for the purpose of investigating the possibilities in connection with this high-grade seam, and during the year 1925 a considerable amount of prospecting and development work was carried on. The results of this work, which included several hundred feet of drifting, raising, and sinking, were sufficiently encouraging to warrant the commencement of shipments and during 1926 these have been steadily maintained; a special grant having been made by the Mines Department for the purpose of repairing the road to Louis Creek from the Canadian National Railway, a distance of 21 miles, by which the hauling of this ore in motor-trucks was made possible. During the year 1,775 tons of ore, averaging nearly 90 oz. silver to the ton, was shipped to Trail, and it is estimated that an approximately similar amount is in sight.

A small compressor has been installed and development has been carried on in advance of the stoping operations. The winze from the old level has been sunk to a depth of 150 feet on the dip of the seam, but the grade of the ore was not maintained. A crosscut, however, which has been driven from the winze back towards the foot-wall, at a depth of about 40 feet below the old workings, has indicated greater possibilities. A 12-inch seam of ore which assayed $115 a ton was encountered by this crosscut, and it is also indicated that below the old workings the dip of the formation and of the barite body lies at a steeper angle.

From the results of development to date, it appears as though there is a mineralized belt closely related to the occurrence of barite, in which there is a series of lenses of ore lying *en echelon*. In the upper levels of the mine quartz with ruby silver and free gold is found in spots. The development of this mine is of particular interest as there are many similar occurrences of mineralized seams, lying with the bedding-planes of the schists, in this locality. The occurrence of barite, however, is characteristic of the *Homestake*.

Rhode Island Lead Co.

This property, which was formerly operated by the Adams Lake Mining Company, has been recently acquired by a local organization of the above name. This property is located on the east shore of Adams lake, almost opposite Squaam bay, and comprises a group of six claims, upon which there is a total amount of about 300 feet of underground workings in addition to a number of surface cuts. There are several outcrops, but the ore occurrence upon which most of the work has been done appears to be related to a zone of fracturing about 100 feet wide. Within this zone several bunches of lead-zinc ore have been encountered and two small trial shipments have been made to Trail.

Acacia.

This property is situated at an elevation of about 1,800 feet above Pass creek and almost immediately opposite the *Homestake* mine. Two seams of zinc-lead mineral lying conformably with the formation have been exposed by H. R. Graham in surface cuts and tunnels. They are from 4 to 8 inches in width and there is some impregnation of the wall-rock. These seams are characteristic of the mineralization that is found throughout this section, which is occupied by the altered schists of the Bastion formation. Other examples are found on the *New Gem* and the *Discovery* group, owned by G. H. Brock, and at Rankin's property at the mouth of Squaam bay.

The ore on the former claims, which are situated at a slightly higher elevation than the *Acacia* and on the other side of a steep ravine which exposes the formation for some 100 feet in thickness, is said to occur in wide seams; on Rankin's property a series of mineralized seams has been exposed in open-cuts for a considerable distance. One of these seams is 7 feet wide, with patchy inclusions of chalcopyrite, zinc-blende, and galena.

Silver Mineral.

No recent developments are to be reported in connection with this property on the East fork of the Barriere river. The same remark applies to the *Schilling* group and other silver-lead prospects in this section, the opening-up of which has been held back by the delay, due largely to forest-fire troubles, in completing the new road and trail, for which a substantial appropriation has been made by the Department of Mines.

Silver Lake. Situated 20 miles north-west from Mount Olie, on the Canadian National Railway and at an elevation of about 5,600 feet, this property has been under development by Pete Johnson and was examined during the summer of 1926 by a representative of the Victoria Syndicate, Limited. A number of open-cuts, tunnels, and shafts has proved the continuity of a mineralized zone of shearing in a black argillite formation, near the contact with an intrusive rock, for a distance of approximately three-quarters of a mile. The chief metallic content is zinc, associated with which is some lead and silver. A sample across 6 feet of a mineralized seam in the shear-zone assayed: Zinc, 12 per cent.; lead, 2 per cent.; silver, 35 oz. to the ton.

At a distance of about 100 feet from this seam, and paralleling it for the greater part of its length, there is another quartz-seam with grey copper. This is a promising prospect, but requires more work to be done upon it, in the direction of open-cutting along the shear-zone to provide sections for systematic sampling.

Windpass. A description of this property was given in the Annual Report for 1925. The option which was held, and under which the work then described was carried on, was relinquished in the early part of the year and operations were suspended. The immediate reason for this abandonment was the failure to prove a sufficient continuity for the ore occurrence which had been found to extend to the 400-foot level. There is an ore reserve which has been variously computed as having a gross value of between $200,000 and $300,000.

During the summer the mine was examined by a representative of the Porcupine Gold Fields and Finance Corporation and a large number of samples were taken. The problem in regard to the continuity of the ore, however, again stood in the way of successful negotiations.

The mine was reopened by the owners in the fall of the year and work has been resumed under the management of A. W. Davis. A semi-Diesel engine and compressor has been installed and a vigorous campaign of development is in progress. The main object of this work, it is understood, will be to sink the main winze to a greater depth, and to thoroughly explore the country lying to the north-west and in the foot-wall of the seam which has been followed down.

As previously stated, some exceptionally good ore is showing up on the bottom of the No. 4 level and the opinion that was formulated in the 1925 report is still held—namely, that the situation in regard to ore reserves can be improved. There is, in fact, enough ore in sight at the present time to justify the erection of a small plant, and the present plans embrace the possibility of erecting a mill on Dunn creek during the coming summer, to which the ore of the adjacent *Sweetholm* property would also be tributary.

Smuggler. This property, which is situated about 2½ miles south of the Canadian National Railway track at Birch Island, has been actively prospected by a local syndicate and has aroused considerable interest by reason of the discovery of several bodies of silver-lead ore of good grade.

The ore occurs within a mineralized zone in a schist formation, close to a contact with quartzite, which forms the ridge of a hill flanking Foghorn creek on the east. Quartz carrying silver-lead minerals occurs in the form of seams and bodies, filling fractures and replacing the soft country-rock which has been intensely disturbed and shattered. There is evidence that there has been an intrusion of an acid igneous rock, probably related to the disturbance and folding of the ground, with which the mineralization is associated. There was some question at one time as to whether these bodies of ore were in place, but as a result of the work which has been done there is now no doubt on this score.

In addition to a number of surface cuts in which some considerable bodies of quartz were exposed and bottomed, two tunnels have been driven along the strike of an ore-body which seems to promise greater continuity. Some high-grade ore has been encountered in these workings and a shipment of 15 tons was sent to the Trail smelter, which yielded a gross return of $35 a ton.

The general direction of mineralization that is indicated parallels the line of contact between the schists and quartzite. In view of the number of exposures and the occurrences of high-grade ore, there would appear to be a reasonable possibility of locating at moderate depth an ore-body of economic importance. Camp buildings have been erected and work has been continued through the winter.

Minnesota Girl. J. Schlichter continued his crosscut tunnel to intercept the ore-body which outcrops 200 feet above. The tunnel was extended to a total distance of 200 feet and a body of quartz was passed through. This quartz was drifted

on for a few feet; it appears to have been displaced. The property lies on the same hill as the *Smuggler*, on the opposite side of the quartzite ridge. There are some quite large bodies of quartz carrying zinc and lead minerals, with some gold and silver values, occurring in partly filled fractures in the belt of quartzite, which shows evidence of the same general disturbance that is characteristic of the formation of this hill.

This tunnel-work represents the deepest workings on the hill and reflects great credit upon the patience and energy of a lone prospector working under difficult conditions.

Bonnie Brae. On Mount Ida, 1½ miles from Salmon Arm, a group of claims of this name has been located by Daggett & Cox, of Salmon Arm, covering a number of exposures of quartz with silver values. The ore occurs in a belt of quartzites and schists, not previously reported, and included in the granite area occupied by the base of the mountain. Although several open-cuts have been made, the work is insufficient for a definite statement as to the character of the deposits. It may be said, however, that there is a large development of quartz in what appears to be a continuous zone of shearing, and that values in silver up to $22 a ton were obtained from selected samples.

The ideal position of this property, situated at such a short distance from the main line of the Canadian Pacific Railway, is an attractive feature and further investigation of the mineralization in this formation is warranted.

Last Chance. A group of claims of this name has been located by J. W. Smith on the west side of Mara lake, and several shafts, tunnels, and open-cuts have been sunk and driven alongside the track of the Canadian Pacific Railway. The rocks here exposed are the lowest members of the Shuswap formation, comprising sediments and sills of hornblende intrusive. There is also a pronounced fracturing cutting the general north-westerly trend of the formation, with a number of quartz veins and silicified seams. Some of these are said to carry gold values.

Cotton Belt. Work has been continued on this property, north of Seymour arm, during the year and reflects credit upon Cotton Belt Mines, Limited, the Vancouver company which, under the management of B. F. Lundy, with F. W. Guernsey as consulting engineer, has continued an aggressive campaign of investigation under considerable difficulty.

Substantial appropriations were made by the Department of Mines for the purpose of trail-construction to permit of the packing-in of machinery and supplies for carrying on this work. An amount of over 60 tons of material has been taken in with pack-horses and excellent buildings have been constructed at the property. Cabins have been also erected on the trail to minimize the difficulty of packing. The programme of work that was carried out during the summer consisted of surface-trenching and diamond-drilling.

The following information, taken from the consulting engineer's report, is made available by the courtesy of the management:—

"The surface-trenching exposed some promising-looking outcrops on the *Cotton Belt* and *Joe* claims, showing widths of 5 to 10 feet of lode. Sixteen holes were put down by means of a diamond-drill at different points on the hanging side, and covering, along the strike of the lode, a distance of 6,500 feet. The total footage drilled amounted to 3,333 feet. Fifteen of these holes cut the lode at depths from the outcrop of from 270 to 370 feet along the dip, indicating that the lode has a width of from 4 to 12 feet and is of unbroken continuity. The most promising indications were obtained from the holes drilled on the *Joe* claim, and it is on this and the *Cotton Belt* claim that the surface outcrops are the strongest.

"The drilling was greatly retarded by the lack of water necessary for drilling owing to the dryness of the season. The contract has not been completed and it is the intention of the contractors to return next season and finish their contract.

"It is recommended that the balance of the drillings shall be done on the *Cotton Belt* and *Joe* claims, and in the meantime the main tunnel can be driven to explore the lode under the surface showings on the *Cotton Belt* and *Joe* claims, and by crosscutting expose the width of the mineralized zone.

"The other activities on the property during the season were the building of suitable quarters for taking care of an adequate force of men and housing the machinery and supplies

necessary for the prosecution of further exploration. These have all been completed and the company is to be congratulated on the quality of the buildings erected.

"A great deal of work has had to be done on the road and trail in order that the machinery and supplies might be transported to the property.

"While the results of the diamond-drilling have not come up to what one would wish, the width of the mineralized zone has been shown to be greater than was anticipated, and the area in which underground work may be prosecuted at first, at least, has been, it is considered, definitely established. At a later date more exploratory work on the less promising portions of the lode can be undertaken."

Tunnelling-work, as indicated in the above report, is being continued throughout the winter. This property is of considerable interest, affording as it does an example of what may be expected in the belt of Pre-Cambrian rocks in which it is situated.

The ore-zone paralleling a belt of crystalline limestone on its foot-wall side has been traced over the surface for over 2 miles. The economic operation of the property depends upon whether there are ore-shoots of sufficient width to provide the assurance of a tonnage concomitant with the requirements in connection with a low-grade ore-body situated at some distance from transportation.

Raft River. Neil Morrison did assessment-work on a group of claims about 20 miles up the Raft river, north of Vavenby, on the Canadian National Railway. These claims lie in another promising section, the development of which has been retarded owing to transportation difficulties. A further grant was made for trail-work.

Summit and War Colt. The ore-bodies occurring in the district north of Clearwater lake were examined by a representative of the Porcupine Goldfields Development and Finance Corporation. There are some attractive bodies of lead-zinc ore, but owing to the distance from transportation the present value of these properties has been considered in relation to associated gold and silver values and results of sampling in this regard were not sufficiently encouraging. Further assistance was afforded by the Department towards the betterment of the 40-mile trail and it is felt that the development of this likely country is bound to mature at a later date.

Louis Creek Placer. A systematic attempt is being made to investigate the possibilities of an attractive stretch of placer-ground at the confluence of Louis creek with the North Thompson river. The occurrence of gold in the gravels of this creek has been known for some considerable time and several attempts have been made to work them by sluicing on a small scale. During 1926 a syndicate in which Edmonton capital is interested, with R. M. Read in charge of operations, acquired a number of holdings and completed plans for hydraulicking operations along the lower reaches of the creek.

At the lower end, where the creek emerges from the narrow valley, a certain amount of concentration appears to have taken place around the rim of a wide sweep of the North Thompson river. The work which has been carried out so far by the syndicate has been in the nature of a test run of a few hundred yards of gravel from this lower section of creek-bed. A bucket elevator was used in order to excavate down to bed-rock, and a satisfactory clean-up was made by the use of a monitor under a low head of water, with a bed-rock flume about 75 feet long. Some coarse gold was recovered and it is estimated that the clean-up averages rather better than $1 a cubic yard.

The syndicate is planning the building of a mile-long flume by which water can be delivered to monitors under a head of about 250 feet, and should the ground continue to prove satisfactory the work will be carried on up the creek-valley.

The syndicate has already acquired several placer leases covering the flats and benches along the valley of the North Thompson below Louis creek, and should the present operations prove to be encouraging it is understood that the systematic drilling of this ground is to be considered.

Gypsum.

Operations at the gypsum-deposit at Falkland, on the Kamloops–Kelowna branch of the Canadian National Railway, have been continued by the British Columbia Gypsum Company and steady production has been maintained.

CLINTON MINING DIVISION.

Watson Bar Creek.

E. J. Taylor and W. Tremble did assessment-work on their claims at the head of this creek, where there are deposits of antimonial silver ore.

Ward Bar Creek.

R. F. Butler has been opening up the ore-body on his *Buster* group of claims, situated near the head of Ward Bar creek at an elevation of about 4,600 feet and at a distance of approximately 4½ miles from the Fraser river. He reports having uncovered a vertical ledge 5 feet wide, below the outcrop of an 18-inch seam of heavy mineral that assayed 47 per cent. antimony, with silver values.

Soda.

Following the installation of a dehydrating plant, with a capacity of 20 tons of soda-ash a day, operations on the extraction of soda from the lakes in the vicinity of the 74-Mile House on the Cariboo road were suspended for a time, pending the completion of certain negotiations. It is understood that satisfactory arrangements have been made and that production will be resumed on a larger scale. Two car-loads of soda-ash and two car-loads of raw soda were shipped during the year over the Pacific Great Eastern Railway.

Several car-loads of soda have been shipped from Lela lake by the Janes Estate and by C. W. Austin from his holdings in the vicinity.

Placer-mining.

Placer-mining operations have been continued on Watson Bar creek by Daly, Johnson & Munro. The work has been handicapped by shortage of water.

Thirteen placer bench leases on the east bank of the Fraser river, south of Kelly creek, were taken up for outside interests by D. J. Stewart, of Pavilion. Some testing-work has been carried on.

One bench lease and one dredging lease on the Fraser river at Big Bar have been retained by Grim & Myers. Test and development work has been carried out in connection with both leases and some good prospects have been obtained. The work included over a mile of ditching and the installation of a hydro-electric plant, cable and hoist, with 1,700 feet of steel and wood pipe of from 24 to 12 inches in diameter. A shortage of water caused a temporary suspension of the operations.

L. F. Green and associates, of Vancouver, have secured eight bench leases on both banks of the Fraser river at High Bar.

W. H. Hammond and associates, of Ashcroft, have taken out three bench leases and one dredging lease on the east bank of the Fraser river above Big Bar.

LILLOOET MINING DIVISION.

Pioneer. The operations upon this property on Cadwallader creek, in the Bridge River area, under the superintendence of D. Sloan, have been productive of extremely satisfactory results. The shaft was continued to a further depth of 160 feet and a crosscut was run to the vein, which was drifted upon, east and west, for 300 feet. For the whole of this distance the drift was in ore and a stope has been commenced up to the level above. The vein on the bottom level varies up to 5 feet wide, and the average value, as calculated from an eight-day run on the ore won from development, was over $50 a ton.

The milling operations were restricted to a certain extent owing to a shortage of water, but the production in bullion for 1926 was nearly $100,000. Ore reserves have been increased to the extent of a total estimated value amounting to over half a million dollars.

It is understood that future plans have not been finally settled, but it is under contemplation to install a new power and equipment plant to handle 100 tons a day.

The successful results of the operation of this property have had a stimulating effect upon development in the camp, and it is generally felt that the anticipations in regard to the future of this gold-producing area are near fulfilment.

Coronation. At this property, adjoining the *Pioneer*, the shaft has been sunk to further depth of 100 feet and 800 feet of drifting has been done on the lower level. About 500 feet of this drifting was in ore that would probably pay to mill.

Although the vein is small and the values are not spectacular, it is estimated that the ore on this lower level is probably as good as that which was previously extracted from the *Little Joe* ore-body. This ore averaged about $60 a ton.

A small mill and water-power equipment have been installed and milling will be commenced early this year. Some diamond-drilling was also done on this ground, two holes being put in to depths of 500 and 548 feet respectively. It is understood that the results of this work were not altogether satisfactory owing to the small recovery of core. A vein with nugget gold was cut in one hole.

Lorne. An option on this group of claims, which adjoins the *Coronation* on Cadwallader creek, has been acquired by Seattle operators, and it is understood that plans have been made for a programme of development and for the installation of a small mill during the coming season.

Taseko River Camp.

This camp, in the Taseko River area, was the subject of investigation by the Victoria Syndicate, Limited. The representatives of the company made a detailed examination of the *Windfall*, *Motherlode*, *Tennessee*, *Spokane*, and *Syndicate* groups.

The work done consisted of surface-stripping and open-cuts. Several wide mineralized shear-zones in the granite with low values in gold and copper were exposed. These zones may provide the basis for the discovery of ore-bodies of economic value.

The development of the camp in general has not yet proceeded to the stage when any definite estimate of claim values can be made. Mineralization is on a scale that makes the area an attractive one for prospectors.

Assessment-work was also performed on the *Massena* group by J. Russell and H. Swartz, who also carried out similar work on the *Native Son* group on Leckie creek.

Shulap. A considerable amount of open-cut work was carried out by Russell and Swartz on their *Shulap* group of claims on Boulder creek, in the Shulap range. Free gold has been discovered in certain zones of shearing in a recent volcanic formation.

Cayoosh Creek.

The Stave Lake Mining Company has been doing some work preparatory to a renewal of placer-mining operations in the wide basin of this creek above the falls, on the south side of Seton lake, near Lillooet. This basin, which is about 1,000 feet wide by 1,000 feet in length, was the scene of activity some sixty years ago, when the Chinese placer-miners were said to have taken out large amounts of gold.

The Chinese workings were carried down to a false bed-rock of clay. More recently an attempt was made to prospect the ground below this level and some drilling was done, the results of which were inconclusive. A bed-rock bar across the creek, above the falls, was cut down to a depth of about 20 feet and a great part of the channel that had been worked was scoured out by this lowering of the creek-bed.

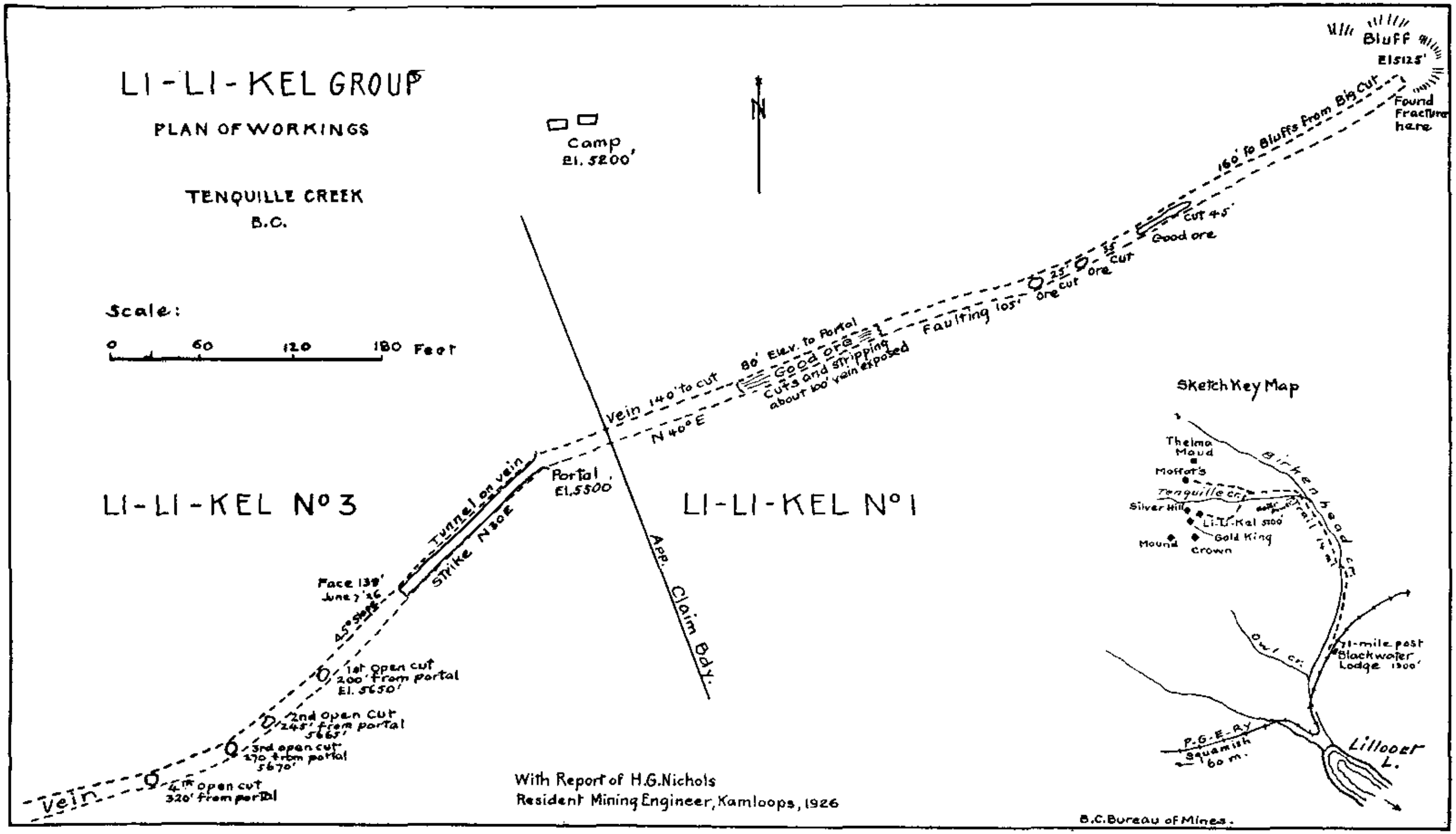
The present operators are proposing to make another cut through this bar in order to reach the actual bed-rock. So far only preparatory work has been done, in the way of digging a ditch for the diversion of the stream from a point about 1,200 feet above the falls.

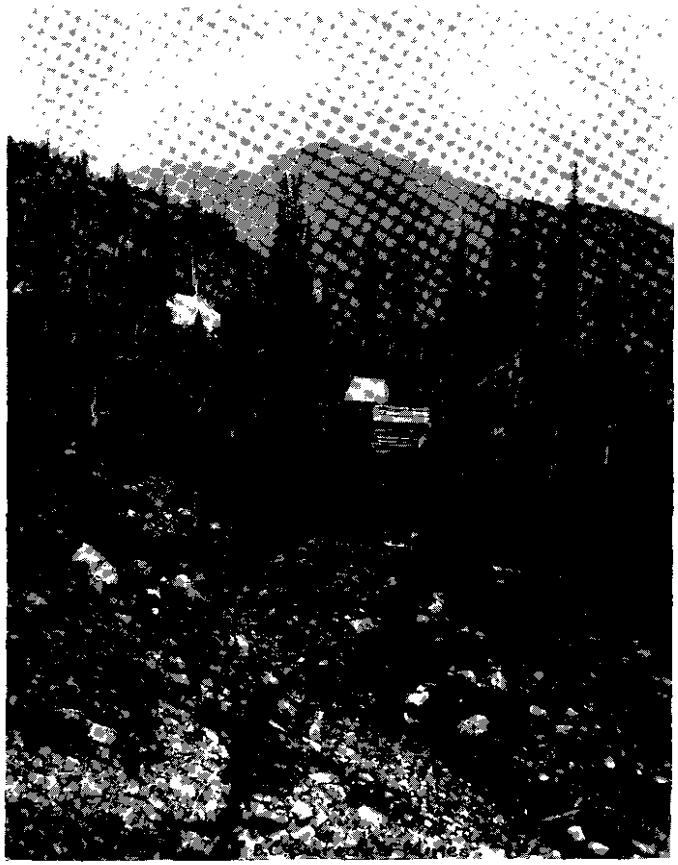
In connection with this project the general inadvisability of following the footsteps of the Chinese placer-miners should be borne in mind.

British Columbia Alluvials, Ltd. The extensive preparations that have been carried out by this company under the management of Cooper Drabble have met with a number of disappointments, but it is satisfactory to note that there is a probability of more successful results in the near future. The work, which has been carried on for some years past, had for its main object the diversion of the Bridge river from its bed, where it swept around the outside circle of the Horseshoe bend, 21 miles above Lillooet, in order to expose the gold-bearing gravels below it.

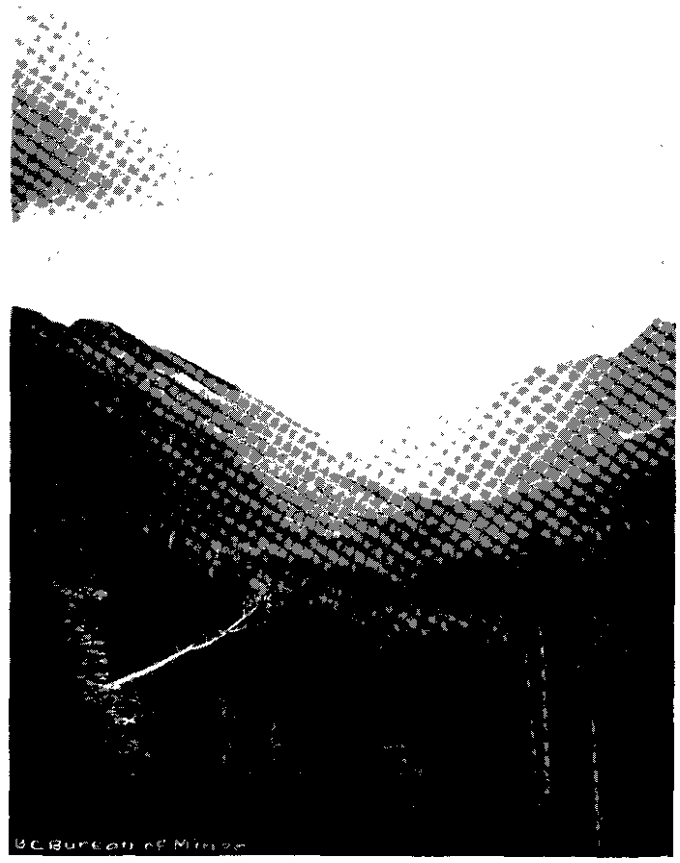
A flume was built 13,800 feet long and over 3,000 feet of pipe-line, ranging from 36 to 9 inches in diameter, was installed, giving an actual head of 340 feet. The equipment included three monitors, donkey-engine, derricks, elevator for a 35-foot lift, and several subsidiary works, such as suspension bridges, etc.

The work of diversion was successfully carried out, the cut around the inner circle of the bend being 1,500 feet long and 250 feet wide, and the river has now cut down this channel to an


LI-LI-KEL GROUP
PLAN OF WORKINGS
TENQUILLE CREEK
B.C.
Scale:
0 60 120 180 Feet
Camp
El. 5200'
N
Bluff
El 5125'
Found Fracture here
160' to Bluffs from Big Cut
Cut 45'
Good ore
Faulting 105'
80' Elev. to Portal
Good ore
Cuts and stripping about 100' vein exposed
Vein 140' to cut
N 40° E
Portal
El. 5500
Tunnel on vein
Strike N 30 E
Face 139'
45° Slope
1st open cut
200' from portal
El. 5650'
2nd open cut
245' from portal
5665'
3rd open cut
270' from portal
5670'
4th open cut
320' from portal
Vein
LI-LI-KEL No 3
LI-LI-KEL No 1
App. Claim Bdy.
Sketch Key Map
Thelma
Maud
Moffat's
Tenquille cr.
Silver Hill
Li-Li-Kel
Gold King
Crown
Mound
Birkenhead
Owl cr.
Blackwater Lodge
P.G.E. RY.
Squamish
Lillooet L.
With Report of H.G.Nichols
Resident Mining Engineer, Kamloops, 1926
B.C. Bureau of Mines.



Li-li-kel Mine, Lillooet M.D.



Tenquille Creek, Lillooet M.D.

average depth of 15 feet into bed-rock at the intake and for 450 feet down-stream. Although some good "pay" was found in the gravel-bed of the old channel, this ground was found to be honeycombed with old Chinese workings and the results, as stated above, were not as anticipated.

A length of 800 feet of virgin channel has now been opened up at the upper end of the bend, where the main canyon enters the Horseshoe. The gutter of this channel carries coarse gold and was partially exposed owing to the cutting-down of the river in regrading its course through the diversion cut; subsequent testing has indicated that this stretch of ground is likely to yield several good clean-ups. The work is being actively carried on so as to take advantage of the low-water season. A 700-foot crib dam is being built, blocking the mouth of the channel, and is being carried along the bar longitudinally in order to divert the river.

An interesting feature in connection with these gravels is the occurrence of nuggets of the nickel-iron alloy, souesite, which has an average composition of 72 per cent. nickel, 28 per cent. iron. These nuggets are found up to the size of a pea.

Index. No further developments are to be recorded on this deposit of molybdenite ore on Texas creek, but a renewed interest is being taken in it on account of the improved market outlook due to the increasing use of molybdenum in the manufacture of steel.

Mineral Mountain Mines, Ltd.—Some prospecting was initiated by this company upon a deposit of lead and zinc ore which occurs as a replacement in a band of limestone on the east side of Anderson lake, near D'Arcy, at an elevation of about 3,000 feet above the level of the lake.

Li-li-kel. Work on this property, near the headwaters of Tenquille creek in the Pemberton area, has been continued by the Federal Mining and Smelting Company, which has had the property under option from the owner, T. Lewis, for the past eighteen months. Exceptionally high silver values are found in fissure-veins cutting a volcanic formation. The property has been described by C. E. Cairnes in the Summary Report for 1924, Canadian Geological Survey.

A tunnel driven on the main fissure was continued for a distance of about 250 feet. The width of the ore was found to vary considerably and values were erratic. There appeared to be some grounds for believing that the extent of the mineralization is dependent upon the character of the formation which is intersected by the fissure.

As pointed out by Cairnes, there are alternating bodies of a porphyritic and a chloritic volcanic rock and the better values appeared to be found where the fissure passed through the porphyritic variety.

It is understood that another lower-level tunnel is to be driven which will pass through a section of the porphyritic country, in which a number of intersecting fractures occur, with some wide outcrops of silver-lead ore.

Gold King. Assessment-work was done on this group, owned by C. Barbour, A. McLeod, and associates, and the property was examined by representatives of the Britannia Mining and Smelting Company, Limited, who also inspected the other claims in this camp in the Pemberton area. The surface work that has been done thus far has hardly effected more than to prove the continuity of a wide mineral-zone with a heavy iron-capping, although indications are not lacking that development in depth may establish the existence of a large body of ore with values in zinc and gold of a payable grade. It is anticipated that plans for the further development of this property will be completed in the near future.

Eva. George Moffat continued his development of this property and struck a lens of ore in his underground workings which looks promising and bears out the view expressed in last year's report, that lenses of ore will be found in this well-defined shear-zone, which parallels a quartz-porphyry dyke. This property, in common with others in the camp, was examined by representatives of the Britannia Company during the summer. A sample across the face of the lens of the ore above referred to assayed: Gold, 0.01 oz.; silver, 0.9 oz. to the ton; copper, 3.8 per cent.; zinc, 0.1 per cent.

Silver Bell. Some high-grade silver-lead-zinc ore has been encountered in underground workings at a depth of 150 feet below the outcrop of this property. A sample of this ore assayed: Gold, 0.05 oz.; silver, 23.8 oz. to the ton; lead, 23.8 per cent.; zinc, 13.3 per cent. T. Charleton and associates are the owners.

ASHCROFT MINING DIVISION.

Gypsum.

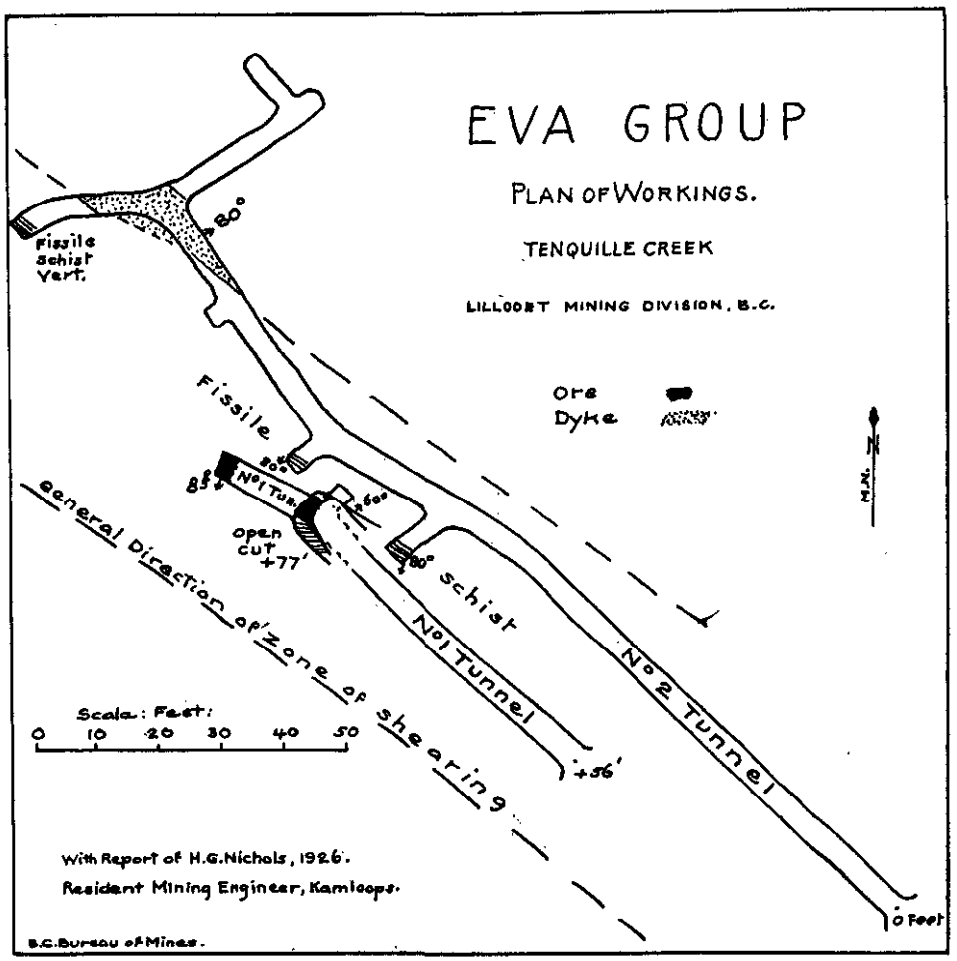
The gypsum-deposits at Spatsum, on the Thompson river, have been examined by the engineer of an influential corporation.

Highland Valley.

There has been very little activity in this section during the year.

Placer-mining.

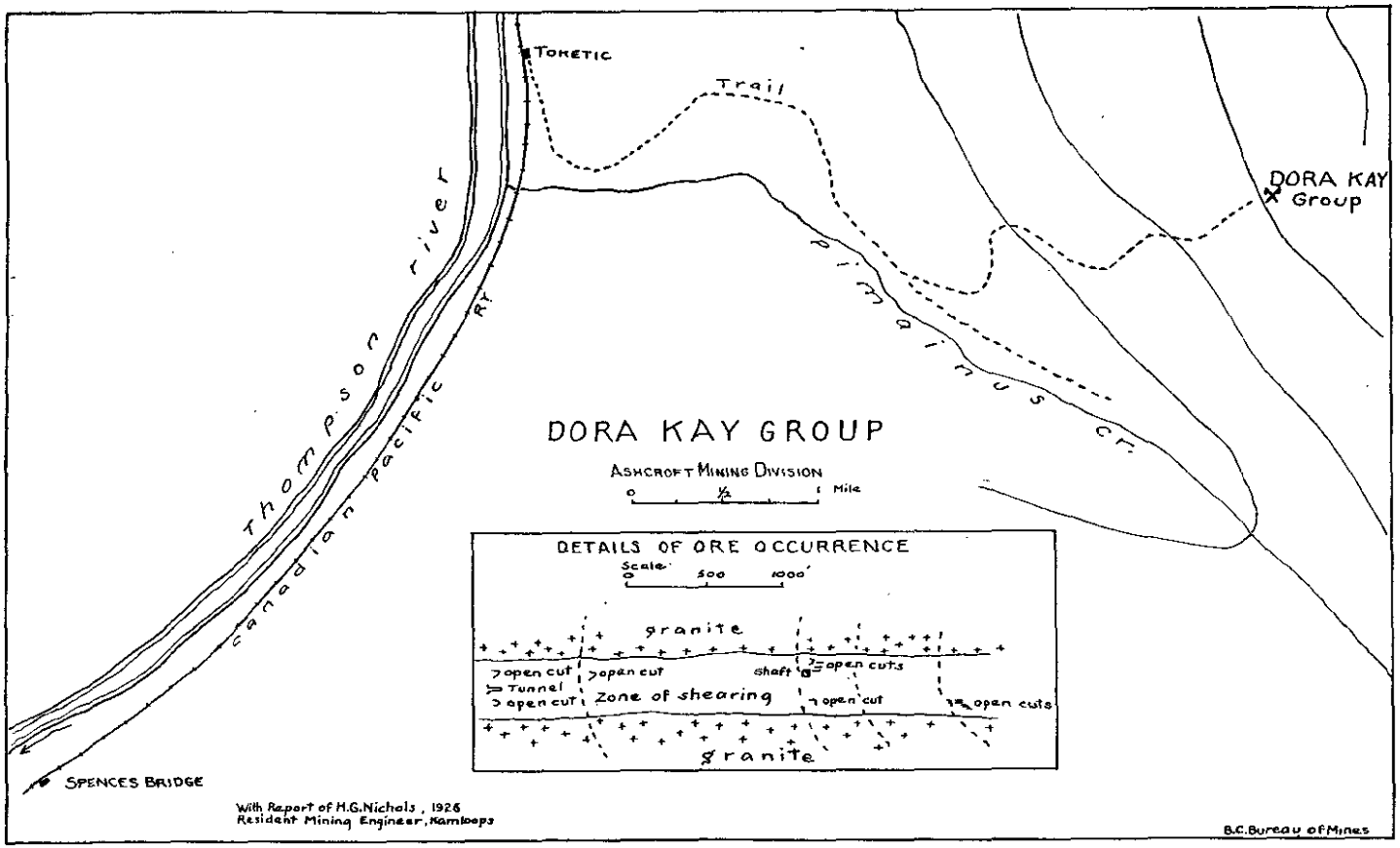
Some sluicing operations were undertaken during the early part of the year on some bench ground along the Thompson river above Spences Bridge. Some good values were recovered, but the boulders were too big for the limited equipment available.



Steyn Creek.

The discovery of gold quartz on this creek, north-west of Lytton, is reported. The precipitous character of the country on the west side of the Fraser river from Lytton to Lillooet has retarded prospecting, but this country is believed to hold considerable promise.

Dora Kay. This group of six claims is situated at a distance of 4 miles east of the Canadian Pacific Railway flag-station at Toketic, 4½ miles above Spences Bridge. The property is held by J. Negrean, of Kamloops. It is reached by trail from Toketic up the right bank of Pimainus creek for a distance of 2½ miles and thence by steep ascent over open grass-covered slopes.


TORETIC
Trail
DORA KAY Group
thompson river
canadian pacific RY
spintus cr.
SPENCES BRIDGE
DORA KAY GROUP
ASHCROFT MINING DIVISION
0 ½ 1 Mile
DETAILS OF ORE OCCURRENCE
Scale 0 500 1000'
granite
open cut
open cut
shaft
open cuts
Tunnel
open cut
Zone of shearing
open cut
open cuts
granite
With Report of H.G. Nichols, 1926
Resident Mining Engineer, Kamloops
B.C. Bureau of Mines

The mineral occurrence is hæmatite-iron ore which has been uncovered in shallow workings *over a horizontal distance of approximately 3,000 feet and at horizons varying between 4,300 and* 5,150 feet above sea-level.

The ore occurs as a metasomatic replacement, associated with tourmaline in seams, and disseminated throughout a zone of shearing, approximately 300 feet wide, in the granite formation. There is a small amount of copper impurity, more especially in the massive seams which conform to the general east-west trend of the shear-zone, but veins of pure specular hæmatite occur in crossing fractures and in patches in the crushed rock. The extent of the mineralization is impressive and more development might be carried out with profit, although the history of iron-ore deposits of this class is not encouraging.

YALE MINING DIVISION.

Independence. This copper property, which was reported on by Charles Camsell and was under option to the Granby Mining and Smelting Company at one time, has been further prospected by J. Holmes. Situated within 2 miles of Coquihalla Station, on the Kettle Valley Railway, it has particular attraction on the score of accessibility. There are five claims in the group, as follows: *Independence*, *Bute*, *Boston*, *Bank*, and *Merry*. Recent work indicates possibilities which do not appear to have received enough consideration in regard to the mineralization of areas of crushed rock related to a system of intrusive dykes. The extent of these areas, as indicated in a number of open-cuts, adds materially to the possibilities of tonnage, upon which the future of this property must depend.

The old work was devoted to the development of a body of ore that was cut by a 300-foot tunnel at a depth of 175 feet below the outcrop, and a considerable amount of raising, sinking, and crosscutting was done. This ore occurs in a zone of crushed granite porphyry alongside a dyke of syenitic rock and is about 45 feet wide. Its lateral extent has not been determined, as the tunnelling-work was diverted along a fracture in which some patches of high-grade ore occur.

The main tunnel, which has been described as following a main fracture, is in reality a crosscut and intersects a number of similar dykes, more or less parallel to one another. The work that has been done recently has outlined large areas of similar crushed rock on the surface, and the sections of this ground that are intersected by the series of dykes above referred to should constitute a profitable field for exploration.

Emancipation. This mine has been operated recently by the Director Mining Company, of Vancouver. Work was confined mostly to the extraction of high-grade ore *from the hanging-wall vein. The ore-zone occurs in the Ladner slates paralleling* a serpentine contact which is traced across the country for some miles. Development of this property has been confined mostly to one level which was driven on a narrow seam, from which some spectacular specimens were obtained from time to time.

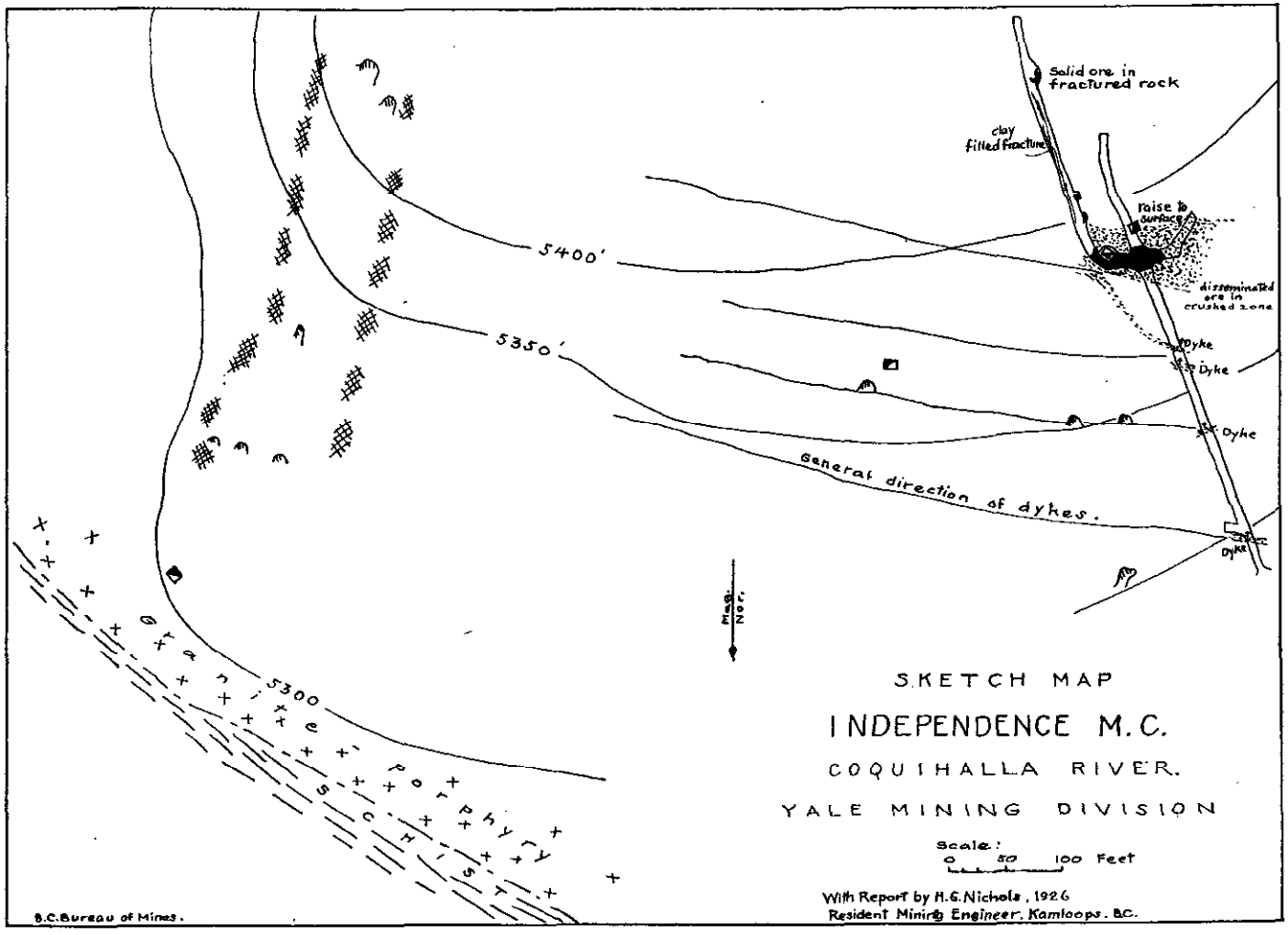
The drift is about 500 feet long; the main ore-shoot, which was stoped up to the surface, being about 60 feet long. This ore-shoot is definitely associated with the intersection of a crossing seam.

High-grade ore was found along the intersection wherever it has been followed. In the foot-wall of this high-grade seam there is an almost parallel body of quartz which carries low values in gold. This quartz-body has been intersected in three crosscuts driven from the main level and a certain amount of drifting has been done upon it, about 100 feet in all. The intersecting seam above referred to should intersect this body of quartz to a depth of about 30 feet below the present workings, and it is to be regretted that no attempt has been made to ascertain whether similar points of enrichment may occur at the intersection.

A tunnel has been driven into the hill for a distance of about 350 feet at a vertical distance of about 200 feet below the main workings, but this tunnel is entirely in the serpentine and no crosscutting has been attempted.

The *Emancipation* is a property that requires development under capable supervision.

Idaho. Recent prospecting has resulted in the discovery of a silicified zone along the serpentine contact. This zone has been exposed in a series of open-cuts over a distance of about 350 feet on the steep hillside flanking the South fork of Ladner creek, some 2 miles from the *Emancipation* workings. The work is insufficient to admit of any definite statement of value to be made, but it is important as proving the continuity of


Solid ore in fractured rock
clay filled fracture
raise to surface
disseminated ore in crushed zone
Dyke
Dyke
Dyke
Dyke
5400'
5350'
5300'
General direction of dykes.
Mag. Nor.
Granite Porphyry
SKETCH MAP
INDEPENDENCE M.C.
COQUIHALLA RIVER.
YALE MINING DIVISION
Scale:
0 50 100 Feet
With Report by H.G. Nichols, 1926
Resident Mining Engineer, Kamloops, B.C.
B.C. Bureau of Mines.

the "gold-belt" which parallels the serpentine contact. Widths up to 7 feet of quartz have been shown in the cuts and free gold has been found. The several claims covering this ground have been consolidated under the name of the *Aurum* group by A. E. Raab, of Hope.

Gold. On this group some spectacular showings of visible gold have been found in the quartz exposed in the bed of Hillsbar creek at an elevation of approximately 2,745 feet above sea-level. This property was described by C. E. Cairnes in the Summary Report for 1923, Part A, of the Geological Survey of Canada, who states: "A series of quartz veins crosses a belt of slates near the contact of an intrusive granodiorite. There is probably a zone of slaty rocks a couple of hundred feet or so in width, following the contact, in which these quartz veins may be expected to occur. The aggregate width of the vein quartz estimated from one section exposed on Hillsbar creek shows a total average width of about 4 feet."

The property is under development by an American syndicate, with E. Strom in charge of operations, and it is understood that a stamp-mill is to be installed. A certain amount of new work has been done since the report above mentioned was made.

Over a distance of 75 feet exposed in the bed of the creek, approximately 15 per cent. is vein quartz; and in one seam, which is 4 feet 6 inches wide, there is 10 inches of quartz carrying visible gold. A great movement of the schists is evident. It is probable that a large proportion of country-rock would have to be crushed in any scheme for the recovery of values.

Midas. W. S. Bradley has located three claims adjoining the *Gold* group on the north, where the same series of gold-bearing quartz veins is exposed in the bed of a small creek tributary to Hillsbar creek. There are three parallel seams of quartz and a zone of slaty rock 35 feet wide, in which the total aggregate of quartz stringers amounts to about 20 per cent. of the whole width.

Pride of Emory. It is understood that difficulties in regard to title to the nickeliferous-pyrrhotite deposit on Emory creek have been overcome, and recent prospecting has improved the outlook in regard to the delimitation of ore having a nickel content higher than the average.

Eureka-Victoria. It is understood that negotiations for the reopening of this old mine are under contemplation. The property, which is situated at an elevation of about 5,000 feet above sea-level in the precipitous mountains lying to the south of Hope, has the distinction of being the first lode mine operated in British Columbia. The production in early years is estimated to have been between $300,000 and $400,000 in high-grade silver ore.

Americanadian Dredging Co. A plant has been installed by this company, with L. A. Thomas in charge of operations, for the purpose of gold and platinum recovery from the Fraser river, about 2 miles above Hillsbar creek. A drag-line with a 32-cubic-foot bucket is being installed to cut a channel at the low point of a bar below the rapids. It is estimated by the operators that they will be able to make twenty trips an hour with this bucket, handling 500 cubic yards of gravel a day.

A considerable amount of capital has been expended on equipment, including a pipe-line and a treatment plant comprising an arrangement of screens, a concentrating-table, and a centrifugal concentrator. The concentrate is to be treated in a Ross mill. There are fourteen men employed.

Siwash Creek.

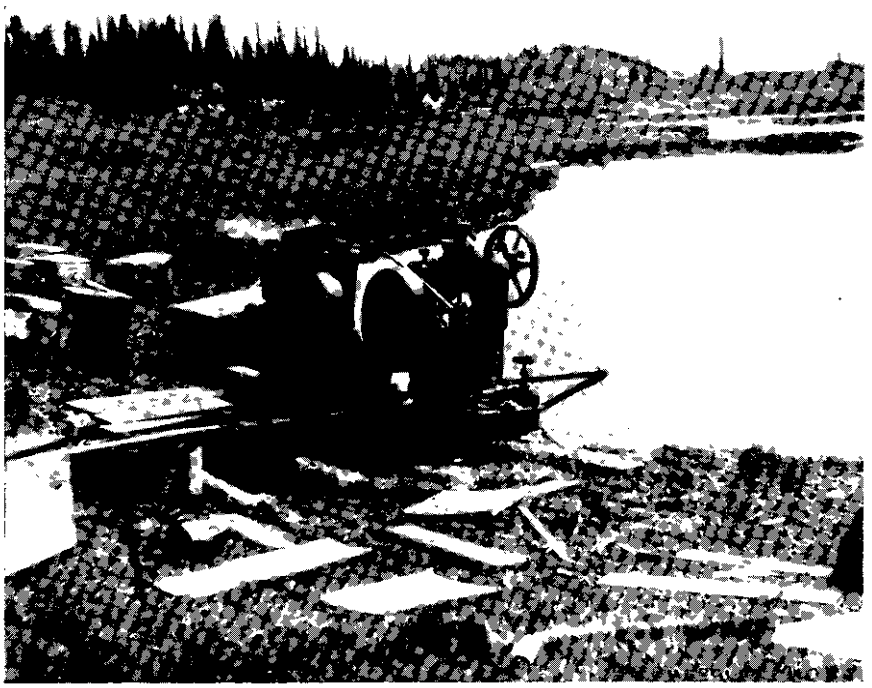
The Azalea Mining Company, with C. J. Dumbolton in charge of work, has completed a 6-foot road to the site of the company's proposed hydraulic operations on Siwash creek. The project includes the cutting-down of the channel above the 1,000-foot falls in order to allow for working the creek-gravels down to bed-rock for a distance of 2 miles up the stream. Substantial appropriations have been made by the Department of Mines for the assistance of the road-work.

Some good pay-gravel has been found in this creek. The grade is from 3.5 to 4 per cent.; the width of the channel averages from 50 to 75 feet and bed-rock is estimated to be as much as 20 feet below the creek-level in places. There are some big boulders along the upper section.

Peers Creek.

J. Fullbrook has continued his work on the bench material on this creek, tributary to the Coquihalla river, with a view to the commencement of hydraulicking operations.

Siwash Creek, Yale M.D.



Cotton Belt Mines, Ltd., Kamloops M.D.

Little Gem. A group of claims of this name has been located at the head of the East fork of Dewdney creek, just over the summit of the divide from the Tulameen valley. A number of seams of zinc ore have been exposed in open-cuts and a 90-foot tunnel has shown a considerable impregnation of zinc minerals throughout the conglomerate formation. The property is close to the contact of this formation with a diorite stock.

NICOLA MINING DIVISION.

Aberdeen. Operations on this property were suspended and Merritt Mines, Limited, withdrew from the camp in the early part of the year. The work which was done upon this property, and at the *Vimy Ridge* adjoining, was not carried out in the best interests of either property. No further information was obtained in regard to the *Aberdeen* ore-body and the workings were allowed to fill with water after the remaining pillars in the upper levels had been extracted.

At the *Vimy Ridge* the work on the 100-foot level was of an erratic nature and the general direction of the mineralized zone of shearing was lost in the broken ground that was encountered. This property is deserving of more systematic exploration.

Thelma.—This property, which is situated about 12 miles due north of Nicola, has been under option during the past year and it is reported that some encouraging results have been obtained in the course of development.

Star. Work has been continued on this property by Planet Mines, Limited. The shaft has been extended down to a depth of 230 feet on the incline and drifts have been run on the 200-foot level. The vein, which appeared to be rather indefinite on the 130-foot horizon, looks better on this lower level, averaging about 2 feet wide and in places swelling out to 5 feet. It is fairly well mineralized with galena and zinc sulphide, together with some grey copper. Ore taken from these workings has been put on the dump and *no shipments have been made.*

The property is situated on the shore of Stump lake and is one of a number of prospects in this area which was named by Dawson "Mineral hill."

A great deal of work was done in this locality many years ago and it is unfortunate that most of the workings are filled with water. The veins, carrying ores of lead, gold, zinc, and silver, are not large, and that may have been the reason that operations were abandoned; there is also the fact that at the time the work was done the complex character of the ore presented difficulties of treatment which would not be so serious now.

In general it may be said that properties in this area, characterized by persistent fissuring in a greenstone formation, are hardly big enough to be worked separately, but that the area as a whole justifies exploration.

Azela. Some work was done by J. L. Brown, of Victoria, upon this property, which is situated about 1½ miles east of the highway between Stump lake and Nicola lake, at an elevation of about 3,000 feet. There are two series of well-defined quartz veins, cutting a diabase formation, which range from 6 inches to 4 feet wide. A sample taken from the dump of an old shaft assayed: Gold, 0.014 oz.; silver, 30 oz. to the ton; zinc, 9 per cent.

This shaft was unwatered and was found to extend to a depth of 50 feet. About half-way down the vein is 3 feet 6 inches wide and is well mineralized with lead and zinc sulphide. At the bottom of the shaft the vein narrows to about 12 inches of quartz with very little metallic mineral.

Several open-cuts were made on different outcrops where strong showings of quartz were encountered, but the values obtained on assay were low.

Middlesboro Collieries, Ltd.

The discovery of the extension of the No. 2 seam at a distance of about 1 mile from the old workings has given rise to a considerable improvement in the coal-mining situation in this field at Merritt. The coal of this seam was of a superior quality and there is an assured market for the production, which is increasing.

The company is developing Nos. 3 and 4 mines, which are looking well. A total of 43,474 long tons of coal was produced during the year. One hundred and ten men were employed on the property.

VERNON MINING DIVISION.

Silver Star. Much local interest has been taken in the discoveries of silver-lead ore on Aberdeen mountain, and a Vernon syndicate has acquired several holdings covering the ground on which these occurrences were exposed in the bed of a creek, following a slide of rock. A camp has been built in preparation for the work of prospecting.

The ore occurs in a wide band of metamorphosed calcareous argillites of the Shuswap formation. The rocks of this whole area are greatly deformed, and it appears as though the ore is generally associated with an amphibolite which probably represents an acute stage of metamorphism. No intrusive rock is found on the surface, but the ore is probably related to an underlying intrusive.

The property calls for careful prospecting, and this might be profitably devoted to tracing the direction of the bands of amphibolite on the surface with a view to locating the presence of the intrusive rock and of the main source of mineralization.

Cherry Creek Placer.

Preliminary work in connection with the clearing away of debris, etc., has occupied the whole season and has been hampered by lack of water.

Shuswap River.

F. Hildreth and partner have been prospecting in Cherry range and Silver hills and have located a number of claims covering outcrops of limy argillites, certain beds of which are impregnated with zinc and copper minerals.

Ophir. W. Brent has performed useful work in demonstrating the continuity of the silicified shear-zone which passes through this property on the west side of the North arm of Okanagan lake, 6 miles from Vernon. The zone has been traced for approximately 350 feet and is shown to be from 15 to 20 feet wide, carrying gold and silver values associated with chalcopyrite, pyrite, galena, and zinc-blende. The property was examined by a representative of the Victoria Syndicate, Limited.

Kelly. J. S. Logie, of West Summerland, has acquired this property, which is situated on Trout creek, about 9 miles north of Penticton, on the west side of Okanagan lake. Some high-grade galena and grey-copper ore is found in seams in an area of crushing and shearing in a granitic rock. The prospect is a promising one.

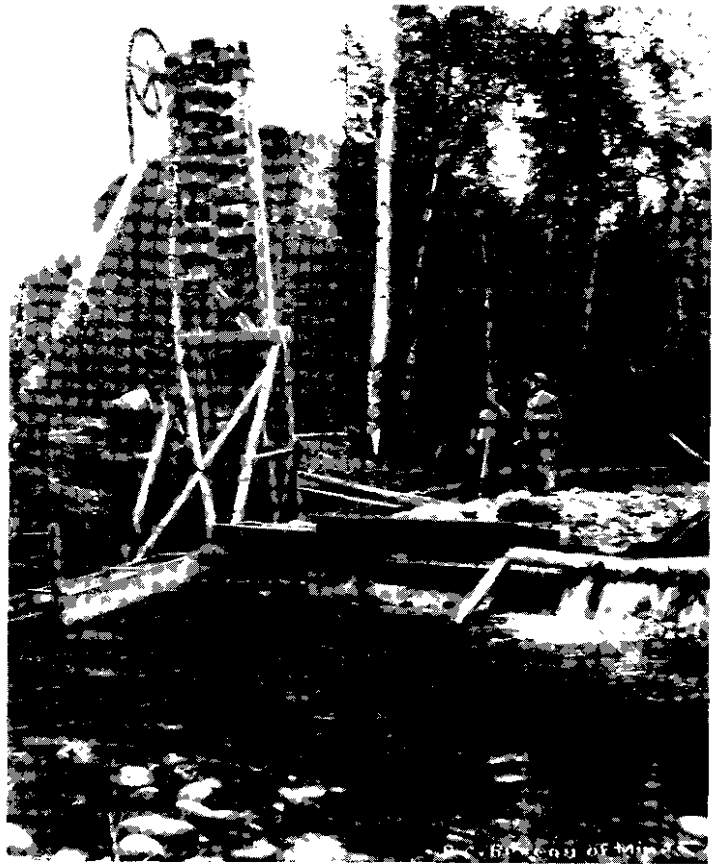
Siwash Creek.

A considerable amount of capital has been spent in the construction of a flume and pipe-line for hydraulicking bench material flanking this creek, about 2 miles above its entry into Okanagan lake. Saskatchewan capital is interested in this venture, which is being superintended by E. I. West.

Mission Creek.

Some placer-work has been carried out on this creek by H. Miller.

Cayoosh Creek Placer-mining, Lillooet M.D.



Louis Creek Placer-mining, Kamloops M.D.

SOUTHERN MINERAL SURVEY DISTRICT (No. 4).

By Philip B. Freeland, Resident Mining Engineer.

INTRODUCTORY.

The Southern Mineral Survey District (No. 4), comprising four Mining Divisions—Grand Forks, Greenwood, Osoyoos, and Similkameen—is situated in the extreme south centre of the Province of British Columbia, and is bounded on the south by the International Boundary-line, on the east by the height of land controlling western-flowing streams, on the north by the watershed of southern-flowing streams, and on the west by waters flowing east from the Coquihalla range of mountains.

Production figures for 1926 again show an increase which is due chiefly to the Granby Company's operations on Copper mountain, and in a smaller way to the mines on Wallace mountain, Beaverdell, and other silver-lead producers in the Greenwood Mining Division. The uncertain outlook for the price of silver curtailed developments to a great extent on the silver-lead prospects, and until the market becomes stabilized this situation is unlikely to improve except in cases where the ore contains a high lead content. Exploration, although well financed, has either ceased or been curtailed on arsenical-gold prospects on Dominion mountain, near Hedley, on copper-gold deposits at Voigt's camp near Princeton, and on copper-pyrrhotite outcrops near Rock creek, due to unusual winter conditions. Work on these discoveries will probably be resumed in the spring and the outlook for one producing mine at least appears to be bright.

Mining in the Grand Forks Mining Division was quieter than usual in spite of the fact that there are some likely prospects of silver-lead and pyrrhotite-gold close to railway transportation. One of the worst features of some undeveloped prospects in this Division is that the owners, in the past, have put a price on their prospects beyond all reason when considering the tonnage developed or indicated, and until this is remedied there is but a small chance that capital will become interested. There are other owners that are willing to give plenty of time for exploration and are asking a price in keeping with the possibilities of their prospects.

The platinum-gold placer-gravels of the Tulameen and Similkameen rivers received a considerable amount of attention during the season and much money was spent in abortive operations. Apparently most of the shallow gravel-diggings have been worked out, and only the benches, deeper channels, and areas where a heavy flow of water prohibited former operations remain for exploration. Insufficient testing of the ground before installing machinery has led to failure and a general belief that there is no pay-gravel in this area. It is safe to assert that none of these operations have proved anything except that the pay-gravels lie in channels and not generally throughout the alluvial material. Prospecting by means of shafts in water-soaked benches has also proved to be disappointing, because it is a very difficult matter to install a pump that will control an unknown and variable flow of water. Churn-drills are therefore to be recommended, in spite of the fact that some of the values may be lost. Future speculators will do well to demand that proper investigations be made before installing machinery. Values to the cubic yard of gravel in benches cannot be safely estimated from pannings taken from shallow pits not going down to bed-rock.

The following table shows the total tonnage and contents produced in No. 4 District by Divisions for 1926 and the district totals for 1925:—

Division.	Ore.	Gold.	Silver.	Copper.	Lead.
	Tons.	Oz.	Oz.	Lb.	Lb.
Grand Forks	11	20	16	.....	.....
Greenwood	3,016	166	408,562	35,342	180,495
Osoyoos	50,358	16,280	11,353	.....	.....
Similkameen	669,356	3,988	141,236	17,752,253	6,598
Totals, 1926	722,741	20,454	561,167	17,787,595	187,093
Totals, 1925	175,719	19,721	504,713	3,464,891	278,107

Division.	Zinc.	Arsenic.	Coal.	Limestone.	Bentonite.
	Lb.	Tons.	Tons. (2,240 lb.).	Tons.	Tons.
Grand Forks	.....	.....	.....	34,916	....
Greenwood	1,339	.....	.....	.....	....
Osoyoos	.....	509	426	.....	....
Similkameen	5,525	.....	135,496	.....	30
Totals, 1926	6,864	509	135,922	34,916	30
Totals, 1925	.....	1,119	131,807	35,150	....

A total of 518,901 common brick valued at $6,787.18 was produced in the Grand Forks Mining Division.

Prospecting.

From time to time mention has been made in the annual report of this district of likely areas for prospecting, and depending generally on the demand for certain metals or non-metals, as the case might be. A résumé of these areas, under Mining Divisions for convenience' sake, together with the more important minerals to be looked for, is given here:—

Grand Forks Mining Division.—In the Paulson section gold, silver, and lead are found with occurrences of platinum associated with pyrite in the Burnt basin. This is an old mining district, but is worthy of more intense prospecting and perhaps close examination of some of the semi-developed mines.

In the Cascade area the dunite rocks contain chromite which has been only partially developed.

In the vicinity of the Granby river (North fork of Kettle river) there are several prospects of silver, lead, zinc, and copper, whilst at Franklin camp the gold and copper ores command attention, especially in the pyroxenite rocks, which contain a good percentage of platinum where the copper sulphides are massive.

At the headwaters of the Granby river, named Lightning Peak camp, the silver-lead deposits are worthy of development.

A belt of serpentinized dunite rocks occurs at intervals between Grand Forks and Phoenix, and a certain amount of platinum is associated with the copper ores found near the contact of these rocks and the sedimentaries.

Greenwood Mining Division.—Further intensive prospecting and development of some of the old silver-lead mines near Greenwood is warranted, as well as a closer study of the copper occurrences at Copper camp beyond Deadwood.

Between Rock creek and Bridesville there are silver-lead deposits which have merit, and if the market price justifies it the chromite prospects in the same belt might be developed successfully.

The silver-lead deposits on Wallace mountain at Beaverdell need no advertising.

The country north and east, lying between the Kettle river and the Westkettle river, is worthy of closer study, especially along the contacts of the quartz monzonite and in the quartz diorite; also the gold-bearing arsenopyrite on Horseshoe mountain.

Osoyoos Mining Division.—The belt of schistose rocks predominating north of Osoyoos lake and between the Okanagan and Similkameen rivers contains many gold-bearing quartz veins which might be prospected.

The whole section of country lying within the curve of the Similkameen river between Princeton and Similkameen Station and north of the International Boundary has not been thoroughly prospected. The geology of the part of the country reported upon by R. A. Daly, in his 49th parallel survey, is sufficiently interesting to be followed up by closer inspection, especially on the contacts of the sedimentaries and igneous rocks. Native arsenic, tungsten, and strontianite have been found in the vicinity of the Ashnola river, which drains this part of the country to the north

Similkameen Mining Division.—A continuation of the last-named area extends west as far as the Coquihalla and has been reported upon in sections by C. E. Cairnes, of the Geological Survey, Summary Report, 1922, Part A. Prospects of coal, silver-lead, and zinc have been found east and south of the Similkameen and Pasayten rivers. The belt of pyroxenite and peridotite rocks extends from Olivine mountain on the Tulameen river in a south-easterly direction to the International Boundary, and along the contact of these rocks in the weathered zones good prospects of platinum have been panned. Transportation facilities throughout the district are good and a great assistance to prospecting.

Transportation Features.

The main trunk motor-road passes through Cascade, Grand Forks, Greenwood, Midway, Rock Creek, Bridesville, Osoyoos, Keremeos, Hedley, Princeton, Tulameen, and Merritt. Main branch roads fork from Cascade and traverse Christina lake and up McRae creek to Paulson and the old *Inland Empire* mine 4 miles beyond. A road from Grand Forks traverses the Granby river to Franklin camp, a distance of 48 miles. Another road follows the Kettle river from Rock Creek to Christian Valley, with a branch up the Westkettle to Beaverdell and Carmi. The Camp McKinney road leaves the main thoroughfare between the Rock Creek crossings and goes direct to Oliver. From 2 miles beyond Osoyoos a road follows Osoyoos lake to Oliver and Penticton, with a branch from Fairview, which joins the Penticton road at Dog lake. There is another road from Penticton to Keremeos, with a branch running up to the *Nickel Plate* mine and another branch to White lake. Four roads branch from Princeton; one follows the Similkameen river for 12 miles, another goes up 1-Mile creek to Merritt, another up 5-Mile creek to Osprey lake, and the fourth follows Summers creek to Missoula lake. From Tulameen a new road has been built up the Tulameen river to Summit camp, a distance of 21 miles.

The main trails traverse the country between the Edgewood–Vernon road, Lightning Peak camp, and Rendell creek. Another trail leaves Carmi and crosses the Kettle River divide into Penticton. Commencing at a point about 8 miles above Keremeos, an old wagon-road and trail follows the Ashnola river to the International Boundary-line. The Dewdney trail leaves the wagon-road 9 miles south of Princeton and crosses the summit to Hope. Numerous trails branch from the wagon-roads and main trails and give access to nearly every part of the district. The West Kootenay Power and Light Company's line passes through the district from Cascade to Princeton and affords cheap power for mine operation.

Road and Trail Construction.

Many operating companies, syndicates, and prospectors in the district have received assistance from the Mines Department towards construction of roads, trails, and bridges leading to their mines and prospects, providing such mines and prospects warranted the expenditure. A total of about $14,000 was spent by the Mines Department for this work. The request from different organizations to keep the roads open with snow-ploughs for motor traffic during the winter months is a new one, which will be costly if granted to every operating concern.

Many thanks are due to all mine operators and prospectors whose claims were visited, for their kindness and hospitality.

LIST OF REPORTS ON DISTRICT.

In the following table a list of the more important reports on parts of this district is given:—

Name of Author.	Publication.	Description.	Year.	Page.
R. W. Brock	Geological Survey of Canada	Boundary District	1901	49A
R. W. Brock	Geological Survey of Canada	Boundary District	1902–3	92A
R. A. A. Johnston	Geological Survey of Canada	Aspen Grove	1904	74A
Chas. Camsell	Geological Survey of Canada	Princeton	1907	.....
Chas. Camsell	Geological Survey of Canada	Hedley	1910	.....
Chas. Camsell	Geological Survey of Canada	Summary Report	1912	211
O. E. LeRoy	Geological Survey of Canada	Phoenix	1912	.....
R. A. Daly	Geological Survey of Canada	49th Parallel	1912	2 vols.
O. E. LeRoy	Geological Survey of Canada	Mother Lode	1913	.....
J. D. Galloway	Minister of Mines' Report		1913	140–171
J. D. Galloway	Minister of Mines' Report		1914	336–357
Leopold Reinecke	Geological Survey of Canada	Beaverdell	1915	.....
D. B. Dowling	Geological Survey of Canada	Coal	1915	255–261
C. W. Drysdale	Geological Survey of Canada	Franklin Camp	1915	.....
J. D. Galloway	Minister of Mines' Report		1915	182–202
W. M. Brewer	Minister of Mines' Report		1915	205
W. M. Brewer	Minister of Mines' Report		1915	235
P. B. Freeland	Minister of Mines' Report		1917	198
P. B. Freeland	Minister of Mines' Report		1918	201
P. B. Freeland	Minister of Mines' Report		1919	162
P. B. Freeland	Minister of Mines' Report		1920	152
Munition Resources Com., Mines Branch, Ottawa		Platinum	1920	134, 147, 161
P. B. Freeland	Minister of Mines' Report		1921	176
P. B. Freeland	Minister of Mines' Report		1922	160
C. E. Cairnes	Geological Survey of Canada	Summary Report, Part A.	1922	88
Eugene Poitevin	Geological Survey of Canada	Summary Report, Part A.	1923	84
C. E. Cairnes	Geological Survey of Canada	Summary Report, Part A.	1923	46
P. B. Freeland	Minister of Mines' Report		1923	176
P. B. Freeland	Minister of Mines' Report		1924	162
P. B. Freeland	Minister of Mines' Report		1925	190

GRAND FORKS MINING DIVISION.

GRANBY RIVER SECTION (NORTH FORK OF THE KETTLE RIVER).

Rock Candy.—The Consolidated Mining and Smelting Company, owners of this property, replaced the aerial-tram cable from the mine to the mill during the summer. No fluorite was mined.

Strawberry. This property is situated about 11 miles up the Granby river, on the west side adjoining the wagon-road and within a mile of the railway. Local interest endeavoured to unwater the old shaft, but owing to the difficulty of purchasing locally the type of pump required for this work the attempt was abandoned until 1927.

Former reports mention that a considerable amount of development-work was done, including open-cuts and two shafts, one about 40 feet and another over 100 feet in depth, with drifts from the deeper workings. On the dump there is a large amount of weathered and disintegrated pyrrhotite and pyrite, which came from the deepest shaft. A sample of this rock assayed: Gold, 0.08 oz.; silver, 2.5 oz. to the ton; copper, 1.34 per cent. Another sample from a shallow open-cut above the shaft assayed: Gold, 0.14 oz.; silver, 0.60 oz. to the ton. There is a great deal of surface mineralization on other parts of the claim which carries values in gold and silver. The ore occurs in shear-zones in andesite, which is intruded by granodiorite. The ore-minerals are pyrite, pyrrhotite, and chalcopyrite in a gangue of silica. The close proximity of the claim to transportation justifies further exploration.

Black Diamond. This group of claims includes the *Black Diamond*, *Orville*, *Paris City*, *Golden Cross*, *Gilt Edge*, and *Imperial*, and is situated approximately 5 miles up Blue-joint creek, which flows into the Granby river near Mile 32. The claims are owned by Elmer Rice, Chas. Hansen, *et al.*, of Grand Forks. Development-work consisting of

open-cuts, stripping, and shallow shafts uncovered large, low-grade segregations of pyrite, chalcopyrite, and bornite, with malachite in the surface fractures. The gangue is silica. The country-rock in which the mineralization occurs is a shonkinite-pyroxenite and similar to the rocks of this type described by Chas. W. Drysdale in his Memoir No. 56, G.S.C., on the geology of Franklin camp. A general sample taken from one of the cuts assayed no gold or silver and 0.7 per cent. copper. Another sample taken by the owners carried about 4 per cent. in copper. No platinum was found in any of the samples. Until more exploratory work is done it is impossible to estimate the value of the property, but the extent of the mineral-zones are such that at least another year's assessment-work should be done before condemning the claims. The presence of platinum may be looked for in these rocks.

Union. Louis Johnson and Pat McGinnis did some development-work on the surface and drove south from the face of No. 2 tunnel, crosscutting the vein for 10 feet. A sample from this cut assayed: Gold, 0.20 oz.; silver, 5.6 oz. to the ton. Some well-mineralized rock was uncovered on the surface, but no samples have been assayed.

Lightning Peak Section.

This section was not visited this season, but reports from the lessees of the *Lightning Peak* group of claims state that the prospects are looking promising and that some silver-lead ore is being rawhided out to the smelter for treatment.

On other claims in the vicinity nothing but assessment-work has been reported. The Government cut out and partially graded a snow-road over the new survey, which enables those interested to rawhide their ore to the main Edgewood–Vernon wagon-road and thence by truck or wagon to Edgewood, on the Arrow lakes.

Paulson Section.

Enterprise. This group, consisting of the *Enterprise*, *King Peter*, *Lucky Peter*, *Corbin*, *Norway-Star*, *Huckleberry*, and *Eurella* claims, situate about 4 miles north-east of Paulson and owned by Ed. Terzick, has been leased and bonded by Joe Grafton, Geo. Elms, and Chas. Hodginson, of Rossland, under the management of Joe Grafton. Development-work for the year consists of one 10-foot open-cut, with a 12-foot tunnel from the cut. A 15-foot tunnel has also been driven at an elevation of 18 feet below the collar of the old 40-foot shaft. During the winter of 1926–27 a car-load of silver-lead-zinc ore was shipped to the siding at Paulson. A half-mile sleigh-road was built to connect the mine-workings with the old wagon-road. The ore-bodies occur as lenses in the schist close to a granite-contact. An intrusive porphyry dyke has cut and displaced the ore in the vicinity of the shaft where most of the work has been done. It is probable that more ore will be found on the north-east side of this dyke. The ore-minerals are galena, zinc-blende, pyrite, and chalcopyrite in a gangue of silica. A general sample of the best ore on the dump assayed: Gold, trace; silver, 10 oz. to the ton; lead, 16 per cent.; zinc, 20 per cent.; copper, 3 per cent.

Molly Gibson. This claim, situated about 4 miles in a south-westerly direction from Paulson, was not examined during the year, but reports from those working the claim state that some high-grade ore was found in the vicinity of the old upper workings. The owners are the Molly Gibson Mining Company, of Rossland. This property was reported on in the 1918 Annual Report.

Tunnel Fraction. This group, consisting of the *Nero*, *All Fractional*, *Lettie*, *Tunnel Fraction*, *Lina*, and *Rosa* claims, is located at Paulson, adjoining the railway, and owned by Fred Kettner, of Paulson. These claims have been developed for many years by the owner and others who became interested. Development consists of numerous shafts near and on the crest of the hill and many open-cuts and tunnels between an elevation of 3,800 and 4,820 feet, most of which were either full of water or caved in, so that it was impossible to inspect them. The upper work has been done chiefly in diorite, in which certain fractures and narrow lenses have been mineralized with pyrite and occasional specks of chalcopyrite, with an insufficient general mineralization to warrant further work. On and near the contact of the diorite and syenite there are other mineralized fractures filled with pyrite and marcasite, much of which has been oxidized. Occasional specks and films of chalcopyrite and malachite are also found, but not in sufficient quantities to make the area attractive.

At an elevation of 4,375 feet the intrusion of a porphyry dyke in a north-westerly direction has been responsible for the general disturbance of its contact rocks. An open-cut 20 feet long has been driven along this contact in an oxidized zone 6 feet wide containing some quartz remnants and segregations of disseminated pyrite. No samples were taken of this material, but it is understood that up to $5 in gold to the ton has been recovered.

A great deal of stripping, a shaft of unknown depth, and an open-cut 18 feet long constitute the development of what is supposed to be a ledge near the top of the hill. As it was impossible to examine the shaft and the stripping was filled in, it is difficult to express an opinion; but judging by the crushed condition of the rocks in the open-cut and collar of the shaft and beyond, there seems to be little doubt that the work has been done on a fault or shear-zone containing small amounts of pyrite.

On the *Berry* claim, at an elevation of about 4,275 feet, an open-cut 18 feet long has been driven on a quartz vein varying from 12 to 14 inches in width and containing isolated segregations and veinlets of pyrite. According to the owner, free gold has been found in the oxidized quartz. A sample of this pyrite taken from the dump assayed: Gold, 0.50 oz.; silver, 0.30 oz. to the ton. Other open-cuts on the same lead and on offshoots from this lead proved its continuance in a south-westerly direction, but as the workings were caved in to a great extent it was not possible to examine them thoroughly. This appears to be the only discovery examined that justifies further work being done upon it.

Two lower crosscuts have been commenced at different elevations and at different times near the wagon-road with the idea of tapping the supposed ore-bodies found between an elevation of 400 and 1,000 feet above. This is too great a lift to take when so little is known about these ore-bodies, and all future crosscutting-work should be confined to 100 feet in depth, at most, below the zone desired to be developed. There is an opportunity to drift on the lead found on the *Berry* claim, and this is undoubtedly the best place to do any work in the future.

Fife Quarries.—The fife quarries shipped 34,662 tons of limestone to the Trail smelter during the year.

GREENWOOD MINING DIVISION.

Wallace Mountain Section.

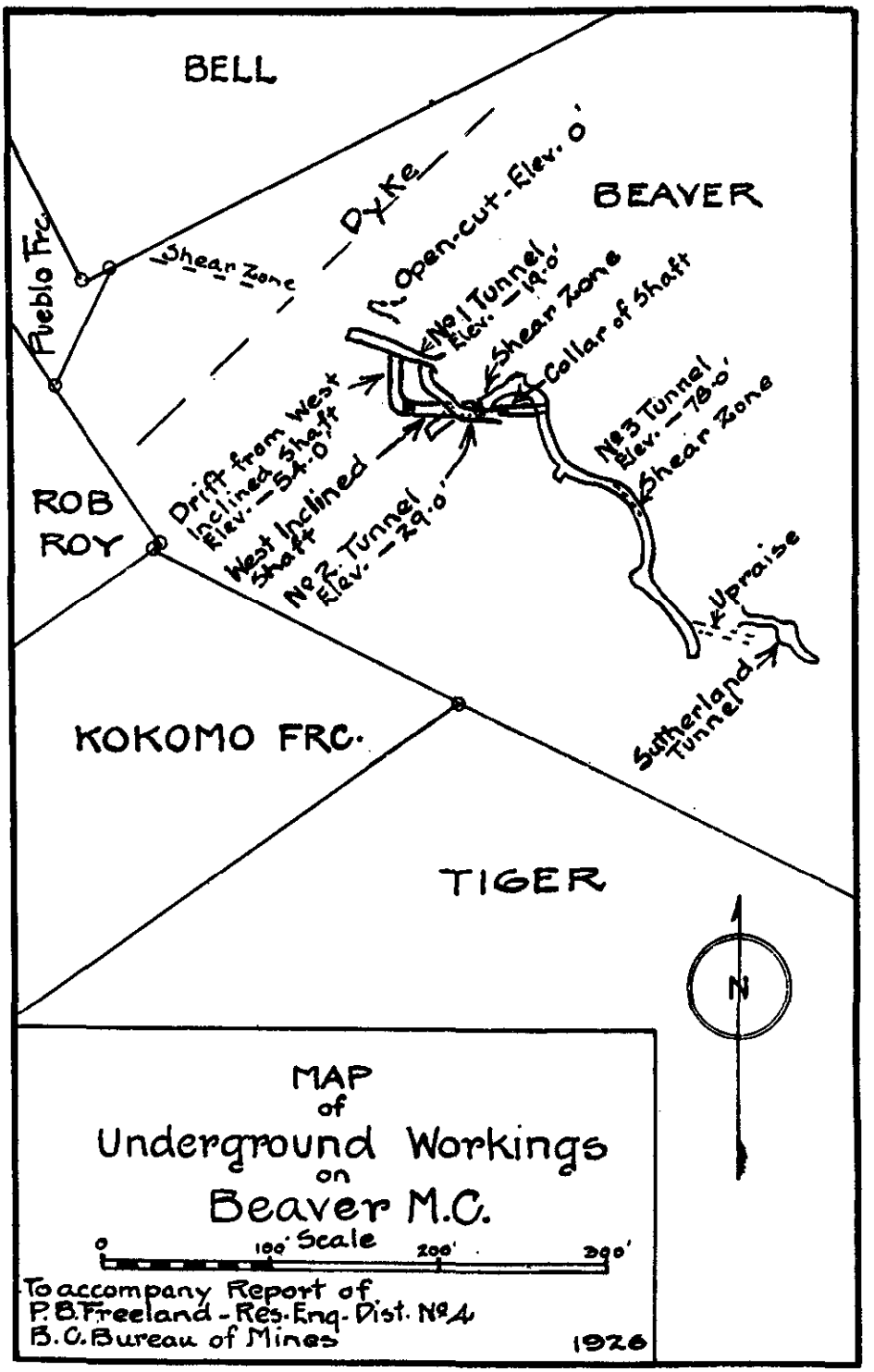
Beaver. This claim, owned by the Hallet estate *et al.*, of Greenwood, and bonded by the Beaver Silver Mines, Limited, adjoins the *Bell*, *Rob Roy*, and *Pueblo Fraction* on Wallace mountain, 4 miles distant from Beaverdell. The property has been equipped with one Ingersoll-Rand compressor with a capacity of 174 cubic feet, one 25-horse-power John Deere gas-engine, one Fairbanks-Morse 6-horse-power, 450-r.p.m. hoist, an ore-sorting shed, bunkers, cable and buckets, and a complete blacksmith's outfit. All the machinery is well housed. The camp consists of an office, bunk-house, cook-house, etc., to accommodate twelve men.

Development-work consists of: Drifting, 557 feet; upraising, 68 feet; west inclined shaft (30°), 53.5 feet; and east inclined shaft (68°), 60 feet (*see* map). In the development of the mine the ore was stripped on the surface and followed down until it was displaced by faulting or the miners were driven out by water.

The lowest tunnel, No. 3 (*see* map), which strikes in a south-easterly direction, crossed the ravine and en route encountered a faulted shear-zone. An upraise from this level also cut the shear-zone under the Sutherland tunnel. In the No. 3 tunnel shear-zone some good ore was mined, although a large part of the ore was low grade. High-grade ore was also encountered in the drag of the fault on the No. 3 level. A test drill-hole 8 feet long tapped what was considered to be high-grade ore in the face of the first cut to the south from No. 3 tunnel. In the crosscut and drift to the west from the shaft on No. 3 level some good ore was mined until a strong flow of water made underhand stoping impracticable.

In the upper workings most of the available ore has been mined. There is still about 150 feet of unexplored ground to the west, between the main workings and the boundary-line of the claim. A considerable amount of stripping and trenching has been done on the south-east side of the claim and some indications of ore found.

The shear-zones containing the valuable minerals have been mined up to the present in the quartz-diorite rocks. The contact of the Wallace series of rocks, which are made up of lavas, volcanic tuffs, etc., and the quartz diorite, lies along the east side of the *Beaver* claim. Up to


BELL
BEAVER
ROB ROY
KOKOMO FRC.
TIGER
Pueblo Frc.
Wheat Zone
Dyke
Open-cut - Elev. 0'
No 1 Tunnel Elev. -19-0'
Shear Zone
Collar of Shaft
No 3 Tunnel Elev. -78-0'
Shear Zone
Drift from West Inclined Shaft Elev. -54-0'
West Inclined Shaft
No 2 Tunnel Elev. -29-0'
Upraise
Sutherland Tunnel
N
MAP
of
Underground Workings
on
Beaver M.C.
0 100' Scale 200' 300'
To accompany Report of
P. B. Freeland - Res. Eng. - Dist. No 4
B. C. Bureau of Mines
1926

the present no high-grade minerals in sufficient quantities have been found in the Wallace formation. It seems probable that the intrusive quartz diorite will underlie the older Wallace formation to a certain extent and the shear-zones containing ore may be looked for up to that contact and perhaps for a short distance beyond.

The ore-minerals are galena, zinc-blende, argentite, free silver, pyrite, and occasionally other silver sulphides. The main faults encountered in the ravine strike in a northerly and southerly direction and dip generally to the west. The intermediate faults and minor slips have no special strike or dip and have to be considered separately.

Forty-seven tons of ore, containing gold, silver, lead, and zinc, was shipped to the Trail smelter.

Having found high-grade ore in the drag of one of the faults on the No. 3 level and also a high-grade sludge in a test drill-hole on the same level, and as there is a block of ground to the west of No. 3 tunnel that appears to be less disturbed than usual, the company is considering further development-work in the spring of 1927.

Tiger. This claim adjoins the *Beaver* on the south-west and has been worked throughout the greater part of the year by the Tiger Mining Company Syndicate, of Naramata. A considerable amount of stripping, sinking, and drifting was done near the surface, but up to the present time very little success has been obtained. The shear-zones so far discovered generally contained high-grade ore, but were badly faulted or pinched, which prohibited successful operation. The quartz-diorite rocks cover the greater part of this claim, and there appears to be the same chance of finding high-grade shoots of ore on the *Tiger* that can be profitably worked as on other claims on Wallace mountain.

Highland Chief. This claim was worked by Highland Chief Mining Company, Penticton, under the management of Mark Smith, of Beaverdell. Numerous open-cuts and short tunnels were driven on and near the contact of the quartz diorite and Wallace rocks. The ore found consisted of galena, zinc-blende, pyrite, arsenopyrite, chalcopyrite, and occasional films of native silver in the rock fractures. The ore-bodies resemble and may be classed as stocks (described by L. Reinecke, Memoir 79, Geological Survey), which generally occur in the Wallace group of rocks. Other stringers measuring from 2 to 4 inches in width and containing some high-grade ore were found; but owing to the extremely broken nature of the ground on the contact it was found impracticable to work them at present. It seems advisable to confine all future operations to the mineral-zones that occur in the quartz diorite and to leave the stocks or scattered lower-grade ores until sufficient capital is available to exploit and perhaps concentrate them. Work on this claim has stopped temporarily. A picked sample from the blacksmith's tunnel ore assayed: Gold, 0.02 oz.; silver, 40 oz. to the ton; lead, 12 per cent.; zinc, 15 per cent.

Revenge, Sunset Fraction, and Bell Fraction. This group of claims, adjoining the north-west corner of the *Bell*, was leased and bonded by the Crysler Mining Syndicate, of Penticton. A Clayton 55-horse-power compressor of 260 r.p.m. and a Canadian Ingersoll-Rand 10- by 10-inch gas-engine were installed and sleeping-quarters for ten men erected. Practically all the development was done on the *Revenge* claim, which has been worked from time to time during past years. No. 2 tunnel was driven ahead and a few tons of ore extracted.

The old water-tunnel was also extended with the idea of crosscutting the shear-zone found in No. 2. This was not accomplished. The barometric difference in elevation between No. 2 and No. 3 tunnels is 144 feet, which is generally considered to be too great a lift to take on Wallace mountain. The reason for this is that, owing to the nature of the faults, unless closely followed, it is quite within the bounds of possibility to pass within a few feet of a shear-zone which has been displaced. If the crosscut tunnel is only a short distance below the shear-zone being sought it is an easy and inexpensive matter to put in an upraise. The reverse is the case when a tunnel is driven at a great depth. A small shipment of silver-lead ore was made to the smelter.

Bell. This mine was operated steadily throughout the year by Dunc. McIntosh and Henry Lee, of Beaverdell. A new Ruston 53-horse-power Diesel engine and a 12- by 10-inch Ingersoll-Rand compressor were installed to replace the old plant. A total of about 1,200 feet of development-work was done, including drifts, crosscuts, and upraises; 1,002 tons of silver-lead ore was shipped to the Trail smelter.

Allenby Copper Co.—Boarding-house.

Allenby Copper Co.—Compressor-house.

Sally Mines. The Federal Mining and Smelting Company dropped its option on the *Sally* group of claims early in the year and operations were carried on by the Sally Mines, Limited, for 10½ months during 1926. The following development-work was done: Drifting, 1,796 feet; crosscutting, 1,251 feet; upraising, 540 feet; and sinking, 30 feet. A good deal of work was done on the lowest tunnel at an elevation of approximately 700 feet below the crest of the hill. Six machine-drills were in constant operation and an average crew of twenty-four men maintained. A total of 1,046 tons of silver-lead-zinc ore was shipped to the smelter, out of which about 700 tons was low-grade or second-class ore.

Wellington. This claim was operated by the Wellington Syndicate, of Greenwood. Development-work for the year consisted of: Drifting on No. 2 tunnel, 75 feet; drifting on No. 3 tunnel, 574 feet; sinking from No. 2 tunnel, 33 feet; and upraising from No. 3 tunnel to bottom of No. 2 shaft, 32 feet. The difference in elevation between No. 2 and No. 3 level is 65 feet and from No. 2 to No. 1 level is 52 feet. The following buildings were erected: Bunk-house, 26 by 18 feet; compressor-house and blacksmith-shop, 16 by 49 feet; ore-bin at mine, 16 by 20 feet; and ore-bin at railway-track, 16 by 20 feet. A new 30-horse-power Ruston-Hornsby oil-engine and a 9- by 8-inch Ingersoll-Rand compressor were installed. A total of 217 dry tons of silver-lead-zinc ore was shipped to the smelter.

Operations on the *Wellington* claim are being carried on at an elevation of about 750 feet below the crest of the hill, which constitutes the lowest high-grade minable ore-bodies found up to the present on Wallace mountain. The ores differ from those found at higher elevations, in that pyrargyrite is almost entirely absent, while a larger proportion of tetrahedrite is noticeable in the shear-zones. The grade of ore does not deteriorate on this account. High-grade ore still persists on the floor of the lowest level and at a later date another lift will be taken.

Bounty. This claim had a considerable amount of development-work done upon it under bond by the Federal Mining and Smelting Company in the winter of 1925–26. Following the cessation of work by this company, the claim was leased by A. McPhee, of Beaverdell, and a narrow shear-zone which had been crosscut (130 feet below the surface) by the Federal Company was opened up and partially stoped for 90 feet in length.

The ore in the shear-zone varies from 1 to 8 inches in width and contains the usual minerals found on Wallace mountain. Some of the machinery, including the compressor and engine, was purchased and moved from the *Bounty Fraction* and is being used on the *Bounty*.

Bounty Fraction and Duncan. In 1925 these claims were worked by the Beaverdell Mines, Limited, from February 1st until September. Later the Beaverdell Mines Syndicate took over the options and continued development. This syndicate was shortly afterwards incorporated under the name of the Penticton Mining Company, Limited. Development-work was continued until the end of June, 1926, and as no paying ore-bodies were discovered all work stopped and the options were dropped. An approximate total of 2,500 feet of drifting and crosscutting was done, chiefly on the *Bounty Fraction*.

Rambler Fraction and Standard Fraction. These claims were under lease to the Beaverdell Mines Syndicate for a short period in 1926 and later to private individuals of Beaverdell. On the *Rambler* the lower crosscut has been extended and a drift commenced on a fault to the south by G. M. Barrett and associates, of Beaverdell. On the *Standard Fraction* a small amount of work was done on a fault at the end of the main lower drift and a few sacks of ore extracted.

Black Diamond. The option taken on this claim by a syndicate of Penticton men was dropped on account of a shortage of funds, necessary to continue the lower crosscut tunnel to what was considered its objective, or the downward extension of the slightly mineralized zone found above. The shear-zones found on the adjoining *Standard Fraction* strike across the *Black Diamond* ahead of the crosscut tunnel, and if these zones persist, although there is no surface development to show their continuance, further work may be justified.

Gold Drop Fraction, Ford Fraction No. 1, and Ford Fraction No. 2. These claims, mentioned in the Annual Report for 1925, were developed by the Kettle River Mining Company, of Penticton, during 1926. At an elevation of 4,820 feet (barometric) a shaft was sunk many years ago on an oxidized gossan. Later a tunnel 40 feet long was driven about 70 feet lower in elevation and a winze 5 feet deep was sunk at the end of the level. A porphyry dyke of unknown width strikes across the face of this tunnel and cuts off the mineralized zone between the upper shaft and tunnel. The ore varies from

1 to 6 inches in width and is composed of pyrite, chalcopyrite, and what appears to be tetrahedrite, although the low values in the ore rather contradict the presence of the latter mineral. A sample of sorted ore from this tunnel assayed: Gold, 1.50 oz.; silver, 11 oz. to the ton.

Numerous other open-cuts extend down the hill on this mineralized zone to an elevation of 4,640 feet (barometric), where a lower tunnel has been driven by the present company a distance of about 175 feet on a lead 4 feet in width. The ore in this lead is mostly pyrite in a gangue of quartz and crushed country-rock (quartz diorite), with occasional specks of galena and zinc-blende. The pyrite is not persistent throughout the length of the lead, but occurs in segregations widely separated. A sample of nearly solid pyrite from this tunnel assayed: Gold, 1.60 oz.; silver, 3 oz. to the ton.

The management states that since the property was examined on May 27th a short crosscut has been driven on the left side of the lower tunnel and another lead from 2 to 2½ feet was encountered, having free walls and an abundance of water flowing through it. There were no sulphide minerals present in this vein, but the gangue appeared to be similar to that in the shear-zones of the *Bell* and *Sally* mines on Wallace mountain and therefore considered to be attractive.

Crystal Mountain.

An examination of this area was made with Frank Carey, of Rock Creek, who is one of the owners of a group of claims that were staked and explored in 1925. This section lies beyond Crystal creek, approximately 2 miles east of Wallace mountain, and can be reached by wagon-road as far as the Harrison ranch on Beaver creek, and from thence by trail up and across Beaver creek to Crystal butte, a total distance from Beaverdell of about 9 miles. The geology of the area, mapped by L. Reinecke, of the Geological Survey, shows that Crystal butte consists of unaltered lava-flows and porphyry dykes surrounded on all except the west side by the Wallace group of rocks (lavas, tuffs, etc.). A tongue of quartz diorite projects from the main mass along the west side of the butte. All the claims examined were located in the Wallace rocks and the ore-bodies are similar in type to the stocks described by Reinecke.

Little Joe. This claim, owned by W. Lawrence and Joe Ker, of Rock Creek, is situated on the south-east and close to Crystal butte. Development-work consists of a shaft about 9 feet deep and a tunnel 35 feet long and 15 feet lower in elevation. The bottom of the shaft could not be examined on account of water, but at the collar there is a vein of quartz about 1 foot wide containing galena, sphalerite, pyrite, and arsenopyrite that assayed a trace in gold, 3.6 oz. in silver to the ton, and 12 per cent. lead. The tunnel was driven in a zone of sheared and faulted volcanic tuffs. Displaced lenses and veins of quartz occurred throughout this zone. Surface mineralization can be traced for about 100 feet up the hill from the tunnel. Two ore-houses, 10 by 10 feet, have been built.

Rainbow. This claim is owned by Frank Carey, Herb. Nicholson, and others, of Rock Creek, and is situated due east of Crystal butte. Former development-work consists of three shafts, 12 feet, 6 feet, and 10 feet deep respectively, on a quartz vein averaging 14 inches in width. Each shaft is about 60 feet apart. The ore-minerals are chiefly pyrite with occasional segregations of galena and chalcopyrite. A sample from the deepest shaft assayed 0.04 oz. in gold, 8.5 oz. in silver to the ton, and 2 per cent. lead. This vein occurs in a stratified tuff and is typical of the "stock" variety of ore-deposit.

Sullivan, Rock Creek, Little Casie. These claims are situated to the east and on the southern toe of Crystal butte and cover a general mineralized area in the volcanic tuffs. Development-work consists of trenching, open-cuts, and shallow shafts on quartz veins and oxidized fractures containing pyrite, arsenopyrite, galena, and zinc-blende. Work up to the present time has shown the mineralized bodies to be insufficiently large to warrant building a reduction plant and not of a high enough grade to ship direct to the smelter. The locality is interesting geologically and warrants further prospecting, especially along the quartz-diorite contact.

Rock Creek.

Three attempts were made to work placer-ground on Rock creek without much success, for different reasons. F. J. Smith acquired some ground below the second road crossing and dug a 200-foot ditch at the entrance to the canyon in an endeavour to reach bed-rock in the basin

above, which had not been tested before. Owing to depth of gravel he found it impossible to carry out this work and after obtaining a few small nuggets of gold abandoned the lease.

T. E. Muir and J. S. Horagan, of Vancouver, sub-leased some ground on Rock creek from James Grant, of Bridesville, near the junction of Rock creek and Jolly Jack creek, and also half a mile below the old wagon-road crossing of Rock creek. Before the work had got well under way, according to the sub-leasers, certain disagreements with J. Grant caused them to throw up their option and quit work. The difficulty of obtaining capital for these ventures should not be forgotten by the owners of leases who cannot afford to work them themselves, and every consideration, instead of hindrance, should be given those who are willing to spend money on development. The intention of the sub-leasers was to hydraulic the benches on the upper lease near Jolly Jack creek, and on the lower one to unwater the old shaft sunk away from the creek in the early days, and retimber a tunnel which was driven in rock from the shaft under the creek. The former operators are supposed to have drilled up through bed-rock from this tunnel and have been flooded out by water. It is estimated that modern pumps could handle this water and that the virgin bed-rock could be worked. Both these leases appear to have merit and under proper conditions might be profitably worked. In any case there is an excellent opportunity to test bed-rock on the lower lease.

Le Roi and War Eagle.

These claims, situated about 1½ miles north of the main wagon-road and about half a mile east of the Camp McKinney road between the Rock Creek crossings, are owned by James Copeland *et al.*, *of* Rock Creek. A lease and bond was taken in the late autumn by the Consolidated Mining and Smelting Company, of Trail, and a diamond-drill installed. Owing to the early hard frosts and consequent freezing of the pipe-line, work was stopped temporarily.

Development-work, consisting of three shafts, 60 feet, 50 feet, and 12 feet deep respectively, as well as numerous open-cuts and stripping, has been done in an area of 100 feet square. J. Copeland and partners sunk the 50-foot shaft when the claims were first staked many years ago. The deepest shaft was sunk shortly afterwards, by a Phoenix syndicate, on the contact of the granite and tuffs, but the ore was too low grade to be mined profitably at that time. During the past few years Copeland sunk a shaft 12 feet and struck much higher-grade ore. All these shafts are within 50 feet of each other.

The surface mineralization, which is chiefly oxidized pyrrhotite and pyrite, with malachite occasionally noticeable in the fractures, occurs in a highly siliceous tuff close to its contact with the granite. At the bottom of the 12-foot shaft, which was the only one examined on account of water, a considerable amount of chalcopyrite was observed. A sample of this ore assayed 0.02 oz. in gold, 4.60 oz. in silver to the ton, and 4 per cent. copper. The general strike of the ore-body appears to be N. 20° W. (mag.), with a dip about N. 65° E., but these bearings can only be estimated owing to the surrounding ground being covered with soil. These claims are an attractive prospect, within 6 miles of the railway and close to a good wagon-road.

Imperial.

This group, consisting of the *Emeline*, *Imperial*, *Imperial No. 1*, *Badger*, *Badger No. 1*, and *Lancashire*, and situated about 3½ miles north of Rock Creek settlement, were reported upon in the 1925 Annual Report. A lease and bond was taken on this group by J. W. Clark, of Greenwood, who in turn bonded it to the Hecla Mining Company, of Idaho. The lower tunnel was driven ahead about 150 feet on the lead and an endeavour made in a small way to prospect the ore-body. A fault was struck 48 feet from the face of the drift and two crosscuts were put in, 21 and 30 feet respectively—one where the ore had faulted and the other 6 feet from the face, in a northerly direction, without picking up the ore again. Another crosscut was run to the south, according to the owners, with a similar result. Early in the autumn the option was dropped by the Hecla Company and J. W. Clark made a shipment of 250 tons of sorted ore from the lower tunnel to the smelter.

The lead, which varies from 4 to 10 feet in width, dips in the outer workings to the south-west (mag.). On approaching the fault the dip gradually changes and the lead completely turns over and plunges apparently below the level. A winze sunk on the fault will probably locate the lead again on a different horizon. Although the ore found up to the present is low grade, the situation of the claims at the railway and Kettle river, and close to electric power, seems to warrant further development in hopes of finding higher values.

GREENWOOD SECTION.

Spotted Horse.

This claim is situated within a quarter of a mile of the town of Greenwood and alongside of the Canadian Pacific Railway tracks. At the present time the property is being worked by the Silver Charm Mining and Milling Company, incorporated with head offices in the Alaska Building, Seattle, Washington. This company has rechristened the claim the *Silver Charm*. The *Spotted Horse* is a Crown-granted claim, No. 887, and will retain its name and number as long as the taxes are in good standing. Spasmodic development dates back over a period of years and, until the present company commenced operations (November 26th, 1927), amounted to two short tunnels and numerous shallow open-cuts on the lead. At the present time, when the property was examined on February 12th, 1927, No. 1 tunnel has been extended about 13 feet, or a total length of about 88 feet, and No. 2 tunnel, which is 45 feet lower (barometric), about 20 feet. A new chute has been built from the ore-sorting shed at the mouth of No. 1 tunnel down to an ore-bin which has been built on the old smelter railway-tracks. At the time of examination four men were working by hand in No. 1 tunnel. It seems to be the intention of this company to install a small air-compressor and engine, which will greatly facilitate development.

The vein, which is a true fissure varying from 4 inches to 3½ feet in width and averaging about 9 inches, consists of pyrite, galena, zinc-blende, and occasional specks of chalcopyrite in a gangue of quartz. The country-rock in the vicinity of the workings is granodiorite. The mineralization in the No. 1 tunnel vein occurs sometimes in banded form and the intimately mixed layers of galena, zinc-blende, and pyrite are separated by thin layers of quartz. In other parts of the vein each mineral appears in scattered segregations, to the exclusion of the others, which suggests different periods of mineralization. Some high assay returns obtained by the owners intimated the presence of some mineral such as tetrahedrite, argentite, or native silver. None of these minerals were observed, but on the mineralized walls of the vein a certain amount of movement had slickensided the galena in places, which gave it the appearance of tetrahedrite or grey copper to the naked eye.

The following samples taken over a period of years point to the fact that the galena found up to the present does not contain a high percentage of silver: Sample No. 1, taken from the highest open-cut in May, 1923, and consisting of nearly all galena, assayed: Gold, trace; silver, 19.20 oz. to the ton; lead, 68 per cent. Sample No. 2, taken from No. 1 tunnel at the same time and consisting of nearly all galena, assayed: Gold, 0.02 oz.; silver, 4 oz. to the ton; copper, trace; lead, 20 per cent.; zinc, 4 per cent. Sample No. 3, taken from the highest open-cut and containing indications of copper, assayed: Gold, trace; silver, 4 oz. to the ton; copper, 0.5 per cent. Sample No. 4, a general sample of the *Spotted Horse* ores, assayed: Gold, 0.04 oz.; silver, 4.6 oz. to the ton; lead, 12.5 per cent.; zinc, 3.3 per cent. Sample No. 5, taken across the vein, 12 inches wide, where the mineralization was massive at the end of No. 1 tunnel, which was 16 feet long, assayed: Gold, 0.04 oz.; silver, 4 oz. to the ton; lead, 17 per cent.; zinc, 12 per cent. Sample No. 6, taken from the dump, which is reserved for mill-feed, on February 12th, 1927, assayed: Gold, 0.01 oz.; silver, 1.4 oz. to the ton; lead, 1.95 per cent.; zinc, 0.80 per cent. Sample No. 7, representing a grab sample taken from the sorted-ore bin, which is reserved for shipping (February 12th, 1927), assayed: Gold, 0.05 oz.; silver, 4.2 oz. to the ton; lead, 5.6 per cent.; zinc, 1.4 per cent. It is quite reasonable to suggest that grab samples are not truly representative of either ore on a dump or in a bin; but it is very apparent that at least 50 per cent. of the shipping-ore is unmineralized quartz which carries practically no values. Unless this ore is very closely sorted and nothing but nearly pure galena saved, which is an extremely difficult and highly expensive operation owing to the intimate association of the different sulphides, there is but a small chance of the company receiving any financial returns from shipments to the smelter at the present time. It was impossible to estimate the probable tonnage of mill-feed on the dump owing to snow and the frozen condition of the ground. On February 12th, 1927, the shipping-bin contained about 20 tons of ore. The samples mentioned above that carried a high percentage of lead were picked especially with the idea of ascertaining the percentage of silver in the galena and therefore do not represent an average.

At the present time a stope 27 feet long has been started near the face of No. 1 tunnel and the ore mined is being sorted for shipment. The vein at this point measures about 3½ feet in width at the widest part and gradually tapers to 12 inches at the east end and 6 inches at the west end. In No. 2 tunnel the vein is about 3 inches wide, is badly crushed and displaced, and

the quartz is practically barren. The strike of the vein is in a north-westerly and south-easterly direction, with a dip varying from 50° to 10° to the north-east. On the face of the hill the vein can be traced for several hundred feet, where it pinches and swells from a fracture to about 4 feet in width and occasionally faults in the direction of its dip. The persistence of this vein, *close to transportation, power, and water, seems to warrant further exploration by this company* in hopes that it may be able to block out a sufficiently large tonnage of ore that will pay to mill. If the company would install a 2-drill compressor and drive No. 1 tunnel ahead with an upraise every 100 feet, an idea of the mine's value may be arrived at in a comparatively short space of time. By continuing to stope out and only partially sort the ore at present in sight, these future possibilities may be delayed indefinitely. No shipments of ore had been made to the smelter at the time of examination. Until the mine is developed further no reliable estimate of ore tonnage can be made.

The following is a copy of the general mine report of the Silver Charm Mining and Milling Company, Incorporated, for the year ended December 31st, 1926, by A. Franchie, mining engineer, Seattle, Wash.:—

"A total of 150 tons of rock was mined, from which 30 tons of shipping-ore was sorted and about 90 tons of milling was saved for further treatment.

"Three men were employed from November 26th, 1926, making a total of eighty man shifts.

"The upper tunnel No. 1 was driven 5 feet and squared, also a stope was started and also the main level drift, all the working showing good ore. The mine was organized and put in operating condition.

"Mine-timbers were hauled over and shops were reconditioned and powder-house built.

"Formalities and agreement with the Canadian Government, railway company, and power company, everything concerning regulations and mining laws are taken care of.

"The conditions at the mine are very favourable for fast development and large production for the year 1927 as soon as machinery is available. Arrangements will be made immediately for the shipment of the first car of ore, which is expected to bring about $120 a ton with a net return of $100. This ore is being sorted 3 to 1. About 2,000 tons of ore are blocked out, which will amount to about $60,000, conservative estimate.

"The new main drift will probably open up as much more ore and the two levels will be carried farther ahead, driving to the west. It can be expected that the future development probably will bring the tonnage to 16,000 tons or more, averaging $38.56 a ton, average mine-run.

"As soon as modern equipment is installed a car-load (50 tons) of sorted ore can be shipped every week, which will bring up about $3,000 to $5,000 per car-load.

"With modern equipment the mine shall be on a paying basis within ninety days."

The statements made in the above report by A. Franchie, the company engineer, do not agree, in any of the more particular details, with the facts found to exist on this property at the time of examination (February 12th, 1927).

Crescent.—This claim was leased by G. Duhamel and associates, of Greenwood, and a shipment of 14 tons of silver-lead ore made from the old workings, consisting of open-cuts.

Providence.—J. W. Clarke shipped about 47 tons of silver-lead-zinc ore from the dump from this mine to the Trail smelter.

Gold Pick. The development of this claim was continued during part of the year by W. Raveley and Dan McGillis. The vein on which most of the work was done, consisting of pyrite, galena, and sphalerite in a gangue of quartz, strikes S. 40° W. (mag.) and dips about 45° to the south-east (mag.). There are other similar nearly parallel veins within a radius of 50 feet on which some work was done in past years. A tunnel 50 feet above the Canadian Pacific Railway tracks was driven for 70 feet on this vein and a crosscut from the tunnel south for 18 feet. Near the mouth of the tunnel an inclined shaft 10 feet deep was sunk on a vein varying from 2 to 8 inches in width. The vein was discovered later below the railway-tracks at an elevation of about 55 feet lower than the upper tunnel. A shaft was sunk a few feet on this discovery, but the ore was generally pinched and displaced and work was discontinued until 1927.

Elkhorn Fraction. This claim, adjoining the *Providence* mine on the south-west, was bonded in the winter of 1925 by the Elkhorn Mines, Limited, of Victoria. An Ingersoll-Rand 1-drill compressor and 25-horse-power gas-engine were installed. The 70° inclined shaft was extended a distance of 60 feet, making a total depth of 137 feet, with a

70-foot crosscut from the shaft; also 90 feet of drifting and a 24-foot upraise. About 12 tons of silver-lead ore was shipped to the smelter. The vein encountered in the lower workings was spread over a wider area than usual in small veinlets, which prohibited profitable mining. A large part of the quartz was also barren of mineral. It is possible that the vein will consolidate again and the minerals become concentrated at a lower elevation, but this is not by any means certain. Owing to the topography of the valley it is necessary to sink to develop this vein on its southerly extension.

Elkhorn. This claim adjoins the *Elkhorn Fraction* to the west and is owned by Geo. White, of Greenwood. A great deal of development was done between 1904 and 1920, including a 40° inclined shaft 180 feet deep, with drifts at the 40-foot and 80-foot levels, to the north about 400 feet and the south 180 feet, and a crosscut from the north drift into the foot-wall for 100 feet. Other levels have been driven, but owing to the caved condition of the ground it was impossible to measure them accurately. Another vertical shaft has been sunk and various open-cuts excavated, all of which were either caved or filled with water. About 600 feet to the north-east and close to the boundary-line of the *Elkhorn Fraction* and *Providence* claims, a tunnel 150 feet long has been driven and a winze sunk 50 feet inside the tunnel, on a quartz vein varying from 2 to 18 inches in width. A vertical shaft, now caved, was sunk about 50 feet north-east of the mouth of this tunnel.

In the workings of the 180-foot inclined shaft practically all the ore developed above the 80-foot level has been mined, except in places where the vein pinches or has been displaced. The width of the vein, judging by the foot and hanging walls in the old stopes, varied from 2 to 16 inches in width. The ore-minerals observed are pyrite, galena, sphalerite, and argentite. The gangue is quartz. According to the owner, a dyke cut off the vein 16 feet below the 80-foot level (now filled with water), but the same formation in which the vein was formed, was discovered near the bottom of the shaft. A flat diamond-drill hole, bored from the bottom of the shaft, cut what was thought to be 18 inches of oxidized vein-matter, 35 feet distant. This was not proved by development.

The country-rocks in this area are generally described by R. W. Brock as augite porphyrites, agglomerates, and porphyritic tuffs, which are underlain by granodiorite. The vein strikes in a general north-easterly and south-westerly direction and dips from 35° to 45° to the south-east. A sample taken from a 4-inch vein on the 80-foot level assayed 0.04 oz. in gold, 13 oz. in silver to the ton, and 4 per cent. lead. A 6-inch sample of the vein taken from the north side of the 40-foot level assayed 0.10 oz. in gold, 40.6 oz. in silver to the ton, and no lead. In the workings located to the north-east of the main shaft the quartz vein is persistent, but generally low grade, with segregations of galena, pyrite, and zinc-blende. The ore shipments made from the *Elkhorn* mine were as follows:—

Year.	Men below.	Men above.	Tons.	Gold.	Silver.	Lead.
				Oz.	Oz.	Lb.
1905	4	2	9	4	902	1,803
1906	6	1	26	9	1,056	523
1907	1	....	21	8	1,786	430
1911	1	1	24	13	3,720	10,301
1912	....	....	17	90	.....	.....
1917	2	....	8	2	276	.....
	....	....	105	126	7,740	13,057

D.A. Fraction and E.C.B. The crosscut tunnel has been driven on the *D.A. Fraction* a total distance of about 475 feet at an elevation of 125 feet (barometric) below the top of the hill. Two mineralized zones were cut, one at a distance of 135 feet from the portal of the tunnel and the other at 445 feet. Two short drifts on each side of the crosscut were driven on the first zone without finding any attractive mineralization. On the second zone, which is on the contact of the granodiorite and volcanic tuffs and probably the downward extension of the ore-body found in a vertical shaft above, an upraise was driven for 30 feet without discovering any valuable ore. On the *E.C.B.* claim narrow quartz veins con-

sisting of galena, sphalerite, and pyrite were traced on the surface for 200 feet, but insufficient work has been done to prove their value. These veins occur in the granodiorite.

The original owners were J. Graham and J. Skilton, of Greenwood. Recently a company has been incorporated. This claim was mentioned in the Annual Report for 1925.

Brooklyn and Surprise No. 3. This old mine, situated in the Phoenix camp, is now owned by R. Forshaw, of Greenwood. A shipment of 25 tons of sorted ore from the old stopes, containing pyrite and chalcopyrite, was made to the smelter. Another shipment of 7 tons of similar ore was taken from the *Surprise No. 3* in the Skylark camp and mixed with the *Brooklyn* ore, making a total of 31 tons.

Jewel. Geo. White and associates, of Greenwood, have been working in an old shaft at the north end of the *Jewel* mine lead and have discovered bunches of high-grade ore about 20 feet below the surface. The lead, according to the owners, varies from 5 to 7 feet in width and looks like fairly good milling-ore. Two samples of the high grade assayed 6.96 oz. in gold and 45.6 oz. in silver to the ton and 9.66 oz. in gold and 52.1 oz. in silver to the ton. A shipment of cleanings from the mill and sorted ore from the waste-dump amounting to 58 tons was made to the smelter.

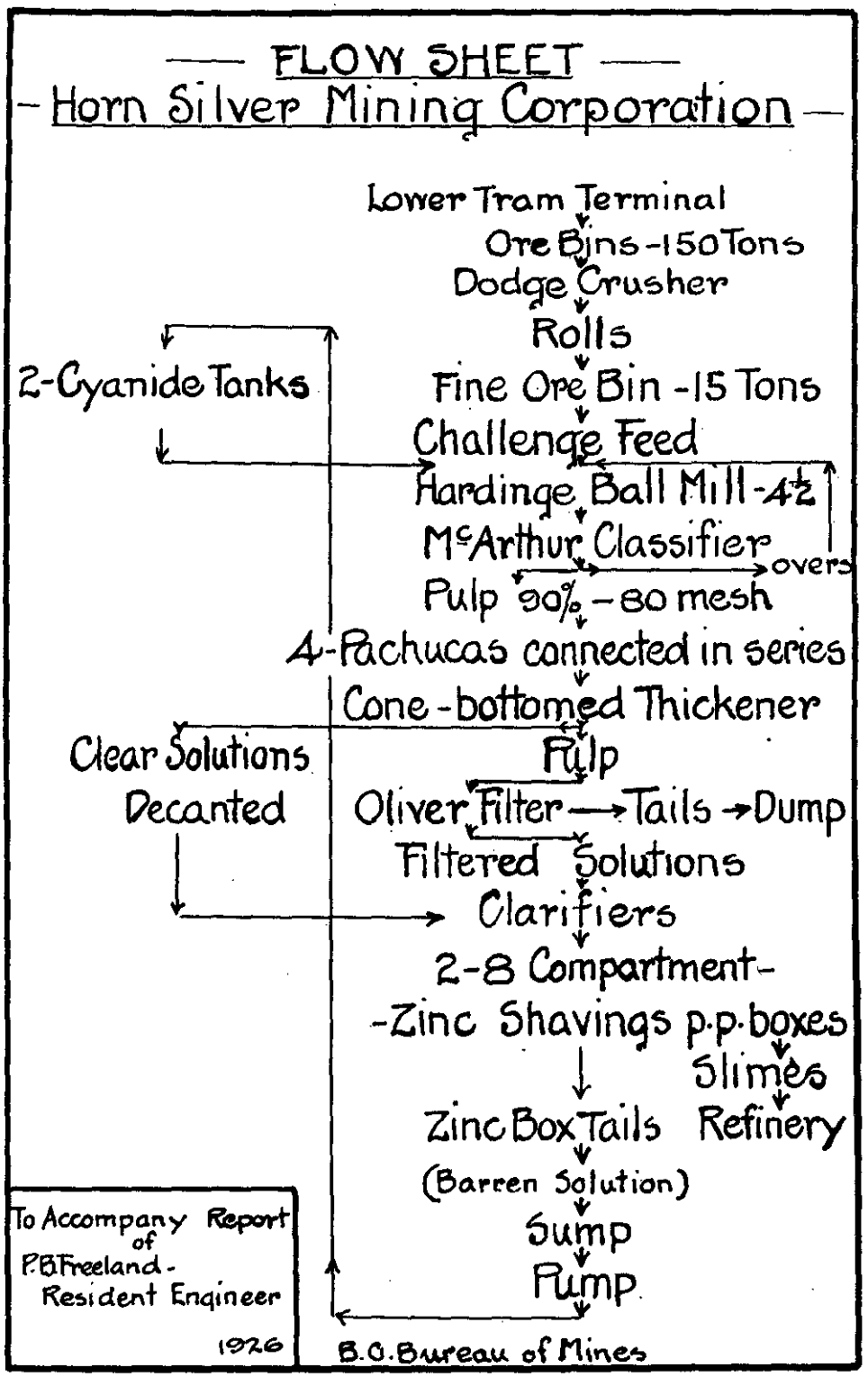
OSOYOOS MINING DIVISION.

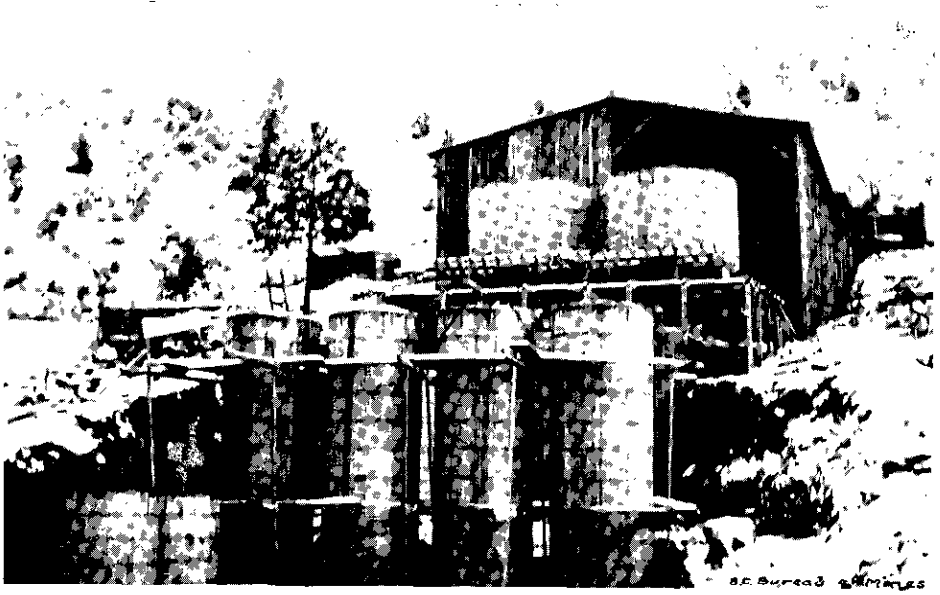
Horn Silver Mining Corporation. This company continued its operations on the *Horn Silver* group of claims, 6 miles from Similkameen Station, during the greater part of the year. Owing to unforeseen difficulties the mill was not completed until late in the spring and actual production was delayed until about June 1st. A flow-sheet of the crushing and cyanide plant is attached to this report. The capacity of this plant is estimated to be about 22 tons every twenty-four hours, but owing to a shortage in power the crushing plant had to be shut down for eight hours during the twenty-four, so that sufficient compressed air could be supplied to run the machine-drills in the mine. A great deal of trouble occurred in the mill, due, chiefly, to a second-hand Oliver filter which did not function properly and was consequently responsible for the low tonnage, a loss of time, and of values in the tailings. This defective machine has been partially reconstructed and will probably operate successfully in future. A total of 668 tons of ore was milled between June 1st and September 30th. The average consumption a ton of dry ore in the mill was as follows: Cyanide, 3.5 lb.; lime, 6 lb.; zinc, 1 lb.

A new ⅝-inch cable 5,000 feet long, carrying twenty-four wooden buckets, was installed between the mine and the mill. The capacity of each bucket is about 155 lb. A new 2½-inch pipe-line was also connected up between the mine and the compressor plant. A total of 582 feet of drifting, upraising, and sinking constituted the mine-development up to September 30th.

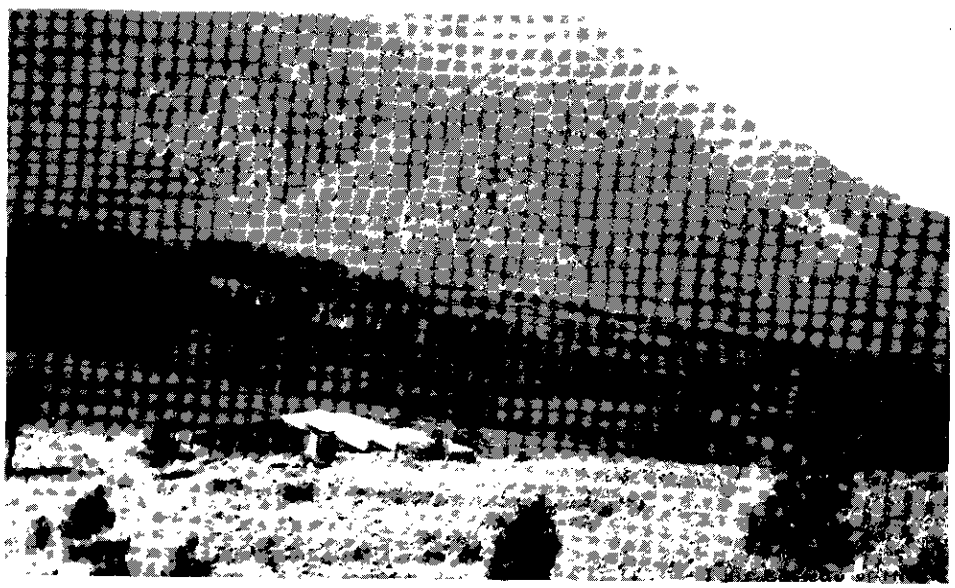
Owing to the shortage of power it was found impossible to carry on any extensive development programme and very little virgin ground was explored. On the east side of the mine, in the north drift, some very high-grade silver ore was found, but owing to the extremely flat dip of the vein stoping operations were naturally expensive. On the west side the vein was generally oxidized and the silver values varied considerably. Some good milling-ore, averaging about 30 oz. to the ton in silver, was found in a winze at the end of the east crosscut. The vein at that point has a dip of about 40° and apparently conforms to the slope of the ravine. The width of the vein in the mine has varied from time to time from 2 inches to 5 feet, and contains argentite, native silver, gold, galena, sphalerite, pyrite, and a trace of chalcopyrite in a gangue of quartz.

Operations ceased in the early winter and the company, it is understood, is contemplating additional financing. To operate this mine successfully it is absolutely necessary to install another power unit to supply compressed air for development, and it is also necessary to keep the mill running at full capacity during the twenty-four hours. If sufficient ore of an average grade of 25 oz. in silver to the ton can be developed in the mine to supply the mill with 22 tons, or to full capacity, in twenty-four hours, a good margin of profit may be assured under economic management and a continued price of silver at 55 cents an ounce. There is no doubt, providing the Oliver filter will function, that a high percentage of extraction can be maintained in the mill. The driving of the lowest west tunnel may be suggested as an economical way to exploit that section of the vein developed in the present west tunnel and in the winze on the east side.


FLOW SHEET
Horn Silver Mining Corporation
Lower Tram Terminal
Ore Bins - 150 Tons
Dodge Crusher
Rolls
Fine Ore Bin - 15 Tons
Challenge Feed
Hardinge Ball Mill - 4½
McArthur Classifier
overs
Pulp 90% - 80 mesh
4-Pachucas connected in series
Cone-bottomed Thickener
Pulp
Oliver Filter → Tails → Dump
Filtered Solutions
Clarifiers
2-8 Compartment-
-Zinc Shavings p.p. boxes
Slimes
Zinc Box Tails
Refinery
(Barren Solution)
Sump
Pump
2-Cyanide Tanks
Clear Solutions Decanted
To Accompany Report of P.B. Freeland - Resident Engineer 1926
B.C. Bureau of Mines



Horn Silver Mining Corporation—New Plant.



Horn Silver Mining Corporation—New Mill.

The continuation of the north tunnel on the east side with upraises every 50 feet to the vein may also be recommended. This mine has been referred to in the Annual Reports for 1919, 1920, 1921, 1923, and 1925.

Duffy. This group, situated close to the town of Hedley, consists of the *Midnight Sun, Union Fraction, Canadian Bell, Northern Light Fraction, Lions Paw, Copper World Fraction, Lorenia,* and *Reno* claims. The owners are J. D. Brass, R. E. Baxter, J. Robinson, of Hedley, and J. R. Campbell, of Keremeos. These claims lie to the north-west of the Hedley Gold Mining Company's claims and beyond the Bradshaw fault. (*See* map in Camsell's Memoir No. 2, G.S.C.) The local geology, described by Chas. Camsell in his Memoir No. 2, G.S.C., "Geology and Ore Deposits of the Hedley Mining District," page 42, is as follows:—

"The oldest rocks of the Hedley area are sedimentary rocks, presumably of Carboniferous age, and correlated with the Cache Creek group of Dawson's Kamloops map-sheet. These are the only consolidated sediments in the area, and they include, besides the true sedimentary rocks, a great thickness of contemporaneous volcanic materials, generally of explosive volcanic origin. They have been tilted in a general direction toward the west and they now dip at angles varying from 15° to 90°.

"Eruptive rocks have been intruded through these rocks in the following order: (1) Quartz diorite and gabbro; (2) granodiorite. These igneous rocks have been accompanied or followed by many dykes of different compositions, porphyrites, lamprophyres, andesites, and rhyolites.

"The last and most recent group of rocks in the sequence are the unconsolidated deposits of sand, gravel, and silt, of glacial and post-glacial origin, which are generally found lying as a thin mantle over the older rocks or forming the floors of the valleys.

"*Table of Formations.*

"In the accompanying table the different geological formations are arranged in descending order, according to age, and it includes the igneous as well as the sedimentary bodies.

"Quaternary—Stream deposits and glacial drift.
Tertiary—Granodiorite.
Mesozoic—Diorite and gabbro.
Carboniferous—Cache Creek group.
(4.) Aberdeen formation.
(3.) Red Mountain formation.
(2.) Nickel Plate formation.
(1.) Redtop formation."

Development-work consists of open-cuts, short tunnels, and shallow shafts, most of which has been done on the *Copper World* and *Reno* claims. As this work was done many years ago, the workings were in many instances caved and in some cases impossible to locate owing to slides from the steep mountain-sides having filled them in. Several samples were taken from the workings with an idea of obtaining an average of the ore developed. The assay results are as follows:—

Description.	Gold.	Silver.	Copper.
	Oz. per Ton.	Oz. per Ton.	Per Cent.
Reno, 20-foot tunnel, 6-foot sample right side	0.05	0.15	0.46
Reno, 20-foot tunnel, 8-foot sample across face and right side	0.05	Trace	Trace
Reno, big slide	0.02	Trace	0.68
Reno, pyrrhotite from big slide	0.05	Trace	0.33
Copper World, 5-foot tunnel on bluff	0.23	1.09	1.16

Other samples carried a trace in gold, silver, and copper. These samples were not assayed for arsenic.

According to the owners some high assay returns had been received in the past, and possibly these may have been the results of picked specimens rather than average samples. There is without doubt a great deal of mineralization throughout the limestones in several localities on the claims, but further work and higher-grade ore will have to be found before outside capital can be interested. The location of these claims on the Hedley Creek slope is ideal for operation.

Kingston. This group lies within a few hundred feet to the south-east of the *Duffy* group and comprises the following claims: *Kingston*, *Metropolitan*, *War Horse*, *Grand View Fraction*, and *King Fraction*. These claims were described in detail by Chas. Camsell, of the Geological Survey, in 1910 and it will be unnecessary to repeat his report here. Only a small amount of development-work has been done since this report was published and no discoveries of importance have been made.

Samples taken from the *Metropolitan* underground workings assayed as follows: 2½ feet of oxidized material on hanging-wall of the upper tunnel, 0.17 oz. gold and a trace of silver to the ton; 6½ feet of sulphide ore (arsenopyrite) next to the hanging-wall, 0.42 oz. gold and 0.08 oz. silver to the ton; 3 feet of oxidized material on foot-wall, 0.42 oz. gold and a trace of silver to the ton; special high-grade streak in lower tunnel, 1 oz. gold and 0.12 oz. silver to the ton. A sample taken over 5 feet in the inclined shaft on the *Kingston* assayed: Gold, 0.10 oz.; silver, 0.78 oz. to the ton; copper, 2.64 per cent. Samples taken from the upper tunnels on the *Kingston* assayed a trace in gold and silver.

The sample of ore, mineralized chiefly with arsenopyrite, from the *Metropolitan* was taken across the widest part of the deposit. Drifts have been driven both ways from the centre of this ore-body and the mineral-zone gradually diminishes in size and has a total length on the strike of about 21 feet. No commercial walls were discovered and the sulphides gradually decreasing were replaced by silicates. In the tunnel below only narrow stringers representing this ore-shoot were in evidence. It is possible that a continuation of this zone may be found above the upper tunnel. The difference in elevation between the lower and upper tunnel is 35 feet (barometric).

The country-rock in which the ore occurs is limestone which has been invaded by quartz diorite, gabbro, diorite porphyry, and granodiorite. On the *Kingston* the sedimentary rocks belong to the upper portion of the Nickel Plate formation and consist of beds of limestone which are intermingled with quartzite and tuffs. Most of these beds have been highly altered by intrusive rocks and generally consist of garnet, epidote, and lime silicates. The sedimentaries are invaded by quartz diorite, granodiorite, diorite porphyries, and gabbro dykes.

There are two types of deposits on the *Kingston*, one principally made up of chalcopyrite and pyrite and the other arsenopyrite containing gold. Most of the work has been done on the *Kingston*. The shaft, 35 feet deep at the portal of a tunnel 22 feet in length above the cabin, is highly mineralized with chalcopyrite, pyrite, and occasional segregations of arsenopyrite. A sample taken over 5 feet of this material (*see* above) was sufficiently attractive to warrant more work being done. It was impossible to examine the bottom of the shaft owing to water, but if this body of ore extends on the dip of the sedimentaries a considerable tonnage of concentrating-ore may be developed.

Other tunnels driven 45 feet higher up the hill developed segregations of arsenopyrite. Two general samples taken from different locations in this tunnel carried a trace in gold and silver to the ton. Much higher assays have been obtained from the oxidized material on the surface. The *War Horse*, which adjoins the *Kingston*, was not examined, but according to Chas. Camsell's report about 200 feet of tunnelling and much surface work has been done. The ore is chiefly chalcopyrite.

Future operators on this group should bear in mind the fact that the ore-bodies on Nickel Plate mountain swell and pinch and are lenticular in shape laterally, which is characteristic of these types of deposits in limestone, and consequently larger bodies may be developed from mineralized fractures.

Peggy. This group, consisting of the *Peggy*, *Hobo*, *Jumbo*, *Tipperary*, *War Eagle*, *Whirlwind*, and *Cyclone* claims, is situated on the divide between Hedley creek and the Similkameen river, about 1½ miles north-west of Hedley. An option was taken on the group by the Consolidated Mining and Smelting Company and a considerable amount of diamond-drilling done. The results of this exploration-work have not been published and the company has not done any further development up to the present time.

Hedley Gold Mining Co.—This company operated its *Nickel Plate* property during the greater part of the year and a total of 49,656 tons was mined and milled. An intensive geological survey was made over the mine area with the idea of locating favourable places for diamond-drilling.

Nelson. This claim, owned by James McNulty, of Hedley, and situated on Independence mountain about 7 miles from Hedley, has been leased and bonded by the Hedley Gold Mining Company. Very little development-work was done owing

to the lateness of the season when the option was taken. This claim has been reported upon in the Annual Reports for 1923, 1924, and 1925.

Daisy. This claim, owned by J. Bouden *et al.*, of Similkameen, is situated about 6 miles below Similkameen Station on the Great Northern Railway and on the west side of the river. Development-work consists of numerous open-cuts and stripping and two tunnels, one 30 feet and the other 10 feet in length, with a difference in elevation of about 18 feet. The vein varies from 1 to 6 inches in width and is mineralized with pyrite, chalcopyrite, tetrahedrite, and argentite in a gangue of quartz. A sample from 6 inches of the vein at the end of the 30-foot tunnel assayed: Gold, 0.04 oz.; silver, 185 oz. to the ton; copper, 3 per cent. The vein strikes about S. 50° W. (mag.) and varies in dip from the horizontal to 45° north-west.

To the south of the 30-foot tunnel for 300 feet the vein has been step-faulted and considerably fractured. Pyrite is the predominating mineral in this direction, with occasional segregations of chalcopyrite and films of tetrahedrite in the fault-planes. It is possible that the mineral tetrahedrite is of secondary origin in the fractured zones to the south of the main workings, although its primary origin is assured in the 30-foot tunnel and below that elevation.

Further development seems justified on account of the silver values in the ore in the face of the upper tunnel and the continuation of the 10-foot drift may be recommended. The situation of this claim close to the wagon-road, the Similkameen river, and within 4 miles of Chopaka Station on the Great Northern Railway makes it an attractive prospect for small capital interests.

Gypo and Ballarat. These claims, owned by Oliver interests, are situated about 1 mile north of the town of Oliver, on the west side of the wagon-road. A lease and bond was taken on the group by the Consolidated Mining and Smelting Company, of Trail, and a shipment of 254 tons made to the smelter, chiefly for fluxing purposes. A considerable amount of diamond-drilling was done and a tunnel about 40 feet long driven across the vein, as well as other development-work. The lead varies from a few inches to about 20 feet and contains pyrite, marcasite, and infrequent specks of galena and chalcopyrite in a gangue of quartz and gneiss. Owing to the low and spotty values in the areas explored, work was discontinued in the autumn of 1926.

White Lake Basin.

Southern Okanagan Collieries, Ltd.—Development-work was carried on spasmodically throughout the year on two seams of coal varying from 3 to 4 feet in width. Owing to the presence of pyrite and "bone" in both tunnels it was considered necessary to construct a washing plant to clean the coal before shipment. At the time of examination some of the machinery had been purchased, second-hand, and was ready for installation but not housed. Concrete foundations were also laid and camp accommodations built. The presence of "bone" is considered by the operators to be a surface condition, owing to the irregularity of the impurities in the seams and the shallowness of the present workings.

The erection of a temporary washing plant was thought necessary to enable the company to ship coal, which would help to finance further operations. If the money spent on shallow development and surface plant had been used for sinking a prospect-shaft a more comprehensive idea of conditions at depth might now be known, and also some tonnage of coal blocked out, which would enable those interested to offer some tangible asset to capital. The details of this property, including coal analyses, are referred to in the 1920 and 1922 Annual Reports.

SIMILKAMEEN MINING DIVISION.

Granby Consolidated Mining, Smelting, and Power Co. (Allenby Copper Co.).

On October 1st, 1926, the Allenby Copper Company was merged with the Granby Consolidated Mining, Smelting, and Power Company and is now known by the latter name. Since operations at Copper mountain and Allenby seem to be fairly well established and successful, a history of development, which has been spread over many years, is condensed here.

History.—The British Columbia Copper Company, of Greenwood, did the first substantial development-work on Copper Mountain properties in 1905 and then dropped its option. The reason for this was due to the then complex problem of smelting direct ores that contained a

high percentage of alumina. The same company took another option on these claims and on Voigt's claims in 1911 and developed the properties by means of diamond-drilling, open-cuts, trenching, tunnels, and shallow shafts. This option was again dropped and another one obtained by the same company on the Copper Mountain properties in 1912, and development-work continued from that date until December, 1920.

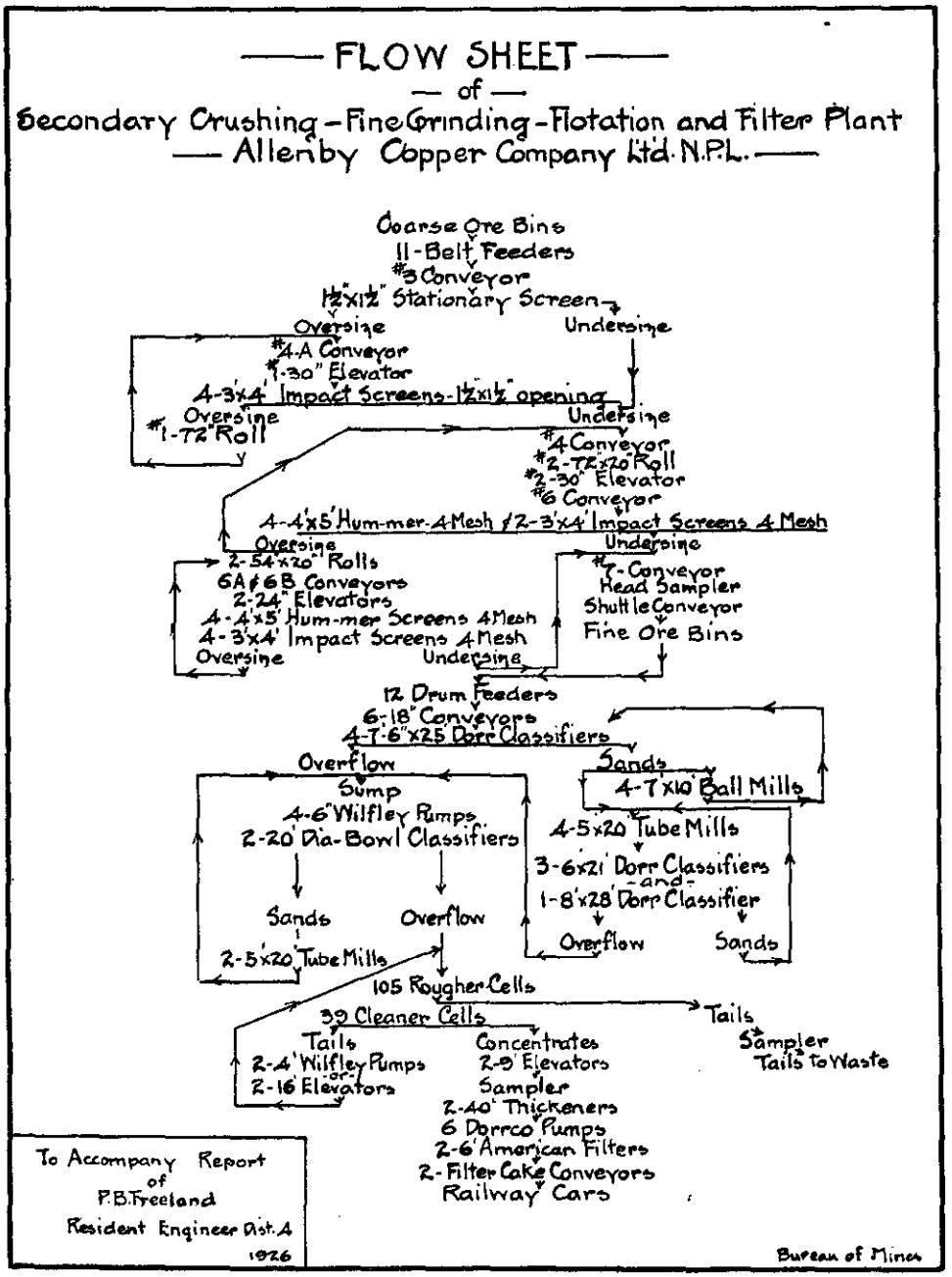
On account of the necessary high expenditures in developing and purchase of the Copper Mountain properties and the exhaustion of the ore-bodies at Greenwood during these years, the British Columbia Copper Company found it necessary to refinance. The result was the forming of a new company called the Canada Copper Corporation, which controlled and financed the older organization. In 1916 a temporary 500-horse-power steam-electric plant was built at Princeton and a 14-mile power-line erected to Copper mountain to facilitate operations. Up to the end of 1917, 114,819 feet of diamond-drilling, 14,798 feet of tunnelling, 90 per cent. of which was 9- by 10-foot tunnels, 6,056 feet of upraising, 641 feet of sinking, and 25,084 feet of surface-trenching was done on the Copper Mountain property alone, with a total expenditure of $1,250,000. Besides analyses on all the diamond-drill cores in ore, test-holes were made with stopers every few feet and the cuttings analysed.

By the end of 1919 the concentration plant at Allenby was practically completed, but active operations were delayed on account of a strike amongst the employees on the railway being built between Princeton and Copper mountain. Much development-work was done at the mine during 1918 and 1919 and everything was in readiness for operation except the primary crushing plant, which awaited the completion of the railway. Electric power was supplied by the West Kootenay Power Company on October 19th, 1920, and both mining and milling commenced shortly afterwards. In December, 1920, the mine and mill closed down on account of being unable to operate when copper was 13 cents a pound. An average of the general analyses of the ores taken from the mine at that time is as follows: Copper, 1.77 per cent.; silica, 50 per cent.; iron, 5.8 per cent.; lime, 9.1 per cent.; sulphur, 1.1 per cent.; alumina, 19.9 per cent.; gold, 0.005 oz.; silver, 0.20 oz.

During 1921 and 1922 the mine and mill remained inactive and the old Canada Copper Corporation was absorbed by the Allenby Copper Company in the interests of the Granby Company. In 1923 a certain amount of work was done on the railway between Princeton and Copper mountain and a force of men employed at the mine and mill preparatory to active operations. The new company discovered that alterations in the mill would take longer to finish and needed a greater monetary outlay than was at first estimated; consequently production was again delayed. The price of copper declined to such an extent in 1924 that nothing of interest took place. Early in the year 1925 the company, under the general managership of Charles Bocking and H. C. Smith as resident manager, remodelled part of the mill and during the latter part of August commenced operations of an experimental nature which required minor changes in the mill flow-sheet from time to time.

Mill.—In 1926 the mill was gradually brought to full capacity and the flow-sheet attached to this report is more or less fixed. Several major changes have been made in the mill since it was first built, such as a separate department for the crushing plant, the addition of one 72- by 20-inch roll, Bowl classifiers, and Dorr classifiers. The primary crushing plant below the mine now consists of a 400-ton coarse storage-bin, one 30- by 42-inch Farrell-Bacon crusher, two 10-inch fine reduction 1½-inch size gyratory crushers, a Trapper conveyor, and a 2,000-ton fine storage-bin.

Shortly after bringing the mill up to full capacity some trouble was experienced in retaining the tailings in the reservoirs below the plant and the overflow contaminated the waters of the Similkameen river to a small extent, causing some inconveniences locally. To remedy this trouble the company purchased what is known as Hitchins flat, between Allenby and Princeton, which has an area of approximately 76 acres and a capacity of about 10,000,000 tons of tailings. A flume 24 inches wide by 12 inches high has been built on a 2-per-cent. grade between the mill and the tailings-pond. At the north end of Hitchins flat a dam 600 feet long, with a maximum height of 40 feet and 30 feet wide on top, is being constructed of earth with a core wall 6 feet wide built of 2- by 8-inch and 2- by 6-inch timber and filled with puddled clay and sand. There will be a 30-foot-wide spillway and a flume to carry off the overflow when the pond is filled, which will probably be some years hence. At the present time two Akens classifiers taken from the mill are being used for building dams on the old reservoir-site and probably three more of


FLOW SHEET
— of —
Secondary Crushing - Fine Grinding - Flotation and Filter Plant
— Allenby Copper Company Ltd. N.P.L. —
Coarse Ore Bins
11 - Belt Feeders
#3 Conveyor
1½"x1½" Stationary Screen
Oversize
Undersize
#4-A Conveyor
#1-30" Elevator
4-3'x4' Impact Screens-1½"x1½" opening
Oversize
#1-72" Roll
Undersize
#4 Conveyor
#2-72"x20" Roll
#2-30" Elevator
#6 Conveyor
4-4'x5' Hum-mer-4 Mesh / 2-3'x4' Impact Screens 4 Mesh
Oversize
Undersize
2-54"x20" Rolls
6A & 6B Conveyors
2-24" Elevators
4-4'x5' Hum-mer Screens 4 Mesh
4-3'x4' Impact Screens 4 Mesh
Oversize
Undersize
#7-Conveyor
Head Sampler
Shuttle Conveyor
Fine Ore Bins
12 Drum Feeders
6-18" Conveyors
4-7'-6"x25 Dorr Classifiers
Overflow
Sands
4-7'x10' Ball Mills
Sump
4-6" Wilfley Pumps
2-20' Dia-Bowl Classifiers
4-5'x20' Tube Mills
3-6'x21' Dorr Classifiers
-and-
1-8'x28' Dorr Classifier
Sands
Overflow
Overflow
Sands
2-5'x20' Tube Mills
105 Rougher Cells
39 Cleaner Cells
Tails
Tails
Sampler
Tails to Waste
2-4" Wilfley Pumps
-or-
2-16" Elevators
Concentrates
2-8" Elevators
Sampler
2-40' Thickeners
6 Dorrco Pumps
2-6' American Filters
2-Filter Cake Conveyors
Railway Cars
To Accompany Report
of
P.B. Freeland
Resident Engineer Dist. 4
1926
Bureau of Mines

these machines will be used for this purpose. This scheme, although somewhat slow, is giving excellent results and the coarser material in the tailings from the mill, which is separated by these machines, packs very closely and makes a water-tight dam.

Some of the dwelling-houses at Allenby were painted, which gives a more prosperous appearance to the surroundings. The company store and mess-house has been rented and is being managed by Al. Armstrom. There are at present fifty-four dwelling-houses and 138 employees at Allenby. Water is supplied to the mill and town by a pumping system installed on the Similkameen river 600 feet below, with a capacity of 850 gallons a minute. A total of 669,000 tons of ore was milled during 1926 and the concentrates shipped to the Trail smelter.

Mine.—Fifty per cent. of the ore mined at the Copper Mountain properties was taken during the summer months from three major glory-holes. Owing to an overburden from 1 to 4 feet in depth it was found necessary to strip the surface before commencing to mine. This work was done partly by a drag-line scraper attached to a small hoist and partly by horses and scraper and with shovels. Some difficulty was experienced when mining one of the glory-holes owing to disintegrated offshoots from the quartz-porphyry dykes which invade the area; and it was found impossible to blast without breaking down a considerable quantity of dyke-rock, which lowered the grade of ore. No definite plan, it is understood, has been worked out to correct this trouble, but it seems probable that sorting-belts may be used and the quartz-porphyry dyke-rock, which is light brown in colour, rejected. During the winter months, when the snow is deep, practically all mining is carried on underground.

The ore from the glory-holes, No. 1 tunnel (elevation 4,073 feet) and above No. 2 tunnel (elevation 3,945 feet), is dumped into a zigzag ore-pass which connects No. 2 tunnel with the present bottom level (3,170 feet elevation). At the bottom of the ore-pass a large storage-pocket has been excavated. Westinghouse 7½-ton electric motors, attached to 7½-ton Granby-type ore-cars, haul this ore to the primary crushing plant at the end of the railway. It is the intention of the management, later, to run two or three levels between the 3,170-foot and the 3,945-foot to facilitate mining the ore developed in that area. Development is being carried on continuously and a diamond-drill is being used for exploration. A surface tram 6 by 8 feet, attached to a ¾-inch cable and operated with a hoist, has been constructed between the 3,170-foot and the 3,945-foot level to haul up supplies and men brought in by the train from Princeton. There are three Rand compressors used at the mine—one of 4,000 cubic feet capacity, one 2,500 cubic feet, and one 1,000 cubic feet; all of which are driven by electric motors. The types of rock-drills used at present are the Waugh, Ingersoll-Rand R. 72, and Chicago Pneumatic No. 5. A Gould triplex pump is installed on the Similkameen river, having a capacity of 100 gallons a minute under 800 lb. pressure and a total lift of 1,700 feet, to supply the mine and town with water. Coal fuel is used for the auxiliary plant, which generates steam-heat for the offices, plant, etc., at the mine. There are forty-four dwelling-houses and bunk-houses to accommodate 218 employees. The store has been rented and is being managed by Wagenhauser & Co., of Princeton. The mess is conducted by the company at the present time. The West Kootenay Power Company, of Bonnington Falls, supplies the mine and mill sub-stations with a 60,000-volt electric current which is transformed into 2,200, 440, and 110 volts. A total of 665,508 tons of ore was mined and shipped to the mill at Allenby by two ore-trains a day during 1926. The geology of the Copper Mountain mines and Voigt's camp was surveyed by Victor Dolmage, Chief of the Geological Survey at Vancouver, and his report upon this area is looked forward to with interest.

Princeton Mining and Development Co.

This company's property, situated 4 miles east of Princeton, has been reported upon in the Annual Reports for 1922, 1923, 1924, and 1925. During 1926 the upraise from No. 3 tunnel has been extended a total distance of 150 feet on an incline. Variable quantities of ore from 2 to 12 inches in width have been developed for 60 feet in this upraise. This ore pinches and swells and consequently it is difficult to estimate probable tonnage until more work has been done. A picked sample of the ore containing some tetrahedrite from this upraise, taken by the owners, assayed: Gold, 0.06 oz.; silver, 12 oz. to the ton; copper, 30 per cent. An average of the ore will probably be very much lower. In the No. 3 tunnel, which has been driven about 900 feet from the portal, ore has also been encountered. The vein material is about 2 feet wide and contains variable quantities of ore from 1 to 8 inches in width. A contract to drive 150 feet of tunnel on No. 2 level was given to J. Carlson, of Princeton, in October. This work is an extension

of the tunnel driven in former years, and for 30 feet the drift remained in ledge-matter, containing variable quantities of ore. At this point the quartz-porphyry dyke encountered in No. 3 tunnel was struck and crosscut for about 90 feet. At the end of the year a small amount of copper carbonates was noticeable in the fractures of the dyke-rock in the face of the tunnel and it seems probable that only a short distance ahead the lead will again be picked up in the andesite. The face of the upraise from No. 3 tunnel is about 200 feet ahead of and farther south from the face of No. 2 tunnel.

Assertions were made and assay certificates produced by one of the stockholders in this company, showing that some samples taken from this property had been assayed and that high values in the platinum group of metals had been discovered. In the presence of the manager, Fred Foster, duplicate samples were taken from the same places as those mentioned above and no platinum or palladium was found. This ore, chiefly chalcopyrite, tetrahedrite, malachite, and azurite in a gangue of quartz and siderite, is not associated or in contact with any of the known platinum-bearing rocks.

Development-work from time to time has uncovered some high-grade chalcopyrite and tetrahedrite, both on the surface, in the No. 3 tunnel and in the upraise from the No. 3 tunnel. The difference in elevation between the surface showings and the No. 3 level is approximately 1,100 feet. The width of the lead varies from 2 inches to 10 feet, but the high-grade ore has seldom been found over 1 foot in width and as far as development has gone the average width is much lower. In the No. 2 tunnel, which is approximately 160 feet higher than No. 3, the ore, which is chiefly carbonates of copper with nodules of chalcopyrite and tetrahedrite, is shot through the lead, which varies from 6 inches to 10 feet in width. This ore might be advantageously sorted and shipped, but the first 50 feet cannot be estimated as mill-feed for an oil-flotation plant on account of the high copper-carbonate contents.

The continuous indications of copper on the surface of this claim, except where the quartz-porphyry dykes cut the andesite, makes it an attractive prospect. It is possible that wider lenses or shear-zones containing high-grade copper minerals may be found, and with that end in view further development-work seems justified.

Voigt's Camp.

A large group of claims situated on Copper mountain and lying to the north of the Granby Company's holdings has been owned by Emil Voigt for many years. A lot of development-work has been done from time to time on some of the claims which has uncovered several mineralized bodies containing copper and gold. In the late winter of 1926 the Consolidated Mining and Smelting Company, of Trail, put a crew of men to work fixing up the camp, and, it is understood, a diamond-drilling campaign will be carried on during 1927.

Summit Camp, Tulameen.

This camp has been described at different times in past Annual Reports and the various properties reported upon according to their merit. For the first time since the camp was discovered there seems to be a sufficient amount of capital available to prove absolutely whether or not some of the ore-bodies discovered are large enough or valuable enough to make paying mines.

History.

A short history of events pertaining to mining operations at Summit camp have been furnished by the management and are related forthwith. Chas. Connelly was supposed to have staked the first claim, now called the *Eureka*, in 1894. In 1895 Fred Sutter discovered other outcrops of ore about 2 miles away and in 1896 F. Sutter and John Amberty staked the *Vigo*, *Lulu*, *Sutter*, and *Skyline* claims for Indiana capital. In 1906 A. Jensen staked the *Silver Chief*, or what is now known as the *Mary E.*

In 1909 or 1910 Wm. Dornberg formed a company called the Treasure Mountain Mining Company, of Spokane, Wash., with a capitalization of 1,000,000 shares at $1 each. Most of these shares were sold for about 5 cents each. Work commenced in 1910 and the upper tunnel was driven. Later, the lower tunnel, 400 feet below, was driven, and work ceased about 1912. From that time until 1915 nothing but assessment-work was done. Later, when no more money was available, the claims were restaked and in 1922-23 W. Dornberg and C. Loeb financed some

developments in the lower tunnel. In 1925 a new company was formed at Bellingham, Wash., called the Mary E. Mining Company, with a capitalization of 2,000,000 shares, some of which were sold from 1½ to 25 cents a share. This company was still operating when arrangements were made between W. Dornberg and C. C. Julian, of Los Angeles, Cal., in 1926 to take over the interests of the company. The stockholders of the Mary E. Mining Company were given an opportunity, it is understood, to participate in the C. C. Julian Company or to sell their holdings at some profit to that company. Arrangements were also made to take over the holdings of the Capital Mining Company, owning the *Blue Bell* in the same camp.

Transportation.

The railway-line from Princeton to Tulameen and beyond was built between 1908 and 1912, which opened up rail transportation between Vancouver and Tulameen and the United States and Tulameen via Oroville, Wash. Shortly afterwards 6 miles of wagon-road was built from Tulameen up the Tulameen river. From that point a good pack-trail traversed the west bank of the river to Summit camp. Another trail also crosses the Coquihalla range from Jessica Siding to Summit camp, a distance of about 10 miles, but this trail is too steep for practical use.

During 1925 and part of 1926 the Mary E. Mining Company built about 16 miles of wagon-road between the end of the old road (6 miles from Tulameen) and Summit camp. A further 1¾ miles was built, it is understood, to the *Blue Bell* claim by the Capital Mining Company. The Provincial Government assisted the building of the 16 miles of road to the extent of $8,500 and the loan of some equipment. The total cost of the road, including bridges, is not to hand, but it probably cost in the neighbourhood of $2,000 a mile. This road is narrow and crooked but the gradients are fairly low.

Present Company.

The Julian Merger Mines, Incorporated, with head office at 634 South Spring Street, Los Angeles, Cal., is capitalized for 15,000,000 non-assessable shares of a par value of $1 a share. This mother company owns control of the Cascade Consolidated Silver Mining Company (Mary E. Mining Company) and the Blue Bell Silver Mine (Capital Mining Company) at Summit camp, Tulameen.

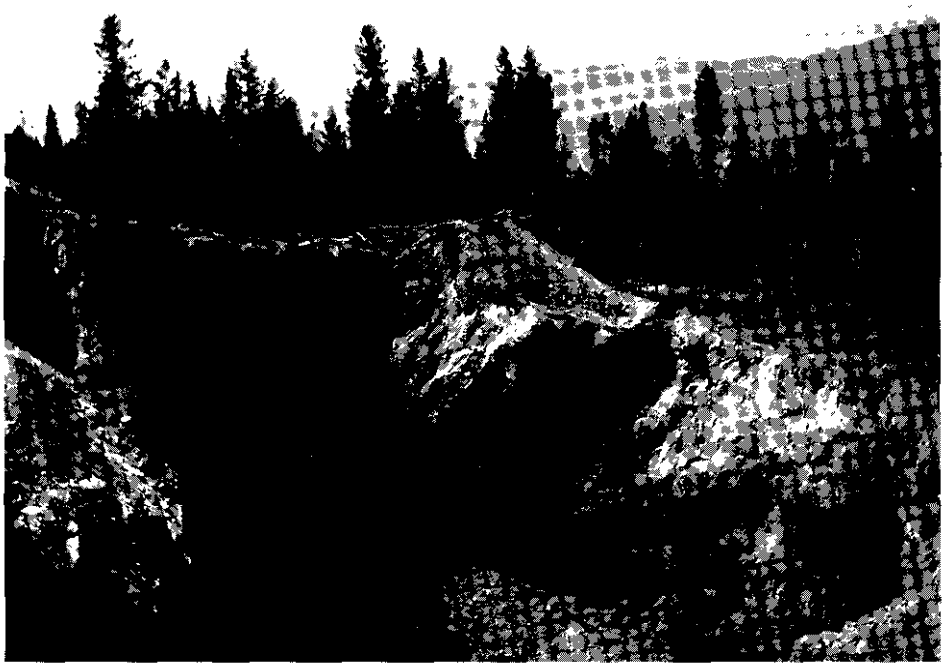
The Cascade Consolidated Silver Mining Company, with offices at 519 Rogers Building, Vancouver, is capitalized for 2,000,000 shares with no par value advertised. The Blue Bell Silver Mine of the same address in Vancouver is capitalized for 1,000,000 shares with no par value advertised. W. B. Dornberg is mine manager; Mona Munro, secretary-treasurer; and Ross Hole, accountant in the Vancouver office. At the mine Angus Beaton is foreman and S. Allan is time-keeper. Both properties are directed from the same office and the mining-work from the Cascade Company's camp office.

The Cascade Consolidated Silver Mining Company's group is situated partly on the summit and partly on the south slope of Treasure mountain, a distance of approximately 22 miles from the town of Tulameen, on the Kettle Valley Railway. The group consists at present of the *Mary E.*, Lot 1160, area 51.65 acres; the *Dorothy*, Lot 1162, area 32.24 acres; the *Hattie*, Lot 1163, area 19.48 acres; and the *Vivian*, Lot 1161, area 46.19 acres. These claims have been surveyed but have not been officially Crown-granted (January 18th, 1927) on account of an adverse action being brought by other interests due to a confliction of ideas regarding the location-line between No. 1 and No. 2 posts on the *Mary E.* claim.

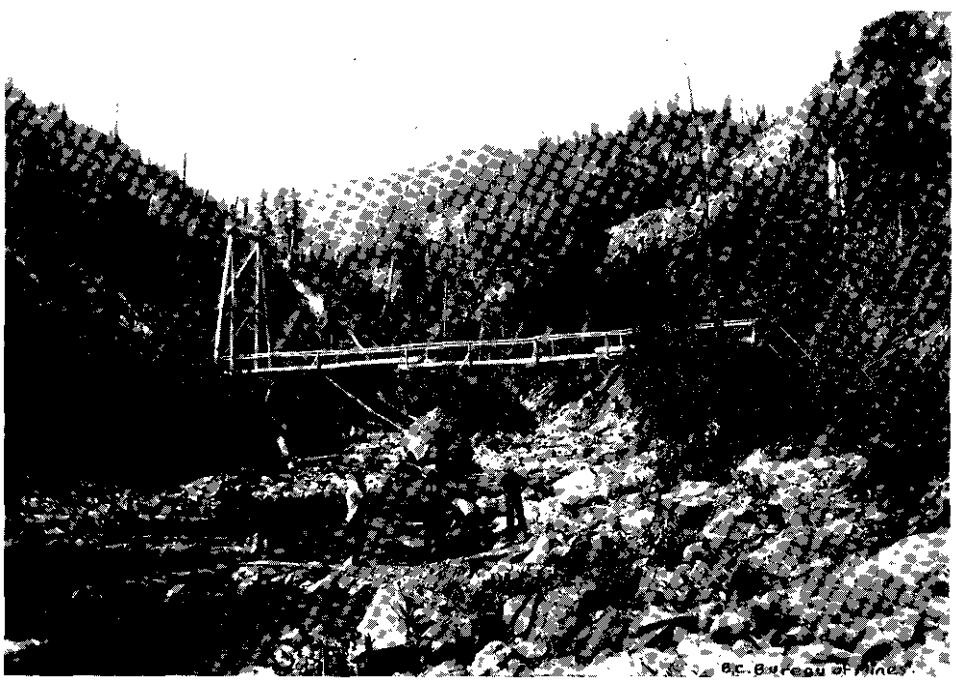
Former Development.

Major development prior to 1926 on the Cascade Consolidated property consisted of a shaft and two tunnels. The shaft, situated on the summit of the hill and said to be about 40 feet deep, has never been examined by the writer on account of being full of water. There is galena and sphalerite on the dump.

No. 1 crosscut tunnel is about 87 feet long with a drift 125 feet long on the vein. Ore exposed varies from 1 to 8 inches in width, with about 4 feet of gangue impregnated with galena and sphalerite. About 400 feet lower in elevation No. 2 crosscut tunnel was driven about 688 feet. The vein was cut at about 590 feet and on the other side of the dyke at about 614 feet. Both veins were drifted on for a total distance aggregating about 270 feet, with an upraise 50 feet on the first vein struck. On the foot-wall or north-easterly side of the porphyry dyke an ore-shoot



Allenby Copper Co.—Glory-hole.



Southeran's Platinum Placers, Tulameen River.

containing lead and zinc, 160 feet long and varying from 1 inch to 1 foot in width, has been developed. On the south side of the dyke an ore-shoot about 30 feet long and 10 inches wide, containing mostly zinc, has been uncovered. The ore-body persists in width for about 25 feet up the raise, where it commences to disappear. The upper part of the upraise is inaccessible at present. The west foot-wall drift was still in ore.

Development-work in the *Blue Bell* consisted of an upper open-cut 54 feet long, elevation 4,920 feet (barometric); a crosscut tunnel at an elevation of 4,900 feet (barometric) 82 feet long, with drifts on the vein for 50 feet; and four trenches and open-cuts over a distance of 237 feet and a difference in elevation of 25, 35, 45, and 85 feet respectively. The vein varied in width from 2 feet to 4 inches in the tunnel and open-cuts.

Development, 1926.

Development-work on the *Cascade* group in 1926 consisted of widening part of the No. 2 crosscut tunnel and driving No. 3 crosscut tunnel 80 feet. No. 3 tunnel was started at an elevation of approximately 425 feet below and to the south of No. 2 tunnel (old crosscut). The size of this tunnel is 5½ by 7 feet and its objective is the downward extension of the main vein system developed in No. 1 and No. 2 tunnels. Practically no development was done on the *Blue Bell* claim in 1926, other than facing up and timbering the mouth of a new tunnel. All work was generally retarded by snow from 3 to 7 feet deep, as the roads were filled and in places made impassable with drifted snow. These weather conditions may generally be looked for between December and March in that locality. Work in the mines did not get fairly under way until January 1st, 1927. At present trucks are running, with the aid of snow-ploughs, between Tulameen and Kelly creek, and from there to the mine 4-horse sleighs are being used to transport fuel-oil and supplies.

Construction, etc.

Active operations during 1926 commenced towards the latter part of September and most of the remainder of the year was spent in establishing camps before winter set in. This constituted excavating, cribbing, and levelling a location for a permanent camp on the *Cascade* group of claims, establishing a half-way camp at Kelly creek, and hauling in lumber and supplies. Rainy weather prevailed during these operations and the new road between Sutter creek and Summit camp, which had not had sufficient time to pack, became a quagmire and almost impassable. The camp on the *Cascade* group consists of an office and store-room, 30 by 18 feet; a cook-house, 18 by 32 feet; a bunk-house, 18 by 40 feet. with a 12-foot shed between; two cabins, 16 by 20 feet, with a 10-foot room between (the old double log cabin moved down and rebuilt); a blacksmith's shop, 18 by 20 feet; an engine-room and machine-shop, 22 by 37 feet; a dry, 18 by 26 feet, with lockers for each man; a barn and stable, 16 by 30 feet; a powder-house, 18 by 20 feet, made of logs; root-house, 16 by 18 feet. Nearly all these buildings are double-boarded and sheeted for protection against the prevailing wind in winter.

Construction on the *Blue Bell* claim comprises an engine-room and machine-shop, 16 by 24 feet; a cook-house, 12 by 12 feet; a bunk-house, 16 by 26 feet; and a powder-house 12 by 12 feet, all double-boarded.

A hot-water heating plant with radiators in each building and hot- and cold-water system has been installed at the *Cascade* camp. Two water-storage dams have been built on the small creek flowing from Treasure mountain and a 2-inch water-main from the lower dam to the camp. All the water and air lines have been buried 3 feet underground for protection against frost. Fuel-oil of 26° gravity is stored in a 10,500-gallon tank at the mine and another tank of similar capacity at Tulameen Station. Consumption of oil at present amounts to about 24 gallons in an eight-hour shift. The cost of this oil is 8 cents a gallon laid down at Tulameen.

Machinery installed on the *Cascade* group consists of one 10- by 12-inch Ingersoll-Rand compressor; one Scandia-Verken engine, 80 horse-power, 325 r.p.m.; one 6-foot receiver; one Robinhood hot-water system furnace and boiler; one Rand steel-sharpener and temper-muffle. About 1,500 feet of 1-inch pipe has been laid and buried to supply the mine and camp with water. Three thousand feet of 12-lb. rails, six mine-cars, two Dreadnaught, one Sullivan, two No. 70 machine-drills, six jack-hammers and four stopers for use in the mine, 1,000 feet of ½-inch steel cable and drum for aerial tram from No. 2 tunnel to camp to transport steel and supplies, and one 1-ton Federal truck have been purchased. At the *Blue Bell* mine there is one 25-horse-power

373-r.p.m. Scandia-Verken oil-engine, one 9- by 8-inch 320-r.p.m. Sullivan compressor, and one Wonder pump to supply water to the camp and mine. A road about 1 mile long was built below the camp to permit hauling in timber for mining, and about three-quarters of a mile of main road diversion was made between Sutter creek and the mine to avoid swamps created by the heavy autumn rains.

Sampling and Values.

Many samples have been taken from different parts of the Cascade Consolidated property from time to time. These samples assay from 0.30 to 156 oz. in silver to the ton, 0.80 to 56 per cent. in lead, and 2 to 26 per cent. in zinc. The high silver values are found in the pure galena, which is generally intimately mixed with sphalerite, although both minerals occur separately. Several attempts have been made to average the values from samples taken both in No. 1 and No. 2 tunnels 400 feet apart, but these may as well be discarded until the ore-bodies are blocked out and a few tons of ore shipped for either direct smelting or a preliminary mill test. The gangue minerals are quartz, calcite, and ankerite. The ore-shoots strike in a north-easterly and south-westerly direction and dip at a high angle to the south-east. The rake of the ore-shoots appears to be to the north-east.

Samples taken from the *Blue Bell* vein assayed from a trace to 0.02 oz. in gold; from 2.5 to 23 oz. in silver to the ton; from 2 to 8 per cent. in lead; and from 4 to 14 per cent. in zinc. These were average samples taken from the tunnel and open-cuts mentioned under former development.

Expenditure.

The amounts expended during 1926 on the Cascade Consolidated Silver Mining Company, Limited, properties are as follows: Construction, $6,413; wages, $19,346 (no salaries included); machinery and equipment, $36,676; development, $3,237; or a total of $65,672. On the *Blue Bell* (Capital Mining Company) construction and development cost is included in the Cascade Consolidated Silver Mining Company's expenditure and is not a very heavy item; wages, $633; machinery and equipment, $1,091; or a total of $1,724. Transportation costs have not been itemized and are probably included in the above totals.

Geology.

The following is an extract from the Summary Report, 1922, Part A, Geological Survey of Canada, by C. E. Cairnes, pages 106A and 107A. The Lower Cretaceous and the Dewdney series that are mentioned include a succession of sedimentary and volcanic rocks, including conglomorates, arkose, tuffs, argillites, and andesite.

"The ore-deposits at Summit camp occur at a number of widely separate points and under a variety of geological associations. There is, however, a rather remarkable uniformity in the character of the ore-bodies at the different showings, a uniformity embracing not only their physical but also their mineralogical characteristics. At each property the ore occurs in veins rarely over a few inches wide, but which may fall within a wider and more sparsely mineralized zone containing other such veins. The entire zone of mineralization constitutes the potential ore-body. It may have a width of several feet, and the whole of it, in at least certain cases, constitutes concentrating-ore. On examination it is found that the mineralized veins are following either lines of fracture or of movement, and that, depending upon the character of the rock traversed, there is some replacement of the wall-rock by mineralizing solutions. The most abundant ore-minerals are galena and sphalerite. They commonly occur in nearly equal proportions, but either may be present almost to the exclusion of the other. The galena is commonly coarsely crystalline and assays of the pure sulphide run between 150 and 600 oz. in silver. Polished specimens of the galena show that the silver values occur as argentite minutely disseminated through the lead sulphide. No argentite or other silver mineral was observed in the sphalerite. This zinc sulphide is dark, lustrous, and either coarsely crystalline or massive, and, underground, is sometimes difficult to distinguish from the lead sulphide. Following these minerals, pyrite is probably the most abundant metallic constituent and with it may be associated the small gold values, usually under a dollar to the ton.

"The ore veins extend indifferently across the strike of both Lower Cretaceous and the Dewdney series. They also follow lines of fracturing or faulting involving the basic hornblende

lamprophyre sills that intersect the Dewdney rocks, and consequently belong to a later period than these intrusives—a deduction which supports the view that these sills are Pre-Lower Cretaceous, for they have nowhere been observed to intersect those sediments assigned to this period. The ore-bearing fissures, however, do not appear to cross the feldspar-porphyry dykes which include the Lower Cretaceous rocks, but may, as in the case of the ore-showings on the *Silver Chief* claim, follow either wall of these dykes. The dykes appear, in certain cases at least, either to follow lines of weakness in the sediments they intrude or to be themselves the immediate cause of the fracturing of the rocks in their vicinity. The ore is regarded as being derived either from the great body of Eagle granodiorite to the east of Treasure mountain or from the smaller bodies of quartz diorite occurring near the main divide at the head of Amberty and Sutter creeks and also near the headwaters of Dewdney creek on the western slope of the divide. The greater abundance of ore veins in the direction of this divide, rather than towards the east, favours this quartz diorite as being the principal source of the ore, a theory strengthened by observation of the very noticeable pyritic mineralization of the older formations almost everywhere in the vicinity of this intrusive.

"The order of deposition of the ore and gangue minerals is to some extent variable. The gangue is commonly composed of quartz and calcite, but ankerite and stilbite have been observed. These gangue minerals tend to form along the walls of the fissures, leaving the more central portion to be filled, subsequently, chiefly by the ore-minerals, of which the most important are galena and sphalerite. Chalcopyrite is sometimes a conspicuous vein-mineral and appears to have been the last sulphide precipitated. Pyrrhotite and pyrite also are locally abundant, and not only occur within the fissure deposits, but commonly impregnate the wall-rock on either side or may be found disseminated through the rock formation far from any fissure deposit. Both of these iron sulphides precede the galena and chalcopyrite, but in one instance at least the zinc-blende was observed to be intersected by veinlets of pyrite. Arsenopyrite is noticeably abundant in certain of the properties and appears to precede the lead and copper sulphides. Its order with respect to the iron sulphides is less certain. There is, probably, however, much overlapping of all the ore-minerals, but the order in which they each begin to precipitate seems to be pyrrhotite, pyrite, sphalerite, arsenopyrite, tetrahedrite, galena, chalcopyrite.

"The association of ore and gangue minerals at Summit camp and the character of the ore-deposits suggest that the solutions from which these minerals were precipitated were of intermediate or in the case of some of the properties possibly of high temperature, and that, consequently, the source of these solutions was at no great distance from the ore-bodies. It has been shown that the quartz-diorite intrusive bodies near the main divide afford the most likely source for the mineralizing solutions, and in this connection it is of interest to note that near these intrusives, and within the zone of contact metamorphism, the older formation is heavily impregnated with pyrite and, to a less extent, pyrrhotite and magnetite, but does not include the other ore-minerals so common in the fissure-veins at a greater distance from the intrusives."

Eureka. This claim adjoins the *Whynot Fraction*, which in turn adjoins the *Mary E.* claim, owned by the Cascade Consolidated Mines. A. Jensen *et al.*, of Tulameen, owners of the *Eureka*, financed, with the aid of outside capital, Lynden Mining Syndicate, development-work during 1926 and 23 tons of silver-lead ore was shipped to the smelter. Development in the second tunnel up to August 22nd amounted to about 65 feet of drifting, mostly on a fault. At a point about 12 feet from the mouth of the tunnel to the west a short piece of vein-matter about 4 inches wide, containing galena and sphalerite in a gangue of quartz and calcite, was found. Several pieces of ore of a similar nature were found in the drag of the fault. At the end of the tunnel the vein, about 12 inches wide, was struck and from all appearances was in place. The strike of this ore is in a general north-easterly direction and the strike of the fault about N. 22° W. (mag.). A narrow porphyry dyke about 4½ feet in width and striking N. 40° E. (mag.) cuts through the sedimentary rocks a short distance north of the No. 2 tunnel.

In the upper workings, consisting of a short tunnel and open-cuts, a great deal of mineralization occurs, including galena and zinc-blende, and it seems likely that the mineralization fissure follows the walls of this dyke in a similar way to the veins on the *Mary E.* claim. A sample taken from some of the sacked ore from this tunnel assayed 0.02 oz. in gold, 49.5 oz. in silver to the ton, 30 per cent. lead, and 12 per cent. zinc. Other much higher-grade samples have been

taken from the workings in the No. 2 tunnel. The assays from the shipment made to the smelter will undoubtedly give a true average value of the ore. The lower workings have been mentioned in the Summary Report, 1922, Part A, of the Geological Survey of Canada.

Tulameen River Section.

A discovery of quartz containing free gold was made along the east bank of the Tulameen river, a short distance below Eagle creek, by Wm. Britten, of Tulameen. An examination was made of this discovery, but unfortunately the owner was absent and nothing but narrow quartz stringers entirely unmineralized could be located. Specimens of ore said to have come from this find showed large quantities of free gold mixed with the oxidized quartz.

Liverpool. This claim, owned by Louis Marcotte, of Coalmont, was reported on in the Annual Report for 1922. Since that time the shaft-tunnel has been driven ahead about 110 feet. From the foot-wall of the collar of the inclined shaft to a point 66 feet within the tunnel the limestone is almost entirely replaced by silica impregnated with pyrite, pyrrhotite, and chalcopyrite, with malachite in the fractures. Two porphyry dykes, one about 9 feet and the other about 12 feet in width, cut the formation at right angles to each other beyond this zone containing copper. The limestone between the dykes is only slightly mineralized with pyrite. At a point within 15 feet from the face of the tunnel on the right-hand side a few specks of galena and small lenses of zinc-blende were found. The face of the tunnel is in schist, which dips about 40° S.W. and strikes N. 24° W. (mag.). The character of the ore appeared to be lower grade than that developed in the shaft—that is, 1.2 oz. in silver to the ton and 3 per cent. copper—but this may improve in depth as it did in the shaft. The size of the zone is an attractive feature. To develop this ore-body it will be necessary to sink.

Silver Bell and Belmont. These claims are situated about 2 miles up Kelly creek from its junction with the Tulameen river. The owner, B. Marks, of Tulameen, extended the development, done several years ago by J. Kelly (now deceased), on a quartz lead near the bed of the creek. An excessive amount of water during sinking operations prohibited further work being done. It is the intention of the owners to sink beyond the creek-bank and drift towards the lead. Picked samples from this lead assayed 0.06 oz. in gold, 30.5 oz. in silver to the ton, and 1.2 per cent. lead. A small percentage of tetrahedrite is noticeable in this ore, associated with galena and pyrite. The width of the vein varies from 2 to 12 inches. The country-rock is schist.

Placer-mining.

The results of placer-mining on the Tulameen river have again been disappointing as far as actual production of the platinum metals and gold are concerned. A lot of exploratory work was done at Slate creek, but owing to unforeseen difficulties, such as beds of glacial clay 20 feet thick lying close to bed-rock, the average value of the bed-rock gravels could not be demonstrated before low water.

A spectacular find was made by Garnet Sootheran on his placer lease about half a mile below Eagle creek, on the west side of the Tulameen river. Higher up the river other work was done later by other interests, but from local information received the results were said to be disappointing. A more detailed account of the Sootheran lease is incorporated in this report. On the Similkameen river above Princeton more attractive preliminary results were obtained by the Tulameen Gold and Platinum Recovery Company, Limited.

The Department of Mines found it necessary from time to time to stop the publication of some rather too optimistic statements in some of the prospectuses issued by stock-promotion companies.

For about the first time in the history of production in this area the placer-miners have been paid for all the metals of the platinum group contained in the clean-up. This was accomplished by sending the crude platinum, generally through the local banks, to Johnson & Son's Smelting Works, Limited, refiners and dealers in the precious metals, 27–33 Paul Street, Finsbury, London, E.C. 2, England. To illustrate the difference the following returns are submitted:—

Date, September 3rd, 1925. Platinum concentrates weighing 5 oz. troy sent to Johnson & Son, London, England.

		£	s.	d.		£	s.	d.
Fine gold	0.152 oz. at	4	4	9	an ounce amounts to	0	17	11
Platinum	2.590 oz. at	24	0	0	an ounce amounts to	62	3	2
Iridium	0.686 oz. at	75	0	0	an ounce amounts to	51	9	0
Osmium	0.292 oz. at	22	0	0	an ounce amounts to	6	8	6
Ruthenium	0.310 oz. at	11	0	0	an ounce amounts to	3	8	2
Rhodium	0.260 oz. at	17	0	0	an ounce amounts to	4	8	5
Total	4.290 oz. paid					128	15	2
Less refining at 15s. an ounce						3	15	0
Total to producer						125	0	2

If all the metal, minus 0.152 oz. troy in gold, had been paid for as usual at platinum prices, and the pound sterling figured at $5, the loss to the producer would have been roughly $124. As long as the price of iridium remained high the miner lost a considerable amount. At the present time the price of iridium is only slightly higher than that of platinum and the difference is negligible. The combination iridio-platinum, quoted at a higher price, is a chemical one and used as a specialized article. The natural alloy found in the placer-diggings cannot be used satisfactorily in its original state, because it contains impurities which render it unsuitable for commercial purposes. The platinum and iridium are therefore separated and paid for as such and chemically combined afterwards. Quotations have been received from Johnson & Son, London, stating that the cost of smelting black sands is £19 a ton.

Sootheran Leases.

Garnet Sootheran owns one river and two bench leases on the Tulameen river, approximately half a mile below Eagle creek. His partner, J. Hamilton, owns the adjoining lease up-stream. The Sootheran lease (No. 153) includes what is known as the *Deadhorse* claim, worked many years ago. During May and June the two partners whilst working together a short distance below Champion Creek bridge discovered a pay-streak along the side of and under the boulder-dumps of some old placer-diggings. Practically no work was done to demonstrate the thickness of this pay-streak or its area, chiefly on account of the piles of small boulders on top of it. Between May 17th and June 22nd 35 crude troy ounces of platinum was taken out from short narrow drains and open-cuts spotted over an area of about 200 feet. According to the owner, this amount of platinum was recovered from 736 partially filled small wheelbarrows, and he estimated that fifteen full barrows represented 1 cubic yard of gravel; so that the 35 crude troy ounces of platinum represents the production from anywhere between 24 and 49 cubic yards. The pay-streak appears to be an iron-stained partially cemented gravel of unknown thickness. Bed-rock had not been tested under this gravel at the time of examination (July 3rd, 1926) except around the rim, where it showed a decided dip down under the old workings.

Two theories are offered as an explanation of this find, since it occurred in an old placer-diggings; one is that the former miners cleaned up all the values, which were thought to be mostly gold, down to the cemented gravel or false bed-rock mentioned above and left everything below because the values were mostly in platinum valued, then, at only a few dollars an ounce; the second theory is that the platinum found is the discard from the former miners' sluice-boxes, which seems unlikely, because, as a general rule, only the coarse platinum was thrown out of the boxes and the final separation took place at the cabins.

The cost of placer-mining in the early days on the Tulameen was very high on account of lack of transportation of any kind. The width of the bench on which the old channel is located is between 300 and 350 feet at the widest part and approximately 2,500 feet long. Owing to the mountain-slides it is very difficult to estimate the width of the old channel and there may be other higher channels filled with debris under the present wagon-road. Cleaning away the piles of loose boulders offers no serious hindrance to the exploration of the bed-rock gravels, and with such high values in platinum obtainable it is difficult to understand why the lease is lying idle. Water for mining can either be obtained from Eagle creek, half a mile distant, or from the Tulameen river. Bed-rock appears to be about 6 feet above the present river, but this

is not at all certain. A sniper permitted to work on the lease for a week or two whilst the owners were awaiting information regarding a deal cleaned up about $10 a day.

Tulameen Placer Mining Co., Ltd.

This company was incorporated on October 14th, 1926, with offices in the Board of Trade Building, Vancouver. The authorized capital of the company is 500,000 shares of $1 each. No fiscal agent is permitted to receive more than 35 per cent. commission on sales of shares. Fifty per cent. of the value of each share is to be paid for on application and the balance upon allotment, or in four monthly instalments if agreed upon by the directors. The following are the directors: R. D. Davies, J. McD. Grosart, L. J. Cooper, A. E. Perman, and J. P. Tait.

The ten leases being acquired from J. McD. Grosart for a consideration of 150,000 fully paid-up shares of the company, are situated on the Tulameen river between Slate creek and Collins gulch and consist of six creek leases and four bench leases having a total area of 488 acres.

Although the ground acquired is favourably located down-stream from Olivine mountain, which is the acknowledged source of the placer platinum, the company will be well advised to avail itself of the experience of other operators and thoroughly test the ground before installing expensive machinery. Where thorough testing operations of the gravels of the Tulameen river have been carried on, the values have been found concentrated along certain well-defined channels and not all through the gravels.

Similkameen Placer Syndicate.

This syndicate, mentioned in the 1925 Annual Report, continued development under the direction of Norman McCormick throughout most of the season on Slate creek. The tunnel commenced in 1925 broke through under the present channel of Slate creek above the upper falls. Owing to a bed of glacial clay about 20 feet thick lying just above bed-rock, work was greatly retarded and it was found necessary to blast a channel through the clay in order to reach that part of the channel which was the objective. Before this was done the water in the creek lowered to such an extent that operations ceased for the season. A good flow of water is necessary to carry off the debris blasted from the workings.

The same syndicate drove a tunnel into the high cut-bank below the mouth of Slate creek in an effort to locate the mouth of the old channel, which is supposed to have been blocked by glaciers. Several hundred feet of tunnel, with two branches radiating from it, have been driven and bed-rock located in all three drifts. At the time of examination (July 3rd) the rock encountered dipped in several directions and it was difficult to predict in which of the three tunnels the old channel might lie. Further work has been done and according to the management the prospects look encouraging. Owing to the impossibility of estimating the right elevation to drive a tunnel to strike bed-rock it may be necessary to sink or to raise to reach the old channel, if there is one. A camp has been built near the mouth of Slate creek.

Ruby Lease.

This lease, situated about 4 miles below Coalmont, is owned by K. Ruby, of Coalmont. Most of the season was spent in building a dam and pipe-line to furnish water for hydraulic mining. Owing to a dry season very little could be done after July. This lease covers what is known as the old Roney high-channel lease, which produced a lot of gold in past years. The elevation of this channel is about 100 feet above the present bed of the Tulameen river. There appears to be a considerable yardage of likely-looking gravel on the east end of the claim which the owner intends working. A total of 25 oz. in gold and 9 oz. in platinum was recovered.

Tahoma Recovery Co.

This syndicate, capitalized for $25,000 and composed of Tacoma, Wash., capital, leased some placer-ground at the mouth of Granite creek and installed a steam-shovel of 1½-yard capacity and a portable sluice-box, including gravel-storage bin, etc., to operate on rails. As it was necessary to commence digging-in operations at the Tulameen river bank, the area supposed to contain pay-gravel was not reached before the freeze-up. Operations, consisting of unloading machinery and construction of portable sluice-boxes, etc., did not start until July 12th and it was late in August before the actual work began. About 300 feet of new channel was dug and 5,000 yards of gravel washed, with only a small recovery, as expected. No work was done during October on account of boiler-trouble.

Granite Creek.

Granite creek, discovered in 1885, produced during five years, on an average, $5,000 for every 100 feet of ground over a distance of 3¾ miles. Most of the ground worked was confined in the

narrow rock-walled canyon through which the creek flows. The gravels varied in depth from 2 to 8 feet, with most of the pay-dirt on bed-rock, so that they were easily worked. At the present time there are several leasers working the benches along the creek who are making a little better than wages during the season.

Granite Basin Mining Syndicate.

This syndicate, with offices in the Dominion Bank Building, Vancouver, operated a lease in Granite basin. This basin constitutes a widening of the valley beyond the canyon on the South fork of Granite creek about 6 miles from its outlet. A branch road leaves the Coalmont–Blackburn wagon-road about 3¾ miles from Coalmont and extends as far as the North fork of Granite creek. This branch road is not safe for automobiles much beyond Johnson's cabin. From the North fork a narrow and often precipitous trail extends across Newton creek and up the South fork of Granite creek.

A shaft has been sunk 42 feet deep on a bench 6 feet in elevation above the creek and a short distance south of the mouth of the canyon. No alluvial gravel was reached in this shaft and the operators were driven out by the excess of water. Two gasolene-driven pumps were installed, and according to the management the larger pump had too great a capacity for the work on hand and the smaller one had insufficient power.

Many years previous an 800-foot tunnel was driven from the canyon below with the idea of exploring the gravels in the bottom of the basin. Most of this tunnel was in solid rock except at the upper end, where it had caved in from the surface. No data are at hand regarding the results obtained from this work, but it is probable that the tunnel was not driven at a low enough elevation. Bed-rock has never been reached in this basin and it is a matter of conjecture whether there are any values in it. The best way to prospect the area would be with an Empire drill, which could be brought in over the present trail. This drill is not as rapid in gravels containing boulders as the engine-driven machines, such as the Star or Keystone, but owing to transportation difficulties it will suit the purpose. The heaviest part weighs 250 lb.

Andrew Gordon Lease.

Andrew Gordon, of Coalmont, owns two creek leases on the South fork of Granite creek below the basin. His first lease commences 200 feet above the North fork of Granite creek and extends up-stream past the mouth of Newton creek. Both leases are located in a steep canyon and cover ground that has been worked (Lambert lease) or has had some development-work done upon it.

At the time of examination A. Gordon and partner were prospecting some shallow ground on the east side of the creek and were getting a few colours. This work was only temporary and the owners hoped to interest capital to the extent of obtaining sufficient money to clear out the old 330-foot tunnel flume in the box canyon and extend the present bed-rock flume (now 1,100 feet long) higher up the channel into virgin ground below the dam. The prospect of getting values appears to be good, if records are correct.

The present owner has also driven a tunnel 200 feet on bed-rock into a gravel bench which projects about 300 feet out into the creek and which evidently caused a diversion in the stream. Evidence of an old channel is developed by other tunnels in the bench higher up the creek. Some gold nuggets were taken out of the lower tunnel, but it has not been driven far enough to reach the old channel proper. This seems to be the most favourable location to do development-work.

At the junction of Newton creek and the South fork of Granite creek much gold and platinum was recovered during the boom between 1885 and 1890. This area lies up-stream from the bench referred to above.

National Holdings, Ltd.

This company operated in a small way during part of the season on its lease 4 miles above Princeton and closed down early in the autumn. A small quantity of gold and platinum was recovered, but as a whole the operation was unsuccessful owing chiefly to the mistake of installing a plant before thorough preliminary investigations had been made. Prospects found by panning on parts of these leases were fairly promising and justified further development, either by shaft-sinking or drilling, but nothing more. The upper leases on Petersen flats have had nothing but a few shallow pits dug in them, from which attractive colours in gold and platinum have been panned. These flats are, it is understood, under lease to a different organization, which intends to prospect

them thoroughly. A full description of the plant and intentions of the National Holdings Company appears in the Annual Report for 1925.

SIMILKAMEEN RIVER SECTION.

Tulameen Gold and Platinum Recovery Co., Ltd.

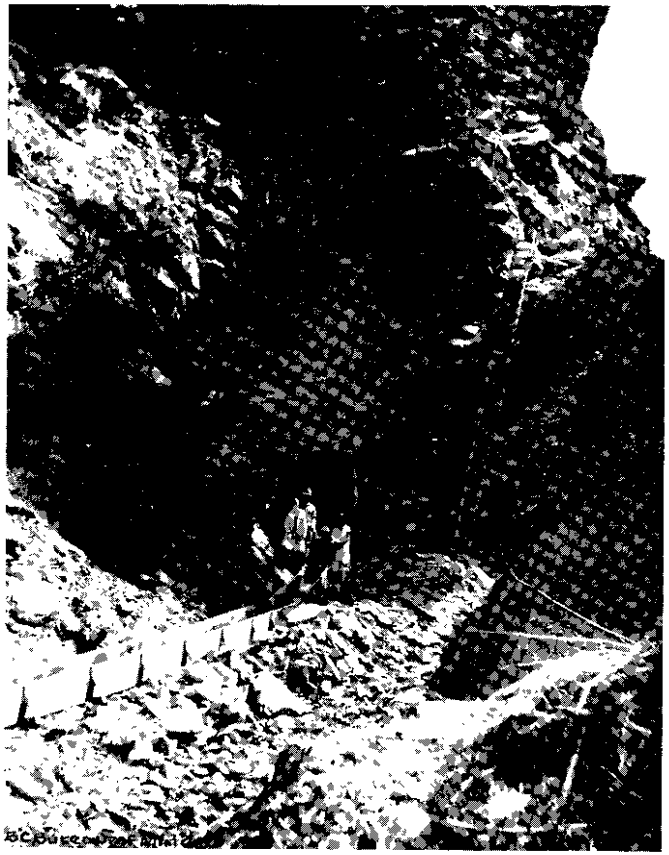
Although this company bears the name of Tulameen and some of its exploration-work was done on what is thought to be an old high channel of that river, the major development took place on a bench on the Similkameen river and is therefore related under this heading. This company was incorporated on May 10th, 1926, with offices in the Dominion Bank Building, Vancouver, and an authorized capital of $2,500,000, divided into 2,500,000 shares of $1 each. The directors of the company are Norman McCormick, Arthur R. Jenni, Alvin Stanlake, James Saborne, and Etna M. Morgan, of Vancouver. The property, purchased by the company from Norman McCormick and Etna M. Morgan, of Vancouver, for 675,000 shares to each, consists of fifteen placer-mining leases situated between the Tulameen and Similkameen rivers, commencing at a point about 4½ miles up the Tulameen and cutting across to a point about 4 miles up the Similkameen river above Princeton. The leases follow a series of terraces and depressions at an elevation of approximately 500 feet above the Tulameen river and cover what is supposed to be an old high channel. The reason for this supposition is that colours of platinum and gold have been panned from shallow holes from several different localities on these leases and the gravels have the appearance of partially assorted alluvial material.

One shaft, over 100 feet deep, was sunk at the north-west end of the leases near the Tulameen river. This shaft was not examined, but the management said that only spasmodic values were found before the work had to close down on account of the cold weather freezing the camp water system. If there is an old channel cutting through the section described above, the surest and most economical way to find the entrance is by prospecting along the banks of the Tulameen river. The leases of this company did not extend far enough toward the Tulameen river to carry out this development scheme during the earlier part of 1926. In the autumn more ground was acquired which will enable them to do this work. The following excerpt from the Preliminary Report on a part of the Similkameen District by Chas. Camsell, Geological Survey of Canada, 1907, page 21, throws some light on the subject:—

"Numbers of terraces and deposits of gravel also occur at various elevations on the sides of the valleys to a height of 3,400 feet above sea-level. The higher ones of these appear to have been formed when the whole valley was filled with water up to these levels, while others nearer the river and lower are the results of the action of the present streams in cutting down their beds. As a rule the higher ones only now occur as small remnants of once more extensive terraces, formed in the period immediately following on the disappearance of the Cordilleran glacier, and which have since been reduced in size by the ordinary atmospheric agencies of erosion. These are the most apparent evidences of comparatively recent changes of level.

"Accompanying these changes of level, and either a direct result of them or of the blocking of ancient channels by recent volcanic flows, have been some striking changes of drainage. The most marked instance of this is the deep valley of Smelter lake and Wolf creek, now occupied by a stream inconsistent with the size of the valley. It seems probable that this valley of Wolf creek, with its continuation through Smelter lake, once carried a great part of the drainage of the southern portion of the Similkameen river, but that the filling-up of parts of its channel by recent volcanic flows, or the same uplift which caused the southern portion of the Similkameen river to cut its deep canyon, also forced the stream into its present roundabout course through the Tertiary basin about Princeton. All the streams entering this valley from the south, above and including the Coldwater river itself, occupy hanging valleys, so that they debouch in waterfalls or have been forced to cut deep canyons down to the level of the trunk valley."

The recent volcanic flows and intrusive rocks are plainly exposed at the west end of this area. If this is an old channel, as supposed, in which the entire Tulameen river flowed, there is a distinct probability that these rocks caused an entire or partial change of drainage. Whether or not these old high channels had a sufficiently strong flow of water through them to concentrate the metallic values can be discovered only by exploration. The shaft sunk by this company encountered a great deal of glacial material which probably filled in any depressions. Since there are no known platinum-bearing rocks within about 10 miles of this area, it appears



Slate Creek Placers, Similkameen M.D.

Granite Creek Placers, Similkameen M.D.

more than likely that the values in the gravels are of glacial origin. Roads and a camp were built close to the west end of this company's holdings to facilitate the work on hand.

The Similkameen River leases (Nos. 353-355) are located near the mouth of Bromley creek at the east end of the area. A part of these leases, on which most of the work was done, consists of a bench about three-quarters of a mile long and about 400 feet wide at the widest part and 6 feet above low water. At the north and south end there are indications of old placer-diggings, and history relates that a good deal of gold was recovered from them forty years ago, but that there was too much water for the old miners to work to bed-rock with the equipment at their disposal. In between these old workings this company put down shafts, test-pits, and drains in an attempt to reach bed-rock. Two or three of these shafts, out of a total of thirteen, reached bed-rock, and in the others the work had to be stopped on account of an excess of water, and the attempt was abandoned. Therefore no positive data were obtained regarding the total yardage or values in this area.

Colours of gold and platinum were found in most of the shafts as far as they went. The depths of the shafts, where measured, varied from 6 to 9 feet. Other shafts were sunk deeper, according to the management, but as these were full of water at the time of examination the depths could not be checked nor the gravels panned. At least 50 per cent. of the gravel at the upper or south end of the lease is small boulders, so that in figuring the possible yardage an allowance must be made for this. Where a section of a shaft where bed-rock was exposed was sampled and panned higher values were obtained; so it seems probable that the pay-gravel lies either on or close to bed-rock.

A part of this bench at the mouth of Bromley creek was inhabited by beavers and several long dams had been built. The company found it necessary to cut these dams and dig long drains to draw off the water, so that it could prospect the ground. Prospects of gold were found in these drains and in open-cuts along the river-bank. The area as a whole seems to have possibilities of producing gold and platinum at a profit to the operator providing the ground will average 50 cents a cubic yard or better.

A steam or electric shovel or drag-line scraper, or both, will probably be used, depending on the character and depth of the bench-gravels. On November 10th the management were drafting plans of an electric shovel and it was their intention to have the different parts made and assembled during the winter months ready for construction on the ground in the spring.

Bromley creek is from 6 to 10 feet in width and is a steady-flowing stream. Light porous colours of gold are found in the surface residue brought down by this creek, and because the direction of the stream is diagonally across the supposed old high channel of the Tulameen river these colours are believed to have come from the channel gravels.

In summing up the situation as it stood at the end of 1926, the following are the main facts and theories: The company believed that there is an ancient high, blocked channel of the Tulameen river situated somewhere in the depressions about 4 miles in a south-westerly direction from Princeton. The geology and topography of the country in that neighbourhood supports this theory to some extent. Colours of gold and platinum, although found only at irregular intervals, adds to the possibilities of the theory. It is also believed possible that there has been a sufficient concentration at the bottom of this old channel and perhaps over a larger area to warrant its exploration. The one shaft, sunk over 100 feet in depth, has bed-rock as its objective and crosscut tunnels should be run each way across the channel or depression in an endeavour to gather information before doing more work.

On the Similkameen River bench it was considered possible to gather sufficient data for future operations by sinking a series of shafts to bed-rock and panning each foot of the work. An excessive flow of water, which the pumps were unable to handle, stopped this work, and although insufficient data were procured to warrant any large outlay of money, the results were sufficiently attractive to justify further exploration. A churn-drill is the only mechanical device that will test gravels immersed in water, but because there has been a wide variance at times in values found by churn-drills and by ultimate operations the management was inclined to be prejudiced against them. Assertions have been made by this company that it had 100 acres of gravel carrying $2 a yard in gold and platinum (metallics). It is possible that there is this gross content in the bench-gravels on its leases on the Similkameen river, and perhaps more, but it had not been proven at the time of examination (November 10th, 1926).

Platinum Production.

It is almost impossible to obtain the correct total production of platinum from placer operations in this district because there are so many different ways of disposing of the metal. Some of it passes through the local banks, some through the local storekeepers, and other amounts are sent direct to the metal-buyers in different parts of the country. Roughly, 50 oz. of metal has been sold and paid for as platinum. Most of the larger platinum nuggets recovered from the Garnet Sootheran lease were taken to Vancouver for display and there is no record of them being sold.

Coal.

During the year the Princeton-B.C. Colliery Company, Limited, ceased operations on its property at Princeton after many years of production. No official information is to hand regarding the future plans or what is to be done with the assets of this company. It is generally believed that there is still a large tonnage of lignite coal on the properties owned at Princeton.

The Tulameen Valley Coal Company continued operations throughout the year and a considerable amount of coal was shipped to outside points as well as for local consumption.

Diamond-drilling and later some drifting was done on the Robert Schulli coal prospects lying about 2 miles south-west of Princeton by W. R. Wilson *et al.* under the superintendency of Ridgeway Wilson, of Victoria. Coal was struck by the diamond-drills, but information regarding other development-work is not to hand.

EASTERN MINERAL SURVEY DISTRICT (No. 5).

By A. G. Langley, Resident Mining Engineer.
(Reports marked * are by B. T. O'Grady, Assistant.)

INTRODUCTORY.

This district comprises the Revelstoke, Lardeau, Trout Lake, Slocan, Slocan City, Ainsworth, Nelson, Trail Creek, Arrow Lake, Golden, Windermere, and Fort Steele Mining Divisions. It is responsible for the great bulk of silver-lead-zinc ore produced in Canada; in fact, the amount of lead and zinc produced in other parts of the Dominion is insignificant as compared to the output of this district. In this connection it is very gratifying to note that its production has shown a steady and substantial increase during recent years, with good prospects for a still greater output in the near future. This very healthy condition of affairs has been principally due to the phenomenal success of the Consolidated Mining and Smelting Company in the development of the *Sullivan* mine and the treatment of the complex ores found therein. The keen demand for silver-lead-zinc properties brought about by satisfactory marketing conditions and the ever-increasing output of these metals by the Trail smelter have naturally attracted the attention of mining men to this district, with the result that a number of properties have been acquired by strong interests and considerable capital has been available for the development of properties of merit.

This year has witnessed a very substantial increase in the tonnage of custom ores shipped to Trail, which is principally due to the acceptance of milling-grade ore for concentration by the Consolidated Mining and Smelting Company. The list of shippers from this district contains sixty-five names and includes five properties which have produced over 15,000 tons each—namely, the *Silversmith*, *Bluebell*, *Lucky Jim*, *Stemwinder*, and *Yankee Girl*.

New Developments and Exploration.

Generally speaking, there has been a marked increase in activities throughout the district, both at the mines and prospects. In the Nelson Division the reopening of the *Yankee Girl* under the management of W. G. Norrie, the development of the *Goodenough* by the Porcupine Goldfields Development and Finance Company, together with several minor operations up Porcupine creek, gave a new lease of life to the Ymir camp. Great interest was caused by the exploration-work being undertaken by the Victoria Syndicate at the *H.B.* on Sheep creek and in the Pend d'Oreille area, where large low-grade lead-zinc replacement deposits in limestone were tested by diamond-drilling followed by underground work.

In the Slocan-Ainsworth district the output of the Sandon and Silverton camps was well maintained, while the increased output of the *Lucky Jim*, *Whitewater*, *McAllister*, and *Bluebell* gave a substantial boost to the production of this area. Exploration-work was actively carried on by the Victoria Syndicate on a large group of claims near Sandon and further development undertaken at the *Hewitt*, which was acquired by them during the year. The Porcupine Goldfields Development and Finance Company did some diamond-drilling at the *Galena Farm* and later acquired the *Mammoth* mine under option.

In the northerly part of West Kootenay the properties which probably attracted most attention were the *Teddy Glacier*, a new prospect with attractive possibilities, in which it is understood American capital has become interested, and the *Multiplex*, which produced a small tonnage of high-grade silver-lead ore. The development and exploration of the "Big Ledge" near Nakusp is also being watched with great interest.

In the East Kootenay important work was done at the *Monarch* near Field by A. B. Trites and associates, who also acquired the *Giant* at Spillimacheen. At this latter property systematic diamond-drilling disclosed favourable indications and underground work was undertaken during the latter part of the year.

Exploration at the *Ruth-Vermont* property on Vermont creek, in the Golden Mining Division, has been attended by very encouraging results. Late in the year a new sleigh-road was slashed out to the mine. The property was acquired by an English syndicate. In the Windermere Division the *Paradise* was acquired from the Hon. Robert Randolph Bruce by the Victoria

Syndicate and further development is being vigorously proceeded with. In the Fort Steele Division the *Stemwinder* entered the shipping-lists and, next to the *Sullivan*, was the largest producer in East Kootenay. The *Aurora*, which had been idle for many years, made a good showing soon after being reopened.

The above probably constitute the outstanding new developments of the season, although there are numerous others taking place, some of which may turn out to be very important, but in many cases not enough work has yet been done to allow a definite opinion to be formed as to the ultimate results. However, the general impression gained after visiting many properties, including prospects and producing mines, was that mining in the district is in a healthy condition and the future can be regarded with confidence, both in respect to increased production and exploration.

Summary of Important Construction-work.

At Kimberley additions to the *Sullivan* concentrator were made which have increased the capacity of this plant from 3,000 to 4,000 tons a day. At Moyie the Consolidated Mining and Smelting Company completed the erection of a 500-ton concentrator to treat the tailings of the old *St. Eugene* mill. At Riondel the *Bluebell* mill was remodelled and a dam built at Lake Fowler for water-storage purposes. Near Bonnington commencement has been made on the installation of 60,000-horse-power hydro-electric plant, and at Trail a great deal of new work was undertaken and accomplished, which is mentioned elsewhere in the report.

Prospecting.

As far as can be ascertained, prospecting activities throughout the district have been about the same as last year, but nothing very spectacular in the way of new discoveries has been reported. Owing to a number of forest fires prospecting and minor operations in certain parts of the district were severely handicapped during the month of August.

Geological Work.

The Geological Survey had a party headed by J. F. Walker and F. M. Bancroft engaged in the Trout Lake and Lardeau Mining Divisions and another headed by C. E. Cairnes in the Slocan area.

The writer wishes to acknowledge with many thanks the courtesies extended by the mine-owners and prospectors.

During the early part of July a mining convention was held at Nelson, which was well attended by visitors from Spokane and various parts of the Province. The programme provided ample opportunity for discussion on mining topics and entertainment for the visitors, while the excellent display of Kootenay ores could not fail to create a very favourable impression of the potentialities of the district.

In October the Canadian and American Institutes of Mining and Metallurgy held a joint meeting at Cranbrook and Kimberley. Among the large number of visitors were included many eminent men of the profession. An excellent opportunity to see the *Sullivan* mine and concentrator was afforded by the staff of the Consolidated Mining and Smelting Company, who did everything in their power to make the stay in Kimberley both interesting and enjoyable, while the Cranbrook Board of Trade added greatly to the success of the meeting by co-operating in making arrangements for the convenience of the members and entertaining them at a dinner on the night of their arrival.

EAST KOOTENAY.

The portion of the Eastern Mineral Survey District (No. 5) known as East Kootenay comprises the Golden, Windermere, and Fort Steele Mining Divisions and is responsible for the greater part of the production of silver, lead, and zinc of No. 5 District. The immense tonnage produced is from the *Sullivan* mine, which is supplemented to a comparatively small extent by the output of the *Stemwinder*, *Aurora*, and *Paradise* mines and a few small shippers.

The progressive policy being pursued by the large mining companies in respect to exploratory and examination work, coupled with the numerous activities of the small operators and prospectors, augurs well for the possibilities of establishing some new and important producers.

The most important mineral-deposits so far discovered in the East Kootenay are in the Pre-Cambrian sediments of the Purcell range. A notable feature in connection with the geology of the ore-bearing zones is the intrusion of dykes and sills of basic igneous rocks.

In the southern part of the district the famous deposits of the *Sullivan, St. Eugene, North Star, and Stemwinder* all occur in the Aldridge quartzites of Pre-Cambrian age in an area which has been subjected to the intrusion of igneous rocks as above mentioned. These Pre-Cambrian rocks, known as the Purcell series, have been correlated with the belt terrain of Idaho and Montana.

Throughout the Purcell range mineralization is widely scattered, there being hardly a creek on which some prospect has not been located, and it is only a matter of time when further development and exploration will disclose other important ore-bodies and entirely new discoveries will be made. Although mining has been carried on in the district for a number of years, prospecting has not been nearly so active as conditions would appear to warrant and large areas of practically unexplored territory still await the prospector.

Considering the great extent of the mineralization at the *Sullivan* mine, it does not seem unreasonable to suspect the presence of other important ore-bodies even at considerable distances from this phenomenal deposit, providing geological conditions are favourable. Fortunately part of the *Sullivan* ore-bodies outcropped, hence the discovery; but the great northern ore-body does not outcrop and nowhere on the surface are there indications that would allow the wildest imagination to picture the present huge dimensions of the underground workings. The logical conclusion to be drawn from the above would appear to be that any surface showing in the possible continuation of the mineralized zone should be worthy of careful attention from the prospector.

GEOLOGICAL REFERENCES.

Memoir 76, G.S.C.: Geology of Cranbrook Map Area, by S. J. Schofield.
Memoir 148, G.S.C.: Geology & Mineral Deposits of Windermere Map Area, by J. F. Walker.
Memoir 55, G.S.C.: Geology of Field Map Area, by John A. Allan.

GOLDEN MINING DIVISION.

This Division, occupying the northerly portion of East Kootenay, has experienced more mining activity than for a number of years. In this connection it is very gratifying to note that important interests are directing their attention to the development and exploration of several well-known properties which have been lying idle for a number of years.

Monarch. This property, which is situated at Field, was acquired last year by the Pacific Mines Petroleum and Development Company, Limited, of Vancouver. A. W. Davis was in charge during the year. The development principally consisted of driving a 700-foot incline raise, 7 by 8½ feet, which now provides connection between the old and new workings. The installation of a 3-rail tram is contemplated in this raise to connect with an aerial tram to the mill, which will probably be built next year. The mill-site is in the Kicking Horse valley, near the main line of the Canadian Pacific Railway. For further reference *see* Annual Report for 1925.

Giant. This property was acquired under option by the Pacific Mines Petroleum and Development Company, Limited, during the summer. Surveying followed by diamond-drilling was undertaken, with results which are reported to have been highly satisfactory and sufficiently encouraging to warrant further development by tunnelling. A. W. Davis, who is in charge of the work, estimates from diamond-drill records a probable 15,000 tons assaying: Silver, 11 oz. to the ton; lead, 25 per cent.; and a probable 100,000 tons of low-grade ore. In the area prospected one drill is reported to have cut 8 feet of ore averaging: Silver, 18 oz. to the ton; lead, 35 per cent.; also a foot-wall streak having a width of 4 feet and assaying 6 oz. silver to the ton and 34 per cent. lead. A 600-foot crosscut is now being driven to tap this ore, from which, it is anticipated, shipments will be made in the spring.

Ruth-Vermont. This property, comprising a group of claims including the *Ruth, Minnie,* and *Charlotte*, was acquired during the year by the Galena Syndicate, in which British capital is interested, on the recommendation of G. W. Edwards, a mining engineer, who came out from London to look over the field in 1926. The claims are situated on Vermont creek, a tributary of the Spillimacheen river, and about 23 miles by trail from Carbonate Landing on the Columbia river.

When the property was last operated, a good many years ago, a winter sleigh-road was built from the mine to Wells Landing, some 8 miles farther up the Columbia. This old road, which has now become more or less obliterated, is not a practical route on account of long grades which cannot be avoided. The only feasible route appeared to be down the valleys of the South

and Middle forks of the Spillimacheen. Since visiting the property in September this latter route was chosen and according to recent reports a new sleigh-road will be cut through to connect with the mine by the end of the year. The length of haul to the railway at Spillimacheen will be approximately 32 miles. The mine cabins are situated in timber at an elevation of 5,650 feet and at a short distance from the workings, which are located in the rugged hillside rising abruptly for several thousand feet to the summit of the ridge.

Since the acquisition of the property development and exploratory work has been vigorously pursued with a crew of about seventeen men and it is intended to carry on underground work during the winter with a smaller crew.

The area examined appeared to occupy a fractured zone in which a number of veins had been exposed having a north-westerly strike and cutting the formation of slate and limestone at a steep angle. Development was being confined to two of these veins on which no previous work had been done. The old workings, from which a small tonnage of ore had been shipped many years ago, consisted mainly of a deep open-cut located farther to the west.

On the easterly or No. 1 vein there had been three tunnels driven, briefly described as follows: At an elevation of 6,400 feet the No. 1 tunnel had been driven on the vein for about 20 feet. The ore, consisting of galena, zinc-blende, and iron sulphides in a quartz gangue, outcrops at the portal of the tunnel and can be seen in the bluffs above. A sample taken across 20 inches at the portal of the tunnel gave the following returns: Gold, 0.22 oz.; silver, 50.78 oz. to the ton; lead, 43.8 per cent.; zinc, 10.1 per cent.

At an elevation of 6,350 feet the No. 2 tunnel had been driven on the vein for 26 feet in loose ground. The ore-streak here was narrow but the ore was of good grade, as indicated by a grab sample taken from a small pile of sorted ore, which gave the following returns: Gold, 0.06 oz.; silver, 88.56 oz. to the ton; lead, 63.4 per cent.; zinc, 4.1 per cent.

At an elevation of 6,200 feet the No. 3 tunnel has been driven on the vein for 60 feet, for which distance the ore is continuous along the roof of the drift and has an average width of from 10 to 12 inches. A sample taken across 10 inches assayed: Gold, 0.08 oz.; silver, 96.48 oz. to the ton; lead, 50.1 per cent.; and zinc, 7.5 per cent. The strike of the vein as determined in this tunnel was N. 35° W. and dip 75° to the south-west.

The No. 2 vein is similar in character to the No. 1 and had been explored by two short tunnels, which disclosed similar widths and character of ore. These two veins are well-defined fissures traceable over a vertical range of 500 feet. Ore was exposed at all the various workings and conditions appeared promising for continuity, but not sufficient drifting had been done to determine the length of the ore-shoots. While the width of ore was narrow, it is not unreasonable to expect that conditions in this respect might easily improve with further development, due to changes in the character of the wall-rock or to the influence of structural movements.

However, that which appealed to the writer as one of the most interesting features of the property was the disclosure in the face of an old tunnel (called the "Nelson" tunnel, elevation 6,100 feet) of a width of 3 feet of sulphide ore which appeared to be a replacement deposit conforming to the dip and strike of the enclosing argillites. Its continuation on the dip was exposed in the face of a bluff some 150 feet higher up the hill.

A sample from the ore exposed in the Nelson tunnel, composed of a finely crystalline mixture of lead, zinc, and iron sulphides, gave the following returns: Gold, 0.02 oz.; silver, 26.01 oz. to the ton; lead, 24.8 per cent.; zinc, 25.7 per cent. This, of course, is a very desirable grade of milling-ore and judging by indications there should be good possibilities for developing an important ore-body.

The old workings from which ore was formerly extracted for shipment could not be examined on account of snow, but at an elevation of 6,100 feet an old tunnel, now known as the "Blacksmith," had been driven into the hill with, presumably, the objective of exploring the downward continuation of the ore in these old surface workings. This old tunnel affords probably the best and safest place to carry on future exploration of the vein system at depth, and preparations were being made to carry on development-work from this point during the winter months.

Iron Ore.

Rumours have been current during the last year or so that a large body of magnetite-iron ore had been discovered near the headwaters of Moose creek in the Rocky mountains, which resulted in a few inquiries being made at this office.

The mining records at Golden show that claims had been staked on the north-east side of the headwaters of Moose creek by Pedley and Smith. This area is covered by J. A. Allan's report as published in Memoir 55 of the Geological Survey. In 1925 J. F. Walker visited the area in question. He examined the occurrence of a mineral high in titanium occurring in a basic pegmatite. This mineral was first determined by the British Columbia Bureau of Mines as being perovskite. Later, samples were sent to the Ottawa Mines Department and there determined by H. V. Ellsworth as being knopite or ceriferous perovskite. A report by H. V. Ellsworth and J. F. Walker describing the occurrence and giving details of a chemical and mineralogical examination of the mineral is contained in the 1925 Summary Report, Part A, G.S.C. It is evident from this report that the mineral only occurs in small quantities and is therefore not of commercial value, but only of scientific interest.

As regards the iron-ore deposits, Dr. Walker states in a letter to the Resident Engineer as follows: "It seems to me that they consider the area of ultra basic rock mapped by Allan and containing 14–15 per cent. magnetite to be an iron ore."

Placer-mining.

A syndicate composed principally of railway-men of Medicine Hat was formed during the year to provide capital for working gold-placer deposits up Quartz creek at the instigation of C. P. Price, more popularly known as "Kid" Price. Quartz creek flows into the Columbia river at Beavermouth, on the main line of the Canadian Pacific Railway.

Soon after the early placer excitement on Wildhorse creek at Fort Steele, the discovery of gold on Quartz creek attracted the attention of the "old-timers." To-day their diggings are hardly discernible, while the old cabins have long since rotted away. What luck attended these early placer operations is not known, but it is thought that the large percentage of boulders encountered seriously interfered with profitable working of the gravels by ground-sluicing methods.

As gold was found to exist some 500 feet above these old creek diggings the presence of an old channel was assumed, and to explore same the present work was started at an elevation of approximately 6,000 feet above sea-level and a number of leases staked along its probable course. The distance from Beavermouth to the workings is between 10 and 12 miles.

A small pit which had been hydraulicked during the latter part of the season exposed the bed-rock, which consists of a soft decomposed slate-schist. On top of this glacial boulders and clayey gravels had been deposited to a depth of about 7 feet. This material is not stratified but remains as left by the glacier. About 13 oz. of gold was recovered during the short period of operation. This gold was fairly coarse and rough, some of it having little quartz attached; hence it evidently had not travelled far and owed its origin to the erosion of some quartz vein or veins by glaciation.

The season's work, which was mostly accomplished by those interested financially in the undertaking, was quite a remarkable performance. It included the building of two cabins, excavating about 2 miles of ditch, building a penstock, laying two lines of wire-wound pipe, each 800 feet long, and the building of a sluice-box. All the supplies had to be packed in over a poor trail and the lumber was whip-sawn.

WINDERMERE MINING DIVISION.

Probably the most important event in the season's activities in this Division was the acquisition of the *Paradise* mine by R. H. Stewart on behalf of the Victoria Syndicate, of London. The property belongs to the Hon. R. R. Bruce, who for many years has been identified with its operation. It has been a small but steady producer of silver-lead ore, which occurred in an oxidized form known as "sand carbonates" in a leached and crushed zone. The mine was opened by adit-tunnels and the ore was extracted by pick and shovel, no powder being necessary in stoping operations. The only equipment the property could boast of was a short length of tram to the bins at the head of the wagon-road and a 3-ton White truck.

However, as depth was gained the "carbonates" became less plentiful and it was no great surprise to those familiar with conditions when primary sulphide ore made its appearance in the lower workings. This ore is essentially of milling grade; hence the management was faced with the necessity of a development campaign to ensure sufficient tonnage to warrant the considerable capital outlay in the installation of a concentrator and tramway.

With this object in view the Victoria Syndicate lost no time in making the installation of the necessary plant to facilitate the further development and exploration of the property. The plant consists of a 2-stage Ingersoll-Rand compressor and a 90-horse-power Vickers-Petter oil-engine. When the property was visited in August the development of the new ore-body had been confined to drifting and a little crosscutting from two intermediate levels, the No. 1 and No. 2, being 90 and 122 feet respectively above the No. 4 level, which latter is the lowest adit of the mine-workings.

The ore exposed in these workings consisted of disseminated lead, zinc, and iron sulphides in a siliceous lime gangue. It appeared to occupy a sheared zone having a width of about 50 feet and a strike of N. 30° W. The Intermediate drift No. 2 cut this ore at an oblique angle and had not determined its true length. A grab sample taken from a muck-pile in this drift, and which was considered to be fairly representative of the full width exposed in the roof, gave the following returns: Gold, trace; silver, 7.8 oz. to the ton; lead, 8.9 per cent.; zinc, 18.5 per cent.

The No. 1 Intermediate is only 32 feet below the No. 2 and had been driven in the same ore-body for a distance of 65 feet; the face of the drift was in ore. These workings lie beyond the end of the Main adit No. 4, which presumably will be extended to explore the downward continuation of the ore-body.

Lead Queen.

This property, comprising a group of eight claims and two fractions, is situated near the headwaters of Frances creek at a distance of approximately 24 miles by road from the railway at Brisco. It was originally located by Tom Brown, of Wilmer. Since its discovery some twenty years ago it has been worked intermittently in a small way and occasional shipments of silver-lead ore made to Trail. According to the records the total amount shipped up to the end of 1919 was 266 tons. Its altitude, distance from transportation, and lack of equipment have seriously handicapped profitable operations in the past. In 1925 the property was acquired by New York interests and a crew of men was put to work during the latter part of the season. Work was continued during 1926 under the direction of F. M. Simmonds, a mining engineer of New York.

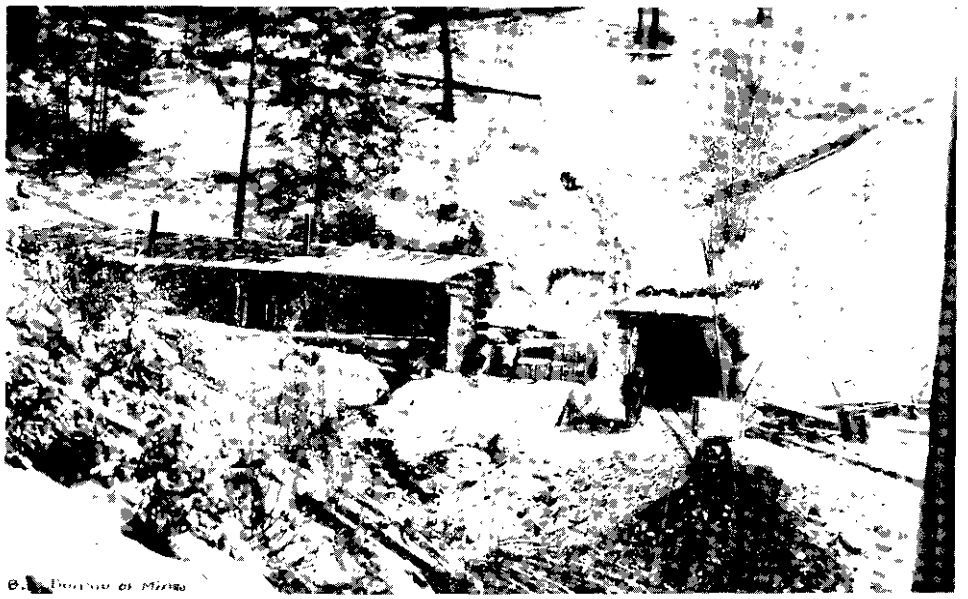
The vein occupies a sheared fracture in a dolomitic limestone and quartzite formation. It is persistent and well defined by a heavy streak of gouge on either wall. The ore occurs in lenses of finely crystalline galena in the sheared filling between walls, which in places are 15 feet apart.

The work done in 1926 was confined to the development of the vein from the No. 2 level. This level is situated at an altitude of 7,850 feet above sea-level and consists of a crosscut 345 feet long from the surface to the intersection of the vein. From the point of intersection the vein had been drifted on for a distance of 50 feet to the north and 50 feet to the south. At the north end face of the drift a 25-inch width of ore was exposed, which apparently had a tendency to widen in the bottom. A sample taken across 25 inches gave the following returns: Gold, 0.01 oz.; silver, 60.2 oz. to the ton; lead, 51.2 per cent.; zinc, 1.3 per cent. This ore-shoot had only been drifted on for about 15 feet. At the south end the drift was in sheared ground, in which values were principally confined to a streak 9 inches wide, a sample across which ran: Gold, 0.01 oz.; silver, 13.4 oz. to the ton; lead, 25.7 per cent.; zinc, 2.5 per cent. The strike of the vein as determined in these workings was N. 15° W. and dip 45° to the west. Wherever encountered the ore seemed to be stronger in the bottom than the top of the drift. This level is 110 feet below the No. 1, from which ore for shipment had previously been extracted.

In order to facilitate the handling of ore and supplies a 2-bucket tram 3,500 feet in length was installed during the summer, connecting the mine-workings with ore-bins at the end of the wagon-road. The track-cable is ⅝ inch, the haulage-line ⅜ inch, and the buckets have a capacity of 500 lb. Many improvements made around the camp added greatly to the comforts of the men and include a new cook-house. Before closing down for the winter a car-load of ore was shipped to Trail. It is the intention of the management to continue operations in the spring as soon as weather conditions permit.

Key.

This property, comprising a group of seven claims and formerly known as the *Beulah* group, was acquired under option by W. A. Drayton in 1925. On account of its high altitude its development and exploration have necessarily been confined to a somewhat limited period each year. The camp, which consisted of several large tents, was situated on a slight bench of the side-hill at an elevation of 7,700 feet and at a distance by trail from the North fork of Toby Creek wagon-road of about 3½ miles. The length of haul from the railway is approximately 23 miles. A rough trail of about a mile in



Giant Mine Portal, Golden M.D.

Giant Mine, Golden M.D.

length led from the camp to the workings, situated at an elevation of about 9,450 feet, in rugged summit country and surrounded by alpine-like scenery of unusual grandeur.

The vein is a small but well-defined fissure in a dolomitic limestone of the Mount Nelson formation. It has a strike of N. 20° W. and dip of 70° to the east. The ore, consisting of fine-grained galena with which is associated small values in copper and zinc, occurs in lenses occupying rolls or swells in the vein. Practically all the work had been confined to open-cuts along the outcrop, the deepest of which was 85 feet long and reported to be down 30 feet. This was full of snow so could not be examined, but a few hundred sacks of ore extracted from this cut were piled ready for shipment. Following along the strike in a northerly direction other open-cut work has disclosed narrow widths of ore, and at a distance of about 160 feet, in the uppermost open-cut, elevation 9,450 feet, a width of a few inches of massive galena was exposed along the bottom for a length of about 16 feet. A sample taken here across a width of 5 inches gave the following returns: Gold, trace; silver, 83.4 oz. to the ton; copper, 2.77 per cent.; lead, 69.8 per cent.; zinc, 5.2 per cent.

As grey copper was noticed in some of the ore here, much higher values might be obtained, but would not be representative of the average grade; for instance, a sample taken across a 2-inch streak of oxidized material at the surface assayed: Gold, 0.07 oz.; silver, 368.2 oz. to the ton; copper, 16.59 per cent.; lead, 12.7 per cent. Samples taken of sacked ore by J. D. Galloway, Provincial Mineralogist, who accompanied the writer on the trip, showed an average value of: Gold, 0.01 oz.; silver, 58.5 oz. to the ton; lead, 50 per cent.; copper, 0.8 per cent.

An old tunnel had been started to explore the vein and if continued would gain a depth of about 150 feet below the surface exposures at the open-cuts. As the ore apparently had a tendency to widen with depth, the driving of this tunnel should demonstrate the possibilities of the property.

In order to lower the ore-sacks to the trail below the camp two light aerial trams had been erected, one 250 feet in length and the other, the lower terminal of which was located near the camp, consisted of a single span of 3,750 feet. A third tram was contemplated; this would consist of a span of 3,000 feet and would land the ore at a point on the trail 3,500 feet below the workings and at a distance of about 1½ miles from the wagon-road.

A crew of eight to ten men was employed during the season and a shipment of 58 tons was made to the Trail smelter.

Among the numerous minor activities the following have been reported: At the *White Cat*, on Slade creek, a small crew of men was employed during the season and a shipment of 35 tons of silver-lead ore was made to Trail. On Toby creek the Silver Spray Mining Corporation, of Vancouver, had a small crew employed during the summer on the development of the *Silver Spray* group, owned by Murdoch McLeod. The option held by the company was not exercised and work was abandoned in the fall.

During the latter part of the season the *Mineral King* was leased by the owners, the Windermere Mining Company, of Vancouver, to Mr. Sontag, of Seattle, who, it is understood, intends to operate the property. The *Outlet* and *Outcrop* claims on the North fork of Toby creek were partly acquired by C. V. Sommerville and it is understood that a trail was constructed and preparations made for establishing a camp. According to recent reports the Silver Spray Mining Corporation has acquired the *Hot Punch* under option and intends to carry on development-work.

On Law creek W. A. Drayton had a crew of men working during the season on the *Scout* group.

List of Shipping-mines in the Windermere Mining Division, 1926.

Mine.	Locality.	Tons.	Character of Ore.
Daisy	Lake Windermere	2	Silver-lead.
Key	Invermere	28	Silver-lead.
Paradise	Invermere	691	Silver-lead.
Star	Windermere	3	Silver-lead.
White Cat	Lake Windermere	34	Silver-lead.
Silver Spray and Hot Punch	Invermere	13	Silver-lead.
Lead Queen	Windermere	35	Silver-lead.
Total		806	

FORT STEELE MINING DIVISION.

The year witnessed more than usual mining and prospecting activities. In the Kimberley area many more claims were staked, some by the Consolidated Mining and Smelting Company and a large block by the Western Exploration Company, of Cranbrook, of which R. A. Grimes is manager. These with previous stakings cover a very large area around the original holdings of the *Sullivan* mine. To the east of the *Sullivan* diamond-drilling was continued on a group of claims held by R. M. Bennett and associates, of Minneapolis. Unfortunately in the area surrounding the *Sullivan* there are few indications which can be accepted as a useful guide as to what may be expected below; hence diamond-drilling more or less at random has largely to be depended upon to reveal the presence of possible ore-bodies.

Sullivan Mine.

The production of the *Sullivan* mine has been well maintained throughout the year at 3,000 tons a day. The underground development has been satisfactory and has added to the already immense ore reserves. Many improvements have been made in the mine, including the replacement of timbering in the main tunnel by concrete posts and steel I beams. The rails in the main haulage-ways are 70-lb., while 45-lb. rails are used for side-tracks. The gauge of the tracks is 36 inches. Ore is hauled from the lower workings by 6- and 12-ton electric locomotives; the ore-cars are of 80 cubic feet capacity and are known as Granby side-dump cars.

The length of the low adit-tunnel, known as the "3,900," is 11,500 feet. It is a 10- by 12-foot tunnel, driven parallel to the ore-bodies in the foot-wall quartzite. At a distance of 9,000 feet from the portal it intersected the North ore-body, due to a change in strike. The vertical distance between the "3,900" level and the "Upper mine," known as the "4,600 level," is 700 feet, which represents a depth of about 1,500 feet on the dip of the vein. To gain further depth below the 3,900 sinking will be necessary. No timber is used in the stopes, pillars being left to support the roof, and it is estimated that about 15 per cent. of the ore is left in the pillars. About 9 tons a day to the man underground is produced. It is interesting to note that, of the men employed, 36 per cent. are Canadians, 24 per cent. are "Old Country" British, 13 per cent. Scandinavian, 13 per cent. Italian, 10 per cent. of other European nations, and 4 per cent. Americans. For further references *see* paper given by M. M. O'Brien, assistant superintendent, at the Western meeting of the C.I. of M. & M. at Cranbrook, October 15th, and published in Bulletin No. 176 (December, 1926) of the institute.

Sullivan Concentrator.—Among improvements made to this plant has been the addition of a re-treatment plant for the treatment of the zinc rougher middlings and tailings of the zinc-cleaners. Two Hardinge mills, 8 feet by 48 inches, are used for the further grinding of this material. The feed first goes to a 20-foot surge-tank. The underflow from this is pumped to a standard Dorr classifier, the sands from which are fed to one of the mills, while the overflow constitutes feed for the flotation-machines. The flotation product, of about 10 per cent. lead and an equivalent amount of zinc, is returned to the main grinding circuit. The tailings form the feed for the zinc-flotation. The resulting zinc concentrate, containing approximately 30 per cent. zinc and 1.9 per cent. lead, joins the zinc rougher concentrate in the cleaners. The main factor in mill equipment which will be responsible for increasing the capacity from 3,000 tons to 4,000 tons a day is the replacement of the primary 8-foot by 48-inch Hardinge mills by four 10-foot by 48-inch Hardinge mills, together with two quadruplex 16- by 20-foot Dorr classifiers.

For further reference to the *Sullivan* concentrator *see* paper read by H. R. Banks at the Western meeting of the C.I. of M. & M. at Cranbrook, October 15th, and published in Bulletin No. 176 (December, 1926) of the institute.

Stemwinder.

The operations of this property by the Porcupine Goldfields Development and Finance Company, Limited, rank next in importance to that of the *Sullivan* in this part of the district. During the year 28,000 tons were mined and shipped partly to Trail and partly to the *Snowstorm* custom mill at Troy, Montana. All the ore shipped was of milling grade. This tonnage represents the output of the *Stemwinder* for the last eight months of the year; previously to this the company was occupied in carrying out exploration-work by diamond-drilling and the Lundberg electrical prospecting methods.

The manager states that exploration and development work has not yet reached its logical conclusion, so it is not possible to say what the final result will be. Forty men were steadily employed at the mine.

At Moyie the Consolidated Mining and Smelting Company started up its new 500-ton concentrator during the summer on zinc middlings from the *Sullivan* concentrator and later switched it on to the tailings from the old *St. Eugene* mill.

These tailings form a big pile at the edge of Moyie lake and are being recovered by a floating suction-dredge, which pumps them into a large settling-pond. A clam-shell dredge excavates this material from this pond and dumps it into the mill-bins.

This concentrator is up to date in every particular; its simplicity in design and the small amount of floor-space occupied in comparison to the tonnage treated bear evidence of the great strides made during recent years in the concentration and separation of the metallic contents of this class of ore.

The grinding equipment consists of one primary Hardinge and two secondary Hardinge mills, each mill working in circuit with a Door classifier. The overflow from the secondary classifiers goes to a surge-tank, which feeds a 20-cell M.S. flotation-machine, where a lead concentrate carrying up to 70 per cent. lead, a zinc concentrate carrying about 51 per cent. zinc, and a middlings product are made. The middlings is returned to the circuit. The feed is said to carry about 2 to 3 per cent. lead and 5 per cent. zinc. The ore is amenable to treatment, being practically free from iron.

During the fall of the year the installation of a coarse-crushing plant was being made. It consists of a gyratory crusher and rolls and is intended for the treatment of ore from the old dumps of the *St. Eugene*.

Aurora. This property, which is situated on the west side of Moyie lake, opposite the *St. Eugene* mine, was acquired during the year by the Moyie Mining Syndicate, of Cranbrook. The Government assisted in building 2½ miles of road to the mine in order to connect it with the railway at Aldridge Siding. Since starting operations in the summer the mine has shipped a considerable tonnage of milling-grade ore to Trail. It is understood that a compressor is being installed. The mine is under the management of W. G. Smith.

Boy Scout. This group, consisting of four Crown-granted claims, is situated on Hell-roaring creek at a distance of approximately 4½ miles by trail from the wagon-road at St. Mary lake. It is owned by A. H. Mayland, of Calgary, and Mrs. John Bennett and N. A. Wallinger, of Cranbrook. The workings are located on the steep wooded hillside of the creek-valley. The vein, which has a south-easterly strike and a dip of about 60° to the south, apparently occupies a sheared zone in quartzites. It has been developed by two adit-tunnels. The No. 1, at an elevation of 5,175 feet above sea-level, was driven south-easterly for about 70 feet in the hanging-wall, when it was turned to the north-west and cut the vein in a few feet, exposing a 12-inch streak of finely crystalline lead, zinc, and iron sulphide ore. A sample across this width gave the following returns: Gold, 0.01 oz.; silver, 4.1 oz. to the ton; lead, 15.8 per cent.; zinc, 8.5 per cent. This ore was followed for 30 feet.

The No. 2 tunnel had been driven at a point 125 feet farther down the hill. For the first 70 feet it is in the foot-wall of the vein, which latter was encountered by a short crosscut. The vein-filling here principally consists of sheared and iron-stained quartzites, carrying small values in lead and zinc across a width of about 3 feet. A sample taken across 31 inches, which showed the most mineralization, assayed: Silver, 2.4 oz. to the ton; lead, 5.8 per cent.; zinc, 1.1 per cent. Past this the tunnel after wandering around in the foot-wall for about 50 feet turns into the vein, which is followed for a short distance. The ore exposed in the side of the drift is similar in character to that exposed in the No. 1 tunnel and in a short crosscut a width of 20 inches is exposed. A sample taken here gave the following returns: Gold, 0.01 oz.; silver, 3 oz. to the ton; lead, 16.5 per cent.; zinc, 8.1 per cent.

To further explore this ground the owners had let a contract for driving a 500-foot tunnel at an additional depth of 200 feet. W. J. Scorgie, who had taken the contract, installed a small portable oil-engine and compressor. A new cabin was built for the accommodation of the men.

Homestake. Situated on Perry creek. Operations were continued by the Cranbrook Gold Mining Company, Limited, of which W. S. Santo, of Cranbrook, is secretary. It is briefly described in the Annual Report for last year. When visited in April of this year the low tunnel had been advanced for a total distance of 500 feet and was within a few feet of its objective—namely, a point under the old shaft from the surface. The tunnel followed a sheared fault-fracture, the filling between walls being composed of broken country-rock, schist, and quartzite.

Several small stringers of quartz were encountered, but no ore in sufficient quantity to be considered of commercial importance. A sample from a 3-inch stringer of quartz assayed as follows: Gold, 0.36 oz.; silver, 1.5 oz. to the ton. A crosscut near the end of the tunnel revealed the width of sheared material to be about 7 feet; a sample across this width gave the following returns: Gold, 0.03 oz.; silver, 0.1 oz. to the ton. While the values in this tunnel were disappointing, the values obtained from several samples taken in the old shaft were encouraging; for instance, one sample taken across about 30 inches at a point 15 feet below the collar of the shaft gave the following returns: Gold, 0.21 oz.; silver, 0.2 oz. to the ton. Another sample taken 25 feet down across 27 inches assayed: Gold, 7.22 oz.; silver, 0.8 oz. to the ton.

This shaft is said to be down 60 feet, but as the ladders were not considered safe it could not be examined. Presumably the owners had satisfied themselves that good average values were obtainable in these old workings and that conditions warranted the expense of driving the long tunnel to further explore this ground.

At some little distance and entirely separate from these workings there are some old workings which are now in a caved condition. The dump of the old tunnel was a mixture of quartz and waste. A sample of some of the best-looking quartz from this dump assayed: Gold, 0.18 oz.; silver, 0.2 oz. to the ton. During the winter of 1925 the camp buildings were destroyed by fire and when the property was visited tents were being used.

Black Bear and Mabel.

This property is situated on the Kimberley–Cranbrook road at a distance of about 1½ miles from Kimberley. G. J. Spreull, of Cranbrook, is the agent for the property. The claims are of long standing and were prospected many years ago but no work has been done in recent years. The surface of the *Black Bear* is fairly flat and the only evidence of mineralization is a little iron-stained quartzite on which an incline shaft had been sunk to a reported depth of 100 feet. This was full of water and therefore could not be examined. However, judging from the dump, a little ore had been encountered, probably along the contact of diorite and quartzite. The ore consisted of coarsely crystalline galena associated with zinc-blende and iron pyrites in a quartz gangue.

On the *Mabel*, which adjoins the *Black Bear* to the south-east, there is evidence of a small vein occupying a tight sheared fracture in quartzite. This had been prospected by a shallow shaft and a little trenching. Of the two showings, that on the *Black Bear* appeared to be the most interesting; but owing to the shaft being inaccessible there was little to be seen.

Copper King.

This claim is situated on Bull river and is owned by W. S. Santo, of Cranbrook. When the property was visited during the early part of the season the long low crosscut tunnel which was being driven to intersect the vein at a depth of 150 feet below the upper workings had been advanced for a total distance of 347 feet and should soon reach its objective.

Great Western.

This group is situated at the head of Little Sand creek and at a distance of about 9 miles by road from the railway at Jaffray. The property, comprising nine claims, is owned by Alvin Benson and associates, of Cranbrook. The surface of the hillside in the vicinity of the workings is covered to a considerable depth with overburden; hence few rock-exposures are visible, except in the creek-bed, where the formation consists of uniformly bedded slates. The vein, upon which considerable prospecting-work had been done, is a strong quartz-filled fissure cutting the formation at a steep angle and striking easterly and westerly.

At an elevation of 4,500 feet a tunnel 63 feet in length had been driven, for which distance the vein was strong and well defined, its filling consisting of quartz, spathic iron with lead, zinc and iron sulphides. A sample taken across 18 inches at the face of the tunnel gave the following returns: Gold, 0.01 oz.; silver, 1.9 oz. to the ton; copper, 0.21 per cent.; lead, 5.9 per cent.; zinc, 6.6 per cent. A grab sample taken from about 50 tons on the dump assayed as follows: Gold, 0.01 oz.; silver, 3 oz. to the ton; copper, 0.32 per cent.; lead, 11.4 per cent.; zinc, 2 per cent. A sample of sorted ore assayed as follows: Gold, 0.01 oz.; silver, 9.4 oz. to the ton; lead, 33.5 per cent.; zinc, 0.8 per cent.

It is claimed that similar ore has been found in the direction of the strike of the vein on the top of the ridge 1,000 feet or more away. Another tunnel was being started on the vein where it had been disclosed in the creek-bed. This tunnel will gain an additional depth of

approximately 300 feet. Apparently the vein is persistent, well mineralized, and further development may open up some important ore-shoots.

Belleville.

These claims, which are of long standing, are owned by J. Hamilton, of Cranbrook. During the season they were worked under option by R. H. Finley and associates. The property is situated at a distance of about 5 miles from Lumberton. It is easily accessible by road and a short length of trail. The area is underlain by Aldridge quartzites which have been intruded in the vicinity of the workings by diorite sills.

The work done by the owner some years ago, and now in a caved condition, consisted of three shafts, the deepest of which is said to be 60 feet. As good-grade zinc ore is said to have been encountered in one of these shafts, a crosscut tunnel 300 feet in length had been driven. This cuts a quartzite formation and then enters diorite. At the contact of the quartzite and diorite there is a sheared zone filled with soft decomposed material, caused, no doubt, by movement and subsequent oxidation of the iron sulphides contained in the igneous rock. This zone had been drifted on for 100 feet to the north-west. In the face of the drift some ledge-matter was encountered consisting of iron sulphides and a little quartz, with a little galena showing in places.

At the time of examination the property was in the prospective stage of development; no ore-body of commercial importance had been developed, but indications appeared to warrant further work being done. A sample from a small pile of sorted ore which had been extracted from the tunnel gave the following returns: Gold, 0.03 oz.; silver, 10.5 oz. to the ton; lead, 4.2 per cent.; zinc, 1.1 per cent. A small crew of men was employed.

Silver and Lead.*

These properties, owned by J. W. Blake and family, of Skookumchuck, are situated at and near the head of an unnamed creek flowing into Lavington creek, which is a tributary of Findlay creek. The *Silver* group, which is at the head of the creek, consists of the *Cougar*, *Morning Star*, *Columbia*, and *Eagle* claims. The *Lead* group, 2 miles lower down the creek, consists of the *Mammoth* and *Superior* claims.

The present route to the properties is from Blake's camp, 2 miles north of Torrent Siding on the Kootenay Central Railway, by pack-trail, an estimated distance of 10 miles to the *Lead* group and a further 2 miles to the *Silver* group. This trail crosses the low divide west of the Columbia River valley and contains unnecessary adverse grades, whereas the natural route would be following the water-grade to the upper end of the Findlay Creek road at Cushing's ranch (some 4 miles from the *Lead* group).

The general formation of the area consists of schists and altered sedimentaries intruded by stocks and sills of granite. The *Silver* group deposit, consisting of oxidized silver-lead-zinc ore, occurs in a band of altered and in places decomposed limestone. At an elevation of about 7,300 feet, or a few hundred feet below the summit of the ridge forming the rim of a small glacial basin, shallow outcrop workings expose oxidized material containing streaks and bunches of carbonates containing small nuggets of galena. The rocks are considerably disturbed and shattered locally and the strike and dip of the sedimentaries could not be determined with accuracy. The shallow workings do not definitely indicate the character of the deposit, but the vein apparently strikes southerly or diagonally along the steep hillside, with very steep dip to the west, conforming to the bedding of the enclosing rock.

About 40 feet below the outcrop a crosscut tunnel has been driven some 120 feet south-easterly to crosscut the ledge, which should have been struck at a short distance inside the portal. At the point where the ledge should have been encountered close timbering prevented an examination of the rock, but it is understood that decomposed and oxidized material necessitated the extra timbering. No drifting was done on this material, which was probably the vein. The following samples were taken:—

Description.	Gold.	Silver.	Lead.	Zinc.
	Oz. per Ton.	Oz. per Ton.	Per Cent.	Per Cent.
Sorted and sacked carbonates from open-cut above tunnel	0.04	10.6	19.8	10.7
Streak of galena and oxidized ore in open-cut above tunnel	0.03	20.4	22.1	26.5
Green-stained oxidized material from same place	0.02	2.7	13.1	.....

The shallow cuts and inconclusive work done in the tunnel do not supply enough information to enable one to form any definite opinions regarding the probable extent or continuity of the deposit, which requires further superficial exploration.

The *Lead* group deposit occurs in a granodiorite sill which forms the base of some steep bluffs just above the cabin at about 5,800 feet elevation. Two short tunnels spaced a short distance vertically apart have been driven as crosscuts into the granite. At the time of the writer's visit in August a flat winze was being sunk at the inner end of the tunnel. The mineralization, consisting of veinlets and stringers of galena and pyrite and sparsely disseminated lead and iron sulphides, occur widely separated over a considerable width in a sheared and silicified zone in the granite. The mineralization dips flatly into the hill, approximating the dip of the schists which contact with the granite just above the workings. No samples were taken in the workings owing to the scattered character of the mineralization. A grab sample from a pile of material extracted from the winze in the upper tunnel assayed: Gold, 0.02 oz.; silver, 4.2 oz. to the ton; lead, 6.8 per cent.; zinc, 2.4 per cent.

Among other activities, the Evans Bros. put in a season at their claims on Whitefish creek. J. Angus continued work on his Hellroaring Creek property, and development of the *Brenda* group on Copper creek was continued under the direction of Dan McIntosh.

Placer-mining.

There was not a great deal of activity during the season in placer-mining, the principal operations being confined to Wildhorse creek, where W. A. Drayton had a small crew at work testing the gravels on the east side of the creek.

Gypsum.

Gypsum was mined by the Canada Cement Company near Mayook Siding on the Crowsnest Railway. It is reported that the Manitoba Gypsum Company intends to further develop its property near Wardner.

Phosphate.

The Consolidated Mining and Smelting Company carried on exploration of an extensive area of phosphate-bearing rocks in the vicinity of Michel. With reference to this work, S. G. Blaylock, general manager, states: "The phosphate-bearing rocks seem to be spread over a fairly large area. Some of the beds contain a fairly good percentage of phosphate and may be workable for the manufacture of fertilizer. If satisfactory methods can be worked out for treating this medium-grade material and markets can be obtained, there is sufficient phosphate to make a very large industry."

List of Shipping-mines in the Fort Steele Mining Division, 1926.

Mine.	Locality	Tons.	Character of Ore.
Sullivan	Kimberley	1,081,989	Silver-zinc-lead.
Stemwinder	Kimberley	28,241	Silver-zinc-lead.
Aurora	Moyie	1,690	Silver-zinc-lead.
St. Eugene	Moyie	86,992	Silver-zinc-lead.
Comet	Galloway	19	Copper.
Total		1,198,931	

SLOCAN MINING DIVISION.

The season's activities are reflected in the long list of shipping-mines which accompanies this report. The increase in production was greatly stimulated by the acceptance of milling-ore by the Consolidated Mining and Smelting Company at Trail, which benefited the large and small producer alike. The following résumé gives a brief outline of the most notable features of the season's mining activities in this famous Mining Division:—

The *Silversmith* mine, which still ranks first among the independent shippers of the district, started the year by making an exceptionally good showing, but shipments fell off towards the latter part and were suspended in December. The *Lucky Jim* produced a large tonnage and

Part of Kimberley, B.C.

Fernie, B.C.—Phosphate-rock Prospects in Foreground.

new developments were attended by satisfactory results. At the *Ruth-Hope* recent developments in the lowest level give rise to expectations that this mine will soon rank among the most important shippers of the district. The Victoria Syndicate, of London, has acquired a number of claims and an extensive development and exploration campaign is being proceeded with under the direction of R. H. Stewart. The *McAllister* mine at Three Forks made a very good showing until the decline in the price of silver took place, when operations were suspended, the principal values being in silver.

The drop in the price of silver has not greatly affected activities at the numerous silver-lead-zinc properties; although it naturally made a difference to their earning-powers, it did not prevent profitable production.

SANDON CAMP.

Silversmith. This mine is owned by the Silversmith Mines, Limited, of which John B. White, of Spokane, is president and Oscar V. White, of New Denver, B.C., is manager. The company was incorporated in 1918 with a capitalization of $500,000; par value of the stock is 20 cents a share; assessable to 5 cents. Dividends paid to date amount to $725,000, leaving assets in cash, Government bonds, etc., of over $300,000. As will be seen from the above, the company has made a very creditable showing under the management of O. V. White, assisted by a competent staff both at the mine and the concentrator. Mr. White has been closely identified with active mining operations in the Slocan for many years; in fact, it was under his direction that the famous *Slocan Star* was developed and ranked first among the earlier producers of the Sandon camp.

Upon what was considered to be the depletion of the *Slocan Star* ore-bodies, an amalgamation was effected taking in the *Rabbit Paw* claim and the present company sprang into existence. Under the management of R. H. Stewart the *Silversmith* ore-body was discovered on the 1,000-foot level in 1918, and subsequently mined under the direction of O. V. White.

In order to handle this ore to the best possible advantage the first thing that needed attention was the provision for proper milling facilities, and in 1921 the *Ivanhoe* mill was bought from the Rosebery-Surprise Mining Company; during the same year and the early part of 1922 the remodelling of this plant and the erection of a tramway occupied the attention of the company. The normal output of about 3,000 tons a month was obtained in June, 1922.

During the period under review the *Silversmith* ore-shoot has been responsible for practically the entire output of the mine. In the prospectus published in 1922 Clyde White, the company's mining engineer, estimated the ore reserves to be sufficient to keep the mill running continuously at capacity for five years, and also made reference to ore possibilities in the easterly section as well as in the upper and lower horizons of the mine-workings. When the mine was visited in November the impression gained was that, while a fair tonnage would probably be won from the lateral and downward extensions of the *Silversmith* ore-body, around the edges of the stoped area, the future of the mine now depended on the development of new ore-bodies.

On the eighth level work was being done at the easterly end of the big stope; the ore developed during the summer in a separate shoot lacked continuity and did not come up to expectations; however, an attempt was being made to pick up the downward continuation of this shoot above the ninth level. Work was also being done at the westerly end of the big stope above the tenth level. On the twelfth level a raise was being driven to encounter the downward continuation of the ore exposed along the hanging-wall on the eleventh level. This raise was up 40 feet. No ore-body of commercial importance was exposed on the twelfth level, but this may be due to purely local conditions caused by tight folding at this horizon and should not be taken to signify that the ore is bottomed at this point; in fact, diamond-drilling from the twelfth level no doubt has been encouraging, for it is reported that the driving of a long tunnel is contemplated to develop the downward continuation of the ore-body at an additional depth of 500 feet.

Shipments to Trail were suspended late in the year; the reason given by the management was that they had decided to withhold same until metal prices improved. In the meantime development and exploration are being vigorously undertaken.

Slocan King. This property, which is owned by the Slocan King Mines, Limited, was formerly the property of the Noonday Mines, Limited. It is situated to the east of the *Silversmith* property and covers the possible extension of the

ore-zone in this direction. John B. White and associates, of Spokane, are principally interested in the incorporation of this company.

The group consists of the following claims: *Slocan King, Hidden Treasure, Echo Fraction, Silver Star Fraction,* part of the *Wyoming, Hillside, Edith Fraction, Minnesota,* part of the *Slocan Star,* part of the *Jennie, Eva Fraction, Emma Fraction, Slocan Belle, Ophir No. 3,* and *Morning Sun.* It is understood that it is the intention of the company to carry out the development of this property from the tenth level of the *Silversmith* and that work in this direction is now being undertaken.

Ruth-Hope.

This property is owned and operated by the Ruth-Hope Mining Company, Limited. The capitalization is $1,000,000, divided into 1,000,000 shares of $1 each; registered office, 717 Vancouver Block, Vancouver. The property comprises fourteen Crown-granted claims, situated near the town of Sandon. Mining and development was vigorously proceeded with during the year both at the upper workings and in the lowest level—namely, the No. 5; this latter has no underground connection with the former.

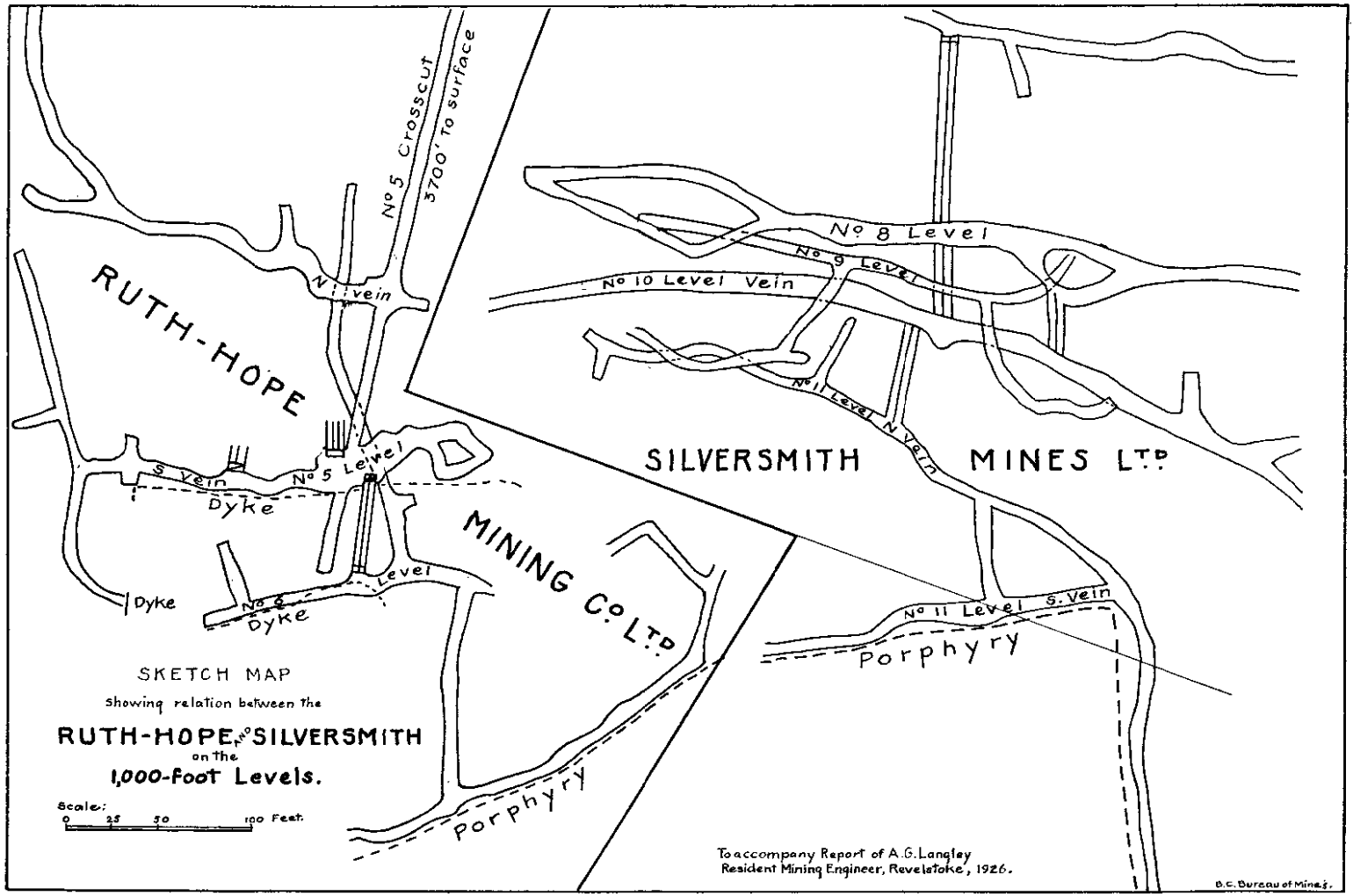
As the future of the property, judging by recent developments, depends largely on the results of the work being done on the No. 5 level, an attempt will only be made to describe this part of the mine. In reviewing the work undertaken during recent years, it may be mentioned that in order to explore the possible westerly extension of the mineralized zone in the adjoining property of the Silversmith Mines, Limited, which has been productive of a large tonnage of high-grade ore, a crosscut 2,700 feet in length was driven from the old workings of the *Ruth* No. 5 level. The total distance from the end of this tunnel to the surface is 3,700 feet. It closely parallels the westerly boundary of the *Silversmith* and has an elevation of 40 or 50 feet below the tenth level of this property; the distance between the workings of the two mines probably does not exceed 50 feet. Ventilation at this distance from the surface has naturally not been all that could be desired, but nevertheless a great deal of work has been accomplished in a comparatively short time.

In the *Silversmith* there are two ore-bearing zones on the tenth and eleventh levels, known as the North ore-body and the South ore-body, which are separated by a considerable width of waste. The *Ruth* crosscut intersected these two zones at 100 feet apart and was continued into the hanging-wall of porphyry. Drifting from this crosscut in a westerly direction along the south ore-zone disclosed small lenses and narrow widths of ore along a length of about 130 feet, when faulting movements were encountered and subsequent crosscutting at this point failed to reveal the continuation of the vein. Drifting easterly from the crosscut on this zone developed some interesting-looking ground, though the information gained from the work done so far is indefinite.

Near the end of the crosscut a 100-foot winze was sunk on what was considered to be the porphyry hanging-wall of the South ore-body. In this shaft a little ore is reported to have been encountered but had not been prospected. The development on the sixth level proved the porphyry on which the shaft had been sunk was a detached block and the true wall was about 130 feet farther to the south. Drifting and crosscutting on this level was disappointing, for although a little ore was encountered and the conditions appeared favourable, no ore-body of commercial importance was discovered and work was abandoned in this part of the mine.

Attention was then directed to the development of the North ore-zone, with results which have been decidedly promising. Drifting from the crosscut in a westerly direction, a 3- to 5-foot width of ore of milling grade is exposed along the roof of the drift for a distance of about 170 feet, when the continuity of the vein was interrupted by a strong sheared and faulted zone, in which drag ore in sufficient quantity to constitute good mill-feed had been developed along a distance of about 130 feet, making the total length of ore developed in this North ore-body about 300 feet. The drag ore occurring in the faulted zone was composed of slickensided boulders and fragments of ore in crushed graphitic slates. Recent shipments from this section of the mine are reported to have had average values of about as follows: Silver, 15 oz. to the ton; lead, 7 per cent.; zinc, 8 per cent. The direction of the fault is north-west and the indications appeared favourable for picking up the continuation of the vein in its normal easterly and westerly course; such being the case, it is possible that it is the downward continuation of the *Hope* vein, which outcrops at an elevation of 1,000 feet above.

Before encountering this ore-bearing zone the long crosscut penetrated about 600 feet of quartzites and then entered a considerable width of sheared and broken ground on the foot-wall side. A theory which has been advanced—namely, that the course of the ore-bearing fissure has


No 5 Crosscut
3700' to surface
RUTH-HOPE
N. Vein
No 5 Level
S. Vein
Dyke
Dyke
No 6 Level
Dyke
MINING Co. LTD
Porphyry
No 8 Level
No 9 Level
No 10 Level Vein
No 11 Level N. Vein
SILVERSMITH MINES LTD
No 11 Level S. Vein
Porphyry
SKETCH MAP
showing relation between the
RUTH-HOPE & SILVERSMITH
on the
1,000-Foot Levels.
Scale:
0 25 50 100 Feet
To accompany Report of A.G. Langley
Resident Mining Engineer, Revelstoke, 1926.
B.C. Bureau of Mines.

been influenced by the resistance of the harder beds, which in places have guided its course and governed to a certain extent the ore-deposition—if correct, may prove to be of assistance in following the ore-deposits of the Slocan. Judging from present indications, the prospects of the *Ruth* becoming an important shipper appear promising.

Leadsmith. This property, owned and operated by the Leadsmith Mines, Limited, comprises a group of five claims—the *Noonday*, *Bolander*, *Grey Eagle*, *Baby Fraction*, and *Fourth of July;* it was formerly owned by the Noonday Mines Company. The present company was incorporated in August, 1925, with a capitalization of $500,000, divided into 20-cent shares which are assessable to 10 cents. Previously to this the property had been lying idle during recent years, except for minor leasing operations. The camp is situated at 1½ miles by road from Sandon and at an elevation of 5,150 feet.

The mine had been opened by three levels, the Nos. 1, 2, and 3, which gain a depth of about 300 feet on the vein; from these workings there is reported to have been shipped 289 tons of sorted ore which averaged: Silver, 39.2 oz. to the ton; lead, 41.9 per cent.; zinc, 6.9 per cent.

The vein as exposed in the No. 2 and No. 3 levels is remarkably persistent and occupies a well-defined fissure between massive walls of slate having a width of from 2 to 3 feet and a north-easterly strike with a dip of 70° to the south-east. The filling consists of sheared country-rock, with varying amounts of spathic iron, quartz, and calcite, which in places form a banded structure. The ore, consisting of galena and zinc-blende, occurs in narrow lenses and lacks continuity along the strike of the vein.

On the No. 3 level the vein retains the same characteristics as in the No. 2, except that it shows a stronger width. Very little stoping has been attempted. There did not appear to be any large tonnage of mill-feed available on the dumps, but this could only be ascertained definitely by trenching and sampling, which would involve a considerable amount of work.

As the vein showed a tendency to widen with depth, a crosscut tunnel was started in the fall of last year to intersect its downward continuation at an additional depth of 300 feet. This tunnel reached its objective in a distance of 690 feet and when examined 120 feet of drifting had been accomplished. In this length of tunnel the vein maintained a width of about 5 feet and a few pockets of good-grade ore had been encountered. The equipment consists of a 35-horse-power portable Ingersoll-Rand compressor and a Sullivan Type C drill-sharpener. The camp buildings provide accommodation for ten men.

Victoria Syndicate. A considerable amount of exploration-work was undertaken during the year near Sandon by the Victoria Syndicate under the direction of R. H. Stewart. The area in which operations were carried on includes a string of claims extending from the *Minnichaha-Carnation* groups to the *Wakefield* group on the south side of the summit ridge, which forms the divide between the valleys of Carpenter and 4-Mile creeks.

On the north side small crews were employed at the development of the *Minnichaha* and *Carnation* claims. At the former property a little ore had been encountered, but owing to formation slips and faulting its continuity was indefinite and at the time of examination no ore-body of appreciable importance had been developed. At the *Carnation* the No. 3 tunnel had been advanced to a total length of 1,700 feet. The strike of the vein is easterly and westerly, with a dip of from 50° to 70° to the south. The vein has a good width, is remarkably persistent, and contains a filling characteristic of the Slocan veins. Ore of possible milling grade was encountered along about 150 feet of the drift at a point below an old prospect-shaft from the surface. It is intended to connect this tunnel with one being driven from the south side of the hill.

On the south side of the summit ridge a camp had been established and exploration-work was being proceeded with on some strong exposures on the *Read* and *Jennie Lind* claims. Where the vein outcrops a strong width of mineralization is exposed, lying between slate on the hanging-wall and lime on the foot-wall side. Bands of calcite are characteristic of the vein-filling, while the ore, in places showing a brecciated structure, apparently occurs as replacing limestone. A sample taken from a small pile of ore lying on the dump of the No. 2 tunnel gave the following returns: Gold, 0.02 oz.; silver, 55.4 oz. to the ton; lead, 17.2 per cent.; zinc, 14.8 per cent.

The vein had been prospected by a series of short tunnels and a low tunnel was being started with the object of developing the downward continuation of the ore-body in the No. 2 tunnel and eventually connecting with the No. 3 *Carnation* tunnel.

Minnesota. This claim is situated in what is known as Sunshine basin at a distance of about 3 miles by trail from Sandon and is owned by Al. Holmquist. The finding of vein-matter containing some high-grade ore in the surface wash has resulted in a considerable amount of tunnelling being undertaken, most of which was done some years ago. The old work consisted of three tunnels driven into the steeply rising hillside in hopes of crosscutting the vein which yielded the "float," but without results. If such a vein does exist in this locality, which seems reasonable to suppose is the case, these tunnels have been driven above it. More recent work consists of a crosscut tunnel 328 feet in length driven 40 feet lower down; in order to gain this depth it was necessary to start at a considerable distance from the lowest of the above-mentioned tunnels.

So far no vein had been exposed in this crosscut, but there were indications of a change at the face and its extension for a short distance appeared to be advisable. A sample from a small pile of float gave the following returns: Gold, 0.02 oz.; silver, 152.6 oz. to the ton; lead, 72.9 per cent.; zinc, 1.4 per cent.

Black Colt. This claim is situated on the south side of Carpenter creek at a distance of about 2½ miles by trail from Sandon. It was worked under option by A. Jacobson and Vandergrift Bros., of New Denver, who shipped a few cars of milling-ore. The area covered by this and the adjoining claims is in line with the possible easterly extension of the *Queen Bess* zone of fissuring. The principal workings consist of two levels driven at a vertical distance of 200 feet apart.

The formation encountered in the upper level consists of slate lying at a flat angle and evidently broken over. In this formation sections of a vein had been developed which yielded small tonnages of high-grade ore, but owing to formation slips and faults its continuity had been interrupted. During the summer a shoot of good-grade ore 80 feet long and about 2 feet wide was mined and shipped. This occurred between two flat faults and had a depth of 30 feet. Very little had been done to trace its upward continuity on account of its proximity to the adjoining claim. The lower tunnel, however, had been advanced 250 feet and it was estimated had still 150 feet to go before results could be expected. It is an interesting area and no doubt further prospecting will uncover more ore. On the dump of the upper tunnel there is a probable 200 tons of milling-grade ore.

Victor. At this group, which lies at a short distance to the north of the last-mentioned property, Geo. Petty, the owner, continued surface prospecting and underground development. A No. 3 tunnel had just been started and followed a small seam of galena for about 35 feet. Unfortunately the development at depth had not established the downward extension of the high-grade ore-shoot developed between the surface and the No. 1 level. As there is a possibility that the vein has been faulted in a horizontal direction, crosscutting from the No. 2 level appeared to be warranted.

Other Properties.—Among the numerous other activities the following have been reported:—

At the *Noble Five* Paul Lincoln, the former manager, secured a lease on the property during the latter part of the year and put a small crew of men to work. Arrangements were made for the use of the *Sovereign* tramway for transporting the ore to the railway at Sandon.

The American Boy Mining Company, which for a number of years has been carrying on exploration and development work at the *American Boy* and latterly at the *Last Chance*, added the *Sovereign* mine to its holdings. This property was formerly owned and operated by Clarence Cunningham.

The *Wonderful* was operated throughout the year by Clarence Cunningham, who had a small crew of men employed.

The *Canadian* group was operated by the owner, Joseph Brandon, and a crew of eight men. At the eighth level, which is driven at an elevation of approximately 1,000 feet below the outcrop, it is reported that 40 tons of ore was mined which gave the following values: Silver, 136 oz. to the ton; lead, 66 per cent.; zinc, 4 per cent. A car-load was also mined from the workings at the summit of Silver ridge, which forms the divide between Carpenter and 4-Mile creeks.

Leasers were busy at the *Colonial, Surprise, Mountain Con, Richmond Eureka*, where the material on the dump was reclaimed by jigging; the *Alamo, Trade Dollar, Rambler-Cariboo*, and *Elkhorn*. Further work was done on the *Dorothy* by the owner, J. P. Wilson, of Sandon; also

on the *Reco*, owned by J. M. Harris, and at the *Corinth* by the Corinth Silver-Lead Mining Company, in which Seattle capital is interested.

Lucky Jim. This mine is owned and operated by the Lucky Jim Lead and Zinc Company, Limited, of which A. G. Larson is president and manager. The mine is situated at Zincton, on the Kaslo & Nakusp Railway. The company started operations in 1925 after acquiring the Rosebery concentrator. Mining and milling operations were carried on continuously until December, 1925, when it was decided to abandon milling the ore at Rosebery and instead ship it to Trail for concentration and reduction. During the year 1926 the company has ranked among the most important shippers of the district.

The ore is low-grade silver-lead-zinc, and as the mine is capable of producing a large tonnage, the problem of concentration and separation of its metallic values at the lowest possible cost was occupying the attention of the management during the latter part of the year, and the erection of a concentrator near the mine was being seriously contemplated.

During the year a very complete power unit was installed, consisting of a 120-horse-power Fairbanks-Morse semi-Diesel engine and a Sullivan single-compound compressor, 16 by 9¾ by 10, with oil-tank of 10,000 gallons.

Probably the most important underground work was the continuation of No. 4 level, where ore was developed for a length of 320 feet, having an average width of about 8 feet, with good possibilities for lateral extensions. On its dip this ore had been followed for 150 feet to the No. 3 level. Above the No. 3 it has been mined for 200 feet on the dip, along a length of about 150 feet, the width averaging about 10 feet.

The property is one which undoubtedly has attractive latent possibilities. Conditions seem favourable for the same structural features, which have been responsible for providing channels for the ore-bearing solutions, being repeated farther back in the hill, thus lending encouragement for further exploration in this direction, while the development of the downward continuation of the ore-zone from Nos. 5 and 6 levels would appear to be of primary importance.

The production for 1926 was 20,478 tons. The silver bears a uniform ratio of 1 oz. to the unit of lead. The zinc tenor of the ore shows a tendency to increase with depth and that of the lead to decrease.

Three Forks.

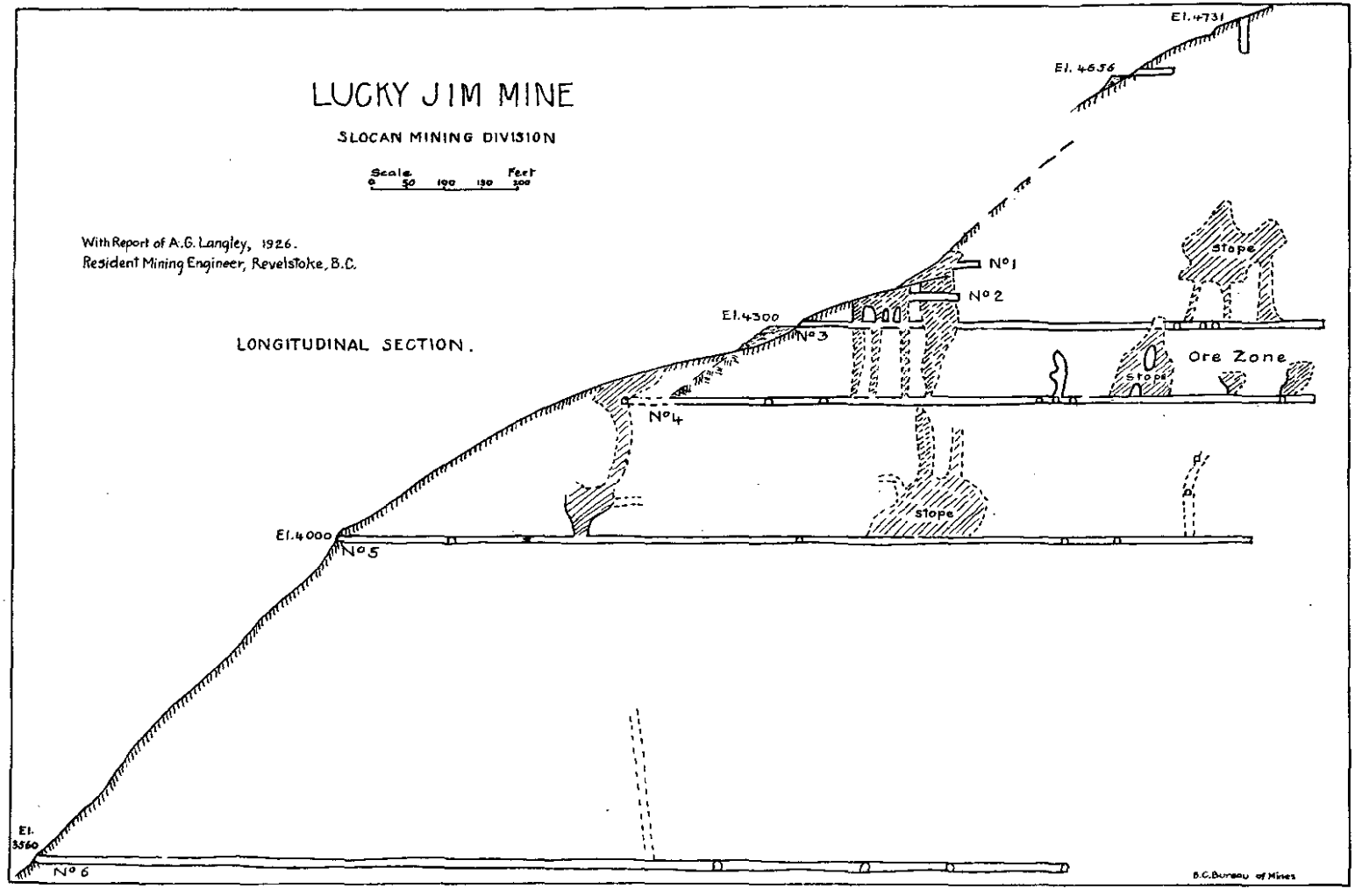
McAllister. This property, which is situated on Kane creek at a distance of 3 miles from Three Forks, is owned by the Slocan Silver Mines, capitalized at $500,000, of which the Standard Silver-Lead Mining Company, of Silverton, owns the control of the stock. The mine was operated during the greater part of the year under the direction of W. H. North.

The area in which the vein occurs is quartzite underlain by a soft bed of slate; the latter has an estimated thickness of 300 feet. This series has been intruded by pre-mineral porphyry dykes which are cut by the vein. The vein is a strong quartz-filled fissure, carrying values in silver which are associated with grey copper (friebergite). In certain sections very high-grade ore has been encountered, although the average values along a 1,000-foot length of drifting on the No. 3 level are reported to run between 30 and 40 oz. to the ton. No ore had been developed in quantity on the fifth and sixth levels, but conditions indicated good possibilities for further prospecting on these horizons. The values on the lowest level at which ore was being mined—namely, the No. 4—were better than those encountered on the level above.

An interesting feature, which has been demonstrated by recent developments, is that in the quartzites the vein is strong and well defined, but where it encounters the soft slate formation its identity is lost. This is either due to faulting at the contact of the slate and quartzite or more probably to the closure of the fissure in the soft slates, in which event its continuity might be expected where it again enters the quartzites.

The mine is well equipped with a tramway and power plant. Shipments were suspended when the price of silver dropped. For further reference *see* Annual Report for 1925 and previous years.

Monitor. At the *Monitor*, which is situated at a short distance from Three Forks, George Gormley mined a few car-loads of milling-ore, which was shipped to Trail. The property is one of old standing and belongs to the Rosebery-Surprise Mining Company, of New Denver.

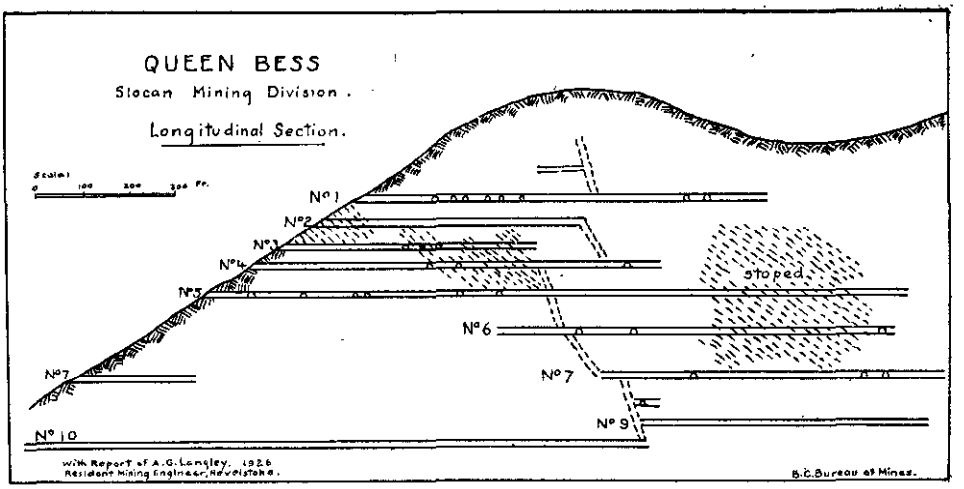

LUCKY JIM MINE
SLOCAN MINING DIVISION
Scale
0 50 100 150 Feet
With Report of A.G. Langley, 1926.
Resident Mining Engineer, Revelstoke, B.C.
LONGITUDINAL SECTION.
El. 4731
El. 4636
El. 4300
El. 4000
El. 3560
No 1
No 2
No 3
No 4
No 5
No 6
Stope
Ore Zone
Stope
Stope
B.C. Bureau of Mines

Alps Alturas.—The trail up the North fork of Carpenter to the *Alps Alturas* was repaired and W. J. McMillan, the owner, spent part of the summer at the mine. The principal values are in antimony.

Queen Bess.

This property, comprising a group of nine claims, is situated near Alamo and is owned by Clarence Cunningham. A brief review of the history of this property reveals what may be accomplished in the Slocan by those who have the courage and tenacity of purpose to undertake systematic development-work in favourable localities. Similar results have been obtained at other properties and in all probability will be repeated for many years to come.

The records show that this mine was a steady producer up to 1904, with a total yield of $225,000 net smelter returns. It was then considered to be worked out and was abandoned. In 1916 Clarence Cunningham, who acquired the property, put a small crew of men to work and in a short time discovered a new ore-shoot having dimensions of 400 feet long and 5 feet wide and extending from the sixth level to within a short distance of the surface. The production from this ore-body was approximately 12,000 tons of ore, which yielded net smelter returns of $1,250,000. The old company missed this ore-body by not extending the main drift on the



fifth level for another 20 feet. In 1917 the mine was equipped with an aerial tram to the railway and steady shipments were made until 1920, since when the production has principally consisted of small tonnages from leasing operations.

The *Queen Bess* vein occupies a sheared fissure in slate and has a north-easterly strike and a dip of 55° to the south-east. The vein-filling consists of sheared and crushed oxidized material, in which the ore occurred as clean galena averaging 1½ oz. of silver to the unit of lead. The mine-workings, consisting of ten levels, are extensive. The downward continuation of the ore-shoot below the seventh level has not been definitely established, although indications on the ninth level appeared favourable and the lower horizons of the mine hold attractive possibilities for further exploration.

During 1925 two leasers extracted about $30,000 worth of ore by gophering about above the No. 1 level, and the only work being done during the present year was the driving of a short crosscut and raising from the No. 1 level to pick up the continuation of this ore. Generally speaking, the mine-workings are in good condition and also the camp buildings, which provide excellent accommodation for the mine crew.

New Denver and Silverton.

Bosun.

This mine is situated near New Denver and is operated by the Rosebery-Surprise Mining Company, of which J. P. MacFadden is superintendent. It has been a steady and profitable producer for a number of years. The production during the year was obtained from an ore-shoot between the sixth and fifth levels. This was discovered by raising on a tight seam of zinc exposed in the roof of the main drift

on the No. 6 level. At 25 feet above the level this opened out into an important ore-body, having a length of about 85 feet and a width of from 12 inches to 3 feet of massive galena carrying high silver values. The ore was tightly frozen between slate walls and occurred as a lens, which at 60 feet above the level began to show signs of diminishing in width and regularity. According to recent reports this ore-shoot is now worked out and the company has commenced shaft-sinking from the No. 6 level on ore exposed in the bottom of the drift.

Exploration-work during the year was principally confined to the advancement of the No. 5 level through the faulted zone at the easterly end of the workings. The old upper workings are being worked under a lease by about twelve men. The company made substantial shipments of crude ore and high-grade milling-ore; a typical analysis of the latter is as follows: Gold, 0.01 oz.; silver, 73.1 oz. to the ton; lead, 12.8 per cent.; zinc, 23.9 per cent.; iron, 6.8 per cent. The lead concentrates from this ore contained the following values: Gold, 0.04 oz.; silver, 215.8 oz. to the ton; lead, 54.4 per cent.; zinc, 17.6 per cent. The zinc concentrates averaged: Silver, 65.8 oz. to the ton; lead, 1.7 per cent.; zinc, 50.7 per cent. The tailings carried: Silver, 4.8 oz. to the ton; lead, 1.1 per cent.; zinc, 2.5 per cent.

Molly Hughes.—The *Molly Hughes* mine near New Denver was operated by a local syndicate, composed of practical miners, during the latter part of the year and a shipment was made to Trail.

Mountain Chief. At the *Mountain Chief*, which is situated on the New Denver–Three Forks road, four Italian miners put in a busy season at reclaiming the old stope fillings. The plant used was inexpensive and practical and might be profitably applied in other cases where water is available for power and washing purposes. The ore from the mine was dumped into a pocket on the dump, from which it passed over a small grizzly, where large pieces of waste were discarded and the fine stuff was fed into a launder, which delivered it into a small Blake crusher and then to two jigs. This miniature concentrator was operated by a 12-inch Pelton wheel at a head of about 400 feet. About twenty sacks of middlings were being made a day, said to average about: Silver, 64 oz. to the ton; lead, 25 per cent.; zinc, 35 per cent. This was shipped to the Trail concentrator for further treatment.

The Standard Silver-Lead Company's mill was destroyed by fire in July, soon after it had been restarted to treat an accumulation of tailings, and ore mined by a number of leasers. Leasing operations, however, are being continued and a few small shipments were made to Trail.

Hewitt. The *Hewitt* mine on 4-Mile creek was acquired under option by the Victoria Syndicate and a crew of men was put to work during the summer at further exploration and development under the direction of R. H. Stewart. It is understood that the work is being principally confined to the development of the vein from the lowest workings.

Van Roi. At the *Van Roi*, which adjoins the *Hewitt* to the east, Clarence Cunningham, who owns the property, had a small crew engaged at the development of the ore which outcrops at the surface and is considered to belong to the South vein. A short tunnel which had been run along the strike of the vein below this outcrop exposed a strong width of low-grade ore which was encountered near the end of the drift, but not sufficient work had been done at the time of examination to prove its extent. Conditions, however, appeared promising for the development of an important ore-body in this section of the mine-workings, which is connected by a raise with the No. 5 level at the head of the tramway.

Galena Farm. This well-known property, which has been operated intermittently for a number of years, is owned by the Patrick Clarke Estate, of Spokane. During the first three months of the year it was operated by the Porcupine Goldfields Development and Finance Company, which undertook a diamond-drill campaign to explore the downward continuation of the ore-bodies, and while this work was proceeding shipped 738 tons of milling-grade ore from the old stopes. Unfortunately the results obtained by the diamond-drill were not considered satisfactory and the option was relinquished.

During the latter part of the year Joe Johnson and Mathews, experienced Slocan miners, took a lease on the property and started work at the west end of the old stope. By following "drag ore" in a north-and-south fault which cuts off the westerly extension of the main ore-body a nice showing of ore was encountered at a height of about 10 feet above the top of the old stope and to the west of the fault. This ore was about 35 feet below the surface, but further prospecting at an additional depth of 40 feet had disclosed its downward continuation. Although

the work done had not been sufficient to determine the extent of this new discovery, the possibilities of deriving a considerable tonnage from this section of the mine-workings were decidedly encouraging.

The main ore-body of the mine, which is now stoped out, had a length of between 300 and 400 feet and an average width of from 8 to 10 feet. It strikes N. 70° W. and dips at an angle of 45° to the north. On account of topographical conditions the greatest depth obtainable by adit-tunnel without an exceptionally long drive is 150 feet below the outcrop.

The geology of the area is complex owing to the intrusive granite and dyke rocks. The *Galena Farm* vein occurs in an inclusion of Slocan sediments in a granite area and lies in a well-mineralized zone, which is traceable to 4-Mile creek in an easterly direction. The displacements by faulting movements which can be distinctly seen in the stope at the 100-foot level, and at a short distance below, have thrown the ore into the hanging-wall side, suggesting that its downward extension might be expected to the north. In the easterly end of the workings a layer of creek-gravel is exposed at a short distance below the 100-foot level, but this is not to be wondered at, for at this point the depth below the bottom of the present creek-channel cannot be many feet. For further reference *see* the Annual Report for 1915.

At the *Metallic* a few men were employed at mining and the further development of the property. A few cars of milling-ore were shipped to Trail. The property lies at a short distance to the east of the *Galena Farm*.

Mammoth. This group consists of five claims—the *Monarch*, *Mammoth*, *Moose*, *High Ore*, and *Hercules*. It is owned by H. W. Dewis and S. Wetterhuus, of Silverton, and is now being operated under option by the Porcupine Goldfields Development and Finance Company, Limited. The area occupied by this group is thought to cover the possible easterly extension of the *Standard* ore-zone, which was responsible for yielding one of the largest ore-shoots ever developed in the Slocan. Prospecting-work is being confined to two veins—namely, the *Buffalo* vein and the *Mammoth*. The former is a small well-defined quartz-filled fissure striking north and south and the *Mammoth* vein occupies a sheared zone in slate and limestone having a width in places of 20 feet, with a strike of about N. 75° E. The workings, consisting of four adit-tunnels, are situated on a steep timbered ridge between snowslide gulches.

The No. 1 tunnel had been driven at an elevation of 5,819 feet for a distance of 145 feet on the *Buffalo* vein, at which point the *Mammoth* vein was intersected. At the point of intersection of the two veins a short shoot of ore having a width of about 7 feet was encountered, which was apparently of milling grade.

The No. 2 level, driven on the *Mammoth* vein at an elevation of 5,656 feet, was in about 200 feet. In this distance the vein-filling, consisting of sheared and crushed country-rock, contained narrow bands and pockets of galena and zinc-blende of sufficient quantity in places to constitute a milling grade of ore. The vein had been stoped to a height of about 10 feet above the drift for a length of 50 feet and from this stope 900 sacks of ore had been hand-sorted for shipment. A sample across 6 feet of the vein here is said to have yielded the following returns: Silver, 33 oz. to the ton; lead, 2 per cent.; zinc, 16.8 per cent. A sample from 50 sacks of sorted ore assayed: Silver, 77 oz. to the ton; lead, 13 per cent.; zinc, 18 per cent.

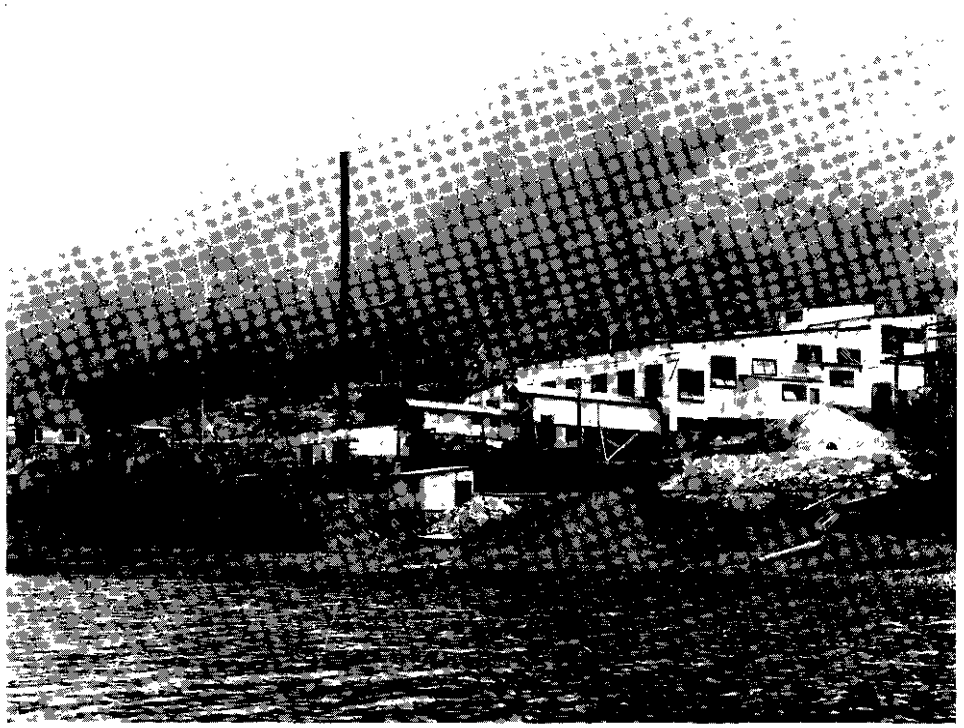
The No. 3 tunnel, driven at an elevation of 5,552 feet, had been advanced about 200 feet on the *Mammoth* vein. Here the vein, dipping at an angle of 65° to the south, showed a width of about 20 feet. The drift was on the hanging-wall side and crosscuts had been run every 50 feet to the foot-wall. A little ore had been exposed and indications looked promising. Above the tunnel the vein had been exposed for a considerable distance by ground-sluicing.

The No. 4 tunnel, driven at an elevation of 5,470 feet, had been advanced for 100 feet on the *Buffalo* vein, its objective being to explore the *Mammoth* vein from the point of intersection, which was estimated to be at a point about 350 feet from the portal. It is intended to make this the main adit-level.

During the summer a telephone was installed at the mine and extensive improvements were made to the trail. The mine crew consists of about twenty men.

Echo.* The *Echo* group comprises the *Echo*, *Duke*, *Duchess*, *W.H.R.*, *Graphic*, and *Boston* claims and is owned by the Echo Silver Lead Mining Company. The property was taken under lease and bond last summer by G. Purt and associates, of Silverton. The property is described in the Annual Reports for 1915 and 1917, when the mine was being operated by the above company, which ceased work the following year.

St. Eugene Mine—Re-treating Tailings.



St. Eugene Mine—Mill for re-treating Tailings.

In 1919 lessees shipped 500 tons of ore and a few tons were shipped in 1921, since when the property has been shut down.

The *Echo* claim, upon which most of the work was done, adjoins the *Alpha* claim of the Standard Silver Lead Mining Company on the north and is staked along the strike of the *Standard* vein.

The lessees propose to continue development-work and ship milling-ore which was left in the workings. A grab sample from a pile of this ore awaiting shipment assayed: Gold, 0.04 oz.; silver, 46.8 oz. to the ton; lead, 13.1 per cent.; zinc, 11.4 per cent. Since the property was visited 25 tons of milling-ore was shipped to Trail.

Fisher Maiden.* This property, situated on 4-Mile creek about 8 miles by road from Silverton, was operated by G. Long, C. Barber, and N. S. Tucker under lease and bond from the owners, a Spokane company which ceased operations in 1905. The property consists of two Crown-granted claims, the *Troy* and *St. Helena*. Until the present operators started work in the fall of 1925 there have only been occasional leasing activities at the property, including the driving of 300 feet of tunnel by Barber and Tucker in 1924.

A considerable amount of development-work was done between 1902 and 1905, during which period 36 car-loads of sorted ore is reported to have been shipped. In the 1904 Annual Report reference is made to a 100-ton shipment which averaged about 90 oz. of silver to the ton and 4 or 5 per cent. lead. The old workings from which this ore was extracted are mostly caved and little information could be obtained about them. They develop fissure-veins in syenitic granite which strike north-westerly up the steep hillside from the creek.

The following extracts from the Annual Report for 1904, page 178, describes the ore occurrence:—

"The vein is a true fissure in syenitic granite, having a north-east and south-west strike, with a dip to the north-west of from 75° to 80°, and appears to accompany, and possibly partially replace, a porphyry dyke, the mineral occurring on either granite wall for from 4 to 12 inches thick in the ore-shoots, while the vein proper is from 1 to 4 feet wide," and "the shoot on No. 4 is about 110 feet long and contains a heavy percentage of zinc."

The lowest of the old tunnels is about 30 feet above the level of 4-Mile creek. The new work consisted of a crosscut tunnel being driven a short distance down-stream from the lowest tunnel, on which about 45 feet additional depth will be gained. At the time of the writer's visit this new tunnel had been driven 251 feet.

The lessees proposed to ship milling-ore from the dumps of material left from the sorting of the higher-grade ore previously shipped. Hundred-pound samples from two of these dumps, each containing a few car-loads, assayed: Gold, trace; silver, 32 oz. to the ton; lead, 3.8 per cent.; zinc, 26.9 per cent.; and: Gold, trace; silver, 20 oz. to the ton; lead, 1.8 per cent.; zinc, 12 per cent. Mill tests on these samples showed that the ore treats very readily with standard reagents, producing only a zinc concentrate and tailing. The grade and extraction of the zinc were both good.

LIST OF SHIPPING-MINES IN THE SLOCAN AND SLOCAN CITY MINING DIVISIONS, 1926.

Mine.	Locality.	Tons.	Character of Ore.
Alamo	Alamo	64	Silver-zinc-lead.
Alpha	Silverton	5	Silver-lead.
Black Coalt	Sandon	170	Silver-lead-zinc.
Bosun	New Denver	5,485	Silver-lead-zinc.
Canadian	Sandon	117	Silver-lead-zinc.
Carnation	Sandon	26	Silver-lead.
Colonial	Sandon	111	Silver-lead.
Dora	Three Forks	2	Silver-lead.
Dougherty	Sandon	7	Silver-lead.
Echo	Silverton	25	Silver-lead-zinc.
Galena Farm	Silverton	748	Silver-lead-zinc.
Hewitt	Silverton	128	Silver-lead-zinc.
Lucky Jim	Zincton	20,478	Silver-lead-zinc.
Mammoth	Silverton	42	Silver-lead-zinc.
McAllister	Three Forks	5,678	Silver (dry ore)

LIST OF SHIPPING-MINES IN THE SLOCAN AND SLOCAN CITY MINING DIVISIONS—*Continued.*

Mine.	Locality.	Tons.	Character of Ore.
Metallic	Silverton	24	Silver-lead-zinc.
Molly Hughes	New Denver	96	Silver-lead.
Monitor	Three Forks	232	Silver-lead-zinc.
Mountain Chief	New Denver	209	Silver-lead-zinc.
Noble Five	Sandon	148	Silver-lead-zinc.
Queen Bess	Alamo	44	Silver-lead.
Rambler-Cariboo	Rambler	82	Silver-lead-zinc.
Richmond-Eureka	Sandon	59	Silver-lead.
Ruth-Hope	Sandon	1,221	Silver-lead-zinc.
Silversmith	Sandon	18,510	Silver-lead-zinc.
Sovereign	Sandon	23	Silver-lead-zinc.
Standard	Silverton	156	Silver-lead-zinc.
Surprise	Sandon	172	Silver-lead.
Trade Dollar	Sandon	102	Silver-lead-zinc.
Van Roi	Silverton	733	Silver-lead-zinc.
Victor	Sandon	42	Silver-lead.
Wonderful	Sandon	841	Silver-lead-zinc.
Enterprise (Slocan City M.D.)	Slocan City	605	Silver-zinc-lead.
Ottawa (Slocan City M.D.)	Slocan City	26	Silver.
Total		56,413	

AINSWORTH MINING DIVISION.

KOOTENAY LAKE SECTION.

The most important work in the Kootenay Lake section of the Ainsworth Division was the operation of the famous old *Bluebell* mine by S. S. Fowler and B. L. Eastman. Temporary difficulties caused by water-shortage for power purposes during the latter part of the summer were successfully overcome by utilizing the water in the lake at the head of Tam O'Shanter creek. This lake, beautifully situated in a basin at the head of the creek, is about 1 mile long and a quarter of a mile wide. Its elevation is about 6,000 feet above sea-level.

Upon investigation it was found that by placing a short dam across the creek outlet sufficient storage could be obtained to supply the *Bluebell* plant with power during the dry period of the year. Accordingly, in September, a small crew of men was put to work, a trail was constructed for packing in supplies, a cabin built, and the dam completed during the latter part of the year.

The beneficial results of this work have already been reflected in the fact that sufficient power was available from September to December to operate the plant, which otherwise would have been forced to close down. During the year the output of the mine—namely, 32,310 tons—was won from various places from the surface down to the lowest or "E" level. Of this tonnage, 23,200 tons was passed through the *Bluebell* concentrator; the balance, except a small amount of waste discarded at the sorting-belt, was shipped to Trail for concentration. The average mill-feed is said to run about 6 to 7 per cent. lead, 8½ per cent. zinc, and 2.8 oz. to the ton in silver.

The outstanding feature of underground work was the very satisfactory results obtained by lateral development of easterly-westerly fractures from which a large tonnage was won at low cost. Numerous references to this property may be seen in the Annual Reports of former years.

Kirby. This property, situated on the shore of Kootenay lake a short distance from Riondel, is owned by the Shepherd Mining Company, of which A. J. Curle, of Kaslo, is president. A lot of work has been accomplished in order to explore the ground underlying surface showings of silver-lead-zinc ore. Briefly, the work consists of a 1,000-foot crosscut tunnel driven from the lake-shore. For the first 750 feet this tunnel penetrates a bank of gravel-wash. Upon striking bed-rock some float carrying galena was encountered, which indicated the possible presence of a vein at this point. At a distance of 900 feet from the portal a small vein slightly mineralized was cut; this is thought to be the same as that which had been prospected on the surface. At 1,000 feet in, another vein was

intersected which showed greater strength and was drifted on for about 750 feet. This vein, having a northerly and southerly strike, conforms with the bedding-planes between the well-defined walls, of which the filling consists of crushed and broken country-rock containing occasional bunches and streaks of ore, but not anywhere in sufficient quantity or high enough in grade to constitute an ore-body of commercial importance. This drift is connected with a shaft from the surface, the total vertical depth being about 150 feet.

A crosscut run into the hanging-wall with the object of picking up the downward continuation of a vein exposed at the surface developed a narrow streak of zinc-blende and galena. The formation encountered in these workings is a dolomitic limestone which has been intruded by aplitic dyke-rock, which apparently has a tendency to conform with the bedding-planes. With evidence of mineralization, seemingly, wherever channels have been provided for the solutions, it is not inconceivable that with favourable structural conditions important ore-bodies might be found to exist.

The camp buildings, which are all new and in first-class condition, consist of a small two-story bunk-house and cook-house combined, a small residence, and a power-house in which an oil-engine and compressor are installed.

Mining activities in the vicinity of Ainsworth have been confined to minor operations of leasers at a number of properties. During the latter part of the year an announcement was made that a new company had been organized to develop the *Florence* mine. According to information received the new company is the Kootenay-Florence Mining Company, Limited, with a capitalization of $600,000. It is understood that D. L. Robinson, of Mapleton, Oregon, has the control and is largely responsible for the financial arrangements.

According to published information the future scheme of development includes the driving of a 3,250-foot tunnel from a point near the lake-level to explore the ground at an additional depth of 550 feet below the present workings. Large ore-bodies were developed in the upper workings and the property has decided potentialities for becoming an important producer. This work is being undertaken on the advice of A. G. Larson, who is the consulting mining engineer for the company.

On the east side of Kootenay lake the Consolidated Mining and Smelting Company is doing some diamond-drill work on the *Kootenain* group in the vicinity of Kootenay bay.

On Woodbury creek the *Violet*, situated at about 15 miles up the creek, was acquired by J. Henry, W. G. McLanders, and Dan McLennan. The vein is a small fissure in granite carrying high silver values. The results of the season's work are said to have been highly satisfactory and it is anticipated that shipments will be made next year. The property is described in the Annual Report for 1921.

Silver Hill.—W. J. Williams and associates operated this property, which is situated near Crawford bay, during part of the year under lease and bond from the owners, the Bank of Montreal. Twenty-five tons of silver-lead ore was shipped. For a description of the property *see* the Annual Report for 1917.

Silver Bell.—This property, near the head of Spring creek, was prospected during the summer months by J. W. Mulholland on behalf of Portland capital. The ore is silver-lead. Considerable prospecting was also done by Mulholland in the Crawford Creek-Kootenay Bay area.

Lookout Group.* This property, consisting of the *Lookout*, *Lookout No. 2*, *Lookout No. 3*, *Goat Cliff*, and *Rainbow*, is situated in the angle of the forks of Fry creek, some 6 miles back from Kootenay lake. During the spring and summer months the owners, D. M. Wadams and associates, of Johnson Landing, completed repairing the Fry Creek trail, large sections of which had been taken out by high water in the creek. Pack-horses are now used to take supplies up Fry creek instead of by the difficult and hazardous route over the Kootenay Joe pass, which in the last few years has been the only way.

The formation of the area is chiefly granite containing eroded remnants of schists and altered sedimentaries. The claims are staked along a pyritized zone in siliceous and calcareous schists following the granite-contact in a south-easterly direction along the South fork of Fry creek. The workings, consisting of short tunnels, a shaft and open-cuts, develop the pyritized contact for some 3,000 feet in length. Most of the underground work has been done on the *Lookout* on the steep hillside above the forks.

The mineralization, chiefly contained in and conforming to the bedding of the altered sedimentaries, but occasionally in the granite, consists of masses and disseminations of auriferous

pyrite associated with quartz and siliceous gangue. Judging from the few samples taken by the writer, the gold values in the sulphide material are too low to be of interest, but gold colours can be panned from leached and decomposed material where local concentration of gold has occurred through oxidation of the iron sulphides. This condition occurs in numerous places and, erosion having taken place on a large scale, decomposed fragments of this oxidized material are strewn about the flat below the workings.

The attention of prospectors was drawn to the placer-mining possibilities of the ground. Apparently, however, there were too many boulders to contend with and the smooth granite bed-rock of the creek-bottom afforded no crevices for the retention of rich pay. After considerable preliminary panning and prospecting, Wadams and associates found the source of the placer gold in the outcrops on the hillside above.

In addition to the mineralization described above, there have also been found narrow seams and fractures, cutting across the trend of the rocks, containing gold values in decomposed siliceous gangue. A sample across one of these fractures, 6 inches wide, assayed: Gold, 2.84 oz. to the ton.

The area is being very actively prospected by the owners, who have done a considerable amount of work, including construction of a cabin, bridges, and trails.

Pegleg.—D. M. Wadams and associates also own a molybdenite property, the *Pegleg*, situated at a high altitude near the head of the South fork of Fry creek, which could not be examined at that time of year (April) on account of snow.

KASLO.

Keen Creek (South Fork of Kaslo Creek).

This well-known creek, on which there are a number of mining activities each year, is called Mansfield creek on the Geological Survey maps; on some of the other Government maps it goes by the name of Keen creek and also the South fork of Kaslo creek. For purposes of this report it is given the name Keen creek, as this is the official ruling of the Geographic Board of Canada.

Cork-Province. On this property, which is situated at a distance of 4 miles by road from the railway at Zwicky, work was carried on during 1926 and 2,022 tons of milling-ore was shipped to Trail. More capital being required for the development of the ore-bodies at depth, the company was reorganized and it is now stated that arrangements have been about completed for the sinking of a 3-compartment shaft for 300 feet.

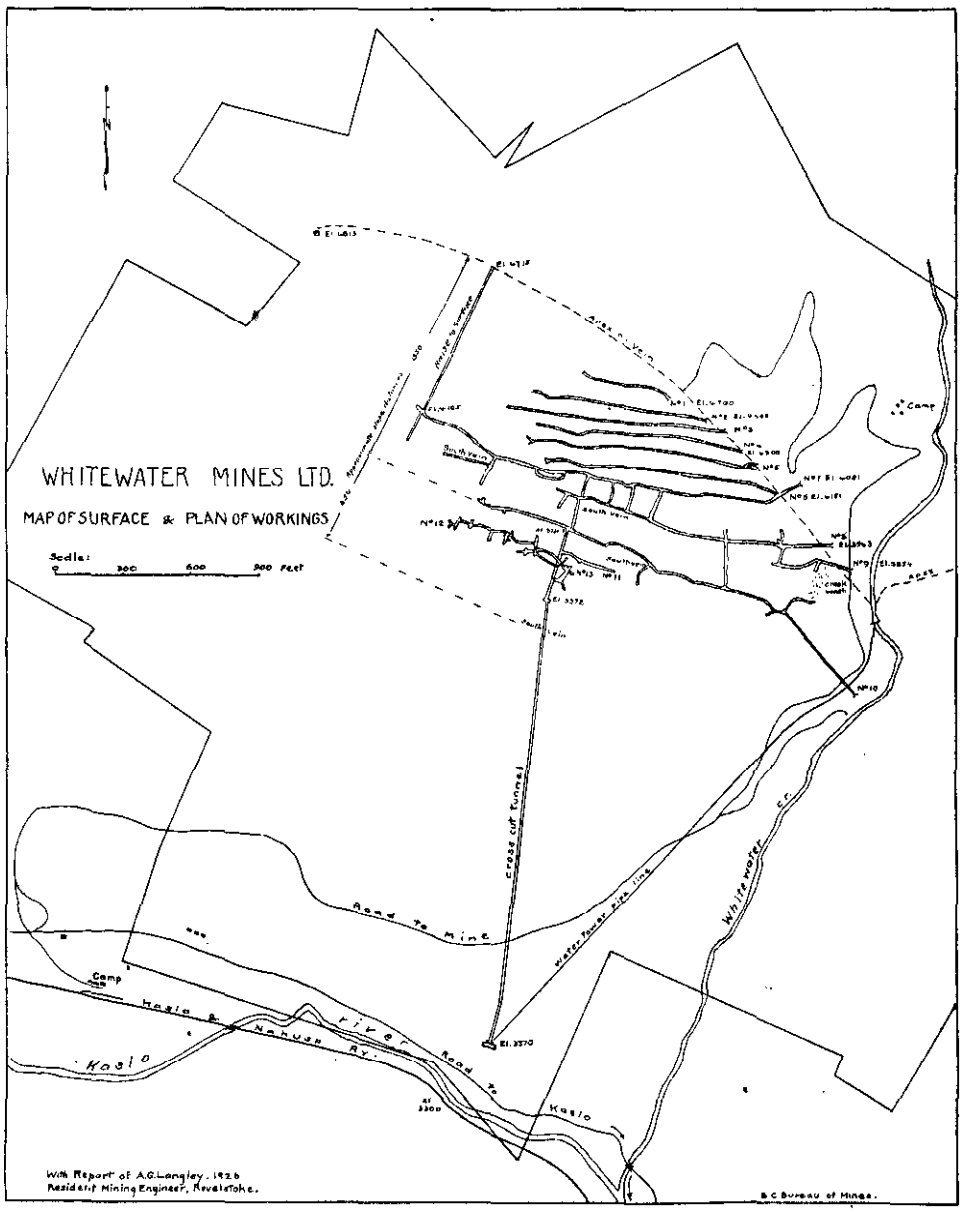
It is reported that work was continued at the *Silver Bell* and the *Silver Bear* properties, which are situated close to the road about 8 miles from the railway.

Revenue.—Work was continued by L. McLean, the owner. The trail to this property connects with the wagon-road at a distance of about 10 miles from the railway. The trail to the *Bismark* up Briggs creek was cleaned out and further work done at the property by J. A. McKay and partner.

Daybreak. This property, owned by the Daybreak Mining Company, in which Portland capital is chiefly interested, is situated on Keen creek, 6½ miles by road from the railway siding at Zwicky. From the road a trail 1½ miles in length leads to the mine. An aerial tramway connecting the mine-workings with ore-bins at the road was under construction during the latter part of the year. A considerable amount of underground work had been done on the property some years ago when it was known as the *Gibson*, but before the production stage was reached it became tied up in litigation and finally forest fires completely wiped out the camp and equipment in 1921. The present company acquired the property in 1923, since which time development has been continued. During the summer of 1926 a hurried visit was paid to the mine and the lower workings, which were considered to be the most important, were examined.

The low level is opened by crosscut from the surface, which intersects a vein known as the "B" vein at a distance of 469 feet from the portal and at a depth of about 185 feet below the next level. At a distance of about 160 feet in, a vein called the "A" vein is intersected and drifted on for about 400 feet, without getting any very definite results. The "B" vein is similar in character to the "A" vein and has been formed along a sheared fault-fracture roughly conforming to the dip and strike of the formation. The filling is composed of sheared and crushed wall-rock, in which ore occurs in small lenses and narrow streaks at intervals. At one

place a small tonnage had been mined to a height of about 30 feet above the drift, but no raising had been done to prove its upward continuity. About 800 feet of drifting has been done on this vein. At the face the formation, consisting of banded limestone, has a strike of N. 50° E. and a dip of 83° to the west. A grab sample from sacked ore at the portal gave the following returns: Silver, 36.9 oz. to the ton; lead, 50.6 per cent.; zinc, 13.4 per cent. During the year 19 tons was shipped to Trail.



Properties tributary to Kaslo–Nakusp Railway.

Whitewater. This mine is owned and operated by the Whitewater Mines, Limited, of which W. H. Burgess, of Kaslo, is secretary and manager. This company was incorporated in 1922 and represents an amalgamation of the *Whitewater* and the *Whitewater Deep*. Its capitalization is $1,200,000, divided into 300,000 preference

shares and 900,000 ordinary shares, all of $1 par value. The property is equipped with a 6-drill compressor driven by water-power from Whitewater creek. The camp buildings provide excellent accommodation for a crew of about twenty-four men. During the year a trestle connecting the low tunnel with a spur of the Kaslo–Nakusp Railway was constructed, thus greatly reducing the costs of loading ore for shipment.

Leasing operations in the old upper workings of the *Whitewater* vein were continued by a dozen or so men and an appreciable tonnage was shipped to Trail. By far the greatest bulk mined, however, was derived by company operations from the large low-grade body of silver-lead-zinc ore which has been developed during the last two years in the lower horizons of the mine-workings—namely, the twelfth and thirteenth levels.

This ore is different in character and occurrence to that mined from the *Whitewater* vein in the area above the tenth level, which heretofore had been responsible for practically the entire production of the mines. Two distinct ore-bodies have, in fact, been developed. That occupying the upper portion of the mine-workings down to the tenth level is known as the *Whitewater* vein and occurs in a strong sheared fracture cutting the formation of slates and having an easterly and westerly strike, with a dip of about 40° to the south. The other ore-body, now being mined below the tenth level, has the character of a replacement deposit and apparently conforms to the strike and dip of the formation, which are respectively about N. 30° W. and 40° to the north-east. Where the *Whitewater* vein and this ore-body intersect the latter is faulted and as yet no work has been done in an endeavour to pick up its continuation on the other side of this fault.

This lower part of the mine-workings, formerly the property of the *Whitewater Deep*, is opened by a crosscut 2,225 feet in length, from the end of which a 4-compartment raise 520 feet in length connects with the twelfth level. From this raise the Nos. 13, 12, and 11 levels were established and a little prospecting done many years ago, with the result that some low-grade silver-lead-zinc and zinc ore was exposed, but was evidently considered too low grade at the time to work profitably and these workings have lain idle until work was recently resumed by the present company. Subsequent development in this section of the mine has been attended by highly satisfactory results.

On the twelfth level an ore-body of about 300 feet in length has been exposed and partly stoped to a height of about 40 feet above the level. The width of this stope, which follows the hanging-wall, is about 10 feet. On the foot-wall side a band of waste 8 or 10 feet thick separates this ore from a similar ore-body of considerable dimensions on the foot-wall, which was being stoped from an intermediate drift between the twelfth and thirteenth levels. In the easterly end of the thirteenth level ore exposed in the face of the drift indicated the continuity of the ore-body in this direction.

The ore being mined consisted of lead and zinc sulphides in a gangue of siderite. The average mill-feed carried about the following values: Silver, 3 to 4 oz. to the ton; lead, 4 to 6 per cent.; zinc, 16 to 20 per cent.; and iron, about 23 per cent. On the eleventh level the main drift was being advanced to the east to explore the downward continuation of the *Whitewater* vein, which had been stoped down to the tenth level. It was estimated this drift had about 50 feet to go to reach its objective.

The recent development-work done at this property has placed it among the most important producers of the district, shipments to Trail during the year amounting to nearly 10,000 tons. According to recent information received it is the intention of the company to erect a concentrator next spring.

Charleston. This mine, which is situated at a short distance from the *Whitewater*, was acquired under option by E. J. Edwards, of Seattle, who succeeded in interesting some American capital. The principal work contemplated was the extension of the No. 5 tunnel to explore the ground below the ore-shoot which had been developed in the "Harris" tunnel, which latter had been driven at an elevation of 180 feet higher up the hill. In order to facilitate this work and allow the proposed installation of an oil-engine and compressor a short length of road was constructed to connect the property with the *Whitewater* road. Unfortunately the funds became exhausted and work was suspended before much progress had been made in the further development of the property. A description of the property may be seen in the Annual Report for 1923.

Metals Recovery Co.

This company, under the management of M. S. Davys, of Kaslo, put in a busy season on the accumulation of tailings from the old *Whitewater* mill, which are distributed over a considerable area along the bed of Kaslo creek. The labour employed was principally Chinese, this being claimed to be the most suitable for this class of work, which consists of digging up and loading tailings that in places had accumulated around old logs and in others become mixed with debris such as collects along the banks of a mountain stream. To transport the tailings to the mill an ingenious contrivance was used—namely, an old Ford car mounted on a truck with flanged wheels running on light rails.

The ore was hauled in side-dumping cars to the mill. Here it was dumped into a pocket and conveyed to the mill-bins by a belt-conveyor. The principal features of the mill, which has a capacity of 60 tons a day, were: To first get rid of the barren coarse material by screening and jigging, the undersize going to a pebble-mill in closed circuit with two King screens, the undersize product from which was treated by flotation, the Callow pneumatic cells being used. The resulting product was a zinc concentrate having values of about: Zinc, 40 per cent.; lead, 7 per cent.; silver, 40 oz. to the ton; and a lead-iron concentrate running about: Lead, 20 per cent.; silver, 80 oz. to the ton; and $5.60 in gold. The ratio of concentration is said to be about 10 to 1. The plant is run by water-power supplied by two near-by creeks.

Vera.

This property is owned by G. H. Murhard, of Three Forks, and is situated at an elevation of about 1,500 feet above the railway on the right bank of Kaslo creek and about opposite Lyle creek. The formation here consists of limestone and slate dipping at a flat angle. In order to explore a small fissure which outcrops in the face of a bluff a tunnel had been driven for a distance of 249 feet. Near the portal a pocket of ore had been encountered at the bottom of the drift; a sample from here ran: Gold, 0.03 oz.; silver, 59.4 oz. to the ton; lead, 56.5 per cent.; zinc, 3.6 per cent. For the remainder of the distance the tunnel follows a narrow stringer, and at 20 feet from the face, where indications looked promising, a raise had been driven for 15 feet. In this raise ore is said to have been exposed in limestone lying next to a porphyry dyke, but unfortunately this showing was obscured by caved ground.

Robb Creek.—A number of properties are located on this creek and in past years the area surrounding its headwaters was the scene of considerable activity. Unfortunately the old workings are now nearly all caved, which makes it difficult for the examining engineer to form an opinion as to the merits of the various properties. However, from what could be seen on the dumps and of the geological conditions, it would appear that some of the workings justify the small expense necessary for reopening in order to allow an examination to be made.

Texas.

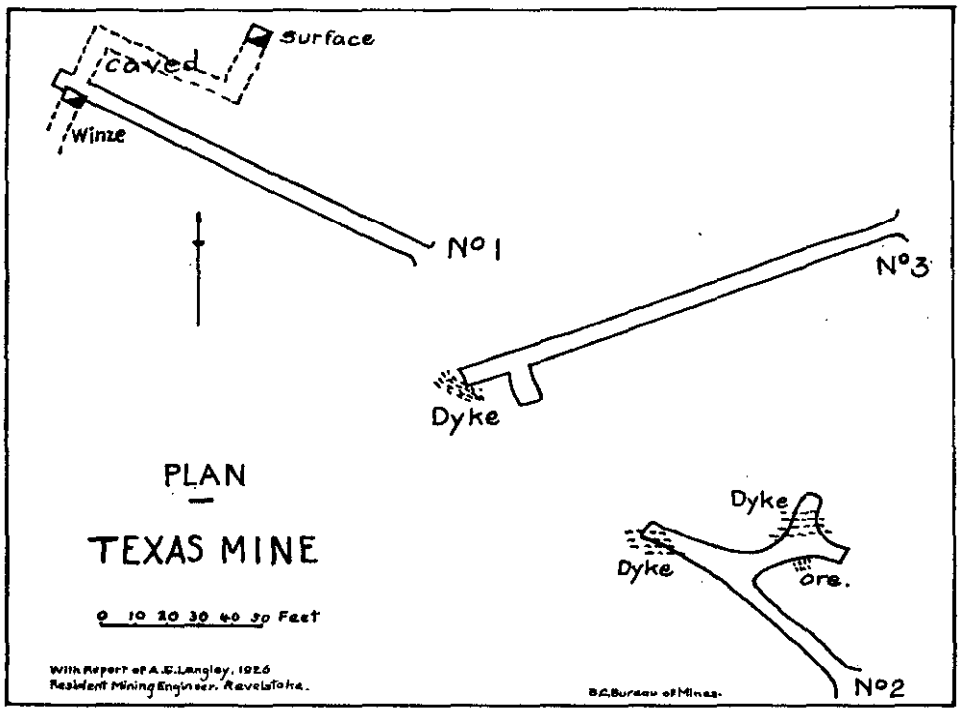
This property is owned by A. T. Garland, of Kaslo, and is situated about 3 miles by trail from the railway at Blaylock, at an elevation of 5,800 feet. The area is underlain by limestone and slates which have been intruded by granite tongues and aplitic dyke-rock. The property was first prospected by a shaft on the outcrop and 17 tons of high-grade ore was extracted in a depth of 70 feet. Following this work the No. 1 tunnel was driven at a depth of 60 feet below the outcrop and connected with the shaft at a distance of 125 feet from the portal. A winze was sunk below the shaft, but the ground around this section of the workings was caved and could not be examined.

The No. 2 tunnel is 80 feet below the No. 1 and has been driven 71 feet in a north-westerly direction. It crosscuts a sheared zone and ends in dyke-rock. At 47 feet from the portal a short drift had been run in this sheared zone and disclosed a little ore lying on the hanging-wall side of the dyke, which latter has an easterly and westerly strike.

As conditions evidently did not appear promising here, another crosscut tunnel was started at the same elevation and at a distance of 140 feet to the north. This had been advanced for 150 feet in slate and ends in dyke-rock. The complex geological structure due to intrusions of dyke-rock and the resulting contortion of the sediments add to the difficulties of forming an opinion as to the possibilities, while the workings do not throw much light on the character of the deposit.

However, the following conclusions were arrived at: It is possible that the ore-bearing zone will be found to lie in a sheared zone formed along the contact of the slate and dyke, which latter has, as far as could be ascertained, a strike of east and west and a dip of 60° to the south.

Should this be the case the No. 3 crosscut, if continued through the dyke, would intersect this zone on the south side, while further prospecting in the No. 2 tunnel along the hanging-wall side of the dyke would appear to be advisable. J. Harris and partner, who were working at the property, recently constructed a new cabin near the workings.

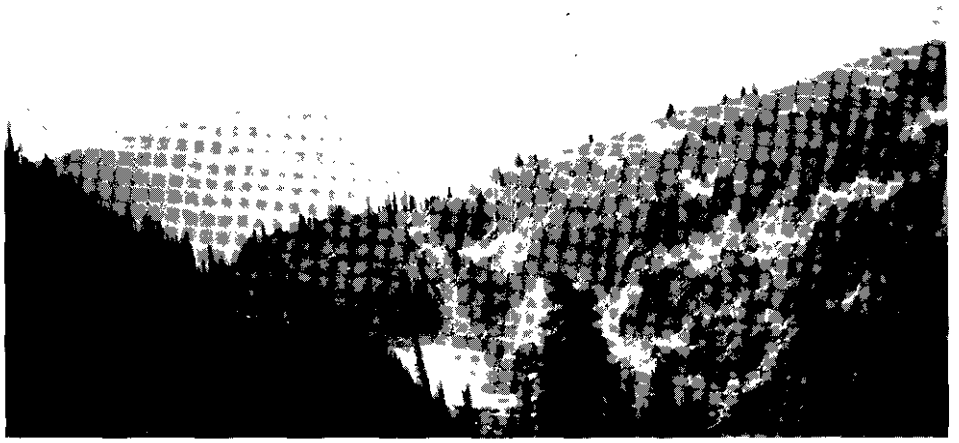


Fourth of July. This claim, situated near the head of Robb creek, adjoins the *Texas* to the south. It is an old Crown-granted claim on which work was done many years ago but is now lying idle. Ore was first found at the surface in a sheared fissure in slate near a granite-contact and after prospecting by trenching and open-cuts, from which a small tonnage of high-grade silver-lead-zinc ore was extracted, a crosscut tunnel was driven at a depth of 80 feet below the outcrop. This crosscut, which has a length of 108 feet, first penetrates granite and then enters sheared and highly metamorphosed slates in which the vein occurs. Drifting for 192 feet in a direction of S. 45° W. disclosed the vein-filling to occupy an apparent width of about 5 feet and to consist of sheared slate carrying bands of oxidized vein-matter and some spathic iron.

This drift appeared to be in the hanging-wall side, as the foot-wall was indefinite. While the vein-matter was well mineralized with iron, the only ore seen was exposed in the foot-wall side, where a 4-inch stringer was uncovered but not prospected at a distance of 72 feet from the crosscut. A sample taken here ran: Gold, 0.01 oz.; silver, 24.7 oz. to the ton; lead, 10.5 per cent.; zinc, 21.7 per cent.

Near the end of the crosscut a winze had been sunk, indicating the presence of an ore-shoot at this point, but this could not be examined on account of water.

At the outcrop the vein can be traced by open-cuts for 200 feet. These surface showings have a width of about 5 feet of oxidized ledge-matter, in which streaks and bunches of galena occur. A sample of this material ran: Gold, 0.01 oz.; silver, 18.9 oz. to the ton; lead, 21.3 per cent.; zinc, 3.7 per cent.; while a sample from a small pile of sorted ore gave the following returns: Gold, 0.02 oz. to the ton; silver, 128.5 oz. to the ton; lead, 62.8 per cent.; zinc, 7.6 per cent. On the dump from the tunnel there are a few tons of milling-grade ore scattered around; a grab sample of the best-looking material ran: Silver, 17.6 oz. to the ton; lead, 9.3 per cent.; zinc, 13.8 per cent.



Paint Lake, Arrow Lake M.D.

Kaslo, B.C.

Boadicea. This claim is situated on the right bank of Robb creek and opposite to the *Fourth of July*. The formation underlying the area, consisting of slate and limestone, has been intruded by tongues of granite. The workings of the *Boadicea* are in the sedimentary rocks, judging by surface indications and the material on the dumps. The vein, which can be seen cutting a high bluff, has been explored by a number of tunnels over a vertical depth of 600 feet. Unfortunately the most important of the underground workings were in a caved condition, hence could not be examined. On the dump of the lowest tunnel there was a considerable quantity of spathic iron, turned black by oxidation, with which was associated galena and zinc-blende. A sample taken of this ore ran: Silver, 6.4 oz. to the ton; lead, 5.2 per cent.; zinc, 10.2 per cent. As this tunnel was probably only caved at the portal it could be reopened at small cost, and conditions appeared to justify such work being done in order to allow a thorough examination to be made. The property was lying idle, no work having been done for a number of years.

Caledonia.* This property, owned by Geo. E. McCready, is situated on the left bank of Kaslo creek, just above Blaylock Siding, to which it is connected by trail. The formation, composed of rocks of the Slocan series, strikes north-westerly, with steep dip to the south-west. The ore, which occurs in a fissured zone in carbonaceous limestone, varies from streaks of clean galena and zinc-blende to several feet in width of mixed sulphides in a gangue of calcite, quartz, and spathic iron. On the surface there are two 20-foot shafts, a short tunnel, and numerous open-cuts exposing oxidized ledge-matter mineralized in places with galena and zinc-blende.

The lowest working is a crosscut 140 feet long, from the inner end of which short tunnels have been driven north-westerly and south-easterly. In the south-easterly drift a raise has been put up 65 feet to the surface, from which a small amount of stoping has been done. Just below the raise a winze has been started from the floor of the tunnel. Samples taken on the lower tunnel level assayed:—

Description.	Gold.	Silver.	Lead.	Zinc.
	Oz.	Oz.	Per Cent.	Per Cent.
Across 12 inches in bottom of winze	0.04	15.4	16.6	34.3
Across 20 inches in north-westerly drift (part of a width of from 4 to 5 feet of sparsely disseminated mineralization)	0.02	10.6	12.4	20.1
Across 3 feet on the north-west side of raise, 18 feet up from tunnel	0.06	38.4	26.1	12.8

The lower tunnel dump apparently contains an appreciable tonnage of ore, mixed with waste, which the owner was preparing to sort out for shipment to the smelter as milling-ore. A 64-lb. sample representing this ore in the dump shipped by him to Trail for a mill test assayed: Gold, 0.02 oz. to the ton; silver, 14.4 oz. to the ton; lead, 11.3 per cent.; zinc, 18.4 per cent. The result of the test indicated that, in spite of the ore on the dump having been exposed to oxidation for a number of years, a very good separation and recovery could be made.

Panama.—This group, owned by H. Glegerich, of Kaslo, is situated near Bear lake. The trail was repaired and further development was undertaken. The ore is a "dry" silver ore similar in character to that of other properties on London ridge.

Rainbow and Central.* These claims, owned by W. Anderson, of Kaslo, are situated in the angle of the forks of 12-Mile creek, some 4¾ miles up the *Utica* road from Adamant Siding. A short length of trail connects the cabin by the roadside with the lower tunnel at an approximate elevation of 5,950 feet. The property was worked during 1926 by L. Johnson, A. Johnson, A. Wall, and G. Larsen under lease and bond. The formation consists of rocks of the Slocan series which have been considerably disturbed by near-by intrusions of granite.

Several veins, varying in width from a few inches to several feet, occupy fissures in the schist country-rock, which strikes S. 35° W., with a very steep dip to the south-east. The ore is galena and zinc-blende in a gangue of altered silicified country-rock.

The main working is a crosscut tunnel driven 130 feet to a vein, which was drifted on a short distance to the south-west. This drift-tunnel is just below a rock-slide and the ground, in which some stoping was done, is loose and broken. The ore in this working, consisting of galena and carbonates in a decomposed gangue, apparently occurs in bunches and small lenses.

A sample of galena sorted for shipment assayed: Gold, 0.06 oz. to the ton; silver, 121.3 oz. to the ton; lead, 71.2 per cent.; zinc, 1.1 per cent. On the same level another short tunnel run westerly in blocky schists cuts a narrow vein sparsely mineralized with zinc-blende. On the steep mountain-side above the lower tunnel a short tunnel, a 40-foot shaft, and open-cuts develop small fissure-veins, from which small amounts of ore have been extracted at times.

A shipment of 5 tons was made by the above leasers.

Mohawk.* This property, owned by Ray Hughes, of Kaslo, is situated above and adjoining the *Rainbow* and *Central* and in the same formation (Slocan series). No work was being done at the time of the writer's visit in July, but subsequently the trail, 1 mile in length from the *Utica* road, is reported to have been cleaned out preparatory to further work. J. Chisholm shipped 12 tons of silver-lead ore from this property in 1919.

California Group, Marble Arch and Big Ben Claims.* The *California* group consists of the *Tunnel Site*, *Lead Horn*, and *California* claims, owned by John Koski. The *Marble Arch* and *Big Ben*, adjoining the *California* group, are owned by W. R. Hunter and O. A. Tapanila. The properties are situated on the western side of 12-Mile creek and adjoin the *Utica* road about 1¾ miles from the Canadian Pacific Railway. The claims extend up the steep mountain-side from the creek at about 3,600 feet elevation. The rocks of the area, classified as the Slocan series, include carbonaceous limestone, schist, quartzite, and slate intruded by granite-porphyry dykes and tongues from the Nelson batholith.

On the *California* group the workings, chiefly on the *Lead Horn* claim, develop a fissured band of limestone from 11 to 20 feet wide, altered and schistose in places, with which porphyry dykes are associated. The strike of the limestone is N. 30° W. and the dip is from 55° to 60° to the north-east. The mineralization consists of occasional sparsely disseminated galena and zinc-blende and in places there are "iron-cappings." The workings, which are only superficial, are as follows:—

A shaft at the upper end of the *Lead Horn* claim sunk in oxidized ledge-matter following the discovery of mineralized "float." Close to the shaft a tunnel was driven in loose ground containing some galena. Lower down the mountain-side a tunnel has been driven 60 feet on the "Big" vein, which is here about 20 feet wide, consisting of limestone and calc-schist considerably iron-stained in places. Some disseminated galena occurs in places in oxidized ledge-matter.

Still farther down the mountain and near the cabin a tunnel has been driven 57 feet on the vein, which at this level is 11 feet wide and shows the same characteristics as in the tunnel above.

The *Marble Arch* is started on the upper or north-westerly extension of the *California* vein, which, however, has not been opened up on this claim. A shallow shaft and two short tunnels develop a quartz-filled fissure containing streaks of high-grade ore. The country-rock is calc-schist.

At the top of the shaft the vein is merely a seam which widens out at the bottom of the shaft, where some 4 inches of clean galena and grey copper assayed: Gold, 0.14 oz. to the ton; silver, 393.6 oz. to the ton; lead, 70.3 per cent.; zinc, trace.

No ore of importance is developed in the two short tunnels below the shaft, but the cleavage is well defined. The *Marble Arch* vein is striking N. 70° E. towards the extension of the "Big" vein (*California* group vein), which lies a short distance away from and below it. The dip is 50° to the south-east.

The *Big Ben* faces 12-Mile creek and adjoins the *Lead Horn* of the *California* group to the south-west. On this claim there is a vein, mineralized with galena, in granite. The vein, which is from 18 to 20 inches wide where examined, strikes N. 75° E. towards the *California* group vein. The dip is 67° to the north-west. The mineralization occurs in stringers and masses of clean galena associated with iron pyrites and small amounts of quartz in a granitic gangue.

At 5,250 feet elevation a shaft was sunk 20 feet on ore, which pinched out at the bottom. A grab sample from a pile of some 2 tons of sorted ore near the collar of the shaft assayed: Gold, 0.12 oz. to the ton; silver, 94.5 oz. to the ton; lead, 81.2 per cent.; zinc, 0.9 per cent.

Howser Lake and Vicinity.

Surprise. This group, comprising three Crown-granted claims and a fraction, is owned by F. A. Devereaux, of Victoria. During the early part of the year it was acquired under the terms of an option by R. K. Waite, of Nelson, who interested Chicago capital for its development. The property is situated on Glacier creek at a distance of approximately 3 miles by trail from the Howser–Argenta wagon-road. The camp is situated in the creek-bottom at an elevation of 2,400 feet above sea-level (aneroid). A steep trail leads to the workings, which are situated on the wooded side-hill at an elevation of 3,700 feet.

The principal workings consist of two adit-tunnels, the No. 1 and No. 4. The No. 1 tunnel had been driven for 70 feet in a direction of N. 25° W., then runs due north for 100 feet. For the first 100 feet the drift follows a strong quartz vein with an apparent dip of 40° to the east and occupying a fractured zone in argillites. Where the quartz has been subjected to cross-fracturing and shearing movements the mineralization, consisting principally of grey copper, is more pronounced, and where these conditions prevailed an ore-shoot of about 50 feet long had been stoped to a height of about 20 feet above the drift. The average width of the vein in this stope was from 4 to 6 feet, with a narrow streak of ore along the foot-wall, the balance of the vein being sparsely mineralized massive white quartz. Where the quartz had been fractured near the foot-wall it contained inclusions of country-rock and seams of graphitic material along the cleavage-planes. A sample taken in the roof of the stope along the foot-wall streak gave the following returns: Gold, 0.04 oz. to the ton; silver, 34.96 oz. to the ton; lead, 0.04 per cent.; zinc, 1.8 per cent. Much higher returns might be expected from picked samples of the ore high in grey copper. It is quite apparent from the character of the vein that careful mining and sorting would be necessary to obtain a shipping product.

The downward continuation of this body of quartz had been prospected by two winzes, 32 feet apart. This work leaves doubt as to the persistency of the vein with depth and failed to disclose the true hanging-wall.

For the first few feet below the drift 3 or 4 feet of good ore is exposed, which narrows down to 16 inches at a depth of 25 feet and is then interrupted by faulting movements. A sample taken across this width gave the following returns: Gold, 0.07 oz. to the ton; silver, 52.92 oz. to the ton; lead, trace; zinc, 0.7 per cent.

The No. 4 tunnel had been driven at an elevation of 110 feet below the No. 1. The writer was informed that the total length of this tunnel was 410 feet, but time did not allow its measurement. Apparently this tunnel, which roughly parallels the direction of the vein as exposed in No. 1, had been driven in the foot-wall.

At a distance of 225 feet from the portal a crosscut tunnel had been driven in a direction of N. 65° E. This cuts a strong quartz vein, which is probably the same as that developed in the upper tunnel. At this point it is only slightly mineralized and no drifting had been done on it. Continuing past this crosscut, the main tunnel swings to the north and discloses what was considered to be the continuation of the vein exposed in the crosscut. Here the quartz is sparsely mineralized with zinc-blende.

Another vein which was exposed in a tunnel some 200 feet to the east of No. 1 tunnel was examined, but without an examination of the surface geology the importance of this showing and that of the work being undertaken to explore by a new tunnel lower down the hill the possible intersection of two veins could not be appreciated.

During the short stay at the property on this occasion the impression was gained that not as much work had been done to develop at depth the ore-shoot exposed in the No. 1 tunnel as conditions would appear to warrant and that future development could probably be done to best advantage from the No. 4 level.

Glacier Creek.* This property, consisting of the *Glacier* and *Summit*, owned by W. L. Smith, of Lardeau, is situated on the north-western side of Glacier creek, which flows into the Duncan river south of Howser lake. The claims are staked up the steep mountain-side to the summit of the ridge separating Glacier creek from Howser lake. The workings, consisting of some open-cuts and a short tunnel lying between the creek and a point about 700 feet vertically above it, develop a wide mineralized zone in limestone. The mineralization consists chiefly of scattered bands and streaks of a fine-grained mixture of zinc, lead, and

iron sulphides, occurring as replacement deposits in the lime-bands. The following samples were taken:—

Description.	Gold.	Silver.	Lead.	Zinc.
	Oz.	Oz.	Per Cent.	Per Cent.
Across 6 feet in open-cut highest up the hill	0.02	0.55	3.8	18.1
Grab sample from small pile on dump at lowest working	0.01	0.85	9.5	14.4
Sample of ore sorted for test shipment	0.01	0.50	13.0	29.2

The work done is not sufficient to prove the continuity of the mineralization, which appears to be strongest at the highest workings.

Amato, Ruby, etc.*

On the north-westerly extension of the same limestone-belt six claims were staked last summer by J. S. Hincks and W. C. P. Heathcote: The *Ruby* and *Amato*, jointly owned by both men; the *Eileen* and *Marjorie*, owned by Hincks; and the *Ruby* and *Anne*, owned by Heathcote. The claims extend from the summit of the ridge above the *Glacier Creek* to Hinck's ranch on the south bay of Howser lake. The workings, consisting of open-cuts, are mostly on the *Amato*, *Eileen*, and *Marjorie* claims at elevations from 250 to 750 feet above the lake. The character and occurrence of the ore in these workings are the same as on the *Glacier Creek*, the mineralization also occurring in streaks and bands of mixed lead, zinc, and iron sulphides in oxidized calcareous gangue and limestone. The following samples were taken from open-cuts on the *Marjorie* and *Amato* claims:—

Description.	Lead.	Zinc.
	Per Cent.	Per Cent.
Across 6 inches of oxidized and decomposed material on hanging-wall of open-cut on Marjorie claim, 750 feet above lake (3 feet parting of waste)	14.1	12.6
Across 12-inch centre band in same open-cut; disseminated iron, lead, and zinc sulphides and oxidized material (2 feet parting of waste)	7.1	2.8
Across 15-inch band on foot-wall side of same open-cut; disseminated sulphides with some oxidized material	12.2	21.3
Across 18 inches in open-cut on Amato claim, 250 feet above lake	14.8	14.7

The gold and silver values in the samples were negligible.

The rocks, which strike north-westerly with steep dips to the north-east, form the low hog-back ridge on the eastern side of the lake between the south and north bays. Along this ridge are situated the claims of G. H. Scott, the Matthews Bros., and J. N. Watson (*Lakeside No. 1* and *No. 2*, etc.). These claims are staked along the ridge, which parallels the lake for several miles, its summit being only a few hundred feet above the water-level. Along the ridge and on both sides of it a few open-cuts have been made in limestone mineralized in places with low-grade disseminated lead, zinc, and iron sulphides. The mineralization in the limestone-belt, therefore, is found at long intervals over a length of between 4 and 5 miles at the several properties mentioned above, including the *Glacier Creek*.

Scarcely any work has been done to prove the continuity of the various showings as yet. Nothing definite is in sight, but where mineralization is found at intervals over such a long distance careful exploratory work would seem to be justified with a view to locating ore-bodies of commercial grade and proportions.

Other Activities.

The *Lavina*, between Hamill and Glacier creeks, was operated by E. Nordman and associates. Improvements were made to the trail and it is expected that ore will be shipped during the winter.

Silver-lead claims have been staked on Boulder creek, upper Duncan river, by H. Hincks, Hugh McKay, and Sam Luffman.

John Noihl worked the *International* on the upper Duncan and C. O. Woodrow, of Nelson, acquired claims on the extension of the same silver-lead vein.

R. S. Gallup worked all summer on the *President* group near the north end of Howser lake.

The *Ruth* and *Florence*, on the south bay of Howser lake, were worked by J. Rady and John Noihl.

A shaft, reported to be 70 feet deep, has been sunk on the *Red Elephant* gold property of Hall creek, which has been bonded by McKay & Power to J. Morris and associates, of Spokane.

On *Gertrude* creek, upper Duncan river, D. D. McPhail has restaked the *Mabel, Maude*, and *No. 2* claims, owned by him jointly with Jack Healy and J. M. Gillis. The claims are on the northern side of the creek at an elevation of 6,700 feet, or about 5,000 feet above the river. A temporary camp was established at the mouth of the creek preparatory to opening up the old trail, about 3 miles in length. Some old superficial workings develop two veins, one of them containing values in gold, copper, and silver, and the other being a vein of iron sulphides with which gold values are associated.

At the Bullock Gold Mines' property near Poplar it is learnt from sources which are considered to be reliable that the last work done on the property was the driving of a tunnel 175 feet in length from a point near the camp-level, and that no important discoveries had been made since the property was reported on in the Annual Report for 1920.

Unfortunately time did not permit a visit to this section of district during the season, but it is understood that the usual amount of prospecting was carried on.

List of Shipping-mines in the Ainsworth Mining Division, 1926.

Mine.	Locality.	Tons.	Character of Ore.
Bluebell	Riondel	31,030	Silver-lead-zinc.
Charleston	Retallack	31	Silver-zinc.
Cork-Province	Zwicky	2,022	Silver-lead-zinc.
Daybreak	Zwicky	19	Silver-lead-zinc.
Metals Recovery	Retallack	16,368	Silver-lead-zinc.
Rainbow	Zwicky	5	Silver-lead-zinc.
Silver Hoard	Ainsworth	24	Silver-lead.
Spokane-Trinket	Ainsworth	67	Silver-lead.
Surprise	Howser	6	Silver.
Tariff	Ainsworth	98	Silver-lead-zinc.
Whitewater	Retallack	9,839	Silver-zinc-lead.
Lake Shore		14	Silver-lead.
Jeanette		11	Silver-lead.
Silver Hill		25	Silver-lead.
Total		59,559	

REVELSTOKE, LARDEAU, AND TROUT LAKE MINING DIVISIONS.

Although the interest in mining has not been as active as conditions would appear to warrant in the Revelstoke Division, nevertheless there have been more men employed in the industry than for a number of years past, and the prospects are that conditions in this respect will be at least as good during 1927 and in all probability will shown an improvement.

The wagon-road which is gradually being extended up the Columbia river into the Big Bend country has already been a great benefit to prospectors and others who have interests in that part of the district. This road is now constructed to a point a few miles past LaForme creek.

For a time the interest of mining men and others was chiefly centred on the operations being undertaken by the Porcupine Goldfields Development and Finance Company at the *J. & L.* group, situated on Carnes creek and owned by I. McBean, where a crew of about ten men was put to work at driving a low tunnel. After accomplishing a limited amount of work the option was relinquished; the complex character of the ore, rather than the ore occurrence itself, is the principal reason given for the abandonment of the property; for reference *see* the Annual Report for 1922.

At the *Woolsey* on Silver creek the Bernier Metals Corporation, of Vancouver, had a crew of about fifteen men working for the greater part of the year under the management of R. F. Hill. New cabins were built at the mine, 7½ miles of telephone-line was constructed, extensive improvements made to the trail, and a loading shed and platform was built at the railway-track. Underground development consisted of driving a tunnel at a vertical depth of 500 feet below the old tunnel driven by the late Dave Woolsey, who owned the property.

This new tunnel lies at a distance of 1,045 feet to the north-east of the portal of the upper tunnel and was driven in a direction parallel to the strike of the vein for a distance of 200 feet, at which point a crosscut had been started and advanced for 152 feet; this has still 450 feet to go to intersect the downward projection of the vein. Work on this was discontinued towards the end of the season pending the installation of a compressor, as the ground became too hard to allow good progress by hand-drilling.

Quartz-outcrops indicated that there are good possibilities of other veins being intersected by this crosscut; in fact, one large body of quartz slightly mineralized had already been encountered. To provide air for this tunnel an 8-horse-power Vickers-Petters oil-engine and a 30-inch ventilating-fan had been installed.

Other work consisted of exploration on Tangier creek (the North fork of the Illecillewaet river), where ten additional claims were staked, making a total of forty-two claims controlled by the company. It is understood some strong quartz veins were uncovered and the results of the initial work were encouraging. For further reference to this property *see* the Annual Report for 1919.

Silver Gland.—At this property, on Tangier creek, J. H. S. Munro, of Revelstoke, had a crew of five men employed at prospecting and development. The trail was repaired and a new cabin built. The ore is reported to be high-grade silver-lead.

Wigwam.—A small crew of men was employed during the year at exploration and development under the direction of W. T. Dumbleton, of Tacoma.

Placer-mining.

On French creek the French Creek Development Company had a small crew of men engaged at building a flume and making preparations for hydraulicking, under the direction of F. N. Remillard. W. J. Smith and several partners, who put in a season on their placer lease on McCullough creek, report that the season's work was very satisfactory. A good deal of time was necessarily taken up in cutting out old grown-over trails, building a cabin, and whipsawing lumber for the sluice-box, etc. It is reported that washing operations were started in September and the returns were very encouraging. The gold is said to be mostly coarse. It is intended to continue operations next season.

LARDEAU MINING DIVISION.

There was more activity around Camborne this year than there has been for many years past; this was due to a larger crew of men being put to work on the *Multiplex*, where some high-grade ore was mined and shipped to Trail; while later in the year F. R. Blockberger succeeded in interesting some American capital in the *Teddy Glacier*, with the result that more men were put to work and pack-trains were busy taking up supplies to the property.

The Lardeau Mines Exploration Company, with head office in the North-West Building, Vancouver, has acquired options on a number of properties, on which it is intended to do initial development-work, with a view to ultimately turning them over to the larger operating companies. So far most of the properties acquired by this company are tributary to Incomappleux creek. Late in the season work was started on the *Paymaster*, just beyond the 12-Mile bridge on Incomappleux creek. Here a crosscut tunnel is being driven to tap showings exposed on the bluffs above. A little work was also done by this company on the *Moscow* group on Poole creek. It is understood that other properties have been acquired near Ferguson.

Multiplex. This property is owned by the Multiplex Mining, Milling, and Power Company, capitalized at $1,000,000 in shares of $1 each. O. T. Bibb is president and manager. The property consists of a large group of claims situated on Poole creek, about 2 miles from Camborne. Small-scale development has been carried on for some years and for the first time in the history of the present company important shipments were made to Trail, the first shipment being mined from the upper workings. It is not known at

present what success was attained at other workings which were being driven to tap the ore-body at greater depth.

At the uppermost working about 60 feet of drifting from the surface had disclosed a short lens of ore having a maximum width of 3 feet. This had been followed down for 6 feet, but the winze was full of water. In the face of the tunnel, about 5 feet from the winze, a streak 3 inches in width was exposed and a sample taken here gave the following exceptionally high returns: Gold, 0.14 oz. to the ton; silver, 611.8 oz. to the ton; lead, 39.1 per cent.; zinc, 3.2 per cent. A sample taken from the bottom of the drift at the edge of the winze ran: Gold, 0.12 oz. to the ton; silver, 307.7 oz. to the ton; lead, 70.5 per cent.; zinc, 6.4 per cent.

The first car-load of ore of 35 tons gave the following assay returns: Gold, 0.07 oz. to the ton; silver, 150.7 oz. to the ton; lead, 23.6 per cent.; zinc, 19.3 per cent.; iron, 8.5 per cent. This ore apparently occurs at the intersection of two veins, for in one side of the drift at the winze there is evidence of another vein striking at an acute angle to the one drifted on and mineralized across a width of 5 feet with lead, zinc, and iron sulphides in a quartz gangue. A sample across this width gave the following returns: Gold, 0.02 oz. to the ton; silver, 37.5 oz. to the ton; lead, 11.7 per cent.; zinc, 20.4 per cent.

A tunnel was being driven at a point 50 feet below to tap the downward projection of this ore and at 113 feet lower down the old workings were being extended. In these latter workings a small stringer had been encountered and further development was awaited with interest. A sample taken from this stringer at the face of the tunnel ran: Gold, 0.08 oz. to the ton; silver, 45.2 oz. to the ton; lead, 3.1 per cent.; zinc, 17.5 per cent. Improvements were made to the trail and new camp buildings were erected. For further reference *see* the Annual Report for 1924.

The following are among the other activities reported: Duncan McIntosh put in a season at the *Lead Star* on Stephney creek. The Consolidated Mining and Smelting Company had a small crew employed at exploration-work on the *Big Showing*, which is held under option from the owner, John Leask, of Cranbrook. The Imperial Syndicate, of Nelson, which controls the *Eva* and *Cholla* groups, had some of the old tunnels cleaned out to allow an examination of the property to be made and did further prospecting on the *Cholla*.

Teddy Glacier.* This property, situated at the head of the Middle fork of Sable creek, some 13½ miles by road and trail from Camborne, was described in the Annual Report for 1925. During 1926 the property was acquired by F. R. Blockberger, of Vancouver, and associates, of Detroit and Buffalo, who have been working the property since the fall of the year. The trail was improved throughout and temporary camps were established, including the building of a cabin to accommodate a few men close to the workings at 7,500 feet altitude.

Late in the fall a new showing of silver-lead ore was found in a parallel fracture some 150 feet farther up the mountain from the lower showings and about 60 feet vertically above them. At the time of the writer's visit in October a short length, some 25 feet, of this showing was exposed, the north-easterly end of it running in under the shallow ice on the rim of the main glacier. The width of the showing was from 3 to 6 feet, consisting of masses of galena and pyrite in a quartz gangue.

A sample of galena and pyrite, free from gangue, from the new discovery assayed: Gold, 0.10 oz. to the ton; silver, 36.1 oz. to the ton; lead, 68.7 per cent.; zinc, 0.2 per cent. A sample of iron pyrites, clean as possible from galena, with a small amount of associated quartz was taken from the new showing to get an idea of the gold content of the pyrite. This assayed: Gold, 0.51 oz. to the ton; silver, 3.7 oz. to the ton; lead, 0.3 per cent. A sample of iron pyrites and quartz from the "big showing" farther down the hill assayed: Gold, 0.76 oz. to the ton; silver, 0.3 oz. to the ton. The last two samples, confirming results obtained in 1925, indicate that the iron pyrites, which are very plentiful in the surface exposures, carry appreciable gold values, which should be of importance if tonnage is developed justifying milling plant.

A crosscut was started by hand which will gain about 35 feet of depth on the "big showing" and close to 100 feet depth on the new discovery. Since the property was described in 1925 new stripping on the main fracture containing the "big showing" has exposed ore almost continuous for 200 feet in length. Similar ore, consisting of masses of galena and pyrite, has also been exposed in small veins and stringers running in various directions from the main system of fracturing.

It is reported that the work was temporarily discontinued when the snow got too deep. Results of development will be awaited with interest, as the proving of large ore-bodies on the *Teddy Glacier* should go a long way towards reviving interest in the Camborne mining camp.

TROUT LAKE MINING DIVISION.

There was about the usual amount of prospecting and mining carried on in this Division during the season, but no new work or developments of outstanding importance have been reported. However, there have been a number of inquiries about properties and the "old-timers" are looking forward to a much busier season in 1927.

True Fissure. This property is owned and operated by the True Fissure Mining and Milling Company, of Cincinnati, Ohio. It consists of a group of eight Crown-granted claims and fractions, situated a short distance from Ferguson. For a number of years a small crew of men has been steadily employed at development with the object of blocking out sufficient tonnage to warrant the erection of a concentrator, tramway, etc., for the ore so far developed is essentially of milling grade and transportation costs and lack of facilities do not allow shipping this character of ore. As mining has been done entirely by hand-work, progress has naturally been slow, but good, considering the method of mining.

During the year development was confined to the *Bluebell*, adjoining the *True Fissure* to the west. Here a 168-foot raise had been driven from the low tunnel to the upper workings. In the low tunnel ore of possible milling grade is exposed in the bottom of the drift for a length of about 50 feet; this level was being advanced in a north-westerly direction. The raise between the two levels follows a streak of zinc-blende of varying widths up to 3 feet. At 110 feet above the level a short intermediate drift exposes a nice showing of good-grade zinc ore having a width of 3 feet.

On the upper level a streak of a finely crystalline mixture of zinc, lead, and iron sulphides having a width of from 18 inches to 2 feet and length of 150 feet is exposed by the drift. A sample taken at random along the length of this ore ran: Gold, 0.08 oz. to the ton; silver, 22.5 oz. to the ton; lead, 9.7 per cent.; zinc, 26.9 per cent. This is of excellent milling grade and with the healthy mineralization here and at other places on the property there should be a good chance for the development of a considerable tonnage. Dave Morgan, of Ferguson, is in charge of the work. For further reference *see* the Annual Report for 1921.

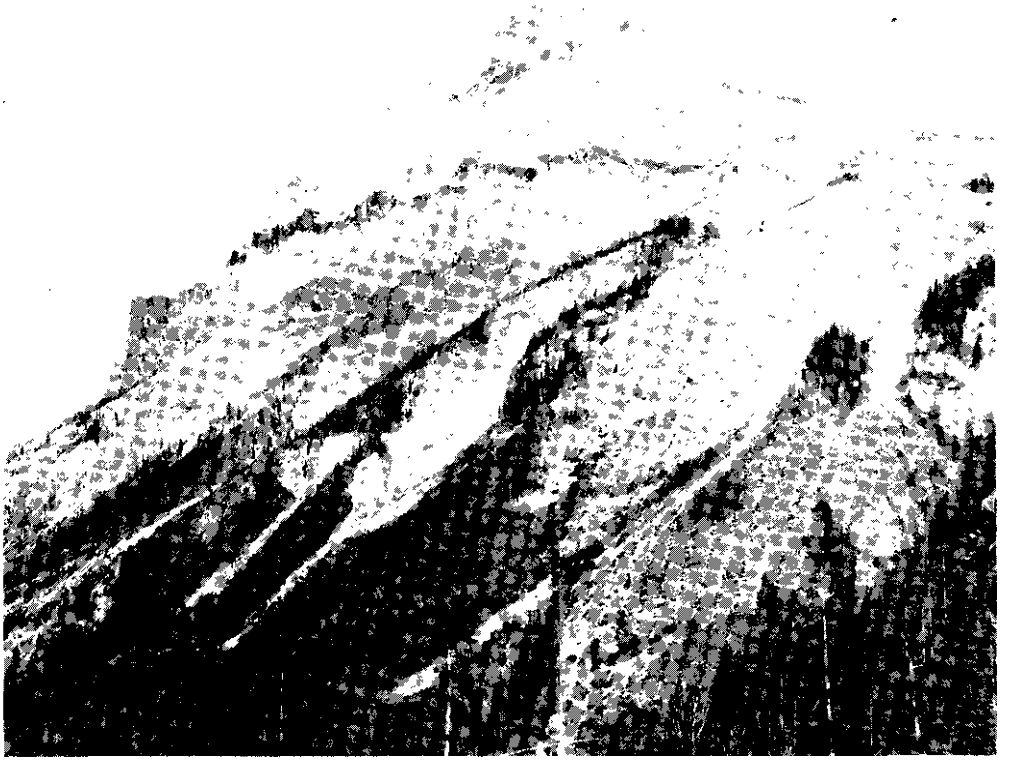
Mohican. The Mohican Mining Company, of Vancouver, which is capitalized at $500,000, divided into 2,000,000 shares of 25 cents each, owns this property. It consists of three Crown-granted claims situated on Gainer creek at an approximate distance of 7 miles by trail from the wagon-road up Silver Cup (South fork of Lardeau) creek. The camp, consisting of a bunk-house and cook-house, provides accommodation for six men and is situated near the workings at an elevation of 6,300 feet.

The old workings, consisting of open-cuts and trenching at the outcrop of the vein, are now all filled in and no ore was visible. From an examination of conditions here and underground it was apparent that shearing and faulting movements had taken place along the line of weakness formed by the vein, which latter was broken and of doubtful continuity. A remnant of quartz on the foot-wall side of the vein, having withstood erosion, was exposed near where the old surface work had been done; it had a strike of N. 75° W. and a dip of 80° to the south-west.

Farther down the hill an old tunnel had been driven to develop the surface exposures at a depth of 125 feet; this was caved near the portal and full of water, so was not examined. It is reported (*see* Annual Report for 1914) that 8.8 tons of sorted ore was shipped from this tunnel and yielded: Gold, 0.01 oz. to the ton; silver, 56.3 oz. to the ton; copper, 1.5 per cent.; lead, 27.8 per cent.; zinc, 10.9 per cent. In order to develop the ore exposed in this tunnel at greater depth a crosscut had been started at a depth of 300 feet below the outcrop.

The work done by the company consisted of advancing this crosscut for a total distance of 346 feet in a north-easterly direction. The formation encountered was a black slate-schist. At the end of the crosscut a sheared fissure was encountered and drifted on in an easterly direction for 90 feet, at which point some small lenses of ore were reported to have been exposed, but as the drift was timbered and lagged, little could be seen. Beyond this point soft swelling ground had caved in the continuation of the drift along the fissure, and to avoid these conditions the tunnel had been driven in the foot-wall side and continued for 165 feet, when it was turned back into the line of the fissure and soft ground, which needed close timbering, was again

Multiplex M.M. & P. Co.—Transporting Ore.



Mount Stephen—Fossil Beds at X.

encountered. Nothing of particular interest could be seen in this drift and no appreciable tonnage of ore was noticed on the dumps.

As regards possibilities, it is difficult to express an opinion, for the most important exposure in the upper adit-tunnel was not accessible for examination and the relation between the upper and lower workings could only be determined by a survey, which no doubt the company has had made, but the impression was gained that the low tunnel would have to be extended for a considerable distance to pick up the downward extension of the ore exposed above.

Among the numerous prospecting activities the following have been reported: At the *Big Five* on Ferguson creek (North fork of Lardeau creek) the owners continued development. Several examinations of the property were made by visiting engineers and during the latter part of the season, it is understood, it was acquired under option by McMillan & Trethewey, who intend to operate it next year.

The Blue Jay Mining Syndicate, of Victoria, acquired the *Blue Jay* group of claims at the headwaters of McDonald creek and had them surveyed with a view to getting them Crown-granted. No work was reported to have been done.

J. Lundy, of Penticton, put in a season at prospecting around the headwaters of Ferguson creek.

The *Abbot*, on Healey creek, after lying idle for a number of years, was acquired by E. B. Brauns and A. E. Brauns, who had a small crew of men employed at exploration and development. A small compressor plant is contemplated for 1927.

Several parties examined the deposit of Iceland spar at the head of Lake creek, of which W. Glenn, of Nelson, is one of the principal owners. It is understood that those who visited the property were well satisfied with the prospects and that it is probable an attempt will be made to mine some of this material during the coming year.

Alex. MacLean and associates, of Gerrard, did some work on the *Magnet* claim near Gerrard, which has been lying idle for many years.

The trail to the *Silver Tray* was repaired and further work was undertaken at the property, which belongs to J. Parisian and associates, of Gerrard.

R. Yuill, of Trout Lake, has been steadily working on his property, the *Free Coinage*, which adjoins the *Silver Cup*. Improvements were made to the trail, over which rails and other supplies were taken in.

Mrs. Jowett, of Trout Lake, who for many years has been interested in a number of properties and has been responsible for a considerable amount of prospecting and development work, made her annual trip of inspection.

Magnet.* This property consists of the *Magnet* and *Maybe* claims, owned by A. McLean, T. West, B. Hicks, and R. and J. Thompson. It is situated on Mobbs (Canyon) creek, 1¾ miles by trail from Gerrard, at an elevation of about 2,700 feet at the tunnel a few hundred feet above Trout lake. The property is situated in the "South-west Mineral Belt," the formation consisting of alternating bands of limestone, schists, and slates.

The ore, a mixture of galena, zinc-blende, and pyrite, with occasional grey copper, in a calcareous and siliceous gangue, in apparently found in stringers and lenses in a wide shattered zone in graphitic schist. The mineralized strata strike north-westerly up the steep mountain-side, dipping steeply to the north-east.

Just above the creek-level an old tunnel, driven along the strike of the ore-bearing ground, was caved at about 100 feet in from the portal, and a winze beyond the caving, from which 9 tons of ore are reported to have been extracted and shipped some years ago, could not be reached. A short distance inside the portal a short crosscut driven north-easterly contains a winze, full of water when examined, from which some ore is also reported to have been extracted. The following samples were taken:—

Description.	Gold.	Silver.	Copper.	Lead.	Zinc.
	Oz.	Oz.	Per Cent.	Per Cent.	Per Cent.
Streak in floor of tunnel 100 feet in	0.21	12.9	1.00	9.7	14.5
From small pile of ore on dump of tunnel	0.21	18.8	1.11	19.9	13.7

Some old surface cuts above the tunnel were caved. The work done during the season by McLean and associates consisted in cleaning out and timbering the workings preparatory to continuing development.

The inaccessible condition of part of the workings prevented a satisfactory examination being made and but little information could be gained as to the character and continuity of the deposits. The area offers interesting prospecting possibilities.

Butte.—This group, situated in Bonanza basin and formerly owned by the late J. G. Jenkins, has been bought by R. H. Graves from the Official Administrator at Kaslo. A company will probably be formed to work the property.

NELSON MINING DIVISION.*

The mining activities of this Division have been more pronounced since the recent entry into the field of strong mining companies, including the Victoria Syndicate and Porcupine Goldfields Development and Finance Company, both of which represent British capital. The activities of these companies in the Sheep Creek, Pend d'Oreille, and Ymir camps have been of considerable benefit and have put new life into those areas. Many examinations were made on behalf of these and other companies, and as a result prospecting activity was considerably stimulated, many claims being staked in the vicinity of the active mining properties.

Mining properties and prospects on which work was done include the *Yankee Girl*, *Goodenough*, *Hunter V.*, *Golden Crown*, *Howard*, and *Porcupine* in the Ymir district; *H.B.*, *Black Jack*, *Lucky Boy*, *Emerald*, *Queen*, and *Salmo-Consolidated* in the Sheep Creek camp; McDonald-Reeves properties and *Red Bird* in the Pend d'Oreille section; molybdenite claims on Lost creek; Beaver Creek mines near Ross Siding; *Arnold* on Erie creek; *Golden Age*, *Euphrates*, *Gold King*, and *Fern* south of Nelson; *Silver Reef*, *Queen Victoria*, *Alma N.*, *Granite-Poorman*, Rover Creek placers, and *Paradise* near Nelson; *Molly Gibson* on Kokanee creek; *Bluebird* at Deer Park; and the Associated Mining and Milling Company's properties near Ginol's Landing. The most important activities centred around Ymir, Sheep Creek, and the Pend d'Oreille River areas.

At and near Ymir the principal features were: Resumption of work at the *Yankee Girl* mine, after about six years' inactivity, by O. C. Thompson, W. T. McDowell, and associates; the development of the *Goodenough* on Wildhorse creek by the Porcupine Goldfields Development and Finance Company, Limited; the exploratory work done by the Consolidated Mining and Smelting Company on the *Hunter V.*, tributary to Porcupine creek; the development of the *Howard* property on Porcupine creek by Portland capital, the results of which are reported to be very encouraging.

In the Sheep Creek and Pend d'Oreille River areas the most important development-work was that done by the Victoria Syndicate at the *H.B.* and McDonald-Reeves properties, to both of which further reference is made in the body of the report.

On the North fork of the Salmon river (Erie creek) diamond-drilling was done by the Consolidated Mining and Smelting Company on the *Arnold* group.

Near Ross Siding on the Great Northern Railway development-work was done on the property of the Beaver Creek Mines Syndicate. The camp buildings are reported to have been destroyed by forest fires, which interfered considerably with small mining operations along the railway south of Nelson.

Near Nelson the gold-placer possibilities of Rover creek have recently attracted some attention and two local syndicates were formed to test the ground. Work done by them in the fall was of a preliminary nature.

On the outskirts of the city of Nelson the *Silver Reef* was operated for a short time by R. K. Waite, and subsequently, towards the end of the year, the property was bonded by H. E. Morgan.

The Apex Mining Company, Limited (N.P.L.), was incorporated late in the year to acquire and operate the *Mint*, *Golden Way*, *Apex*, and *Gold Cap* claims, owned by R. K. Waite. The claims, which had been successively staked and restaked for many years by various people, were seized by the Sheriff at Nelson on December 31st to satisfy a judgment against Waite in

favour of G. E. Sanderson, of Portland, in connection with litigation over the *Porcupine* property, another of Waite's promotions.

South of Nelson the Terzian Bros. made interesting discoveries of ore containing free gold associated with iron, lead, and zinc sulphides. The property, known as the *Euphrates*, is described in the body of the report. On Hall creek south of Nelson a small amount of work was done by O. Groh and O. Staples on the *Gold King* and *Fern* properties.

Towards the end of the year Geo. Matthews and associates started to open up the *Alma N.* gold property above the *Eureka*, west of Nelson, with a view to starting development in the spring of 1927. At the *Granite-Poorman* mine in the same locality E. B. Sullivan shipped a small tonnage of gold-copper concentrates.

Near Beasley K. Scheer and associates shipped a car-load of sorted copper ore from the *Queen Victoria*, on which they had a lease.

On Kookanee creek the *Molly Gibson*, owned by the Consolidated Mining and Smelting Company, was operated under lease by A. Molander and associates.

On Cultus creek the *Iva Fern*, chiefly owned by J. W. Mulholland, who discovered the property, was bonded by him late in the fall to A. E. Place, of Los Angeles. An initial payment was made and development-work is due to start in the spring of 1927.

On the South fork of Canyon creek the Laib Bros. were busy in connection with improving the trail to their *Spokane* property.

Near Ginol's Landing on Kootenay lake a number of reverted Crown-granted claims were acquired by the recently incorporated Associated Mining and Milling Company, of Trail, and a large number of claims were staked for the company on adjoining ground. Further reference to this company's properties is made in the body of the report.

Near Kitchener a small amount of work was done on the *Leadville* property. At Creston the *Alice* mine has been worked in a small way by G. Constable. During the early part of the year some development-work was done on the *Alice* by the Porcupine Goldfields Development and Finance Company, Limited. At Deer Park the *Bluebird* property was worked in a small way by G. Briggeman and P. Knabe.

Ymir District.

Yankee Girl.* The reopening of this mine by a private company called the Yankee Girl, Limited, formed by O. C. Thompson and associates, has been an important addition to mining activity in the Nelson Division. The mine, which overlooks the town of Ymir on the eastern side of the Salmon River valley, has been shut down since the year 1920. An aerial tram connects the workings with ore-bins at the railway-tracks. W. G. Norrie, in charge at the mine, reports that new development has been done which has proved a considerable tonnage of ore and indicates possibilities of further important tonnage justifying operations on a much larger scale.

The property has been shipping steadily to the Trail smelter since March. At first the ore, consisting of auriferous pyrite accompanied by galena and zinc-blende in a siliceous gangue, was shipped in bulk for direct smelting as its high silica content made it desirable for fluxing purposes. Later, however, because of the great advances made in the milling practice at Trail, it has been found that excellent recoveries of all the metals can be made by selective flotation, resulting in a better net value than was originally figured on. The average grade of the "run of mine," aggregating some 7,000 tons, was: Gold, 0.44 oz. to the ton; silver, 3.38 oz. to the ton; lead, 3.07 per cent.; zinc, 4.95 per cent. The remainder of the ore shipped was the clean-up of the dumps, amounting to some 11,000 tons of slightly lower-grade material.

The work done during 1926 has disclosed that the ore occurs in a wide shear-zone at points where the fissure-vein traverses granitic tongues. The width of the ore-shoots varies from 6 feet up to 20 feet and the ore has been found to a depth of 1,235 feet below the surface, showing some increase in width as depth is attained with no diminution in values. A new power plant has been installed consisting of a 600-cubic-foot capacity Ingersoll-Rand compressor driven by a water-wheel designed and built by the Nelson Iron Works. The property was completely re-equipped.

Goodenough.* This property, on Wildhorse creek, adjoining the *Ymir* mine on the south-west, was worked under lease and bond during part of the year by the Porcupine Goldfields Development and Finance Company, Limited, which shipped a few hundred tons of ore taken out in development. Towards the end of the year work was dis-

continued by the company and O. D. Frith secured an option on it with a view to interesting capital to continue development. The ore consists of pyrite, zinc-blende, and galena in a quartz gangue, the principal values being in gold.

Dewey.* This property, consisting of the *Dewey*, *Tyne*, *Burch*, and *Dempsey* claims, is situated on the northern side of Porcupine creek, about a mile from the Great Northern Railway. About half a mile of rough-graded road connects the lower tunnel, at an elevation of about 2,675 feet, with the Porcupine Creek wagon-road, a few hundred feet below. The claims are owned by the Chloride Mining and Milling Company, Inc., of Waverley, Wash. The company has done a small amount of work on the property during the last two years.

The formation is composed of metamorphosed sedimentaries of the Pend d'Oreille group near the contact with the Nelson granite, which lies a short distance to the east. The strike of the rocks is north-easterly, with steep dip to the north-west. The ore, consisting of disseminated sulphides of iron, lead, and zinc with occasional copper sulphides, occurs in a silicified band of altered limestone. In the workings examined the width of the mineralization is from 3 to 4 feet.

The lower tunnel, in about 214 feet, is a crosscut which strikes the vein near the face. Here a sample across 4 feet assayed: Gold, 0.02 oz. to the ton; silver, 3 oz. to the ton; lead, 5.4 per cent.; zinc, 2.6 per cent. A sample from a small pile of sorted ore from the lower tunnel assayed: Gold, 1.12 oz. to the ton; silver, 8.3 oz. to the ton; lead, 13.8 per cent.; zinc, 3.5 per cent. The vein is reported to have been traced some distance farther up the mountain-side with open-cuts and short tunnels.

Porcupine.* This group, comprising seven claims owned by E. Haukendahl, E. Guille, and Nels Peterson, is situated on the southern side of Porcupine creek, about 1½ miles by road from the railway. The *Porcupine* claim, which is the oldest claim in the immediate district and the one the creek is named after, was staked in 1895 and most of the old superficial workings date back to 1897.

The property, which is referred to in the Annual Report for 1925, was bonded early in the year by R. K. Waite, who subsequently interested J. E. Riley, representing capital in Cleveland, Ohio. The ore, consisting of low-grade disseminations of galena, zinc-blende, and pyrite in a siliceous gangue, occurs in a zone of contact between Pend d'Oreille schists and Nelson granite. Camp buildings were erected and development-work was done during the spring and summer months. A 1-drill Worthington compressor and 25-horse-power oil-fuel engine were installed. Work was discontinued in the fall.

Howard.* This property consists of the *Howard*, *Paddy*, *Glencoe*, *Lochiel*, *Prince Charlie*, and *Contact* claims and is situated on the eastern slope of the valley of the South fork of Porcupine creek, about 6 miles by road from the Great Northern Railway. A trail, about three-quarters of a mile in length, connects the lower workings with the head of the road. The claims, owned by D. A. and Mrs. Cameron, were bonded during the summer by J. H. Pomeroy, of Portland. An initial payment was made and development-work was done under the management of J. W. Peck, some eight men being employed.

In 1902 about 1,000 feet of development-work was done on the *Howard*, then known as the *Union Jack* group, by the Active Gold Mining Company of British Columbia, promoted in Cincinnati. Towards the end of this company's operations, which were of brief duration, Durkee electric drills were installed, in connection with which the company put in a small power plant at the creek-level some 2,000 feet (estimated) below the workings, which are a little over 6,000 feet above sea-level. Subsequently the mine was closed down and the plant dismantled, since when the property remained idle until taken over by the present operators.

Preliminary work done includes erection of new camp buildings at the mine, repairing and construction of trails, and the installation at the head of the road of a Sullivan gas-engine and portable 250-foot compressor supplying air to the mine through 3,000 feet of 2-inch pipe. A new building was also erected at the compressor camp.

The formation consists of metamorphosed sedimentaries, including quartzites, siliceous and calcareous schists, intruded by granitic stocks and sills of the Nelson batholith. The strike of the sedimentary rocks, which is northerly, with steep dips to the east, conforms roughly to the trend of the border of the main granite-mass. In the marginal zone and in the granite there

are several veins developed by the old workings. On the *Prince Charlie* claim the old workings develop two well-defined quartz veins in granite, the mineralization consisting of pyrite carrying gold values.

On the most northerly vein a 45-foot shaft containing a short drift, both full of water when visited, develop a quartz vein, 30 inches wide at the surface, but widening below the collar of the shaft, striking about N. 40° E. and dipping 70° to the north-west. Work on this vein was apparently discontinued when it was cut off by a small mica lamprophyre dyke in the drift. The same dyke is exposed on the surface, showing the vein to continue beyond it. Several hundred feet southerly an old tunnel has been driven some 325 feet on another quartz vein in granite, 1 to 3 feet wide. This vein strikes about N. 25° E. and dips steeply to the south-east.

No new work has been done on these quartz veins, the deposits on the *Howard* claim, hereinafter described, being considered the most important. On the *Howard* claim, south-easterly from the *Prince Charlie*, open-cuts have been made on what appear to be two parallel veins, some 30 feet apart, striking north-easterly up the steep hillside. The country-rocks are quartzites and siliceous limestone of a dark colour, thick-bedded, and very hard.

On the south-easterly vein an open-cut showed 5 feet of crushed country-rock, quartz and calcite, mineralized with "nuggets" of galena and carbonates. This vein apparently dips to the south-east about 65°. A sample of the sorted sulphide ore assayed: Gold, 0.12 oz. to the ton; silver, 31.6 oz. to the ton; lead, 60.7 per cent.; zinc, 1.2 per cent.; and a sample of the carbonates assayed: Gold, 0.12 oz. to the ton; silver, 14.7 oz. to the ton; lead, 30.1 per cent.; zinc, 0.9 per cent.

On the "main" vein, lying parallel to and about 30 feet from the first vein, the surface workings examined consisted of an old 17-foot shaft (caved), an open-cut, and two trenches. In the open-cut there was exposed a width of 6 feet of sparsely disseminated pyrite, galena, and zinc-blende in a siliceous gangue. The trenches show up to 16 feet of schist containing bands of quartz. The dip of this vein varies from the vertical to 80° to the north-west. The upper tunnel, some 80 or 90 feet vertically below the open-cut on the first-mentioned vein, was driven 325 feet in an easterly direction. This tunnel does not follow any definite vein and apparently lies between the two veins exposed on the surface. Some indefinite mineralization was encountered at two points in this tunnel, 60 feet in and 170 feet in respectively.

The lower tunnel, 90 or 100 feet vertically below the upper one, was driven some 256 feet in an easterly direction, but the results were also indefinite. About 72 feet inside the portal a quartz vein 5 to 9 feet wide and standing about vertical was drifted on for a short distance to the south. In the quartz disseminated galena, zinc-blende, and pyrite occur in bands. The main tunnel only develops a short segment of this vein and then turns away into barren rocks, leaving the quartz in the north wall.

All the above work, which gave such indefinite results, was done by the old company and describes the situation when the property was taken over by J. H. Pomeroy and visited by the writer. The position was that there was some good ore on the surface, but that results underground were unsatisfactory. Since then the work done, according to reliable authority, has been very encouraging and is briefly as follows:—

The first work done by J. W. Peck consisted in driving a tunnel northerly at a point about 170 feet inside the portal of the upper tunnel, where the strongest indications of mineralization were encountered in the old working. Ore was struck almost immediately and followed for a length of some 225 feet through altered sedimentaries to the granite. Here some displacement occurred, but the ore was picked up and followed in the granite. The mineralization, concentrated over a width of about 6 feet in the sedimentaries and 2½ feet in the granite, consists of disseminated galena and sphalerite, with a little pyrite and possibly pyrrhotite. Good milling values are, it is understood, claimed for the whole tunnel. It is not known exactly what relation this ore has to the surface showings, but it is assumed that in the first few rounds the tunnel crosscuts the main vein and thereafter follows a cross-fracture.

In the lower tunnel, at a point about 20 feet back from the face, Peck drove a tunnel northerly, which encountered and followed ore containing good values in gold, silver, lead, and zinc, the gold values in this ore being appreciably higher than met with in any of the other showings. This mineralization apparently also follows a cross-fracture striking in the same

direction as the ore encountered in the new tunnel on the level above. Development, it is understood, will be continued along the cross-fractures and raises will be put up on the ore to prove the relations of the various showings.

Sheep Creek Camp and South of Salmo.

H.B.* At the *H.B.* mine in the Sheep Creek camp development was continued by the Victoria Syndicate throughout the year, Harold Lakes being in charge. Camp buildings were enlarged and improved and over 3,000 feet of crosscutting and drifting was done with a view to proving the downward extension of the zinc ore-bodies mined in the upper levels. The crosscut, about 1,100 feet in length, was driven at a depth of 300 feet below the No. 2 or main level of the old workings. The remainder of the new underground work consisted of drifting northerly and southerly in the ore-zone.

Aspen.* The *Aspen* group, situated on Deer creek, 2 miles above the *H.B.*, was under option to R. J. White, of Wallace, Idaho, when the district was visited early in the year. There are six Crown-granted claims in the group, owned by P. F. Horton, Mrs. Vellacott, E. W. Rawson, and Crease & Crease. Reference to the *Aspen* is made in the Annual Reports for 1915 and 1917. The principal values are in silver. A small amount of work done in 1920 by Horton & Rawson and exploratory work done by Horton during 1926 indicate interesting prospecting possibilities in the area.

Black Jack.* This group, consisting of the *Legal Tender* (Crown-granted), *Black Jack No. 1*, *Black Jack No. 2*, and *Black Jack No. 1 Fraction*, is situated on the western side of Deer creek, near its intersection with Sheep creek, and due south of the *H.B.* property. An option on the claims was acquired by P. F. Horton, original locator of the *H.B.*, and G. L. Peters. Subsequently Los Angeles capital was interested and late in the year some development was done on the *Legal Tender* claim by R. J. White, consisting of a series of long trenches at horizontal intervals of 100 feet.

The property is in the "lime-belt," which is a limestone formation (Pend d'Oreille group) extending almost continuously from the *Emerald* to the *Aspen*. The deposits are of replacement type, the mineralization consisting chiefly of zinc-blende and pyrite, with small amounts of associated galena in places.

At the time of this examination, which preceded the trenching-work done by R. J. White, there were numerous showings of zinc ore exposed in superficial surface workings, the width of the mineralization varying from 4 to 12 feet. The trend of the ore-bodies is northerly up the hill and the dip is from 45° to the west to nearly vertical. A sample was taken across a width of 12 feet in a trench at the upper end of the property, which assayed: Gold, 0.04 oz. to the ton; silver, 6.4 oz. to the ton; lead, 0.8 per cent.; zinc, 9.6 per cent. Higher zinc values could have been obtained, however, over a slightly narrower width. The deposits, which occur throughout a vertical range of 600 feet, are very favourably situated as regards transportation, cheap mining, and development.

Lucky Boy.* This property, consisting of two claims adjoining the *Black Jack* group on the south side of Sheep creek, is included in the deal with R. J. White. The formation, character, and occurrence of the ore are generally much the same as on the *Black Jack*. In places small amounts of molybdenite are associated with the zinc-blende, pyrite, and galena. A few hundred feet above the creek-level a short tunnel crosscuts a wide mineralized zone in silicified limestone containing bands of ore of milling grade from mere streaks up to 6 feet in width. The trend of the deposits is north and south as on the *Black Jack*. A small amount of development-work was done in the fall of 1926.

Emerald.* At the *Emerald* exploratory work was done during the early part of the year, followed by some diamond-drilling. Subsequently work was temporarily suspended. The property has a good record of productive activity extending over a period of years; it is described in previous Annual Reports.

Wolf Lake.* This group, consisting of the *Wolf Lake*, *Hidden Gold*, and *Gold Park* claims, owned by B. M. Wilson, is situated on the eastern slope of the valley at the head of Wolf creek. The formation in the vicinity of the workings is composed of highly siliceous sedimentary rocks and quartzites striking northerly, with steep dips

to the east. At an elevation of about 6,225 feet a tunnel, between 500 and 600 feet in length, follows a quartz-porphyry dyke, 18 feet wide in places, which cuts the formation in an easterly and westerly direction. Some scattered mineralization, consisting of iron and copper sulphides carrying gold and silver values, occurs in and associated with quartz stringers in and along the dyke.

The character of the mineralization was too indefinite to sample in the limited time available, but the following samples give the results obtained from selected material:—

Description.	Gold.	Silver.	Copper.
	Oz.	Oz.	Per Cent.
Copper-stained pyritic ore	0.11	1.8	20.37
Massive pyrite with small amount of quartz	0.37	0.8	1.79

In addition to the tunnel there are several open-cuts in which similar material is exposed. All the work was done unaided by the owner, who, dispensing with car and tracks, used a wheelbarrow in driving the comparatively long tunnel. For many years he has spent every summer prospecting the area.

Vancouver.* The *Vancouver* property, consisting of the *Vancouver*, *Victoria Fraction*, and *Marie Fraction* claims, is situated on the eastern side of Wolf creek, about 1 mile by trail from the *Queen* mine camp, which is 10 miles by road from Salmo, on the Great Northern Railway. The property comprises 9.37 acres in the Sheep Creek gold camp, adjoining the *Queen* and the *Kootenay Belle*.

The *Vancouver* veins have the characteristic north-easterly strike and south-easterly dip of the gold-quartz veins of the camp and occur in the same geological formation, consisting of quartzites, slates, and schists. The general strike of the rocks is about N. 12° E., with steep dips to the east. The veins are fissure-veins angling across the formation in a north-easterly direction and dipping steeply to the south-east. The ore consists of free gold and iron sulphides carrying gold in a quartz gangue.

Of the three known veins on the property, the *Vancouver* vein is the only one which has had any development done on it, and this work can only be considered as superficial since the depth attained below the surface is only about 120 feet (to the bottom of the winze below the lower tunnel-level). This vein, from 18 inches to 3 feet in width, is well defined and has been traced along the surface for several hundred feet. The workings on this vein consist of two drift-tunnels spaced about 50 feet vertically apart on the steep hillside, a raise connecting the lower and upper tunnels and the upper tunnel and the surface, and a winze sunk about 50 feet from the lower tunnel. From these workings a small amount of stoping was done at different periods between 1909 and 1916, when 208½ tons of high-grade sorted ore was shipped to the Trail smelter. This ore averaged about 4 oz. in gold and 1½ oz. silver to the ton.

The lower tunnel, at an elevation of about 4,100 feet above sea-level, or about 800 feet vertically above Wolf creek, is in about 315 feet. The vein was encountered a short distance in from the portal and drifted on to the face, throughout which distance it is clean cut between quartzite walls. About the centre of the tunnel the ore-shoot was encountered from which the high-grade shipments were made. A small amount of stoping was done for a length of some 70 feet and a raise following the ore was put through to the upper tunnel, 50 feet above (estimated). Below the stope a winze, inaccessible on account of the ladder-way being in bad condition, but said to be down 50 feet, was sunk, presumably in good ore, as a small amount of underhand stoping was done and subsequently a new tunnel was started farther down the hill to mine the ore in the winze from below. This tunnel, reported to have been driven by the Dempster Bros. in 1916, is a crosscut which has not been driven far enough to reach the vein, which should be, however, only a short distance ahead. The upper tunnel, which develops the vein for a length of 150 feet (by scale from plan), was not examined because of its unsafe condition. A small amount of stoping was apparently done off the raise connecting the upper tunnel and the surface.

The following samples were taken to get an idea of the value of the ore remaining in the workings and on the dump which was not considered high enough grade to ship, but which might constitute milling-ore:—

Description.	Gold.	Silver.
	Oz.	Oz.
Lower tunnel, 5-inch pay-streak on foot-wall of vein in face of stope just west of raise and about 15 feet above floor of tunnel (this is similar material to the high grade previously shipped)	10.36	1.6
Lower tunnel, across 18 inches (including foot-wall pay-streak) on west side of raise	8.72	1.3
Lower tunnel, across 18 inches of ore at western end of stope just above level	1.06	0.4
Lower tunnel, across 2½ feet of ore in floor of level below easterly end of stope	1.56	0.4
Upper tunnel, across 18 inches of ore at portal	0.28	0.3
Selected ore from dump of lower tunnel	3.41	0.7

There is a small tonnage of ore of milling grade left in the workings and on the dumps.

Future possibilities of the property would appear to depend mainly in the development of the *Vancouver* ore-shoot (which is very small down to the lower tunnel level) at depth, together with the results obtained by developing the other two veins of the property mentioned below. The *Queen* mine, which was extensively developed, might be accepted as a guarantee of the probable continuity with depth of the other veins of the camp and the continuity of the uniformity of the values with the depth attained. The face of the lower tunnel is about 110 feet short of the eastern boundary of the *Vancouver* property and the schist-belt is believed to be a short distance ahead, so that possibilities for another ore-shoot of appreciable length in that direction are limited.

There are two other known veins on the property on which scarcely any work has been done. One of these, a 6-foot quartz vein with the characteristic strike and dip of the veins of the camp, was recently discovered by J. C. Hansen about 150 yards back along the trail from the portal of the lower tunnel. It is apparently on the *Victoria Fraction* ground, near the boundary of the *Hide Away* claim of the *Queen* property. The country-rock is also quartzite. A sample across 3½ feet on the hanging-wall side of this vein gave an assay of 0.14 oz. in gold to the ton. There should be possibilities for an ore-shoot by trenching along the outcrop of this vein, which strikes in the general direction of the *Kootenay Belle* workings farther up the mountain.

The third and smallest vein lying between the last-described vein and the *Vancouver* vein was not examined on account of snow on the shallow outcrop workings, but it is understood to have the same strike and dip and it cuts the same quartzite-band. This examination was made as a result of a request for a report made to the Department by the Official Administrator at Nelson. Subsequently the property was bonded by W. E. Herbert, of Chicago.

Queen.* W. W. Philbrick and associates, of Spokane, operated the *Queen* mine under lease and bond over a period of a few months. Some of the old dumps were run through the mill while arrangements were being made for development, which, however, never materialized.

Salmo-Consolidated.* This property, consisting of the *Sitting Bull, Yellowjack, Blue Jack, White Cloud, Yellowjack Fraction*, and *Blue Jack Fraction* Crown-granted claims, is situated on the eastern side of Cariboo (or Elk) creek, which is a tributary of Sheep creek from the north. A trail about 2 miles in length connects with the Sheep Creek wagon-road at a point 7½ miles from Salmo. The claims were acquired early in the year by P. F. Horton, of Nelson, and associates, of Los Angeles (A. E. Place, W. W. Hartman, R. R. Ball, Jr., and G. A. Hartman).

The formation is composed of siliceous and calcareous members of the Pend d'Oreille schists intruded by granite stocks and sills of the Nelson batholith. In these rocks, which strike north-easterly, with dips from 35° to 50° to the south-east, and conforming to their stratification, there is a series of veins carrying gold values associated with iron, lead, and zinc sulphides in a siliceous and calcareous gangue.

The lowest working, at an elevation of about 5,000 feet (estimated), is an old shaft, then nearly full of water, said to have been sunk 152 feet. The vein developed by the shaft follows a contact between schist and granite, the latter forming the foot-wall. At the top of the shaft the vein, from 12 to 18 inches wide, contains galena and zinc-blende in a siliceous and calcareous gangue. A sample across 12 inches assayed: Gold, 0.06 oz. to the ton; silver, 5.2 oz. to the ton; lead, 10.1 per cent.; zinc, 5.1 per cent.

When the property was last visited, P. Horton had driven a tunnel 40 feet north-easterly on the vein, which widened out to 4 feet in that distance, the face of the tunnel being mineralized with disseminated pyrite, galena, and zinc-blende. Sparsely disseminated mineralization also occurred in the country-rock on the foot-wall. A sample of the dump of material derived from driving this tunnel assayed: Gold, 0.06 oz. to the ton; silver, 1.9 oz. to the ton; lead, 4.8 per cent.; zinc, 6.6 per cent. A sample from the dump of material sorted out from the above assayed: Gold, 0.12 oz. to the ton; silver, 9.2 oz. to the ton; lead, 20.6 per cent.; zinc, 3.9 per cent.

Between the shaft and the summit of the ridge shallow workings and outcroppings indicate a series of similar veins containing disseminated sulphides in a siliceous gangue. A few men were employed during part of the summer and a temporary camp of tents was established. Mining by hand having been found unsatisfactory, work was discontinued with a view to installing a compressor and Diesel engine during the coming season, when arrangements will be made for further development and erection of necessary camp buildings.

Mortgage Lifter.* This property, consisting of the *Mortgage Lifter*, *Tenderfoot*, *Valley View*, *Wild Rose*, *Lone Pine*, *Marble Bluff*, and *Blue Ridge* claims, owned by B. Feeney, is situated on the eastern slope of the valley of the Salmon river, about 8½ miles south of Salmo. The Nelson–Spokane highway is within a quarter of a mile of the property. The formation in which the deposits occur consists of limestone strata of the Pend d'Oreille group striking northerly, roughly parallel to the valley and dipping easterly into the hill. A considerable area of granite lies a short distance to the west.

Some shallow trenches and open-cuts, from 200 to 500 feet above the valley, trace the outcrop of the mineralized strata along the steep side-hill at intervals through the *Mortgage Lifter* and *Tenderfoot* claims. The mineralization, associated with siliceous phases in the limestone, is of an indefinite character, consisting of irregular disseminations of grey copper, pyrite, occasional native silver, and in places molybdenite. Most of the ore shows slight copper-stains and some of it is coated with molybdic oxide. The following samples give an idea of the values:—

Description.	Gold.	Silver.	Copper.
	Oz.	Oz.	Per Cent.
Sorted ore from lowest cut on Mortgage Lifter claim	0.02	68.9	0.74
Sorted ore from most southerly cut on Tenderfoot claim	0.01	27.4	0.23
Broken ore from cut going north along outcrop on Tenderfoot claim	0.04	64.8	0.29
Float from near northerly end of Tenderfoot claim	0.01	31.3	0.21

The property, on which the amount of work done is very small, offers interesting prospecting possibilities.

Molybdenite.* On Lost creek the Consolidated Mining and Smelting Company is reported to have acquired the *Molybdenite* group and a small crew was employed in the fall on preliminary work, establishing camps, etc. The property is described by Galloway in the Annual Report for 1915.

Pend d'Oreille River Section.

McDonald-Reeves.* A considerable amount of work was done during the year by the Victoria Syndicate to further explore the large, low-grade, silver-lead-zinc replacement deposits in the limestone of the Pend d'Oreille River section. Following some 10,000 feet of diamond-drilling, commenced in 1925, a camp was established and tunnelling operations were undertaken. Upwards of 1,200 feet of underground work was done with machine-drills on the Reeves property (*International* group). On the McDonald

property a preliminary camp was established and approximately 600 feet of work was done by hand. Some thirty men were employed at the two properties.

Red Bird.* The *Red Bird* group, situated on the south side of the Pend d'Oreille river, was acquired in 1925 by the Red Bird Mining Company, of Spokane, the property being worked in a small way throughout the greater part of 1926. The property is referred to in the Annual Report for 1924, since when a considerable amount of underground work is reported to have been done. The deposits are in the same mineralized belt as the McDonald-Reeves properties, the values also being in silver, lead, and zinc.

Placer Gold.

A small suction-dredge built by M. Y. Anderson was installed in the sand-bars of the Pend d'Oreille river and after a brief trial period was moved to the Salmon river, about a mile above its confluence with the river. Unfortunately, just prior to the completion of the plant, a sudden burst of high water carried the dredge down to the Pend d'Oreille river, where it was completely smashed and lost.

Near Nelson.

Paradise.* The *Paradise* claim, worked by E. and W. Kline during the early part of the year, is situated between Eagle and Forty-nine creeks, west of Nelson, and is reached by a short piece of road connecting with the upper Granite road. The formation of the area is granite. The workings consist of a tunnel 143 feet long and some trenches which develop a small well-defined quartz vein carrying gold and silver values associated with iron and copper sulphides. Occasional free gold is found.

The vein in the tunnel swells and pinches and in the face, 35 or 40 feet below the surface, is 3½ feet wide. Payable gold values appear to be confined to streaks and stringers, where the sulphides are concentrated. A sample across 6 inches of quartz and sulphides on the hanging-wall side in the face of the tunnel assayed: Gold, 1.12 oz.; silver, 1 oz. to the ton.

Some 40 or 50 tons were put through the *Granite-Poorman* mill, but results, it seems, were disappointing, probably because too much barren material was included and the gold values are chiefly associated with the sulphides. More work is required to prove up the vein, having in view the possibility of widening of the pay-streak.

Work done by the Kline Bros. includes the driving of 66 feet of tunnel with a machine supplied with air from an ingeniously contrived compressor driven by a Chevrolet-car engine. They also built a substantial ore-bin and about a quarter of a mile of rough sleigh-road connecting the ore-bin with the wagon-road.

Euphrates.* This property, consisting of the *Euphrates*, *Rosa*, *Lillian*, *Pasadena*, and *Minto* claims and owned by S. Terzian, E. Terzian, A. Pashgian, and G. Pashgian, is situated on the eastern side of the Salmon river, opposite Golden Age Siding on the Great Northern Railway south of Nelson. The claims were staked following discoveries made during the summer, when prospecting was facilitated by the complete clearing of all brush and timber off the hillside by forest fires.

The rocks of the area surrounding the deposits consist of highly schistose members of the Rossland Volcanic group, which occupy a considerable area south of Nelson. These consist of a series of chlorite-schists in which can be recognized metamorphosed andesite, banded tuffs, and coarse augite porphyrite. Large areas of granodiorite of the Nelson batholith are exposed on the high ground some miles to the east and west. The whole series is intensely schistose, the foliation striking S. 40° E. (up the hill) and dipping 70° to 80° to the south-west.

With the exception of one small fissure-vein cutting the schistosity, the veins or lenses lie parallel to the foliation. The country-rocks in the immediate vicinity of the deposits are bands of chlorite-schist containing intercalated sills of augite porphyrite. A short distance from the river a big trench showed 6 feet of oxidized material containing stringers of quartz mineralized with disseminated pyrite.

A little farther up the hill, and possibly 75 feet above the river-level, a second trench showed a width of 18 inches of qhartz and schist, a sample of which assayed: Gold, 0.44 oz. to the ton; silver, 0.20 oz. to the ton. A selected specimen containing free gold from the same place assayed: Gold, 1.49 oz. to the ton; silver, 1.5 oz. to the ton.

Farther up the hill a third and smaller cut exposed a narrow quartz vein containing considerable galena and zinc-blende, a sample of which assayed: Gold, 0.19 oz. to the ton;

silver, 23.8 oz. to the ton; lead, 10.1 per cent.; zinc, 1.6 per cent. Going up the hill a little superficial digging showed from 3 to 4 feet of siliceous ledge-matter containing sparsely disseminated pyrite and specks of galena.

The fifth open-cut going up the hill is in the bed of a small creek about 1,100 feet vertically above the Salmon river. The showing here consists of a mineralized zone in the schist about 15 feet wide containing bands and lenses of quartz carrying disseminated galena, zinc-blende, and arsenopyrite. The strike of the showing, which conforms to the schistosity of the enclosing rocks, is about S. 40° E. (up the hill) and the dip is 70° to the south-west. A sample across a width of 4½ feet, where the sulphides were concentrated, assayed: Gold, 0.37 oz.; silver, 11.4 oz. to the ton; lead, 4.8 per cent.; zinc, 3.7 per cent. A grab sample from the broken ore on the dump assayed: Gold, 0.27 oz.; silver, 16.1 oz. to the ton; lead, 5.6 per cent.; zinc, 3.5 per cent.

Some 300 yards westerly from the last-mentioned cut and a few hundred feet below it some ground sluicing and stripping has been done, exposing a quartz vein, 6 to 8 inches wide, mineralized with pyrite, chalcopyrite, and free gold. Unlike the other veins of the area, this vein dips to the north-east from 70° to 75°, cutting across the schistosity. A sample of this vein assayed: Gold, 1.83 oz.; silver, 1.2 oz. to the ton; copper, 3.34 per cent.

Since the property was visited further discoveries have been reported, which indicate a series of parallel veins or lenses on the claims. The owners of the *Euphrates* are also reported to have acquired the old *Lost Cabin* property, which lies southerly from the property described and in a similar formation. Brief reference to the *Lost Cabin* is made in Geological Survey Memoir 94, "Ymir Mining Camp." It is understood that capital is available to develop both properties and that a start is to be made early in 1927.

Kootenay Lake.

Chicago.* This property consists of the *Montana*, *Montana Fraction*, and *Bald Mountain* Crown-granted claims, owned by the LaFrance Creek Mining Company, of Chicago, and is situated at the head of LaFrance creek, 9 miles by trail from Kootenay lake. The elevation of the upper tunnel is about 7,800 feet above sea-level, or about 6,000 feet above Kootenay lake. The camp buildings are situated in an open park-like glacial basin a few hundred feet below the workings. Underground work aggregating over 2,000 lineal feet of tunnelling was done by the company in 1900 and following years. The property has not been operated under company management for many years, but work has been done at intervals on behalf of the company by T. Wall, who owns a ranch at the mouth of LaFrance creek.

The rocks of the area, classified as members of the Selkirk series, consist of dark grey, sericitic argillites, siliceous limestones, argillaceous quartzites, and altered greenstones, the latter probably being sheared diabase. The workings develop two veins striking north-westerly, with dips from 70° to 85° to the north-east, the country-rock being a very siliceous, rusty weathering, white limestone which strikes northerly and southerly, with easterly dip. The associated minerals consist of argentiferous galena, zinc-blende, with some chalcopyrite and cupriferous pyrite in siliceous and calcareous gangue.

The underground workings consist of three tunnels. The upper one is 130 feet long with a winze 74 feet deep at 125 feet from the portal. The centre tunnel, some 500 feet in length with two crosscuts, is driven 130 feet vertically below the portal of the upper tunnel. The lower tunnel, about 1,100 feet long with three crosscuts, is about 240 feet vertically below the centre tunnel. (The measurements given above were supplied by T. Wall, who accompanied the writer on his examination.)

Commencing at the top of the hill and going down, the showings are briefly as follows: Just above the upper tunnel an open-cut exposes a width of about 8 feet of disseminated sulphides of lead, zinc, and copper and oxidation products in decomposed ledge-matter. In the upper tunnel, and in the two short crosscuts driven from it, there are streaks of ore in oxidized ledge-matter. The 74-foot winze, said to contain 5 feet of mixed ore at the bottom, could not be examined for lack of a rope. Outside the portal of the upper tunnel there is a big pile of sorted ore, possibly containing from 15 to 20 tons, a grab sample of which assayed: Gold, 0.06 oz. to the ton; silver, 63.4 oz. to the ton; copper, 2.11 per cent.; lead, 39.1 per cent.; zinc, 1.5 per cent. The centre tunnel could not be entered owing to some caving at the portal.

A grab sample from a small pile of sorted ore outside the portal assayed: Gold, 0.05 oz. to the ton; silver, 41.9 oz. to the ton; lead, 28.2 per cent.; zinc, 5.2 per cent. In the lower tunnel the first indications of mineralization were encountered in a crosscut about 200 feet in from the portal. In a short tunnel off this crosscut a sample across 7 feet of silicified limestone assayed: Gold, 0.04 oz.; silver, 0.8 oz. to the ton; lead, 1.1 per cent.; zinc, 2.3 per cent. Continuing along the lower tunnel to about 600 feet in from the portal, narrow bands and streaks of ore are found over a length of about 80 feet. In the face of the tunnel a streak of ore 6 to 8 inches wide, which appears to be widening in the floor of the tunnel, assayed: Gold, 0.06 oz. to the ton; silver, 16.4 oz. to the ton; lead, 38.3 per cent.; zinc, 18.1 per cent.

In addition to the showings mentioned, there are places in the several tunnels where the limestone, oxidized and decomposed over a considerable width, contains sparsely disseminated mineralization, indicating possible starting-points for further exploration with a view to opening up ore-bodies. Mineralization in these siliceous limestones, which can be traced north and south of LaFrance creek for several miles, is widespread, but as yet no large deposits have been opened up, possibly because little or no serious prospecting has been done since the short active period when the discoveries were made and most of the work was done.

Celebration.* The *Celebration* Crown-granted claim, adjoining and south-westerly from the *Chicago* group, is owned by T. Wall. The country-rocks, occurrence, and character of the ore are all very much as on the *Chicago* property. About 1,000 feet south-westerly from the *Chicago* camp some open-cuts show a considerable amount of scattered mineralization in streaks in decomposed limestone. Some of the galena occurs clean in nuggets in the oxidized gangue. Selected galena from streaks in a big pot-hole in the lime assayed for the owner gave from 68 to 82 oz. in silver to the ton and from 71 to 76 per cent. lead.

Snow King.* This property, owned by T. Wall, consists of the *Snow King*, *Snowdrop*, *Snowstorm*, *Assurance*, and *Experiment* Crown-granted claims, situated about 1½ miles westerly from the *Chicago* group, or about 7½ miles from the lake. On the *Snow King* claim, at an elevation of about 6,800 feet, a 90-foot tunnel and two shallow winzes develop a flat-lying vein in limestone, the strike of the strata being northerly up the hill. The width of the vein varies from a seam to 1 foot, containing up to 6 or 8 inches of clean galena in places. The vein is well mineralized through the workings, the ore consisting of galena with small amounts of chalcopyrite and copper carbonates in a calcareous and siliceous gangue. A sample from a small pile of sorted ore outside the portal of the tunnel assayed: Gold, 0.02 oz. to the ton; silver, 55 oz. to the ton; lead, 76.2 per cent.; zinc, 1.8 per cent.

A short distance easterly from the tunnel, and at a slightly higher elevation, another tunnel has been driven some 60 feet in limestone containing stringers and bunches of clean galena with some sparsely disseminated galena. Near the face of the tunnel a winze has been sunk 40 feet, but was inaccessible. Other showings in open-cuts between the tunnels and the summit were not examined for lack of time.

On the *Snowdrop* claim, which adjoins the *Snow King* on the south, an open-cut in limestone shows a stringer of calcite and quartz containing some clean galena. A sample from a small pile of sorted ore assayed: Gold, 0.04 oz. to the ton; silver, 55.6 oz. to the ton; lead, 73.7 per cent.; zinc, 1.8 per cent.

Cultus Creek.* The *Cultus Creek* group consists of the *Morning*, *Evening*, *Old Pick*, *Gad*, *Keno*, *Joe*, and *Bob* claims, owned by the Cultus Creek Syndicate, of Nelson. The property is situated on the southern side of Cultus creek, some 8 miles by trail from Kootenay lake. Cultus creek flows into the western side of the lake at a point some 10 miles north-westerly from Kootenay Landing. Transportation is afforded on Kootenay lake by the Canadian Pacific Railway boats, which call at Cultus Creek Landing when required. The claims extend from Cultus creek, at an elevation of about 3,900 feet, up the mountain-side to the summit of the low ridge separating Cultus creek from Pass creek, at an elevation of about 5,000 feet above sea-level.

The workings, consisting of trenches and open-cuts, develop a mineralized band of altered and silicified limestone of an indicated width of from 40 to 50 feet. The strike of the rocks is N. 20° W. up the hill and the dip is about 55° to the south-west.

The surface of the mountain-side in the vicinity of the workings is covered with a few feet of overburden and few rock-exposures are visible. The formation of the area appears to consist

of highly metamorphosed rocks of sedimentary origin, which, in the vicinity of the vein, have been intruded by basic lamprophyre dykes which may be genetically connected with the ore-deposits. Long shallow trenches dug across the strike of the formation disclose wide zones of oxidized material containing disseminated copper and iron sulphides. All the trenches, extending over a long distance, expose more or less mineralization of similar character.

The following samples were taken at the big cut, where the most work has been done, at an elevation of about 4,750 feet. A grab sample from a big pile of ore assayed: Gold, 0.04 oz. to the ton; silver, 0.09 oz. to the ton; copper, 3.21 per cent. Samples taken in the face of the big cut across 8 and 24 feet, respectively, assayed: Gold, 0.04 oz.; silver, 1.1 oz. to the ton; copper, 1.66 per cent.; and: Gold, 0.06 oz.; silver, 0.7 oz. to the ton; copper, 1.52 per cent.

On the summit of the ridge large boulders of well-mineralized float indicate that higher values in silver and copper may be encountered by trenching across the strike of the vein between the summit and the big cut. A sample of some of this float assayed for the owners gave: Gold, 0.03 oz.; silver, 5.7 oz. to the ton; copper, 5.6 per cent.

Physically the deposit lends itself to economical mining, as drifts can be run in on the vein from the surface of the steep hillside throughout a vertical range of over 1,100 feet. Timber for mining purposes is convenient and plentiful, while water-power could be economically developed on Cultus creek for mining and milling if sufficient ore of economic grade is developed.

Associated Mining and Milling Co., Ltd.*

This company, with registered office in Trail, was incorporated during 1927 to operate mining properties near Ginol's Landing on Kootenay lake. W. Frampton, one of the promoters, is president and field manager and E. Mason is secretary. The following reverted Crown-granted claims have been or are being acquired for the company: *Valparaiso*, *Martilda*, *Starter*, *No. 3*, *Schmilka*, and *Government*. In addition, some nineteen or twenty claims have been staked for the company on adjoining ground. The claims are divided into several groups, known as the *Gold Rand*, *Gold Reef*, *Lake Shore*, and *Mount Royal* groups. As there was snow on the ground when the area was visited in November the examination was limited to the vein traversing the *Government*, *Valparaiso*, *Florence*, and *North Rand* claims, on which a considerable amount of work was done by the Valparaiso Gold Mines, Limited, in 1900.

In the Annual Report for 1901 it is recorded that "owing to litigation the properties of the Valparaiso Gold Mining Company and the Imperial Mines, Limited, situated on Goat creek, and upon which large sums of money had been expended, have remained idle since early in the season." Nothing further is recorded concerning these companies, whose former holdings form the nucleus of the present company's property, and in due course the above-mentioned claims reverted to the Crown for non-payment of taxes.

The formation of the area examined is granite. The *Valparaiso-Government* vein is a well-defined quartz-filled fissure striking about N. 20° W. along the contour of the mountain-side in a direction nearly parallel to the eastern shore line of Kootenay lake and from 2,000 to 2,400 feet vertically above it. The vein dips easterly, or into the hill, at about 40° The ore, consisting of quartz mineralized with pyrite and arsenopyrite and occasional specks of galena, carrying gold and silver values, occurs in shoots in the vein. The length of the ore-shoots has not yet been determined. The quartz varies considerably in width, the payable ore apparently being confined to narrow bands in which the sulphides are concentrated.

The old workings, consisting of some short tunnels and numerous open-cuts, trace the outcrop of the vein for a length of several thousand feet. At the southern extremity of the area examined there is a short crosscut tunnel which has not been driven far enough to cut the vein. Near this tunnel there are two open-cuts in which the vein could not clearly be seen for debris. Grab samples of broken ore from the dumps of both cuts assayed: Gold, 0.58 oz. to the ton; silver, 8.6 oz. to the ton; and: Gold, 0.42 oz. to the ton; silver, 16.2 oz. to the ton.

Going northerly along the outcrop and on the *Valparaiso* claim a crosscut has been driven about 230 feet, tapping the vein at a depth of about 125 feet. From the crosscut drifts extend a short distance northerly and southerly on the vein and in the north drift, which was caved at the mouth and inaccessible, a raise connects with the surface and a winze is reported to have been sunk a short distance below the level. The best values were presumably found on the north side of the crosscut. A sample across 2 feet of quartz and oxidized material at the intersection of the vein in the crosscut assayed: Gold, 1.04 oz. to the ton; silver, 4.2 oz. to the ton.

A sample across a 6-inch band of quartz heavily impregnated with iron sulphides on the foot-wall side of the vein in the open-cut just above the tunnel assayed: Gold, 0.24 oz. to the ton; silver, 2.1 oz. to the ton. Another sample across the 3½ feet adjoining the last sample on the hanging-wall side gave: Gold, 0.06 oz. to the ton; silver, 1.4 oz. to the ton.

Some 250 feet vertically below the last-described working a crosscut driven a short distance has not reached the vein. Farther north the outcrop of the vein is traced through the *Florence* and *North Rand* claims by open-cuts and short tunnels. Farther up the mountain, and easterly from the property described, old workings are reported to develop other quartz veins similar in character and mineralization.

Summarizing the situation, it would seem that, when the numerous open-cuts and other workings are cleaned out, a very careful and systematic sampling of the veins is required to determine their gold and silver content and to ascertain if payable values are distributed over sufficient length and width to constitute a commercial proposition. Good assays can evidently be obtained in many places, but whether these assays represent any appreciable tonnage has yet to be determined. The work done during the year was of a preliminary nature, including the cleaning-out of the old workings, repairing cabins and trails.

Copper Canyon.* This property, operated by the Imperial Mines, Limited, in 1900, is situated on Goat (Akokli) creek and was restaked by W. Frampton and associates, of Trail, who are closely connected with the Associated Mining and Milling Company. The group, which consists of the *Copper Canyon*, *Copper Creek*, *Dark Canyon*, *Nakusp*, *Red Rock*, *Copper Hill*, and *Copper Centre* claims, was not visited owing to the lateness of the season. It is reported that the ore consists of copper sulphides in a quartz gangue and that development done by the old company includes two tunnels driven on the vein and several open-cuts.

Country Girl.* This claim, situated on the east side of Kootenay lake, a quarter of a mile south of Columbia point, north of Ginol's Landing, was staked recently by A. N. Gibbs and E. J. Irving, who disposed of interests to L. F. Tyson and T. F. Lean. Subsequently the claim was transferred to W. Frampton, of the Associated Mining and Milling Company. Just above high-water mark there is an old tunnel driven a short distance easterly along a silicified fractured zone in granite. Associated with quartz and penetrating the country-rock in places there is some mineralization consisting of sparsely disseminated pyrite, zinc-blende, and galena.

Just below the then water-level there is reported to be a showing 4 feet wide of quartz containing disseminated galena. A sample from a small pile of ore taken from this showing assayed: Gold, 0.03 oz. to the ton; silver, 2.3 oz. to the ton; lead, 11.2 per cent.; zinc, 0.8 per cent. A short distance southerly along the lake-shore open-cuts expose a quartz vein striking northerly, 18 to 24 inches wide, mineralized with irregular disseminations of galena.

Iolanthe.* This claim, situated on the east side of Kootenay lake, about a quarter of a mile northerly from Sanca creek, was staked recently by A. N. Gibbs and E. J. Irving, who disposed of interests to L. F. Tyson and T. F. Lean. Subsequently the claim was transferred to W. Frampton, of the Associated Mining and Milling Company, The property is situated in a small area of metamorphosed sedimentary rocks surrounded by granite.

Near the lake-shore, where two shallow shafts have been sunk and some trenching has been done, the rocks are quartzose mica-schist, talc-schist, and quartzite. These rocks strike south-easterly, climbing the hillside diagonally, and dip to the east into the hill. Lying parallel to the foliation of the schists are stringers and veinlets of quartz mineralized in places with pyrite, zinc-blende, and galena. A grab sample from a small pile of ore derived from the hanging-wall streak of the "ledge" near the lake-shore, which was the strongest mineralization seen, assayed: Gold, 0.04 oz. to the ton; silver, 5.5 oz. to the ton; lead, 3.4 per cent.; zinc, 16.5 per cent.

Five other claims, known as the *Iolanthe No. 1*, *No. 2*, *No. 3*, *No. 4*, and *No. 5*, staked in the vicinity of the *Iolanthe* by the same interests, were not visited.

LIST OF SHIPPING-MINES IN THE NELSON MINING DIVISION, 1926.

Mine.	Locality.	Tons.	Character of Ore.
Yankee Girl	Ymir	18,179	Gold-silver-zinc-lead.
Goodenough	Ymir	323	Silver-lead-gold.
Alice	Creston	133	Silver-lead.
Molly Gibson	Kitto	44	Silver-lead.
Queen Victoria	Beasley	29	Copper.
Bluebird	Deer Park	5	Silver-lead.
Granite-Poorman	Taghum	10	Gold-silver-lead.
Queen	Salmo	27	Gold.
Silver Reef	Nelson	4	Silver-lead.
Boulder City	Ymir	7	Gold.
Porcupine	Hall	18	Silver-lead.
Storkey	Nelson	1	Silver-lead.
Total		18,780	

TRAIL CREEK MINING DIVISION.

At the Rossland mines of the Consolidated Mining and Smelting Company about 100 men were steadily employed during the year and a steady though small production was maintained.

Operations at the *I.X.L.* were suspended by the lessees after a considerable amount of exploration-work had been accomplished in an effort to pick up the continuation of the rich gold-quartz vein which had yielded them such handsome returns. The property, which is mentioned in previous Annual Reports, became famous a few years ago for its phenomenally rich gold quartz, some of the ore running as high as 300 oz. in gold to the ton. On the *O.K.*, which adjoins this property to the west, a considerable amount of underground work has been accomplished by a local syndicate in an endeavour to pick up the extension of the *I.X.L.* vein in this direction, but so far without any very encouraging results. On the easterly side, however, work on the *Midnight* claim by another syndicate has resulted in picking up broken segments of the vein, in which some high-grade ore has been encountered. During the year work was confined to driving a low tunnel to tap the downward extension of a small ore-shoot which is exposed in a 30-foot winze from the level above. This property is equipped with an electrically driven compressor, which also supplies air to the *O.K.*, power being supplied by the West Kootenay Power and Light Company.

Further exploratory work was also done at the *Golden Drip*, which adjoins these properties to the south.

TRAIL REDUCTION-WORKS.

The Consolidated Mining and Smelting Company eclipsed all previous records at this great plant with a production in gold, silver, copper, lead, and zinc valued at $37,223,235, while additions now being made forecast a still greater production in 1927. The lead production heads the list with 248,800,000 lb. to its credit, followed by zinc with 123,200,000 lb.; silver, 6,846,000 oz.; copper, 21,760,000 lb.; and gold, 1,000,000 oz. The tonnage of ores and concentrates shipped to Trail during 1926 was nearly 600,000 tons.

Of this immense tonnage, the large bulk of silver-lead-zinc concentrates was derived from the *Sullivan* mine, supplemented by a substantial tonnage from various independent shippers of the district, notably those in the Slocan and Ainsworth Divisions. The increase in copper production has been principally due to the receipt of flotation concentrates from the Granby Consolidated Company's mine at Copper mountain. The shipping-list, which includes the names of some sixty-five independent shippers of District No. 5, indicates the widespread activity which has taken place during the year.

Each year witnesses many important additions and alterations to the plant, all made with a view to increasing production, improving recoveries, and reducing the costs of handling material. Among some of the most important innovations the following may be mentioned: Additions to the zinc plant, which were well under way at the end of the year, provide for an increased production of 80 tons a day, making its total capacity 280 tons a day of refined zinc. A 50-ton addition to the lead-refinery has been completed, making the total capacity 400

tons of refined lead a day. The erection of a 30-ton electric furnace was commenced during the latter part of the year. This will be used for the treatment of the residue from the zinc-leaching plant. At the copper plant a reverberatory furnace is being installed to smelt the copper-flotation concentrates from the Allenby mill. A new concrete stack, 409 feet high and 24 feet diameter at the top, has been erected to take care of the fumes from the lead plant, after the same have passed through a new Cottrell treater, similar to that at the zinc plant and described in the 1925 report.

Owing to the increased tonnage of ores received for concentration an addition of a 300-ton unit was added to the concentrator at Trail, making its total capacity 600 tons a day. During 1926 the lead and zinc cleaner-cells were added and a complete testing laboratory was installed at one end of the building. The benefit derived from this plant by independent shippers is reflected in the fact that in 1925, when it was first made available for customs ores, 13,000 tons of ore was concentrated at Trail and in 1926 the tonnage increased to 81,700 tons.

In order to cope with the ever-increasing power requirements the West Kootenay Power and Light Company (a subsidiary) has commenced preparations for the installation of another plant on the Kootenay river below Bonnington which will develop an additional 60,000 horse-power. This will bring the total power-development of this company on the Kootenay river up to 152,000 horse-power.

SLOCAN CITY MINING DIVISION.

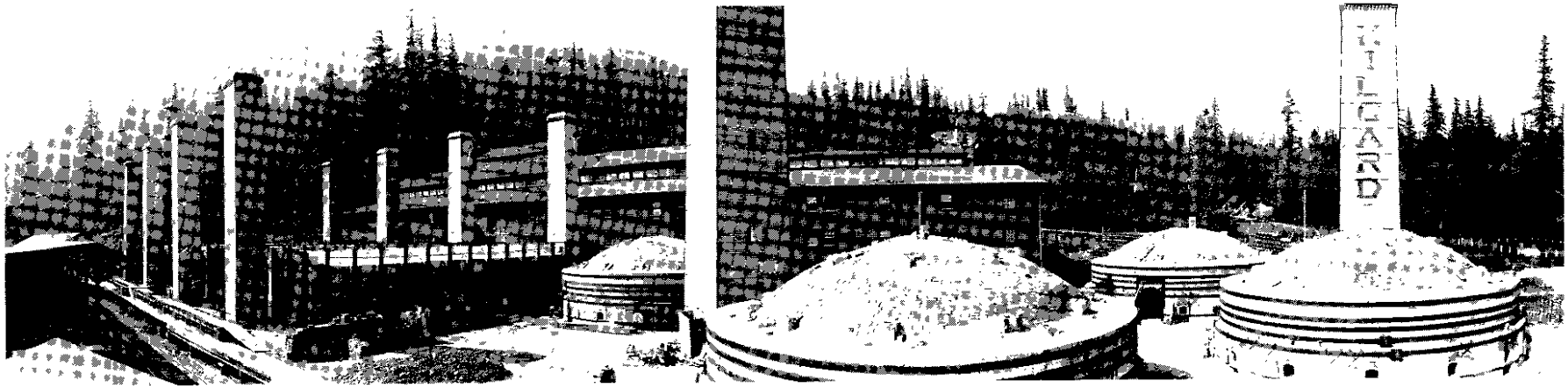
Prospecting activities in the Slocan City Division have not been quite as active as usual, while the principal mining operations were carried on at the *Enterprise* on 10-Mile creek. However, it is reported that the B.C. Exploration Company, recently formed, has acquired under the advice of R. C. Campbell Johnston a large number of claims on which extensive exploration and development is planned. Operations of this kind, if successful, would do a great deal towards stimulating interest in this section of the district.

The *Enterprise* mine, which was operated steadily during the year, shipped 605 tons of milling-ore to Trail. During the year improvements were made to facilitate handling the ore at the mine. The No. 5 level was reopened, as was also the No. 4 to a certain extent. Ore was mined from an intermediate between these two levels as well as from the No. 7. E. C. Wragge, of Nelson, and P. McGuire, of Slocan City, control the property, references to which may be seen in previous Annual Reports.

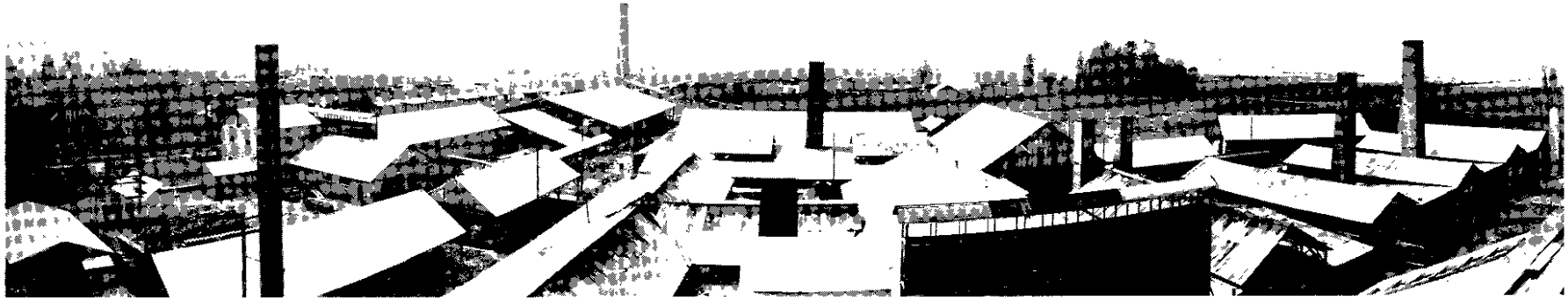
The *Anna* group on Springer creek, which is owned by Kurt Zimmerman, of Slocan City, was acquired under option by Neil Bertrandias and associates, of Portland, who are proceeding with further development. The *L.T.* group on Springer creek was worked by the owner, D. B. O'Neail, of Slocan City. At the *Ottawa*, which is owned by the Consolidated Mining and Smelting Company, 26 tons of silver ore was shipped by lessees.

ARROW LAKES MINING DIVISION.

The outstanding event in this Division during the year was the bonding of the *Big Ledge* group of claims on Pingston creek by American interests on the advice of Colonel Owen James and A. St. Clair Brindle. The property is one of old standing on which not much development has been done. The mineralization exposed in the surface showings consists largely of zinc and iron sulphides, with which is associated a little galena. Late in the fall supplies were packed up and contracts let for a few hundred feet of tunnelling; in addition to this, diamond-drilling was contemplated. For further reference *see* Annual Report for 1923.



Clayburn Company, Ltd.—Kilgard Plant.



Clayburn Company, Ltd.—Clayburn Plant.

WESTERN MINERAL SURVEY DISTRICT (No. 6).

By Wm. M. Brewer, Resident Mining Engineer.

As the following report will be the last one the writer will make as Resident Mining Engineer for the No. 6 District, for the reason that he is retiring from the Government service, he desires to express his appreciation of the universal courtesy and assistance he has received from prospectors, mine owners and operators, visiting mining engineers, the members of the Geological Survey of Canada, the officers of the Chamber of Mines, and, in fact, from every one connected with the mining industry in his district in any capacity whatever.

INTRODUCTORY.

The Western Mineral Survey District (No. 6) includes the Alberni, Clayoquot, Quatsino, Nanaimo, Victoria, Vancouver, and New Westminster Mining Divisions. The boundaries are as follows: The north-east corner is on the Mainland near the intersection of latitude 52° and longitude 125° at the head of the Klinaklini river; from that point the eastern boundary follows an irregular line which is the watershed between the rivers that flow into the Fraser towards the south-east and east and those that flow into the strait of Georgia towards the west and south-west. This line is also the western boundary of the Clinon, Lillooet, and Yale Mining Divisions. The south-east corner of the No. 6 District is on the International boundary at a point a short distance easterly from Chilliwack lake; thence the southern boundary follows the International boundary-line to the coast on the 49th parallel of latitude near the mouth of the Fraser river; thence from that point the southerly boundary follows an imaginary line between the islands off the south-east coast of Vancouver island on the International boundary; thence the westerly boundary is the Pacific ocean in a north-westerly direction to the north end of Vancouver island; thence the boundary crosses from Vancouver island to the entrance of Seymour inlet on the south end of Queen Charlotte sound and follows an irregular line in a north-easterly direction to the head of Klinaklini river, the point of starting.

This district includes all of the islands between the Mainland and Vancouver island as well as all of the islands on the west coast of Vancouver island, and occupies an area roughly figured out as approximately 248 miles from north to south by 213 miles from east to west.

The Nanaimo Mining Division, the largest one in the district, covers approximately one-third of Vancouver island, in addition to a section of the Mainland, and extends inland a distance of about 150 miles, or as far as the headwaters of the Klinaklini, Homathko, Southgate, Toba, and all other streams that flow westerly and south-westerly from the watershed that separates the Pacific ocean from the Fraser river.

The district has the distinction of being the scene of the earliest coal-mining and also metal-mining in the Province. The earliest lode-mining of which there is any record was carried on by the Howe Sound Copper Mining Company, of New Westminster, in 1867, on some mineral claims staked on White Cliff point at the entrance to Howe sound, where there was an occurrence of bornite-copper ore. The first coal-mining on a commercial scale was carried on for a short time at Suquash in 1835, on the north-easterly coast of Vancouver island, and in 1852 at Nanaimo, on the east coast of Vancouver island, where several collieries are still in active operation.

The entire area covered by No. 6 District is very mountainous and for the most part covered by dense forests, in which the prevailing varieties of timber are Douglas fir, hemlock, red cedar, spruce, balsam, alder, and cottonwood.

The coast-lines around Vancouver island and the west coast of the Mainland are extremely irregular owing to the fact that a large number of fiords or inlets penetrate the coast, extending in some cases on the Mainland for a distance of 65 or 70 miles inland, as illustrated by Howe sound, Burrard, Jervis, Toba, Bute, Loughborough, and Knight inlets. These fiords or inlets offer splendid opportunities for prospectors to use launches and small boats to prosecute their occupation, because there are several arms of each one and also many islands with good anchorages especially for launches and small boats. Usually during the summer season the waters in these inlets are quite calm, but the tides have to be studied and understood because of the several narrows where the waters flow at the rate of several knots an hour. During the winter months travelling in small boats or launches is not as comfortable as in summer, yet many prospectors, timber-cruisers, and others can be found all the year round travelling in this manner.

Another advantage that the district has for prospectors is the large number of lakes, especially on Vancouver island, which often form links in a chain; so that it is possible to travel for many miles in a chain of lakes separated by portages of various lengths.

The west coast of Vancouver island is cut up into a series of sounds and bays, which are so located that although the coast-line has the appearance of being very inhospitable, yet it is possible to travel from Victoria, the south end of Vancouver island, to Cape Scott, the north-western point, in sheltered waters except in four stretches; the first being from Port San Juan (Renfrew) to Cape Beale, a distance of about 40 miles; the next from the west entrance of Barkley sound to the entrance of Clayoquot sound, a distance of about 24 miles; the third from Sidney inlet to Nootka sound, a distance of about 32 miles; and the last exposed section, being the longest and usually most stormy, from Esperanza inlet to Cape Scott, a distance of about 100 miles. In this last section sheltered water can be entered in Kyuquot sound, also at Forward inlet, Quatsino sound.

The sheltered waters on the west coast of Vancouver island travelling north-westerly are Sooke harbour, Port Renfrew or San Juan harbour, Barkley sound, with three entrances from the ocean, within which is a group of islands known as the "Thousand islands," and Alberni canal, penetrating about 25 miles into the coast-line. On one side or the other of most of the islands, coves and small bays usually occur where there is fairly good anchorage for launches or small boats. The next sheltered water to Barkley sound is in Ucluelet harbour and inlet; from there open water extends to Clayoquot sound, with its several islands and inland waterways, by which the trip between the entrance to Clayoquot sound and Sidney inlet, a distance of about 25 miles, can be made entirely on inside waterways. The next westerly harbour is Hesquiat, where the shelter for small boats or launches is not good, with a wind from the south, south-east, or south-west. Nootka sound, which is the next sheltered water, furnishes an opportunity to travel via Tasis canal in inside water to Esperanza inlet, a distance of about 35 miles, from which last point a traveller up the west coast is compelled to remain in exposed waters because, although Kyuquot and Quatsino sounds both afford shelter, neither of these have connecting bodies of inside water paralleling the ocean shore-line similar to Nootka and Barkley sounds.

The abundance of several varieties of fish, including clams, oysters, and crabs, as well as grouse and big game, both on the Mainland and Vancouver island, proves a great attraction to prospectors. The saying along the Coast, "When the tide is out the table is spread," refers to the numerous and extensive clam-beds that occur at frequent intervals on the entire coast-line.

From the foregoing it can readily be seen that the opportunities for prospecting, from a central camp established at good anchorage in a sheltered inlet or bay from which the mountain sides and summits can be reached in short distances, offer a great advantage over the usual method of prospecting timbered mountains where long distances have to be travelled inland and supplies packed on men's backs.

The greater part of the district is contiguous to the coast and so possesses a mild and equable climate, with variations of temperature very much modified as compared with the interior mountainous districts. The climatic conditions are such that over a large part of the district prospecting can be carried on for ten months in the year, while field-work can be done practically all the year round. Underground development-work can be carried on the entire year round without cessation.

Another advantage possessed by the No. 6 District is the numerous possibilities to develop water-power, which, according to the estimates by the Commission of Conservation of Canada, show the total horse-power possibilities on Vancouver island to be 270,000 and 162,500 on that section of the Mainland included in the No. 6 District. This estimate does not include the possible power of any stream of less than 1,000 horse-power. Later in this report more details with regard to water-power possibilities, both developed and undeveloped, will be given.

Transportation.

The transportation facilities in the district are good considering the character of the country, which makes it compulsory for the prospector and engineer to travel on foot and pack their own supplies from base camps on the various shore-lines, but to reach these base camps there are several steamers that ply from Vancouver and Victoria on regular schedules that stop at settlements, logging camps, and mining camps situated along the route.

So far as land travel by automobile is concerned, there are only a comparatively few places in the mineral-zones in the district where this way of travel can be taken advantage of. As an illustration, from Victoria to Campbell River, on the east coast of Vancouver island, there is the Island highway, 175 miles long, a branch of which forks off at Parksville on the east coast en route to Port Alberni on the west coast, a distance of about 30 miles.

On the southern Mainland there are automobile-roads as well as the Canadian Pacific, Canadian National, and British Columbia Electric Railways between Vancouver and Ruby Creek, the easterly boundary of the district, also a wagon-road over which an automobile can be driven from Chilliwack, the eastern terminus of the British Columbia Electric Interurban line, to the foot of Chilliwack lake near the International boundary, a distance of about 30 miles.

In the northerly portion of the district on the Mainland, which is also the northerly portion of the Nanaimo Mining Division, the transportation facilities are the Pacific Great Eastern Railway, with automobile-roads from the northern terminus at Williams Lake, westerly across the Fraser river to One Eye lake, near the headwaters of the Klinaklini river. In this section of the district saddle and pack horses can be used by prospectors and engineers on field-work.

On Texada, Lasqueti, and Quadra islands there are several miles of wagon-roads on which automobiles can be used.

Generally speaking, the mineral-deposits in the district so far discovered have been located within a few miles of the shore-line, either along the coast or on the lakes, and as a rule the mountain ranges rise from the water-line with precipitous sides, so that very often elevations from 2,000 to 5,000 feet are reached within a comparatively short distance of the shore, which of course renders any other method of transportation, except on foot, impossible.

Field-work.

During 1926 field-work was started in the Nanaimo Mining Division on Texada island and the Malaspina peninsula, February 6th, and was carried on practically continuously, making examinations of mines, prospective mines, and some newly staked prospects until December 15th.

The following sections in District No. 6 were visited and examinations made during the field-work referred to:—

Alberni Mining Division: West coast of Vancouver island—Barkley Sound section and Uchucklesit harbour.

Clayoquot Mining Division: West coast of Vancouver island—Clayoquot sound, Nootka sound, and Tasis canal.

Quatsino Mining Division: West coast of Vancouver island—Quatsino sound and its arms, also vicinity of Alice lake.

Nanaimo Mining Division: East coast of Vancouver island—Courtenay, Comox, Campbell river, Rock bay, and Humpback bay.

Nanaimo Mining Division: Islands—Lasqueti, Jervis, Texada, Quadra, and Thurlow.

Nanaimo Mining Division: Mainland—Theodosia arm and adjacent mountains, Powell lake, Malaspina peninsula, Phillips and Frederick arms of Cordero channel, and Knight inlet.

Vancouver Mining Division: Mainland—The mountains adjacent to Jervis inlet, Howe sound, Hotham sound, Seechelt inlet, Salmon arm, Pacific Great Eastern Railway section, including upper Squamish, Mamquam, and Brandywine rivers.

New Westminster Mining Division: Mainland—Pitt lake and Chilliwack section.

Victoria Mining Division: Vancouver island—Sooke River section, Leech river, Mounts Sicker and Brenton, Koksilah river, also some other places in the vicinity of Victoria, and Jordan River section.

In the field-work it is impossible to visit every prospect annually; consequently the sections where the most important new work or outstanding discoveries are located were selected. A large proportion of the time occupied in field-work has to be devoted to the examination of prospects in the course of development, the owners of which make application for assistance from the Government, under the provisions of the "Mines Development Act," for either building new trails and roads or reconstructing and repairing old ones.

Resulting from such examinations during 1926, grants of several thousand dollars for such work were made by the Department of Mines. The results from such assistance have been very satisfactory from the standpoint of improving the transportation facilities to such an extent that heavy machinery has been hauled in to some properties by auto-trucks instead of having to be packed in either by horses or by manual labour.

Prospecting.

While the number of prospectors engaged in the district during 1926 has not been large by any means, there have been enough to have located and recorded a considerable number of new mineral claims, some of which show considerable promise and with proper development may result in the opening-up of mines of commercial value.

In looking over the lists of new located mineral claims, it is noticeable that there have not been as many restakings as has been the practice in years gone by, for the records show that on a very large percentage of the un-Crown-granted mineral claims the annual assessment-work has been done more thoroughly and systematically than has been often the case in the past; so that scouting engineers will find better opportunities for examining properties.

Some idea of the work that has been done by the prospectors during 1926 can be gleaned from the fact that there are approximately 1,800 un-Crown-granted mineral claims in good standing in the district up to December 31st, 1926. In addition there are about 2,000 Crown-granted mineral claims.

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Summary of Progress in Metalliferous Mining.

During 1926 metal-mining has shown a marked improvement in District No. 6. The Britannia Mining and Smelting Company has again been the only producer, but this mine made a much larger production than in any previous year.

The notable progress in the industry has been the extensive development-work done on several properties; the chief being on the *Old Sport*, operated by the Coast Copper Company; the *Alice Lake* and *Millington* groups, in Quatsino Division; the *Star of the West* group, Tasis canal, Nootka sound, Clayoquot Division; the *Caledonia* group near Quatse lake, Nanaimo Division; *Revenue* group on Theodosia arm, Nanaimo Division; the *Monte Christo* group, Fanny bay, Phillips arm of Cordero channel, Nanaimo Division; the *Florence*, *John Bull*, and *Royal Arch* groups, Malaspina peninsula, Nanaimo Division, about midway between Powell River and Lund; the *Gem* and *Marjorie* groups, Texada island, Nanaimo Division; the *Lenora* and *Tyee* on Mount Sicker, Victoria Division; the *Golden King*, *Bruce*, *Radiant*, *Brandywine*, *Blue Jack*, *Astra*, *Contact*, and *Lynn Creek Zinc* groups, Vancouver Division; *Silver Chief*, Chilliwack lake, and *Viking* group, Pitt lake, New Westminster Division.

So far as new discoveries are concerned, the most notable have been those reported by a group of prospectors about 10 or 12 miles from the head of Knight inlet in the high mountains bordering the Klinaklini river. Intensive prospecting has been done in the vicinity of Squamish, Vancouver Division; on Ray creek, tributary of the Stawamus river; and in the mountains adjacent to the upper Squamish river; also on Quadra island and along the east coast-line of Vancouver island between Rock and Humpback bays. The mountains on the west side of Howe sound have also been considerably prospected.

Of importance also was the policy of the Consolidated Mining and Smelting Company of Canada, Limited, in keeping scouting engineers in the field during 1926 to examine prospects. The company has bonded some properties and let contracts to the original owners to extend the development-work. The writer is reliably informed that during 1927 this company will operate diamond-drills on some of these prospects.

The Britannia Mining and Smelting Company adopted the same policy during 1925, when that company prospected some mineral claims on Goat creek, Squamish section, by diamond-drilling. The company is also in line to secure good prospects with promising possibilities and engineers from the staff are prepared to examine any such prospects that may be brought to their attention.

The Porcupine Gold Fields Development and Finance Company, Limited, of Ontario, is another of the big mining corporations that has had its engineers in the field. The *Lynn Creek Zinc* group on Lynn creek near North Vancouver was bonded by this company and development-work is being carried on.

Coal-mining.

No mention is made in the following report of the coal-mining industry, because that is fully covered by the Chief Inspector and his staff, whose reports appear in this Annual Report under their proper headings.

Non-metallic Minerals and Building-stone.

In previous Annual Reports the non-metallic minerals, building-stone, crushed rock and gravel, Portland cement, and road-making materials have not received as much attention as they are now entitled to, because of the rapidly growing importance of the industries with which they are connected. Later in this report, therefore, descriptions of the quarries and plants will be found under the heading of the Mining Divisions in which they occur.

The non-metallic minerals in this district include building-stone, gypsum, talc, bauxite (of low grade, used in refining gas), potter's clay, shale (used in making sewer-pipes, paving and pressed brick), common brick-clay, natro-alunite, and limestone (used for the manufacture of sulphite in the pulp and paper mills, also in the copper-smelters for flux, and exported in barrels as hydrated lime).

Building-stone occurs at several points, the varieties being marble, granite, sandstone, and andesite, which are, with the exception of marble, quarried on a commercial scale. The most extensive granite-quarries at present being operated are on Nelson and Granite islands, Jervis inlet, about 60 miles north-westerly from the city of Vancouver. Sandstone of excellent quality for building occurs on Newcastle island, near Nanaimo, where a large quarry has been opened. Andesite tuff, used in the erection of the Parliament Buildings and other important buildings, is quarried on Haddington island, 4 miles west of Alert Bay.

There are several quarries from which crushed rock and gravel are obtained for building and road-making purposes; the most important in the No. 6 District are those on Pitt river, Howe sound, and Burrard inlet, on the Mainland, and on the south-westerly coast of Vancouver island near Esquimalt. No. 6 District contains the only plants in the Province where Portland cement is manufactured. These are in the Victoria Division.

Iron and Steel.

There have been no new developments relative to the iron and steel industry in the No. 6 District during 1926. In fact, so little interest seems to exist at the present time that no application has been received for supplies of iron ore for experimental purposes under the provisions of the "Iron-ore Supply Act."

Labour Conditions.

During 1926 labour conditions have been mutually satisfactory to operators and employees throughout the district. The rule of supply and demand has been permitted to govern to the satisfaction of every one interested and to the advantage of the industry and the men employed.

The bonus system is practised by the Britannia Mining and Smelting Company, by which the regular wages are increased in any department of the mine-workings where a man's work can be measured and a unit of production can be set for which a base wage is paid. Any saving or decrease in cost below the standard cost that has been ascertained by close study is split on a fifty-fifty basis between the company and the employee.

Esquimalt & Nanaimo Railway Company's Land.

In the Annual Report for 1925 the regulations adopted by the company for the administration of the Esquimalt & Nanaimo land-grant, which comprises practically one-third of Vancouver island, were published on pages 267 and 268, and as there have been no alterations since it is not deemed necessary to repeat them in this report.

The area within the boundaries of this land-grant forms a portion of the Victoria, Alberni, and Nanaimo Mining Divisions, and all base metals, coal, and petroleum that occur within the land-grant belong to the railway company, leaving only the precious metals belonging to the Crown.

The territory embraced by the land-grant is open to prospectors for prospecting and staking mineral claims for the precious metals, subject to the regulations laid down by the company, which are published in pamphlet form, which can be obtained on application to Newton J. Ker, Land Agent, Esquimalt & Nanaimo Railway Company, Victoria.

ALBERNI MINING DIVISION.

Progress in lode-mining in Alberni Division during 1926 has been to a great extent disappointing, because on December 31st there were only seventeen un-Crown-granted mineral claims in good standing and none of the numerous Crown-granted claims were being worked. A few new locations were made during the year by some of the old-time prospectors living in the old town of Alberni and at Port Alberni. These men continue to do their annual assessment-work on their un-Crown-granted claims, but have no capital to extend that work to serious development, and while waiting for the opportunity to make a sale many of them become discouraged and abandon the claims, with the result as stated, only seventeen un-Crown-granted claims in good standing in a Mining Division where there were more than a hundred several years ago.

That part of the Alberni Division which is situated within the Esquimalt & Nanaimo land-grant covers about one-fifth of the area included in the Division, and the boundary is marked by a line extending north-west and south-east, crossing the Alberni canal at Dunsmuir point, about 6 miles below Port Alberni, the head of navigation. This line extended north-westerly crosses Great Central lake at a point about 25 miles from the Alberni canal and 5 miles from the foot of the lake.

This Division was the scene of both placer and quartz mining in the early nineties and had two mines shipping copper-sulphide ore to the Tacoma smelter as early as 1899. The ore-bodies, however, proved to be lenticular as the development was advanced, with the result that when the available ore was mined and the apparent termination of the producing lenses was reached, operations were suspended about 1901 and one of the properties, the *J.J.J.*, has never been reopened; the other, known as the *Monitor*, has been operated spasmodically two or three times since. The latest operations were from 1916 to 1918, during which time the property was purchased by Samuel Ryder, of England, who closed the work down in 1918, since when the property has been idle.

Both of these properties are located on the west side of Alberni canal, from about 14 to 18 miles below the port, the main mine-workings of both properties being about half a mile from the shore-line at an elevation of about 1,500 feet.

There have been two examinations made of the geology in the Alberni Division by the staff of the Geological Survey of Canada. The first of these was made by C. H. Clapp during the field seasons of 1908, 1909, and 1910; the second by Victor Dolmage during the field season of 1919. The report on the first of these examinations was published as Memoir No. 13, G.S.C., "Southern Vancouver Island"; the report on the second examination was published in the Summary Report, 1919, C.G.S., Part B. Clapp's report describes the geology of the area south-east from Alberni canal and Dolmage's report includes the coast-line of Barkley sound and westerly shore-line of Alberni canal.

The minerals that have been found in the Alberni Division to date have been copper-sulphide ores, copper-gold-silver ores, some gold-bearing quartz veins, placer gold, magnetite-iron ore, pyrrhotite, one deposit of metallic or native arsenic, and one deposit of mercury.

The placer gold was found on China creek and Franklin river, tributaries of the Alberni canal, which flow into the canal on the easterly side below Port Alberni, the first mentioned about 8 miles down the canal and the last mentioned about 12 miles. These creeks were worked in 1896, 1897, and 1898 by bed-rock sluicing and two hydraulic plants were installed. They were only operated for a short time when the diggings were abandoned as worked out. Until quite recently, however, a few prospectors would not be convinced until they found out by experience, but they are now satisfied as they only succeeded in obtaining a few colours.

The interesting feature in this connection is that near the heads of both of the streams in the Beaufort range of mountains there occurs a well-defined system of quartz veins which carry values in gold, sometimes as high as several ounces to the ton, and about 1898 and 1899 there were several claims staked, recorded, and prospected to some extent. One group, which was known as the *W.W.W.*, was developed into a shipping-mine; the ore from this was sacked, packed on horses about 12 miles miles to the mouth of the Franklin river on the east side of Alberni canal, and shipped to the Tacoma smelter. This ore yielded in the neighbourhood of $75 to the ton in gold, but after operating for about two years work was suspended, and although since then work has been resumed twice, the last time in 1921–22, the property has been idle since then.

One reason why there is no activity in this northern section of the Division along the southerly face of the Beaufort range is that the transportation facilities have not been improved; in fact, they are not as good as they were twenty years ago. At that time there was a good wagon-road from Port Alberni to Mineral hill, a distance of about 15 miles and close to the old Alberni Consolidated property, as well as horse-trails into the section where the *W.W.W.* and other claims are located; these old trails have been destroyed partly by logging operations and, not being used by prospectors, they have not been kept in repair. The ore in the Alberni Consolidated group occurs in a similar system of quartz veins as was the case on the *W.W.W.*

Reference is made to these old claims to emphasize that such a system of quartz veins carrying gold values occurs, and to point out that the zone maintains continuity towards the north-west for several miles, but has not been thoroughly prospected. This range is really the backbone of Vancouver island, composed, as suggested by Clapp, "of a large Coast Range-like batholith, not yet largely unroofed, of which the exposed batholiths are merely protuberances or cupolas," and extending from Mount Arrowsmith south-easterly from Alberni to near the north-westerly end of the island, not, however, as one continuous range, but broken up at intervals by passes and valleys eroded during the glacial period.

Great Central Lake Section.

The most extensively mineralized area in the Alberni Division is the Great Central Lake section, occupying a large area from near the head of Great Central lake northerly and westerly to the boundary of the Division.

In this section are located the highest peaks in the Beaufort range. One, known as Big Interior mountain, with an elevation of about 7,000 feet above sea-level, contains a large mineralized deposit of copper-sulphide ore known as the *Big I.* group, which was discovered in 1899; it has passed through several vicissitudes until the group was Crown-granted during 1925. It is still owned by J. A. Drinkwater and M. Tebo, Drinkwater being one of the original locators.

The mineralized body on this property is continuous for a length of about 3,000 feet, as shown along the side of the mountain which has been eroded off; so that the mineral-deposit stands up like a long perpendicular wall, a great part of it being above a glacier that occupies the basin made as a result of the erosion.

Although the *Big I.* group has been bonded to some of the largest operators in the mining industry since its location in 1899, none of the negotiations were completed, and with the exception of annual assessment-work until the Crown grant was issued about a year ago no further development has been done since the writer's examination in 1916. The chief reasons have been the inaccessible location and distance from any transportation facilities, the only approach at present being by way of trail from the head of Great Central lake, about 10 miles up the Drinkwater river to near its head, where a climb of over 2,000 feet at an average incline of about 30° has to be made to Della lake, a glacial body of water near the base of the glacier already referred to.

In 1916 the writer made quite a thorough examination of the group, his report being published in the Annual Report for that year. Since then examinations have been made by engineers representing the Consolidated Mining and Smelting Company of Canada and other corporations, but none of these materialized into a sale. For this there are several good reasons, apart from considerations of the extent and grade of the ore-deposit. Transportation facilities have been somewhat improved by the construction of a branch of the Esquimalt & Nanaimo Railway to the foot of Great Central lake.

Only an owner backed by ample capital could develop the property into a shipping-mine, as the logical method of development would be to drive an adit from the Drinkwater river into the base of the mountain, which would give backs of some 3,000 feet or more under the summit of the outcrop and would furnish a haulage-way to transport ore to a point where a road 10 miles long down the Drinkwater river would land it at the head of Great Central lake. It is estimated that 300 horse-power could be developed from the "Della" waterfalls. The Drinkwater river has two falls, one 2½ miles from its mouth of 90 feet in 2,000 feet, estimated at 800 horse-power, and at the upper canyon rapids with a total fall of 970 feet in about 3 miles to the foot of "Della" falls, giving an estimated horse-power of 250.

The *Della*, adjoining the *Big I.*, contains gold-bearing quartz veins which occur paralleling the strike of the copper-ore deposit, but separated from it by Della lake.

The mineralization on Big Interior mountain extends westerly into the Clayoquot Division, where the *Ptarmigan* group is located across the summit of the range from the *Big I.* and is reached from the head of Bedwell (Bear) river, which flows into Bedwell sound, an arm of Clayoquot sound on the west coast of Vancouver island. Apparently the *Big I.* mineralized zone and the quartz-vein system extend south-easterly to Taylor river, which flows into Taylor arm of Sproat lake. Similar mineralized zones occur on Myra creek, near the head of Buttle lake in Strathcona Park, in the Nanaimo Division, a few miles north-westerly from the *Big I.* group.

Practically no prospecting has been done recently in and around Big Interior mountain; consequently the question of relationship between the *Big I.* group and the other mineralized zones here referred to has never been established, but the Great Central Lake section of the Alberni Mining Division merits thorough prospecting, although it will be found a difficult country to explore owing chiefly to the precipitous mountain-sides and the elevations reached by the various peaks in the range.

Taylor River Section.

The Taylor River section of the Alberni Division is only partly within the boundaries of the Esquimalt & Nanaimo land-grant. It is reached from the old town of Alberni by auto-road to

Sproat lake, a distance of about 10 miles; thence by motor-boat up Sproat lake and by way of Taylor arm to the head of the lake into which Taylor river flows.

The present trail up Taylor river should be extended to the pass in the mountains between the head of that river and the head of Kennedy (Elk) river, which flows into Kennedy lake, the foot of the lake being situated about 12 miles from the settlement of Tofino, the regular port of call for the C.P.R. steamer "Princess Maquinna."

Such a trail would form a connection between Alberni and Kennedy lake, and judging from the mineralized zone on which the *Morning* group is located about 4 miles up Taylor river from its mouth, also from the discoveries made on Kennedy river, it would appear as though this section fully merited being opened up for the benefit of prospectors.

Morning. This group consists of the *Morning*, *Morning No. 1*, and *Apex* claims, situated near the north bank of Taylor river, about 3½ miles above the mouth. The owners are A. L. Smith and associates, of Alberni. The property is reached by automobile from Alberni to Sproat lake and by launch up Sproat lake to the head of Taylor arm, and from there on foot by a good pack-trail. The group was examined in 1916 when it was known as the *Columbia*, the report being published in the Annual Report for that year; also in the 1923 Annual Report as the *Morning*. Further development was carried on in 1926. The ore occurs in a well-defined fissure-vein system, the vein-filler being chiefly quartz, in which occur gold and silver values.

Assays from samples taken in 1923 and one in 1926 are as follows:—

Description.	Gold.	Silver.	Copper.	Zinc.
	Oz.	Oz.	Per Cent.	Per Cent.
No. 1. Across 16 inches from face of adit at fault-plane	0.72	0.5	.....	.....
No. 2. Across 12 inches from east side of crosscut at fault near face of adit	.....	.....	.....	.....
No. 3. Across 4 feet at 55 feet from face of adit	0.36	0.2	.....	.....
No. 4. Across 4 feet at 80 feet from face of adit	0.14	0.2	.....	.....
No. 5. Across 4 feet at 88 feet from face of adit	0.12	0.1	Trace	.....
No. 6. Across 4 feet about 246 feet from face of adit	Trace	Trace	.....	.....
No. 7. Across 4 feet near portal of adit	.....	.....	0.8	.....
Sample taken in 1926	0.18	3.0	1.0	Trace

It is noticeable that the gold values in all these samples are sufficient to warrant that more thorough prospecting be done on the property, as the shear-zone in which the vein occurs is continuous across the three claims. In the adit where most of the samples were taken the vein itself maintains continuity between well-defined walls for 343 feet from the portal, varying from 12 inches to 5 feet in width and mineralized with pyrite, arsenopyrite, pyrrhotite, and occasional crystals of zinc-blende and galena. The country-rock is typical of the Vancouver group of volcanics. The ore in the *Morning* group is well adapted for concentration, especially by the oil-flotation selective method.

Taylor river, while it is not reported as favourable for power purposes, has an ample flow for a concentrating-mill and domestic purposes. No water-power could be developed, according to the report of the Commission of Conservation of Canada, nearer than the mouth of Sproat river, just below the outlet of Sproat lake, where 3,000 horse-power is estimated could be developed.

About 2½ miles north from Sproat lake, and nearly paralleling it at an elevation of 190 feet higher, Great Central lake is situated, and it is suggested that by a diversion of the water from Great Central lake to Sproat lake 12,000 horse-power could be developed; also that at Stamp falls and Stamp river below the mouth of Ash river, 7 miles north-westerly from Alberni, another 12,000 horse-power could be developed; while at the upper Stamp falls, at the outlet of Great Central lake, another 2,000 horse-power could be developed. From these estimates we have within a radius of a few miles water-power possibilities from which 29,000 horse-power could be developed, according to the estimates of the Commission of Conservation.

During 1926 Andrew Smith, an old resident of Alberni, and his associates have been prospecting in the Taylor River section and on the south-west branch discovered ore-deposits, on which three claims, known as the *Falls No. 1*, *Falls No. 2*, and *Falls No. 3*, were located on October 12th last; these will be more thoroughly prospected during 1927.

Mr. Smith has made more than one trip from the head of Taylor river to the head of Kennedy river through a pass known as "Sutton" pass, named after the late William J. Sutton, who was the geologist for the Dunsmuir interests for several years, and Mr. Smith reports that he observed several veins in the country-rock which carried low values in gold. He considers this to be an attractive field for prospectors.

Alberni Canal Section.

The mountains adjacent to both sides of Alberni canal have been more or less prospected for lode minerals for over thirty years, and reference has already been made to the fact that mines located near the canal were developed up to a shipping-point stage as early as 1898. During recent years, or at least since the *Monitor* mine was closed down in 1922, the only active prospecting operations have been those carried on by Charles Lewis on the *Dauntless* group, which was examined and reported on in the Annual Report for 1918. As Mr. Lewis has been gradually extending the development-work on the group ever since then, it is again referred to in this report.

Dauntless. This group, consisting of the *Dauntless No. 1*, *Dauntless No. 2*, *Evelyn Lewis*, and *Cora*, is situated about 4 miles from Alberni, on the west side of the canal and within the boundaries of the Esquimalt & Nanaimo land-grant. The country-rock shows considerable shearing movement. It is classified as belonging to the Vancouver volcanic series. The mineralization consists principally of chalcopyrite and pyrite occurring in a gangue composed almost entirely of quartz, with which is also associated some breccia. The ore occurs in well-defined fissures in the shear-zone and is disseminated through the gangue rock as small lumps and grains. In two fissures separated by about 200 feet of country-rock the width of the ledge-matter in each is about 7 feet.

From the *Dauntless* group down the canal there are several Crown-granted claims located at varying distances from the canal and connected with it by trails which are now in disrepair.

The rock formations intersected by the Alberni canal belong generally to Clapp's Vancouver group, composed chiefly of metamorphosed basic volcanic rocks with interbedded limestone, and nearly all of the ore-deposits so far discovered on both sides of the canal below the *Dauntless* group belong to the contact-metamorphic type, occurring at or near the contacts between the limestone and volcanic rocks.

This fact has had a great influence in retarding development in this section of the Alberni Mining Division, because the ore-deposits are lenticular and in almost every case where any serious development had been attempted the lenses that outcrop on the surface have wedged out as deeper work was done, the operator became discouraged and quit work without extending it to determine whether or not other lenses could be discovered.

Grizzly. This claim is about 1 mile south of the *Duke of York* dam on China creek and about 10 miles south-easterly from Port Alberni. It is owned by Ernest Loubert, Port Alberni. The route by which the *Grizzly* is reached at present is via wagon-road from Port Alberni to the dam across China creek on the old *Duke of York* hydraulic mine, where the intake for the Port Alberni city waterworks is located. China creek is crossed near the dam on a foot-log, and there is a trail from the crossing to the property, distant about 2 miles in a westerly direction.

On this claim there occurs an outcrop of native arsenic of some extent, from which specimens have been sold to some of the universities and museums, as the writer is informed, and a new industry started on a limited scale. The specimens are generally about 1 lb. in weight and are man-packed from the prospect and forwarded either by mail or express from Port Alberni. Sufficient prospecting to ascertain the conditions at depth has not yet been done, but it is mentioned as it is the only deposit of native arsenic reported in the Western District.

Magnetite-deposits.

Several deposits of magnetite occur in the Alberni Division. These are located at widely disconnected points, some near the western side of Alberni canal, about 18 miles from Port Alberni; others on Copper island in Barkley sound; on the Sarita river near the easterly

entrance to Barkley sound; on the west side of Henderson lake, in the mountains back of Kildonan cannery in Uchucklesit harbour; also on Sechart peninsula between the middle and western channels of Barkley sound. All of these deposits were examined in 1916 and reports published in the Annual Report for that year.

For the reason that there is no market for this ore none of these deposits, most of which are Crown-granted, are being worked and most of the trails built twenty to twenty-five years ago are impassable at the present time.

Cinnabar Ore.

On one of the earliest locations made on Vancouver island, a description of which is included in the Annual Report for 1896 by W. A. Carlyle, the then Provincial Mineralogist, there is a deposit of cinnabar, the ore of mercury. This is situated on Sechart peninsula, about half a mile from the shore near the old whaling-station.

No work has been done on it since 1915, when T. Golby, the owner, drove a tunnel 45 feet long through a narrow ridge to turn the water from the creek and expose the bed-rock, in which narrow veinlets containing cinnabar had been exposed. The deposit is here referred to because inquiries are often made about the occurrence, which is the only one known on Vancouver island.

CLAYOQUOT MINING DIVISION.

The Clayoquot Division occupies an area on the west coast of Vancouver island from Ucluelet peninsula to Kyuquot sound. It is bounded on the east by the summit of the Beaufort range.

A notable feature with regard to the Clayoquot Division is the number of inlets or fiords which penetrate into the mainland of Vancouver island from the Pacific ocean, and which afford numerous well-sheltered harbours, as well as a long mileage of inland waters, by which prospectors are enabled to work from base camps on the shores of any of these numerous inlets.

There are a number of rivers in the Division, all of which are influenced by the tides for a considerable distance, and on a rising tide are navigable by shallow-draught launches for short distances and for much greater distances by canoes. Some of the valleys along these rivers are of considerable width, but usually narrow down to gulches and box canyons within a few miles of the mouths.

The water-power possibilities on the rivers in the Clayoquot Division were not investigated by the Commission of Conservation. The report merely states that they are situated in a region of large annual precipitation, and many have steep grades and would probably afford several water-power sites. Some attention has been paid to Gold river and an application for a site for a water-power up to 4,000 horse-power has been made, but no attempt to develop it has been yet recorded.

Prospecting.

The south-easterly part of the Clayoquot Division has been the most thoroughly prospected, especially on Kennedy river, Tofino creek and inlet, and Bedwell river, also around the vicinity of Catface mountain, in the vicinity of Tofino and Clayoquot settlements at the entrance to Clayoquot sound.

Most of the prospecting in this section was done between 1898 and 1900, when there were more than fifty *bona-fide* prospectors in the district, most of whom made their headquarters at Clayoquot settlement on Stubbs island in the Broken Channel entrance to Clayoquot sound. A part of the Division extends into the southern portion of Strathcona Park, but except in the vicinity of the head of Bedwell river no prospecting has been done within the park boundaries in that Division.

The north-westerly section of the Division—that is, in the neighbourhood of Nootka sound—has been fairly well prospected, especially on Muchalat arm and along the lower part of Gold river, Tlupana arm, Tasis canal, and Zeballos river.

The interior section of the Division is extremely mountainous. The summit of the range which forms the north-eastern boundary contains many peaks with saw-tooth structure, which reach to elevations of 6,000 feet and upwards within a comparatively short distance from the ocean shore-line, and on several of these peaks there are glaciers and snow-fields of very considerable extent. Except to a few prospectors and trappers this interior section is *terra incognita*, and since the disappearance of the majority of the prospectors who were working between 1898 and 1900 the probabilities are that this section will remain unexplored for years.

The early discoveries of mineral-deposits consisted of chalcopyrite associated with magnetite that carried generally from 6 to 8 per cent. copper, with quite low gold and silver values. Many of these prospects were developed on a limited scale, the result generally being that the ore-bodies, which are of the metamorphic-contact type, proved to be lenticular in structure, and after the lenses exposed on the outcropping wedged out the operators were unable to obtain capital to continue further development, or rather to systematically prospect the deposit.

Indian Chief. The *Indian Chief* group, operated by the Tidewater Copper Company from 1916 to 1923, is the only property which has been developed and equipped in an extensive manner in Clayoquot Division. Since 1923 the property has been idle, and the Tidewater Copper Company having defaulted on its bonded debt, the assets of the company were sold at public auction and bought in by a committee acting as trustees for the debenture-holders. Since the sale no plans have been announced by the purchasers with regard to resuming operations. The property is fully described in the Annual Reports for 1917, 1920, 1922, and 1923.

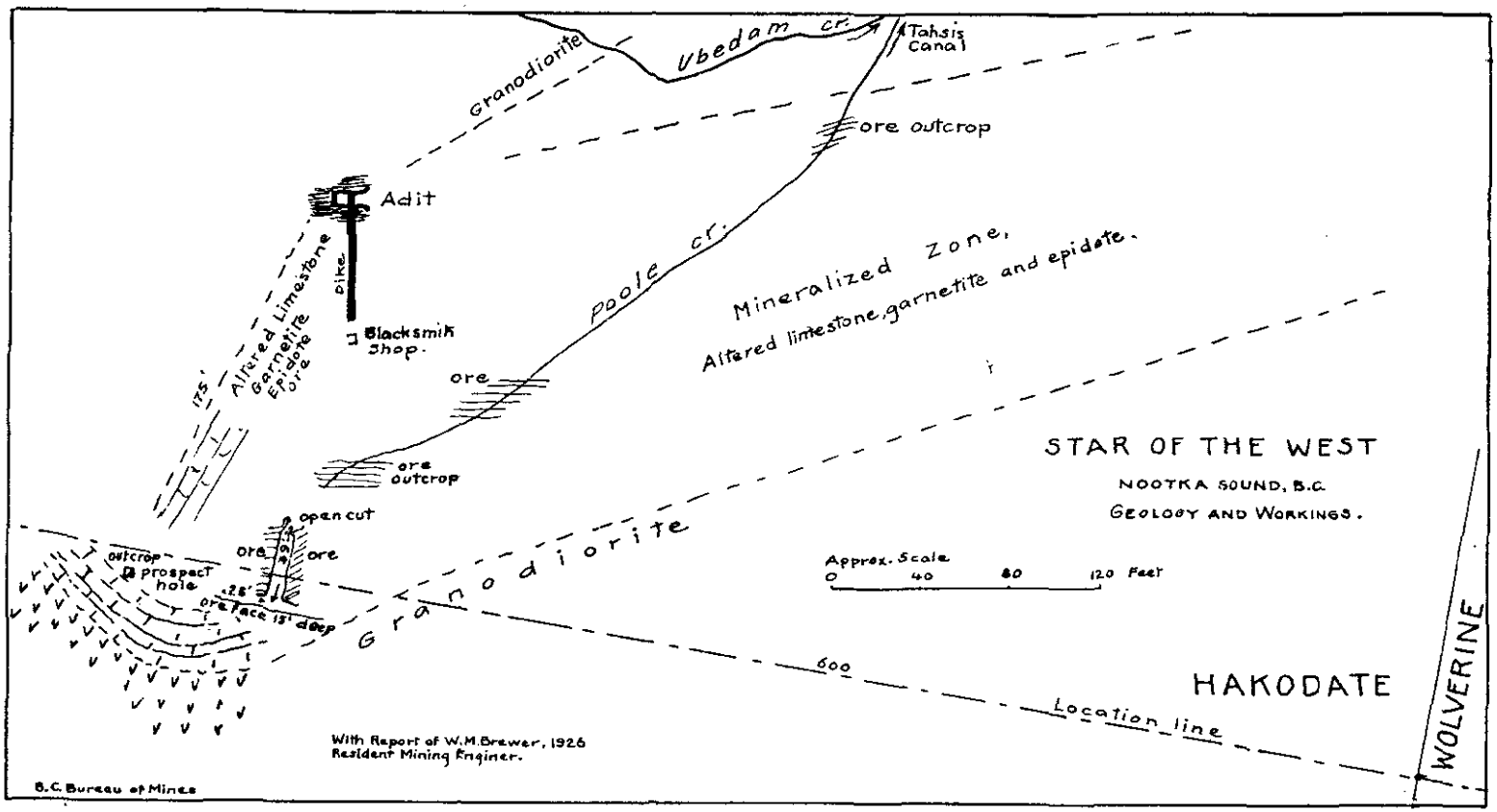
Apparently this property has suffered from the management of its affairs. The ore-bodies, while low grade, are extensive and plenty of possibilities remain for further development.

Star of the West. This group, owned by William H. Poole, of Nootka, contains three claims—*Star of the West, Wolverine,* and *Hakadate;* all the work so far done has been on the first two. The south-west line of the *Hakadate* is approximately 6,000 feet from the beach, near where there is a good site for bunkers and wharf with good anchorage in sheltered deep water. These claims are in good standing, although they have not yet been Crown-granted. The location is at the head of Tasis canal, approximately 22 miles from the Nootka cannery and post-office in a northerly direction, but only about 6 miles from the new pilchard reduction-works of the Canadian Packing Company, Limited, at the head of Esperanza inlet, where a post-office was established in 1926, designated as Cee Pee Cee. This plant is connected with the *Star of the West* group by sheltered water through the narrows between Esperanza inlet and Tasis canal.

Although at present this group can only be considered as a prospect with very promising possibilities, yet the extensive systematic prospecting-work by the owner has been done in such a thorough manner that the property to-day offers many attractive features and shows every indication that it can easily be developed into a mine of commercial importance. The property has been previously described in the Annual Reports for 1922, 1923, and 1925. Since the last report Mr. Poole has done further work and has proven that the extent of the mineralized zones is greater than the earlier work indicated would be the case.

It is unnecessary to repeat the previous descriptions of the property, but a table of assays of samples taken on all examinations is considered useful; the last six samples were taken in 1926.

Description.	Gold.	Silver.	Copper.	Zinc.
	Oz.	Oz.	Per Cent.	Per Cent.
Star of the West	0.04	4.0	7.0	15.0
General sample from prospect-hole	0.24	1.0	9.0	14.0
Hakadate—				
From open-cut	0.16	1.5	16.0	.....
175 feet from open-cut	Trace	Trace	2.5	.....
Across gulch, in garnetite gangue	0.04	0.8	7.5	.....
From open crosscut across 4 feet of solid ore	Trace	1.0	3.7	1.0
Selected ore on dump from the above crosscut	0.10	1.0	12.0	1.0
From the above crosscut in hole after shot fired	0.10	1.0	6.9	1.0
General sample from prospect-hole 150 feet south-easterly from main workings	Trace	Trace	4.0	3.0
No. 1 sample	Trace	Trace	Trace	2.0
No. 2 sample	0.10	1.0	6.0	4.0
No. 3 sample	0.12	1.0	9.0	.....
No. 4 sample	0.04	2.2	15.0	2.0
Star of the West—				
No. 1 sample, from prospect-work	Trace	Trace	0.2	2.0
No. 2 sample, from same working	0.70	2.6	9.0	6.0


Granodiorite
Ubedam cr.
Tahsis Canal
ore outcrop
Adit
dike
Blacksmith Shop.
Poole cr.
Mineralized Zone,
Altered limestone, garnetite and epidote.
175'
Altered Limestone
Garnetite
Epidote
Dike
ore
ore outcrop
STAR OF THE WEST
NOOTKA SOUND, B.C.
GEOLOGY AND WORKINGS.
open cut
outcrop
prospect hole
ore
ore
25'
ore face 15' deep
Granodiorite
Approx. Scale
0 40 80 120 Feet
600
HAKODATE
Location line
WOLVERINE
With Report of W.M. Brewer, 1926
Resident Mining Engineer.
B.C. Bureau of Mines

In addition to the ore exposed in the workings, outcroppings occur between the adit on the north contact and the open-cut on the south contact, which indicate that the mineralized zone at that point is approximately 175 feet wide, composed chiefly of altered limestone, garnetite, and epidote, with ore disseminated irregularly through this gangue. The zone is traversed diagonally by Poole creek, which has very precipitous banks, difficult to prospect, but with low-grade ore-outcroppings exposed in the south-easterly side. One of these outcroppings from the bed of the creek near the head is represented by No. 2 sample.

From the records of the Mining Recorder at Clayoquot it is noticeable that five different sections of the Clayoquot Division are represented by new locations of mineral claims made during 1926. These are the Zeballos river, Muchalat arm, Tofino (Deer) creek, Bedwell river, and Kennedy (Elk) river. The locations made on the Zeballos river are at points between 7 and 9 miles from tide-water and in the neighbourhood of the confluence between the main river and East fork. Twelve claims in all were staked, designated as *Ehatset Nos. 1* to *12*.

These claims were staked in September and October, 1926, so that no prospecting-work has been done on them. They were not examined by the writer. Undoubtedly the incentive that led the prospectors into that section of the Mining Division was the discovery that was made in 1924 of a narrow quartz gash-vein about 3 miles from the mouth of Zeballos river. Some specimen samples from this prospect assayed several ounces in gold to the ton, some going as high as 22.3 oz. During the season of 1925 the English syndicate that had purchased 51 per cent. of the prospect when it was first staked employed some good miners to thoroughly prospect for an extension of the narrow vein. After working for several months no encouraging indications of further ore were found; consequently the syndicate abandoned the work. During the time this work was going on a good trail was built with Government assistance from the mouth of Zeballos river to the group, a distance of about 3 miles. This trail has been of assistance to prospectors. Presumably during the coming season prospecting-work will be done on these newly located claims.

White. This group is one of the most important and attractive, so far as exposures of high-grade ore-deposits are concerned, in the Clayoquot Division. The group is located on Tofino creek, about 2 miles from the mouth on the west side of the creek, which flows into Tofino inlet of Clayoquot sound; it contains the *White*, *Norman*, *Walton*, *Dunlop*, and *Alfa* claims, occupying an area of approximately 250 acres.

The property is owned by William Walton, of Tofino, and Duncan McMillan, of Victoria. It was quite fully described in the Annual Reports for 1919 and 1921, but is again referred to in this report because further prospecting has been done by the owners, which is so encouraging as to warrant the carrying-out of a still more thorough systematic and extensive programme of development-work.

The mine-workings are about 1½ miles from the head of Tofino inlet, where there is good anchorage and shelter for a site for a wharf and bunkers; also a good site for a concentrating plant near the mouth of Tofino (Deer) creek, which carries an ample supply of water for use in a plant, although not sufficient for development of power.

The occurrences of copper-sulphide ores, chiefly chalcopyrite, occur in several outcrops on a bench, about an acre in area, about 800 feet elevation up the side of a steep mountain. In order to determine the extent and continuity at depth of the deposits diamond-drilling should be done. There are several lenses of ore outcropping in country-rock belonging to the Vancouver group of volcanic rocks, with interbedded beds of limestone and associated with garnetite, epidote, quartz, tremolite, pyroxene, and actinolite. Efforts have been made to determine the source of the ore found on the bench mentioned, which apparently is from a wide fissure in the precipitous mountain-side overlooking the bench or terrace, on which the several outcroppings of chalcopyrite occur; and although the owners are evidently using every endeavour to locate the source of the ore to determine its extent and continuity at depth, it is slow work and requires the expenditure of more capital than the owners can command.

Samples thoroughly representative of the outcroppings referred to assay as follows:—No. 1: Gold, trace; silver, 1.6 oz. to the ton; copper, 11.5 per cent. No. 2: Gold, trace; silver, 1.6 oz. to the ton; copper, 12.5 per cent.

It is impossible to form any estimate as to the "probable" tonnage of ore in sight because of insufficient development-work, and so far as the tonnage of "actual" ore exposed by the open-cut work in the outcroppings on the bench mentioned, that is problematical. In some

places the ore appears to occur as a blanket over most of the area on the bench, but some of the lenses show indications of extending to an undetermined depth; they are not, however, sufficiently exposed to allow an estimate of tonnage. The future of this property depends on further thorough prospecting, which should be by diamond-drilling as the structural conditions lend themselves to such prospecting at a minimum cost.

Kennedy River Section.

During 1926 the Kennedy (Elk) River section has been prospected considerably, and in the fall several new locations were made in the neighbourhood of the old *Rose Marie* group; it was too late in the year to examine these.

In this section narrow quartz veins occur in the Vancouver series of volcanic rocks, which is the prevailing country-rock. The quartz from many of these fissures carries values in free gold ranging from a few dollars to 2 or 3 oz. of gold to the ton, and several of these are located in close proximity to the river, where there are good sites for concentrating plants with an ample supply of water. Some of these occurrences offer good opportunities for men experienced in mining and milling gold-bearing ore to make a stake, but are not large enough for company organization.

Bedwell River Section.

Several new locations have been made on the east side of Bedwell river, about 4 miles from its mouth, which, however, have not yet been prospected to any appreciable extent.

Ptarmigan. The most important of the locations in this section are in the neighbourhood of the head of Bedwell river in the high range of mountains which forms the divide between the waters flowing south-easterly into Great Central lake and those flowing westerly into Clayoquot sound. The *Ptarmigan* group contains the following Crown-granted claims: *Big I. No. 6*, *Big I. No. 7*, *Great Central Lake No. 5*, and *Great Central Lake No. 6*, situated on the westerly slope of Big Interior mountain at an elevation of about 6,300 feet.

The group is owned by the Ptarmigan Mines Company, of London, England, which has kept the taxes paid up to date, although the property has not been actively operated since 1914, when on the declaration of war by Great Britain the entire staff and force of miners left for the front, leaving winter supplies in the camp, as well as about 1½ tons of explosives on the bank of Bedwell river at its mouth, and the entire plant for an aerial tramway of 4 miles in length that had been purchased from the Tyee Copper Company earlier in the year. The company was an organization promoted by the Earl of Denbigh, who authorized an expenditure of about $40,000 for building a road, bridges, and development-work on the claims.

The mineralized zone on the *Ptarmigan* is apparently an extension of the zone already described in this report that occurs on the *Big I.* group on Big Interior mountain, in the Alberni Division. The property is mentioned in this report more for the purpose of attracting attention to the mineralization of that portion of Vancouver island than for any other reason, and as the payment of taxes is kept up it may be presumed that it is the intention of the company at some future time to resume the work and fully develop the property, which is undoubtedly a very promising prospect.

The transportation facilities necessary to connect the mine-workings on the *Ptarmigan* group with tide-water would necessitate an aerial tramway from near the summit of the mountain to the head of Bedwell river, and from there by water-grade tramway about 12 miles in length to the mouth of Bedwell river, where there is a good site with deep sheltered water for a wharf and bunkers.

Gold-bearing Quartz Veins.—Near the head of Bedwell river there are some comparatively narrow gold-bearing quartz veins in the Vancouver series of volcanic rocks, which is the prevailing country-rock, and as late as 1897 more or less placer gold was mined from the bars in the river for quite a considerable distance below its head. The placer operations were carried on principally by Chinamen and it has never been possible to ascertain how much gold was taken out.

The last work done on the quartz veins was that by J. H. Woodworth and associates in 1921 and 1922, when a small mill was erected and several men employed in mining and milling. Late in the fall of 1922 the entire camp, including the mill, was destroyed by fire and later in the

winter the main bridge as well as some smaller ones across Bedwell river were carried away by high water. The road from the base of the mountain to the mouth of the river was also badly damaged by high water and no attempt has since been made to repair the road or rebuild the bridges.

QUATSINO MINING DIVISION.

The Quatsino Mining Division occupies the smallest area of any of the Divisions in the Western Mineral Survey District (No. 6). Although there has not been any production from metalliferous mines in this Division during 1926, there has been considerable interest shown and extensive development-work done on several properties. Twenty-eight certificates of improvement were recorded during 1926, and in addition there were about the same number of un-Crown-granted claims in good standing, on which assessment-work had been done during the year.

In addition to lode-mining in the Quatsino Division, there is a non-metallic industry, which is being developed by the owners of two properties situated on Easy creek, a tributary to Kokshittle inlet, Kyuquot sound. This industry is based on deposits of pyrophyllite and natro-alunite which occur on both sides of Easy creek.

West Arm of Quatsino Sound.

This arm extends from Quatsino narrows, that connect the main Quatsino sound with the West arm, in a westerly direction to the head of the arm, where the settlement of Holberg is situated and where the waters from Spruce river enter the arm.

Millington.

This group contains the following six claims: *Crackerjack*, *Millington*, *Hood*, *Molly B.*, *Molly Bawn*, and *Paystreak*, owned by a syndicate composed of James Spooner, Dave Spooner, Ed. Spooner, Pete Obling (post-office address, Holberg), and Alfred Hood, of Victoria. The group was examined on August 27th, 1926, when samples were taken from new work done since it was examined in 1919 and 1924 and reported on in the Annual Reports for those years.

The group is situated about 3 miles above the mouth of Spruce river, on the westerly side, at an elevation of about 500 feet above sea-level, and is reached by a good wagon-road from Holberg to the crossing of the river, which is made by a platform hanging on a cable, and a good pack-horse trail from the river crossing to the claims. The cable crossing of the river was constructed during the late fall of 1926 after a new bridge that had been built in 1925 had been carried out by exceptionally high waters.

The rock formation in the vicinity of the claims is classified by Victor Dolmage, Geological Survey of Canada, as a highly amygdaloidal basalt in which occur as impregnations several lenses of solid bornite-copper ore. The development-work done previous to this year was confined to the *Crackerjack* claim and consisted of two adits, some open-cuts, and surface-stripping.

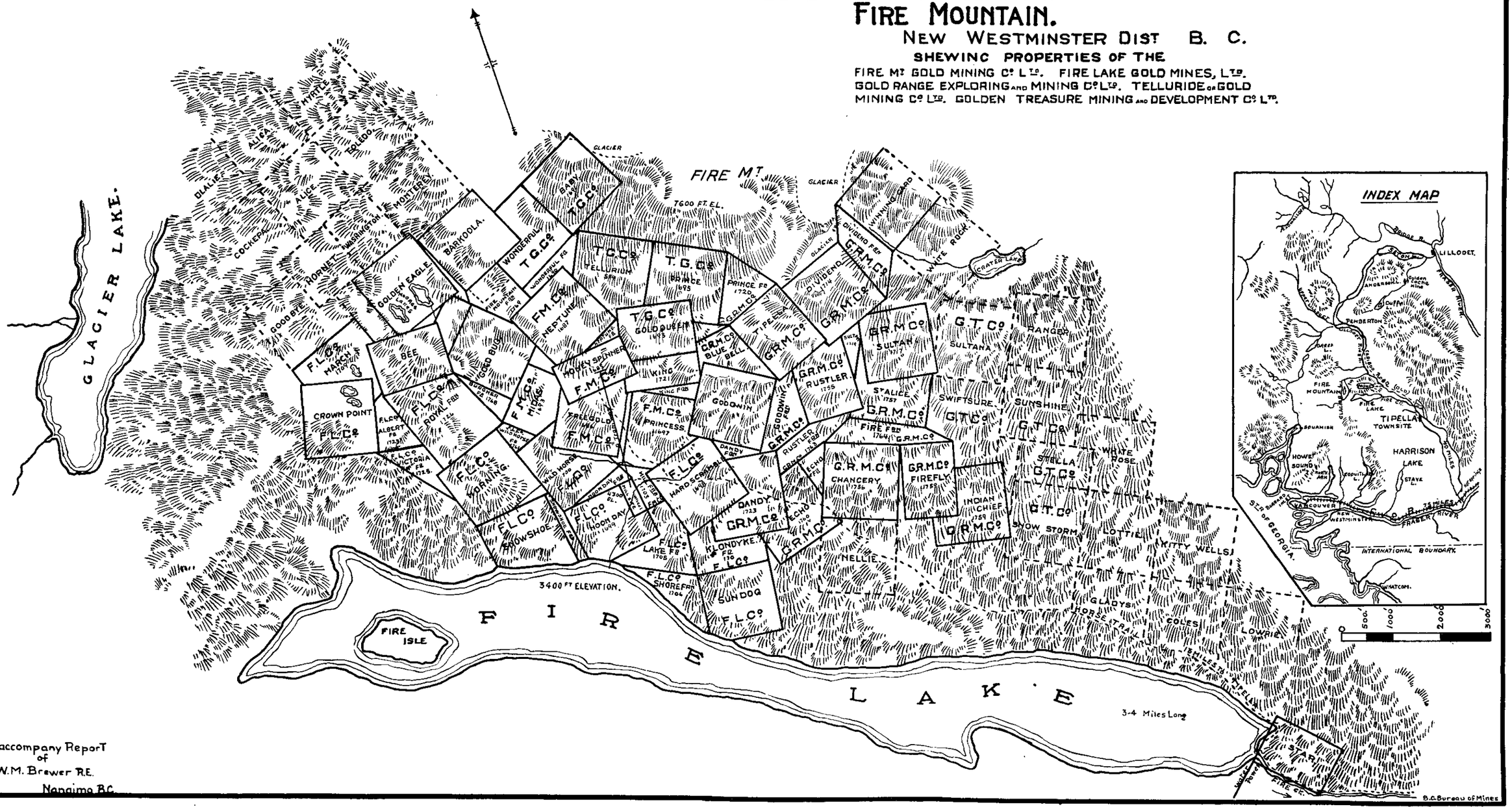
The No. 1 adit is at an elevation of about 490 feet. It is about 60 feet long with an open-cut approach about 15 feet long. The main open-cut on the surface above the No. 1 adit is 30 feet long and 4 feet deep. The No. 2 adit is about 110 feet lower elevation than the No. 1 adit. It is driven in the right bank of a creek, a length of about 70 feet, with drifts to the right and left, starting from a point 50 feet from the portal of the adit. The drift to the left is 21 feet and that to the right 15 feet long. Other work consists of a crosscut 40 feet long driven from the left drift in the lower adit; also a second drift driven 35 feet long, starting from opposite to the entrance to the crosscut just referred to.

The work done during 1926 consists of a No. 3 adit driven as a crosscut about 100 feet lower elevation than the No. 2 adit. The object of driving the No. 3 adit is for the reason that its elevation is only a little above the cabin camp, and the intention is to use it in future for the main haulage-way for transporting ore after it is connected by raises with the workings at higher levels; also in order to crosscut the formation below the higher workings and prove up the conditions with regard to extension of the ore-bodies exposed in those workings. In order to accomplish this purpose the adit will have to be driven about 300 feet, but at the time of the examination it was only 35 feet long under cover with an open-cut approach, all in solid rock 18 feet long. Stripping has also been done across a vein that outcrops in the bed of the creek between the No. 1 and No. 2 adits. This stripping exposed a lens of ore 43 feet long, with the width undetermined.

MAP OF MINERAL CLAIMS SITUATED ON FIRE MOUNTAIN.

NEW WESTMINSTER DIST B. C.

SHEWING PROPERTIES OF THE
FIRE M^T GOLD MINING C^O L^TD. FIRE LAKE GOLD MINES, L^TD.
GOLD RANGE EXPLORING AND MINING C^O L^TD. TELLURIDE OR GOLD
MINING C^O L^TD. GOLDEN TREASURE MINING AND DEVELOPMENT C^O L^TD.



To accompany Report
of
W.M. Brewer M.E.
Nanaimo B.C.

B.C. Bureau of Mines

A sample fairly representing the ore exposed in the stripping between the Nos. 1 and 2 adits assayed: Gold, trace; silver, 0.2 oz. to the ton; copper, 5 per cent.; zinc, 1 per cent. The assays from samples taken from various points in the workings during previous examinations are given in former reports referred to.

South-east Arm of Quatsino Sound.

The South-east arm of Quatsino sound extends from the southerly side of the main sound opposite Limestone island to Port Alice, the headquarters of the Whalen Pulp Company, and is enclosed on both sides by high ranges of mountains which have been considerably prospected ever since the first settlement by white men about 1894. A number of mineral claims have been staked from time to time and most of them are Crown-granted. June Landing, about 6 miles up from the Quatsino settlement, is the starting-point for the *Alice Lake* and *Old Sport* groups. Until last fall the route from June Landing to Alice lake, a distance of about 6 miles, was by pack-horse trail with heavy grades and during rainy season much mud.

During last summer the Coast Copper Company, which owns the *Old Sport* group, with the assistance of a grant from the Mines Development Fund, constructed an automobile-road from June Landing to Alice lake, 5 miles in length, on which a 1-ton auto-truck is now used. This improvement to transportation facilities of this section is quite important both to prospectors and operators.

During the coming summer the Coast Copper Company also proposes to extend this auto-truck road from the east shore of Alice lake to the foot of Kathleen lake, a distance of about 3½ miles, which will afford easy access to the *Old Sport* and other properties in the neighbourhood of Elk lake, also to the summit between that chain of lakes and Nimpkish lake, on the east side of Vancouver island.

Alice Lake.

This group contains the *Alice Lake, Lucky Strike, Pay Streak, Galena, Iron Knob*, and *Olga* claims, situated near the west shore of Alice lake and near the auto-truck road completed last summer from June Landing. The group is owned by William Clancy, W. D. Kinsey, and associates, of Quatsino. The claims were staked and recorded in July, 1924, since which time the owners have been intensively prospecting, as well as having driven a crosscut adit 95 feet long under cover in addition to open-cut approach.

This adit was driven with the expectation of intersecting a deposit of gold-silver-zinc ore which outcrops on the surface about 50 feet higher than the level of the adit mentioned. The results from driving this adit were disappointing and during the past summer the owners have been further developing by drifting along the strike of the ore-body. This drift was in 35 feet (September 2nd, 1926, when the property was examined) on an ore-body between 12 and 18 inches wide, having its strike S. 45° E. and its dip varying from 30° south-westerly to vertical. A representative sample was taken from this work which assayed: Gold, 0.80 oz.; silver, 2.2 oz. to the ton; copper, *nil;* zinc, 8 per cent.

The country-rock in the vicinity of the *Alice Lake* group belongs to the Vancouver series as classified by Dawson, with interbedded limestone that has been intruded by dykes of felsite porphyry and other igneous rocks.

Occurrences of ore on the *Alice Lake* group appear from surface indications to belong to the contact-metamorphic type, with limestone as the hanging-wall and felsite porphyry the foot-wall, but recent prospecting would seem to indicate that the ore occurs as a replacement in the limestone instead of as the contact-metamorphic type. The attractive feature with regard to this property is the persistency and regularity maintained by the gold values as shown by all the sampling that has been done, and the owners propose to continue development-work systematically to determine the commercial value of the property.

Elk Lake Section.

Coast Copper Co.

By far the most important operations being carried on in the Quatsino Division are those of the Coast Copper Company, a subsidiary of the Consolidated Mining and Smelting Company of Canada. The groups known as the *Old Sport* mine have been steadily developed since 1916, when the majority of the stock of the Coast Copper Company was acquired by the Consolidated Company. This property has been reported on in the Annual Reports for the years 1916, 1917, 1919, 1924, and 1925.

The name of the *Old Sport* mine is given to the various groups of claims which constitute the property. These are as follows: *Penstock, Old Sport No. 1, Old Sport No. 2, Idaho, Machets,*

Robin, *Eagle*, *Bean*, *Merry Widow*, *Martin*, *Hemlock*, *Oak*, and *Teal Fraction*. Each of these groups contains a varying number of mineral claims, totalling seventy-two claims, many of them Crown-granted and Crown grants applied for the rest. Most of these claims are located on the south-west side of Elk lake, but some are on Canyon creek, Raging river, and Benson river in close proximity to the main group. Elk lake is one of and near the source of a chain of lakes which receive the waters flowing down Raging river, Canyon creek, and Benson river, all torrential streams that have their sources in the high range of mountains that forms the divide which separates the waters that flow into Quatsino sound from those which flow into Nimpkish lake.

These lakes are Elk, Kathleen, and Alice, which have their outlet down Marble creek, emptying into Rupert arm of Quatsino sound. Victoria lake, the head of which is a few miles south from Elk lake, may also be considered in this chain because the waters from it flow into Alice lake through a short unnamed stream.

The property is reached by auto-road from June Landing, on the South-east arm of Quatsino sound, to Alice lake, by crossing that lake by gasolene-launch, then pack-horse trail 3½ miles to Kathleen lake; thence gasolene-launch from the head to the foot of that lake, and along a short portage with pack-horse trail from there to the mining camp on the south-west shore of Elk lake.

It is unnecessary in this report to refer to the history, geology, and ore-deposits of the *Old Sport*, which are given quite fully in the Annual Report for 1924, so that the following is merely a detailed report respecting the footage of working-openings and diamond-drilling during 1926, together with the total number of feet done on the property to date, including information relative to the power plant on Raging river.

During 1926 there has been done 788.5 feet of drifting, 133 feet of crosscutting, 72.5 feet of raising, and 357 feet of sinking, making a total of 1,351 feet of working-openings, in addition to which there has been 1,487 feet of diamond-drilling. The work done during 1926 brings the development-work on the property up to that point where the ore-deposits have been opened up to a depth of 1,200 feet on the dip and for a length of approximately 3,000 feet.

The total development-work done to date is as follows: Prior to and including the year 1923 there was a total footage of drifting, crosscutting, raising, and sinking of 7,295.5 feet, and 12,465.4 of diamond-drilling. The following table shows the work done during the last three years:—

Description.	1924.	1925.	1926.
	Feet.	Feet.	Feet.
Drifting	1,925.0	2,021.0	788.5
Crosscutting	132.5	721.0	133.0
Raising	114.5	17.5	72.5
Sinking	.....	.....	357.0
Diamond-drilling	540.0	4,526.8	1,487.0

During 1926 the company installed at Raging river a 1,000-cubic-foot Ingersoll-Rand 2-stage air-compressor. It is controlled by a Pelton governor and driven by a 3-foot Pelton wheel, working under a 165-foot head and using 900 cubic feet of water a minute. This is conveyed from Raging River falls, a distance of 1,700 feet, in a 3-foot by 15-inch flume, constructed of 2-inch plank, which carries 1,200 cubic feet. The machine is automatic in all details, such as oil-supply, air-load, and speed. The air is conveyed to the mine, a distance of 3,300 feet, in a 4-inch pipe. The old plant will be retained.

Kyuquot Sound Section.

The Kyuquot Sound section of the Quatsino Division has not been very thoroughly prospected, except near and at the head of Kokshittle arm, where a group of claims was located in 1919 by George Nordstrom and H. O. Bergh, which was described in the Annual Report for 1920 under the heading *Caledonia* group.

Natro-alunite and Pyrophyllite Deposits.—On Easy creek, a tributary of Kokshittle arm, near its entrance, there occur extensive deposits of these minerals, which were described in the Annual Report for 1920; as there has been no activity in mining since, it is not deemed necessary to repeat the descriptions here.

NANAIMO MINING DIVISION.

The Nanaimo Division embraces a much greater area than any other in No. 6 District. Although for administrative purposes the district is considered as a unit, geographically it is separated into three main units for the reason that a portion of the Division is situated on the Mainland, another portion embraces all of the islands between the Mainland and Vancouver island, and a third unit is the strip of land paralleling the east coast of Vancouver island and extending from near Ladysmith north-westerly to Cape Scott, the extreme north-westerly point on the island.

The mineral industry in Nanaimo Division includes lode-mining, coal-mining, and the production of some non-metallic and building materials.

Developed and Undeveloped Water-power.

The Division is especially favoured with rivers that furnish most excellent potential sites for the development of extensive water-powers. These are situated on the Mainland, some of the islands, and Vancouver island; the most important among these are:—

Powell river, where 48,000 horse-power has been developed by the Powell River Company.

Forbes river, tributary of Humphrey channel, estimated horse-power at the cascades 1 mile at the mouth, 1,000.

Toba inlet, from the following tributaries:—

Chewson creek, from the cascades near the mouth, estimated 5,000 horse-power.

Hazel creek, 8 miles up Toba at McKenzie falls, estimated 3,500 horse-power.

Little Toba river, total from the rapids above and below Big creek, estimated 1,600 horse-power.

Falls creek, tributary of the North fork of Toba, from falls in a rapid canyon from near the mouth, estimated 5,000 horse-power.

Owens creek, tributary of North fork, from rapids and falls from near the mouth, estimated 2,000 horse-power.

Thomlinson creek, tributary of South fork, from rapids and falls about half a mile above the mouth, estimated 5,500 horse-power.

Canyon creek, tributary of South fork of Toba, 15 miles above the fork at canyon and falls near the mouth, estimated 17,000 horse-power.

First falls, East fork of Toba river, 31 miles above the forks, estimated 2,000 horse-power.

Second falls, 32 miles above forks, estimated 3,200 horse-power.

Summit creek, tributary of South fork of Toba, 29 miles above forks at rapids near the mouth, estimated 1,000 horse-power.

Tahumming (Graveyard) creek, falls and rapids near the mouth, estimated 1,000 horse-power.

Brem river, north side of Toba inlet, rapids and falls near the mouth, estimated 4,000 horse-power.

Bute inlet, from the following tributaries:—

Salmon river (Orford bay), falls and rapids in box canyon, 4½ miles from the mouth, estimated 4,500 horse-power.

Twenty-two-mile creek, falls near the mouth, estimated 3,000 horse-power.

Homathko river, Waddington canyon, 8 miles below forks, estimated 6,000 horse-power.

East Fork canyon, estimated 6,000 horse-power.

West Fork canyon, estimated 6,000 horse-power.

Ice River rapids and two canyons, estimated 2,500 horse-power.

Eckheinick river, rapids near the mouth, estimated 4,000 horse-power.

Rodell creek, from cascades and rapids 1 mile from the mouth, estimated 3,000 horse-power.

Second West tributary, at falls 800 feet from the mouth, estimated 1,500 horse-power.

Loughborough inlet, from its tributary, Stafford river, from the first, second, third, and fourth rapids, totalling about 1½ miles, estimated 4,000 horse-power.

Knight inlet, from its following tributaries:—

Wawhash creek, from first and second rapids, totalling about 3½ miles, estimated 6,000 horse-power.

Klinaklini river, from rapids and Grand canyon, 15 to 25 miles above the mouth, estimated 15,000 horse-power.

Slide creek, tributary to Klinaklini river, rapids and canyon near the mouth, estimated 3,000 horse-power.

Simm creek, from rapids 2 miles from mouth, estimated 6,500 horse-power.

From Seymour river, tributary to Seymour inlet, at the falls 2½ miles from the mouth, estimated 4,000 horse-power.

East coast of Vancouver island:—

Nanaimo river, from Cassidy canyon to Wellington Collieries bridge, estimated 2,500 horse-power.

From Wellington Collieries bridge to South Fork road bridge, estimated 4,500 horse-power.

South Fork road bridge to Jump creek, estimated 3,000 horse-power.

Jump creek to the storage-dam site, estimated 1,500 horse-power.

Millstone river, near Newcastle, 200 horse-power developed by the Nanaimo Electric Light, Power, and Heat Company.

Little Qualicum river, from Cameron lake to the mouth, estimated 3,500 horse-power.

Qualicum river, at falls and rapids, estimated 1,200 horse-power.

Puntledge or Comox river, development by Canadian Collieries, Limited, site No. 1, ultimate horse-power, 19,000; site No. 2, rapids below site No. 1, 4,000 horse-power.

Campbell river, estimated maximum development, 100,000 horse-power.

Buttle lake and following tributaries:—

Wolfe creek, from fall 1 mile from the mouth, estimated 500 horse-power.

Marble creek, from rapids and falls, estimated 700 horse-power.

Myra creek, rapids near the mouth, estimated 900 horse-power.

Thelwood creek, rapids below lake, estimated 4,000 horse-power.

Ralph river, falls and rapids below lakes, estimated 600 horse-power.

Shepherd creek, tributary to Ralph river, estimated 500 horse-power.

Salmon river, at the canyon 23 miles from the mouth, estimated 1,200 horse-power.

White river, tributary to Salmon river, at the first canyon, 2 miles from the mouth, estimated 5,000 horse-power.

Mememey river, tributary to Salmon river, at canyon, 2 miles from the mouth, 1,300 horse-power.

Koksish river, at canyon from 3 to 6 miles from mouth, estimated 10,000 horse-power.

Nimpkish river, at dam-site, 1½ miles from mouth, estimated 5,500 horse-power.

Camosun creek, 5½ miles above Nimpkish lake, estimated 3,500 horse-power.

Big falls, 2 miles above Woss river, estimated 2,000 horse-power.

One-mile riffle above Davie river, estimated 1,500 horse-power.

Shushart river, at rapids in canyon, estimated 1,200 horse-power.

Klinaklini River and Tatlayoko Lake Section.

As there has been no mining activity in this section during the past year no examination was made of it during 1926, but the section is referred to because in several parts there are indications which promise that deposits of minerals are likely to be found as a result of thorough prospecting. In the past this section of the Nanaimo Mining Division has hardly been scratched over. Some prospecting has been done which resulted in the discovery of gold-bearing quartz veins near the foot of Tatlayoko lake and about 4 miles back in the mountains near Homathko river. Deposits of hæmatite-iron ore occur on Chromium creek, near the head of Klinaklini river.

Descriptions of this section will be found in the Annual Reports for 1910, 1916, and 1920. In the Summary Report for 1925, Part A, G.S.C., there is a useful report by Victor Dolmage under the title of "Tatla-Bella Coola Area Coast District, B.C." The last-named report describes the geology, both general and economic, in much more detail than is done in any of the others *referred to.*

This section is practically inaccessible from the Coast by direct route, as there are no trails from the heads of Knight and Bute inlets into it, and the country is very rough. This section is, however, easily approached from the interior, because an automobile can be driven from Williams Lake, on the Pacific Great Eastern Railway, to One Eye lake, near the head of Klinaklini river or to the head of Tatlayoko lake, although the section of the last-mentioned road from Red Stone, about 70 miles west of Williams Lake, is not in good condition for auto-travel, but the entire section can be travelled with ease by horseback.

In Dolmage's report he refers to the area mapped as lying along the boundary between the two main physiographic areas of western British Columbia, the rugged mountains of the Coast range on the south-west and the Interior Plateau region on the north-east.

He also calls attention to the fact that between these well-defined areas lies a transitional belt from 10 to 12 miles wide, characterized by round and flat-topped mountains. The boundary between the plateau and the transitional belt passes south of Tatla lake and follows the base of the low hills lying north of One Eye lake. The boundary between the transitional belt and the Coast range is not so well defined. It extends from the north end of Tatlayoko lake, crossing the West Homathko river south of Bluff lake, and continuing north of Perkins peak near the head of Klinaklini river.

In describing the economic geology Dolmage draws attention to the fact that very little mineral has been found, and that the only known deposits in the district are a deposit of auriferous arsenopyrite, situated about 2 miles north of Perkins peak, and a deposit of hæmatite 1 mile south of the peak.

Inlet Section.

This section covers Knight, Bute, Toba, and other inlets and embraces a very considerable area of the Nanaimo Division. It is practically an unknown country, except along the shores of the inlets mentioned and in the near-by mountains. The entire area is covered by the Coast Range batholith, composed almost entirely of quartz diorite, granodiorite, and other related plutonic rocks. The prospecting that has been done near the inlets mentioned has determined that there are several occurrences of belts with lenticular structure composed of altered older sedimentary rocks, which represent roof-pendants. In some of these roof-pendants there occur deposits of copper sulphide and magnetite-iron ores. Some of these on Knight inlet have been prospected to some extent and partially developed, and were described in the Annual Report for 1919, pages 211 to 213.

During the field season of 1926 the writer made a trip with a launch up all of these inlets and visited all of the recorded mineral claims where he could find the owners or some reliable guide to show him the development-work that had been done. During this trip he found that a party of prospectors had been working on the west side of the Klinaklini river, about 10 miles above its confluence with Knight inlet, but was unable to locate any of them, and after referring to the record of mineral claims and assessment-work recorded during the past year in that section, it is noted that there has not been any; therefore it is presumed that the prospectors did not meet with any success.

The *Copper Princess* and *Happy Chance* mineral claims on Knight inlet, near Glendale cove, owned by the Union Copper Company, of Vancouver, are still in good standing, but the work done since these mineral claims were described in the Annual Report for 1919 has not changed the conditions materially; therefore it is unnecessary to repeat the description here.

Copper King. This group is situated on Theodosia river, about 8 miles above the mouth. It is owned by Revenue Investments Company, Limited. The *Copper King* group comprises eleven locations, all Crown-granted. It was located about 1898, and was formerly owned by Colonel McKinnon, of Vancouver, and acquired by the present owners in the late fall of 1925. It covers approximately 550 acres on a steep mountain-side about 4 miles from the present terminus of the logging-railway owned and operated by Merrill & Ring, who own very extensive timber limits in the vicinity. The railway was built to the crossing of the Theodosia river, which at that point is a comparatively small stream flowing between very steep high banks, which in order to be crossed by railway would necessitate a long bridge at a considerable height above the bed of the stream.

The location of the property is rendered easy of access because of the present railway, and will be much easier after the river is spanned by a bridge and the railway-construction continued near to the mountain on which the claims are located.

The ore-deposits occur on the *Copper King* claim and consist of a well-defined body of zinc-blende ore at the contact between limestone and igneous rocks. There is also quite an extensive deposit of magnetite, with which is associated chalcopyrite, the mineralization occurring as a deposit of the contact-metamorphic type between limestone and greenstone, with a great deal of epidote in the greenstone. The magnetite-copper ore occurs about 264 feet in a south-westerly course from the deposit of zinc-blende ore.

Several years ago the deposit of zinc-blende was developed by an open-cut and a crosscut adit 40 feet long, with a winze 8 feet deep below the floor. In the adit the ore is exposed about 10 feet wide. It has a north-westerly strike and dips nearly vertical.

The development-work on the magnetite-copper ore deposit consists of an open-cut 64 feet long, driven in a south-westerly direction, or as a crosscut in which ore is exposed for a length of 52 feet; also a glory-hole near the westerly end of the open-cut about 10 feet deep and 12 feet wide at the surface, all in ore. The distance from the glory-hole to the upper side of the stripping is 37 feet and shows that apparently ore may be continuous across that distance. In the glory-hole the ore is exposed for a length of 30 feet and about 5 feet wide at the bottom, but 12 feet wide at the top.

A general sample from the dump at the mouth of the adit on the zinc-blende deposit assayed: Gold, trace; silver, 2.4 oz. to the ton; copper, 2 per cent.; lead, *nil;* zinc, 17 per cent. Another sample taken from the same adit across 3 feet near the portal assayed: Gold, trace; silver, 2 oz. to the ton; copper, *nil;* lead, *nil;* zinc, 2 per cent. Owing to the condition of the timbers and the winze in the adit it was not possible at the time of the examination to sample a greater width than 3 feet, although apparently the ore-deposit is about 10 feet wide.

A grab sample from the dump of the glory-hole assayed: Gold, trace; silver, trace; copper, *nil;* iron, 55.6 per cent. Another sample from the dump of the glory-hole assayed: Gold, trace; silver, 2 oz. to the ton; copper, 5.7 per cent.; iron, 46.6 per cent. It is only fair to say that there were portions of the ore exposed by the long crosscut and glory-hole from which samples could be selected that would carry more than 20 per cent. copper, but in actual mining practice considerable sorting would have to be done to secure the high-grade copper ore in commercial quantities. Although not included in the samples that were assayed, some specimens of high-grade ore were taken for exhibits in the Government Museum.

Phillips and Frederick Arms Section.

During 1925 there was considerable work done on the *Doratha Morton* and *Alexandria* groups, situated on Phillips and Frederick arms of Cordero channel, but this development was not continued during 1926.

Glasair Mining Corporation. This corporation, which acquired in 1924 the *Doratha Morton* and about thirty mineral claims adjacent, did work in 1925, but suspended work in 1926. The company is expected to resume operations on the *Enid* and *Julie* groups during 1927. These groups contain the *Enid, Stella, Julie, Jennie B., Daisy, Daisy No. 1, Daisy No. 2, Glasair Fraction,* and *Comox.* The company also owns the *Champion* group, west of the *Doratha Morton;* which contains the *Champion, Commonwealth, Clear McCoy, Commonwealth No. 2, Glasiar No. 2,* and *African;* as well as the *Monte Christo* group, containing the *Monte Christo Fraction, Monte Christo No. 1, Monte Christo No. 2, Monte Christo No. 3,* and *Monte Christo No. 4;* and the *Riverside* group, containing the *Amy, Lorie,* and *Isis* mineral claims, the last-named group being on the east side of Phillips arm.

Alexandria. This group of Crown-granted claims, consisting of the *Alexandria, Highland Laddie, Duke, Emperor, Jubilee,* and *Duchess,* extends up the mountain from Picton point at the entrance to Phillips arm to the summit of the Pembroke mountain range, where the north-westerly boundary of the *Duchess* adjoins the easterly boundary of the *Julie,* one of the properties owned by the Glasair Mining Corporation.

The development-work commenced during 1925 was suspended during 1926 after the organization of the Alexandria Mines Company, Limited, had been perfected, but it is stated that the work will be resumed at an early date during 1927.

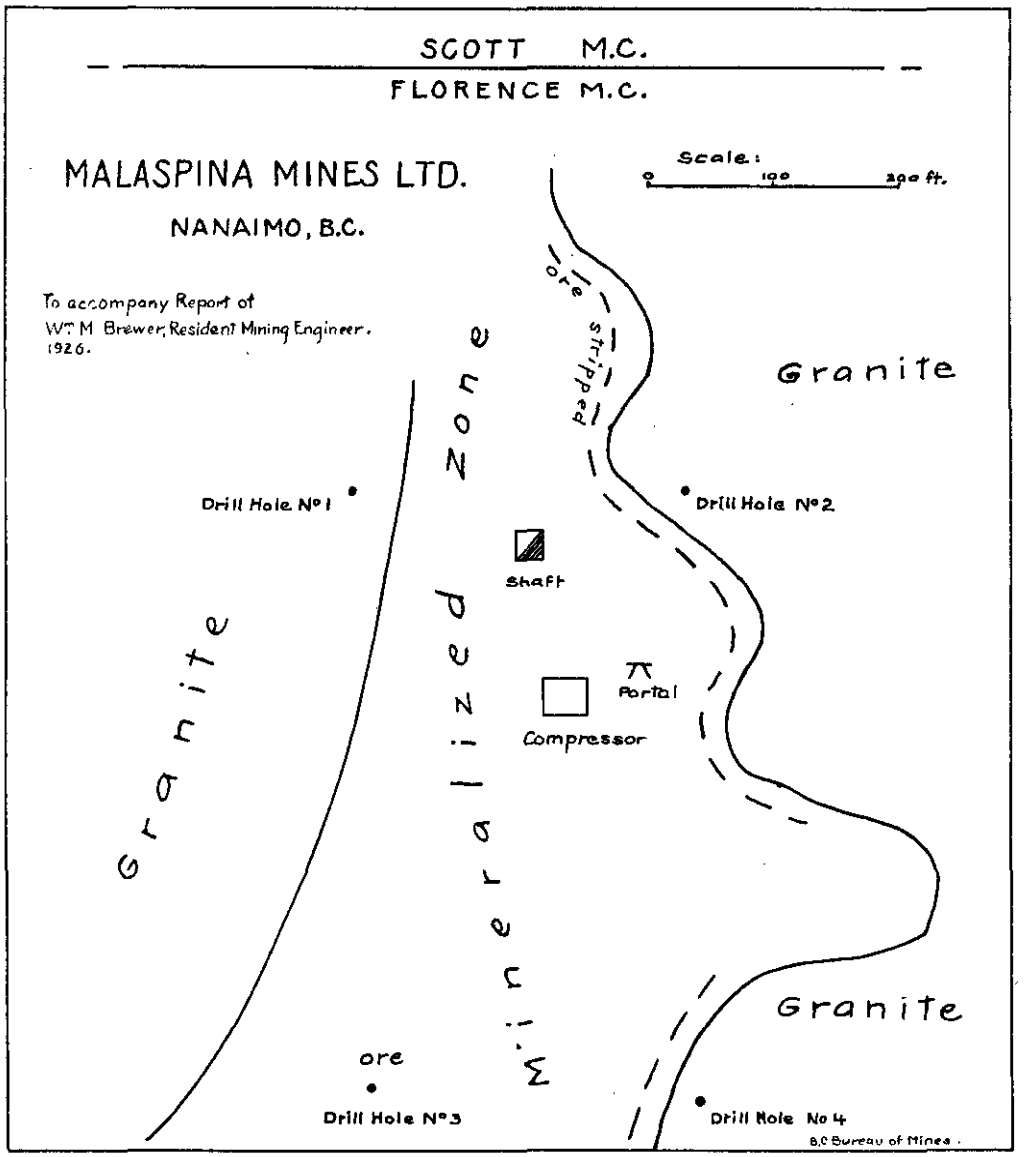
Constitution. The only other prospecting-work that has been done in this section during 1926 has been on the *Constitution* claim on the northern end of Upper Thurlow island. Davie Cox, the owner, has been continuing the prospecting-work described in the Annual Report for 1925, but there has been very little change in the conditions as described in that report.

Malaspina Peninsula Section.

The Malaspina Peninsula section embraces the territory between Jervis inlet and Sarah point at the northerly end of Malaspina peninsula, along the coast-line of Malaspina strait, and including the interior portion of the Mainland tributary to Powell lake. In the Annual Report for 1925 this section was entitled the "Powell River" section, but for the reason that at present

the only active operations being carried on are near the south-westerly shore-line of the Malaspina peninsula, south-easterly from Lund Post-office, the title of the section is changed to the above.

Those portions of the section from the westerly side of Jervis inlet to Powell lake, including the latter, have been visited by a few prospectors who reside near Powell River, and several samples of ore from outcroppings that have been found in the vicinity of Cranberry lake, about 3 or 4 miles easterly from Powell river, have been assayed, but showed such small values that work started was not continued.



Malaspina Mines, Ltd.

During 1926 two examinations were made of this company's property. The first examination was made in February, 1926, which was described in the Annual Report for 1925, with which is incorporated a sketch-map showing the locations of the mineral claims that made up the groups acquired by the company, with the geology as sketched by Victor Dolmage, of the Canada Geological Survey. The second examination was made in August, 1926.

Soon after the last examination was made Colonel J. E. Leckie resigned from the management, and W. G. Dickenson, the vendor of the *Florence* claim to the Malaspina Mines, Limited, was appointed manager. Since then any work that has been carried on has been under contract instead of by day-labour, as was the custom under the old management.

Other changes made have been the relinquishment of the options held on the *Royal Arch* and *John Bull* groups to the original owner, William Uzzell, the former of which adjoins the *Florence* group on the south-east boundary. At the present time the property owned by the company is represented by the *Florence*, *Maple*, *Cypress*, and *Scott* claims, with all the development-work that has so far been done located on the *Florence*.

During 1926 several hundred feet of diamond-drilling was done, as well as open-cut work and some crosscut adits driven in order to determine the extent of the ore-deposits on the *Florence* claim. Previous to the abandonment of the options on the *Royal Arch* and *John Bull* groups, about 200 feet of open-cut work was done and a shaft about 30 feet deep sunk on the *John Bull* claim. Sufficient development has not been done to enable an engineer to measure up the tonnage of actual ore in sight on the *Florence* claim, but all the indications warrant the favourable opinion expressed in the report published in 1925.

John Bull and Royal Arch.

These two groups are owned by William Uzzell (post-office address, Powell River). The *John Bull* was described in the Annual Reports for 1922, 1924, and 1925. The *Royal Arch* was fully described in the Annual Report for 1924. It is therefore unnecessary to make any lengthy reference in this present report, except so far as new work is concerned and to repeat the assay results obtained from samples taken at the time of earlier examinations.

New development has been done on the *John Bull* and consists of an open-cut 150 feet long, from 10 feet deep near the entrance to 20 feet deep at the face, driven in a north-westerly direction to the south-westerly side of an igneous dyke which is a prominent feature and appears to be intrusive into the limestone country-rock, and also through the ore-body as ore occurs on both sides of the dyke, which strikes in a north-westerly direction.

On the north-easterly side of the dyke an old shaft known as the No. 1 was sunk some years ago, but when the *John Bull* was examined at earlier visits it was full of water, and at the time of a recent examination could not be examined for the same reason. Another shaft has also been sunk on the *John Bull* to a depth of 31 feet, but as no work was being done at the time (February 27th, 1927) the water in it prevented an examination.

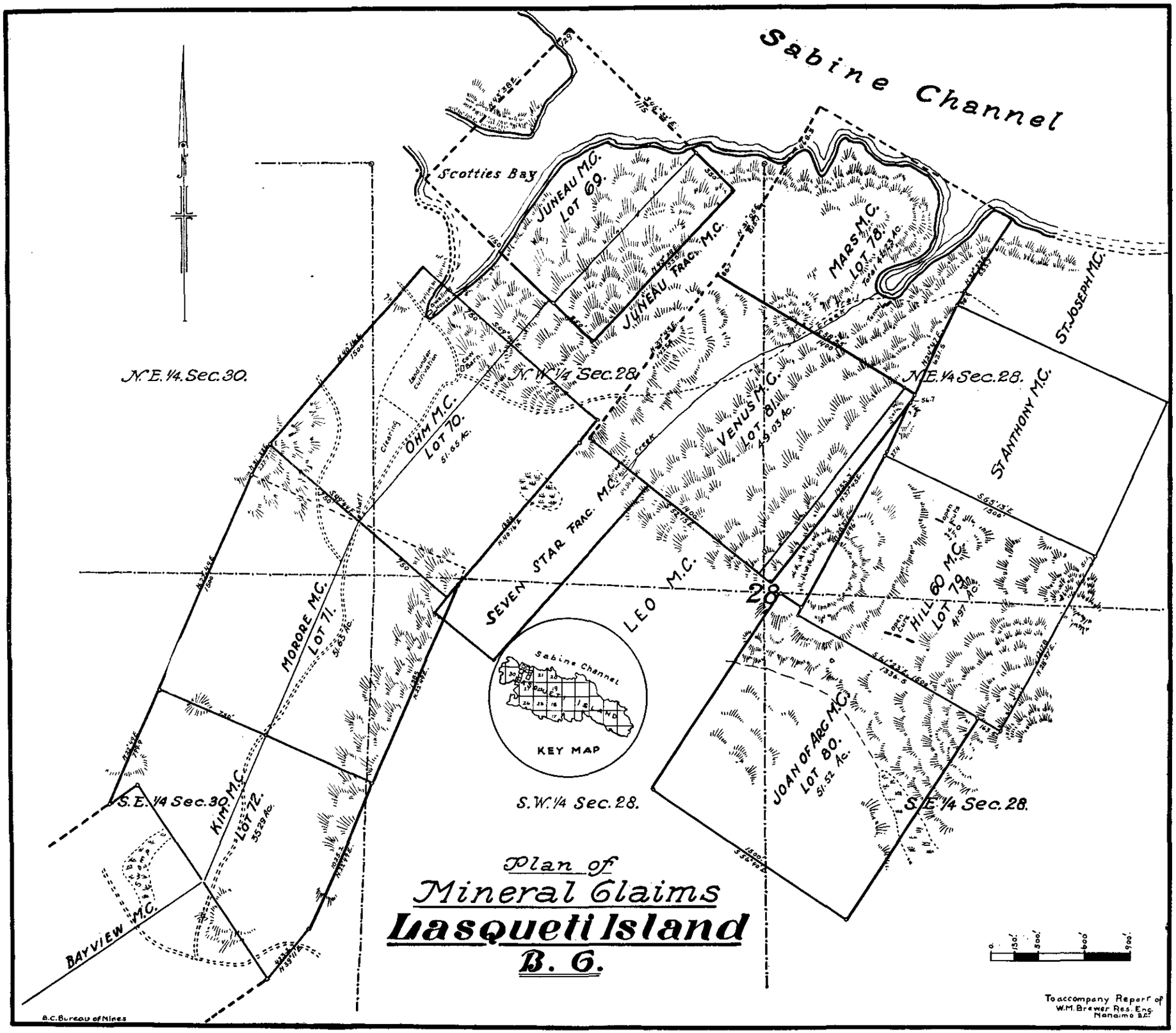
On the *Royal Arch* mineral claim there has not been any new work of any importance done since it was examined and reported on in 1924.

Samples and Assays.

Location.	Gold.	Silver.	Copper.	Lead.	Zinc.
	Oz.	Oz.	Per Cent.	Per Cent.	Per Cent.
1. John Bull, 1922	Trace	4.4	0.8	.. .	10.0
2. John Bull, 1922	Trace	Trace	.....	.....	17.5
3. John Bull, 1922	0.02	0.2	0.2	.....	31.0
4. John Bull, 1922	Trace	1.2	.....	2.0	1.6
5. John Bull, 1924	Trace	Trace	.....	.....	11.0
6. John Bull, 1924	0.7	0.5	Trace	.....	Trace
7. John Bull, 1926	Trace	0.2	.....	.....	30.0
8. John Bull, 1926	0.04	0.4	.....	.....	40.0
9. John Bull, 1926	.....	.....	.....	.....	52.0
10. Royal Arch, 1924	.....	.....	0.1	.....	17.5
11. Royal Arch, 1924	Trace	2.2	6.9	.....	5.5
12. Royal Arch, 1924	Trace	2.0	6.9	.....	6.0

Islands Section.

The Islands section of the Nanaimo Division embraces all of the islands between the Mainland and the east coast of Vancouver island, but there are only a few of these on which there occur any deposits of mineral, and these are Thurlow, Cracroft, Quadra, Redonda, Texada, Lasqueti, and Jervis islands.


Sabine Channel
Scotties Bay
JUNEAU M.C. LOT 69.
JUNEAU FRAC. M.C.
MARS M.C. LOT 78. 51.43 Ac.
ST. JOSEPH M.C.
N.E. 1/4 Sec. 30.
N.W. 1/4 Sec. 28.
N.E. 1/4 Sec. 28.
OHM M.C. LOT 70. 51.65 Ac.
VENUS M.C. LOT 81. 49.03 Ac.
ST. ANTHONY M.C.
SEVEN STAR FRAC. M.C.
LEO M.C.
28
HILL 60 M.C. LOT 79. 41.97 Ac.
MOORE M.C. LOT 71. 51.85 Ac.
KIM M.C. LOT 72. 35.29 Ac.
JOAN OF ARC M.C. LOT 80. 51.52 Ac.
BAYVIEW M.C.
S.E. 1/4 Sec. 30.
S.W. 1/4 Sec. 28.
S.E. 1/4 Sec. 28.
KEY MAP
Plan of
Mineral Claims
Lasqueti Island
B. C.
0 150' 300' 600' 900'
To accompany Report of
W.M. Brewer Res. Eng.
Nanaimo B.C.
B.C. Bureau of Mines

Thurlow Island.—Although Thurlow island is generally referred to as only one, there are really two islands separated by Mayne passage and should be referred to as East and West Thurlow islands. On the East island, Shoal Bay was the distributing centre years ago for the mining and logging camps operating on the Mainland as well as on several of the other islands near Thurlow. At that time the *Doratha Morton, Alexandria, Monte Christo,* and *Douglas Pine* mines were being operated.

During recent years, although the post-office for a large district is still maintained at Shoal Bay, the old name, or Thurlow, its present name, there has not been any mining activity since the closing-down of the *Douglas Pine* mine, located on the island about twenty years ago, except a little flutter about 1919, when the Ladysmith Smelting Corporation was doing some development-work on the *Dawn* claim, which was later suspended and has not since been resumed.

Cracroft Island.—This island is situated near the entrance of Knight inlet, with its southerly coast-line bordering on Johnstone strait. It is one of the largest of the several islands. On it there is a splendidly sheltered harbour with good anchorage named Port Harvey, at which there is a good store kept by an old-timer named Bennett.

Venture. This claim is located on Boat harbour, Forward passage, on the southerly coast of Cracroft island, about 7 or 8 miles westerly from Port Harvey. It was staked several years ago and an adit was driven by the Cracroft Copper Mining Company about ten years ago after that corporation had acquired the property from the Fife Bros., of Port Neville.

Owing to the caved condition of the tunnel it was not examined, but on the dump there was a considerable tonnage of country-rock as well as a small tonnage of ore that had evidently been sorted for shipment. Two samples were taken from the sorted ore; one of which assayed: Gold, trace; silver, trace; copper, trace; and the other: Gold, trace; silver, trace; copper, 0.5 per cent. These low values are accounted for by the fact that, judging from all the material on the dump, no quantity of really solid ore was found to occur in the tunnel, which had evidently been driven in a sheared country-rock resembling quartz porphyry, in which the shearing-planes were filled with thin streaks or stringers of chalcocite, with which was associated considerable epidote.

The *Venture* claim was restaked by H. E. Rines on May 31st, 1926, but when examined on August 2nd last no new work was found.

Quadra Island.—Quadra island is the southernmost of the Valdes archipelago, which is made up of Sonora on the north, Maurella on the east, and Quadra, the largest and most southerly.

About twenty years ago there was considerable excitement relative to the mineral-deposits on this island. A comparatively large tonnage of ore was obtained from the *Lucky Jim* claim near Granite bay on the north-westerly coast; also from the *Copper Mountain* group at the head of Gowland harbour on the south-westerly coast, and from the *Copper Cliff* on the westerly coast, about 4 miles below Seymour narrows. Shipments were made intermittently from one or the other of these groups until about 1920. Since that time only assessment-work has been done.

During the latter end of July, 1926, and beginning of August several of the mineral claims on the island where work had been recently done were examined.

Lucky Jim. This property was described in the Annual Reports for 1908 and 1910. It is located about 3 miles south-easterly from Granite bay and has not been actively operated for about ten years, but previous to that time had a record as a shipper of a considerable tonnage of ore which contained gold tellurides, and is said to have yielded about $75 to the ton at the Tyee Company's smelter at Ladysmith.

This group comprises the *Lucky Jim, Rising Sun, Saxon,* and *Standard* claims. From 1908 to 1910 ore was shipped to the Tyee smelter. The mine was under bond to George D. Munford, of New York. It was closed down about 1911 and has not been operated since. In 1925 a forest fire swept over the island and destroyed all of the mine camp buildings, the gallows-frame over the shaft, and ruined the machinery, consisting of an air-compressor, pump, blacksmith-tools, etc. The property has been recently acquired by R. Crowe-Swords, of Vancouver, and associates, who propose to reopen it during the early spring of 1927 and expect to again place it in the ranks of shippers.

Plato. This claim is owned by J. M. Law, of Hyacinth Bay (post-office address, Heriot Bay). It adjoins the *Lucky Jim* group and was prospected considerably before the war, when it was first staked, but since then the work has

been confined only to the annual assessment-work. The showing consists of a well-defined quartz vein varying in width from 2 to 18 inches, heavily mineralized, chiefly with iron pyrite. The strike of the vein is N. 20° W. (mag.) and the dip 80°. The vein is a fissure in andesite country-rock and can be traced for about 350 feet along the strike by several trenches and open-cuts. It is possible that the continuity is maintained definitely for that distance, but this has not been actually proven.

The development-work consists of two shafts in addition to considerable open-cutting, trenching, and stripping. The depths of the shafts are undetermined, because in the No. 1 water was up to about 10 feet of the surface, and the No. 2 shaft, located about 60 feet north-westerly from the No. 1, was full of water, so that neither of them could be thoroughly examined. Samples were taken from the No. 1 shaft by means of a platform that had been constructed at about 8 feet below the surface. Four samples were taken during the examination, as follows:—

No. 1, across 12 inches from the side of the No. 1 shaft 8 feet below the surface, assayed: Gold, 1.50 oz.; silver, 0.30 oz. to the ton; copper, *nil;* zinc, 1 per cent.

No. 2 sample, taken up the vein exposed in the shaft from near the platform to the surface across varying widths, from 2 to 18 inches, assayed: Gold, 0.54 oz.; silver, 0.1 oz. to the ton; copper, *nil;* zinc, trace.

No. 3 sample, taken across 12 inches at the surface at the collar of the No. 1 shaft, assayed: Gold, 27 oz.; silver, 3 oz. to the ton; copper, *nil;* zinc, *nil.*

No. 4 sample, taken across an outcrop 7 feet wide about 350 feet north-westerly from the No. 1 shaft, assayed: Gold, trace; silver, trace; copper, *nil;* zinc, *nil.*

Wyho. This mineral claim is about 1 mile easterly from the head of Deep Water bay, on the westerly coast of Quadra island, and about 6½ miles nearly due south from Granite bay. It was formerly known as the *Wanderer* claim, owned by Albert Ross and Edward Hamilton, of Granite Bay, and was fully described in the Annual Reports for 1920, 1921, and 1922. During 1925 the claim was restaked under the name of *Whyo* and acquired by Albert Ross, one of the original owners. It was examined on July 26th last, but as there was very little change in the conditions since the former examinations and reports it is not necessary to make further reference in this present report.

Gowlland Harbour.

During 1926 there has been no activity on any of the mineral claims in the vicinity of Gowlland harbour, at the southerly end of Quadra island, nor on the *Copper Cliff* group on the westerly coast.

As the mineral claims on this part of Quadra island were fully described in the Annual Reports for 1916, 1918, and 1919, since which time they have all been idle, it is not deemed necessary to repeat the descriptions in this report.

Near Bold point, on the easterly side of the island, the *Santa Anna* group is located, which was fully described in the Annual Reports for 1916 and 1919.

Redonda Island.

This island is bounded on the north by Pryce channel, on the west by Lewis channel, on the east by Waddington channel, and on the south by Desolation sound, and is situated in an easterly direction from Quadra island.

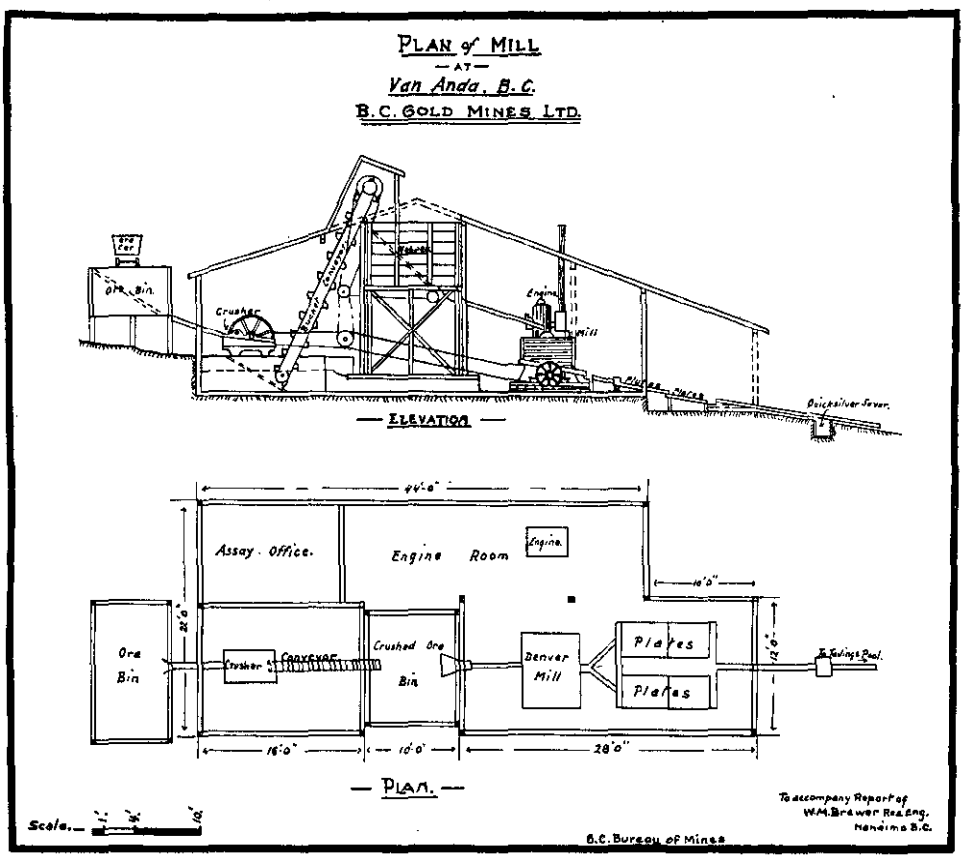
The only mining activity on this island during 1926 has been quarrying limestone from a large quarry on the shore of Pryce channel, a short distance easterly from the magnetite-deposits owned by the Redonda Iron-Copper Company, Limited, of Vancouver, which were fully described in the Annual Report for 1919. The limestone quarried on Redonda island is used in the Whalen pulp and paper mills.

Texada Island.

This island and the mines on it have been fully described in nearly every Annual Report since 1916, when a very full description of the iron-ore deposits on the west side of the island was published. These deposits were recently examined by G. A. Young and W. L. Uglow, of the Geological Survey of Canada, in 1922, 1923, and 1924, and were fully reported on in a memoir entitled "Economic Geology Series No. 3," "Iron Ores of Canada, Volume 1, British Columbia and Yukon," by G. A. Young and W. L. Uglow.

Lode-mining on Texada island during 1926 has been represented by the operations on two properties—one known as the *Gem*, owned and operated by the British Columbia Gold Mines, Limited, of Vancouver; and the other, the *Marjorie* group, owned and operated by the Chickamin Gold Mines, Limited, of Victoria.

Gem. This property, owned by the British Columbia Gold Mines, Limited, is described in the Annual Reports for 1924 and 1925. Between February and June, 1926, most of the work consisted of constructing a building for the mill-house, including an assay office and living-rooms for the superintendent, arranging equipment for handling the ore from the shaft to the crusher-floor of the mill, continuing the drift on the 100-foot level, and sinking from the 100-foot level to the 150-foot level of the new shaft. The underground workings could not be examined in June owing to water in the shaft.



A visit was again made in August, with the expectation of finding the mine and mill in active operation, but work in the mine was closed down until the installation of a new crusher for the mill was completed.

The visit on December 4th, 1926, also proved to be a disappointment, because owing to recent heavy rains a very considerable and extra quantity of water had flooded the mine, for the reason that the pumping capacity was not sufficient to control it, and the superintendent was absent in Vancouver making arrangements for an extra pump.

The visit in February, 1927, proved equally disappointing, because all operations had ceased and the property was in the hands of a caretaker and the water had risen to about the 50-foot level in the shaft. While an examination of the underground workings was, however, impossible at that time, the writer was able to examine the surface showing of the vein that had been reported as being 14 feet wide on the surface and carrying good values.

The tailings-dump would indicate that about 200 tons of ore had been milled all told, and a sample was taken from shallow trenches, which, while it could not be claimed to represent an absolute average, yet was fairly representative of the dump. This sample assayed: Gold, 0.70 oz. to the ton; silver, 0.1 oz. to the ton.

A shaft sunk in the so-called 14-foot vein could not be sampled owing to water. This vein is apparently a cross-vein in a sheared porphyrite country-rock and outcrops on the surface about 125 feet westerly from the main vein. The strike is north (mag.), while the strike of the vein that has been drifted on underground is almost east (mag.). While it is claimed that the surface outcropping yielded good values in gold across 14 feet, yet it is noticeable that near the surface, in the sides of the pit that was sunk to connect with the drift on the 50-foot level from the main shaft, about 12 feet out of the 14 is made up of rotten decomposed oxidized country-rock, while the quartz vein itself is only about 2 feet wide.

When the mine was closed down about December 1st after it had been examined by Dr. Schofield, the writer is informed that the drift on the 50-foot level in the main workings was being extended westerly for the purpose of intersecting the cross-vein. Because of the water in the mine it was not possible to examine this drift, nor could any information be gathered relative to the conditions underground, for the reason that the superintendent and all men who had worked below were absent from the property.

Marjorie. This group, on which no work had been done for several years, was acquired during the late fall by R. F. Castle, of Victoria, who organized the Chickamin Mines, Limited, and started mining about November last. The problem on the *Marjorie* group was to determine the condition on the 100-foot level from the main shaft of eight fissure-veins that outcrop on the surface and have their lines of strike practically parallel to each other. This work was being done when the property was examined on December 4th, 1926, and also on February 21st, 1927.

On the last-named date the No. 8 vein had been intersected by the crosscut adit and the management proposed to drift about 125 feet along the vein, which drift would be under an open-cut on the surface, about the same length, in which the vein was exposed the entire distance and from which several tons of surface ore had been mined and milled a few years back. The examination showed that the condition of the property was such that the future depended entirely upon the results that would be obtained from the proposed drift.

Marble Bay. Since 1921 the Marble Bay mine, owned by the Tacoma Steel Company, has been idle, but during the past summer it has been rumoured that there was a possibility of the old mine being reopened under new management, which rumour, however, has not yet been verified. The Tacoma Steel Company, though, has sold the limestone-quarries which border on Sturt (Marble) bay to the Powell River Company, on which is kept a small gang of miners working steadily. About 6,000 tons of lime-rock was mined during 1926 and a larger output is planned for 1927. This limestone is used at the Powell River plant on the Mainland, about 8 miles by water from the quarry.

Loyal Co. During the past year all technical and legal points with regard to the titles of the various mineral claims and Crown-granted land lots owned by the old Vananda Copper-Gold Company have been settled, and under a sale by the debenture-holders the property was acquired by the Loyal Company, an old company incorporated under the laws of the State of Washington.

There was a rumour during the fall, after the sale had been completed, that the mine would again be actively operated either by the Loyal Company or by purchasers of the property from that company, but up to the time of writing this report negotiations had not been closed.

Pacific Lime Co. This company, which operates limestone-quarries bordering on Blubber bay, at the north-west end of Texada Island, has been working continuously for several years past, and during 1926 produced approximately 200,000 barrels of quicklime in addition to several hundred tons of broken lime-rock which was shipped to the Granby Mining, Smelting, and Power Company, to be used as a flux in its copper-smelter at Anyox.

Some idea of the extent of the quarries being worked by this company can be gleaned from the fact that there are two quarries, known as No. 1 and No. 2. The floor of the No. 1 is approximately 400 by 200 feet in area, with the face around half of the quarry 75 feet deep and around the remainder 40 feet deep. The No. 2 quarry is 80 feet southerly from the No. 1 and the dimensions of this is 150 by 100 feet, with a face 40 feet deep.

Between these two quarries there is an intrusive dyke of igneous rock, through which an adit has been driven connecting the two quarries and is being continued 100 feet beyond the south wall of the No. 2 quarry. From this level a raise will be made in limestone to the surface, about 75 feet above the floor of the adit.

The Pacific Lime Company, at its works at Blubber bay, is perfectly self-contained, because, in addition to quarrying limestone, manufacturing hydrated lime for domestic and export trade, and shipping lime-rock, the company has its own sawmill, manufactures its own barrels, generates the electricity for the entire plant, furnishes employment the year round for approximately 200 men, and has been in continuous operation for about twenty years. The head office of this company is in the Pacific Building, Vancouver.

Stromberg.

This group was described in the Annual Report for 1925. The owners, William Stromberg, of Vananda, and associates, have done further prospecting-work on the group during 1926. This work was on outcroppings occurring on the *Delora* and *Kate* claims of the group, which contains in addition the *Edith*, *Hill*, *Ethel*, *Bullion*, and *Big Bluff* claims. The showings occupy a contact-metamorphic zone between limestone and porphyrite, in which occur intrusive dykes that, on the *Kate* and *Delora* claims, apparently have a decided influence with regard to the mineralization of the contact-zone.

These diorite dykes apparently strike almost parallel to the ore-zone, which is apparently about 500 feet wide, and where it has been prospected on the *Edith*, *Kate*, *Delora*, *Ethel*, and *Bullion* claims apparently maintains its continuity. For the reason that the *Hill* and *Big Bluff* claims have not yet been prospected the continuity throughout the entire group is not proven, but as the *Hill* is situated between the *Delora* and *Ethel* the continuity of the zone may be taken for granted, though it has not been determined, because the contact between the limestone and porphyrite is apparently persistent across that claim. The *Big Bluff* claim is at the extreme northerly end of the group, but not having yet been prospected, no data of importance are obtainable.

Previous to 1926 the prospecting and developing work on the group was confined to the *Edith*, *Ethel*, and *Bullion* claims. Starting from the cabin on the shore-line on the *Edith* mineral claim, there is a good trail across a portion of the *Kate* and on to the *Delora* claim, which was followed at the time of the examination to a point about 1,000 feet from the No. 1 post on the *Delora* in a north-westerly direction, where at a point about 300 feet from the location-line the surface had been stripped for a length of 30 feet along the strike of a well-defined fissure filled with quartz between 15 and 18 inches wide in a sheared zone in porphyrite; the strike of the fissure is N. 30° E., but the strike of the shearing-planes is N. 40° W.

In this quartz vein there was considerable epidote, with the mineralization chiefly bornite scattered sparingly through the quartz. The sheared country-rock was stripped for about 55 feet along the strike in a north-westerly direction by 12 feet wide. About 40 feet distant on the north-easterly side of the stripping mentioned an area 10 feet long by 3 feet wide has been stripped along a ridge from 10 to 15 feet higher than the surrounding country. In an easterly direction 90 feet from the last stripping mentioned there is an open-cut 20 feet long by 8 feet wide. The ridge mentioned was followed in a south-easterly direction from the stripping for about 100 feet, where there is open-cut work about 50 feet long and from 10 to 12 feet wide in the same general character of rock and mineralized with grains of bornite disseminated through it.

Beyond this in a south-easterly direction there are two open-cuts—one 18 feet long, the other 40 feet—to a diorite dyke, apparently an intrusive into the mineralized zone, because mineralization of sparingly disseminated bornite associated with chalcopyrite shows on both sides of the dyke, which is about 20 feet long by 15 feet wide, in which also occurs similar mineralization. The dyke can be traced across a small unnamed creek about 150 feet in a N. 10° E. (mag.) direction from the last-mentioned open-cut, and there are also good indications of mineralization along the sides of the dyke in both the banks of the creek, which are very steep and are quite difficult to prospect owing to underbrush and fallen timber.

From the southerly boundary of the *Delora* claim the trail crosses on to the *Kate* claim in a south-westerly direction to a shaft said to be 50 feet deep, with a drift 45 feet long, but owing to water in the shaft this work could not be examined. From this work the trail continues on to a prominent bluff which overlooks the sea-shore and rises about 100 feet above the water-level at a very steep angle.

On this bluff there are several open-cuts, a shaft 17 feet deep full of water, with an open-cut 120 feet long and 8 feet deep, which leads to the shaft mentioned. This work, however, could not be examined owing to the walls being caved and the shaft being full of water. The conditions on the bluff with regard to the structure of the rock formation relative to strikes and dips are complicated and no really reliable opinion could be formed unless diamond-drilling was done.

The country-rock has the appearance of a very basic igneous rock with porphyritic structure, very much sheared and a large proportion of it mineralized with grains of bornite and chalcopyrite associated with much epidote. There are also many narrow veinlets of calcite, and at the 17-foot shaft mentioned there is a quartz vein between 2 and 3 feet wide exposed along the floor of the open-cut which leads to the shaft.

There are many prospecting-holes which appear to have been sunk at haphazard and are irregular in size, and usually shallow in depth, scattered over the summit of the bluff, which is about 100 feet above sea-level and slopes gently upwards from the summit towards the surrounding country.

In the following table of assays from the *Stromberg* group Nos. 1 to 8 were taken during the examination, samples Nos. 9 to 12 were sent in by William Stromberg, December, 1926, and Nos. 13 to 16 are reprinted from the 1925 Annual Report:—

Location.	Gold.	Silver.	Copper.	Zinc.
	Oz.	Oz.	Per Cent.	Per Cent.
1. Delora	.....	.....	1.0	1.0
2. Delora	.....	.....	1.5	1.0
3. Delora	.....	.....	0.6	1.5
4. Delora	.....	.....	0.5	2.0
5. Delora	.....	.....	2.0	3.0
6. Delora	.....	.....	0.4	1.0
7. Kate	.....	.....	1.0	2.0
8. Kate	.....	.....	1.0	1.0
9. Delora	Trace	2.0	.....	Trace
10. Delora	Trace	0.6	2.5	Trace
11. Delora	Trace	Trace	2.5	Trace
12. Delora	Trace	0.8	7.0	.....
13. Bullion	Trace	Trace	3.3	.....
14. Bullion	Trace	Trace	3.0	.....
15. Bullion	Trace	1.0	7.1	.....
16. Edith	Trace	0.6	8.7	.....

Comox Limestone and Fertilizer Co.

During 1926 there has been quite a movement in acquiring limestone-deposits on Texada island since the Powell River Company purchased the quarry on Sturt (Marble) bay from the Tacoma Steel Company about 1922. First, Messrs. Fry and Planta acquired a deposit at the head of the lagoon about a mile from Sturt bay, on which quarrying would have been in operation during last autumn but for a hitch in securing a right-of-way across a part of the Tacoma Steel Company's property to the water-front. Mr. Fry was the first local manager of the Pacific Lime Company at Blubber bay, from which position he resigned some years ago, and Mr. Planta is one of the pioneer prospectors and all-round mining men who settled on the island about thirty years ago.

The latest movement has been made by the Comox Limestone and Fertilizer Company, which has acquired a deposit of limestone on the west coast of Texada island near Davies bay and proposes to quarry the stone for shipment to a crushing plant erected at Courtenay, and has found a good market for crushed rock amongst the farmers in the Comox valley, who use it for soil dressing.

Lasqueti Island.

This island is situated between the southerly end of Texada island and the east coast of Vancouver island. The mineral-deposits so far discovered have been confined to the westerly end of the island and occupy a restricted area, every part of which is of easy access from Scotties bay, which affords splendid shelter and anchorage regardless of the weather outside.

The mineralization is almost exclusively chalcocite, with which usually is associated some bornite and chalcopyrite. The gangue is generally quartz, sometimes with garnet and crushed

country-rock. The prevailing country-rock in which the mineralization occurs is quartz diorite. Several mineral claims within the boundaries of the mineralized zone on this island were described in the Annual Reports for 1920 and 1922.

Juneau.

This group consists of *Juneau*, *Juneau Fraction*, *Ohm*, *Morore*, *Kim*, and *Bayview* claims, all Crown-granted. The group is owned by the Kurtzhals Bros., residents on the island. In a general way three mineralized zones can be traced across part of the island. The easterly one is developed on the *St. Joseph* and *St. Anthony* claims; the centre one on the *Mars*, *Venus*, and *Leo* claims; and the third or westerly one extending through from the *Juneau Fraction* to the *Bayview*. This description of the *Juneau* group is a report on the westerly zone, with a description of the several mine-workings, giving the assay values from samples taken from these workings.

This section of the island is an ideal one to travel over, as the summit between Scotties bay and False bay only reaches an altitude of about 300 feet. It is also an ideal section on which to carry on mining operations, because deep-water transportation from Scottles bay or False bay is easily accessible. Good trails and fairly good roads are conveniently situated, so that all of the mine-workings and prospect-holes can be reached easily. The main camp on this part of the island is on the *Mars* mineral claim, one of the *Venus* group, at the head of the lagoon, close to the portal of the main tunnel that was driven when mining operations were being carried on by the Lasqueti Mining Company, Limited, during 1920 and 1921.

On the *Juneau Fraction* ground there are several shafts, the deepest being about 21 feet, which was full of water. In this shaft a vein is said to be 2½ feet wide, mineralized with chalcocite, bornite, and chalcopyrite in a gangue made up chiefly of quartz. A general sample taken from the dump assayed: Gold, 0.7 oz.; silver, 2 oz. to the ton; copper, 15.5 per cent.; zinc, 3 per cent. Generally speaking, the above sample may be said to be a fair representative of the ore exposed in some of the other holes in the vicinity, and checks closely with a sample taken from one of these holes during an examination in April last, which assayed: Gold, 0.7 oz.; silver, 1.2 oz. to the ton; copper, 19.6 per cent. Another sample taken from a prospect-hole known as No. 3 during the April examination assayed: Gold, trace; silver, trace; copper, 4.5 per cent.

Near the line dividing the *Ohm* from the *Morore* claim a shaft has been sunk on a quartz vein; the depth of the shaft is undetermined and as it was full of water could not be examined, but along the apparent strike of the quartz vein about 30 feet from the shaft an open-cut has been made about 30 feet long, 5 feet deep at the face, in which is exposed apparently an extension of the quartz vein on which the shaft was sunk. A sample taken across 12 inches in the face of the open-cut assayed: Gold, *nil;* silver, *nil;* copper, 1 per cent.; zinc, 2 per cent.

The development on the *Morore* claim is located about 400 feet easterly from the trail in a ridge made up of quartz diorite, and consists of a shaft 10 feet deep, full of water, but with an oxidized vein-filler showing in the wall about 2 feet wide, with a solid quartz vein about 6 inches wide separated from the oxidized material by about 3 feet of country-rock. No sample was taken from this work owing to the water in the shaft and no windlass or bucket to unwater it.

Other work on this claim is an adit driven in the quartz diorite about 100 feet long. This adit was driven S. 10° E. for about 50 feet, but from there to the face it is very crooked, and very little ore was exposed beyond a point about 40 feet from the portal, where a winze was sunk 8 feet deep on the left side of the adit in a lens of ore. Water in the winze prevented any examination; consequently no samples were taken from this.

About 200 feet inside of the *Kim* boundary there is a shaft said to be 24 feet deep which was close-timbered and full of water; consequently no examination was made, but a sample was taken from a small dump of ore near the collar of the shaft, which assayed: Gold, *nil;* silver, *nil;* copper, 2 per cent.; zinc, 2 per cent. This shaft is known as the No. 1 *Kim* shaft.

Another shaft, known as the No. 2, is said to be 26 feet deep and appears to have been sunk on a lens of ore lying *en eschelon* to that on which the No. 1 shaft was sunk and about 70 feet to the south-east. A grab sample from the dump of this shaft, in which a vein about 18 inches wide is exposed close to the collar of the shaft and representing a general sample, assayed: Gold, trace; silver, 0.4 oz. to the ton; copper, 7.8 per cent.; zinc, 1 per cent.

About 60 feet southerly from this shaft there is an open-cut 20 feet long, 8 feet deep at the face, in which a vein 6 inches wide made up chiefly of solid sulphides is exposed. No sample was taken from this showing.

From this work on the *Kim* the trail was travelled on to the *Bayview* mineral claim to the summit of a ridge of quartz diorite that extends from near the head of Scotties bay across the island to False bay. On this claim there is a shaft 10 feet deep on the westerly side of the wagon-road, in which is exposed a vein which strikes north (mag.) in quartz-diorite country-rock and shows mineralization of some chalcopyrite associated with some molybdenite.

The vein-filler at this occurrence is about 5 feet wide, with considerably oxidized rock in the centre, apparently resulting from the oxidation of iron pyrites. The gangue is chiefly quartz which fills gashes in the country-rock and is frozen to it.

Venus. Messrs. Batten and associates, of Victoria, reopened the underground mine-workings on the *Mars* and *Venus* claims and extended the prospecting with a view of renewing active operations from the point where the work was suspended in 1921. The old workings were not examined, nor was any sampling done except the following: Returning from the *Bayview* claim back to the camp across a part of the *Mars*, a sample was taken from the dump of a shaft about 15 feet deep, dimensions 12 by 8 feet, near where the sample was taken from the *Juneau Fraction*. This sample assayed: Gold, 0.4 oz.; silver, 0.4 oz. to the ton; copper, 4.5 per cent.; zinc, 3 per cent.

Jervis Island.

Jervis is a small island lying about 2 miles easterly from Lasqueti island in Sabine channel. The area of Jervis island is approximately 200 acres, Crown-granted as to the surface, and practically the entire island is covered by four Crown-granted mineral claims, known as the *Lady Helen*, *Sir Chet*, *Sir Ned*, and *Lady Evelyn*. The mineral claims were located on September 20th, 1924, by Paul Lambert, the then owner of the island, but when the surface Crown grant was acquired by R. H. Schwartzkopf, of Los Angeles, for a summer home in 1926, sufficient development-work has been done on the claims to Crown-grant them.

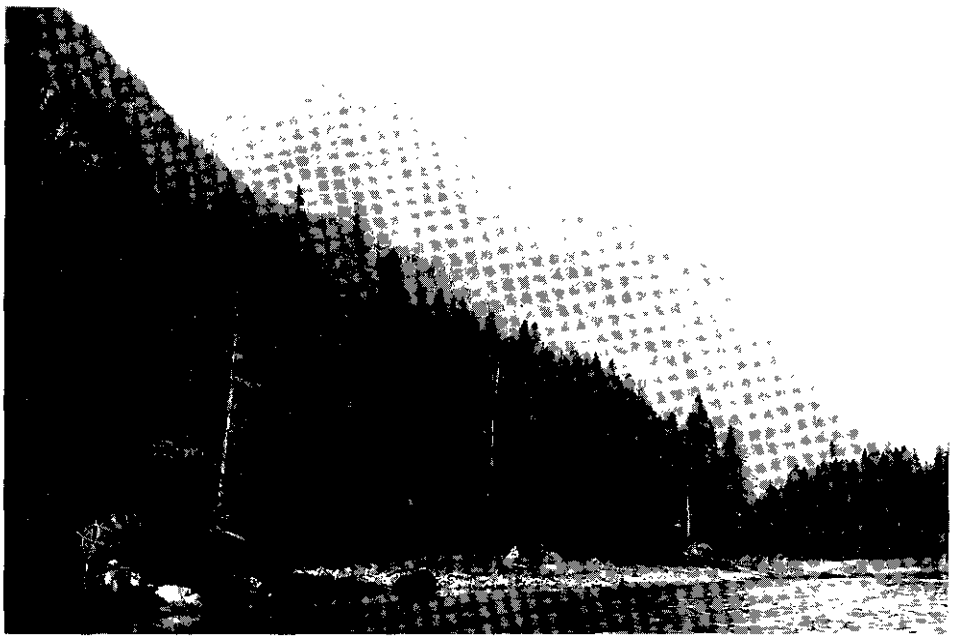
The prevailing country-rock on the island is porphyrite, in which occur several shear-zones, with the shearing sometimes almost sufficient to produce schistosity. In these shear-zones there frequently occur veinlets, sometimes filled with quartz mineralized with solid chalcocite for widths varying from 1 to 5 or 6 inches. These veinlets are also often found to be filled with calcite, garnet, epidote, also mineralized with some chalcocite and copper-carbonate ore.

In places the country-rock is very much slickensided and sheared zones varying in width occur. At one point on the *Sir Chet* claim in a declivity between prominent bluffs which overlook the sea there occurs one of these sheared zones, in which a narrow vein having its strike N. 75° E. and dip vertical had been exposed at the time of the examination at the latter end of April, 1926. This was being developed by a well-timbered shaft sunk from the outcrop of the vein to a vertical depth of about 30 feet.

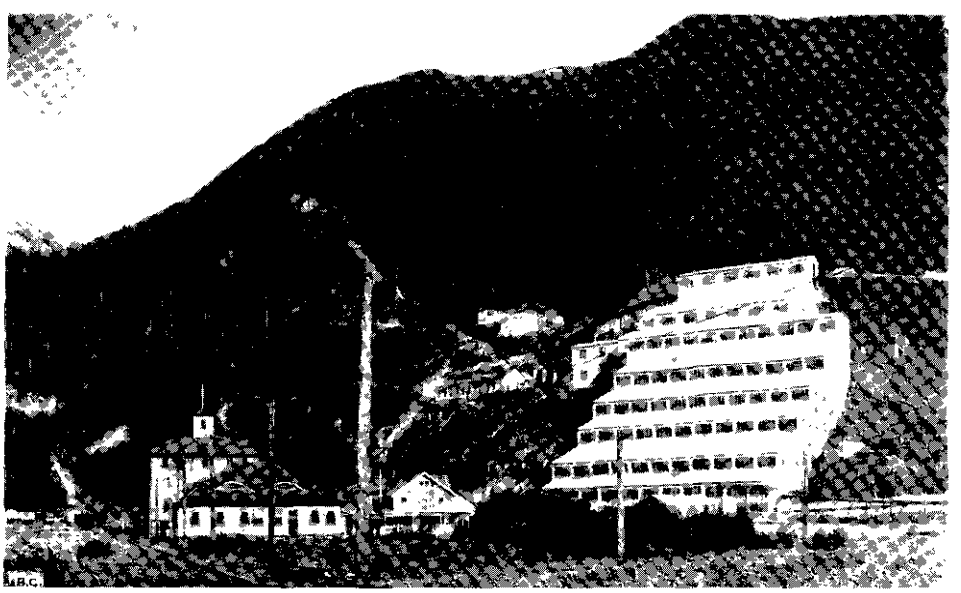
The vein maintains continuity to the bottom of the shaft, varying in width from 2 to 3 inches at the surface to a foot at a depth of about 15 feet. In the vein-filler in places there occurs a concentration of solid chalcocite ore about 3 inches at the widest, samples from which have been taken that assayed as high as 40 per cent. copper, but a sample taken by the writer across 12 inches of vein-filler assayed: Gold, trace; silver, 0.2 oz. to the ton; copper, 4.7 per cent. Another sample taken from the dump at the collar of the shaft from sorted ore assayed: Gold, trace; silver, 1 oz. to the ton; copper, 11.2 per cent.

The work was done on this property under the superintendence of David M. Anderson, mining engineer from Los Angeles, who proposed continuing the development during the summer until Crown grants were issued, then returning to Los Angeles to consult with the owner of the island as to future development.

The mining-work on the *Sir Chet* claim is situated about 1,200 feet from the westerly shore-line of the island at an elevation of about 300 feet. The sheared zone can be traced from near the shore-line up a declivity or shallow gulch to the development-work and for a distance of about 300 feet farther with a N. 75° E. strike. At that point the shearing forms a junction with another zone, with the shearing-planes striking N. 40° E., and the theory was formed that at or near this junction the vein might increase in width. If the development proved satisfactory the transportation facilities are good, as ore could be transported by means of a short aerial tramway to bunkers at deep water on the shore near the north-westerly end of the island in a fairly well-sheltered bay.



Wa-shi-la Bay, B.C.

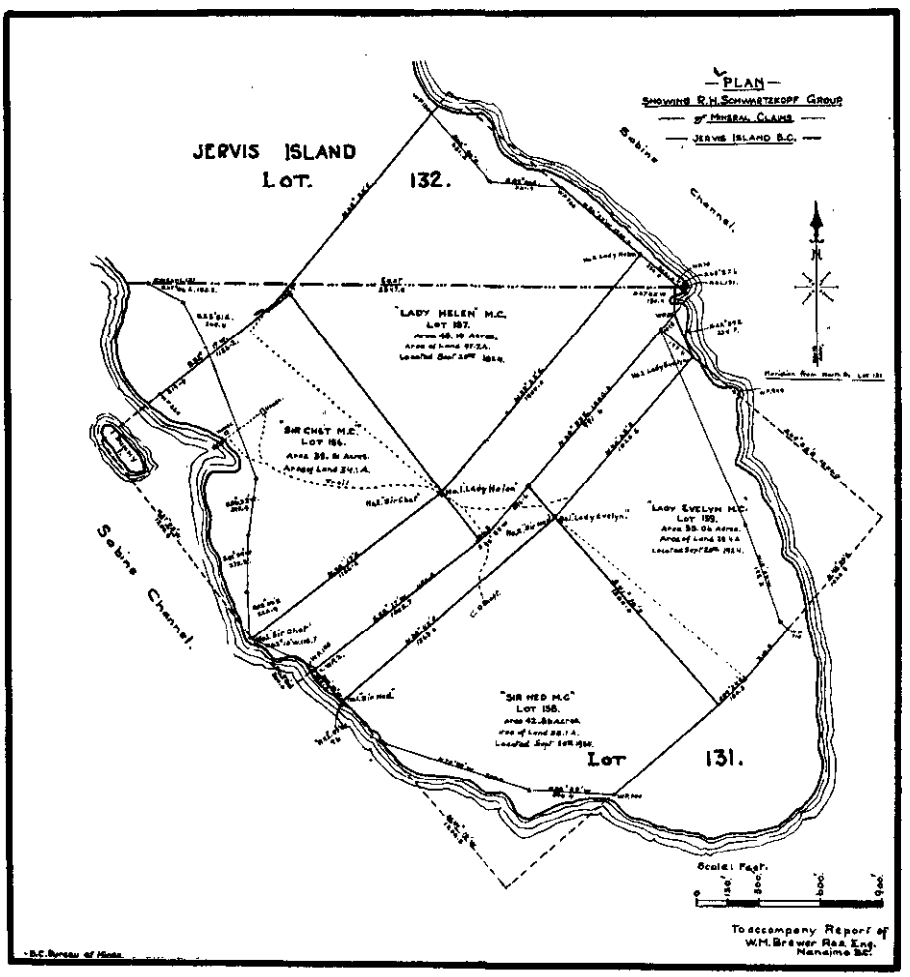


Britannia M. & S. Co.—Copper Concentrator.

VANCOUVER ISLAND SECTION.

That portion of Nanaimo Division described in this report as the Vancouver Island section comprises nearly half of the entire area occupied by that island. This section includes within its boundaries all of the coal-mining operations on Vancouver island, which is still by far the most important industry in the Nanaimo Mining Division. The production has for several years shown a considerable decrease owing to the competition of fuel-oil on the railways and ships, which formerly used coal exclusively. Under the heading "Inspection of Coal-mines" full details are given about coal-mines, so no further mention is made here.

The greater part of the eastern coast-line of Vancouver island is covered by sandstone, conglomerate, and other sedimentary rocks belonging to the coal-measures. This formation



extends into the interior of the island to the contact between the coal-measures and the Vancouver series of volcanics, which occurs near the easterly base of the Beaufort range, so that prospectors in search of metallic minerals are confined to the vicinity of the headwaters of the various streams that flow towards the east and south-east coasts, which is often several miles back from the coast.

A comparatively small portion of the Nanaimo Division lying north from Cowichan lake near the south-westerly boundary of the Division, another small area occupying part of the north-westerly end of the Division, also an area drained by Adams river, which flows into

Johnstone strait, are so far the only areas in which any discoveries of metallic-mineral deposits of promise have been discovered.

In the first-mentioned portion there are several mineral claims, most of which were located before the war, some of which show promising possibilities in ore-deposits carrying gold and silver values in addition to their copper content. The ore-deposits at the north-westerly end of the island carry chiefly silver and zinc values with some lead.

Caledonia.

This group contains the *Caledonia*, *Cascade*, and *Blue Bell* claims, for which application for Crown grants have been made. (*See* Annual Report for 1924.) The claims are situated on Caledonia creek, which flows in a southerly direction into Quatse lake, which drains into the Quatse river that empties into Hardy bay, about 8 miles from the group.

Until within the last year the owners of the group were T. D. Harris and Robert A. Grierson, of Hardy Bay, and Murray C. Potts, of Alert Bay; but during 1926 the owners organized the Caledonia Mines Company, Limited, with the head office at Alert Bay. In June, 1926, active development was started. The old prospecting-work was extended by making several more open-cuts along the line of the contact between granite and limestone, in which the ore-deposits occur for a distance of about 300 feet westerly from Caledonia creek.

Since the report made in 1924 several new open-cuts have been made across the ore-body, the results from which demonstrate that the ore-body is practically continuous for a length of more than 300 feet; in that distance there are gaps between the open-cuts where the ore-body is not exposed.

The following claims have been added to the group and some prospecting-work done on them. These are the *Scotia*, which adjoins the *Caledonia* on the north-east and extends beyond the west line of the *Cascade;* the *Maple*, which adjoins the *Cascade* on the north-east and extends beyond the west line of the *Blue Bell;* and the *Thistle*, which adjoins the *Scotia* on the north-east.

The opinion expressed in the 1923 Annual Report with regard to the occurrence of the ore-deposits on this group and the geology surrounding the deposition of the ore has been confirmed by the recent development-work.

The mineralization, which is exposed in open-cuts on Caledonia creek, also in those designated as 3A, old Nos. 1 and 1B, consists of galena, zinc-blende, iron pyrites, some chalcopyrite, magnetite, and some pyrrhotite in a gangue of limestone and altered limestone, associated with which is much garnet and epidote. Although it was stated in the 1923 Annual Report that the ore-deposit was lenticular in structure, it would appear that the recent work done indicates that continuity may be maintained for a total length of at least 300 feet along the strike, starting at the outcroppings in the bed of Caledonia creek in a N. 60° W. (mag.) direction, but such has not been yet absolutely proven.

Ore has been exposed in all of the open-cuts except Nos. 1A and 2A, which have not been made deep enough to reach solid rock under the overburden of soil and gravel, which is so deep that although the face of each cut is fully 10 feet high no bed-rock is exposed.

The development-work that has been done since the previous examination consists of extending the crosscut adit projected to intersect the ore-body under the outcroppings in the bed of Caledonia creek; also four new deep open-cuts, designated as Nos. 1A, 2A, 3A, and No. 1B, and deepening the old No. 1 cut about 3 feet through its entire length of about 75 feet, in which near the face an ore-body is exposed more than 6 feet wide.

The new open-cuts are each one made across the contact between limestone and granodiorite in which the vein carrying ore occurs. They have been made about 15 feet deep at the faces and are of the following lengths: No. 1A, 100 feet; No. 2A, 75 feet; No. 3A, 75 feet; No. 1B, 40 feet. The old No. 1 cut, which was sampled across 6 feet of practically solid ore, is about 85 feet higher elevation than the crosscut adit under Caledonia creek. This open-cut is approximately 300 feet from the creek outcrop in a N. 60° W. (mag.) direction. It is about 30 feet in a south-easterly direction from open-cut No. 1B, which is the most north-westerly working of any extent on the group, except some surface prospecting done on the *Bluebell* in an endeavour to trace the ore-bearing vein through that claim, which has not yet been done. It is to determine depth maintained by the ore that every effort should be made by the management in future development-work.

The following assays show the values contained in the ore:—

Claim.	Width sampled.	Gold.	Silver.	Copper.	Lead.	Zinc.
	Feet.	Oz.	Oz.	Per Cent.	Per Cent.	Per Cent.
Caledonia	3	Trace	0.6	....	....	.....
Caledonia	9	Trace	19.0	3.2	....	.....
Cascade, grab sample	....	0.04	0.2	0.5	....	.....
Cascade	30	Trace	16.0	3.2	....	10.0
Cascade, from No. 3A cut	10	Trace	12.0	2.5	1.0	5.0
Cascade, from No. 1 cut	6	Trace	12.2	2.0	0.8	10.0
Cascade, from No. 1B cut	2.6	Trace	6.5	0.5	Trace	3.0

Silver Leaf. This group contains the *Silver Leaf* and *Mountain Ash*, owned by the Silver Leaf Syndicate, of Duncan. It is located near the headwaters of Jump creek, a tributary of the Nanaimo river, and is reached by a good pack-horse trail from the mouth of Cottonwood creek, a tributary of Cowichan lake. The group was fully described in the Annual Report for 1922, and although considerable development-work has been done since that time, the conditions have not been materially changed since then.

The transportation facilities have not been improved very much since 1922, and this section, in which there are several other mineral claims in good standing, is still badly handicapped. Rails have been laid on the Canadian National Railway along the northerly shore of Cowichan lake, which will be eventually the logical way for shipping the ore.

Other Prospects.—On the Vancouver Island section there are short stretches along the coast-line where the coal-measures have been eroded off and the Vancouver volcanics are exposed, and quite a little prospecting-work has been done in the vicinity of Rock, Elk, and Humpback bays on the shore of Johnstone strait. None of these prospects have been developed to a sufficient extent to warrant the expression of any definite opinion as to their future possibilities.

Lucky Jim. This group, containing the *Lucky Jim*, *Lucky John*, and *Marjorie* claims, is situated on Adams river, which empties into Johnstone strait about 15 miles north-westerly from Sayward settlement near the mouth of Salmon river. It was fully described in the Annual Report for 1918, when it was owned by Alex. and Walter McKay, of Vancouver. The group has not been examined since that time because until recently no work other than annual assessment-work had been done.

Further prospecting and some development work was done during 1926, when the property was submitted to the Consolidated Mining and Smelting Company of Canada. After an examination by the company's engineers an option was taken and a contract has been let for further prospecting by diamond-drilling and development-work to be done during 1927. This action by the Consolidated Company is well worthy of notice, because it marks a new departure by that company in acquiring interests in practically undeveloped prospects.

NEW WESTMINSTER MINING DIVISION.

This Division is situated north of and adjoining the International boundary. On December 31st, 1926, there were approximately 240 un-Crown-granted mineral claims in good standing and a large number of Crown-granted mineral claims in good standing in this Division. There were no mines from which shipments of ore were made during the past year. The development-work was chiefly confined to sufficient to enable owners to record the annual assessment-work.

The sections of the Division which appear to have been the most popular among the prospectors were the mountains in the vicinity of Pitt lake and river; Chilliwack lake and river; and in the Cheam range in the neighbourhood of the *Lucky Four* group, near the head of Wahleach (Jones) lake and creek; also to the south of the Chilliwack river on Pierce mountain; Canyon creek and Slesse creek near the International boundary.

Maple Leaf. Several days were occupied about the middle of October in making an examination of this group, which contains the *Copper Queen*, *Maple Leaf*, *Empress*, and *Wayside*, owned by Carl and Frank J. Wagner, of Lyndon, Washington, who were working on the ground at the time the examination was made. This property is situated on the easterly side of Pitt lake, near the head, and is reached from the town of New Westminster via Coquitlam, with a launch from that point up the Pitt river and lake to the mouth of Scott creek.

The country-rock in this section is chiefly made up of greenstone and granodiorite. On the *Maple Leaf* group there is a fairly well-defined contact between these rocks, with a wide sheared zone in the greenstone, in which between the shearing-planes there occur narrow seams or veins of lenticular structure filled with pyrrhotite, pyrite, and a little chalcopyrite.

Development consists of an adit 67 feet long driven in the face of a precipitous mountain along the strike of the shear-zone in an easterly direction. The face of the mountain is so steep here that backs of about 400 feet vertical height will be gained in a short distance horizontally. In addition to the drift-adit there are several open-cuts and some stripping on the mountain-side above the adit.

In the following table of assays the first three samples were taken by the writer and the last three were taken by Mr. Elenbass, an interested party, who was on the ground at the same time.

Location.	Gold.	Silver.	Copper.	Zinc.
	Oz.	Oz.	Per Cent.	Per Cent.
1. *From a small dump from ore taken out near the* face of the adit	.....	.....	2.0	Trace
2. From the right-hand side of the adit, about 12 feet from the face, a grab sample from a shot placed during the examination	.....	.....	0.8	Trace
3. From the face of the adit on the north side	.....	.....	0.2	Trace
4. From the right side in the adit 12 feet from the face	.....	.....	2.0	Trace
5. From the left side of the adit at the face	Trace	1.5	4.2	Trace
6. From an open-cut in the surface 50 feet above the adit	.....	.....	1.0	Trace

The examination was made during the time that Provincial Police were searching for Doc. Brown, who had been lost while prospecting amongst the glaciers northerly from the head of Pitt Lake.

Pitt Mining Co., Ltd.

This company is the recorded owner of the *Viking* group, originally known as the *Golden Ears* group, which was examined and reported on in the Annual Report for 1923. The work that has been done since that examination has not materially changed the conditions and operations were suspended almost entirely during 1926. During the early spring of 1927 it is reported that a new company has been formed, capitalized with $250,000, to take over and operate the property, and it is proposed by the new company to start on the construction of a concentrating-mill with a capacity of 50 tons a day in the near future.

Silver Chief.

This group, which was formerly known as the *Dolly Varden* group, containing eight claims, is situated near the mouth of Dolly Varden creek, which empties into Chilliwack lake at the south end. It is owned by the Silver Chief Mining Company and was examined and described fully in the Annual Report for 1923. Since that report was made the company has been engaged for a considerable proportion of the time in assisting to build a wagon-road to connect the north end of Chilliwack lake with Sardis, near the town of Chilliwack. Assistance was also given by the Mines Department to build this road.

The company took in machinery consisting of a compressor plant, water-wheel, and dynamo in the late fall of 1925, which, excepting the compressor plant, was lost by fire during the spring of 1926. The dynamo and water-wheel (turbine), 60 horse-power, were replaced during the fall of 1926, and development-work on the mine continued by driving a crosscut adit to intersect the vein described in the report for 1923, which it is expected will be accomplished in a distance of about 50 or 60 feet from the entrance.

During the spring of 1926 a sample shipment of 1,680 lb. of ore was made to the smelter, net returns being $92; the values being almost entirely in silver.

Lucky Four.

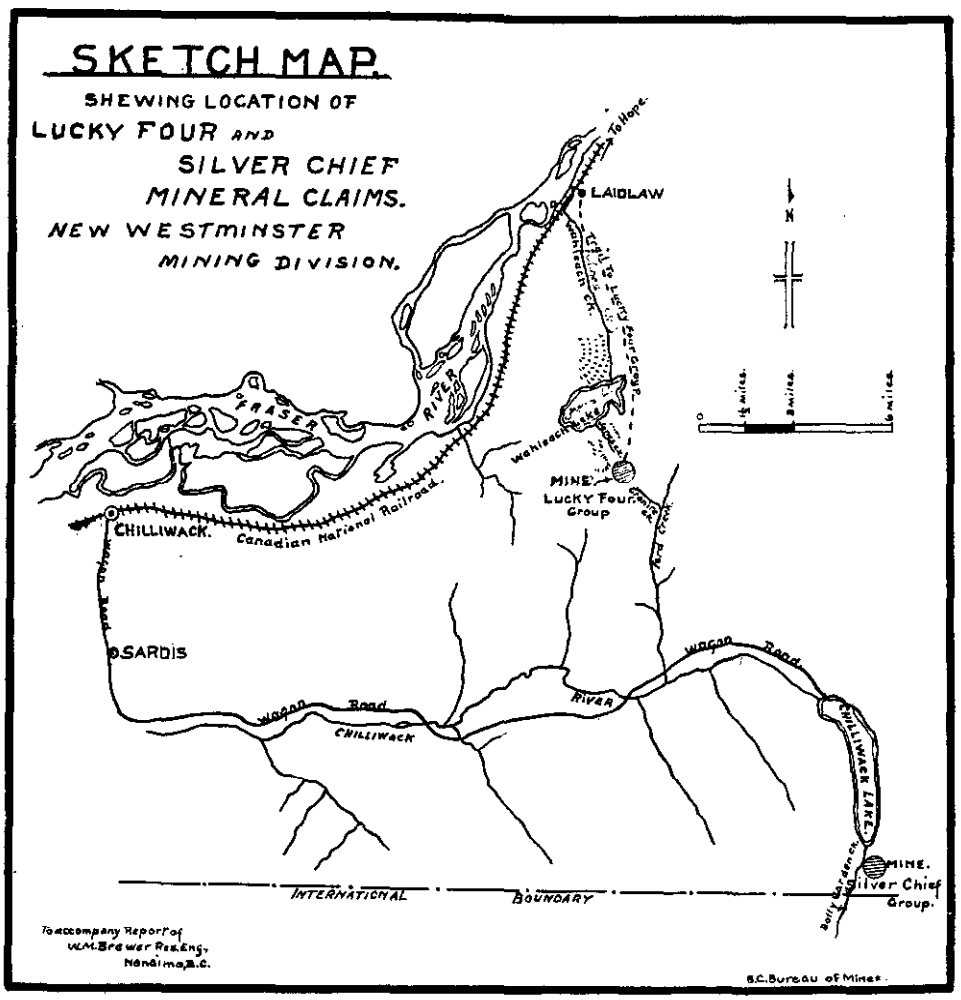
This group was fully described in the Annual Report for 1919, and although it has been rumoured several times that Sperry & White, of Seattle, the recorded owners, had negotiated a sale to one or other of the big companies, there is no evidence up to date, so far as operations at the mine are concerned, of such negotia-

tions having been completed. It is not deemed necessary in this report to repeat the previous description.

LILLOOET VALLEY SECTION.

This section of the New Westminster Division is referred to under a separate heading because of the fact that it was examined by C. E. Cairnes, of the Geological Survey of Canada, during the field season of 1925, and the geology and mineralogy are described in detail in papers written by Dr. Cairnes and published in the *Canadian Mining Journal* for February 18th and 25th.

The Lillooet valley as described by Dr. Cairnes extends from the Canadian Pacific Railway at Agassiz in a north-westerly direction to the extreme headwaters of the upper Lillooet river, about 25 miles north-westerly from the Pacific Great Eastern Railway crossing near the head



of upper Lillooet lake, a distance of approximately 110 miles, but it is only the south-easterly portion from Agassiz to Green Lake, on the Pacific Great Eastern Railway, that is included in the Western Mineral Survey District (No. 6).

The interesting feature with regard to this section is that the easterly boundary nearly coincides with the contact between the granodiorite batholith of the Coast range and the older altered sedimentaries of the Interior plateau, while the entire Mining Division is included within the Coast range, and consequently should be one of the most attractive fields for prospectors in this portion of the Province.

It is near that contact that the first lode-mining was done in the Province, near Hope, on the *Eureka* mineral claim, about 10 miles beyond the eastern boundary of the Mining Division. Silver ore was discovered and mining operations carried on as early as about 1875; in fact, the original claim is recorded as No. 1 in the records of Crown grants issued for mineral claims.

The section has received very little attention since about 1898 or 1899, when the *Providence* mine on Harrison lake, which was then owned by James McLaren, a part owner in the Harrison hot springs at the foot of the lake, was being developed, and the *Money Spinner* mine on the southerly slope of Fire mountain, about 13 miles from the head of Harrison lake on Fire creek, was also being operated, but since work was suspended on both of these properties about 1899 there has been but little attention given to any of them, especially the locations in and around the southerly slope of Fire mountain.

Dr. Cairnes in his articles describes briefly each of the groups situated in this section, and there is some possibility that new interest will be taken by some of the prospectors who have expressed such considerable faith in the section that certain mineral claims have been kept alive, while others have been Crown-granted and the taxes are being paid regularly.

Dr. Cairnes in his description includes the *Empress* and *Anna* groups, which were fully described by this writer in the Annual Reports for 1918 and 1922; also the *Providence* mine, described in the Annual Report for 1900 by H. Carmichael. Cairnes also describes the *Money Spinner* group on Fire mountain and the *May Flower* group near the Indian village Skookumchuck, about 20 miles from the head of Harrison lake. The last mentioned was described in the Annual Report for 1904, and the *King No. 4* group, located on the east bank of 25-Mile creek, near the foot of Little Lillooet (Tenas) lake.

Owing to the occurrence of high-grade free-milling gold-bearing quartz veins which outcropped on some of these various properties, the Lillooet valley, including Fire mountain, was prospected by quite a large number of men in 1898 and 1899, but principally owing to the fact that the free-milling character of the ore was replaced by sulphide ore a short distance below the surface, and the further fact that at that early date the methods of concentration and treatment of refractory gold ores either by cyanide or chlorination processes were not thoroughly understood by the owners of these several mineral claims, there has been practically no activity since the dates mentioned. The accompanying map showing the locations of mineral claims made in the Fire Mountain portion of the section is published in order to call attention to the popularity of the district at that time, and the possibilities that may follow provided the advanced methods of mining and metallurgy are practised in the future.

Non-metallics.

The New Westminster Division is especially favoured by the occurrences of beds of clay and shale which occur on Sumas mountain, east of Clayburn, on the Seattle branch of the Canadian Pacific Railway, and the Chilliwack branch of the British Columbia Electric Railway.

Clayburn Clay and Shale Deposits.—In Memoir No. 24-E, entitled "Preliminary Report on the Clay and Shale Deposits of the Western Provinces," by Heinrich Ries and Joseph Keele, published by the Canada Department of Mines in 1912, these clay and shale deposits are referred to as being one of the most interesting series of clay-deposits found in the western Provinces. This statement is followed by a description in detail of the deposits as they appeared at that time, together with the result of analyses and fire tests, which revealed how superior a quality of clay and shale these deposits contain.

The Clayburn Company, Limited, is one of the few companies in the Province operating beds of fireclay and shale and manufacturing therefrom firebrick, red and buff facing-bricks, and sewer-brick, and the business has grown to such importance that space is here devoted to a brief description of the plant.

The plant of the company is situated about 1 mile easterly from the Clayburn Station, operated jointly by the British Columbia Electric, Great Northern, and Canadian Pacific Railways. The property of the company extends in an easterly direction from the Clayburn plant to Kilgard, a distance by air-line of about 4 miles, but by auto-road about 10 miles.

In extent the clay and shale deposits owned by the company occupy about 1,100 acres, but this acreage is not in one compact body, but made up of areas of various extent, extending in easterly and south-easterly directions from Clayburn plant, which is the most westerly point

of the property of the company. The shale-mines are located at Kilgard on Sumas mountain, while the clay-mines are in the valley near Clayburn.

All the mining, with the exception of one open quarry at Kilgard, is underground work, a total footage of which is about 2,000 feet, the main slope being sunk on a 30° incline and crosscuts that portion of the clay-deposits being mined. The manufacturing plants are divided between that at Clayburn and another at Kilgard.

The Clayburn plant, at which is manufactured fire and sewer bricks, contains eleven kilns varying in dimensions, these being six round and five rectangular-shaped. The diameters of the round kilns vary from 30 to 36 feet; the dimensions of the rectangular kilns are 77 feet long by 28 feet wide by 12 feet high, which is also the height of the round kilns. At Kilgard the plant consists of six round and four rectangular-shaped kilns of about the same dimensions as those at Clayburn.

The machinery at both plants is driven by electric power transmitted from the British Columbia Electric Railway Company's power-station at Clayburn. The machinery consists of several rolls weighing 18 tons each for grinding; three brick-machines at Clayburn and two at Kilgard; also one sewer-pipe machine at Kilgard. The fuel used for burning brick is nut coal from Ladysmith, on Vancouver island. A fairly full description of the clay and shale beds was published in the Annual Report for 1917.

Blue Mountain Co.—The property owned by this company is situated in Section 2, Township 4, Range 4, west of 7th meridian, about 6 miles northerly from Whonnock Station on the Canadian Pacific Railway, at an elevation of about 1,200 feet above sea-level. This property was described in the Annual Report for 1917 and since that time the conditions surrounding it have not materially changed. During the fall of 1926 it was reported that the property had been acquired by a syndicate of capitalists and that development-work as well as the construction of a plant would be commenced at an early date. The lack of transportation is a great handicap to this property, as there is only a trail between the railway and the clay-deposits.

Pitt River Stone-quarry.—On Pitt river, near the lake, Gilley Brothers, Limited, operates a stone-quarry which when running to full capacity can produce about 400 cubic yards a day of crushed rock. This product is used for constructing roads, but a certain amount of what is termed "riprap" rock produced at this quarry is used for river-protection work. The quarry is fully equipped with crushers, elevators, and all the necessary machinery for handling this material.

Coquitlam Gravel-pit.—Another non-metallic mining industry is that which has been carried on by J. A. Dewar & Co. at the gravel-pit at Coquitlam, which it is reported has been recently acquired by the Deeks Sand and Gravel Company, Limited, of Vancouver. This company has also gravel-pits in the Vancouver Mining Division, which will be described in their proper place. The extent of the property purchased from Dewar & Co. is 125 acres, which includes water-frontage on Burrard inlet at Port Moody and a lease of the running right of the railway from the Coquitlam pits to Port Moody.

The new owners propose to equip this pit with all the necessary machinery, rolling-stock, and other equipment necessary to produce a large tonnage of sand and gravel daily.

VANCOUVER MINING DIVISION.

The entire area of the Vancouver Mining Division is occupied by the Coast Range granodiorite batholith, which is crosscut in two places: First, from the head of Howe sound by the Pacific Great Eastern Railway; and, second, by the Jervis river and inlet, the entrance to the latter being on the north side of the Seechelt peninsula. The Coast range is also traversed in a south-easterly direction from the headwaters of the upper Squamish river; consequently splendid opportunities are offered for prospecting in this section of the Division.

The work of the greatest importance from a mining standpoint in this Division is the operation carried on by the Britannia Mining and Smelting Company, Limited, headquarters for which are at Britannia Beach, on the east side of Howe sound, about 5 miles from the head. While it may be considered very disappointing that out of the large number of Crown-granted and un-Crown-granted mineral claims in the Vancouver Division the Britannia is at present the only producer, there was development-work going on during 1926 in other portions of the Division, notably along the Pacific Great Eastern, which may possibly result in other claims being developed into shipping-mines.

Britannia Mining and Smelting Co., Ltd.

The property owned by this company and the operations carried on have been described in several of the Annual Reports of the Minister of Mines, but particularly in that for 1924, when the property had been in active operation for twenty-five years. It has also been described in quite minute detail in an article written by James I. Moore, Jr., superintendent of the company, in the *Engineering and Mining Journal* of December 11th, 1926. In this report only a summary of the operations for the year 1926 is given, which has been furnished the writer through the courtesy of C. P. Browning, general manager, as follows:—

"*Operations for 1926.*

* "*Production.*—33,117,388 lb. copper; 10,472 oz. gold; 163,444 oz. silver.

"*Tonnages.*—Drawn from the mine, 1,187,632 wet tons; milled, 1,192,197 wet tons; milled, 1,156,470 dry tons; broken reserve in stopes, 1,358,415 tons; total reserves, including broken reserve, 6,649,556 tons.

"*Development.*

	Drifts.	Cross-cuts.	Raises.	Winzes.	Stopes.	Fillings.	Total.
Bluff-Jane	2,794	1,432	1,165	488	306	.....	6,185
Fairview	635	477	433	137	302	66	2,050
Empress	818	179	553	.....	55	264	1,869
Victoria	2,087	591	408	174	595	1,128	4,983
Robinson	31	.....	.....	.....	.....	.....	31
Fair West	788	525	.....	57	.....	.....	1,370
2,700 tunnel	3,799	.....	.....	.....	.....	.....	3,799
Totals	10,952	3,204	2,559	856	1,258	1,458	20,287

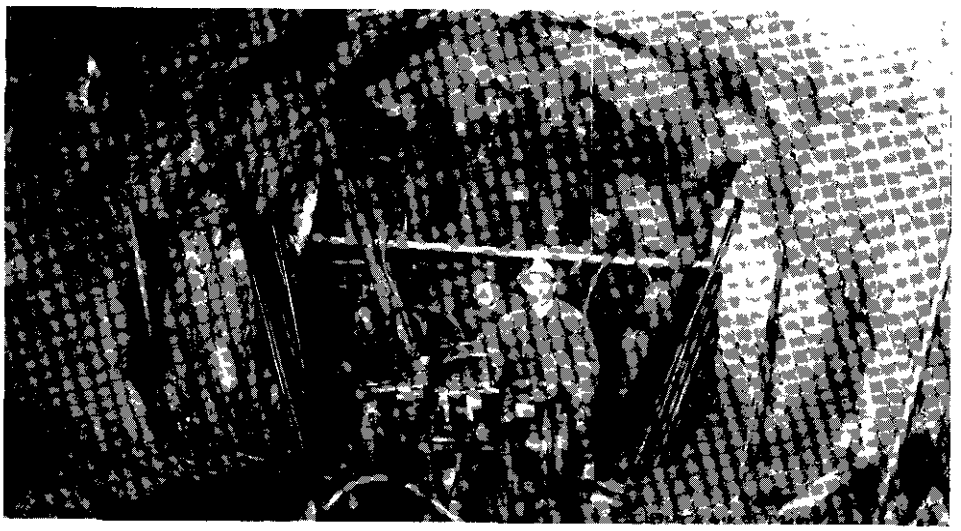
"Development in the *Bluff West* deposit was of primary importance during the year and placed in sight a large tonnage of new ore. In order to mine this section most economically, driving on the 2,700 haulage-tunnel was resumed in the spring. This meant an extension of 6,300 feet and a 500-foot shaft to connect with the 2,200 level of the *Bluff* mine. This plan will be completed during 1927, the connection being expected in April. This 2,700 haulage-tunnel will eliminate the outside 3-per-cent. narrow-gauge railway as an ore-carrier, greatly helping transportation conditions, especially in the winter months with heavy snowfall. The equipment used in the driving of this haulage-tunnel is noteworthy, in that four machines are set up on the drill-carriage and a Conway mechanical shovel is used for the mucking. To speed up the advance a car-shifter is used whereby a 2-ton car is lifted from the main track, set to one side, and replaced on the track after car ahead of it has been loaded. This eliminates the necessity of frequent switching, for the car-shifting arrangement is done close to the working-face.

"The *Victoria* mine was developed on the 2,350 level, a winze was sunk to the 2,500 level, and partial development of this latter before the close of the year. Development by levels in the *Victoria* section, including drifts, crosscuts, raises, and winzes, is as follows: 1,800 level, 219; 1,900 level, 420; 2,000 level, 596; 2,100 level, 444; 2,200 level, 615; 2,350 level, 2,155; 2,500 level, 534; total, 4,983.

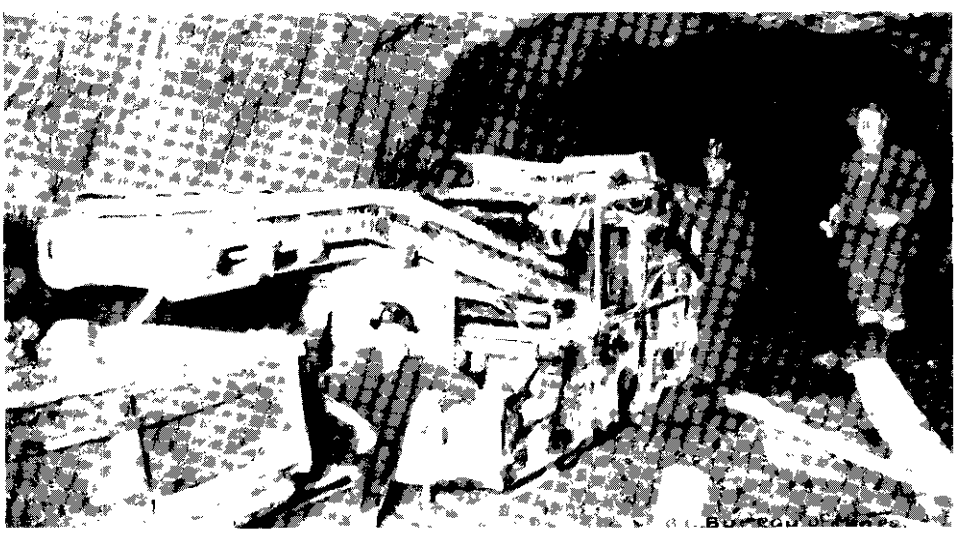
"In the spring 380 acres of surface were electrically surveyed by the Swedish American Prospecting Corporation and during the year throughout the various sections of the mine there were 10,909 feet of diamond-drilling completed. In August and September the two 7½-k. gyratory crushers formerly operated at 68 rock-raise on 1,800 level were moved to the Beach mill just ahead of the roll plant. This change centralizes the primary gyratory crushing and also effected economies in repairs and better control of crushing conditions.

"*Milling.*—The mill treated an average of 3,177 dry tons per milling-day. A noteworthy change during the year in our milling practice was the adoption of a plan for re-treating the low-grade production taken from the tail end of the flotation units. This was called 'scavenging' and permitted of a much better recovery throughout the mill. Two additional grinding-mills and one 42- by 16-inch roll were added to the mill equipment during 1926, which gave a larger capacity in the fine-grinding department. Early in 1927 a pyrite concentrate carrying approximately 47 per cent. sulphur will be made and marketed to the manufacturers of sulphuric acid."

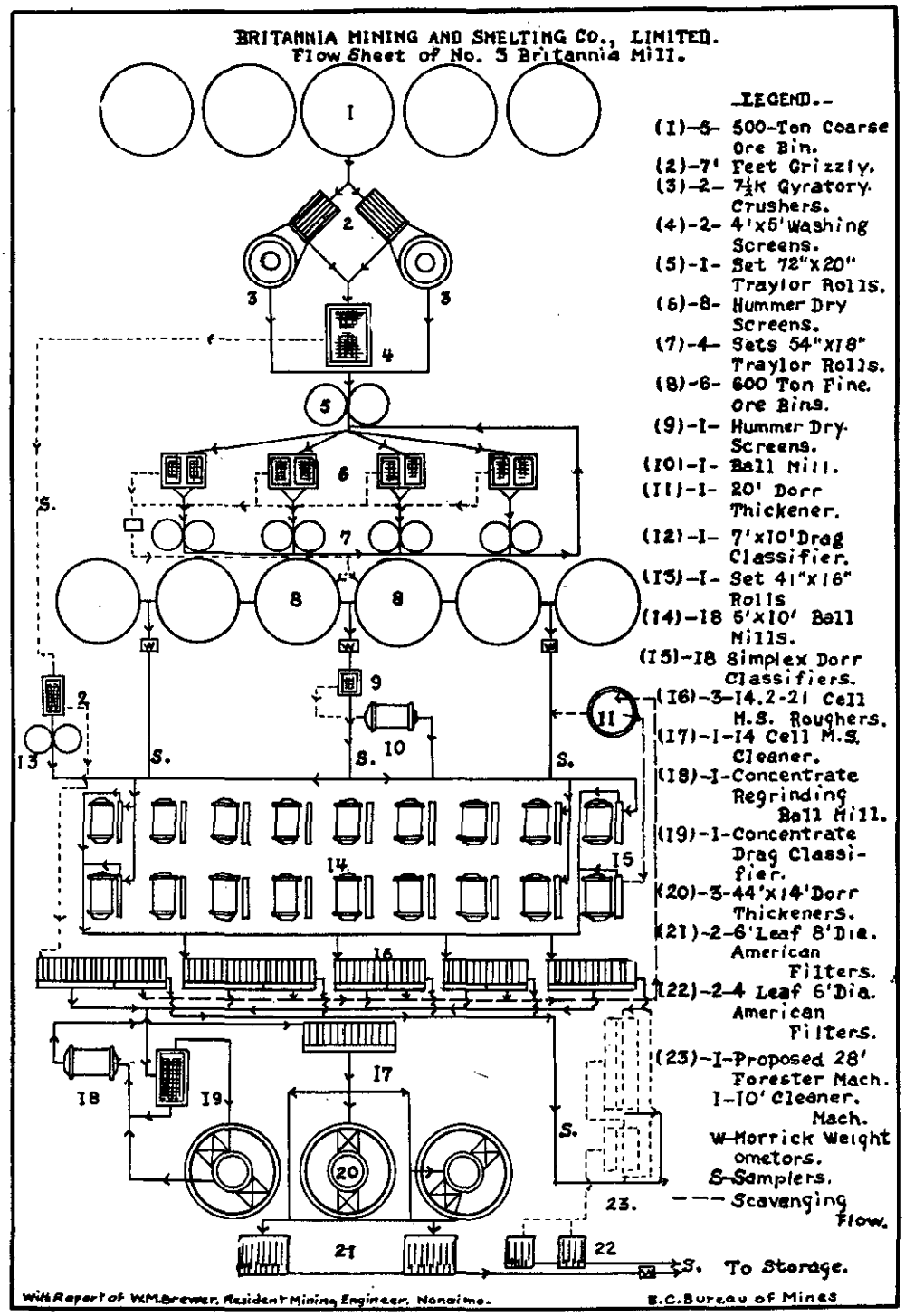
* Assay contents.



Britannia M. & S. Co.—Diamond-drill.



Britannia M. & S. Co.—Automatic Loader.


BRITANNIA MINING AND SMELTING CO., LIMITED.
Flow Sheet of No. 5 Britannia Mill.
LEGEND.-
(1)-6- 500-Ton Coarse Ore Bin.
(2)-7' Feet Grizzly.
(3)-2- 7½K Gyratory Crushers.
(4)-2- 4'x5' Washing Screens.
(5)-1- Set 72"x20" Traylor Rolls.
(6)-8- Hummer Dry Screens.
(7)-4- Sets 54"x18" Traylor Rolls.
(8)-6- 600 Ton Fine Ore Bins.
(9)-1- Hummer Dry Screens.
(10)-1- Ball Mill.
(11)-1- 20' Dorr Thickener.
(12)-1- 7'x10' Drag Classifier.
(13)-1- Set 41"x16" Rolls
(14)-18 5'x10' Ball Mills.
(15)-18 Simplex Dorr Classifiers.
(16)-3-14.2-21 Cell M.S. Roughers.
(17)-1-14 Cell M.S. Cleaner.
(18)-1-Concentrate Regrinding Ball Mill.
(19)-1-Concentrate Drag Classifier.
(20)-3-44'x14' Dorr Thickeners.
(21)-2-6'Leaf 8'Dia. American Filters.
(22)-2-4 Leaf 6'Dia. American Filters.
(23)-1-Proposed 28' Forester Mach.
1-10' Cleaner. Mach.
W-Morrick Weightometors.
S-Samplers.
---- Scavenging Flow.
S. To Storage.
With Report of W.M. Brewer, Resident Mining Engineer, Nanaimo.
B.C. Bureau of Mines

The flow-sheet published herewith showing the operations in the mill has been revised up to January 1st, 1927, by A. C. Munro, mill superintendent. It will be noted, by comparing the flow-sheet published in this report with that in the Annual Report for 1924, that the change in the milling practice of re-treating the low-grade production, called "scavenging," is shown by a broken line with dots between each break to distinguish that part of the treatment from what might be called the regular milling practice.

The Britannia Mining and Smelting Company is adopting a new practice with regard to the acquisition of additional mineral claims in other sections of the Province, and the writer is informed by C. P. Browning, general manager, that the company is prepared to have its engineers examine any promising properties.

Other Prospects on Howe Sound.

Considerable prospecting has been carried on during the past season, judging from the fact that there are twenty-one un-Crown-granted mineral claims in good standing in other portions of the Howe Sound section outside of the Britannia mineral-belt. Most of these un-Crown-granted claims are still held by the original locators, who are not financially able to do more than the annual assessment-work each year, but in many cases this annual assessment-work has been done for so many years that the results from it are beginning to show the difference between merely prospecting and serious development, so that a prospective purchaser is better able to judge the merits of such claims to-day than could have been done previously.

Horse Shoe. This claim is situated on McDonald's creek, on the westerly side of Howe sound, nearly opposite to Britannia Beach, and is owned by Mike Johanson, who resides most of the time in the cabin on the shore near the claim. The prospecting-work done on this claim indicates a rather extensive deposit of copper-sulphide ore of comparative low grade. The claim is convenient for transportation and the showings are good enough to warrant much more thorough prospecting and serious development-work than has been done.

Several other mineral claims in the Howe Sound section would have been examined during a trip made by the writer by launch for that purpose, but as the owners were absent and it was not possible to find the mine-workings without a competent guide these examinations had to be postponed. This is one difficulty hard to overcome, as most of the owners have to work as miners or other occupations and are only on their claims long enough each year to do the annual assessment-work.

Pacific Great Eastern Railway Section.

The Pacific Great Eastern Railway section of the Vancouver Division embraces all of the area on each side of the Pacific Great Eastern Railway from Squamish, the ocean terminus, to the divide between Alta and Green lakes, about 40 miles from Squamish, and includes the areas drained by the Squamish and upper Squamish, Mamquam, and Stawamus rivers and their tributaries.

The Pacific Great Eastern Railway traverses the Coast Range batholith almost at right angles to the strike or axis of the Coast range of mountains, and the building of the railway has been a great help to prospectors working in the adjacent mountains, because the grading in many places has resulted in indicating the locations of "roof-pendants" of altered sedimentaries which occur in several localities in the Coast range, and usually mineralized zones are found in them.

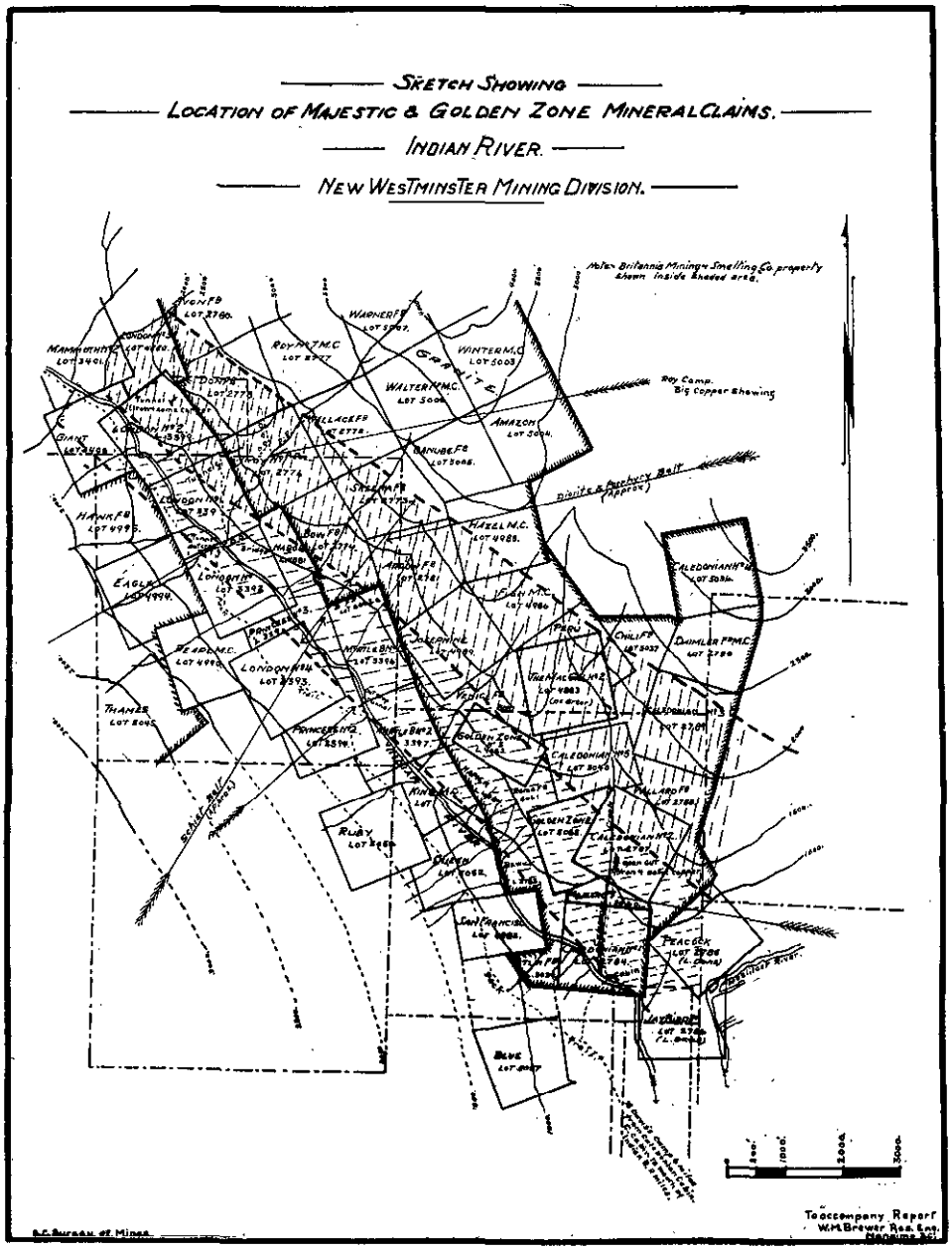
Most of the prospecting has been done within comparatively short distances on both sides of the railway, and there are nearly 150 mineral claims in good standing.

The writer made three trips during the past year into this section and examined all the groups on which recent work had been done and the owners or some competent guide could be conveniently found. The most important properties are the *Bruce*, *Radiant*, *Contact*, *McVicar* and *Brown*, *Rafuse* and *Perdue*, *Golden King* and *Bell* groups, situated in the southerly part of the section—that is, from within 3 to 12 miles from Squamish—the last named, the *Bell*, being located at the head of Indian river, 12 miles easterly from the Squamish settlement. The *Golden King* group on Ashloo creek, a tributary of the upper Squamish, about 30 miles in a north-westerly direction from Squamish, is the farthest removed from the railway in that direction.

In the northerly part of the section, which includes the vicinity of the Brandywine river, headwaters of the Cheakamus river, and the mountains in those vicinities, also around Daisy, Alta, and Cheakamus lakes, there are about fifty claims in good standing. Amongst those

examined in 1926 and on which the most development-work has been done is the *Brandywine group, situated about 3 miles from Brew Siding, which is close to Brandywine falls, a favourite* scenic attraction for tourists.

The majority of the mineral claims in the southerly part of the Pacific Great Eastern Railway section have been examined and reported on in previous Annual Reports as follows:



Bell group, 1913; *Bruce* group, 1919 and 1921; *McKinnon* group, 1919; *Radiant* group, 1921; *Goat Creek* group, 1925; *Gold King* group, 1925.

Brandywine. This group contains the *Brew, Brandywine, Eureka, Exchange, Annie, Pioneer, Cypress,* and *Wild Rose* claims and is owned by William Barclay and Dave Byington, of McGuire Siding; James McKenzie, Vancouver; and William

Anderson, Daisy Lake. (*See* Annual Report for 1924.) The mining camp is located on the north side of the Brandywine river, about 3 miles from the Pacific Great Eastern Railway, at an elevation of about 2,000 feet.

During 1926 the development has been extended by making large open-cuts in the schist country-rock that is impregnated with iron pyrite, some little galena and zinc-blende. The following samples were taken from the several open-cuts on the property during the examination made in 1926, the last four samples being submitted by the owners:—

Location.	Gold.	Silver.	Lead.	Zinc.
	Oz.	Oz.	Per Cent.	Per Cent.
1. Brandywine tunnel	Trace	2.0	.....	3.0
2. Brew mineral claim	Trace	.....	.....	1.0
3. Brew mineral claim	Trace	2.0	0.8	5.0
4. Brandywine big lead across 6 feet	.....	.....	.....	1.0
5. Brandywine big lead across 6 feet	.....	.....	.....	2.0
6. Brandywine big lead across 6 feet	.....	.....	.....	2.5
7. Brandywine big lead across 3 feet	0.10	2.6	0.5	4.0
8. Brandywine big lead across 8 feet	Trace	0.8	.....	1.0
9. Brandywine big lead across 6 feet	0.02	0.6	Trace	2.0
10. Brandywine big lead across 6 feet	Trace	0.4	.....	.....
11. Brandywine big lead	Trace	0.4	Trace	0.5
12. Brandywine big lead	3.5	1.3	Trace	3.0
13. Brandywine big lead	Trace	0.4	Trace	Trace
14. Brandywine big lead	Trace	Trace	.....	Trace

The samples marked from the big lead were taken from series of open-cuts made in the precipitous bank of the Brandywine river, about 40 feet between each open-cut, starting from a point about 10 feet above high water and with about 40 feet vertical between each cut, four in number. The surprising results in the two assays, one of 0.10 oz. and the other 3.5 oz. in gold to the ton, can be only explained from the fact that occasionally pannings of gravel on bars in the river and bed-rock have shown colours of placer gold, and it is quite possible that the schist-belt in which the mineralization is found is the source of the placer gold. As occasionally considerable quartz is found in the schist country-rock, it is possible that the samples which assayed the gold contained a considerable proportion of quartz. It is also possible that such pockets may be found to occur occasionally in the mineralized zone that is being developed.

Blue Jack. Adjoining the *Brandywine* group on the northerly side is the *Blue Jack* group that was examined and fully described in the Annual Report for 1924. Since that time a good pack-horse trail 3 miles in length has been constructed from McGuire's Station on the Pacific Great Eastern Railway to a new cabin on the property. New development on the claims consists of a tunnel driven about 60 feet to intersect the ore-body, but at the time the tunnel was examined this expectation had not been fulfilled.

Astra. This group contains the *Astra*, *Alfred*, *Stewart*, *Robert*, *Royal Oak*, and *Avenue* claims, owned by B. A. Falconer, Frank Price, and Henry Robertson. The *Astra* group is situated about 2 miles easterly from the cabin at the end of the *Blue Jack* trail and the boundaries adjoins those of the *Blue Jack No.* 7 and *No.* 8.

The country-rock is very similar to that on the *Brandywine* and *Blue Jack* groups, with minerals occurring in a belt of greenish quartzose schist. The work done consists of some open-cutting about 15 feet long and 15 feet deep at the face. Two samples taken from the open-cut assayed:—No. 1: Gold, trace; silver, 1.6 oz. to the ton; lead, 2.6 per cent.; zinc, 5 per cent. No. 2: Gold, trace; silver, trace; lead, *nil;* zinc, 1 per cent.

Golden King. This group was fully described in the Annual Report for 1925. Since then most of the work that has been done was in completing the construction of a pack-horse trail, in which assistance was given under the "Mines Development Act," from the upper Squamish river to the property. Unfortunately, when work in the mine was being continued in the fall of 1926, the principal owner, Fred Pykett, died. This occurred just when the Consolidated Mining and Smelting Company of Canada had taken an option on the group and given Mr. Pykett a contract to continue the development-work. The company has since placed a force of miners on the property.

This property attracted a great deal of attention during the last two or three years on account of the high gold values found in some of the ore, which is chiefly solid pyrrhotite. Three samples taken from the last work done in the mine previous to Mr. Pykett's death assayed:—No. 1: Gold, 10.2 oz.; silver, 22 oz. to the ton; copper, 0.2 per cent. No. 2: Gold, 4.8 oz.; silver, 5.6 oz. to the ton; copper, 0.6 per cent. No. 3: Gold, 2 oz.; silver, 3 oz. to the ton; copper, 1.2 per cent.

Jervis Inlet Section.

No work other than the annual assessment-work has been done during 1926 on the *Lillie* group, situated near Mount Diadem, west from the mouth of Britain river, and containing the *Jupiter Nos. 1, 2, 3, 4,* and *5*, the *Star No. 1*, and *Leo Nos. 1, 2, 3, 4,* and *5* claims, the chief owner of which is Philip White, of Vancouver. The same conditions also apply to other mineral claims in the vicinity of Britain river, one of the tributaries of Jervis inlet on the west side and about midway between the entrance and the head of the inlet.

The *Baramba* group, owned by the Baramba Mining Company, Limited, is on the east side and near the head of Hotham sound, which is the west arm of Jervis inlet, with its entrance near the junction of that inlet and Malaspina strait. No work has been done on this group during 1926, and the same remarks apply to the *Jolley* group, adjoining the *Baramba* on the north. Both of these properties were examined in 1917 and the reports published in the Annual Report for that year. Since then there has been no activity around Hotham sound in the mining industry; consequently no further examinations have been made.

The *Norman* group, situated on the west side of Jervis inlet, in Prince of Wales reach, has had no work done on it for some years. It was also fully described in the Annual Report for 1917, when the claims were being worked under a bond by R. J. McLean and associates, of Vancouver.

Lynn Creek Valley Section.

Lynn Creek Zinc Mines, Ltd.

During the fall of 1926 an option was secured by the Porcupine Goldfields Mining and Development Company, Limited, on the property of the Lynn Creek Zinc Mines, Limited. F. E. McLaughlin, mining engineer for that company, who has charge of the work, has had a force of miners cleaning up the old camp, reopening the old openings, and continuing a thorough and systematic extension of prospecting-work that had been carried on intermittently for the past several years.

The Lynn Creek Mines, Limited, controls an area of approximately 450 acres, on which are located the following Crown-granted mineral claims: *Kemptville Extension, Evening Star, Pretty Bess, Fleming, Morning Star, Cascade, Jersey, Russel,* and *Lucky Star*. The property is located on the West fork of Lynn creek, North Vancouver, a distance of about 7 or 8 miles from the intake for the City of Vancouver's waterworks. This property was reported on by J. D. Galloway in the Annual Report for 1913, and by the writer in the Report for 1917. Since these reports were published there has been very little activity around the property, except that the company has been doing the annual assessment-work on some of the claims that were not Crown-granted, all of which since have been Crown-granted.

During the late fall of 1924 this property was bonded by A. B. Trites, and a new camp was built to accommodate a large force of men and a programme for extensive prospecting and developing work laid out; but in the spring of 1925 Mr. Trites concluded to drop the bond on the property, and it has been idle until this present resumption of development.

VICTORIA MINING DIVISION.

The Victoria Mining Division occupies the smallest area of any of the Divisions in the Western Mineral Survey District. The lode-mining industry in the Victoria Mining Division has shown very little progress during 1926. The chief reason for this is that while there are mines in the Division sufficiently developed to warrant operations being carried on, as is the case with the *Sunloch* mine on Jordan river, and probably the *Gabbro*, the adjoining property, the owners of these, however, are not yet prepared to install the necessary plants for treating the copper-gold-silver ore of which the deposits on these properties are made up.

Considerable further prospecting-work has been done on the *Sunloch* group during 1926, also an automobile-road has been constructed, with Government assistance, to the north-easterly limits of the extensive area included in the group. The property was fully described in the

Annual Reports for 1917, 1918, and 1920, and it is unnecessary to repeat these descriptions. An examination of the *Sunloch* and *Gabbro* groups was made recently by engineers for the Britannia Mining and Smelting Company.

The *Gabbro* group adjoins the *Sunloch* on the west and extends down the Jordan river on both sides. The group contains about twenty-three Crown-granted mineral claims and was fairly fully described in the Annual Reports for 1920, 1921, 1922, and 1923.

Mount Sicker Section.

Lenora and Tyee.

The work of clearing out the old workings on the *Lenora* and *Tyee* mines was continued during 1926 by a small force of men working under instructions from R. G. Mellin, of Duncan, who holds a lease with option to purchase on the *Lenora* property, and has made arrangements with Messrs. Thompson and Carmichael, the purchasers of the assets of the old Tyee Copper Company, to take over his lease and option.

Under this arrangement it is expected that with ore-bodies which were known when the *Tyee* mine was being operated, but which on account of the zinc contents it was not advisable to attempt to mine, will under the process that will be in future worked in the old Ladysmith plant furnish a nucleus of ore to keep the plant in operation regardless of a supply of custom ore.

Ladysmith Tidewater Smelters, Ltd.

This company has acquired the old Ladysmith smelter, together with the *Tyee* mine and all other assets of the old Tyee Copper Company. The company has also acquired the patent rights to the Gordon process for treating complex ores, and it was expected that previous to this time the company would have had its organization perfected and been busy making the alterations necessary in the old smelter before it would be prepared to receive ore for treatment.

It was hoped that in this report a full description of the process to be adopted at Ladysmith as well as the operations would have been available for publication, but up to the present time such has not been the case, and will not be until after the return from England of Messrs. Thompson and Carmichael.

Non-metallics, Cement, Building-stone, Sand, and Gravel.

The non-metallic branch of the mining industry in the Western District is practically all confined to the southern portion of the district, except the quarrying of building-stone on Haddington island, Nanaimo Division.

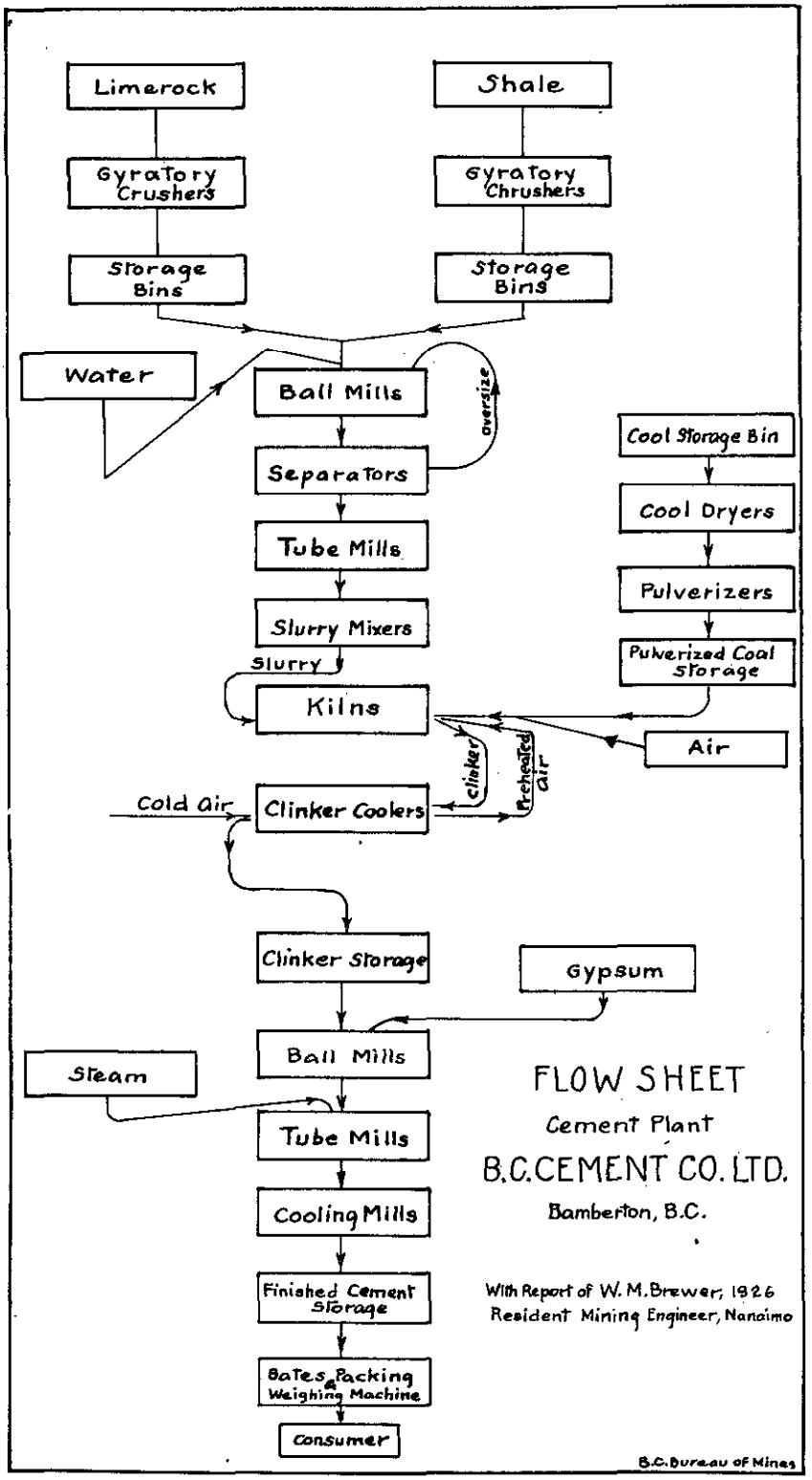
Haddington Island.—Haddington Island stone is an andesite and has been used in the Parliament Buildings and several other prominent buildings in the Province. It withstands weathering exceedingly well and the quarry is located very close to deep-water transportation.

B.C. Cement Co., Ltd.—An investment of approximately $3,500,000 has been made by this company at Tod inlet and Bamberton, on Saanich inlet, within 20 miles of Victoria, and what the company's activities mean to the south end of Vancouver island and Victoria is indicated from the fact that a pay-roll of approximately $250,000 annually is distributed by this company in addition to large expenditures for supplies. It can therefore be readily understood that this company's operations form the most important of any connected with the mining industry in the Victoria Division.

The company's manufacturing plant on the Saanich inlet is massive in size. There are two plants, one at Tod inlet and the other at Bamberton, on the west side of Saanich inlet. These have a combined annual manufacturing capacity of 1,500,000 barrels of Portland cement. They are practically identical in size and capacity; but the Tod inlet plant has been closed down since June, 1921.

The Bamberton plant is located on the side of a mountain beneath the famous Malahat highway and extends from the beach to a height of more than 200 feet above sea-level. The buildings have been designed in such a manner that gravity can be taken advantage of in handling raw material through the different methods of treatment from the limestone-quarries near the top of a bench to the storage-bunker, from which the finished cement product is loaded on to vessels.

There are two quarries, No. 1 and No. 2. The floor-level of the No. 1 quarry is about 150 feet above sea-level; the dimensions of the bottom are approximately 200 feet by 450 feet by about 150 feet high at the face. The dimensions of the No. 2 quarry are approximately 200 feet by 100 feet at the bottom, which is 70 feet higher than the floor of No. 1, with the face


Limerock
Shale
Gyratory Crushers
Gyratory Chrushers
Storage Bins
Storage Bins
Water
Ball Mills
oversize
Separators
Tube Mills
Slurry Mixers
Slurry
Kilns
Cool Storage Bin
Cool Dryers
Pulverizers
Pulverized Coal Storage
Air
clinker
Preheated Air
Cold Air
Clinker Coolers
Clinker Storage
Gypsum
Steam
Ball Mills
Tube Mills
Cooling Mills
Finished Cement Storage
Bates Packing Weighing Machine
Consumer
FLOW SHEET
Cement Plant
B.C. CEMENT CO. LTD.
Bamberton, B.C.
With Report of W. M. Brewer, 1926
Resident Mining Engineer, Nanaimo
B.C. Bureau of Mines

about 70 feet above the floor. The surface outcropping of the deposit of blue limestone which forms the calcareous content of the cement is very extensive. Its continuity has been determined for a very considerable distance along the strike of the bedding-planes in a north-westerly direction. The width has not been fully determined beyond the dimensions in the floor of the No. 1 quarry, neither has the depth yet been fully determined lower than the floor.

Air-drills and steam-shovels are used exclusively in quarrying and handling the broken limestone which is deposited from the steam-shovel into small freight-cars that are drawn up railway-tracks by cable to the top of the first of a series of mills, above a large gyratory crusher. The empty cars return by gravity down the incline into the quarry. From the crusher the broken material passes into the storage-bins and from there by gravity into a set of ball-mills, five in number, rotated by five motors; thence into separators, next into tube-mills, each 22 by 6 feet in diameter, where crushed shale is mixed with the crushed limestone; then into slurry-mixers, where water is added to the pulverized rock, and from the slurry-mixers into kilns.

In another unit of the plant, shale, which enters into the manufacture of cement, is crushed in a gyratory crusher set at the same elevation and parallel in the mill as that into which the lime-rock is deposited. From the crusher the broken shale passes into storage-bins, and from there passes into the same battery of ball-mills as the broken lime-rock with which the broken shale has been mixed, and from that point to the kilns, the mixture of limestone and shale having been perfected.

The next step in the manufacturing process is the pumping of the mixture, known to the trade as "slurry," to four storage-tanks to the right of the quarry. These are really huge, open concrete pans 66 feet in diameter and about 4 feet deep. They are situated at slightly different elevations and the slurry is made to flow from one to another to obtain exactly the desired proportion of ingredients. Samples from the tanks are tested hourly in the laboratory. While in the tanks the liquid is stirred constantly by huge paddles revolving about a central column in the middle of each pan.

From the pans the liquid is pumped higher up the hill to a huge building housing the drying-kilns. These are truly impressive contrivances, three in number. Each is a huge steel cylinder 185 feet long and 8.9 feet in diameter. Each is lined inside with firebrick and enters the base of a concrete chimney towering upwards for 100 feet. At the other end of the cylinder is a horizontal fountain of flame fed by pulverized coal from rotary fans and producing a temperature of 2,700° F. The cylinder is rotated slowly by powerful electric motors.

The liquid enters the chimney end of the cylinder and slowly flows down to the searing jet of flame. It gradually thickens and hardens. By the time it is ready to fall from the cylinder at the furnace it has become "clinker," a dry, hard substance, exactly similar in appearance to the stuff that is raked from the fire in an ordinary coal-furnace.

From the drying-kilns the clinker falls into more revolving steel cylinders, called rotary coolers, in which it is reduced in temperature by contact with cold air. From the coolers the clinker falls into concrete storage-bins.

Cement is mainly this clinker ground to extreme fineness. Mainly, but not altogether; for pulverized clinker would set hard as granite the instant water was added to it. This would constitute what is known as "flash" setting. To retard the setting-rate, gypsum is ground in with the clinker. This substance is procured from deposits on the Kelowna branch of the Canadian National Railways, south from Kamloops. It is elevated from scows at the water's edge by means of a cable-car to storage-bins built beside the clinker-bins.

In the desired proportions, clinker and gypsum are extracted through openings in the bottom of the bins to enter a series of ball-mills which duplicate those in the building far below. Here the mixture is pulverized to a rough powder and any particles of free lime are hydrated by the introduction of steam. Beneath the ball-mills again are the tube-mills, which complete the pulverizing of the mixture into cement. From the tube-mills the powder is conveyed to a series of cooler-mills below. When it emerges from these it is so fine that 90 per cent. of it will pass through a sieve containing 40,000 apertures to the square inch.

From the cooler-mills it passes along a screw conveyor to fall into any one of twenty-eight vast concrete storage-bins, each of which has a capacity of 2,600 barrels. From the bottom of each bin the cement is extracted by screw conveyors and given its final hoist skywards up a bucket elevator, so that it may fall down a shaft upon a screen and thus be deprived of possible "tramp" iron, stray nut or bolt.

Vancouver Granite Company—Nelson Island Quarry, Nanaimo M.D.

After having been screened the cement passes into a most ingenious packing-machine. This has five spouts at the bottom edge of the outer face. These spouts penetrate into an empty sack, not through the mouth, for that has been wired up by another machine, but through a valve in the bottom. The cement pours into the sack through the spout. As soon as 87½ lb. of it has entered, the flow is stopped by an automatic weighing-machine and the filled bag is dropped on to a conveyor-belt to be carried out to the hold of one of the company's two freight-steamers, the "Teco" or the "Carla."

There are the machine-shop, the blacksmith-shop, the general stores, and half a score of other subsidiary units included in the plant. Over 30,000 tons of coal is used every year for burning the cement clinker in the kilns. This is towed to Bamberton from Nanaimo or Ladysmith on scows, passed through a grinding-mill on the wharf, where it is pulverized into particles nearly as minute as the cement itself; then dried and hoisted up to the kilns by means of a conveyor.

In a big concrete sub-station electricity at 60,000 volts is stepped down by means of three transformers to 550 volts. Ten switchboards control the current used for power-motors and six control the current used for lighting purposes. The British Columbia Railway Company furnishes the electric power.

One of the most interesting sections of the plant is the laboratory. Here searching analyses are made by expert chemical engineers to test both raw material and the finished product. The company knows just exactly what has entered into the manufacture of the cement. It knows the exact degree of tensile strength and soundness of every sack of the product which reaches the market. Samples of every shipment are placed in sealed containers and, as it were, filed away.

About 180 men find employment at the Bamberton plant. All, of course, are domiciled on the company's property. On a shelf in the mountain-side above the quarries is a small village. Additional quarters are located near the shore-line. The company does all in its power to keep its employees cheerful and contented. In a huge recreation-hall, with a dancing-floor as large as that of the Empress Hotel, and every bit as smooth, gay parties are staged every week. The company has never had a strike or a dispute with its employees.

There is no foreign capital invested in the Bamberton plant, or in that at Tod inlet, which duplicates it. The company uses about 300 different kinds of supplies in its cement plants, and a large majority of these are secured in Victoria and other places throughout the Province.

The British Columbia Cement Company, Limited, is purely a Canadian-British enterprise and has a long and enviable record of good service to the public of British Columbia.

Nelson Island Granite.—The granite-quarries on Nelson island, at the entrance of Jervis inlet, have been in operation since 1902, when they were first started to quarry stone for piers for the Fraser River bridge, which was built by Armstrong, Morrison & Company, Limited, at that time. The quarries were acquired by the firm, but are operated under a separate organization known as the Vancouver Granite Company. The acreage contained in this property is approximately 350 acres, contained in Land Lots 468 and 2009, situated on the south-west corner of Nelson island. The face of the quarry is 60 feet high by 500 by 250 feet, which does not include the waste-dump.

Some idea can be gained with regard to the quality of this granite for various purposes, both useful and ornamental, from the fact that 125,000 cubic feet has recently been used in the construction of the Songhees dry-dock at Esquimalt.

The following is a list of places where the rock has been used for ornamental purposes, especially for memorial shafts and statues: Convent, Sacred Heart, Point Grey; Harding memorial, Stanley Park, Vancouver. War memorials: Victoria; Vancouver; Chilliwack; Nanaimo; Kamloops; Boise, Idaho; Calgary, Alberta; McMinnville, Oregon; and several other points in the Prairie Provinces; also for the mausoleum, Portland, Oregon; and for base course on ground floor in new Elks' Temple, Portland, Oregon.

The production from this quarry is approximately 50,000 cubic feet annually and has been a million and a half cubic feet since the quarry was started; as the rock averages 10 cubic feet to the ton, this represents a total tonnage of about 150,000, or 500 scow-loads. Transportation from quarry to the consumers is by contract with available shipping companies.

There is an average of fifteen men employed for about ten months annually. During Christmas the quarry is closed down and remains so for from one to two months, according to the weather, when merely a caretaker is employed. All the stone is sold in the raw state to various stone-cutters, by whom it is cut and polished.

Deeks Gravel and Rock Co., Ltd.—The production of rock and gravel for building purposes, chiefly for making concrete, on the Mainland is practically confined to one company, the Deeks Gravel and Rock Company, Limited, which owns and operates three pits in the Vancouver Division: Nos. 1 and 2 on the east side of Howe sound, where No. 1 produces crushed rock chiefly and No. 2 chiefly washed gravel; the No. 3 plant is 1 mile below the Second narrows on Burrard inlet on the north shore.

All of these pits are equipped with large crushers of the jaw-construction type, varying in sizes from 13 by 24 inches to 24 by 30 inches. Each plant is also equipped with Symons disk crushers, two being 24 inches and the third 36 inches. The total capacity of all the plants is 1,200 cubic yards a day.

Each plant is equipped with hydraulic machinery for washing the gravel, the Nos. 1 and 2 plants being so arranged that all the gravel from the pit is washed down to the bunkers on the shore by hydraulicking and gravity. In the hydraulic plant there are twelve giants altogether in use, of the No. 3 size, manufactured by the Vancouver Engineering Works. The No. 3 plant is equipped with a Drysdale pump having a capacity of 2,200 cubic feet of water a minute, which water is pumped from Seymour creek near North Vancouver.

The No. 1 pit and plant were acquired in 1908 by John F. Deeks, the present president and general manager of the company. The No. 2 pit and plant were acquired in 1912 and the No. 3 in 1925. The secretary of the company is H. S. Armstrong, with headquarters at 712 Pacific Building, Vancouver. The company also owns and operates a fleet of tugs and a large number of scows for transporting the production from the pits to the consumers.

Newcastle Island Stone.—On Newcastle island in Nanaimo harbour there is a large deposit of sandstone very valuable for building purposes. During the past few years the owner, John McDonald, has organized a new industry, so far as British Columbia is concerned, by cutting "pulp-stones" (very much like the old-fashioned "mill-stones" used in grist-mills), which are used in the pulp and paper plants along the Coast in place of the imported stones formerly in use.

The Newcastle Island building-stone has been used in several prominent buildings in the Province and is very popular amongst architects and builders because of its excellent weathering qualities. Since Mr. McDonald has been furnishing "pulp-stones" the quarry has been kept in almost continuous operation.

THE LATE GEORGE WILKINSON.

The mining industry of the Province sustained a severe loss in the sudden passing away at Victoria, August 11th, 1926, of the late George Wilkinson, Chief Inspector of Mines for British Columbia. As an operating colliery manager and later as Chief Inspector, Mr. Wilkinson had a thorough knowledge of the coal industry and its many problems; he possessed the respect and confidence of both the operators and the miners and his sterling worth was appreciated by all who came in contact with him.

Born May 27th, 1876, the late Mr. Wilkinson gained some early experience in coal-mining in the Cumberland field in England. He came to British Columbia in 1896 and was for years prominently identified with coal-mining in the Vancouver Island field. As Chief Inspector of Mines his experience was extended to cover the whole field of mining in the Province. During his term of office he was always in the lead in promoting measures for the safety and health of the workmen.

Through the death of Mr. Wilkinson, the Department of Mines lost a most valuable and capable official, one whose genial disposition endeared him to all his colleagues.

INSPECTION OF MINES.

REPORT BY JAMES DICKSON, CHIEF INSPECTOR OF MINES.

I have the honour to submit my annual report as Chief Inspector of Coal and Metalliferous Mines, covering the year ended December 31st, 1926. Appended hereto are the reports of the District Inspectors relative to the production of coal and number of persons employed; reports of the District Inspectors on metalliferous mines; reports of Instructors of Mine-rescue Stations; report of Secretary to Board of Examiners for coal-mine officials; list of accidents reported under the provisions of section 71, subsection (1), "Coal-mines Regulation Act," and section 19, subsection (1), "Metalliferous Mines Regulation Act"; and prosecutions.

PERSONNEL OF STAFF OF INSPECTORS, INSTRUCTORS, AND BOARD OF EXAMINERS, AND THEIR ADDRESSES AT HEADQUARTERS.

Inspectors.

James Dickson	Chief Inspector, Victoria.
James Strang	Inspector, Victoria.
Robert Strachan	Senior Inspector, Fernie.
Henry E. Miard	Inspector, Fernie.
John MacDonald	Inspector, Fernie.
H. H. Johnstone	Inspector, Rossland.
James W. Jemson	Acting-Inspector, Nanaimo.
Henry Devlin	Inspector, Nanaimo.
Thomas R. Jackson	Inspector, Nanaimo.
John G. Biggs	Inspector, Merritt.
Thomas J. Shenton	Inspector, Prince Rupert.

Instructors, Mine-rescue Stations.

John D. Stewart	Nanaimo Station.
John Thomson	Cumberland Station.
John T. Puckey	Fernie Station.
William C. Stone	Middlesboro Station.

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.

CHANGES IN THE INSPECTION BRANCH DURING 1926.

George Wilkinson, who had held the position of Chief Inspector of Mines for a number of years, died in August after a very brief illness.

James Dickson, Inspector of Mines and member of the Board of Examiners, was appointed to the position of Chief Inspector of Mines, made vacant by the death of Mr. Wilkinson, and James Strang, for a number of years manager of Wellington-Extension mines, was appointed Inspector of Mines and member of the Board of Examiners.

James W. Jemson was appointed Acting-Inspector of Mines to take over the duties of Henry Devlin, Inspector of Mines, Nanaimo, who was on sick-leave at the end of the year.

INSPECTION DISTRICTS.

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

Inspection District.	Mining Divisions covered by Inspection District.
Vancouver Island	Victoria, Alberni, Clayoquot, Quatsino, and that portion of the Nanaimo Division situated on Vancouver Island.
Southern Coast	Vancouver, New Westminster, and that portion of Nanaimo Division situated on the Mainland.
Northern	Atlin, Liard, Stikine, Portland Canal, Nass River, Omineca, Peace River, Skeena, Bella Coola, and Queen Charlotte Islands.
Nicola-Princeton	Cariboo, Quesnel, Clinton, Lillooet, Kamloops, Ashcroft, Nicola, Vernon, Similkameen, and Osoyoos.
West Kootenay and Boundary	Revelstoke, Lardeau, Trout Lake, Ainsworth, Slocan, Arrow Lake, Slocan City, Nelson, Trail Creek, Greenwood, and Grand Forks.
East Kootenay	Fort Steele, Windermere, and Golden.

PRODUCTION.

The total tonnage produced by the coal-mines of the Province for the year ended December 31st, 1926, was 2,330,036 tons, being a decrease of 114,256 long tons or 4.68 per cent. below the production of 1925.

The Coast District, which includes Vancouver Island, Nicola-Princeton, and Telkwa coal-fields, produced 1,481,588 long tons, a decrease of 108,224 tons or 6.80 per cent. as compared with 1925.

The Vancouver Island collieries produced during 1926 1,293,175 tons, a decrease of 119,582 tons or a little over 8 per cent. as compared with 1925.

The Telkwa mines produced 1,260 tons, a decrease of 321 tons as compared with 1925.

The Nicola-Princeton District produced 187,153 long tons, an increase of 11,679 tons or 6.6 per cent. more than in 1925.

The East Kootenay District produced 848,448 long tons, a decrease of 6,032 tons as compared with 1925.

The coal companies producing during the year were: The Crow's Nest Pass Coal Company and Corbin Coal Company in the East Kootenay District; the Coalmont Collieries, Middlesboro Collieries, Princeton-B.C. Colliery, Tulameen Valley Coal Company, Keystone Coal Company, the Southern Okanagan Collieries, and Sunshine Coal Company in the Nicola-Princeton District; Telkwa Collieries in the Northern District; and the Western Fuel Corporation of Canada, Limited, Canadian Collieries (Dunsmuir), Limited, Granby Consolidated Mining, Smelting, and Power Company, Limited, Nanoose Colliery, East Wellington Coal Company, and the King & Foster Coal Company on Vancouver island.

The Morden mine and the Suquash mine, both owned by the West Coast Collieries, have not been operated for a number of years. During the year the Princeton-B.C. Collieries and the Nanoose-Wellington Collieries ceased operations.

A considerable amount of prospecting and exploratory work has been carried out in the Nicola-Princeton District, both by actual mining and by diamond-drilling.

On Vancouver island the Canadian Collieries (Dunsmuir), Limited, at the Wellington Extension Colliery have opened mines, on a small scale as yet, at two different parts of the property.

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

Colliery and Mine.	Gross Tons 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.
Nanaimo—								
No. 1 mine	323,533	255	728	1.74	444	493	2.57	656
Reserve mine	180,591	255	368	1.92	490	245	2.89	737
Wakesiah mine	40,197	144	167	1.67	240	111	2.52	362
Comox, Nos. 4 and 5	270,788	283	724	1.31	374	569	1.68	476
Extension, Nos. 1, 2, 3, and 6	175,811	263	540	1.23	325	392	1.70	448
South Wellington, No. 5	47,434	231	132	1.55	359	102	2.00	465
Granby, No. 1 mine	167,286	307	242	2.25	691	179	3.04	934
Nanoose, Lantzville	27,459	82	257	1.30	106	203	1.64	135
East Wellington, No. 1	43,474	228	173	1.10	251	139	1.36	312
King & Foster Coal Co.	16,602	263	72	0.87	230	47	1.34	353
Middlesboro, Nos. 2, 3, and 4	43,474	230	110	1.72	395	82	2.30	530
Keystone, Nos. 4 and 6	7,717	314	16	1.50	482	11	2.18	701
Coalmont, Nos. 3 and 4	121,458	248	317	1.54	383	192	2.54	632
Princeton, No. 1 shaft*	813	.....	.....	.....	.....	.....	.....	.....
Tulameen, No. 1 mine	13,225	270	22	2.22	601	13	3.69	1,017
Southern Okanagan Colliery	426	.....	13	.....	32	7	.....	61
Sunshine Coal Co.	40	.....	3	.....	.....	3	.....	.....
Telkwa, Goat Creek	1,260	119	7	1.42	180	7	1.42	180
Coal Creek, Nos. 2, 3, 1 E., 1 S., and 9	366,054	205	682	2.61	536	494	3.61	741
Michel, Nos. 3 and 8	363,795	248	614	2.38	592	408	3.59	891
Corbin, Nos. 3, 4, and 5	118,599	244	135	3.60	878	60	8.10	1,976

* Company in receivership since April 30th, 1925.

Collieries of Vancouver Island Inspection District.

The output of Vancouver Island collieries was 1,293,175 tons, and adding to this 11,907 tons taken from stocks makes a gross total of 1,305,076 tons. Of this amount, 154,614 tons or 11.8 per cent. was lost in preparation for the market, 112,960 tons or 8.7 per cent. was consumed by producing companies as fuel, and 1,037,502 tons or 79.5 per cent. was sold in the competitive markets.

Of the amount sold in the competitive markets, 941,093 tons or 90.7 per cent. of the amount sold and nearly 72.1 per cent. of the total output mined was sold in Canada, and 96,409 tons or about 9.3 per cent. of the amount sold and nearly 7.3 per cent. of the total output mined was sold in the United States.

Collieries of the Nicola-Princeton Inspection District.

Of the gross output of 187,153 tons produced by the collieries of the Nicola-Princeton District, 1,275 tons or 0.6 per cent. was lost in preparation for market, 12,151 tons or 6.4 per cent. was consumed by producing companies as fuel, and 173,955 tons or 93 per cent. was sold in the competitive markets.

Of the amount sold in competitive markets, 173,672 tons or 99.8 per cent. of the amount sold and nearly 92.6 per cent. of the total output mined was sold in Canada, and 283 tons or 0.2 per cent. of the amount sold and about 0.15 per cent. of the total output mined was sold in the United States.

Collieries of the East Kootenay Inspection District.

Of the gross output of 848,448 tons produced by the collieries of the East Kootenay District, 51,675 tons or 6.1 per cent. was consumed by the producing companies as fuel, 142,838 tons or 16.8 per cent. was made into coke, 37,978 tons or 4.5 per cent. was added to stock, and 615,957 tons or 72.6 per cent. was sold in competitive markets.

Of the amount sold in competitive markets, 418,724 tons or 67.9 per cent. of the amount sold and 49.4 per cent. of the total output was sold in Canada, and 197,233 tons or 32.1 per cent. of the amount sold and 23.2 per cent. of the total output was sold in the United States.

The following table shows for the past twelve years the output and the *per capita* production of the various districts:—

OUTPUT AND PER CAPITA PRODUCTION OF 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.
1915	East Kootenay District	852,572	1,748	488	1,183	721
	Coast District	1,120,008	3,230	347	2,512	446
	Whole Province	1,972,580	4,978	396	3,695	534
1916	East Kootenay District	882,270	1,674	527	1,125	784
	Coast District	1,603,310	3,386	474	2,569	624
	Whole Province	2,485,580	5,060	491	3,694	673
1917	East Kootenay District	551,751	1,481	372	944	584
	Coast District	1,846,964	3,689	501	2,816	656
	Whole Province	2,398,715	5,170	463	3,760	638
1918	East Kootenay District	732,864	1,327	552	814	900
	Coast District	1,845,860	4,100	450	2,844	645
	Whole Province	2,578,724	5,427	475	3,658	705
1919	East Kootenay District	558,806	1,369	409	1,000	559
	Coast District	1,850,142	4,597	402	3,145	588
	Whole Province	2,408,948	5,966	404	4,145	581
1920	East Kootenay District	847,389	1,582	536	1,062	798
	Coast District	1,849,385	4,767	388	3,129	591
	Whole Province	2,696,774	6,349	425	4,191	643
1921	East Kootenay District	759,755	1,774	428	1,207	629
	Coast District	1,809,884	5,111	354	3,515	515
	Whole Province	2,569,639	6,885	373	4,722	544
1922	East Kootenay District	554,361	1,538	360	1,063	521
	Coast District	2,026,554	5,106	396	3,649	551
	Whole Province	2,580,915	6,644	388	4,712	547
1923	East Kootenay District	740,531	1,434	516	965	767
	Coast District	1,802,456	4,715	395	3,377	546
	Whole Province	2,542,987	6,149	413	4,342	585
1924	East Kootenay District	273,518	1,147	238	797	343
	Coast District	1,714,015	4,271	401	3,097	553
	Whole Province	1,987,533	5,418	366	3,894	510
1925	East Kootenay District	854,480	1,466	582	989	864
	Coast District	1,589,812	3,977	399	2,839	559
	Whole Province	2,444,292	5,443	449	3,828	639
1926	East Kootenay District	848,448	1,431	592	962	881
	Coast District	1,481,588	3,891	380	2,795	530
	Whole Province	2,330,036	5,322	437	3,757	620

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

Collieries of British Columbia—Production, 1926.

Mine.	Sold.			Total Sales.	Lost in Washing.	Used in making Coke.	Used under Co.'s Boilers, etc.	Total for Colliery Use.	Stocks.		Difference.		Output for Year 1926.
	In Canada.	In U.S.A.	Elsewhere.						First of Year.	Last of Year.	Added to.	Taken from.	
Vancouver Island.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons (2240lb.).
Canadian Collieries (D.), Ltd.—													
South Wellington	35,900	.....	.....	35,900	7,652	.....	3,882	11,534	.....	.....	.....	.....	47,434
Extension	94,929	38,384	.....	133,313	27,317	.....	12,697	40,014	4,127	6,611	2,484	.....	175,811
Comox	226,698	5,012	.....	231,710	41,244	.....	4,096	45,340	8,822	2,560	.....	6,262	270,788
Western Fuel Corporation of Canada, Ltd.—													
No. 1, Nanaimo	235,400	25,317	.....	260,717	21,877	.....	46,057	67,934	20,142	15,024	.....	5,118	323,533
Reserve mine	140,989	15,133	.....	156,122	15,417	.....	10,321	25,738	7,912	6,643	.....	1,269	180,591
Wakesiah mine	24,263	2,625	.....	26,888	1,926	.....	11,521	13,447	3,877	3,739	.....	138	40,197
Nanoose-Wellington Collieries, Ltd.	21,174	.....	.....	21,174	4,235	.....	2,050	6,285	.....	.....	.....	.....	27,459
King & Foster Coal Co., Ltd.	13,148	.....	.....	13,148	3,254	.....	200	3,454	.....	.....	.....	.....	16,602
East Wellington Coal Co., Ltd.	36,153	.....	.....	36,153	1,625	.....	5,955	7,580	359	100	.....	259	43,474
Granby Cons. M. S. & P. Co., Ltd.	112,439	9,938	.....	122,377	30,067	.....	16,181	46,248	2,509	1,170	.....	1,339	167,286
Totals, Vancouver Island	941,093	96,409	.....	1,037,502	154,614	.....	112,960	267,574	47,748	35,847	2,484	14,385	1,293,175
Nicola-Princeton District.													
Middlesboro Collieries, Ltd.	39,587	.....	.....	39,587	.....	.....	4,003	4,003	357	241	.....	116	43,474
Princeton-B.C. Colliery Co., Ltd	525	.....	.....	525	.....	.....	380	380	92	.....	.....	92	813
Coalmont Collieries, Ltd.	113,974	43	.....	114,017	.....	.....	7,441	7,441	.....	.....	.....	.....	121,458
Tulameen Valley Coal Co., Ltd.	11,710	240	.....	11,950	1,275	.....	.....	1,275	.....	.....	.....	.....	13,225
Keystone Coal Co., Ltd	7,410	.....	.....	7,410	.....	.....	327	327	100	80	.....	20	7,717
Southern Okanagan Collieries, Ltd.	426	.....	.....	426	.....	.....	.....	.....	.....	.....	.....	.....	426
Sunshine Coal Co.	40	.....	.....	40	.....	.....	.....	.....	.....	.....	.....	.....	40
Totals, Nicola-Princeton District	173,672	283	.....	173,955	1,275	.....	12,151	13,426	549	321	.....	228	187,153
Northern District.													
Telkwa Collieries, Ltd.	1,260	.....	.....	1,260	.....	.....	.....	.....	.....	.....	.....	.....	1,260
Grand totals, Coast District	1,116,025	96,692	.....	1,212,717	155,889	.....	125,111	281,000	48,297	36,168	2,484	14,613	1,481,588
East Kootenay District.													
Crow's Nest Pass Coal Co., Ltd.—													
Coal Creek Colliery	112,948	174,684	.....	287,632	.....	53,732	29,436	83,168	5,491	745	.....	4,746	366,054
Michel Colliery	258,332	574	.....	258,906	.....	89,106	16,073	105,179	290	.....	.....	290	363,795
Corbin Coals, Ltd.	47,444	21,975	.....	69,419	.....	.....	6,166	6,166	3,110	46,124	43,014	.....	118,599
Totals, East Kootenay District	418,724	197,233	.....	615,957	.....	142,838	51,675	194,513	8,891	46,869	43,014	5,036	848,448
Coal.													
Grand total for Province	1,534,749	293,925	.....	1,828,674	155,889	142,838	176,786	475,513	57,188	83,037	45,498	19,649	2,330,036

Collieries of British Columbia—Men employed, 1926.

Mine.	White Men.																		Indians.			Japanese and Chinese.									Total Men employed.		
	Supervision and Clerical.			Miners.			Helpers.			Labourers.			Mechanics and Skilled Labour.			Boys.			Labourers.			Miners.			Helpers.			Labourers.					
	U.	A.	T.	U.	A.	T.	U.	A.	T.	U.	A.	T.	U.	A.	T.	U.	A.	T.	U.	A.	T.	U.	A.	T	U.	A.	T.	U.	A.	T.	U.	A.	T.
Vancouver Island.																																	
Canadian Collieries (D.), Ltd.—																																	
South Wellington	6	2	8	72	..	72	..	..	..	19	13	32	5	9	14	..	6	6	..	..	..	..	..	.	..	..	..	..	..	..	102	30	132
Extension	21	14	35	260	..	260	8	..	8	75	15	90	22	56	78	..	16	16	..	..	..	..	..	..	..	..	..	6	47	53	392	148	540
Comox	27	17	44	106	..	106	3	..	3	65	41	106	76	72	148	6	2	8	..	..	..	115	..	116	99	..	99	72	23	95	569	155	724
Western Fuel Corp. of Canada, Ltd.—																																	
No. 1, Nanaimo	26	26	52	178	..	178	..	..	..	186	72	258	82	54	136	21	18	39	..	1	1	..	..	..	..	..	..	..	64	64	493	235	728
Reserve	11	9	20	127	..	127	6	..	6	68	29	97	19	30	49	13	12	25	1	..	1	..	..	..	..	..	..	..	43	43	245	123	368
Wakesiah	6	5	11	54	..	54	2	..	2	30	15	45	10	14	24	9	7	16	.	..	..	..	..	..	..	..	..	..	15	15	111	56	167
Nanoose-Wellington Collieries, Ltd.—																																	
Lantzville	20	7	27	99	..	99	21	..	21	33	7	45	25	13	38	..	6	6	..	..	..	..	..	..	.	..	..	..	21	21	203	54	257
King & Foster Coal Co., Ltd	3	3	6	31	..	31	..	..	..	12	16	28	..	6	6	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	47	25	72
East Wellington Coal Co., Ltd	2	3	5	70	..	70	..	..	..	44	4	48	17	9	26	6	6	12	..	..	..	..	..	..	..	..	..	12	12	139	34	173
Granby C. M. S. & P. Co., Ltd.—Cassidy	8	9	17	121	..	121	..	..	..	..	34	34	50	20	70	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	179	63	242
Totals, Vancouver Island	130	95	225	1118	..	1118	40	..	40	537	246	783	306	283	589	56	73	129	1	1	2	115	..	115	99	..	99	78	225	303	2480	923	3,403
Nicola-Princeton District.																																	
Middlesboro Collieries, Ltd	10	3	13	40	..	40	18	..	18	14	11	25	..	10	10	..	4	4	..	..	..	..	..	..	..	..	..	..	..	..	82	28	110
Princeton-B.C. Colliery, Ltd.*	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Coalmont Collieries, Ltd	13	13	26	114	..	114	..	..	..	61	85	146	1	24	25	3	2	5	..	..	..	..	..	..	..	..	..	1	1	192	125	317
Tulameen Valley Coal Co., Ltd	1	3	4	10	..	10	2	..	2	..	5	5	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	13	9	22
Keystone Coal Co., Ltd	2	..	2	5	..	5	4	..	4	..	3	3	..	2	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11	5	16
Southern Okanagan Collieries, Ltd	1	2	3	5	..	5	1	..	1	..	2	2	..	2	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7	6	13
Sunshine Coal Co., Ltd	..	..	..	3	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..	3
Totals, Nicola-Princeton District	27	21	48	177	..	177	25	..	25	75	106	181	1	39	40	3	6	9	..	..	..	..	..	..	..	..	..	1	1	308	173	481
Northern District.																																	
Telkwa Collieries, Ltd	1	..	1	2	..	2	2	..	2	1	..	1	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7	..	7
Grand totals, Coast District	158	116	274	1297	..	1297	67	..	67	613	352	965	308	322	630	59	79	138	1	1	2	115	..	115	99	..	99	78	226	304	2795	1096	3,891
East Kootenay District.																																	
Crow's Nest Pass Coal Co., Ltd.—																																	
Coal Creek Colliery	24	12	36	255	..	255	..	..	..	47	68	115	159	106	265	9	2	11	..	..	..	..	..	..	..	..	..	..	..	494	188	682
Michel Colliery	16	9	25	199	..	199	..	..	..	33	102	135	144	83	227	16	12	28	..	..	..	..	..	.	..	..	..	..	..	408	206	614
Corbin Coals, Ltd	4	10	14	35	..	35	10	..	10	5	28	33	6	35	41	..	2	2	..	..	..	..	..	..	..	..	..	..	..	..	60	75	135
Totals, East Kootenay District	44	31	75	489	..	489	10	..	10	85	198	283	309	224	533	25	16	41	..	..	..	..	..	..	..	..	..	..	..	..	962	469	1,431
Grand totals for Province	202	147	349	1786	..	1786	77	..	77	698	550	1248	617	546	1163	84	95	179	1	1	2	115	..	115	99	..	99	78	226	304	3757	1565	5,322

* Company in receivership since April 30th, 1926.

Note.—U=underground; A=above ground; T=total.

LABOUR AND EMPLOYMENT.

During the year 1926 there were 5,322 persons employed in and about the coal-mines of the Province, a decrease of a little over 2 per cent. as compared with 1925.

The collieries of the Province were entirely free from labour disputes during the year, the only time lost being through lack of trade.

Apart from the regular holidays, the mines in Vancouver Island District lost about 18 per cent. of the working-days through lack of trade.

In the Nicola-Princeton District the different collieries worked from 75 to 95 per cent. of the working-days, averaging for the district about 88 per cent. of the working-days.

The mines in the East Kootenay District worked from 68 per cent. at the lowest to 82 per cent. at the highest of the working-days during the year, and worked for an average for the whole district about 77 per cent. of the time.

The table on page 344 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 as required by section 66 of the "Coal-mines Regulation Act."

FUEL-OIL COMPETITION.

The importation and use of fuel-oil continues to be the greatest competitor of the coal produced in British Columbia.

In 1924 there were 98,351,974 gallons of fuel-oil imported into British Columbia; in 1925 the importation rose to 108,836,183 gallons, while in 1926 the quantity imported was 106,160,145 gallons. This amount of fuel-oil displaces the use of approximately 750,000 tons of coal a year.

The most hopeful sign from the coal-mining view is that the consumption of fuel-oil on the Pacific coast is now in excess of the production, with the result that the price has very considerably increased.

A large section of the Great Northern Railway has changed over from the use of fuel-oil in its locomotives to coal; much of this coal will be supplied from the Crowsnest Pass District.

ACCIDENTS IN AND AROUND COAL-MINES.

During 1926 there were 5,322 persons employed in and around the coal-mines. Ten fatal accidents occurred during the year, as compared with six for 1925.

The ratio of fatal accidents per 1,000 persons employed was 1.88, as compared with 1.10 in 1925; in 1924 the ratio was 1.66; in 1923, 7.32; in 1922, 4.66; in 1921, 1.45; in 1920, 2.67; in 1919, 2.10; in 1918, 5.15; in 1917, 8.51; averaging 3.6 for the ten-year period.

The number of fatal accidents per 1,000,000 tons produced during 1926 was 4.3. During 1925 the fatalities per 1,000,000 tons was 2.45; in 1924, 4.52; in 1923, 17.6; in 1922, 12.01; in 1921, 3.98; in 1920, 6.30; in 1919, 4.98; in 1918, 10.86; in 1917, 18.34; the average for the ten-year period being 8.53 per 1,000,000 tons mined.

The following table shows the collieries at which the fatal accidents occurred during 1926 and comparative figures for 1925:—

Name of Company.	Name of Colliery.	1926.	1925.
Canadian Collieries (D.), Ltd.	Comox, No. 4 mine	1	....
Canadian Collieries (D.), Ltd.	Extension	....	1
Canadian Collieries (D.), Ltd.	South Wellington, No. 5 mine	....	1
Western Fuel Corporation of Canada	Wakesiah mine	....	2
Western Fuel Corporation of Canada	Reserve mine	2	1
Granby Cons. Mining, Smelting and Power Co., Ltd.	Granby, No. 1 mine	4	1
East Wellington Coal Co., Ltd.	East Wellington	1	....
Crow's Nest Pass Coal Co., Ltd.	Coal Creek	1	....
Crow's Nest Pass Coal Co., Ltd.	Michel	1	....
Totals		10	6

The following table shows the various causes of fatal accidents and their percentage of the whole, with corresponding figures for the year 1925:—

Cause.	1926.		1925.	
	No.	Per Cent.	No.	Per Cent.
Falls of rock	3	30.00	4	66.67
Falls of coal	1	10.00	....	.....
Blow-outs of gas and material	3	30.00	....	.....
Mine-cars and haulage	2	20.00	1	16.67
Miscellaneous (underground)	1	10.00	1	16.66
Totals	10	100.00	6	100.00

The following table shows the number of tons of coal mined for each fatal accident in their respective classes in the years 1926 and 1925:—

Cause.	1926.		1925.	
	No. of Fatal Accidents.	No. of Tons of Coal mined per Fatal Accident.	No. of Fatal Accidents.	No. of Tons of Coal mined per Fatal Accident.
Falls of rock	3	776,665	4	611,073
Falls of coal	1	2,329,996	....	.....
Mine-cars and haulage	2	1,164,998	1	2,444,292
Blow-outs of gas and material	3	776,665	....	.....
Miscellaneous (underground)	1	2,329,996	1	2,444,292
Totals	10	232,999	6	407,382

The number of tons mined per fatal accident during 1926 was 232,999 tons, compared with 407,382 tons for 1925; the average for the last ten years was 115,747 tons.

The following table shows the fatalities from various causes in coal-mines during the year 1926 and comparisons with 1925, classified according to Inspection Districts:—

District.	Number of Deaths from Accidents.						Total.		Accident Death-rate.			
	Explosions of Fire-damp.	Falls of Ground.	Blow-outs of Gas and Material.	Haulage and Mine-cars.	Miscellaneous (Underground).	On Surface.	1926.	1925.	Per 1,000 Persons employed.		Per 1,000,000 Tons of coal mined.	
									1926.	1925.	1926.	1925.
Vancouver Island	....	3	3	2	....	....	8	6	2.35	1.73	6.18	4.24
Nicola-Princeton	....	....	....	....	....	....	....	....	.....	.....	.....	.....
East Kootenay	....	1	....	....	1	....	2	....	1.39	.....	2.35	.....
Northern	....	....	....	....	....	....	....	....	.....	.....	.....	.....
Province (1926)	....	4	3	2	1	....	10	....	1.88	.....	4.29	.....
Province (1925)	....	4	....	1	1	....	....	6	.....	1.10	.....	2.45

The following table shows the ratio of accidents per 1,000 employees and per 1,000,000 tons of coal mined in the Coast and East Kootenay Inspection Districts for the ten-year period ended December 31st, 1926:—

District.	No. of Fatalities.	Accident Death-rate.	
		Per 1,000 Employees.	Per 1,000,000 Tons of Coal mined.
Coast	162	3.6	9.1
East Kootenay	51	3.5	8.1
For Province	213	3.6	8.6

Details surrounding the occurrence of the fatal accidents in coal-mines during 1926 are as follows:—

The fatal accident which occurred to John Gray, miner, on February 4th in the Reserve mine, Western Fuel Corporation of Canada, Limited, was caused by a fall of top and side coal while engaged in retimbering preparatory to starting a new skip in pillar-extraction; some loose coal fell against the timbers, which gave way and allowed the roof-coal to fall; more care would have prevented this accident.

The fatal accident which occurred to David Alton, miner, on March 25th in Cassidy mine, operated by the Granby Consolidated Mining, Smelting, and Power Company, was caused by a blow-out of dirty coal and gas. The blow-out apparently gave no warning and the material displaced covered deceased. The seam in this immediate area was only 10 inches thick and consisted largely of dirt.

The fatal accident whereby Frank Sundberg and Bert Conti were killed on April 6th in the Cassidy mine, operated by the Granby Consolidated Mining, Smelting, and Power Company, was a blow-out of coal and gas. The seam at this point is comparatively thin and where the blow-out occurred the coal was only 18 inches thick, increasing to about 36 inches at the other side of the place; more details of this and the previous accident are given in another part of this report.

The fatal accident which occurred to How Tai, Chinese driver, No. 4 mine, Comox Colliery, on May 22nd, was apparently caused by being caught and crushed by a loaded car which was being hauled by the mule in charge of deceased. There was a slight grade at this point and the driver should have kept behind the car.

The fatal accident which occurred to Nick Tonick, rope-rider, on July 14th, Coal Creek Colliery, was caused by an empty trip, in charge of deceased, entering by mistake and at a high speed a level off the Main slope. This happened on the afternoon shift, when only a few trips are hauled, and deceased had charge of directing the trips and setting the switches to suit.

He had either omitted to close the switch for this level or else had failed to give the hoistman the signal for entering the level, with the result that the trip entered this level at the ordinary speed normal to the straight slope. The trip was derailed, displaced some of the supporting timbers, and caused a cave which resulted in the death of Tonick.

The fatal accident which occurred to Joseph Burns, rockman, Michel Colliery, on July 17th, was caused by deceased taking out a centre post from under a collar by use of a hammer, instead of using a prop-withdrawer as he was ordered to do just prior to the accident. The prop-withdrawer was convenient and was in daily use for this purpose.

When deceased drove the centre post from its position the roof caved on him, with fatal results. Obedience to the regulations and special orders given would have prevented this accident.

The fatal accident which occurred to William Foy, miner, Reserve mine, on August 21st, was due to a deficiency of timbering at the working-face; this allowed some roof matter to fall on Foy, with fatal results. Closer observance of the special rules *re* timbering would probably have prevented this accident.

The fatal accident which occurred to Thomas C. Wales, rope-rider, in Cassidy mine, on September 13th, was apparently caused by deceased slipping while boarding a single car being hauled up a short slope at low speed, and being run over or crushed by the car. This man

was wearing rubber shoes, the place was wet, and it is supposed that he had slipped and fallen in front of the car.

The fatal accident to George Edgar, miner, in No. 1 mine, East Wellington Coal Company, on November 10th, was due to a fall of roof. Deceased was apparently engaged in timbering this part of the roof that fell on him, with fatal results; a temporary post would have prevented this accident.

It will be seen that all the foregoing accidents, excepting those due to blow-outs, could have been prevented by the exercise of more care and a realization of the results of dangerous practice.

EXPLOSIVES.

The following table shows the quantity of explosives used in coal-mines during 1926, together with number of shots fired, how shots were fired, tons of coal produced per pound explosive used, and the average pounds of explosives per shot fired (these quantities include all explosives used for breaking coal and for rock-work in coal-mines):—

Vancouver Island District.

Colliery and Mine.	Quantity of Explosive 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.
Nanaimo—					
No. 1 mine	71,757	323,533	96,328	4.51	0.744
Reserve mine	57,453	180,591	76,708	3.14	0.748
Wakesiah mine	16,561	40,197	21,262	2.42	0.778
Comox, Nos. 4 and 5 mines	35,755	270,788	43,883	7.57	0.816
Extension, Nos. 1, 2, 3, and 6	66,670	175,811	89,108	2.63	0.748
South Wellington, No. 5	21,550	47,434	36,650	2.20	0.588
Granby, No. 1 mine	13,380	167,286	12,123	12.50	1.103
Nanoose, Lantzville	10,587	27,459	20,000	2.59	0.529
East Wellington, No. 1	18,251	43,474	25,440	2.38	0.717
King & Foster Coal Co.	48,000	16,602	40,000	0.35	1.200
Total for district	359,964	1,293,175	461,502	3.59	0.779

Nicola-Princeton District.

Middlesboro, Nos. 2, 3, and 4	17,200	43,474	24,850	2.52	0.692
Keystone, Nos. 4 and 6	4,380	7,717	5,490	1.76	0.797
Coalmont, Nos. 3 and 4	38,345	121,458	55,891	3.19	0.686
Princeton, No. 1 shaft	200	813	240	4.06	0.833
Tulameen, No. 1	3,000	13,225	6,000	4.43	0.500
Sunshine Coal Co.	.....	40	.....	.....	.....
Southern Okanagan Colliery	400	426	1,300	1.06	0.308
Total for district	63,525	187,153	93,771	2.94	0.677

Northern District.

Telkwa, Goat Creek	550	1,260	625	2.29	0.880

East Kootenay District.

Coal Creek, Nos. 2, 3, 1 E., 1 S., and 9	4,496	366,054	3,516	81.41	1.278
Michel, Nos. 3 and 8	17,468	363,795	18,729	20.82	0.932
Corbin, Nos. 3, 4, and 5	18,115	118,599	14,075	6.54	1.286
Total for district	40,079	848,448	36,320	21.16	1.120
Total for Province	464,118	2,330,036	592,218	5.02	0.783

QUANTITIES OF DIFFERENT EXPLOSIVES USED.

	Lb.
Monobels of different grades	417,756
Miner's Friend	4,150
Coalite "A"	1,009
Gelpermite	37,803
Stumping-powder	3,400
Total	464,118

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 (2), "Coal-mines Regulation Act":—

Nobel Monobel.
Polar Monobel No. 3.
Polar Monobel No. 4.
Polar Monobel No. 6.
Coalite "C" L.F.
Miner's Friend No. 6.
Miner's Friend No. 9.
Polar CXL-ite.
Gelpermite No. 1.

MACHINE-MINED COAL.

During the year 1926 mining-machines produced 141,180 tons of coal, or 6.06 per cent. of the total. Of the total machine-mined coal, Vancouver Island District produced 138,836 tons, or 98.3 per cent., and East Kootenay District 2,344 tons, or 1.7 per cent.

The following tables give the district, number of machines, how driven, tons of coal produced, and type of machine used:—

District.	Number driven by		Tons of Coal produced.		Total Tons (2,240 lb.).
	Electricity.	Compressed Air.	Electricity.	Compressed Air.	
Vancouver Island	9	20	3,751	135,085	138,836
Nicola-Princeton	....	....	.....	.....	.....
East Kootenay	....	2	.....	2,344	2,344
Northern	....	....	.....	.....	.....
Totals	9	22	3,751	137,429	141,180

TYPES OF MACHINES IN USE.

Type.	Districts.				Total.
	East Kootenay.	Nicola-Princeton.	Vancouver Island.	Northern.	
M.C. Pick-quick cutter-bar	....	....	5	....	5
Siskol punchers	....	....	9	....	9
Sullivan chain-cutters	....	....	13	....	13
Radialaxe punchers	....	....	2	....	2
Hardy Post-type punchers	1	....	....	....	1
Sullivan coal-puncher	1	....	....	....	1
Totals	2	....	29	....	31

The machine-mined coal produced by the different companies during 1926 and comparative figures for 1925 are as follows:—

	1926. Tons.	1925. Tons.
Western Fuel Corporation of Canada, Nanaimo	86,241	86,683
Canadian Collieries (D.), Ltd., Comox	3,751	3,988
Nanoose-Wellington Collieries, Ltd.	10,587	9,348
East Wellington Coal Co., Ltd.	38,257	30,962
Princeton-B.C. Colliery	.....	7,079
Crow's Nest Pass Coal Co., Ltd., Michel	1,644	340
Corbin Coals, Ltd.	700	.....
Totals	141,180	138,400

SAFETY-LAMPS.

There were 4,661 safety-lamps in use in the coal-mines of the Province. Of this number, 329 were flame-lamps of the Wolf type and 4,347 were electric lamps of various makes, as follows: Edison, 3,560; Wheat, 787. No open lights are allowed in the coal-mines of British Columbia.

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

VANCOUVER ISLAND DISTRICT.

Colliery and Mine.	Method of Locking Lamp.		Illuminant used.	
	Magnetic Lock.	Screw or Automatic Clip.	Naphtha Gasolene.	Electricity.
Nanaimo—				
No. 1 mine	66	560	66	560
Reserve mine	14	259	14	259
Wakesiah mine	10	126	10	126
Comox, Nos. 4 and 5 mines	26	598	26	598
Extension, Nos. 1, 2, 3, and 6	29	538	37	530
South Wellington, No. 5	....	139	7	132
Granby, No. 1 mine	8	180	8	180
Nanoose-Wellington	20	275	20	275
East Wellington, No. 1	10	165	10	165
King & Foster Coal Co.	3	60	3	60
Totals for district	186	2,900	201	2,885

NICOLA-PRINCETON DISTRICT.

Middlesboro, Nos. 2, 3, and 4	12	80	12	80
Keystone, Nos. 4 and 6	3	12	3	12
Coalmont, Nos. 3 and 4	10	240	10	240
Tulameen, No. 1	1	27	1	27
Southern Okanagan Colliery	2	.....	2	.....
Princeton, No. 1 shaft	....	.....	....	.....
Totals for district	28	359	28	359

NORTHERN DISTRICT.

Telkwa, Goat Creek	8	.....	8	.....

EAST KOOTENAY DISTRICT.

Coal Creek, Nos. 2, 3, 1 E., 1 S., and 9	65	570	65	570
Michel, Nos. 3 and 8	27	463	27	463
Corbin, Nos. 3, 4, and 5	10	70	10	70
Totals for district	102	1,103	102	1,103
Totals for Province	324	4,362	339	4,347

The following is a list of safety-lamps permitted for use in the coal-mines of British Columbia:—

APPROVED (ELECTRIC) SAFETY-LAMPS.

No. 1.—The electric lamp manufactured by the Edison Storage Battery Co., Orange, N.J., U.S.A., under approval No. 10 of the United States Bureau of Mines. This lamp shall be used with a flexible cord identified by the Bureau's specification CD-17. The only bulbs approved for use with this lamp are the symbol BM-10 bulbs, manufactured by the National Lamp Works of

the General Electric Co., Cleveland, Ohio; the symbol BM–10 bulbs, manufactured by the Edison Works of the General Electric Co., Harrison, N.J.; the symbol 26–V bulbs, manufactured by the Miniature Incandescent Lamp Corporation, 95 Eighth Avenue, Newark, N.J.; and the symbol BM–10 bulbs, manufactured by the Westinghouse Lamp Co., Bloomfield, N.J.

No. 2.—The Concordia approved portable electric (hand-lamp) mine-lamp, manufactured by the Concordia Electric Co., Pittsburgh, Pa., under approval No. 12 of the United States Bureau of Mines. The only bulbs approved for use with this lamp are the symbol Osram 08510 bulbs, sold by the Concordia Electric Company.

No. 3.—The Wico approved portable electric mine-lamp, manufactured by the Witherbee Igniter Co., Springfield, Mass., under approval No. 14 of the United States Bureau of Mines. This lamp shall be used with a flexible cord identified by the Bureau's specification CD–43. The only bulbs approved for use with the lamp are the symbol BM–14 bulbs, manufactured by the Edison Lamp Works of the General Electric Co., Harrison, N.J.

No. 4.—The Concordia approved permissible portable electric mine-lamp, manufactured by the Concordia Electric Co., Pittsburgh, Pa., under approval No. 12 of the United States Bureau of Mines. This lamp shall be used with a flexible cord identified by the Bureau's specification CD–17. The only bulbs approved for use with this lamp are the BM–15 bulbs, manufactured by the Nation Lamp Works of the General Electric Co., Cleveland, Ohio.

No. 5.—The Pioneer approved portable electric mine-lamp, manufactured by the Pioneer Electric Mine Lamp Co., Philadelphia, Pa., under approval No. 16 of the United States Bureau of Mines. This lamp shall be used with a flexible cord identified by the Bureau's specification No. CD–31, and with battery-plates manufactured by the Electric Storage Battery Co., Philadelphia, Pa. The only bulbs approved for use with this lamp are the BM–16 bulbs, manufactured by the Edison Lamp Works of the General Electric Co., Harrison, N.J.

No. 6.—The Wheat approved portable electric mine-lamp, manufactured by the Koehler Manufacturing Co. (Inc.), Marlboro, Mass., under approval No. 17 of the United States Bureau of Mines. This lamp shall be used with a flexible cord identified by the Bureau's specification CD–31, and with battery-plates manufactured by the General Lead Battery Co., Newark, N.J. The only bulbs approved for use with this lamp are the BM–17 bulbs, manufactured by the National Lamp Works of the General Electric Co., Cleveland, Ohio.

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

Approved (Flame) Safety-lamps.

No. 12.—The bonneted, double-gauze lamp, with magnetic lock, known as the Wolf lamp.

No. 13.—The flat-wick steel-frame lamp, as specified in approval No. 201 of the United States Bureau of Mines, manufactured by the Koehler Manufacturing Co., Marlboro, Mass., U.S.A.

No. 14.—The round-wick steel-frame lamp, as specified in approval No. 201–A of the United States Bureau of Mines, manufactured by the Koehler Manufacturing Co., Marlboro, Mass., U.S.A.

No. 15.—The flat-wick steel-frame lamp, as specified in approval No. 202 of the United States Bureau of Mines, manufactured by Ackroyd & Best, Ltd., Arrott Power Building, Pittsburgh, Pa., U.S.A.

No. 16.—The flat-wick aluminium-frame lamp, as specified in approval No. 203 of the United States Bureau of Mines, manufactured by the Koehler Manufacturing Co., Marlboro, Mass., U.S.A.

No. 17.—The round-wick aluminium-frame lamp, as specified in approval No. 203–A of the United States Bureau of Mines, manufactured by the Koehler Manufacturing Co., Marlboro, Mass., U.S.A.

Approvals Nos. 201, 201–A, 203, and 203–A apply to magnetic-lock lamps that are equipped with steel gauzes. The only glasses approved for use with these lamps are marked "Macbeth No. 2100 High Speed." The only igniter approved for use with these lamps is the Koehler pyro internal igniter, 1915 model, using a cerium-zinc-copper alloy for igniter-points.

Approval No. 202 applies to a magnetic-lock lamp. The only glasses approved for use with this lamp are marked as follows:—

ACKD
BEST
A–1

This lamp is relighted electrically. The only relighter approved for this lamp is the Ackroyd & Best underground relighter.

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.*

ELECTRICITY.

Electric power is used for various purposes on the surface at fifteen mines and underground at eight mines. The purpose for which it was used, together with the amount of horse-power in each instance, is shown in the following table:—

Above ground— Nature of its Use.	Aggregate H.P.
Winding or hoisting	1,257
Ventilation	1,985
Haulage	424
Pumping	20
Coal washing or screening	1,967
Miscellaneous	1,655
Total horse-power	7,308
Underground—	
Haulage	1,800
Pumping	1,060
Coal-cutting	240
Miscellaneous	484
Total horse-power	3,584
Total horse-power above and under ground	10,892

Of the above amount, approximately 2,000 horse-power was operated as direct current and 8,892 horse-power as alternating current.

The electrical regulations passed in 1925 prohibits the use of electric locomotives by the open trolley-wire system after the 1st day of January, 1930, and no new installations of this system have been permitted since the above regulations were passed.

VENTILATION.

The District Inspectors' reports give details regarding the ventilation in the splits and main returns of the various mines. In one or two instances demands had to be made during the year for increases in the amount of air being circulated in a few of the splits in a few mines, but on the whole the provisions requiring adequate ventilation were generally well observed at the different mines.

USE OF THE BURRELL GAS INDICATOR.

The Burrell Gas Indicator is used in practically every ventilating-split at least once a month and continues to be the approved method for determining the CH_4 content in the mine atmosphere where the percentage is too small to be detected by means of the flame safety-lamp.

MINE-AIR SAMPLES.

Mine-air sampling was carried out as usual during the year and 223 samples were collected in the coal-mines of the Province; of this number, thirty-eight were spoiled in transit and accidents in the laboratory. While samples were taken in all mines at intervals, this method is carried out most intensively in the mines of the Crowsnest Pass District, where the gas-outflow is much higher than in the other mining districts of the Province.

The following table shows the analyses of mine-air samples taken in the various splits and main returns of the coal-mines in the Province during 1926 (the detailed analyses of mine-air samples taken in other portions of the various mines are on file in the office of the Chief Inspector of Mines):—

Return from Mine-air Samples taken in the Various Splits and Main Return Airways of the Coal-mines of the Province during the Year 1926.

Sample No.	Date.	Mine.	Ventilating District.	Working or Idle.	Tonnage per Day.	Tonnage of Split per Day.	Chemical Analyses.				Velocity of Air in Feet per Minute.	Quantity of Air in Cubic Feet per Minute.	Barometer.	Hygrometer.			Cubic Feet of Methane per Minute.	Cubic Feet of Methane per Day.	Cubic Feet of Methane per Ton.	Tons Methane per Day.
							CO_2.	O.	CH_4.	N.				Wet Bulb.	Dry Bulb.	Humidity.				
		Vancouver Island.																		
55D	Jan. 7	East Wellington....	Return shaft.....	Working ...	300	....	0.15	20.64	0.51	78.70	420	21,000	30.80	....	....	.....	107	154,080	514	2.23
57D	" 13	" " ...	Long-wall return.....	Idle	300	....	0.15	20.83	0.28	78.84	100	2,000	30.60	....	....	.....	7	10,080	33	0.21
58D	" 14	Nanoose-Wellington.	Main return.....	Working ...	300	....	0.16	20.63	0.21	79.00	700	45,000	30.00	54.0	56.0	87.0	94	135,360	451	2.84
61D	March 11	" " .	"	" ...	300	....	0.10	20.80	0.10	79.00	650	45,500	30.40	53.0	56.0	81.0	45	64,800	216	1.36
320	June 28	No. 4, Comox (C.C.)	No. 1 slope return.....	" ...	600	....	0.16	20.75	0.08	79.01	400	50,000	29.81	61.0	61.0	100.0	40	57,600	96	1.21
321	" 28	" "	No. 2 Slope return.....	" ...	400	....	0.17	20.80	0.06	78.97	2,500	90,000	29.80	62.0	62.0	100.0	54	77,760	194	1.63
328	Aug. 6	" "	No. 1 split, No. 1 slope..	" ...	600	200	0.64	19.60	0.26	79.50	200	13,000	29.80	59.0	60.0	95.0	34	48,960	245	1.02
M1	Dec. 7	Well.-Exten., No. 5	Main return.....	" ...	200	....	0.31	20.64	0.28	78.97	400	16,000	30 25	58.0	60.0	88.0	45	64,800	324	1.36
335	" 8	No. 1 mine (W.F.C.)	Main South return.....	" ...	1225	600	0.35	20.29	0.12	79.26	400	16,000	30.20	58.0	59.0	94.0	19	27,360	45	0.57
336	" 8	" "	Slope return.....	" ...	1225	200	0.12	20.62	0.28	78.98	275	11,000	30.20	57.0	58.0	94.0	31	44,640	223	0.93
337	" 8	" "	No. 3 Level return.....	" ...	1225	212	0.39	19.86	0 16	79.59	649	22,700	30.20	57.0	58.0	94.0	36	51,840	244	1.08
338	" 10	Cassidy.....	Main return.....	" ...	630	....	0.18	20.60	0.26	78.96	1,070	154,080	29 20	50.6	52.0	86.0	400	576,000	914	12.09
339	" 10	"	South Side return	" ...	630	330	0.11	20.78	0.12	78.99	900	72,000	29.20	50.0	52.0	86.0	86	123,840	375	2.60
M5	" 15	Reserve (W.F.C.) ...	Main return.....	" ..	720	....	0.20	20.53	0.10	79.17	980	29,400	29.85	57.0	58.0	94.0	29	41,760	58	0.80
M9	" 16	East Wellington	"	" ...	250	....	0.15	20.75	0.20	78.90	900	19,800	30.02	57.0	58 0	94.0	40	57,600	230	1.21
341	" 20	No. 4, Comox (C.C.)	No. 1 Slope return.....	" ...	600	....	0.20	20.54	0.54	78.72	300	14,000	29.70	57.0	58.0	94.0	75	108,000	180	2.26
342	" 20	" "	No. 2 Slope return.....	" ...	500	....	0.06	20.86	0.04	79.04	250	12,000	29.70	57.0	58.0	94.0	5	7,200	14	0.15
343	" 27	No. 1 mine (W.F.C.)	Main North return.....	" ...	1225	600	0.24	20.44	0.06	79.26	860	56,000	30.00	60.0	62.0	90.0	33	47,520	79	0.99
344	" 27	" "	Main South return.. ...	" ...	1225	625	0.36	20.06	0.13	79.45	700	40,000	30.00	57.0	58.0	94.0	52	74,880	120	1.57
347	" 30	No. 4, Comox (C.C.)	No. 1 Slope return.....	" ...	500	....	0.48	19.83	0.27	79.42	450	55,000	29.60	57.0	58.0	94.0	148	213,120	426	4.47
		Michel.																		
556	May 10	No. 3 mine.....	No. 3 split.....	" ...	860	120	0.13	20.53	1.40	77.94	110	8,580	26.49	49.0	49.0	100.0	120	172,800	1,440	3.19
557	" 10	"	No. 4 split.....	" ...	860	180	0.09	20.53	1.28	78.10	200	16,500	26.49	51.0	51.0	100.0	211	303,840	1,688	5.62
558	" 10	"	No. 5 split.....	" ...	860	180	0.08	20.16	0.96	78.33	900	36,000	26.49	48.5	48.5	100.0	345	496,800	2,760	9.19
559	" 10	"	Main return.....	" ...	860	....	0.19	20.53	0.64	78.64	900	90,000	26.49	51 0	51.0	100.0	576	829,440	964	15.34
563	June 11	"	No. 3 split.....	" ...	860	120	0.10	20.55	1.47	77.88	80	6,720	26.20	50.0	50.0	100.0	99	142,560	1,188	2.63
564	" 11	"	No. 4 split.	" ...	860	180	0.15	20.46	1.59	77.80	280	16,800	26.20	53.0	53.5	97.0	267	384,480	2,136	7.11
565	" 11	"	No. 5 split.....	" ...	860	180	0.12	20.58	1.09	78.21	900	36,000	26 20	51.0	51.0	100.0	392	564,480	3,136	10.45
566	July 9	"	No. 3 split.....	" ...	850	280	0.46	20.25	0 84	78 45	140	11,760	26.30	53.0	53.5	97.0	99	142,560	509	2.63
567	" 9	"	No. 4 split.....	" ...	850	210	0.08	20.59	0.96	78.37	240	21,600	26.30	53.0	53.0	100.0	207	298,080	1,419	5.51
569	Sept. 13	"	No. 4 split.....	" ...	850	210	0.12	20.62	1.04	78.22	310	24,800	26.10	...	...	.....	258	371,520	1,769	6 87
570	" 13	"	Main return	" ...	850	....	0.20	20.50	0.66	78.64	1,160	116,000	26.10	.....	.....	.....	766	1,103,040	1,297	20.40
		Coal Creek.																		
1394	Jan. 15	No. 1 East mine	No. 1 split.....	" ...	690	165	0.15	20.51	1.02	78.32	210	14,700	25.60	56.0	56.0	100.0	150	216,000	1,309	3.89
1395	" 15	"	No. 3 split.....	" ...	690	150	0.15	20.62	1.61	77.82	200	18,000	25.60	53.0	56.0	81.0	290	417,600	2,784	7.72
1396	" 15	"	No. 4 split.	" ..	690	120	0.11	20.64	0.89	78.36	160	12,800	25.60	50.0	51.0	93.0	114	164,160	1,368	3.03
1397	" 15	"	North return.....	" ...	690	525	0.15	20.48	1.06	78.31	1,200	108,000	25 60	54 5	55.5	93.0	1,145	1,648,800	3,140	30.50
1401	" 21	No. 2 mine.....	No. 4 Incline District...	" ...	400	200	0.28	20.34	0.65	78.73	170	13,600	26.00	70.0	70.0	100.0	88	126,720	633	2.34
1407	March 11	"	No. 1 split.....	" ...	400	200	0.25	20.43	1.08	78.24	340	17,000	26.00	58.5	59.5	93.0	184	264,960	1,324	4.90
1408	" 15	No. 1 East mine	No. 3 split.....	" ...	675	120	0.10	20.55	1.11	78.24	300	25,500	26.00	50.0	51.0	93.0	283	407,520	3,396	7.54

RETURN FROM MINE-AIR SAMPLES TAKEN IN THE VARIOUS SPLITS AND MAIN RETURN AIRWAYS OF THE COAL-MINES OF THE PROVINCE DURING THE YEAR 1926—*Continued.*

Sample No.	Date.	Mine.	Ventilation District.	Working or Idle.	Tonnage per Day.	Tonnage of Split per Day.	Chemical Analyses.				Velocity of Air in Feet per Minute.	Quantity of Air in Cubic Feet per Minute.	Barometer.	Hygrometer.			Cubic Feet of Methane per Minute.	Cubic Feet of Methane per Day.	Cubic Feet of Methane per Ton.	Tons Methane per Day.
							CO_2.	O.	CH_4.	N.				Wet Bulb.	Dry Bulb.	Humidity.				
		Coal Creek—Contd.																		
1409	March 17	No. 3 mine	No. 1 split	Working	400	25	0.10	20.69	0.75	78.46	160	9,600	25.50	58.0	58.5	97.0	72	103,680	4,147	1.91
1415	" 29	No. 2 mine	No. 2 split	"	400	200	0.49	19.99	1.08	78.44	150	13,500	25.80	70.0	71.0	93.0	146	210,240	1,051	3.88
1419	April 15	No. 1 East mine	No. 1 split	"	675	225	0.21	20.33	1.46	78.00	270	18,900	....	57.0	57.0	100.0	276	397,440	1,766	7.35
1420	May 4	No. 3 mine	"	"	400	25	0.10	20.70	0.58	78.62	190	11,400	25.30	59.0	59.0	100 0	66	94,040	3,761	1.74
1421	" 4	"	No. 2 split	"	400	375	0.33	20.09	2.11	77.48	600	36,000	25.30	64.0	64.0	100.0	760	1,094,400	2,918	20.24
1423	" 6	No. 1 East mine	No. 3 split	"	675	120	0.10	20.58	0.83	78.49	330	26,400	25.40	51.0	52.0	93.0	219	315,360	2,626	5.83
1424	" 6	"	No. 4 split	"	675	120	0.15	20.51	1.14	78.20	230	17,710	25.40	54.0	54.0	100.0	202	290,880	2,424	5.38
1426	" 15	"	No. 2 split	"	675	210	0.18	20.31	1.59	77.92	220	20,460	25.70	56.0	57.0	93.0	325	468,000	2,228	8.65
1427	" 18	No. 1 South mine	No. 1 split	"	448	196	0.25	20.28	1.18	78.29	230	13,800	25.60	54.0	56.0	87.0	163	234,720	1,200	4.34
1429	" 18	"	Main return	"	448	...	0.24	20.37	0.60	78.79	750	45,000	25.60	61.0	61.0	100.0	270	388,800	867	7.19
1430	June 12	No. 2 mine	No. 2 split	"	400	200	0.50	19.76	1.11	78.63	90	8,640	25.70	74.0	74.0	100.0	96	138,240	691	2.55
1431	" 12	"	Main return	"	400	....	0.51	20.03	0.62	78.84	700	49,000	25.70	69.0	69.0	100.0	304	437,760	1,094	8.09
1433	July 6	No. 3 mine	No. 2 split	"	425	375	0.35	20.03	2.23	77.39	580	34,800	25.25	69.0	69.0	100.0	776	1,117,440	2,979	20.67
1434	" 6	"	Main return	"	425	....	0.29	20.26	1.29	78.16	1,100	66,000	25.25	66.0	67.0	93.0	851	1,225,440	2,883	22.67
1435	" 8	No. 2 mine	"	"	400	....	0.68	19.81	0.85	78.66	450	31,500	25.45	71.0	71.0	100.0	268	385,920	965	7.13
1436	" 8	"	No. 4 incline	"	400	200	0.47	20.03	0.96	78.54	100	9,600	25.45	72.0	72.0	100.0	92	132,480	662	2.45
1437	" 13	No. 1 East mine	No. 1 split	"	675	225	0.24	20.25	1.55	77.96	300	18,000	25.60	61.0	63.0	88.0	279	401,760	1,785	7.40
1438	" 13	"	No. 2 split	"	675	210	0.24	20.17	2.04	77.55	300	27,900	25.60	58.0	59.0	93.0	569	819,360	3,901	15.15
1440	" 14	"	No. 4 split	"	675	120	0.17	20.48	1.25	78.10	180	16,200	25.55	56.0	56.0	100.0	203	292,320	2,436	5.40
1441	Aug. 4	No. 3 mine	No. 2 split	"	425	375	0.39	19.92	2.42	77.27	600	36,000	25.60	69.0	70.0	94.0	871	1,254,340	3,344	23.20
1444	" 6	No. 1 East mine	"	"	675	210	0.24	20.15	1.99	77.62	350	21,000	25.65	59.5	60.0	97.0	418	577,920	2,762	10.69
1445	" 6	"	"	"	675	120	0.17	20.50	1.16	78.17	320	20,480	25.65	56.0	58.0	87.0	238	342,720	2,856	6.24
1447	" 10	No. 3 mine	No. 1 split	"	350	60	0.35	20.02	2.23	77.30	500	30,000	25.67	70.0	71.5	92.0	699	1,006,560	16,776	18.62
1448	" 10	"	Main return	"	350	....	0.27	20.28	1.32	78.13	800	48,000	25.67	....	....	.....	634	912,960	2,608	16.88
1451	" 19	No. 1 East mine	No 2 split	"	675	210	0.17	20.47	1.13	78.23	400	28,000	25.30	60.0	61 0	93.0	316	455,040	2,166	8.41
1454	" 24	No. 3 mine	"	"	400	375	0.32	20.12	1.99	77.57	640	38,400	25.60	70.0	71.0	94.0	764	1,100,160	2,933	20.35
1455	Sept. 2	No. 1 South mine	No. 1 split	"	448	196	0.34	19.88	1.97	77.81	150	9,750	25.60	61.0	61.5	98.0	192	276,480	1,410	5.11
1456	" 2	"	No. 2 split	"	448	282	0.10	20.62	0.33	78.95	220	7,600	25.50	52 0	53.0	93.0	25	36,000	127	0.66
1457	" 2	"	Main return	"	448	....	0.36	20.08	0.97	78.59	630	40,800	25.50	64.0	64.5	98.0	396	570,240	1,272	10.54
1458	" 8	No. 3 mine	No. 1 split	"	400	25	0.16	20.67	0.56	78.61	150	9,000	25.40	61 0	62 0	93.0	50	82,000	3,280	1.51
1459	" 7	"	No. 2 split	"	400	375	0.21	20.45	1.11	78.23	570	34,200	25.40	71.0	71.0	100.0	380	547,200	1,459	10.12
1460	" 7	"	Main return	"	400	....	0.30	20.30	1.13	78.27	1,000	60,000	25.40	66.5	67.0	97.0	678	976,320	2,440	18.06
1461	" 9	No. 2 mine	Diagonal district	"	400	200	0.26	20.43	0.88	78.43	250	12,500	25.70	63.5	64.0	98.0	110	158,400	792	2.93
1462	" 9	No. 1 East mine	No. 2 split	"	675	225	0.21	20.34	1.48	77.97	530	31,800	25.60	60.0	60.0	100.0	471	678,240	3,014	12.54
1464	" 14	"	No. 3 split	"	675	120	0.15	20.53	0.86	78.46	310	26,350	25.30	56.5	57.5	93.0	227	326,880	2,724	6.05
1466	" 14	"	North return	"	675	525	0.18	20.38	1.16	78.25	1,120	100,800	25.30	57.0	57.5	98.0	1,169	1,683,360	3,206	31.14
1467	Oct. 10	No. 3 mine	No. 2 split	"	425	375	0.27	20.34	1.25	78.14	430	30,960	25.60	70.0	70.0	100.0	387	557,280	1,486	10.30
1469	Nov. 1	"	"	"	425	375	0.27	20.31	1.43	77.99	300	21,600	25.60	69.0	69 0	100.0	309	444,960	1,186	8.23
1474	" 9	No. 1 East mine	No. 1 split	"	780	250	0.26	20.16	1.90	77.68	380	22,800	25 65	62.0	62.0	100.0	433	623,520	2,494	11.53
1485	Dec. 14	No. 3 mine	No. 2 split	"	400	375	0.20	20.47	1.09	78.24	480	34,560	25.70	....	...	.....	377	542,880	1,447	10.40
		Corbin.																		
39	May 5	No. 4 mine	Main return	"	120	....	0.15	20.27	0.11	79.01	700	24,500	24.90	52.0	52.0	100.0	27	38,880	324	0.71
40	" 5	No. 6 mine	"	"	300	....	0.05	20.89	0.10	78.96	660	36,300	24.90	40.0	40.0	100.0	36	51,840	173	0.95

INSPECTION COMMITTEES.

Practically all the mines throughout the Province have had inspection committees, appointed by the workmen under General Rule 37, section 101, "Coal-mines Regulation Act," who made monthly inspections on behalf of the employees.

The courtesy is acknowledged of many of the inspection committees in forwarding copies of their reports to this office. The different operations were reported by the above inspection committees to be in good condition generally.

COAL-DUST.

During 1925 regulations for precautions against coal-dust were put into force pursuant to the provisions of the "Coal-mines Regulation Act."

The floor, roof, and sides of every road or part of a road which is accessible must now be treated in one of the following ways: Either they shall be treated with incombustible dust in such manner and at such intervals as will ensure that the dust on the floor, roof, and sides respectively shall always consist throughout of a mixture containing not more than 50 per cent. combustible matter; or they shall be treated with water in such manner and at such intervals as will ensure that the dust on the floor, roof, and sides respectively is always combined throughout with 30 per cent., by weight, of water in the intimate mixture.

Tests of samples of dust, so taken as to be representative of the normal composition of the dust throughout the roads of the mine on the floor, roof, and sides respectively, shall be made as often as may be necessary, but not less frequently than once a month.

The results of the tests shall be posted at the entrance to the mine and recorded in a book to be kept at the mine for the purpose.

Since the passing of the regulations for precautions against coal-dust the operating companies have been giving this matter great attention, and through courtesy from them the Chief Inspector of Mines' office is furnished with copies of all tests made. Practically all the coal-mines in the Province have now got their roadways up to standard required by the regulations.

EXPLOSIONS.

There was a small ignition of gas in No. 3 mine, Michel Colliery, immediately following a shot that was fired in rock. It is supposed that a small quantity of gas had been contained in roof-cracks where it could not be detected by the safety-lamp.

SULPHUR-POISONING.

While some evidence, principally by smell, shows that sulphur exists in some of the areas being worked, no complaints have reached this office during 1926 to the effect that any miners were seriously affected by this condition.

DANGEROUS OCCURRENCES.

During 1926 there was reported, as provided for by section 71, subsections (*c*) to (*h*), forty occurrences, as follows: One broken slope-rope; thirty-two outbursts of gas and coal; three gob-fires; one bump; one ignition of gas; one breakage of compressed-air main; one breakage of lug on hoisting-cage; and the collapse of a trestle. Of the above outbursts of gas and coal, five occurred in the Coal Creek mines and the remaining twenty-seven in Cassidy mine, and practically all in one section of the mine.

ORDER STOPPING WORK UNDER AUTHORITY OF SECTION 87.

In a few instances during 1926 stoppage of work was ordered by the Inspection Department in parts of mines until proper remedies were applied for safeguarding those employed.

Usually a willing spirit of co-operation was shown by the various managements at the different collieries in applying the required remedies.

The most important stoppage was in connection with the No. 7 South section, Cassidy mine, operated by the Granby Consolidated Mining, Smelting, and Power Company, Limited. This section was opened by two rock tunnels, 2,200 feet long, driven from the Main slope at a point about 5,000 feet from the surface.

The part of the seam (Douglas) reached by the slopes gave early evidence of being subject to blow-outs of coal and gas. In most cases the blow-outs gave sufficient warning to permit the miners to retire to safety before the blow-out actually occurred, but in some cases the miners narrowly escaped being caught by the material thrown out.

On March 25th, while a miner was engaged in mining, a blow-out occurred which killed him. The seam at this point was only 10 inches thick and consisted of very dirty coal. This place was being driven to make a connection for ventilation and was only 5 feet wide and about 5 feet high; the rock floor being brushed to make the required height. Shots had been fired in the brushing on the previous shift and the miner had been working about fifteen minutes on the face when the blow-out occurred.

On April 8th two men were killed by a blow-out in No. 7 South Main level. The thickness of the seam in this place varied from 3 feet on the low side of the place to 18 inches on the upper side. The blow-out came diagonally from the upper corner and apparently gave little warning.

The District Inspector of Mines, Thos. R. Jackson, and the overman of the mine had been in this place only five minutes before this blow-out and there was no indication of anything unusual at that time. In this case also shots had been fired in the floor brushing on the previous shift, and the miners had only been working on the face for a very short time when the blow-out occurred.

In view of the absence of warning when a blow-out was pending where the seam was thin, the Inspection Department considered this area constituted too great a menace to the lives of the miners and a special investigation was conducted regarding this danger.

The late Chief Inspector of Mines, George Wilkinson, Thos. R. Jackson, James Dickson (now Chief Inspector of Mines), and the officials of the colliery, after thoroughly considering the matter, decided that no further advance should be made in this area.

The Honourable the Minister of Mines personally visited the area during this period and on the recommendation of his Inspectors confirmed and made permanent the order prohibiting further advance in this ground. Arrangements were made to recover the coal already blocked out and this section was practically abandoned at the end of 1926.

The accompanying map shows the more important blow-outs in the No. 7 South section.

INQUIRIES.

Arising from the circumstances connected with a fatal accident in the Reserve mine, Western Fuel Corporation of Canada, Limited, whereby a miner was killed by a fall of rock, a Court of Inquiry under the provisions of section 48, "Coal-mines Regulation Act," was held at the Court-house, Nanaimo, to inquire into the conduct of the manager, overman, three of the firebosses, and one miner. The Minister of Mines appointed William Wall, of Vancouver, to hold this inquiry, at which the persons whose conduct was being inquired into were represented by counsel, as was the Department of Mines. This inquiry was held on October 12th and adjourned until December 7th, Mr. Wall having made an investigation at the scene of the accident in the interval.

The decision of the Court was that, while the evidence did not show the existence of gross negligence on the part of the persons whose conduct was being inquired into, all of them had shown inattention to the special rules regarding timbering in the working-place where the miner was killed.

For this inattention the Court reprimanded the mine officials and miners concerned.

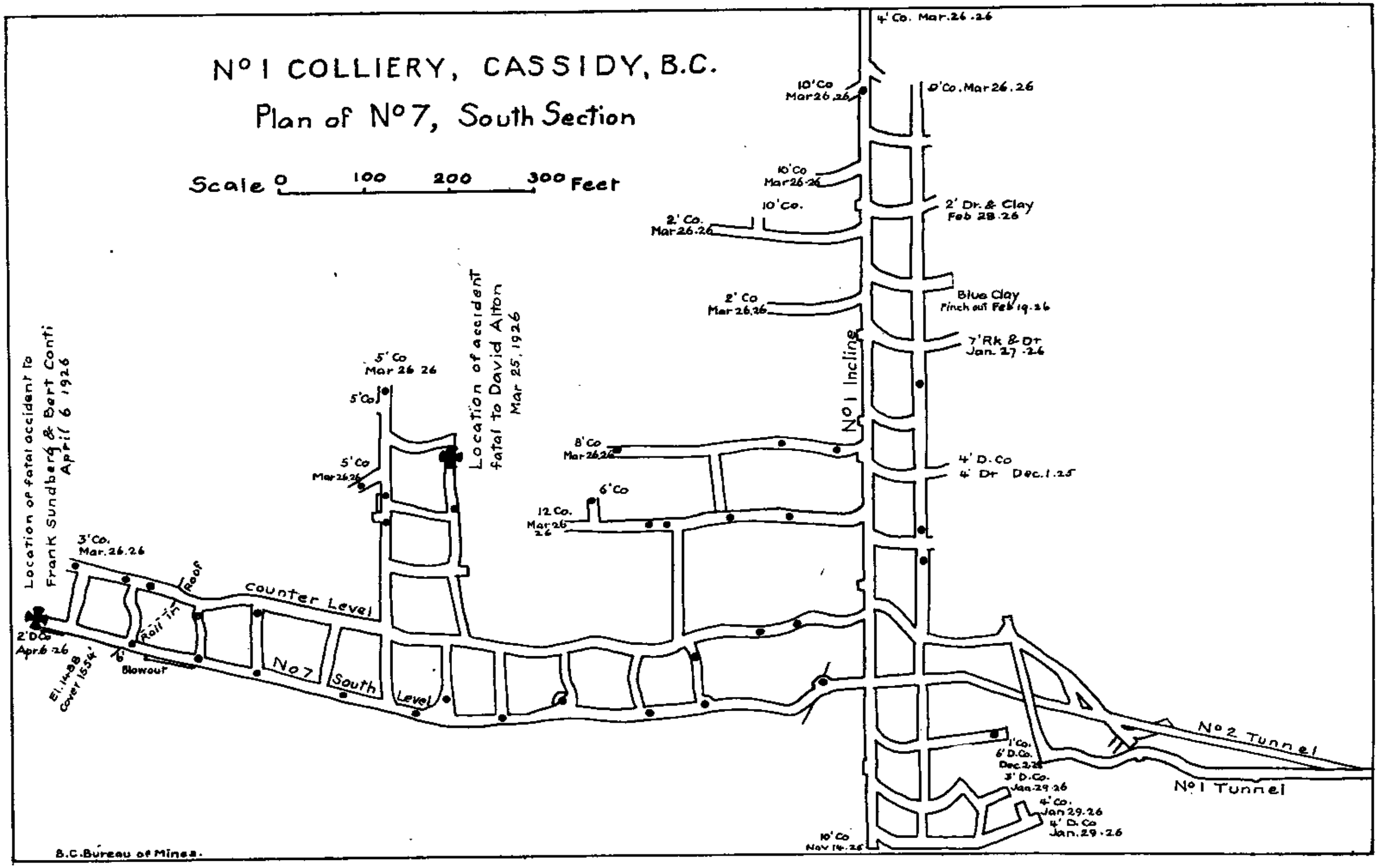
PROSECUTIONS.

During 1926 there were seventeen prosecutions made, sixteen of which resulted in convictions and one in dismissal, with a caution by the Magistrate. Details of the cases are given in a table at the end of this section.

MINE-RESCUE AND TRAINING.

Many holders of certificates of competency in mine-rescue training underwent training during the year at the different stations.

During the year trained teams did valuable work in fire areas in the Middlesboro Collieries at Merritt with the aid of the oxygen apparatus.



Nº 1 COLLIERY, CASSIDY, B.C.
Plan of Nº 7, South Section
Scale 0 100 200 300 Feet
Location of fatal accident to Frank Sundberg & Bert Conti April 6 1926
Location of accident fatal to David Alton Mar 25, 1926
Counter Level
Nº 7 South Level
Nº 1 Incline
Nº 2 Tunnel
Nº 1 Tunnel
Roof
Rail In
Blowout
El. 1488 Cover 1554'
2'D Co Apr.6 26
3'Co. Mar. 26.26
5'Co Mar 26 26
5'Co
5'Co Mar 26 26
8'Co Mar 26 26
6'Co
12 Co. Mar 26 26
2' Co. Mar 26.26
10'Co.
10'Co Mar 26 26
10'Co Mar 26 26
2' Co Mar 26.26
4' Co. Mar. 26.26
D'Co. Mar 26.26
2' Dr. & Clay Feb 28.26
Blue Clay Pinch out Feb 19.26
7'Rk & Dr Jan. 27.26
4' D. Co
4' Dr Dec. 1.25
1'Co. 6'D.Co. Dec.2.25
3' D.Co. Jan.29.26
4' Co. Jan 29.26
4' D. Co Jan. 29.26
10' Co Nov 14.26
B.C. Bureau of Mines.

The following persons took the complete training course and obtained certificates:—

Cert. No.	Name.	Where trained.	Cert. No.	Name.	Where trained.
601	William D. Carson	Ladysmith.	605	John Whittaker	Michel.
602	James Littler	Michel.	606	Andy Smith	Michel.
603	Albert Krall	Michel.	607*	Thomas Branch	Michel.
604	William H. Cartwright	Michel.			

* Substitute for No. 534.

During 1926 there was added to the equipment at the Government Mine-rescue Stations six Burrell All Service Masks and 150 H.H. Inhalators.

There are now kept ready for use at the mines and in the Government Mine-rescue Stations 206 sets of mine-rescue apparatus and resuscitating devices. There has been issued a total of 607 certificates of competency in mine-rescue training and eighteen special certificates to officials physically unfit to stand the training, but who have taken a course of lectures fitting them to handle rescue crews in cases of emergency.

To stimulate interest in this work the Minister of Mines presented a self-rescuer machine to all competitors who took part in the competitions in 1925; a total of 100 self-rescuers being distributed.

The operators and workmen are urged to make further investigation of the possibility of saving lives in the event of mine explosions by extensive use of the self-rescuer.

MINE-RESCUE AND FIRST-AID COMPETITIONS.

The East Kootenay Mine Safety Association held its fifth annual mine-rescue and first-aid contest at the Government Mine-rescue Station, Fernie, on August 7th.

In the mine-rescue competition there were six teams—two from Fernie, two from Coal Creek, and two from Michel. This event was keenly contested, as is evidenced by the fact that while the winning team obtained 99.4 per cent. of the possible marks, the lowest team was rated at 93 per cent. The first prize, the King shield, was retained by the Coal Creek team, captained by John Caufield. In the first-aid competitions (senior) Fernie No. 1 team, captained by Thos. McGuire, won the Department of Mines cup and the Rotary shield with 89 per cent. marks. In the ladies' competitions the Fernie team, under the leadership of Mrs. John Wilson, won the first prize. The junior team from Michel succeeded in retaining the Bonnell and Corson cup, which they won in the previous competition. This team was captained by A. De Luca.

The eleventh annual meet of the Vancouver Island Branch of the British Columbia Mine Safety Association was held at Ladysmith on September 6th, and much credit is due to the Canadian Collieries (Dunsmuir), Limited, and its local representative, T. A. Spruston, for the erection of the mine and use of the grounds. The problems in the mine-rescue meet were prepared by the Mines Department, while the judging of the work of the teams was carried out by George T. Wake, Inspector of Mines for the State of Washington, and H. E. Miard, Inspector of Mines, Fernie.

Seven teams were entered in this event, as follows: Coal Creek (Captain Caufield); Ladysmith (Captain Galloway); Cumberland No. 2 (Captain Woods); Extension (Captain Carson); Nanaimo (Captain Gillis); Cumberland No. 1 (Captain Williams); and Cassidy (Captain Hogan). The Coal Creek, Cassidy, and Nanaimo teams used the Gibbs apparatus, while the other teams used the Paul machine. The first prize was won by the Coal Creek team; this is the team which was also successful in taking first place in the Fernie competition. The second and third prizes were won by Extension and Cumberland respectively.

The different first-aid events were keenly contested and were won as follows: B.C. Department of Mines cup by Extension team, with Nanaimo No. 2 team as a close second; the Coulson cup was won by Cumberland No. 1 team, followed by Nanaimo No. 1 team for second place.

In the two-man event Watson and Waterford, of Cumberland, won first place, while Hart and Wallis, of Britannia mines, were second; the one-man event was won by Stobbart and Kemp, Nanaimo, and second place by Wallis and North, Britannia mines. In the junior competitions the girls' team from Cassidy won first place and Western Fuel Corporation of Canada's

cup, with Irene Hogan as captain; the Nanaimo team, under Mary Clarke, gained second place. In the ladies' cup the Nanaimo team, under Mrs. Scott, was first, while the second team was captained by Mrs. Turner. The first and second places in the boys' event were won by Nanaimo No. 1 team and Cassidy team respectively.

The prizes were presented by the Honourable William Sloan, Minister of Mines, at the close of the competition.

These two mine-rescue and first-aid competitions, held annually, are made possible by substantial grants from the Department of Mines; in addition, the resources of the different mine-rescue stations are at the service of the meets.

The help of the Instructors at the different stations is also an important factor in the intensive training of the teams.

In May the late George Wilkinson, Chief Inspector of Mines, James Dickson, H. E. Miard, and J. D. Stewart, of the Mines Department, at the request of the Washington State authorities, went to Burnett, Wash., to act as judges of the mine-rescue contest held at that place by the mining companies of Western Washington.

EXAMINATIONS FOR CERTIFICATES OF COMPETENCY.

Two examinations for certificates of competency for coal-mine officials were held during 1926; details of these examinations are dealt with in the report of the Secretary to the Board.

Examinations for certificates of competency as coal-miners were held regularly during 1926 at the various mines.

SUPERVISION OF COAL-MINES.

During 1926 sixteen coal companies operated eighteen collieries, with thirty-five mines, employing 3,757 men underground.

In the supervision of underground employees there were twenty managers, two safety engineers, twenty-seven overmen, 151 firebosses and shotlighters, a total of 200 officials, or one official for every nineteen persons employed underground.

METALLIFEROUS MINES.

Production.

The output from the metalliferous mines for 1926 was 4,775,073 tons, an increase of 925,804 tons over the tonnage for 1925. This tonnage was produced from 138 mines, of which 55 shipped 100 tons or more.

Accidents.

There were nine fatal accidents in and about the metalliferous mines during 1926, an increase of four compared with the figures for 1925.

There were 4,341 persons employed in and about the metalliferous mines in 1926.

The ratio of fatal accidents was 2.07, compared with 0.97 for 1925. The ratio for the last ten-year period was 2.22.

The tonnage mined per fatal accident was 530,564, compared with 769,854 tons per fatal accident for 1925.

The tonnage mined per fatal accident for the last ten-year period was 320,290.

The following table shows the mines at which fatal accidents occurred during 1926 and comparative figures for 1925:—

Mining Division.	Mine.	No. of Accidents.	
		1926.	1925.
Vancouver	Britannia	1	2
Fort Steele	Sullivan	1	1
Slocan	Carnation	1	....
Fort Steele	Stemwinder	1	....
Greenwood	Rambler	1	....
Similkameen	Copper Mountain	1	1
Northern	Hidden Creek	2	....
Lillooet	Pioneer	1	....
Slocan	Bosun	....	1
Totals		9	5

The following table gives the cause and percentage to the whole of the fatal accidents, with corresponding figures for 1925:—

Cause.	1926.		1925.	
	No.	Per Cent.	No.	Per Cent.
By blasting	1	11.11	1	20.00
By falling into chute, raises, winzes, etc.	4	44.44	3	60.00
By falls of ground	2	22.22	....	.....
Miscellaneous (underground)	1	11.11	1	20.00
Miscellaneous (surface)	1	11.12	....	.....
Totals	9	100.00	5	100.00

Details surrounding the occurrence of fatal accidents in and around metalliferous mines during 1926 were:—

The fatal accident which occurred to Robert Smiljanich, machine-miner, in the *Fairview* mine, operated by the Britannia Mining and Smelting Company, on February 9th, 1926, was due to deceased falling into a glory-hole. He was drilling on a bench in the glory-hole in daylight when from some unknown cause he fell from this bench, leaving his machine still running. He was using a new type of machine and a man who was sitting near for the purpose of checking the performance of this machine said deceased appeared to fall forward without any apparent cause and fall into the glory-hole.

The fatal accident which occurred to Edward Carlson, miner, *Hidden Creek* mine, operated by the Granby Consolidated Mining, Smelting, and Power Company, on June 4th was caused by deceased slipping while trying to remove a broken steel from a hole. He fell into a chute and was killed by the fall.

The fatal accident which occurred to Jacob Henson, miner, *Carnation* mine, operated by the Victoria Syndicate, on June 12th was caused by a fall of ground from an unsuspected natural slip.

The fatal accident to Peter Hagberg, miner, in the *Pioneer* mine, operated by D. Sloan and associates, on June 12th was caused by being crushed while in a sinking shaft by a loaded bucket owing to a derangement of the hoisting equipment.

The fatal accident which occurred to Max Botkoryok, miner, *Copper Mountain* mine, operated by the Allenby Copper Company, on August 11th was caused by deceased fainting and falling into a glory-hole on the surface. Deceased and two fellow-miners were walking single file down into the glory-hole, deceased being in the middle. The man behind noticed that Botkoryok appeared to be in distress, but before any one could get hold of him he had fallen over the side and into the glory-hole, with fatal results.

The fatal accident which occurred to Ogilvie Robertson, motorman's helper, on the surface at the *Stemwinder* mine, operated by the Porcupine Goldfields Development and Finance Company, on August 14th was caused by being struck on the head by a crowbar which he was using to loosen the ore in a chute at the bunkers. When the ore was loosened a piece struck one end of the bar and caused the other end to strike deceased.

The fatal accident which occurred to C. Pontoni, miner, at the *Sullivan* mine, operated by Granby Consolidated Mining, Smelting, and Power Company, on October 4th was caused by being carried down a chute with the ore. The ore had hung up and Pontoni and several others had gone into the chute to start the ore running by means of a blast. After placing the charge, and lighting same, the ore started running before deceased could get out of the chute; he was carried some 60 feet to the level below, where his body was recovered before the blast had gone off.

The fatal accident to Vagn Thiesen, miner, *Hidden Creek* mine, operated by the Granby Consolidated Mining, Smelting, and Power Company, on October 10th was caused by being struck by a flying rock from surface blasting some 600 feet away. A warning whistle was blown for some time prior to the blast, but Thiesen failed to take cover and merely turned his back to the direction of the blast. A piece of rock struck him and caused him to fall into a glory-hole.

The fatal accident which occurred to Arne Palojari, mucker, *Rambler* mine, operated under lease by Lawrence & Rinta, on October 26th was caused by a fall of ground in a disused stope.

There was a total of thirty-two accidents reported under the requirements of section 19, "Metalliferous Mines Regulation Act." An analysis of the causes shows that a large percentage of the accidents were preventable had proper care been exercised by the injured persons. Of the nine fatal accidents in and about the metalliferous mines, four occurred to men who were working in daylight.

Ventilation.

The District Inspectors report that the ventilation of the metalliferous mines was fairly well maintained throughout 1926.

Mine-air Sampling.

During 1926, as in previous years, mine-air samples were frequently taken in the metalliferous mines of the Province; much valuable information has been obtained from the samples and added to that previously obtained relative to the hydrogen, carbon-monoxide, and carbon-dioxide contents of the atmosphere in the metalliferous mines.

Mine-rescue Work.

Several of the larger mining companies have installed sets of the Burrell all-service gas-masks for emergency use in case of fires or dealing with noxious gases.

First-aid Work.

Many of the employees of the more important mining companies have taken first-aid training during 1926 and in some instances competitions have been held to widen the interest in this work.

Conclusion.

I desire to express my appreciation of the faithful co-operation and assistance afforded during the year by the District Inspectors and Instructors in mine-rescue work. I also wish to thank the management and employees at the various collieries for the assistance and support given in making operations as safe as possible and look forward to a continuation of the same during the coming year. It is only by the closest and efficient co-operation of all parties concerned that we can keep down the number of accidents and make the mining industry a safer and more congenial occupation.

I am much indebted to the Director of the Mines Branch at Ottawa for co-operation in the work of mine-air sampling, and the Dominion Government for furnishing the sample-bottles and making all analyses free of charge.

REPORTS OF METALLIFEROUS MINES INSPECTORS.

NORTHERN INSPECTION DISTRICT.

REPORT BY T. J. SHENTON, INSPECTOR.

I have the honour to submit my annual report for the year 1926 for the Northern Inspection District, including the following Mining Divisions: Atlin, Portland Canal, Nass River, Omineca, Queen Charlotte, and Skeena.

ATLIN MINING DIVISION.

Engineer.—This mine is operated by the Engineer Gold Mines Company, Limited, under the managership of A. C. Brinker. During 1926 an average of 100 men was employed and the operations were carried on throughout the year without serious accident to any employees. There is a resident medical practitioner at this mine and during my last inspection I found the operations in accord with the "Metalliferous Mines Regulation Act."

Gleaner.—There were two men employed at this mine during the early part of the year, no work being done after the month of June. The requirements of the "Metalliferous Mines Regulation Act" were well adhered to.

Taku Arm.—An average of ten men was employed during the year under T. Oxley, superintendent, and the operation was in accordance with the "Metalliferous Mines Regulation Act."

Atlin Silver Mine.—At the time of my last inspection fourteen men were employed underground and general conditions were well in accordance with the "Metalliferous Mines Regulation Act."

PORTLAND CANAL MINING DIVISION.

SALMON RIVER SECTION.

Premier Extension.—This mine is operated by the Alaska Canadian Mining Company and at the time of my last visit employed three men. General conditions were found to be good.

Silver Crest.—Four men were employed on the occasion of my last visit, when general conditions were found to be good.

Silver Tip.—This mine is operated by the Silver Tip Mining Syndicate, Limited, and on my last visit I found seven men employed underground. General conditions were found to be satisfactory.

Big Missouri.—This property is operated by the Big Missouri Mining Company, with S. Petersen as superintendent. An average of twenty men has been employed throughout the year. Work has been carried on by tunnels and raises with the addition of diamond-drilling. General conditions of ventilation, timbering, and accommodation for employees were found to meet the requirements of the "Metalliferous Mines Regulation Act."

National Silver.—This mine is operated by the Sebakwe District Mines, Limited, and was opened in April. A 65-horse-power Diesel engine was installed and tunnelling to the extent of 900 feet completed. General conditions were found to be good.

B.C. Silver.—Operated by the B.C. Silver Mines, Limited; C. A. Banks, general manager; C. B. North, superintendent. This mine employs seventy-five men. During the year a 100-horse-power Diesel engine and Sullivan compressor of 1,050 cubic feet capacity have been installed, while the mine haulage has been improved by the addition of Mancha storage-battery locomotives. Satisfactory improvements have been made to the accommodations for the employees and the general operations found to meet the requirements of the "Metalliferous Mines Regulation Act."

Premier.—Operated by the Premier Gold Mining Company, Limited; D. L. Pitt, general manager; B. Smith, assistant general manager; and H. MacDonald, mine superintendent. The mine operated continuously during 1926, while a considerable amount of new machinery was installed during the year and the capacity of the mill was greatly increased. The general conditions in the mine were found to be satisfactory and in accordance with the "Metalliferous Mines Regulation Act."

Bear River Section.

Dunwell.—Operated by the Dunwell Mines, Limited; R. M. Stewart, president and managing director; T. S. McPherson, vice-president; M. Little, mine superintendent. An average of thirty men was employed underground during the year and about thirty-five men on construction-work on the surface, principally on the new mill and power plant. New ore-bins at the mine have been completed and all the towers for the aerial tram-line are in place, and general improvements have been carried out in the camp building to provide better accommodation for the employees.

Three Burrell all-service gas-masks have been purchased for use in case of emergencies underground. In my different inspections I have found this operation to be conducted in accordance with the "Metalliferous Mines Regulation Act."

Independence.—Operated by the Independence Gold Mine Company, Limited; S. Fitzgerald, managing director; J. Fitzgerald, mine superintendent. There were six men employed in this mine at the time of my last inspection and general conditions were good.

L. & L.—Operated by the L. & L. Glacier Creek Mines, Limited; J. Thomey, superintendent. There were six men employed at the time of my last visit and the workings and accommodations were found in a satisfactory condition.

Silverado.—Operated by the Silverado Mines, Limited; J. J. Haahti, mine superintendent. There were six men employed at this mine until September, when work was suspended for the remainder of the year.

Marmot Section.

Porter-Idaho.—Operated by the Porter-Idaho Mining Company, Limited; C. Porter, general manager. There was a small crew of men employed during the year; general conditions were found to be satisfactory.

Marmot Metal.—Operated by Marmot Metal Mining Company, Limited; A. A. McDonald, mine foreman. There were three men employed in this operation, which was in a satisfactory condition.

Washington.—Operated by the Washington Mining Company, Limited; G. Lunvall, superintendent. There were six men employed at the time of my last visit and the timbering, ventilation, and camp accommodations were found to be satisfactory.

Portland Canal Section.

Outsider.—Operated by the Granby Consolidated Mining, Smelting, and Power Company, Limited; J. M. McDonald, superintendent. The average number of men employed is forty. In my different inspections during 1926 I found general conditions to be satisfactory.

NASS RIVER MINING DIVISION.

Observatory Inlet Section.

Golskiesh.—Operated by the Granby Consolidated Mining, Smelting, and Power Company, Limited; C. H. Bocking, general manager; W. R. Lindsay, general superintendent; J. D. Ferguson, mine superintendent. This mine was worked continuously during 1926; eighteen men were employed during the latter part of the year. This operation produces silica, which is used in the company's smelting operation at Anyox. The general conditions were found to be very satisfactory and in accordance with the "Metalliferous Mines Regulation Act."

Hidden Creek.—Operated by the Granby Consolidated Mining, Smelting, and Power Company, Limited; W. R. Lindsay, mine superintendent; I. C. Cooke, assistant superintendent; A. Swanson, mine foreman. This mine is the largest in operation in this district; the average number of men employed was 340 a day; and the output was 1,200,000 tons. During the year 530 tons of explosives was used in this mine. Efficient training in first aid was given by J. W. Lang, resident doctor; most of the officials and many of the men have qualified for the St. John first-aid certificate.

A crew trained in the use of rescue apparatus is maintained to deal with emergencies that may require the use of this machine. The apparatus used is the Paul. An accident-prevention committee, consisting of the officials and men from each section of the mine, meet to discuss and recommend safety measures.

The general conditions in this operation were found to be satisfactory and in accordance with the requirements of the "Metalliferous Mines Regulation Act."

ALICE ARM SECTION.

Toric.—Operated by the Toric Mines Company, Limited; A. C. Gerhardi, manager. A small amount of work was done in this mine early in the year, but the greater part of 1926 was taken up with mill-construction. This operation was found to be in accordance with the "Metalliferous Mines Regulation Act."

La Rose.—Operated by the La Rose Mining Company, Limited; Neil Forbes, manager. This operation employed six men until November, when the mine closed down for the year.

Esperanza.—Operated by A. Armour, of Anyox, and J. F. Fraser, of Alice Arm. This mine was operated during the first half of 1926. The timbering in this mine was found to be unsatisfactory and it was requested that no further work be done until this was rectified; other conditions were found to be satisfactory.

Keystone.—Operated by the Keystone Mining Company, Limited; R. E. Griffiths, manager. A new camp was built and work commenced in May and was continued until the end of October, when the operations ceased for the year. General conditions in this mine were found to be in accordance with the requirements of the "Metalliferous Mines Regulation Act."

Wolfe No. 2.—Operated by J. Stark, Alice Arm.; J. Fiva, mine foreman. There were three men employed at this mine until operations were stopped in November for the remainder of the year.

OMINECA MINING DIVISION.

Red Top.—Operated under bond to the Standard Silver Lead Company; F. H. Taylor, owner. There were four men employed in this mine at the time of inspection; general conditions were found to be satisfactory.

Cassiar Crown.—Operated by the Cassiar Crown Mining Company; W. G. Harris, manager. There were nine men employed in this mine at the time of my inspection. A new camp has been built and a 2-drill compressor was in course of installation. General conditions were found to meet the requirements of the "Metalliferous Mines Regulation Act."

Henderson.—Operated by J. F. Duthie, Seattle, Wash.; J. R. Turner, manager; A. Nelson, mine foreman. This property is located on Hudson Bay mountain and is 16 miles from Smithers, the ore being hauled this distance by motor-trucks to the railway. The average number of men employed throughout the year was thirty-five. The general conditions during the different inspections were found to be good.

Sunrise and Silver Cup.—Operated by W. S. Harris, New Hazelton. These mines are under the same ownership and are located on Nine-mile mountain and are about 11 miles from New Hazelton. These mines worked, with eight men, from May to October, when operations ceased for the year. The general conditions at above mines were satisfactory.

Cordillera.—Operated by the Kitselas Copper Mountain Company, Limited. This mine is situated about a mile west of Usk. The workings were found to be in good condition generally.

Little Beaver.—Operated by Hopper Davis Syndicate; H. W. Davies, managing director; J. M. Hoar, mine superintendent. This mine is situated 27 miles from Terrace and at the time of inspection employed seven men. General working conditions were found to be satisfactory.

QUEEN CHARLOTTE MINING DIVISION.

Owing to the information received that very little mining developments were being carried on it was considered unnecessary to visit this Division during the year.

SKEENA MINING DIVISION.

Trixie.—Operated by F. T. Patterson. This mine is situated on Porcher island, about 35 miles from Prince Rupert. The timbering in this mine was found to be unsatisfactory. Steps were taken to have this rectified. Other conditions were satisfactory.

Surf Inlet and Pugsley.—These mines are owned by the Belmont-Surf Inlet Mines, Limited. F. H. Penn, manager; J. Matson, mine foreman. The *Pugsley* mine was closed on April 9th, 1926, and the *Surf Inlet* mine on June 23rd, and a large part of the mill machinery and power plant at the mine was dismantled. The hydro-electric plant at the beach was kept intact.

SOUTHERN COAST INSPECTION DISTRICT.

REPORT BY T. R. JACKSON, INSPECTOR OF MINES.

I have the honour to submit my annual report as Inspector of Metalliferous Mines for the Southern Coast Inspection District for the year 1926.

Britannia Mining and Smelting Co.—C. P. Browning, general manager; James I. Moore, superintendent; C. V. Brennan, assistant superintendent; John Sleeman, mine foreman. The mines operated by this company are situated near Howe sound, about 35 miles north of Vancouver, and are several miles inland. The bulk of the ore is transported between the main tunnel of the mine (2,200-foot level) and the mill, which is on the tide-water, by means of electric-locomotive haulage; the difference in elevation is overcome partly by a 3-per-cent. grade on 3½ miles of haulage-track, and the remainder by means of a 1,400-foot transfer-shaft into which the ore is discharged and reloaded on another electric haulage-train at the bottom. This lower tunnel is 4,000 feet long and the portal is a few hundred feet from the mill and at an elevation which permits the ore to be discharged into the storage-bins of the mill.

There are approximately 1,000 men employed in the various departments of the mine, mill, and transportation. One fatal accident occurred during the year. B. T. Smiljanich, miner, was fatally injured, February 9th, 1926, by having the base of his skull fractured from a fall from the Frank glory-hole at 450-foot level to the Morrison slope at 700-foot level. He was dead when picked up.

During the year the driving of working-places totalled 20,287 feet and diamond-drilling totalled 10,909 feet. A certain portion of the surface was prospected by electrical survey, carried on by the Swedish American Corporation. In order to economically mine ore in the *Bluff* extension to the west a haulage-tunnel which was started years ago at the elevation head of the incline was extended towards the mine. When this is completed and holed through in April, 1927, it will afford transportation of all of mine production to the Beach mill without going over the surface electrical railway at the mine camp. This will greatly facilitate transportation conditions, especially so in the winter, when heavy snow often causes some embarrassment. The work at the *Fair West* section east of the *Victoria* mine was discontinued in the fall and the equipment removed.

The bonus system for a major portion of the underground employees continues to work satisfactorily. An intensive safety campaign is carried on continuously in order to reduce and prevent accidents, both underground and on the surface. As members of the National Safety Council, excellent literature and posters are used throughout the workings and camps, and during 1927 it is proposed to carry out a scheme of safety bonus as a further incentive to individuals to work safely at all times.

Group insurance for all employees was inaugurated during the year, this insurance being carried entirely by the company, with no expense to the employees. After an employee has been in continuous service for six months his life is insured for $500, and if he continues his insurance is increased $200 each six months until he is covered by a maximum of $1,500 in three years. The employees seem to appreciate this insurance plan, and it is believed that it has considerable to do with keeping the turn-over low, which is an aid to safe practices and efficiency.

When inspected during 1926 the various workings were well ventilated and timbered. Safety-first measures introduced by the company officials were carefully carried out by the workmen, and the officials carried out their duties in accordance with the provisions of the "Metalliferous Mines Regulation Act."

Clayburn Co., Ltd.—Head office, Vancouver; J. W. Ball, manager; Edward Wilkinson, mine manager. This company's factory and mines are situated about 50 miles east of Vancouver. The mines are at Straiton and Kilgard. The total tonnage of clay mined underground during the past year was 27,133 tons and from the open workings 2,368 tons. During the year twenty-three men were employed in these mines. A 30-horse-power electric hoist is in use at the Fireclay mine, the other mines being operated by hand.

The clay is hauled to the factory at Clayburn, a distance of 3½ miles, by an electric motor with a crew of two men. From the Kilgard bunkers an endless-rope and gravity system is used to lower the clay down to the chutes, a distance of about 2,500 feet. The mines were found to be well ventilated and in safe condition.

NICOLA-PRINCETON INSPECTION DISTRICT.

REPORT BY JOHN G. BIGGS, INSPECTOR.

I have the honour to submit my annual report as Inspector of the metalliferous mines operating in the Nicola-Princeton Inspection District for the year ended 1926.

Iron Mask.—A. E. Wallinder, superintendent; Joseph Fisher, foreman. This company is operating a group of mineral claims situated 7 miles south-west of the city of Kamloops and consists of shaft operations. The main working-shaft is known as the *Iron Mask* and follows the ore-body down a distance of 750 feet to the lower level, which is connected by a drift on this level with the *Erin*, situated 700 feet east, which is provided with a manway and produces the necessary ventilation.

During 1926 there has been a considerable amount of drifting done off the lower level, which has been entirely of an exploratory nature for the purpose of proving other ore-bodies. These roads have been driven with a small sectional area, well barred down, and cleaned and timbered where required.

The provisions of the "Metalliferous Mines Regulation Act" have been well adhered to. Good accommodation has been provided for the employees and the cook-house, bunk-house, and wash-rooms are in a sanitary condition.

Copper Mountain.—John McLaughan, superintendent; Steve Swanson, mine foreman. This mine is situated in the Similkameen Mining Division, 12 miles from the town of Princeton. It has been in active operation during the whole of 1926 and has been developed with a view of producing a large tonnage by three large and well-maintained levels entering the side of the mountain and extending a distance of several thousand feet. The chief operations are conducted on the No. 2 level, where the ore is loaded into the mine-cars at the foot of the various chutes and gathered by trolley locomotives and hauled to a spiral chute connecting the Nos. 2 and 3 levels, where the cars are dumped by automatic arrangement. The ore is again loaded into mine-car trips on the No. 3 level and taken to the surface in trips by an electric trolley locomotive and dumped into a large crusher-bin. Descriptions have been given in previous reports of this mine by the Resident Engineer and the Inspection Department.

For the purpose of maintaining a large ore reserve an aggressive policy of development has been followed during 1926 by way of diamond-drilling, both at the surface and underground, while not only the branch drifts but the main levels have been extended and raises holed through to the surface, where glory-holes have been developed; six of which are at present in operation.

The mine is well supervised and attention given to maintain a high standard as regards safety to the employees. The roads are wide and well provided with electric lights. The block system of signals is used on the main haulage and is strictly adhered to, and not only the motor but the rear of the ore-trains are provided with spot-lights; signals operated by compressed air are provided at the surface and are used to warn employees when blasting is about to take place in the glory-holes. A well-equipped first-aid room is provided, steam-heated, and under the supervision of a qualified man.

The accommodation of the employees is well provided for by a large steam-heated rooming-house, while a well-furnished mess-house with a large seating capacity is in use at the mine.

Inspections have shown the scaling and barring of the stope walls and roof well barred down by a staff of experienced men employed for this purpose and the provisions of the "Metalliferous Mines Regulation Act" well adhered to.

Coronation.—David Sloan, superintendent; Malcom McGregor, foreman. Situated 1 mile south of the *Pioneer* and after being idle for a number of years was taken over by Vancouver interests during the year 1925, which resulted at that time in hauling in the necessary supplies and material, which chiefly consisted of a large supply of fuel-oil, a 60-horse-power Fairbanks Diesel engine, and a 360-cubic-foot belt-driven single-stage air-compressor. This was used for providing power for a small hoist and the drilling-machines and was installed during 1925.

Work commenced during December, 1925, on a 2-compartment shaft which was sunk a distance of 200 feet and a fair amount of drifting done on the ore at each side of the shaft, when work was suspended underground in September, 1926, and preparations were made for the installation of a mill which will be operated by water-power from Cadwallader creek by a 140-horse-power turbine. When last visited, 920 feet of 3-foot wooden conduit was being freighted to this property, while sixteen men were employed above ground, chiefly engaged in construction-work.

The general conditions of this camp were found to be good and the provisions of the "Metalliferous Mines Regulation Act" well adhered to.

Pioneer.—David Sloan, superintendent. Situated in the Bridge River district, 50 miles north of the Pacific Great Eastern Railway, and accessible by a wagon-road from Shalath, a station situated a few miles west of the town of Lillooet. Hydro-power derived from Cadwallader creek, which flows in close proximity to the mine, is used for operating, but as a result of freezing operations are generally suspended a few months during the winter.

Work was commenced during March, 1926, with an aggressive policy of development outlined, the shaft being sunk a further distance of 160 feet to the 600-foot level and a fair amount of drifting and stoping done on this level.

A 4 by 5 flume 1,700 feet in length is installed at a dam in the creek above the mine, which follows the north bank of the river to the mill, where a 40-foot head of water is produced, operating a 170-horse-power turbine generator which provides power for the mill machinery. Two single-stage air-compressors having an aggregate capacity of 600 feet of free air a minute is the power used for driving the hoists, pumps, and machine-drills at the mine.

A new addition was made to the camp buildings during 1926 which greatly improved the accommodations. When last visited nine men were employed underground and working on the two-shift system. General conditions of the mine were fairly good, the provisions required by the "Metalliferous Mines Regulation Act" well adhered to, and every endeavour made to care for the safety of the employees. The cook-house and the sleeping-apartments appeared to be satisfactory and in a sanitary condition.

Horn Silver.—George Shepherd, superintendent; Elwood Bromley, mine foreman. Situated 15 miles south of the town of Keremeos and accessible from the main highway leading to the International Boundary. It consists of two adits entering the side of the mountain at an elevation of 2,400 feet and 1,600 feet above the camp, where the mill is located, the ore being transported by a gravity overhead tram 3,000 feet in length.

During the early part of 1926 work was concentrated on the installation of the mill and a power plant was completed and commenced operations during April. The chief source of power consists of a 60-horse-power Petter's Diesel engine coupled by belt gearing to the mill machinery, also a belt-driven single-stage air-compressor which provided power for the mining-machines, being conducted through a 3-inch pipe laid up the side of the mountain, a distance of some 3,000 feet.

These operations are small and when last visited eight men were employed at the mine. The general conditions were good, satisfactory accommodations being provided for the employees, the camp buildings being in a sanitary condition, and the "Metalliferous Mines Regulation Act" complied with.

Nickel Plate.—G. P. Jones, general manager; Wallace Knowles, superintendent. Situated on the Nickel Plate mountain and accessible from the town of Hedley, where the mill and the power plant are situated. The ore, being in an andesite gangue, is of a very hard nature and as a result little timber is required in these operations. A 2,000-horse-power hydro-electric power plant, situated on the Similkameen river, 1 mile below the town of Hedley, provides power for these operations.

Work was suspended during the winter of 1925 and commenced during March, 1926. Owing to the small flow of water in the river this company found it necessary to revert to steam-power during August, when actual mining was gradually suspended and recourse made to loading out the loose ore from the foot of the stopes for the purpose of providing mill-feed. The steam-power was continued until October, when the water in the river commenced to rise, and as a result general mining operations recommenced by the hydro-power until December, but owing to ice conditions in the river operations were again discontinued for the balance of the year.

Good accommodation is provided for the employees at the mine and during inspections the provisions of the "Metalliferous Mines Regulation Act" were found well complied with.

Homestake.—W. L. Bell, superintendent; A. Kiedler, mine foreman. Situated several hundred feet above the road passing through Sinmax valley from Louis creek, situated in the North Thompson district, to Squam bay. It consists of an adit-level entering the side of the hill and operating on silver-lead ore overlaid with a thinly laminated talc-schist, which, being of a friable nature, requires careful timbering. Eighteen men were employed underground and the mine was operating on the two-shift system. The roof conditions appeared to be well attended to and timbered across the face with framed sets well lagged above.

The ore is trammed by hand from the mine to an ore-bin situated some distance from the entrance, where it is loaded into skips operating on a gravity-tram 960 feet in length. It is automatically dumped into an ore-bin situated at the foot of this incline, loaded into auto-trucks, and transported a distance of 21 miles to the Louis Creek Station. The only power used at the mine consists of a single-stage 8 by 9 compressor, belt-driven by a gas-engine situated a little below the entrance to the mine, and used for operating the machine-drills.

The camp accommodations situated at the foot of the hill appeared satisfactory and provisions of the "Metalliferous Mines Regulation Act" complied with.

Enterprise.—R. J. Grant, superintendent. Situated a short distance west of the Merritt–Kamloops highway and about 30 miles from Merritt, operating the *Enterprise* mining claim, which was formerly known as the *Star*, the work generally being of a prospective nature for the purpose of developing a mine on this property. New camp buildings in close proximity to the mine have been erected, consisting of a large commodious rooming-house, cook-house, and dining-room, which provides good accommodation for the employees.

Operations have been continuous during 1926. The ore, which is found to be dipping into the side of the hill at an angle of about 60°, is being developed by an inclined shaft, which has been extended a distance of about 230 feet from the surface, with levels driven off from the shaft north and south.

The power plant consists of a 25-horse-power Scandia distillate-engine coupled to a belt-driven single-stage compressor having a capacity of 125 feet of free air a minute, which is used for the air-drills, small pump, and ventilating-fan. This air is conducted to the face of the slope by means of a 6-inch galvanized air-line.

The material is drawn from this 2-compartment shaft by a bucket travelling on a skidway by a ⅝-inch cable passing over a wheel installed above the shaft head-frame and dumped into an ore-bin. It is operated by an 8-horse-power Fairbanks loose drum hoist provided with a clutch and wood-lined brake. Ten men were employed around this mine, five of which were employed underground.

General conditions in and around this mine were found to be very good and the provisions of the "Metalliferous Mines Regulation Act" well adhered to.

WEST KOOTENAY AND BOUNDARY DISTRICTS.

REPORT BY H. H. JOHNSTONE, INSPECTOR.

I have the honour to submit my annual report as Inspector of Metalliferous Mines for West Kootenay and Boundary Districts for the year 1926.

During the year fifty-four different properties were inspected and 150 visits of inspection made.

TRAIL CREEK MINING DIVISION.

The Rossland properties, operated by the Consolidated Mining and Smelting Company, during 1926 included the *Centre Star*, *Le Roi*, and *Josie* mines. An average force of 103 men, under the superintendency of F. S. Peters, was employed during 1926 in development and production.

The *Velvet-Portland*, owned and operated by a local syndicate, completed their long drainage-tunnel, which was a complete success as regards the drainage of the mine. Very little work was done subsequent to this completion of the tunnel and work was discontinued early in 1926.

The *I.X.L.*, *O.K.*, and *Midnight* properties in the free-gold belt south-west from Rossland, on Little Sheep creek, were operated by small forces of leasers. The lessees on the *I.X.L.*, after a long period of successful operation, did a lot of prospecting by drifting and diamond-drilling. This did not prove of an encouraging nature and they abandoned their lease. The *O.K.* and *Midnight* leasers operated throughout the year.

NELSON MINING DIVISION.

The *Yankee Girl*, at Ymir, is operated by the Yankee Girl, Limited, with W. G. Norrie as superintendent. An average force of twenty-eight men was employed. A large tonnage was shipped to Trail.

The *Goodenough*, situated on Wildhorse creek, was operated by the Porcupine Goldfields Development and Finance Company, Limited, for the greater part of 1926 with an average force

of eighteen men. A fair tonnage of ore was shipped to Trail, operations being discontinued in October. There is a strong probability of work being started on this property by another company during 1927.

The *Hunter V.*, on Porcupine creek, owned and operated by the Consolidated Mining and Smelting Company, was under development. After the completion of a long raise to connect with the upper workings the mine is now in a position to resume shipments. A force of nine men was employed under W. J. Turner, superintendent.

The *Emerald* was operated for a short time on development and diamond-drill work.

The *H.B.*, situated on Deer creek, was operated throughout the year by the Victoria Syndicate, Limited. An average force of twenty-two men was employed under the superintendency of M. O'Donnell.

The *Queen* was operated for a short time under lease.

The McDonald property and the Reeves property, on the Pend d'Oreille river, after being tested in a thorough manner with diamond-drills by the Victoria Syndicate, Limited, were operated on a programme of development by that corporation. An average of ten men was employed on the McDonald and twenty-one men on the Reeves, under H. Gamble, superintendent.

The *Beaver*, at Ross spur, was operated part of 1926. A crosscut tunnel was driven to cut the vein and some drifting done on the vein.

The *Howard*, on Porcupine creek, is an old property that has been reopened during 1926, twelve men being employed.

AINSWORTH MINING DIVISION.

The *Bluebell*, at Riondel, was worked continuously throughout 1926, with the exception of short shut-downs due to trouble with the power-house; improvements are under way which will practically eliminate any further trouble from that source. The property is being operated by Fowler & Eastman under a lease from the owning company. Charles F. Sherwin is mine foreman. An average crew of forty-five men was employed.

The *Cork-Province* was operated with a small force during a part of the year under the superintendency of W. E. Zwicky.

The *Gibson* was operated by the Daybreak Mining Company throughout the year with a force of eight men. A gravity-tramway has been installed and prospects of shipments from this property in 1927 are good.

The *Whitewater-Deep* was operated continuously with an average of twenty-eight men. Numerous improvements have been made in and about the property.

SLOCAN MINING DIVISION.

The *Slocan Star*, owned and operated by the Silversmith Mines, Limited (O. V. White, superintendent), was worked continuously with an average of seventy men. Milling and shipment of ore and concentrates were discontinued in the latter part of 1926 and attention given entirely to development.

The *Ruth-Hope*, operated by the Ruth-Hope Mining Company (J. Hanna, superintendent) was steadily developed on the lower level of the mine, as well as producing ore from the upper levels.

The *Carnation* and *Minnehaha*, operated by the Victoria Syndicate, Limited, were worked continuously on development during 1926, the *Carnation* with an average of sixteen men and the *Minnehaha* with eight men. A. L. MacPhee had charge of both properties. On the *Carnation* a long tunnel is being driven from the Sandon side of the divide to the Silverton side on 4-Mile creek. The expectation is that this tunnel, connecting two of the principal ore-producing districts of the Slocan, will be completed about April, 1927.

The *Wonderful*, owned and operated by Clarence Cunningham, has been worked with a small crew.

The *Corinth* was also worked with a small crew on development.

The *McAllister*, operated by the Slocan Silver Mines, Limited, a subsidiary of the Standard Silver Lead Mining Company (W. H. North, superintendent), was worked with twenty-two men till the slump in silver, when it was closed down. In all probability operations will be resumed in the spring of 1927.

The *Molly Hughes* was operated spasmodically by different managements and was finally closed down towards the end of 1926.

The *Bosun*, operated by the Rosebery-Surprise Mining Company (J. P. MacFadden, superintendent), was worked with seventeen men throughout the year.

The *Galena Farm* was operated by the Porcupine Goldfields Development and Finance Company, Limited, under lease and bond. Quite a large amount of development-work was done by machine-drills and diamond-drills, but the bond was finally relinquished. Since that time the property has been worked by leasers.

The *Hewitt* was operated by the Victoria Syndicate, Limited; R. H. Stewart, manager; W. Tattrie, superintendent. A crew of thirty-one men worked on development.

The *Van Roi*, owned and operated by Clarence Cunningham, was operated for a part of 1926 with a crew of thirteen men.

The *Mammoth*, operated under lease and bond by the Porcupine Goldfields Development and Finance Company, employed a crew of seventeen men on development.

The *Rambler-Cariboo* was operated by leasers.

The *Enterprise*, on 10-Mile creek, was operated by McGuire & Wragge, seven men being employed.

The *American Boy* was operated by a small crew on development-work.

The *Noble Five*, after being closed for a number of years, was reopened in October, 1926, by Paul Lincoln under lease from the Dunsmuir Estate.

The *Noonday*, another property that has been idle for a number of years, was again opened. The Leadsmith Mines, Limited, now operating the property, has embarked on an extensive scheme of development.

The *Lucky Jim* was operated continuously by the Lucky Jim Lead and Zinc Mining Company; A. G. Larson, manager; M. Ulrilla, superintendent. A crew of twenty-seven men was employed.

TROUT LAKE, LARDEAU, AND REVELSTOKE MINING DIVISIONS.

The *Multiplex*, situated on Poole creek, was operated by the Multiplex Mining, Milling, and Power Company; O. T. Bibb, superintendent. Nineteen men were employed in and about the mine.

The *Mohican*, on Gainer creek, was worked for part of 1926 by the Mohican Mining Company; C. L. Copp, superintendent. Six men were employed.

The *True Fissure*, on Great Northern mountain, near Ferguson, was operated throughout 1926 by the True Fissure Mining Company; D. Morgan, superintendent.

The *Silver Creek* was operated by the Bernier Metals Company; R. F. Hill, superintendent. Fourteen men were employed.

GREENWOOD MINING DIVISION.

The operations in this district have been principally on Wallace mountain at Beaverdell.

The *Sally* was operated, under option, by the Federal Smelting and Refining Company. The option was relinquished and the property again taken over and operated by the owners, the Wallace Mines, Limited (E. Nordman, superintendent), with a crew of twenty-six men.

The *Bell*, owned by McIntosh & Lee, worked steadily throughout 1926 with a crew of seventeen men.

The *Bounty Fraction* and *Duncan* worked during part of 1926 by the Beaverdell Mines, Limited; G. Timmermeister, superintendent.

The *Tiger* and *Bounty* worked for part of 1926 by the Federal Mining and Smelting Company (S. B. Davis, superintendent) with a crew of eleven men. Operations were discontinued when the Federal Company gave up its option on the *Sally*. The *Tiger* has since been operated by another outfit.

The *Beaver* was operated part of the year with a crew of seven men.

The *Wellington*, operated by the Wellington Syndicate (A. J. Morrison, superintendent), worked continuously with a crew of nine men.

The *Revenge* was operated during part of 1926 with a crew of nine men.

The *Imperial*, at Rock creek, was operated in a small way and was finally optioned by the Hecla Mining Company, which employed a small crew.

The *Elkhorn Fraction*, at Greenwood, was operated during part of 1926 by the Elkhorn Mines, Limited (Roy Clothier, superintendent), eight men being employed.

Two fatal accidents and three of a serious nature happened during 1926.

The managements of the different properties have been, with but few exceptions, desirous of co-operating with the Inspector in all endeavours to make the mines more safe and working conditions better. Any suggestions made by the Inspector have been received in a friendly spirit and, as far as possible, carried out. For this they have the thanks of the Inspector and a desire on his part for a continuance of the same relations.

EAST KOOTENAY, WEST KOOTENAY, AND BOUNDARY INSPECTION DISTRICTS.

REPORT BY ROBERT STRACHAN, SENIOR INSPECTOR.

I have the honour to submit the annual report covering the inspection of metalliferous mines in this district for the year 1926.

For the purposes of inspection the district is divided into two—West Kootenay and Boundary, with H. H. Johnstone as Inspector in charge, with office in Rossland, and East Kootenay, with J. MacDonald as Inspector in charge, with office in Fernie; while the Senior Inspector acts as supervising Inspector for both districts.

WEST KOOTENAY AND BOUNDARY DISTRICT.

Conditions in respect to progress, safety, and health in this district are very well covered in the report attached made by H. H. Johnstone, Inspector of Mines, and show that while the number of workmen employed in the Rossland district has fallen off, due to curtailment on the part of the operating company, this has been rather more than offset by increases in other districts.

EAST KOOTENAY DISTRICT.

In this district nine mines came under inspection, as compared with four in 1925, these being the *Sullivan* (upper mine and tunnel); the *Stemwinder*, at Kimberley; the *Aurora*, at Moyie; the *Alice*, at Creston; the *Globe*, at Skookumchuck; the *Paradise*, at Invermere; the *White Cat*, at Wilmer; and the *Monarch*, at Field.

The *Sullivan*, with E. G. Montgomery as superintendent and M. O'Brien as assistant superintendent, is situated near Kimberley and is owned and operated by the Consolidated Mining and Smelting Company of Canada, Limited.

This is the largest producing mine in the district, averaging over 3,000 tons of ore a day and employing about 800 workmen in and around the mine. The ore mined is a lead-zinc-silver one, with the principal values in the two first named.

The mine is operated in two divisions, the Tunnel district and the Upper district, the latter being the old working first developed, the latter being those connected with the long crosscut tunnel driven to reach the ore at depth.

In the Tunnel district all the operations are on a larger scale, tracks, loading equipment, etc., and from here a considerable amount of the ore from the Upper workings is handled. This ore is brought down a chute, which connects the Upper workings and the Tunnel.

Two separate raises or chutes connect the Tunnel and the Upper workings; these are situated so as to facilitate the handling of the ore and assist the ventilation of the mine. The latest connection made has four separate compartments or shafts, each being separated by a concrete bulk-head, while the sides are protected by the same material, landings are provided at intervals, and cages used to transport men and material.

With the many descriptions already given of this mine, and especially that given by A. G. Langley, Resident Mining Engineer, it is unnecessary to again describe it, as these previous reports are all available for reference.

The production of ore has remained very high all year, being limited only by the capacity of the concentrator, and even at that some has been shipped to the recently erected concentrator at Moyie. This was necessary owing to the delay in enlarging the Kimberley concentrator, due to the inability of securing the necessary machinery. The equipment used in the production of

ore is practically the same as last year, except that the Tunnel has been laid with 80-lb. steel rails and 24-ton locomotives have been installed. This provides for a greater load being hauled out and allows for a fairly large margin, so that the production can be increased as the requirement arises.

No increase was made in the power-house during 1926 and power is still obtained from the East Kootenay Power Company. Accommodation for employees in the McDougal townsite continues to grow, keeping pace with the increasing force of workmen, and during 1926 a $60,000 recreation-hall has been provided for this camp. At the Upper camp, Sullivan hill, a recreation-hall costing $15,000 has been erected for the workmen there and a similar one at the concentrator.

Relations between employees and the company have been very cordial, and it is very much doubted if there could be found anywhere a more earnest attempt to maintain good relations with their employees than is made here.

During the inspections of this mine it is found the conditions with respect to safety and health are maintained at a very high standard, and the attitude of the officials is such that their every endeavour is to comply with the requirements of the "Metalliferous Mines Regulation Act" and every suggestion tending to greater safety.

The *Stemwinder*, situated on Mark creek, on the other side and a little farther up than the tunnel of the *Sullivan*, is operated by the Porcupine Goldfields Development and Finance Company, Limited, with R. V. Neily as superintendent.

As in 1925, the principal work was in connection with sinking the shaft and developing, and in the latter part of 1926 a considerable surface area was stripped, exposing the mineral.

The ore mined is practically similar to the *Sullivan* ore—lead, zinc, and silver—and during 1926 a considerable amount was shipped to Trail smelter.

An average of about forty workmen was employed during the year.

Power for hoisting, sinking, and other purposes is obtained from the East Kootenay Power Company. No bunk or cook houses are maintained, all the workmen residing in the town of Kimberley, and a fairly good change-room is maintained at the mine for their use.

Conditions in relation to safety and health have generally been found very good during the year and the "Metalliferous Mines Regulation Act" well complied with.

The *Paradise*, situated about 20 miles out from Invermere, in the Windermere valley, in Paradise basin, is reached by a wagon-road following Toby and Spring creeks.

The mine is owned by the Hon. Robert Randolph Bruce, Lieutenant-Governor of the Province, but at the end of the summer was leased to R. Stewart on behalf of the Victoria Syndicate, Limited. Robert McDonald, who has been manager for Mr. Bruce for many years, is still in charge of the mine.

The ore mined is lead and silver, generally in the form of carbonates, but recent developments have revealed a fairly large body of sulphide ore. This has necessitated the installation of a small oil-driven power plant for exploration and development purposes.

About twenty men have been employed during the year, all of whom reside in the bunk-houses provided by the company.

On visits of inspection it is generally found that both the bunk-house and the cook-house are in fairly good condition, clean and sanitary.

The *Globe* is situated on Copper creek, or rather between Copper creek and Skookumchuck creek, 5 miles from Torrent Station, on the Kootenay Central Railway.

The work here consists mostly of development and only about six workmen were employed. The ore contains grey copper with silver and lead values, and so no great quantity of ore has been shipped, apart from sampling.

Conditions at the mine were fairly good with respect to safety and health and fairly good cook and bunk houses are maintained for the workmen. D. A. McIntosh is in charge of the work.

The *White Cat* is situated in the Windermere district, on Slade creek, about 24 miles from Windermere Station. The work consists of prospecting several outcrops of ore, lead, silver, and very small zinc contents. These outcrops are situated at the side of a steep snowslide gulch, above which hangs a fairly large glacier.

Two short tunnels have been driven and some open trenches cut; a short gravity-tram bringing the ore down to the creek-bottom, from where it is hauled by a stone-boat to the camp, about 1½ miles, and from there to the railway by teams.

Six men were employed at the time of visiting and the conditions with respect to health and safety were fairly good. Fairly good accommodation is maintained for the workmen, both as

regards bunk-house and cook-house. E. Scott was in charge of the work and the "Metalliferous Mines Regulation Act" reasonably well complied with.

The *Aurora* is situated on Moyie lake across from the town of Moyie, and was reopened during 1926 by the Aurora Syndicate, with W. G. Smith as superintendent. About fourteen men were employed, some underground and some on the surface, shipping from the old dumps.

A road has been constructed from Aldridge, a station on the Crowsnest branch, and a considerable amount of ore shipped to Trail, being hauled from the mine to the railway by auto-truck. The ore shipped contains lead, zinc, and silver.

The general conditions in and around the mine were fairly good, most of the workmen residing in the town of Moyie, a cook-house and small bunk-houses providing accommodation for the others. The "Metalliferous Mines Regulation Act" was fairly well complied with.

The *Monarch*, probably one of the oldest in the Province, was reopened during the year by the Pacific Mines Company, with A. W. Davies as superintendent. About twenty men were employed, principally in development-work and in driving a long tunnel to connect the old *Monarch* mine-workings with those of the *New Monarch*, which, besides providing a more direct method of haulage, eliminated a lot of outside climbing, which never seemed very safe and was always difficult.

In October sufficient development-work had been done to satisfy the company and the mine was temporarily abandoned pending future developments.

Conditions in and around the mine were kept fairly good and the requirements of the "Metalliferous Mines Regulation Act" well complied with.

A fairly good camp was established in the flat alongside the Kicking Horse river and almost underneath the *Kicking Horse* claim, where a good bunk-house and cook-house were maintained. The ore mined is silver, lead, and zinc at both places.

Some work was done on the *Kicking Horse* claim, but there was no active work being done at the time of visit. This work was done by the same company as at the *Monarch* mine and under the same management.

INSPECTIONS.

During 1926 more mines were inspected than in 1925, due in a great measure to the new blasting regulations. These regulations came into force on May 15th, 1926, and very little time was lost by the larger operations in putting them into force.

In the smaller operations, due principally to a lack of knowledge, their enforcement was slower, but in every case willingness was shown to comply with them, and gratification is felt with the co-operation shown in every case to comply with them in detail.

Visits of inspection were made to the larger mines almost every month; in the smaller operations less frequently; the existing conditions determining the number of inspections. Where conditions were unsatisfactory, these were pointed out and later visits made to ascertain that they had been remedied. All serious and fatal accidents were investigated and, where possible, inquests on fatal accidents were attended. No provision is made in the "Metalliferous Mines Regulation Act" for notice of these inquests to be sent to the Inspector of Mines; therefore in some cases, owing to this cause, it was not possible to attend. In other cases the Coroner has been kind enough not only to notify but to adjourn the inquest pending the attendance of the Inspector, and this privilege is appreciated.

During the year in the Kootenay-Boundary District sixty-three mines were visited and 181 visits of inspection made, as follows:—

	Mines Inspected.	Visits of Inspection.
West Kootenay and Boundary District	54	150
East Kootenay District	9	31

ACCIDENTS.

As provided for by section 19 of the "Metalliferous Mines Regulation Act," notice was received of fifteen accidents, involving death or injury to an equal number of workmen. Fourteen of these accidents came under subsection (*b*) and one under subsection (*a*), due to explosion of some detonators. This shows a slight increase in the accident-rate over 1925 and in the case of the fatal accidents equals 66 per cent. The rate of fatal accidents per thousand employees

for 1926 is slightly over three per thousand, as compared with 1.7 for 1925. Of the fifteen accidents, three fatal and eight serious occurred underground, two fatal and two serious outside the mine.

According to districts, the accidents occurred as follows:—

District.	Mine.	Fatal.	Serious.
East Kootenay	Sullivan	2	7
East Kootenay	Stemwinder	1	....
Nelson	Molly	....	1
Slocan	Slocan Star	....	1
Slocan	Carnation	1	....
Slocan	Rambler	1	....
Boundary	Wellington	....	1

Cause.	Number.
Haulage	4
Falls of roof or sides	4
Chutes	2
Rock on muck-pile	3
Ladder	1
Explosions	1
Employment.	
Electrician	1
Timberman	1
Motor-helper	2
Miner	5
Labourers or muckers	6

In investigating these accidents, it is impossible to overlook the fact that the greater number of these are avoidable, generally by more care on the part of the workmen.

In the case of the fatal accidents, two occurred in the Slocan district, both due to falls of roof or sides. Better supervision and a more careful examination of the mine-workings, as provided for by section 16 of the regulations, would go a long way to reduce this class of accidents.

In the case of the *Rambler-Cariboo* mine, where within the past few years two workmen were killed under similar circumstances, in both cases the workmen are supposed to have gone into some old workings and falls of either roof or sides killed them.

The fatal accident connected with the chute in the *Sullivan* mine, where the deceased and several others visited the scene of the stoppage in the chute, arranged to place a charge of explosives to relieve the block, placed the charge and lighted the fuse, then when retreating the block relieved and carried the man into the chute, with fatal results. There was even sufficient time to get the body out of the chute before the blast went off, and the only good point about the whole business was that only one man was caught, for at one time there were four men in the chute inspecting this block.

It has now been arranged to provide safety chambers and passages to prevent a repetition of such accidents in this mine, and attention is drawn to stress this point so that others may take steps to avoid such accidents.

The other fatal accident at the *Sullivan* mine was outside the tunnel portal, where an old man over 70 years of age was employed cleaning up tracks, etc. Unfortunately he was slightly deaf and did not hear the ore-train coming out and was run over.

The fatal accident at the *Stemwinder* can only be accounted for as accidental, as the deceased while barring down ore in the loading-bins outside the mine, using a long steel bar, a fairly large piece struck the point of the crowbar in the chute, causing the other end to fly up and strike the man under the chin, breaking his neck.

Rocks rolling down the muck-pile was the cause of three non-fatal accidents, and it is thought that the workmen could be more careful to see that the angle of repose on the muck-pile is maintained and so prevent such accidents.

In the case of the man injured by an explosion of detonators, while the evidence of the witnesses is conflicting, there is distinct evidence of carelessness. This man was crimping a detonator on to a fuse and a box containing a fairly large amount of detonators went off, severely injuring him.

Witnesses claim, although the man was a smoker, he was not smoking when the occurrence took place in the blacksmith-shop; they claim the furnace was not going, nor did the detonator the man was working on go off. The only logical conclusion that can be arrived at, despite this evidence, is that either the workman was smoking a pipe or a cigarette, or the furnace was in use and that a spark dropped in the box of detonators, causing the ignition. As a matter of fact, in this case the workman did not have a blaster's certificate. This is a common occurrence with prospectors, but as was remarked before, not because of any wish to defy the law, but due to ignorance of the new regulations.

FIRST-AID WORK.

At the *Sullivan* classes in first aid were held last winter as usual, and two teams, one representing the mine and the other the concentrator, took part in the annual field-day of the East Kootenay Mine Safety Association. At other mines in the district very litte attention is given to this work, although the need for such is even greater, frequently situated far from medical aid, than are the large mines, which usually have ready access to medical aid.

Thanks are again extended to the workmen, the officials, and the companies for their assistance and co-operation in carrying out our duties during 1926, and look forward with confidence to a continuation of the same, realizing that it is only with their co-operation that the list of accidents, both fatal and non-fatal, can be reduced and kept to its lowest.

REPORTS OF COAL-MINE INSPECTORS.

The coal-mines of the Province are situated in four Inspection Districts—namely, Vancouver Island, Northern, Nicola-Princeton, and East Kootenay Districts.

VANCOUVER ISLAND INSPECTION DISTRICT.

THOS. R. JACKSON, HENRY DEVLIN, AND H. E. MIARD, INSPECTORS; JAS. W. JEMSON, ACTING-INSPECTOR.

The Canadian Collieries (Dunsmuir), Limited, operated Nos. 4, 5, and 6 mines, Comox Colliery, and Nos. 1, 2, 3, 5, 6, 8, and Vancouver slope, Wellington Extension Colliery.

The Western Fuel Corporation of Canada, Limited, operated No. 1 Reserve and Wakesiah mines, Nanaimo Colliery.

The Granby Consolidated Mining, Smelting, and Power Company, Limited, operated No. 1 mine, Granby Colliery, Cassidy.

The Nanoose-Wellington Coal Company, Limited, operated the Lantzville mine at Lantzville.

The East Wellington Coal Company, Limited, operated the No. 1 mine, East Wellington.

King & Foster (Island Collieries) operated Nos. 2 and 6 mines at Wellington.

The West Coast Collieries, Limited, Morden and Suquash Collieries, did not operate during the year.

NORTHERN INSPECTION DISTRICT.

The Telkwa Collieries operated the Goat Creek mine.

NICOLA-PRINCETON INSPECTION DISTRICT.

JOHN G. BIGGS, INSPECTOR (HEADQUARTERS, MERRITT).

The Middlesboro Collieries, Limited, operated Nos. 4, 4 East, 5 East, and 5 South mines, Middlesboro Colliery, Merritt.

The Keystone Coal Company operated a pair of slopes in the No. 5 seam.

The Coalmont Collieries, Limited, operated Nos. 3 and 4 mines, Coalmont Colliery, Blakeburn.

The Princeton-B.C. Colliery Company, Limited, operated the new shaft mine at Princeton.

The Tulameen Valley Coal Mine Company operated its No. 1 mine.

The Sunshine Coal Company did a little work and made a small shipment from its mine near Merritt.

The Chu Chua, Wigan Collieries, and Hat Creek mines did not operate during the year.

EAST KOOTENAY INSPECTION DISTRICT.

ROBT. STRACHAN, SENIOR INSPECTOR, AND JOHN MACDONALD, INSPECTOR (HEADQUARTERS, FERNIE).

The Crow's Nest Pass Coal Company, Limited, operated No. 1 East, No. 2, No. 3, No. 1 South, and No. 9 mines, Coal Creek Colliery, and No. 3, No. 3 East, and No. 8 mines, Michel Colliery.

The Corbin Coals, Limited, operated Nos. 4, 5, and 6 mines, Corbin Colliery.

VANCOUVER ISLAND INSPECTION DISTRICT.

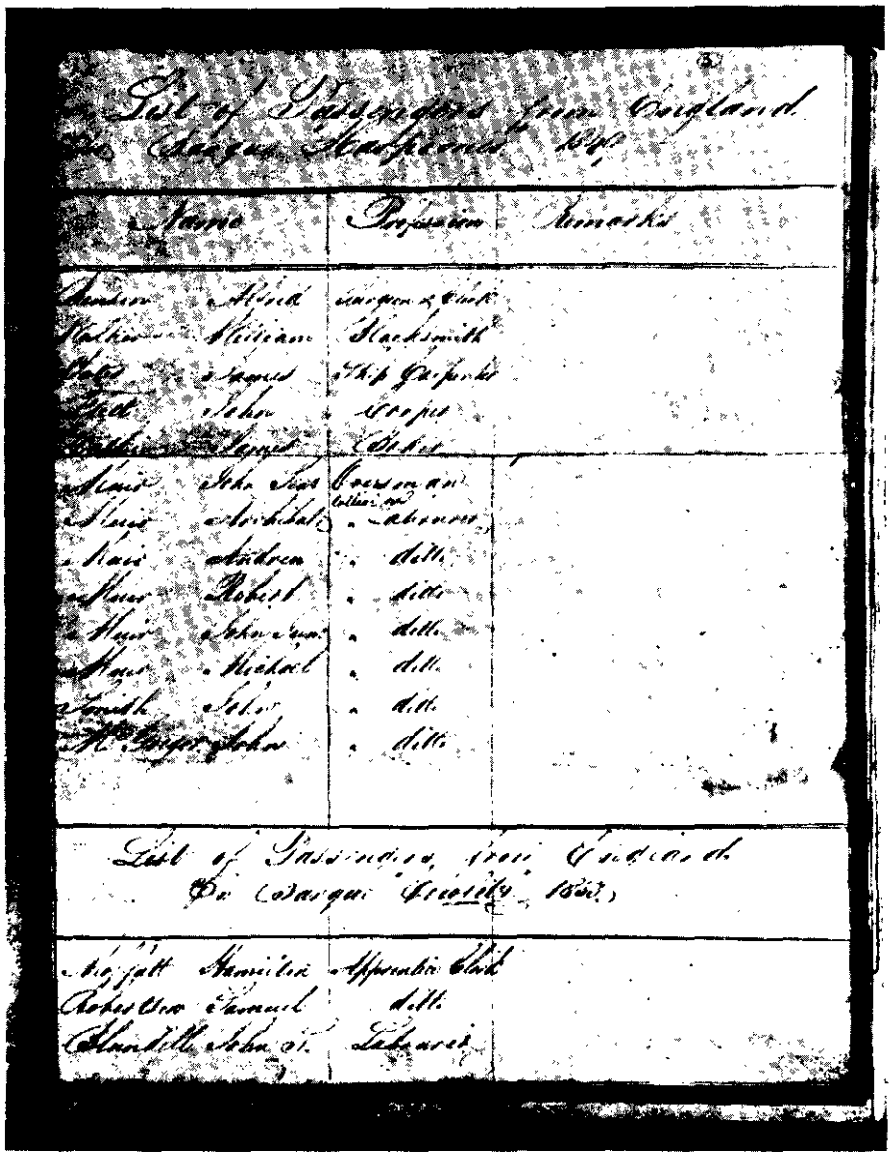
REPORTS BY THOS. R. JACKSON AND HARRY E. MIARD, INSPECTORS.

Western Fuel Corporation of Canada, Ltd.

Head Office—Nanaimo, B.C.

H. J. McClung, President, Phoenix, Arizona; G. W. Bown, Vice-President, Nanaimo, B.C.; Mark Bate, Jr., Secretary-Treasurer, Nanaimo, B.C.; John Hunt, General Manager, Nanaimo, B.C.

The above company operated during 1926 the Nanaimo Colliery, which consists of No. 1 Reserve and Wakesiah mines, all situated in the vicinity of the city of Nanaimo.



The above is a reproduction of the passenger-list on the barque "Harpooner" in 1849 and barque "Cowlitz," 1850. Many of these passengers were the first coal-miners brought to Nanaimo under contract by the Hudson's Bay Company.

1. Benson, Alfred, surgeon and clerk.
2. Walker, William, blacksmith.
3. Yates, James, ship carpenter.
4. Flett, John, cooper.
5. Cathie, James, baker.
6. Muir, John, Sr., oversman.
7. Muir, Archibald, collier or labourer.
8. Muir, Andrew, collier or labourer.
9. Muir, Robert, collier or labourer.
10. Muir, John, Jr., collier or labourer.
11. Muir, Michael, collier or labourer.
12. Smith, John, collier or labourer.
13. McGregor, John, collier or labourer.
14. Moffatt, Hamilton, apprentice clerk.
15. Robertson, Samuel, apprentice clerk.
16. Blundell, John S., labourer.

The following returns show the combined output of all the mines of the Nanaimo Colliery:—

AGGREGATE RETURNS FROM THE WESTERN FUEL CORPORATION'S MINES FOR YEAR 1926.

SALES AND OUTPUT FOR YEAR.	COAL.		COKE.	
(Tons of 2,240 lb.)	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	400,653	.....	.....	.....
Sold for export to United States	43,075	.....	.....	.....
Sold for export to other countries	.....	.....	.....	.....
Total sales	.....	443,728	.....	.....
Used in making coke	.....	.....	.....	.....
Lost in washing	39,221	.....	.....	.....
Used under colliery boilers, etc	67,900	.....	.....	.....
Total for colliery use	.....	107,121	.....	.....
		550,849		
Stocks on hand first of year	31,932	.....	.....	.....
Stocks on hand last of year	25,406	.....	.....	.....
Difference taken from stock during year	.....	6,526	.....	.....
Output of colliery for year	.....	544,323	.....	.....

NUMBER OF HANDS EMPLOYED, DAILY WAGES PAID, ETC.

Character of Labour.	UNDERGROUND.		ABOVE GROUND.		TOTALS.	
	No. employed.	Average Daily Wage.	No. employed.	Average Daily Wage.	No. employed.	Average Daily Wage.
Supervision and clerical assistance	43	.....	40	.....	83	.....
Whites—						
Miners	359	.....	.....	.....	359	.....
Miners' helpers	8	.....	.....	.....	8	.....
Labourers	284	.....	116	.....	400	.....
Mechanics and skilled labour	111	.....	98	.....	209	.....
Boys	43	.....	37	.....	80	.....
Japanese	.....	.....	.....	.....	.....	.....
Chinese	.....	.....	112	.....	112	.....
Indians	1	.....	.....	.....	1	.....
Totals	849	.....	403	.....	1,252	.....

REPORT BY THOS. R. JACKSON, INSPECTOR.

NANAIMO COLLIERY.

No. 1 MINE.

Arthur Newbury, Manager; Edward Courtney, Overman, Protection Mine. John Sutherland, Overman, No. 1 Mine. Robert Adam, Matthew Broderick, William Halliday, William Neave, James Dudley, Alex. Coombs, George B. Bradshaw, John Weeks, John Devlin, John Marrs, James McMeakin, George Perry, Andrew Bennett, Joseph Dean, Neil McMillan, J. M. Brown, Thomas J. Woods, George Jardine, Josh Norris, George Moore, and Fred Nash, Firebosses.

This mine is situated at the south end of the Esplanade on the shore-line of the bay. It is the oldest working-pit in the Nanaimo district and has a large submarine area extending several miles in a seaward direction. The mine has four openings. No. 1 shaft is used for hoisting coal and the screening plant is situated at this shaft; it also serves as a downcast shaft for the ventilation of the South side workings. The men working in the South side portion of the mine are also raised and lowered at this shaft. No. 2 shaft, which is situated about 300 feet distant from No. 1, serves as an upcast shaft for the ventilation of the South side workings. Protection shaft, which is situated on Protection island across the bay, about 1 mile distant from No. 1 shaft, serves as a downcast shaft for the ventilation of the North side workings. The men who work in the North side portion of the mine are lowered and raised in this shaft; there is a ferry in operation for taking the men to and from Nanaimo. Newcastle shaft, situated on Newcastle

island, about 3 miles distant from No. 1 shaft, serves as an upcast shaft for the ventilation of the North side workings. It is also provided with a ladder-way serving as a third means of ingress and egress from No. 1 mine.

The power plant consists of two 530-horse-power Babcock & Wilcox water-tube boilers, coupled with two 208-horse-power return-tubular boilers which operate at a lower pressure than the B. & W., the steam from the B. & W. passing through a No. 8 "Locke Pressure" reducing-regulator which works very satisfactorily. The B. & W. boilers were installed during 1925, being completed in October, and are equipped with chain-grate stokers, induced and forced draught fans. Copes feed-water regulators and Cochrane steam-flow meters. A new feed-pump of the Rees turbo type has been installed and is giving every satisfaction.

The installation of the two new boilers dispensed with the service of two water-tube boilers and six return-tubular boilers, four of the latter being left for purposes of emergency. The present installation marks a considerable saving of both fuel and man-power.

The boilers supply steam to the power-house, which consists of two cross-compound Ingersoll-Rand compressors, each supplying 2,500 cubic feet of air a minute, and two Robb-Armstrong Corliss-valve engines which are direct-connected to d.c. generators, also to fan, hoisting, and washery engines and mine-pump. A Post-type brake engine controls the hoisting-engine.

Electrical equipment consists of two generators driven by steam-engines. One generator is of the Westinghouse type, 250 kw., running at 150 r.p.m. and direct-coupled to a Robb-Armstrong steam-engine. These units supply power to all the electrically driven machinery above ground and underground. There are underground one 10-ton Westinghouse motor; three 6-ton Jeffrey motors; and one 10-ton Edison motor, all of which are operated on the open overhead-trolley system; four electric hoists ranging from 30 to 140 horse-power; and a 3-stage centrifugal pump driven by a 125-horse-power motor running at 1,740 r.p.m.

The power is carried into the mine by four armoured cables which enter the mine by way of the shaft; two of these are leads and two returns.

In connection with the washery plant, two centrifugal pumps of the Fairbanks-Morse type and capable of delivering 1,000 gallons of water a minute each are driven by two 40-horse-power motors. There is also a 90-horse-power motor used for the sludge-pump and a 30-horse-power motor used for driving the coal-washers. Seven motors are in use at the coal wharves for raising and lowering the coal-chutes to facilitate loading coal into scows or ships.

Firebosses and shotlighters use the Wolf safety flame-lamp; workmen use the Edison electric safety head-lamp.

Operations are being conducted in the Douglas and Newcastle seams. On the South side of the mine the Douglas seam is wrought exclusively; on the North side of the mine coal is taken from both seams. Permitted explosives are used for blasting; shots are fired by cable and electric battery; compressed air and electricity are used as motive power for haulage and drainage purposes. Hoisting-engines at the shafts are steam-driven.

Haulage on the Main levels on the North side of the mine is done by electric locomotives of the overhead-trolley type. Heavy steel rails are laid and a copper trolley-wire carried for approximately 3 miles on No. 1 level, extending from the shaft to near the foot of Lamb's incline. Haulage on the South side of the mine is a combination of electric motor and direct rope-haulage on the main roads and drivers and horses are employed for the purpose of getting the cars to and from the working-faces to the main haulage.

The development-work on the North side of this mine has been chiefly confined to driving No. 6 slope, which is about 1,500 feet past No. 5. The slope is about 175 feet long on a grade of 1 in 3. The seam is 24 inches thick and of good quality. There are two face-lines, 300 feet each, and the coal is loaded out by means of conveyors. The development-work on the South side was confined to driving five north slopes; a fairly good area of coal has been found in this section. The slopes have been graded, heavy steel rails laid to the face, and an electric hoist installed to handle the coal.

The following conditions were found to prevail at the time of different inspections during the month of December: There were seven men and one horse in Protection pillars; there were four men and one horse in Hope section.

Lamb's Incline Split.—There were sixty-eight men and nine horses in this split and the quantity of air passing a minute for their use was 13,500 cubic feet.

There was 53,760 cubic feet of air a minute passing up Protection slope, which divides into four splits.

Diagonal Slope.—All working-parts were examined and conditions found to be generally fairly good. No methane was detected and the sections were fairly free from coal-dust. There was 47,000 cubic feet of air a minute passing down Main slope, dividing into three splits.

Diagonal Slope Split.—There was 18,000 cubic feet of air a minute passing for the use of forty men and ten horses. The pillars being extracted in this slope are more or less connected with coal area which has been affected by spontaneous combustion in the past and must be recovered now or definitely abandoned. This slope is finishing fairly rapidly.

No. 2½ Wall, No. 4 Wall, and No. 10 Rock Tunnel.—All working-parts were examined. The general conditions were good; no gas found and sections practically free from coal-dust owing to dampness, water, and mud. There were six men and one horse in No. 2½ wall; twelve men and four horses in No. 4 wall; and five men and one horse in No. 10 wall.

No. 3 Wall Split.—There was 7,000 cubic feet of air a minute passing for the use of seventeen men and five horses.

No. 5 North Slope.—All working-parts were examined and the general conditions were found to be good. About 3 cubic feet of explosive gas was found at face of No. 1 Left roadway. This section was comparatively free from coal-dust, except along the principal part of No. 1 Left level, where more incombustible dust should be added to fulfil the requirements of the "Coal-mines Regulation Act."

No. 5 North Slope Split.—There was 8,000 cubic feet of air a minute passing for the use of twenty-two men and two horses. This section is in the course of development and for the past month or so has exhibited a fine area of coal, out of which a production of 22 tons a day is obtained. Considerable solid ground is ahead of this slope operation.

No. 3 Level, South Side.—All working-parts were inspected. The general conditions were good. No gas was found and the sections fairly free from coal-dust, due to the natural dampness prevailing.

Protection Pillar Split.—There was 20,000 cubic feet of air a minute passing for the use of forty men and six horses. The coal produced from this level consists mostly of what is obtained from pillar-extraction. A new slope is being pushed down from the Douglas to the Newcastle seam. It is expected to develop this seam by means of electric coal-cutters and perhaps use conveyors as the means to get the coal from the face-line to the cars in the roadway.

Protection Pillar Section, Hope, No. 5 and No. 6 Slopes, and No. 7 Long-wall.—All parts of these workings were inspected. The general conditions were good. No gas was found and sections were practically free from coal-dust.

The workmen at this mine availed themselves of the opportunity provided by the provisions of section 101, Rule 37, "Coal-mines Regulation Act," and appointed their own representatives for the purpose of examining the mine. Inspections have been made regularly during the year and reports of inspections, which were generally satisfactory, have been sent to this office.

The following are the official returns for No. 1 mine for the year ended December 31st, 1926:—

Sales and Output for Year.	Coal.		Coke.	
(Tons of 2,240 lb.)	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	235,400	.....	.....	.....
Sold for export to United States	25,317	.....	.....	.....
Sold for export to other countries	.....	.....	.....	.....
Total sales	.....	260,717	.....	.....
Used in making coke	.....	.....	.....	.....
Lost in washing	21,877	.....	.....	.....
Used under colliery boilers, etc	46,057	.....	.....	.....
Total for colliery use	.....	67,934	.....	.....
		328,651		
Stocks on hand first of year	20,142	.....	.....	.....
Stocks on hand last of year	15,024	.....	.....	.....
Difference taken from stock during year	.....	5,118	.....	.....
Output of colliery for year	.....	323,533	.....	.....

NUMBER OF HANDS EMPLOYED, DAILY WAGES PAID, ETC.

Character of Labour.	Underground.		Above Ground.		Totals.	
	No. employed.	Average Daily Wage.	No. employed.	Average Daily Wage.	No. employed.	Average Daily Wage.
		$		$		
Supervision and clerical assistance	26	.....	26	.....	52	.....
Whites—						
Miners	178	7.36	.....	.....	178	.....
Miners' helpers	.....	.....	.....	.....	.....	.....
Labourers	186	4.01–4.55	72	3.12–4.68	258	.....
Mechanics and skilled labour	82	4.55–5.22	54	4.92–5.96	136	.....
Boys	21	1.78–3.54	18	1.14–3.00	39	.....
Japanese	.....	.....	.....	.....	.....	.....
Chinese	.....	.....	64	2.20–3.20	64	.....
Indians	.....	.....	1	4.38	1	.....
Totals	493	.....	235	.....	728	.....

REPORT BY THOS. R. JACKSON, INSPECTOR.

RESERVE MINE.

Robert Laird, Manager; Clifford Dickinson, Overman; Richard Rallison, Ernest Delly, Jacob Stobbart, Fred Bell, George Frater, Albert Manifold, William Neilson, James McGrath, Harry Allsopp, and Harry Meikle, Firebosses.

This mine is situated in the Cranberry district, about 5 miles south of Nanaimo. The first shaft sunk reached the seam at a depth of 1,162 feet. On account of folding in the measures and heavy pitches it was decided to drive a crosscut tunnel 7 by 12 in sections across the measures at a point 950 feet from the surface, with the result the seam was struck at a distance of 180 feet from the shaft. The second shaft was sunk to a depth of 950 feet and a tunnel driven across the measures for a similar distance and the seam struck. A level was then driven in the coal a distance of 300 feet, connecting the two tunnels. After considerable development-work had been done from this point a new tunnel was driven across the measures from No. 1 shaft at a point 200 feet higher, penetrating the seam at a point about 200 feet distant from the shaft. This tunnel is now the main haulage of the mine.

Operations are conducted in the Douglas seam, which is very much troubled with "folds" or overlaps, which tend to make operations difficult. At times the seam pinches out and may be found underlapping or overlapping. The coal, which carries from 3 to 20 feet in thickness, is fairly hard, with a fairly good roof.

Complaints of men being affected by sulphur were not quite so numerous this year, a circumstance that is highly gratifying.

The ventilation of this mine is produced by a pair of 90-inch Sirocco fans, connected to a 20- by 30-inch engine, rope-driven. On the engine is a drive-wheel 5 feet in diameter. These fans, running at an engine-speed of 16 r.p.m., are capable of producing 100,000 cubic feet of air a minute, against a 3-inch water-gauge.

A description of the surface plant at this mine has been given in former reports. The underground mechanical haulage is carried on by means of compressed-air winches.

Edison electric head-lights are used exclusively by all the workmen; the firebosses and shot-lighters use the Wolf-type flame safety-lamp.

The conditions prevailing at the time of inspections made during the month of December are as follows:—

All working-parts of the mine were inspected and general conditions were found to be good. No gas was found and the mine was fairly free from coal-dust. Sulphur was detected in air of No. 2 place, Left section.

Rock Tunnel Split.—There was 15,400 cubic feet of air a minute passing for the use of twenty men and three horses.

No. 10 Dip Split.—There was 15,400 cubic feet of air a minute passing for the use of sixty-five men and eight horses.

Main return had 29,400 cubic feet of air a minute passing.

The workmen at this mine availed themselves of the opportunity provided by the provisions of section 101, Rule 37, "Coal-mines Regulation Act," and appointed their own representatives for the purpose of examining the mine. Inspections have been made regularly during the year and reports of inspections, which were generally satisfactory, have been sent to this office.

Two fatal accidents occurred at this mine during 1926.

The following are the official returns for Reserve mine for the year ended December 31st, 1926:—

Sales and Output for Year.	Coal.		Coke.	
(Tons of 2,240 lb.)	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	140,989	.....	.....	.....
Sold for export to United States	15,133	.....	.....	.....
Sold for export to other countries	.....	.....	.....	.....
Total sales	.....	156,122	.....	.....
Used in making coke	.....	.....	.....	.....
Lost in washing	15,417	.....	.....	.....
Used under colliery boilers, etc	10,321	.....	.....	.....
Total for colliery use	.....	25,738	.....	.....
		181,860		
Stocks on hand first of year	7,912	.....	.....	.....
Stocks on hand last of year	6,643	.....	.....	.....
Difference taken from stock during year	.....	1,269	.....	.....
Output of colliery for year	.....	180,591	.....	.....

Number of Hands employed, Daily Wages paid, etc.

Character of Labour.	Underground.		Above Ground.		Totals.	
	No. employed.	Average Daily Wage.	No. employed.	Average Daily Wage.	No. employed.	Average Daily Wage.
		$		$		
Supervision and clerical assistance	11	.....	9	.....	20	.....
Whites—						
Miners	127	6.67	.....	.....	127	.....
Miners' helpers	6	4.01	.....	.....	6	.....
Labourers	68	4.01–4.55	29	3.50–4.68	97	.....
Mechanics and skilled labour	19	4.55–5.22	30	4.92–5.56	49	.....
Boys	13	1.78–3.54	12	1.14–3.00	25	.....
Japanese	.....	.....	.....	.....	.....	.....
Chinese	.....	.....	43	2.20–3.08	43	.....
Indians	1	4.30	.....	.....	1	.....
Totals	245	.....	123	.....	368	.....

Report by Harry E. Miard, Acting-Inspector.

WAKESIAH COLLIERY.

Arthur R. Wilson, Manager; Nat. Bevis, Overman; Thos. Chapman, Harry Carroll, Andrew Dean, James Richards, and John Webber, Firebosses.

This mine, situated on the Western Fuel Corporation of Canada's farm, about 2 miles from Nanaimo, is operated in the Wellington seam, which here varies in thickness between 2 and 20 feet. Minor dislocations are common and the dip, although irregular, is usually moderate, except on the western side of the mine, where it reaches, and even occasionally surpasses, 45°. Both the pillar-and-stall and the long-wall methods of working were formerly in vogue here, but early in 1926 the long-wall sections were abandoned and the coal-cutting machines and the conveyors were withdrawn. Following this, the mine stood practically idle for a period of about six months, only a few maintenance-men remaining at work.

Operations were resumed in September, 1926, in the Lewis Heading and the Slope sections. Rock tunnels were also started in Gavin's dip in order to develop the seam on the east side of the mine, but so far it has been found very thin. On the west side of the Lewis Heading district the thick and highly inclined part of the seam already mentioned was reached, after a small fault had been cut through, and was opened on the pillar-and-stall system, the coal being brought to the level by a chute serving all places. This has proved to be a very profitable operation and the No. 2 Right level in the Slope section is now being reopened with the intention of reaching the same ground at another point.

The mine is entered by two shafts, 320 feet in depth. The coal is hoisted by a 14 by 16 first-motion steam-hoist, a single cage with counterbalance being used. Steam, electricity, and compressed air are used as motive power underground. The hoists handling the output of the Slope and Gavin's dip are operated by steam, as is the large Cameron pump at the shaft-bottom. The winches used on the main and tail haulage in the Lewis Heading section and several small pumps, taking care of local drainage, are driven by compressed air. The Lewis Heading passes over a minor anticlinal fold and the output of the whole section is brought up one of its branches, and lowered down the other, by an electric hoist situated at its apex. The shaft-bottom and the stables are electrically lighted.

The roof is a sandy shale, often frail, and demanding careful timbering. The roadways are kept in fairly good condition. A considerable part of the workings is rather damp. Samples of dust are collected at regular intervals on the roadways, and when they have been tested inert dust is applied, if necessary, to bring the proportion of incombustible matter up to the prescribed percentage.

Storage-battery electric cap-lamps are used exclusively by all workmen. Officials are provided with Wolf safety-lamps for gas-testing purposes.

Explosive gas was met only once in the course of inspection during 1926, a small quantity having accumulated in the cavity left by a fall of roof in an abandoned stall. The ventilation of the Lewis Heading section benefited considerably from a rearrangement just completed at the end of 1926.

The mine is ventilated by a 90-inch Sirocco fan installed in 1925. At the time of the last inspection 11,200 cubic feet of air a minute was supplied to the Lewis Heading section for the use of forty men and five horses; 6,300 cubic feet passed into the Slope split for twelve men and three horses; and Gavin's dip received 5,500 cubic feet a minute for the use of three men. The total quantity measured a short distance away from the downcast shaft was 25,000 cubic feet.

Only one serious accident was reported from this mine during 1926. A fireboss sustained a broken thigh when struck by a loaded car.

The following are the official returns from the Wakesiah Colliery for the year ended December 31st, 1926:—

Sales and Output for Year.	Coal.		Coke.	
(Tons of 2,240 lb.)	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	24,263	.....	.....	.....
Sold for export to United States	2,625	.....	.....	.....
Sold for export to other countries	.....	.....	.....	.....
Total sales	.....	26,888	.....	.....
Used in making coke	.....	.....	.....	.....
Lost in washing	1,926	.....	.....	.....
Used under colliery boilers, etc	11,521	.....	.....	.....
Total for colliery use	.....	13,447	.....	.....
		40,335		
Stocks on hand first of year	3,877	.....	.....	.....
Stocks on hand last of year	3,739	.....	.....	.....
Difference taken from stock during year	.....	138	.....	.....
Output of colliery for year	.....	40,197	.....	.....

NUMBER OF HANDS EMPLOYED, DAILY WAGES PAID, ETC.

(Average for six months operated.)

Character of Labour.	UNDERGROUND.		ABOVE GROUND.		TOTALS.	
	No. employed.	Average Daily Wage.	No. employed.	Average Daily Wage.	No. employed.	Average Daily Wage.
		$		$		
Supervision and clerical assistance	6	.....	5	.....	11	.....
Whites—						
Miners	54	6.91	.....	.....	54	.....
Miners' helpers	2	4.01	.....	.....	2	.....
Labourers	30	4.01–4.55	15	3.50–4.68	45	.....
Mechanics and skilled labour	10	4.55–5.22	14	4.92–5.56	24	.....
Boys	9	1.78–3.54	7	1.14–3.00	16	.....
Japanese	.....	.....	.....	.....	.....	.....
Chinese	.....	.....	15	2.20–3.08	15	.....
Indians	.....	.....	.....	.....	.....	.....
Totals	111	.....	56	.....	167	.....

Canadian Collieries (Dunsmuir), Ltd.

Head Office—Montreal, Que.

F. Perry, President, Montreal, Que.; Lieut.-Col. Chas. W. Villiers, General Manager, Victoria, B.C.; H. S. Adlington, Secretary, Montreal, Que.; P. S. Fagan, Assistant Secretary, Victoria, B.C.; Thomas Graham, General Superintendent, Cumberland, B.C.

The above company operated the following mines during 1926: The Comox Colliery, Nos. 4, 5, and 6 mines, situated in the vicinity of Cumberland; the Wellington Extension Colliery, Nos. 1, 2, 3, 5, 6, 8, and Vancouver slope, situated at Extension; and No. 5 mine, situated at South Wellington.

The following returns show the combined output of the company's collieries during 1926:—

AGGREGATE RETURNS FROM THE CANADIAN COLLIERIES (D.), LTD., MINES FOR YEAR 1926.

SALES AND OUTPUT FOR YEAR.	COAL.		COKE.	
(Tons of 2,240 lb.)	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	357,527	.....	.....	.....
Sold for export to United States	43,396	.....	.....	.....
Sold for export to other countries	.....	.....	.....	.....
Total sales	.....	400,923	.....	.....
Used in making coke	.....	.....	.....	.....
Lost in washing	76,213	.....	.....	.....
Used under colliery boilers, etc	20,675	.....	.....	.....
Total for colliery use	.....	96,888	.....	.....
		497,811		
Stocks on hand first of year	12,949	.....	.....	.....
Stocks on hand last of year	9,171	.....	.....	.....
Difference taken from stock during year	.....	3,778	.....	.....
Output of colliery for year	.....	494,033	.....	.....

NUMBER OF HANDS EMPLOYED, DAILY WAGES PAID, ETC.

Character of Labour.	UNDERGROUND.		ABOVE GROUND.		TOTALS.	
	No. employed.	Average Daily Wage.	No. employed.	Average Daily Wage.	No. employed.	Average Daily Wage.
Supervision and clerical assistance	54	.....	33	.....	87	.....
Whites—						
Miners	438	.....	.....	.....	438	.....
Miners' helpers	11	.....	.....	.....	11	.....
Labourers	159	.....	69	.....	228	.....
Mechanics and skilled labour	103	.....	137	.....	240	.....
Boys	6	.....	24	.....	30	.....
Japanese	115	.....	.....	.....	115	.....
Chinese	99	.....	.....	.....	99	.....
Indians	78	.....	70	.....	148	.....
Totals	1,063	.....	333	.....	1,396	.....

COMOX COLLIERIES.

These mines are situated in the Comox district, about 13 miles from Union Bay (by road). A railway about 20 miles in length connects the separate mines to a shipping-point at Union Bay, over which the whole output of coal is conveyed.

The mines in operation are Nos. 4, 5, and 6. The latter is a shaft acting as a means for drainage and intake air for No. 5 mine. No. 4 mine is located at the east end of Comox lake and is about 3 miles distant from the city of Cumberland. No. 5 mine is about a mile away from the city. No. 6 is close to the city.

The mine ventilation of Nos. 1 and 2 slopes, of which No. 4 mine is comprised, is produced by a Sullivan reversible fan, double-inlet, having a capacity of 180,000 cubic feet of air a minute, against a 6-inch water-gauge. This fan, which is located at the return end of No. 2 parallel slope, is electrically driven by a 350-horse-power induction-motor, 2,200 volts, speed 250 r.p.m., directly connected to the fan-shaft. A 108-inch double-inlet reversible Sirocco fan is situated at the return end of No. 1 parallel slope and is now in operation.

A large area of the seam to the dip has been worked out, abandoned, and allowed to fill up with water. This great reduction of old workings, through which the air travelled at one time, has enabled the management to augment the ventilation.

Advantage was taken by the workmen, under provision of Rule 37 of section 101 of the "Coal-mines Regulation Act," to appoint their own representatives for the purpose of examining the mine. Inspections have been made regularly and the reports furnished to this office have shown conditions found were generally satisfactory.

The hydro-electric plant of this company, which has been described in previous reports, has been in constant operation during 1926. Sufficient electricity is generated at this plant to supply motive power to all the collieries, the wharf at Union Bay, and for the lighting of Union Bay and Cumberland.

No. 4 MINE.

Thos. Williams, Manager; John S. Williams, Overman, No. 1 Slope; Charles Parnham, Overman, No. 2 Slope; Charles O'Brien, Sam Harwood, William Devoy, Harry Jackson, A. W. Watson, Tom Shields, William Herd, Thomas Lewis, J. H. Caughan, Robert Walker, Watkin Williams, Alf Jones, James Quinn, E. H. Devlin, and Tom Wilson, Firebosses.

This mine consists of two slopes with but one main entrance. There is also a manway part of the way. No. 1 slope runs due north; the lower workings beyond No. 15 West level are practically abandoned. No. 2 slope runs N. 45° E. and all work is practically finished beyond No. 18 West level. These slopes diverge at a point about 75 feet from the main portal. The electric haulage-engine is so connected that trips can be run simultaneously on both slopes to a point where they converge to the main entrance.

The men are conveyed from the bottom and other sections of the slope in a man-trip at the end of each working-shaft. A safety-car is connected to the rear of the man-trip, which ensures the safety of the workmen while riding up the slope. As a precaution against trips breaking away on these slopes the car is now used behind all trips ascending the slopes. Electric head-lights of the Edison storage-battery type are used by the workmen and the firebosses use flame safety-lamps of the Wolf type for testing purposes.

In No. 1 slope electricity is used as the motive power to operate all pumps, winches, and motors. A storage-battery locomotive is employed for haulage purposes in No. 11 West level, which has been reopened through a pillar area for about a mile.

The extraction of pillars is general throughout the mine. The thickness of the coal varies from 3 to 7 feet.

In No. 4 mine the work during 1926 has produced a further increase of pillar-extracted area to the dip off No. 14 West level, No. 1 slope, and No. 15 East and West levels, No. 2 slope, which has been allowed to fill up with water.

The main electric pump is stationed just below No. 15 East level on the left side of slope, and will meet all requirements in connection with keeping the water at a certain level in order to better further extraction of the pillars.

No. 1 West level has penetrated the old working-pillar area for a distance of approximately a mile, and No. 6 East level, No. 2 slope, has advanced into the old pillar area close to 4,000 feet. Both levels are still advancing. No new ground is being developed either in No. 1 or 2 slope of this mine.

The following conditions were found to prevail during the various inspections in December: The workings in Nos. 5 and 6 East levels and No. 7 West level were examined and found to be in good condition generally. There was 54,000 cubic feet of air a minute passing down Main slope at a point immediately above No. 7 West level.

The roadways generally were in good condition, except a few parts where roof-pressure had occurred, causing some low broken stringers; but repairmen were at work in these defective places. No explosive gas was found and the sections were practically free from coal-dust on account of natural dampness and water.

There were thirty-four men and six mules engaged in Nos. 5 and 6 East levels, which are ventilated by the main East split. There were twelve men and three mules engaged in No. 7 West level, which is ventilated by the main West split.

The workings in No. 15 East level and Nos. 11 and 16 West levels, No. 2 slope, were examined, and the following conditions found to prevail therein: The ventilation was good, except the inside place to raise of No. 15 East slope, where it was sluggish, due to derangement of the curtains. Some black-damp was found in this place, which was fenced off. No explosive gas was found, but a trace to ⅛-inch gas-cap was obtained at face of main Right roadway, No. 15 East level.

Roadways were generally in good condition and the timbering was in good order. The section was practically free from coal-dust on account of dampness and water.

In No. 15 East level split there was 15,200 cubic feet of air a minute passing for the use of fifty-nine men and nine mules. In West side split there was 13,400 cubic feet of air a minute passing for the use of forty-five men and five mules.

The total quantity of air entering the main intake airways of No. 4 Comox mine was 135,800 cubic feet a minute, totalled as follows: Manway, 35,000; main, 100,800. The methane content in air at fan averages from 0.1 to 0.3 per cent. Only permitted explosives are used and all blasting done by means of cable and battery under the supervision of certificated officials.

The workings in Nos. 9, 11, and 14 West levels, No. 1 slope, were examined, and the following conditions found to prevail therein: Measured 50,000 cubic feet of air a minute passing down Main slope at a point immediately above No. 11 West landing, which divided into two main splits, namely: No. 11 West level split, which passed 32,000 cubic feet of air a minute, and the Slope split, which passed the remaining 18,000 cubic feet of air a minute.

The quantity of air passing into No. 11 West level is divided into a Right and Left split. In the Left split there was 15,200 cubic feet of air a minute passing for the use of fifty-six men and six mules; in the Right split there was 13,000 cubic feet of air a minute passing for the use of forty-eight men and six mules.

The ventilation was generally good, the roadways were in fairly good condition, and timbering in good order. No explosive gas was found and the sections were practically free from coal-dust owing to dampness and water.

One fatal accident occurred in this mine in 1926, when a Chinese driver was killed by being crushed by a loaded car.

The following are analyses of dust taken during the month of December:—Dust sample from *No. 2 slope from No. 7 West level to a point 300 feet above it (screen analysis by weight)*: Plus 28 mesh—70.54 per cent. by weight; ash, 49.80 per cent.; moisture, 11.04 per cent. Minus 28 mesh—29.40 per cent. by weight; ash, 42.05 per cent.; moisture, 11.04 per cent. Dust sample from No. 1 slope from No. 11 West level to a point 200 feet above on the main slope (screen analysis by weight): Plus 28 mesh—81.45 per cent. by weight; ash, 48.20 per cent.; moisture, 17.54 per cent. Minus 28 mesh—18.55 per cent. by weight; ash, 42.60 per cent.; moisture, 17.54 per cent.

Regarding the placing of sprays in these slopes as was reported in 1925, water-pipes ¾ inch in diameter were laid down each slope for a distance of 2,000 feet. Taps were taken off at intervals of 75 feet and spray-nozzles placed thereon and adjusted that through them a fine spray of water is ejected and is carried by the ventilating air-current down the slope, which dampens the roof, sides, and floor of the roadway in a very efficient manner.

Samples of the mine air were taken at intervals during the year and forwarded to the Dominion Department of Mines, Ottawa, for analysis.

No. 5 Mine.

George O'Brien, Manager; Robert Brown, Overman; Sam Jones and Robert McNeil, Firebosses.

The workings of this mine are reached by a shaft 280 feet deep and known as No. 1 seam. A short distance from the shaft-bottom slopes have been driven down through the measures to another vein of coal called No. 2 seam, 115 feet vertically below No. 1 seam. No. 2 seam, which is about 40 inches high, is still in the course of development. The undercutting of the coal in the development-work is done by a Sullivan chain-cutter mining-machine of a type approved by the Bureau of Mines and operated by means of electricity of 440 volts.

The Edison electric head safety-lamp is used by all workmen and the firebosses use the flame safety-lamp of the Wolf type for testing purposes. Only permitted explosives are used. No blasting is done without the use of cable and battery and shots are fired under the supervision of certificated officials.

The engine used for hoisting purposes in this shaft, which is 280 feet deep, is a Wellman-Seaver-Morgan engine, coupled to a 300-horse-power motor. Line unit is 2,200 volts, 3-phase system, 25 cycles. The hoist is equipped with single drum having two ropes attached, each of which is 1⅛ inches in diameter. An air-brake control is supplied with an overwinding prevention device.

The fan producing ventilation is a 100- by 100-inch double-inlet reversible fan, driven by a motor of 250 horse-power, speed of 250 r.p.m. Line unit, 2,200 volts, 3-phase system, 25 cycles. The quantity of air produced is 200,000 cubic feet a minute, with a 6-inch water-gauge. This fan is automatically controlled with temperature relays on all bearings. This device does away with the necessity of an attendant, as any excessive temperature would be at once relayed to an electric contact, which would act in cutting off the electric current supplied to operate the fan.

Beginning the last few days in November of 1926 this mine commenced producing coal from its long-walls, of which there are two, each about 300 feet long. These walls are located at the foot of a slope 3,000 feet in length.

The method employed for the removal of the coal from the working-face line is by means of belt-conveyors, two of which are in use at present. For the operations of these walls there are three roadways, comprising an intake and two returns.

The main roadway, which serves the purpose of intake and haulage, is situated in the middle of these sections of long-wall. The ventilating air-current entering the haulage-way splits at the face, one air-current travelling to the right and the other air-current going to the left, and thence into return airways on extreme left and right of walls.

Track is kept laid in the return airways to facilitate the movement of face-props, lagging, cog-wood, or machinery, or the removal in cars of excess rock from the walls or the brushing. At the bottom of the Main slope (which is about 1,000 yards in length and lies between No. 1 and No. 2 seams) there is a main intake roadway where electric cables, transformers, and drainage-pipes are located. A line of props in the middle of this roadway with boards attached separate this equipment from the manway, down and up which the men and animals travel to or from their work.

A gate-end loader is employed and is set in the main haulage roadway at the face. The coal loaded by loaders on the moving belt conveys the coal until it finally falls into the gate-end loader, where creepers grip the coal and convey it up a slightly inclined plane; thence along a short horizontal plane, where the creeper-bars pass underneath the loader and the coal falls into the mine-car. The creeper-bar device is wrought on the endless-rope principle.

There are about eighty men engaged in this operation, which is worked three shifts of eight hours. The coal has to be shot down and the shot-holes are drilled by means of a patent electric rotary drilling-machine.

When inspected in December the mine was found generally in good condition. No gas was found and the ventilation, roadways, and timbering were in good order. The mine was practically free from coal-dust. There were thirty-five men and two mules engaged in this operation during the day shift. The quantity of air passing into the East side of the mine was 106,350 cubic feet a minute. Sample mine-air test showed an average of 0.2 per cent. methane.

No dangerous occurrence was reported from this mine during 1926. It is a pleasure to report that no fatal accident occurred during 1926 at this mine.

No. 6 Mine.

This mine is supervised by the officials of No. 5 mine. Practically all the water entering Nos. 5 and 6 mines is hoisted from No. 6 shaft by specially constructed tanks capable of delivering 1,200 gallons a minute. During the last inspection in December there was 52,000 cubic feet of air a minute passing through to No. 5 Comox mine. Roads and timbering were fair, stoppings good, and no gas was found; no coal-dust exists on account of complete dampness.

The following are the official returns for the year ended December 31st, 1926, and the aggregate output of all the mines of the Comox Colliery:—

Sales and Output for Year.	Coal.		Coke.	
(Tons of 2,240 lb.)	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	226,698	.....	.....	.....
Sold for export to United States	5,012	.....	.....	.....
Sold for export to other countries	.....	.....	.....	.....
Total sales	.....	231,710	.....	.....
Used in making coke	.....	.....	.....	.....
Lost in washing	41,244	.....	.....	.....
Used under colliery boilers, etc	4,096	.....	.....	.....
Total for colliery use	.....	45,340	.....	.....
		277,050		
Stocks on hand first of year	8,822	.....	.....	.....
Stocks on hand last of year	2,560	.....	.....	.....
Difference taken from stock during year	.....	6,262	.....	.....
Output of colliery for year	.....	270,788	.....	.....

NUMBER OF HANDS EMPLOYED, DAILY WAGES PAID, ETC.

Character of Labour.	UNDERGROUND.		ABOVE GROUND.		TOTALS.	
	No. employed.	Average Daily Wage.	No. employed.	Average Daily Wage.	No. employed.	Average Daily Wage.
Supervision and clerical assistance	27	.....	17	.....	44	.....
Whites—						
Miners	106	.....	.....	.....	106	.....
Miners' helpers	3	.....	.....	.....	3	.....
Labourers	65	.....	41	.....	106	.....
Mechanics and skilled labour	76	.....	72	.....	148	.....
Boys	6	.....	2	.....	8	.....
Japanese—						
Miners	35	.....	.....	.....	35	.....
Helpers	27	.....	.....	.....	27	.....
Chinese—						
Miners	80	.....	.....	.....	80	.....
Helpers	72	.....	.....	.....	72	.....
Indians	72	.....	23	.....	95	.....
Totals	569	.....	155	.....	726	.....

REPORT BY H. E. MIARD, ACTING-INSPECTOR.

WELLINGTON EXTENSION MINES.

Thos. A. Spruston, District Superintendent.

This division of the Canadian Collieries mining properties comprises Nos. 1, 2, 3, 6, and 8 mines, which, with the new Vancouver slope, are considered as constituting the Extension Colliery, and No. 5 mine at South Wellington, made the subject of a separate section of this report. The entire output of the Extension Colliery is brought to Ladysmith over the Wellington Collieries Railway, which also affords means of transportation to and from their work for the employees of the company residing at Ladysmith.

LADYSMITH.

The general shipping-point for the output of these mines is Ladysmith, where the coal is either loaded on vessels or sent to Mainland points in railway-cars by means of transfer-barges. The coal-washery is equipped with three washers, each having a computed capacity of 200 tons in twelve hours, 6-compartment jigs, and four 14- by 7-foot Mascoe tables taking care of the smaller-sized coal. A very high grade of steam and domestic fuel is produced and finds a ready market in the Coast cities and at many Mainland points.

Power for the washery is supplied by a Pelton wheel. Provisions are made to replace the ordinary fresh-water supply by salt water in case of abnormally cold weather. A 40-kw., 240-volt Allis-Chalmers-Bullock generator is furnishing the power necessary for lighting purposes to the washery and wharves.

EXTENSION COLLIERY.

Jas. Strang, Manager.

The workings of this colliery are situated partly in the Cranberry and partly in the Douglas districts. Here the Wellington seam underlies an area some 2 miles in width at its south-east end, in the vicinity of the Nanaimo river, and extending about 4 miles in a north-westerly direction. The presence of coal in this section was accidentally discovered in the year 1895 and rapid development followed. Unfortunately, the idea of conservation does not seem to have always been uppermost in the minds of pioneer mining men in this field, and a large part of the operations carried on during the last few years has consisted in the recovery of coal left behind in the early days, for reasons that, in the light of present conditions, appear often trifling.

All the Extension mines are in the western limb of an important anticline, the axis of which is closely followed by the Extension valley. The field is traversed by several minor folds, all running in a general north-westerly to south-easterly direction, as do the two major faults. Of the latter, that separating Nos. 1 and 6 mines from Nos. 2 and 3 is by far the most important, both as to continuity and displacement, its throw sometimes approaching 500 feet. At some points it has a comparatively low dip to the south-west and there assumes all the characteristics of an overthrust. As a result of the intense folding the edges of the basin are turned up rather sharply and the highest dips are generally met in the vicinity of the outcrops.

Many dislocations of varying magnitude are encountered in the course of mining operations, as are also rolls, wants, and barren ground. As a rule, these appear with increasing frequency as the south-eastern end of the field is approached. The nature of the roof varies considerably. It is generally a sandy shale, sometimes containing a considerable proportion of carbonaceous matter, seldom exceeding 25 feet in thickness and overlaid by conglomerate. At some points this bed of shale is lacking entirely and at others—namely, in part of No. 2 mine—it assumes a decidedly argillaceous character. The main floor is almost invariably a firm but thin-bedded sandstone.

The entire output of Nos. 1, 2, and 3 mines is brought to the tipple through a rock tunnel, driven 14 by 7 in the clear and on a 1-per cent. grade, which meets No. 1 mine at a distance of three-quarters of a mile from the portal. It continues from there to No. 2 mine, a total distance of a little over a mile. Haulage along this road is by electric locomotives, which also run about half a mile in No. 3 and 1⅛ miles in No. 2 mine. The underground employees are taken to and from their work in "man-trips" hauled by a 13-ton Baldwin-Westinghouse electric locomotive.

No. 6 mine is situated about 1¼ miles to the north-west of the main tunnel and is connected to the tipple by a narrow-gauge railway about a mile in length and an incline 3,000 feet long.

Power-house.—The boiler plant consists of four Goldie & McCulloch return-tubular boilers of 163-horse-power capacity each. The electric power is supplied by three 250-volt d.c. generators. No. 1 is a Crocker-Wheeler of 112.5-kw. capacity, direct-coupled to a 15 by 14 Ideal engine; No. 2 is a 150-kw. Westinghouse, connected directly to a 14 by 14 by 32 Fleming-Harrisburg compound engine; and No. 3 is a 150-kw. General Electric, direct-connected to a 16 by 16 Robb-Armstrong engine. A Blake fire-supply pump 12 by 8 by 10 is maintained in good order in the boiler-house.

During 1926 the Canadian Collieries purchased the plant of the Nanoose-Wellington Coal Company, and a considerable part of the electrical supplies thus acquired was used to improve and extend the Extension power-distributing system.

Wash-house.—This is a steam-heated building, providing accommodation for more than 400 men and equipped with thirty-six spray-baths, a number of hot- and cold-water taps, and a dry-room. Separate lockers and wash-rooms are provided for the firebosses and other officials.

First Aid and Mine-rescue.

Well-attended first-aid classes are conducted every year and the colliery possesses a very competent staff of qualified first-aid men. In addition to the well-equipped room at Extension, an excellently appointed ambulance railway-car is constantly kept in readiness within a short distance of the principal mine entrance.

Local arrangements for the mine-rescue and first-aid contest held at Ladysmith on Labour Day, under the auspices of the Vancouver Island branch of the B.C. Mine Safety Association, were made under the supervision of T. A. Spruston and reflected the most thoughtful and painstaking preparation. The second prize in the mine-rescue contest was awarded to the Extension team, under Captain Geo. Carson, A fact worthy of note is that on the same day Captain Carson obtained the first prize in the five-men first-aid event.

Accidents.

During 1926 six accidents were reported from Extension. Four of these were due to falls of rock, one occurred while timber was being unloaded, and one, which later had unfortunately

to be classed as fatal, was due to a man striking a low stringer while riding on a loaded trip in contravention to the special rules in force at the colliery.

No. 1 Mine.

James Strang, Manager; Thos. Wilson, Overman; William Bauld, David Gordon, John Greenhorn, Harry Mitchell, and Alex. Orr, Firebosses.

The workings of this mine, situated in the part of the field locally known as the "Underlap," are grouped in two independent sections separated by a large expanse of worked-out and barren ground. The position of the fan-shaft, sunk many years ago, has now become far from advantageous, and the main ventilating apparatus could not supply an adequate quantity of air to the No. 4 East section were it not assisted there by a 5-foot Stine fan, driven by a 15-horse-power d.c. motor and used as a booster. The problems presented in winter by the heavy inflow of water has been greatly simplified by the abandonment of the No. 6 East district, and, although severely taxed, the two electrically operated pumps used on the Main slope have so far proved themselves equal to their task.

In the No. 4 East district the coal is worked on the long-wall system, except in a part (reached during the year by a rock incline 250 feet in length) where the presence of a fairly thick and very brittle band of shale above the coal led to the introduction of a double-stall system. The West Incline section is hemmed in by a rather sharp upthrow, following the outcrop of the seam, and the abandoned workings of the No. 2 East district. This limits the operations to a strip seldom exceeding 350 feet in width, but traversed lengthwise by a slope more than 1,900 feet long. The coal is very thick near the fault and is worked in two lifts. Double-stalls are driven in the lower bench and the top coal and pillars are extracted on a retreating system. The latter operation is a difficult one, but has so far been skilfully conducted, with satisfactory results from the standpoints of both safety and recovery. The slope is drained by means of a siphon leading to old workings, a communication with these being established by means of a slant road driven through barren ground.

The haulage equipment consists of an Ottumwa hoist, driven by a 100-horse-power compound-wound d.c. motor, and three smaller units, one handling the output of the dip workings in the No. 4 East section and the other two being used in the West Incline district.

The mine is ventilated by twin fans of the Murphy type, driven by an Allis-Chalmers-Bullock d.c. motor, and passing a total quantity of 65,000 cubic feet a minute, against a water-gauge of 0.75 inch. This installation covers not only the requirements of the parts at present in operation, but does also ventilate No. 6 mine and a vast area of abandoned workings. In the course of the last inspection 20,100 cubic feet of air a minute was measured for the use of seventy men and nine horses. At the same time the No. 4 East booster was passing 15,000 cubic feet a minute.

During 1926 explosive gas was met on but a single instance in the course of inspection, a small quantity being found above the stringers in one stall. For a short time some slight difficulty was experienced with black-damp (mostly free nitrogen) issuing from the abandoned No. 6 East workings, but this condition was speedily remedied. Working-places were always found well timbered and the roadways in good condition. The mine is naturally damp and practically free from coal-dust.

No. 2 Mine.

James Strang, Manager; Robert L. Spruston, Overman; George Carson, David Crawford, William Gilchrist, R. N. Hamilton, Ed. Heyes, Joseph Watson, and William Wesnedge, Firebosses.

This is the most extensive mine being operated at Extension at the present time. Its workings are grouped in four widely separated sections, known as the East Incline, No. 2 Incline, No. 17 Incline, and the Old Motor-road districts.

In the East incline all operations are limited to the extraction of pillars. Some excellent recovery-work was done in this district during 1926; particularly in the No. 2 East level. The vast amount of cogging and stowing done in the course of previous operations did probably contribute to the success of the undertaking to a certain extent, but, nevertheless, the freedom from accidents and the high rate of recovery reflect the greatest credit upon the skill displayed by the officials in charge.

The district has an independent intake and is ventilated as a separate split. At the time of the last inspection there was 7,500 cubic feet of air a minute passing for the use of twenty-four men and five horses. The roadways were generally in good condition. Owing to the nature of the ground the timbering of the faces requires and receives the closest attention.

The No. 2 Incline section is worked almost entirely on the long-wall system. The seam varies greatly in thickness and quality and produces a considerable amount of refuse. The roof is a heavy and brittle shale. A roadway is at present being driven in barren ground from the new motor-road, its object being to afford another outlet to these workings, thus doing away with the long and costly haul to the incline. It had not yet reached the coal at the time of the December inspection.

No. 17 Incline section is opening new ground and extending in the general direction of the Nanaimo river. Here the seam is extremely irregular. It contains a shale-parting several feet thick at many points and extensive "pinch-outs" are very common. The roof is often frail, being sometimes little more than slightly indured clay, and the whole district is extremely wet. Haulage operations have been greatly simplified since the opening of the new motor-road, the coal being now transferred directly from the hoist to the electric locomotive without intermediate handling.

The ventilation was generally good, although black-damp appeared occasionally in the lower parts of the district. At the time of the December inspection all preparations had been made to rearrange it upon more favourable lines (particularly as far as the No. 3 East level is concerned) as soon as a communication had been established with the abandoned workings of No. 21 incline, which would then be used as an intake airway. The working-faces were all carefully timbered (an indispensable feature in this section, particularly on the East side) and the roadways were all in fairly good condition.

At the inner end of the Old Motor-road (No. 4 East level) some pillars left behind in former days, owing to the presence of a thick band of shale in the middle of the seam, have been almost completely removed. Along the No. 4 East level itself roadways intended to facilitate the eventual extraction of the roadside pillars are being driven at two different points.

With the exception of the East incline, all the workings of No. 2 mine are ventilated by an electrically driven Stine fan, installed at the top of a shallow shaft sunk in close proximity to the No. 17 Incline section, and maintaining a water-gauge of 0.9 inch. When last inspected the total quantity of air circulating through these parts of the mine amounted to 26,800 cubic feet a minute for the use of forty-six men and six horses.

No explosive gas was found in No. 2 mine during 1926 in the course of inspections. The presence of traces of black-damp in the air was detected on several occasions at a few points in the East Incline and No. 17 Incline sections.

Electrically driven hoists are handling the output of the Incline sections, delivering it directly to the new motor-road, on which it is hauled to the Main tunnel by an electric locomotive, a distance of 1⅛ miles in the case of No. 17 incline. A smaller locomotive of the same type is operated on the old No. 4 East level and takes care of the few working-places scattered along its course.

No. 3 Mine.

James Strang, Manager; Thos. Strang, Overman; Patrick Malone, James Nimmo, and Geo. Smith, Firebosses.

In this mine operations are now limited to the extraction of the pillars left along the main haulage-road. These have suffered considerably at some points from the great weight thrown upon them and the maintenance of roadways, always onerous here, has now become particularly arduous. Only five pairs of miners were employed at the time of the last inspection. Difficulties due to the presence of black-damp issuing from the old workings have not been infrequent, although they never reached the magnitude of those experienced before the direction of the air-current had been reversed. Working-places were always well timbered, and the roadways were kept in as good a condition as the nature of the ground in which they had to be maintained could allow them to be. The mine is extremely wet and, although a considerable amount of coal-dust was occasionally produced in badly crushed pillars, this may be said to have been most efficiently counteracted by the enormous volume of percolating water finding its way to the workings.

The mine is ventilated by electrically driven twin fans of the Murphy type, enclosed and run as blowers. The improvised casings do not comply with the most exacting requirements of such structures and a certain amount of vibration is unavoidable, but the whole apparatus is able to force 30,000 cubic feet of air a minute through the live parts of the mine and the adjoining extensive goaves, against a water-gauge of a trifle less than 0.9 inch. In the course of the December inspection the volume of the air-current passing out of the last working-place was found to be 10,000 cubic feet a minute. There were then twenty-four men and three horses in the mine.

No. 6 Mine.

James Strang, Manager; Thos. Wilson, Overman; Robert Houston and Walter Joyce, Firebosses.

No. 6 mine, adjoining the westernmost abandoned workings of No. 1, has been operated during the last four years in a part of the latter's territory that earlier operations had failed to reach. Its extent was limited by the presence of important faults and the end of 1926 found it very nearly worked out. No explosive gas was found in the course of inspection during 1926, the working-faces were always well timbered, and the roadways were kept in good condition, although generally very damp. Owing to the latter fact the mine was practically free from coal-dust.

No. 6 mine is ventilated by No. 1 fan, advantage being taken of the negative pressure maintained in the abandoned workings of the latter. At the time of last inspection 3,200 cubic feet of air a minute was passing into the mine for the use of twelve men and three horses.

The mechanical equipment consists of a portable boiler and a steam-hoist, which is used both to haul the coal up the slope and to lower it over the outside incline. The mine is drained by gravity, the water finding its way to the main haulage-tunnel through the old workings.

New Vancouver Slope.

James Strang, Manager; Thos. Strang, Overman; Hugh M. Davidson, John Pearson, and Joseph Tennant, Firebosses.

The object of the operations begun here towards the end of September, 1926, is to recover pillars and top coal, said to have been left in this mine at the time of its abandonment, about a quarter of a century ago. An advantageous location was finally selected and a slope was started on the full dip of the seam (which is fairly high at this point). A small electric hoist was brought over from Extension and a power-transmission line was installed. At the same time the mine was connected by a single-track incline, approximately 1,000 feet long, with the F. Beban Lumber Company's logging-railway, alongside which a short siding was provided. The erection of a small tipple fitted with a bar-screen completed the surface preparations.

In October the pillar left alongside the outcrop was cut through and heavily caved ground was encountered. At the time of last inspection three exploratory roadways were being driven through these goaves, some top coal being recovered in the process. They were well timbered and otherwise in good condition. Only seven men were employed underground on each shift. The mine is easily accessible by road from Nanaimo, where nearly all men employed are residing.

The ventilation depends upon the positive pressure, maintained in the abandoned workings extending between this opening and No. 3 mine by the latter's fan, which induces the circulation of a sufficient quantity of air to satisfy the present requirements.

No. 8 Mine.

William Clifford, Overman; John McLeod, Fireboss.

The presence of the Wellington seam, under conditions of thickness and quality rendering it workable, on the south side of the Nanaimo river and in the vicinity of McKay lake was proved by boring and surface prospecting several years ago. Operations began there towards the end of the month of May and were energetically prosecuted. Preparations for shipping were made at the outset. These included the construction of a spur from the Timberlands logging-railway, the installation of a siding, and the erection of a small tipple with screening facilities. The slope, driven in excellent coal, struck a sharp declivity, and after advancing for some time

on a very strong dip met some disturbed ground, which fact led to its abandonment. Another roadway was then started on a course forming an angle of about 40° with that of the original slope, and presented a most promising appearance at the time of the last inspection. The coal was thick and clean and the gradient very moderate. Two other exploratory roadways were also being driven at the time, both on the south side of the slope.

The mechanical equipment consists of two portable boilers, a hoist, a small centrifugal fan, and a duplex Worthington pump handling the rather heavy inflow of water underground. Steam is the only form of motive power used.

The output is brought from the mine to the Canadian Collieries Railway over the Victoria Lumber Company's track and as part of the logging-trains operated on the latter, but the construction of a special branch railway is being considered. The employees, who are all residents of Ladysmith, travel by the regular Extension trains as far as Lockner's Crossing, whence they complete their journey by means of motor conveyance specially provided.

Explosive gas has never been found here since the beginning of operations. At the time of the last inspection the fan was passing 2,100 cubic feet of air a minute for the use of seven men, and the working-faces and roadways were well timbered.

The following are the official returns from the Extension Colliery for the year ended December 31st, 1926:—

Sales and Output for Year.	Coal.		Coke.	
(Tons of 2,240 lb.)	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	94,929	.....	.....	.....
Sold for export to United States	38,384	.....	.....	.....
Sold for export to other countries	.....	.....	.....	.....
Total sales	.....	133,313	.....	.....
Used in making coke	.....	.....	.....	.....
Lost in washing	27,317	.....	.....	.....
Used under colliery boilers, etc.	12,697	.....	.....	.....
Total for colliery use	.....	40,014	.....	.....
		173,327		
Stocks on hand first of year	4,127	.....	.....	.....
Stocks on hand last of year	6,611	.....	.....	.....
Difference added to stock during year	.....	2,484	.....	.....
Output of colliery for year	.....	175,811	.....	.....

Number of Hands employed, Daily Wages paid, etc.

Character of Labour.	Underground.		Above Ground.		Totals.	
	No. employed.	Average Daily Wage.	No. employed.	Average Daily Wage.	No. employed.	Average Daily Wage.
Supervision and clerical assistance	21	.....	14	.....	35	.....
Whites—						
Miners	260	.....	.....	.....	260	.....
Miners' helpers	8	.....	.....	.....	8	.....
Labourers	75	.....	15	.....	90	.....
Mechanics and skilled labour	22	.....	56	.....	78	.....
Boys	.....	.....	16	.....	16	.....
Japanese	.....	.....	.....	.....	.....	.....
Chinese	6	.....	47	.....	53	.....
Indians	.....	.....	.....	.....	.....	.....
Totals	392	.....	148	.....	540	.....

REPORT BY HARRY E. MIARD, ACTING-INSPECTOR.

WELLINGTON EXTENSION, No. 5 MINE, SOUTH WELLINGTON.

Thos. A. Spruston, Manager; William Brown, Overman; Daniel Caldwell, Robert Ewing, Neil McIntyre, and Thos. Robson, Firebosses.

This mine, situated in the Cranberry district near the South Wellington Station of the Esquimalt & Nanaimo Railway, is operated in the Douglas seam and adjoins the old Alexandria mine, from which it is separated by a safety-pillar having a minimum breadth of 300 feet. The seam varies greatly in thickness and quality. The weak sandy-shale floor shows much more frequent irregularities than does the roof, which may be either a sandy shale or a rather coarse grit. "Pinches" and "wants" are by no means uncommon. The coal, which finds a ready market both as domestic and boiler-fuel, belongs to the high-volatile variety.

The shipping facilities at the mine are excellent owing to its close proximity to the Esquimalt & Nanaimo Railway, to which it is connected by a short spur. The coal is sent over this road to the Canadian Collieries shipping centre at Ladysmith, from which it is distributed.

The tipple is provided with a revolving dump, chain car-haul, shaker screens, picking-table, loading-boom, and a scraper conveyor for boiler-fuel. The power plant consists of four Goldie & McCulloch return-tubular boilers, each having a capacity of 163 horse-power; two 250-volt, d.c., 112-kw. generators—one a Crocker-Wheeler directly connected to a 15 by 14 Ideal engine, the other an Allis-Chalmers coupled directly to a 16 by 16 Skinner engine; and a Sullivan air-compressor. A supply-pump completes the power-house equipment.

The entire output is hauled up the Main slope by a first-motion steam-hoist, with 18 by 36 engines, situated on the surface. A 100-horse-power electrically driven Ottumwa hoist is used on the No. 3 North Diagonal slope, but will soon be replaced by another, operated by compressed air, which will be situated much nearer the present workings. Three small compressed-air winches are also used in the No. 20 Left section.

The No. 6 South district was finally worked out during the year. The old level has been transformed into a sump of generous dimensions by the erection of a dam at its entrance, two pumps being installed there to deal with the large quantity of water flowing out of the abandoned workings.

The main pumping installation consists of a 6-inch 7-stage turbine-pump, having a capacity of 360 gallons a minute, directly connected to a Canadian General Electric shunt-wound, 75-horse-power, d.c. motor making 1,400 revolutions a minute. The discharge-pipe reaches the surface through a borehole about 460 feet in depth.

A new connection established between the Main slope and the North diagonal will eventually greatly simplify the haulage problem. Exploratory roadways have been started with the object of proving the territory left untouched by the No. 6 South workings.

The mine is ventilated by a 60-inch single-inlet Keith fan, electrically driven and having a capacity of 32,000 cubic feet a minute, against a water-gauge of 1 inch. At the time of the last inspection there was 16,000 cubic feet of air a minute circulating through the North side workings (at present the only part of the mine in operation) for the use of fifty-four men and six horses. A recent analysis of air from this split gave the following results: Oxygen, 20.44 per cent.; nitrogen, 78.97 per cent.; methane, 0.28 per cent.; carbon dioxide, 0.31 per cent. The mine is generally damp, but samples of dust are collected at regular intervals in the drier parts of the roadways. The most recent tests made showed that only between 50 and 66 per cent. of the material collected passed through a 28-mesh screen. These parts of the samples contained from 53.4 to 64 per cent. of ash and from 5 to 6.3 per cent. of moisture.

Small quantities of explosive gas were met on three different occasions during 1926 in the course of inspection. The presence of traces of sulphur in the air was occasionally noticed in the workings of the South side, now abandoned.

A well-appointed first-aid room and a motor-ambulance are provided. Three accidents to employees were reported during 1926, all having occurred underground. Two of them were due to falls of rock. In the third case a miner sustained two fractured ribs by falling off a scaffold in his working-place.

The following are the official returns from the Wellington Extension No. 5 mine for the year ended December 31st, 1926:—

Sales and Output for Year.	Coal.		Coke.	
(Tons of 2,240 lb.)	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	35,900	.....	.....	.....
Sold for export to United States	.....	.....	.....	.....
Sold for export to other countries	.....	.....	.....	.....
Total sales	.....	35,900	.....	.....
Used in making coke	.....	.....	.....	.....
Lost in washing	7,652	.....	.....	.....
Used under colliery boilers, etc	3,882	.....	.....	.....
Total for colliery use	.....	11,534	.....	.....
		47,434		
Stocks on hand first of year	.....	.....	.....	.....
Stocks on hand last of year	.....	.....	.....	.....
Difference added to (or taken from) stock during year	.....	.....	.....	.....
Output of colliery for year	.....	47,434	.....	.....

Number of Hands employed, Daily Wages paid, etc.

Character of Labour.	Underground.		Above Ground.		Totals.	
	No. employed.	Average Daily Wage.	No. employed.	Average Daily Wage.	No. employed.	Average Daily Wage.
Supervision and clerical assistance	6	.....	2	.....	8	.....
Whites—						
Miners	72	.....	.....	.....	72	.....
Miners' helpers	.....	.....	.....	.....	.....	.....
Labourers	19	.....	13	.....	32	.....
Mechanics and skilled labour	5	.....	9	.....	14	.....
Boys	.....	.....	6	.....	6	.....
Japanese	.....	.....	.....	.....	.....	.....
Chinese	.....	.....	.....	.....	.....	.....
Indians	.....	.....	.....	.....	.....	.....
Totals	102	.....	30	.....	132	.....

Report by Thos. R. Jackson, Inspector.

Granby Consolidated Mining, Smelting and Power Co., Ltd.

J. T. Crabbs, President, New York City; Chas. Bocking, Vice-President, Anyox, B.C.; R. H. Plommer, Treasurer, Vancouver, B.C.; Robert Henderson, Superintendent, Cassidy, B.C.

No. 1 Mine.

Robert Henderson, Manager; Alexander McLaughlin, Overman; Albert Radford, Matthew Meek, Tom Tullin, J. Stewart, and Tom Cunliffe, Firebosses.

Granby Colliery No. 1 mine is situated some 7 miles in a southerly direction from Nanaimo. The main entrance to this mine is by a slope 7 by 14 feet in the clear to allow for a double track and is timbered by 12- by 14-inch framed sets, 4 feet centre to centre. A separate manway is provided for a travelling-road and it at the same time forms an intake airway. The Douglas seam, which varies from 3 to 20 feet in thickness, is worked at this mine and the system of work adopted is pillar and stall.

This mine is ventilated by a Sirocco fan having a capacity of 150,000 cubic feet of air a minute, with a 3.5-inch water-gauge. This fan is driven by a 150-horse-power Westinghouse electric motor. The main hoist is a Vulcan 18- by 36-inch double-drum, second-motion hoist. The mine-cars are large and have a carrying-capacity of 1.75 tons of coal. No mules or horses are used in this mine. Compressed air is used underground for the driving of drills, pumps, and winches. A Rand cross-compound condensing compressor, with capacity of 2,000 cubic feet

of air a minute, furnishes the power. Electric power is supplied by an Allis-Chalmers 450-kw. generator (2,300-volt. 3-phase, 60-cycle, 300 r.p.m.), both direct-connected to vertical high-speed engines of the Goldie & McCulloch type. The remainder of the electric equipment is of the Westinghouse type. A Worthington fire-pump, capacity of 1,000 gallons a minute, size 18 by 10 by 12 inches, is kept in readiness for emergency.

A large house called the "change-house" is used by the miners for the purpose of changing their clothes. An attendant is in charge whose duty is to keep the place clean, well ventilated, and heated. The heat produced in the drying-room is sufficient to make the mine clothes perfectly dry and comfortable for the workmen to don before they go to work in the mine. The change-house is equipped with steel lockers, which are heated with steam-coils from underneath. There are shower-baths and large lavatory, including every convenience for the use of the workmen.

The intake air is heated by exhaust steam passing through radiators and allowed to travel down the mine, thus to some extent preventing the drying-out of the mine. Very fine fog sprays are placed about every 150 feet apart on the Main slope and these operate automatically for twenty minutes out of every hour. Farther in the mine the main roadways are liberally treated with inert dust and water to such extent that the sample tests for coal-dust show an incombustible content in compliance with the requirements of the "Coal-mines Regulation Act."

Edison head-lamps are used by the employees, except in the case of officials, who use the Wolf flame safety-lamp for testing purposes.

During December, 1926, Nos. 6, 6½, and 7 North levels were inspected and general conditions were found to be good. In Main slope and Manway slope there was a total of 118,640 cubic feet of air a minute passing. No explosive gas was found, and the timbering, roads, and ventilation were also good. A good percentage of inert dust and moisture was contained among the coal-dust, making the dust comply well with the requirements of the "Coal-mines Regulation Act."

In No. 6 North level split there was 31,900 cubic feet of air a minute passing for the use of twenty-five men.

In one place in No. 4 South level about 12 cubic feet of explosive gas was found in a roof-cavity and quite a quantity in the gob off Main heading, No. 7 South level. The ventilation, timbering, and roadways were found to be in good condition, sections practically free from coal-dust owing to liberal supply of incombustible dust, and a generous natural supply of water.

In No. 7 South split there was 18,000 cubic feet of air a minute passing for the use of thirty men. No blasting is permitted in No. 7 South section.

The following are the official returns for the Granby Colliery for the year ended December 31st, 1926:—

Sales and Output for Year.	Coal.		Coke.	
(Tons of 2,240 lb.)	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	112,439	.....	.....	.....
Sold for export to United States	9,938	.....	.....	.....
Sold for export to other countries	.....	.....	.....	.....
Total sales	.....	122,377	.....	.....
Used in making coke	.....	.....	.....	.....
Lost in washing	30,067	.....	.....	.....
Used under colliery boilers, etc	16,181	.....	.....	.....
Total for colliery use	.....	46,248	.....	.....
		168,625		
Recovery from dump	1,207	.....	.....	.....
Stocks on hand first of year	1,302	.....	.....	.....
	2,509			
Stocks on hand last of year	1,170	.....	.....	.....
Difference taken from stock during year	.....	1,339	.....	.....
Output of colliery for year	.....	167,286	.....	.....

NUMBER OF HANDS EMPLOYED, DAILY WAGES PAID, ETC.

Character of Labour.	UNDERGROUND.		ABOVE GROUND.		TOTALS.	
	No. employed.	Average Daily Wage.	No. employed.	Average Daily Wage.	No. employed.	Average Daily Wage.
		$		$		$
Supervision and clerical assistance	8	6.00	9	8.20	17	7.17
Whites—						
Miners	121	6.31	.....	.....	121	6.31
Miners' helpers	.....	.....	.....	.....	.....	.....
Labourers	.....	.....	34	.....	34	.....
Mechanics and skilled labour	50	4.24	20	3.93	70	4.08
Boys	.....	.....	.....	.....	.....	.....
Japanese	.....	.....	.....	.....	.....	.....
Chinese	.....	.....	.....	.....	.....	.....
Indians	.....	.....	.....	.....	.....	.....
Totals	179	5.72	63	4.54	242	5.41

REPORT BY HARRY E. MIARD, ACTING-INSPECTOR.

East Wellington Coal Company.

H. G. Helsterman, President, Victoria, B.C.; P. S. Fagan, Secretary-Treasurer, Victoria, B.C.

EAST WELLINGTON COLLIERY.

William Wilson, Manager; William Roper, Overman; George Gray, Daniel McMillan, George Oswald, Chas. Webber, and Joseph Wilson, Firebosses.

This mine, situated in the Mountain district, is operated in the Wellington seam. Its territory extends from the boundary of the old Jingle Pot to the abandoned workings of the Chandler mine operated in the late nineties. In the present workings the coal seldom exceeds a thickness of 2 feet, but is of superior quality, particularly as domestic fuel. It might be added that, owing to the nature of the seam and the method of working followed, an abnormally large percentage of lump coal is produced.

The seam is reached by two slopes, 1,320 and 1,220 feet in length respectively, of which the former is the main haulage-road and intake, the other being used as a return airway. The Main slope has a gradient of about 25°. The workmen travel in and out of the mine in a special trip of six cars, reserved exclusively for the purpose, all connected, in addition to the ordinary couplings, by a ⅞-inch steel rope running through the whole train and connected to the main rope shackling.

The coal worked on the long-wall system is undermined by two Sullivan chain-cutters and loaded by hand. The present workings consist of two walls, respectively 400 and 500 feet long. They are separated by a fault with a vertical throw of 10 feet, and, in addition, a local pinch-out 35 feet long has been met near the centre of the lower wall and is greatly interfering with the operation of the mechanical coal-cutters. Gateways are driven on 32-foot centres, the bottom is brushed (although a little ripping of roof is done occasionally), and the top is secured by pack-walls and alternate cogs. This method provides an ample supply of stowing material. At the faces the method of timbering followed is that commonly known as "post and strap," necessary in order to permit the operation of the coal-cutting machines. The roof is a sandy shale, occasionally weak. The roadways are fairly well kept, although frequently of small cross-sectional area.

The entire output is brought to the foot of the Main slope by a main and tail haulage, which is also bringing the coal from the lower wall to the Main level with the assistance of a small auxiliary hoist. The output of the upper wall is brought down over a short incline by another

hoist. All underground machinery is operated by compressed air, except the Main slope pumps, which are steam-driven.

Extensive prospecting operations were carried on during 1926, rock-drifts following the seam being driven on the north-west side over a total distance of 1,350 feet. This roadway is ventilated by a small centrifugal fan, driven by a compressed-air engine, and a line of 12-inch galvanized-iron tubes.

The power plant consists of four return-tubular boilers, with an aggregate rating of 476 horse-power; two Canadian Rand tandem compressors of 550 cubic feet capacity each; a Norwalk tandem compressor with a capacity of 1,650 cubic feet; and two small electric generators supplying power for lighting, charging lamp-batteries, etc.

A new tipple has just been completed. It is equipped with a rotary dump, Marcus screens, boiler-coal elevator, and a simple but extremely convenient loading arrangement. The whole was erected at a very moderate cost and reflects considerable credit upon the ingenuity of its designers.

Electric cap-lamps are used exclusively by the workmen, while officials are provided with safety-lamps of the Wolf type for gas-testing purposes.

Early in 1926 the abandoned workings on the South side were sealed off, following instructions issued by James Dickson, Inspector, owing to the difficulty experienced in keeping them properly ventilated and clear of gas. In the parts of the mine at present in operation inflammable gas was met once in the course of inspection, in a blind end of the north-west prospect-tunnel.

The ventilation was generally good, but will be greatly improved, particularly in the case of the upper wall, by a new airway at present being driven. At the time of the last inspection 19,800 cubic feet of air a minute was measured for the use of fifty-eight men and three horses. Samples of return air gave the following average analysis: Oxygen, 20.79 per cent.; nitrogen, 78.93 per cent.; methane, 0.15 per cent.; carbon dioxide, 0.13 per cent.

A fatal accident occurred at the colliery during 1926, a loader being killed by the fall of a slab of roof-rock under which he was preparing to set up a "strap."

The following are the official returns from the East Wellington Colliery for the year ended December 31st, 1926:—

Sales and Output for Year.	Coal.		Coke.	
(Tons of 2,240 lb.)	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	36,153	.....	.....	.....
Sold for export to United States	.....	.....	.....	.....
Sold for export to other countries	.....	.....	.....	.....
Total sales	.....	36,153	.....	.....
Used in making coke	.....	.....	.....	.....
Lost in washing	1,625	.....	.....	.....
Used under colliery boilers, etc	5,955	.....	.....	.....
Total for colliery use	.....	7,580	.....	.....
		43,733		
Stocks on hand first of year	359	.....	.....	.....
Stocks on hand last of year	100	.....	.....	.....
Difference taken from stock during year	.....	259	.....	.....
Output of colliery for year	.....	43,474	.....	.....

NUMBER OF HANDS EMPLOYED, DAILY WAGES PAID, ETC.

Character of Labour.	UNDERGROUND.		ABOVE GROUND.		TOTALS.	
	No. employed.	Average Daily Wage.	No. employed.	Average Daily Wage.	No. employed.	Average Daily Wage.
Supervision and clerical assistance	2	.....	3	.....	5	.....
Whites—						
Miners	70	.....	.....	.....	70	.....
Miners' helpers	.....	.....	.....	.....	.....	.....
Labourers	44	.....	4	.....	48	.....
Mechanics and skilled labour	17	.....	9	.....	26	.....
Boys	6	.....	6	.....	12	.....
Japanese	.....	.....	.....	.....	.....	.....
Chinese	.....	.....	12	.....	12	.....
Indians	.....	.....	.....	.....	.....	.....
Totals	139	.....	34	.....	173	.....

REPORT BY THOS. R. JACKSON, INSPECTOR.

Nanoose-Wellington Collieries, Ltd.

Head Office—Lantzville, B.C.

Alvin W. Defiel, Chairman, St. Paul, Minn.; John A. Coleman, Managing Director, Lantzville, B.C.; Russell H. Phinney, Secretary, St. Paul, Minn.; Martin N. Olsen, Treasurer, Lantzville, B.C.; J. W. Jemson, Superintendent, Lantzville, B.C.

LANTZVILLE MINE.

James B. Jemson, Superintendent; Joseph Neen, Overman; H. M. Davidson, W. H. Moore, W. Angell, W. Bradley, D. Caldwell, W. Nuttall, T. Chapman, and A. Derbyshire, Firebosses.

This mine was operated in the early part of 1926 by the Nanoose Collieries, Limited, and was then closed down. The property was later purchased by the Canadian Collieries (Dunsmuir), Limited, who partly dismantled the plant and filed notice of abandonment of the mine on October 2nd, 1926.

The following are the official returns from the Nanoose-Wellington Collieries for the year ended December 31st, 1926:—

SALES AND OUTPUT FOR YEAR.	COAL.		COKE.	
(Tons of 2,240 lb.)	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	21,174	.....	.....	.....
Sold for export to United States	.....	.....	.....	.....
Sold for export to other countries	.....	.....	.....	.....
Total sales	.....	21,174	.....	.....
Used in making coke	.....	.....	.....	.....
Lost in washing	4,235	.....	.....	.....
Used under colliery boilers, etc.	2,050	.....	.....	.....
Total for colliery use	.....	6,285	.....	.....
		27,459		
Stocks on hand first of year	910	.....	.....	.....
Stocks on hand last of year	.....	.....	.....	.....
Difference taken from stock during year	.....	910	.....	.....
Output of colliery for year	.....	26,549	.....	.....

NUMBER OF HANDS EMPLOYED, DAILY WAGES PAID, ETC.

Character of Labour.	UNDERGROUND.		ABOVE GROUND.		TOTALS.	
	No. employed.	Average Daily Wage.	No. employed.	Average Daily Wage.	No. employed.	Average Daily Wage.
Supervision and clerical assistance	20	.....	7	.....	27	.....
Whites—						
Miners	99	.....	.....	.....	99	.....
Miners' helpers	21	.....	.....	.....	21	.....
Labourers	38	.....	7	.....	45	.....
Mechanics and skilled labour	25	.....	13	.....	38	.....
Boys	.....	.....	6	.....	6	.....
Japanese	.....	.....	.....	.....	.....	.....
Chinese	.....	.....	21	.....	21	.....
Indians	.....	.....	.....	.....	.....	.....
Totals	203	.....	54	.....	257	.....

REPORT BY HARRY E. MIARD, ACTING-INSPECTOR.

Island Collieries, Ltd.

(KING & FOSTER COAL CO., LTD.)

Head Office—Herald Building, Nanaimo, B.C.

NOS. 2 AND 5 MINES.

Henry Shepherd, Superintendent; S. K. Mottishaw, Manager; John Michek and George Stewart, Firebosses.

These mines are operated in the Wellington seam, near North Wellington. No. 5 is in the Main, while No. 2 mine, which is the most important, is in the Upper seam. No. 2 mine is entered by means of two slopes, several hundred yards apart, but only one of which is at present in use. The coal is worked by long-wall, the only method applicable in this case owing to the large amount of refuse to be handled. At many points the seam has been dislocated and the roof fractured by the extraction of pillars in the Lower seam, and mining operations are seriously complicated thereby.

No. 2 mine is ventilated by a small steam-driven Sheldon fan. At the time of the last inspection 7,500 cubic feet of air a minute was supplied to thirty-two men and six horses. No explosive gas has yet been found (there is only 30 feet of cover and this is fissured at frequent intervals), but black-damp has occasionally proved troublesome. All underground workmen use the Edison storage-battery electric cap-lamps exclusively. Officials are provided with flame safety-lamps of the Wolf type for testing purposes. The mine is damp and free from coal-dust.

The coal is hauled up the slope by a small second-motion hoist, supplied with steam by a vertical boiler, and is taken to the screening and loading plant by a gasolene-locomotive. The latter installation is situated close to the Esquimalt & Nanaimo Railway at a distance of about a mile from the mine.

In No. 5 mine an effort has been made to penetrate a fault against which the former workings had been stopped. At some points there the roof is little more than gravel and requires the utmost care in timbering. A vertical boiler and a small steam-hoist compose all the surface equipment at this mime. Only two men were employed underground at the time of the last inspection.

An accident was reported from this colliery during February, 1926. Two men engaged in repairing a shallow shaft, known as No. 7, fell a distance of 40 feet when their scaffolding broke. One of them escaped with a severe shaking, but the other sustained very serious injuries.

The following are the official returns from the Island Collieries for the year ended December 31st, 1926:—

Sales and Output for Year.	Coal.		Coke.	
(Tons of 2,240 lb.)	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	13,148	.....	.....	.....
Sold for export to United States	.....	.....	.....	.....
Sold for export to other countries	.....	.....	.....	.....
Total sales	.....	13,148	.....	.....
Used in making coke	.....	.....	.....	.....
Lost in washing	3,254	.....	.....	.....
Used under colliery boilers, etc	200	.....	.....	.....
Total for colliery use	.....	3,454	.....	.....
		16,602		
Stocks on hand first of year	.....	.....	.....	.....
Stocks on hand last of year	.....	.....	.....	.....
Difference added to (or taken from) stock during year	.....	.....	.....	.....
Output of colliery for year	.....	16,602	.....	.....

Number of Hands employed, Daily Wages paid, etc.

Character of Labour.	Underground.		Above Ground.		Totals.	
	No. employed.	Average Daily Wage.	No. employed.	Average Daily Wage.	No. employed.	Average Daily Wage.
Supervision and clerical assistance	3	.....	3	.....	6	.....
Whites—						
Miners	31	.....	.....	.....	31	.....
Miners' helpers	.....	.....	.....	.....	.....	.....
Labourers	12	.....	16	.....	28	.....
Mechanics and skilled labour	.....	.....	6	.....	6	.....
Boys	1	.....	.....	.....	1	.....
Japanese	.....	.....	.....	.....	.....	.....
Chinese	.....	.....	.....	.....	.....	.....
Indians	.....	.....	.....	.....	.....	.....
Totals	47	.....	25	.....	72	.....

NORTHERN INSPECTION DISTRICT.

Report by T. J. Shenton, Inspector.

Telkwa Collieries Co., Ltd.

J. McNeil, Managing Director; A. Robinson, Mine Foreman.

GOAT CREEK.

This mine worked during the first three months of 1926 and reopened again in October; then worked during the remainder of the year with an average of eight men employed.

No trace of inflammable gas was found on the various inspections and the general conditions were found to be in compliance with the "Coal-mines Regulation Act."

The following are the official returns from the Telkwa Colliery for the year ended December 31st, 1926:—

Sales and Output for Year.	Coal.		Coke.	
(Tons of 2,240 lb.)	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	1,260	.....	.....	.....
Sold for export to United States	.....	.....	.....	.....
Sold for export to other countries	.....	.....	.....	.....
Total sales	.....	1,260	.....	.....
Used in making coke	.....	.....	.....	.....
Lost in washing	.....	.....	.....	.....
Used under colliery boilers, etc	.....	.....	.....	.....
Total for colliery use	.....	.....	.....	.....
Stocks on hand first of year	.....	.....	.....	.....
Stocks on hand last of year	.....	.....	.....	.....
Difference added to (or taken from) stock during year	.....	.....	.....	.....
Output of colliery for year	.....	1,260	.....	.....

Number of Hands employed, Daily Wages paid, etc.

Character of Labour.	Underground.		Above Ground.		Totals.	
	No. employed.	Average Daily Wage.	No. employed.	Average Daily Wage.	No. employed.	Average Daily Wage.
		$				
Supervision and clerical assistance	1	6.00	.....	.....	1	.....
Whites—						
Miners	2	5.00	.....	.....	2	.....
Miners' helpers	2	4.00	.....	.....	2	.....
Labourers	1	4.00	.....	.....	1	.....
Mechanics and skilled labour	1	5.00	.....	.....	1	.....
Boys	.....	.....	.....	.....	.....	.....
Japanese	.....	.....	.....	.....	.....	.....
Chinese	.....	.....	.....	.....	.....	.....
Indians	.....	.....	.....	.....	.....	.....
Totals	7	.....	.....	.....	7	.....

NICOLA-PRINCETON INSPECTION DISTRICT.

Report by John G. Biggs, Inspector.

I have the honour to herewith submit my annual report as Inspector of Mines for the Nicola-Princeton District for the year ended 1926.

The coal-mining companies operating in the district during the past year were: The Coalmont Collieries, Limited; Middlesboro Collieries, Limited; Keystone Coal Company; Tulameen Valley Coal Company; Princeton-B.C. Colliery, Limited; the Southern Okanagan Coal Company, Limited; and the Sunshine Coal Company.

All the above companies continued to operate during the whole of the year with the exception of the Princeton-B.C. Colliery Company, which ceased operations during the month of February, and the Southern Okanagan Coal Company, which suspended operations during the month of October.

As usual, there has been several small operations where the work done has been entirely of a prospective nature for the purpose of proving the ground. The Sunshine Coal Company, which is comprised of three miners residing in the city of Merritt, has practically done nothing during 1926. The British American Coal Company, a Bellingham syndicate, has followed an aggressive prospecting policy at the Vaydo property, situated at Deer valley, in the East Princeton District, under the supervision of Alfred Gould during the year. An adit-level was extended

a distance of some 1,600 feet, with a branch level 400 feet from the face of the level, for the purpose of proving some coal-showings that have been exposed in an old level above. These operations were suspended during the month of November. The Southern Okanagan Collieries, Limited, after being inactive for some time, commenced work at the White Lake basin during the early part of the spring, where a number of men were employed not only in exposing the seams of coal, but in the installation of the necessary equipment and machinery for the operation of a coal-mine; however, this work was suspended during the month of October.

Probably the most important prospective work done in this district during the present year was conducted by R. R. Wilson, of Victoria, on coal leases situated about 2 miles west of the town of Princeton, in close proximity to the Kettle Valley Railway and on the opposite side of the river to the holdings of the Tulameen Valley Coal Company. A number of men have been engaged during most of the year in prospecting the side of the mountain by saps and short tunnels, while a drilling contract was let and three diamond-drill holes were put down at different locations on this property, with the result that a section of the whole strata was procured to the base of the measures, which proved the existence of several seams of coal.

During the spring of 1926 there was rather a serious mine fire to deal with at the No. 3 seam operations of the Keystone Coal Company, Limited, when the gobs commenced to heat and the resulting gases came back into the workings. This occurrence necessitated the sealing-off of this mine near the entrance to the slope and the fan-drift until such time as a larger and more effective fan could be installed; on this being completed the seals of the mine were opened and the fan put into operation. Success was achieved in cleaning out this mine and sealing off the affected area and work was recommenced.

Conditions in regard to the dangers of coal-dust as required by the regulations established by section 128, 1924, have been well attended to in this district during 1926. Samples of material have been taken from the roads of the mines and the result of analysis mailed to this office. With slight exception, these tests have shown the material contained incombustible matter in excess of the requirements of the said regulations.

It was not found necessary to treat the roads of the mines with incombustible dust, with the exception of the Main slope of the No. 4 mine of the Coalmont Collieries, Limited, where it was found, owing to the large volume of air entering this mine during the fall of 1926, a large amount of moisture was absorbed in the upper portion of the slope. This is required to be cleaned from time to time and treated with an inert and incombustible material taken from the surface.

Inspection on behalf of workmen, as provided for by General Rule 37, was taken advantage of by the workmen at the various mines during 1926 and found to be a great help in assisting to maintain safe conditions, and the miners are thanked for giving their attention to this important matter.

It is gratifying to have the pleasure to again report another year free from fatal accidents in the operating of coal-mines in this district. This may be greatly attributed to the care taken by the officials and the employees exerting every effort to make coal-mining, which at the best of times is an hazardous occupation, as safe as possible.

There were five accidents reported to this office during 1926, all of which were reported as required by section 71 of the "Coal-mines Regulation Act." Four of these accidents occurred at the operating mines of the Coalmont Collieries, Limited, while one occurred at the No. 1 mine of the Tulameen Valley Coal Company.

Middlesboro Collieries, Ltd.

E. W. Hamber, President, Vancouver, B.C.; C. S. Raphael, Vice-President, Vancouver, B.C.; Thomas Sanderson, Secretary, Vancouver, B.C.; C. M. O'Brian, Treasurer, Vancouver, B.C.; Robert Fairfoull, Superintendent, Merritt, B.C.

MIDDLESBORO COLLIERY.

Robert Fairfoull, Manager.

This colliery is situated 1 mile south of the city of Merritt and is connected by a branch line off the Kettle Valley Railway. At present it constitutes the chief coal operations in the Nicola basin. The mine plant is situated at the foot of the hill in the valley, while the mining operations are being conducted in the adjoining hill and are generally above the elevation of

the mine-tipple. The measures are found to be lying at a high angle of inclination, dipping towards the centre of the basin and cropping near the apex of the hill.

During 1926 work has been concentrated on the development of new coal-showings exposed during the year 1925, situated 2,000 feet south and at an elevation of 200 feet above the mine-tipple, where the management of this company was successful in uncovering two valuable seams of coal, with an average thickness of 6 feet, in the upper series. The general mining conditions were found to be very favourable, with the result that this company is at present opening an entirely new area of coal in the Nicola field.

For the purpose of developing this portion of the field necessitated the grading for a mine-track alongside of the hill to the siding situated near the entrance to the No. 4 East mine, a distance of some 1,600 feet, while a large siding, provided with four mine-tracks 500 feet in length, completed near the entrance to the new tunnels makes ample provision for the storage of a large number of mine-cars. For power purposes 2,000 feet of 4-inch air-line has been laid from the power-house to these new operations, which is used for driving hoists and coal-cutting machines that have been installed during December, 1926.

No. 4 East Mine.

A. D. Allen, Overman; Thomas Rowbottom, Fireboss.

This mine is situated south and on the same elevation as the mine-tipple. It has been developed by a pair of 15° slopes driven from the surface croppings and operating a section of the No. 4 seam lying behind a fault that could not be conveniently reached from the old No. 4 mine.

Ventilation is produced by a small steam-driven double-inlet fan situated near the entrance to the counter-slope. During the visit of inspection ventilation measured showed 7,000 cubic feet of air a minute passing into this mine for the use of sixteen men, the roads and airways being free from any trace of explosive gas, while a good current of air was passing around the working-faces. The stoppings and brattice were in good order. The working-faces were found well timbered and a sufficient supply of suitable timber provided for the use of the workmen. The roads were well timbered and in fairly good condition.

No. 2 North Mine.

James Fairfoull, Overman; William Ewart, William Hallinan, and Robert Drybrough, Firebosses.

This is a new mine situated 2,000 feet south of the entrance of the No. 4 East mine and commenced operations during the year 1925. The measures are found in the form of a basin having a general pitch east of 60° near the surface of the hill and gradually diminish in pitch towards the centre of the basin; the pitch at the face of the slope being about 12°.

Development consists of an adit-level commenced at the outcrop at the side of the hill, from which headings have been driven to the surface above, which is reached at an approximate distance of 400 feet on the lay of the coal. Pillars have been blocked out and are at present being extracted above this level.

Slopes have been driven to the dip from the surface at the same elevation as this level and have reached a distance of 600 feet, provided with the necessary crosscuts, from which levels have been started at intervals and extended a limited distance.

At this mine when last visited there was 13,500 cubic feet of air a minute passing into the workings for the use of thirty-one men. No trace of explosive gas was found. The working-places were well timbered and a sufficient supply of suitable timber provided for the use of the workmen. The roads were well timbered and in good condition and, being naturally wet, were free from dangerous coal-dust.

No. 3 North Mine.

Andrew McKendrick, Overman; Matthew McKibben and William Adamson, Firebosses.

The entrance of this mine is situated at the centre of the large siding 150 feet north of the No. 2 North mine opening. Operations were commenced from the surface croppings during the year 1925. The measures are found to be lying in full conformation at a high angle of inclination at the surface and have a general pitch east towards the centre of the basin.

The developments of the No. 3 mine follow very closely the developments of the No. 2 mine. It is entered by an adit-level from the surface and has been extended a distance of 1,500 feet,

from which headings have been driven to the surface, a distance of approximately 400 feet, greatly facilitating the ventilation of the mine. A slope has been driven to the dip and has reached a distance of 350 feet; levels are being driven from this for the purpose of development.

At this mine when last visited ventilation measured showed 5,400 cubic feet of air a minute passing into the workings for the use of sixteen men. No trace of gas was found and there was a fairly good current of air conducted around the working-faces, the brattice and stoppings also being in good order.

The working-places were well timbered and a sufficient supply of suitable timber was provided for the use of the workmen. The roads were well timbered and in good condition.

With the exception of two mining-machines which were placed in operation during December, 1926, at the No. 3 North mine, the coal has been mined by hand. Edison electric safety-lamps are used by all the employees underground, while flame safety-lamps of the Wolf magnetic-lock type are used by the officials for inspection purposes.

No change was made in the power plant during 1926. It consists of four return-tubular boilers having an aggregate horse-power of 600, used for driving a Canadian Rand 2-stage cross-compound air-compressor having a capacity of 2,000 feet a minute, which provides power for mine-hoists, coal-cutting machines, and mine-fans, while a 2,300-volt alternator is in use for providing power for surface and lighting purposes.

Copies of the "Coal-mines Regulation Act," special rules, and plans of the mines are well posted at these mines.

The following are the official returns for the Middlesboro Colliery for the year ended December 31st, 1926:—

Sales and Output for Year.	Coal.		Coke.	
(Tons of 2,240 lb.)	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	39,587	.....	.....	.....
Sold for export to United States	.....	.....	.....	.....
Sold for export to other countries	.....	.....	.....	.....
Total sales	.....	39,587	.....	.....
Used in making coke	.....	.....	.....	.....
Used under colliery boilers, etc.	4,003	.....	.....	.....
Total for colliery use	.....	4,003	.....	.....
		43,590		
Stocks on hand first of year	357	.....	.....	.....
Stocks on hand last of year	241	.....	.....	.....
Difference taken from stock during year	.....	116	.....	.....
Output of colliery for year	.....	43,474	.....	.....

Number of Hands employed, Daily Wages paid, etc.

Character of Labour.	Underground.		Above Ground.		Totals.	
	No. employed.	Average Daily Wage.	No. employed.	Average Daily Wage.	No. employed.	Average Daily Wage.
		$		$		
Supervision and clerical assistance	10	.....	3	.....	13	.....
Whites—						
Miners	40	4.50–6.00	.....	.....	40	.....
Miners' helpers	18	4.00	.....	.....	18	.....
Labourers	14	4.00–4.50	11	4.00–4.50	25	.....
Mechanics and skilled labour	.....	.....	10	4.50–5.50	10	.....
Boys	.....	.....	4	2.50	4	.....
Japanese	.....	.....	.....	.....	.....	.....
Chinese	.....	.....	.....	.....	.....	.....
Indians	.....	.....	.....	.....	.....	.....
Totals	82	.....	28	.....	110	.....

Keystone Coal Co., Ltd.

F. R. Anderson, President, Vancouver, B.C.; C. W. St. John, Vice-President, Vancouver, B.C.; J. S. Salter, Secretary, Vancouver, B.C.; J. F. Higginbotham, Treasurer, Vancouver, B.C.; Joseph Graham, Superintendent, Merritt, B.C.

KEYSTONE COLLIERY.

John T. Brown, Manager; Richard Dunnigan, Fireboss.

This company is the successor to the Fleming Coal Company, operating in the north-west portion of the Nicola basin, which consists of a plateau situated about 2 miles west and 500 feet above the city of Merritt. The measures lie at a high angle of inclination, pitching towards the west, with several of the seams cropping near the surface.

These operations are small and consist of a pair of slopes driven from the surface croppings of the No. 2 seam, where the bottom or lower level, at present operating, is situated about 320 feet from the entrance to the mine at the western extremity of this portion of the coal-basin. The operations in this mine have been greatly retarded by excessive faulting, causing mining to be very difficult.

Work at present consists of the extraction of pillars in close proximity to the Main slope, with the result that operation in this mine is limited to a very few months, as the coal is being drawn back towards the surface croppings and no development-work at present being done.

When last visited eight men were employed underground in this mine. Ventilation measured showed 6,000 cubic feet of air a minute passing into this mine. The stoppings and brattice were in good order, the working-places well timbered, and a sufficient supply of suitable timber was provided for the use of the workmen. The roads were also well timbered and in good condition.

A fair amount of work was done during 1926 for the purpose of proving the No. 2 seam from the surface outcrop on the north side of this property. A 30° slope has been driven a distance of about 140 feet from the surface croppings on the No. 2 seam of coal, which is found to be about 5 feet in thickness, lying at a high angle of inclination and intersected by a rock-band, the intention being to prove this seam by means of slopes, near the bottom of which the measures below will be explored for the purpose of proving the existence of the No. 1 seam on this property.

Edison electric lamps are used by the workmen and flame safety-lamps of the Wolf type are used by the officials for inspection purposes.

No changes were made to the surface plant by this company during 1926.

The following are the official returns of the Keystone Colliery for the year ended December 31st, 1926:—

Sales and Output for Year.	Coal.		Coke.	
(Tons of 2,240 lb.)	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	7,410	.....	.....	.....
Sold for export to United States	.....	.....	.....	.....
Sold for export to other countries	.....	.....	.....	.....
Total sales	.....	7,410	.....	.....
Used in making coke	.....	.....	.....	.....
Used under colliery boilers, etc.	327	.....	.....	.....
Total for colliery use	.....	327	.....	.....
		7,737		
Stocks on hand first of year	100	.....	.....	.....
Stocks on hand last of year	80	.....	.....	.....
Difference taken from stock during year	.....	20	.....	.....
Output of colliery for year	.....	7,717	.....	.....

NUMBER OF HANDS EMPLOYED, DAILY WAGES PAID, ETC.

Character of Labour.	Underground.		Above Ground.		Totals.	
	No. employed.	Average Daily Wage.	No. employed.	Average Daily Wage.	No. employed.	Average Daily Wage.
		$		$		$
Supervision and clerical assistance	2	6.00	.....	.....	2	6.00
Whites—						
Miners	5	5.00	.....	.....	5	5.00
Miners' helpers	4	4.25	.....	.....	4	4.25
Labourers	.....	.....	3	4.00	3	4.00
Mechanics and skilled labour	.....	.....	2	4.75	2	4.75
Boys	.....	.....	.....	.....	.....	.....
Japanese	.....	.....	.....	.....	.....	.....
Chinese	.....	.....	.....	.....	.....	.....
Indians	.....	.....	.....	.....	.....	.....
Totals	11	.....	5	.....	16	.....

Coalmont Collieries, Ltd.

W. J. Blake Wilson, President, Vancouver, B.C.; General J. W. Stewart, Vice-President, Vancouver, B.C.; A. H. Douglas, Secretary, Vancouver, B.C.; D. McLeod, Treasurer, Vancouver, B.C.; D. McLean, Superintendent, Coalmont, B.C.

COALMONT COLLIERY.

Donald McLean, General Manager; George Murray, Manager.

This colliery is the largest and most important coal operation in this district. It is situated on the North fork of Granite creek at an elevation of 1,600 feet above and 4 miles by road from the town of Coalmont. The tipple and power plant is situated in close proximity to the Kettle Valley Railway, the coal being transmitted over the mountain by an overhead tramway in buckets that constitute the body of the mine-cars, which have a capacity of about 1 ton.

The mines at present operating are known as the No. 3 and No. 4 mines, separated by a large fault or dyke which cuts across the basin, and while these mines are operating in the same seam of coal in the Coalmont series, they are two entirely separate and distinct operations. The No. 3 mine, generally known as the "Wilson tunnel," was the oldest and largest of these operations. It was developed by adit-levels following the strike of the seam, a distance of some 3,000 feet. Considerable work was done to the dip by three haulage-slopes, but owing to the fact that a destructive fire developed in this mine during the spring of 1925, which necessitated the sealing-off of this mine on the levels a short distance outside of the No. 1 slope, the mine was closed for some time. The mine was successfully reopened during the fall of 1925 and continued to operate until the spring of 1926; since this time the operation of No. 3 mine has been of an intermittent nature.

The No. 4 mine was opened during the year 1924 and is situated 1 mile west of and at an elevation of 400 feet above the entrance to the No. 3 mine. It continued to operate during the whole of 1926 and is at present the largest and most important development on this property.

During the latter part of 1926 work was commenced driving a rock tunnel situated near the foot of the No. 4 mine surface incline, which is on the same elevation and about 1½ miles away from the top terminal of the overhead tramway. This will encounter the lower portion of the mine-workings and as a result will greatly shorten and simplify the haulage by eliminating the upper portion of the Main slope and the surface incline.

No. 3 MINE.

James Simm and Harry Hopkins, Firebosses.

The entrance to this mine is situated on the same elevation and a short distance west of the top terminal of the overhead tramway and is developed by a well-timbered 8 by 12 level following the strike of the seam. It is generally known as the "Wilson tunnel." Operations

have been very intermittent at this mine during 1926 and consisted of the extraction of pillars in close proximity to the Main level and the "skipping" of pillars in the upper portion of the No. 2 slope. The workings to the dip are filled with water, which collected during the time this mine was sealed off. This is at present being drawn off by a compressed-air pump, which is situated on the slope and is moved forward as the water recedes.

The coal is conveyed from the mine to the tipple by an overhead tramway 2½ miles in length, with a difference of elevation between the top terminal and the lower one at the tipple of some 1,600 feet. The buckets, which consist of the body of the mine-cars, have a capacity of 1 ton and are lifted from the mine-car frame by means of carrier-arms to an overhead rail connected to the tramway cables, where they are attached to a ¾-inch travelling cable and supported on the empty side by a 1⅛-inch locked coil cable, while the full buckets are carried by a stationary 1⅝-inch track strand, reversible lay, smooth-coil crucible-steel cable. The running cable is controlled by a 50-horse-power constant-speed a.c. motor connected by gearing to a "Fowler Grip" pulley, which is also provided with a friction-brake operated from the control-house.

This tramway was succesfully operated during 1926 and has given very little trouble, the normal capacity being limited to about 60 tons an hour.

The power plant is situated at the town of Coalmont, near the tipple, and consists of two 25-horse-power cross-drum horizontal-inclined water-tube boilers, fitted with forced draught, duplicate pumps and feed-water heaters attached, and are used for driving a 600-horse-power Corliss cross-compound condensing-engine coupled direct to a G.E. 3-phase, 60-cycle, 480-ampere, 550-volt generator running at a speed of 150 r.p.m., this voltage being stepped up to 10,000 by transformers situated near the power-house and taken over the mountain by high-tension wires to transformers situated near the mine, where the voltage is reduced to 550 volts for power and 110 volts for lighting purposes. However, owing to the extension of the underground developments and to the fact that the larger portion of the workings are dipping, more power was required, and as a result during 1926 a new 250-horse-power boiler has been added to the power plant, while a 500 D.W. Westinghouse-Parson's steam-turbine generator set is being installed, which will duplicate the plant in use and provide a reserve power and is expected to be in operation during the early part of 1927.

This plant is supplemented by a small steam plant situated at the mine, consisting of two Jenks return-tube boilers, and is used for operating a steam-driven air-compressor for the pump situated in the No. 3 mine and also heating the dining-room, rooming-house, wash-house, machine-shop, and mine offices.

A well-appointed doctor's office, steam-heated and supplied with hot and cold water, is situated at the camp, with a doctor in daily attendance, while a first-aid man is in attendance at all times.

A mine-rescue station with smoke-room is provided and is equipped with five sets of Gibbs self-contained breathing apparatus, pulmotor, and charging-pump, while a good supply of oxygen and regenerators are on hand.

Edison electric safety-lamps are in use by all the employees underground at this colliery, while safety-lamps of the Wolf type are in use by the officials for inspection purposes.

Coal Creek Colliery, Fort Steele M.D.

The following are the official returns from the Coalmont Collieries for the year ended *December 31st, 1926*:—

Sales and Output for Year.	Coal.		Coke.	
(Tons of 2,240 lb.)	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	113,974	.....	.....	.....
Sold for export to United States	43	.....	.....	.....
Sold for export to other countries	.....	.....	.....	.....
Total sales	.....	114,017	.....	.....
Used in making coke	.....	.....	.....	.....
Used under colliery boilers, etc.	7,441	.....	.....	.....
Total for colliery use	.....	7,441	.....	.....
		121,458		
Stocks on hand first of year	.....	.....	.....	.....
Stocks on hand last of year	.....	.....	.....	.....
Difference added to (or taken from) stock during year	.....	.....	.....	.....
Output of colliery for year	.....	121,458	.....	.....

Number of Hands employed, Daily Wages paid, etc.

Character of Labour.	Underground.		Above Ground.		Totals.	
	No. employed.	Average Daily Wage.	No. employed.	Average Daily Wage.	No. employed.	Average Daily Wage.
		$		$		$
Supervision and clerical assistance	13	6.63	13	6.03	26	6.33
Whites—						
Miners	114	7.48	.....	.....	114	7.48
Miners' helpers	.....	.....	.....	.....	.....	.....
Labourers	61	4.86	85	4.27	146	4.52
Mechanics and skilled labour	1	5.77	24	4.99	25	5.02
Boys	3	3.83	2	3.50	5	3.70
Japanese	.....	.....	.....	.....	.....	.....
Indians	.....	.....	1	2.64	1	2.64
Chinese	.....	.....	.....	.....	.....	.....
Totals	192	6.53	125	4.56	317	5.75

Princeton-B.C. Colliery Co., Ltd.

George E. Stringer, President, London, England; R. B. Glover, Vice-President, London, England; R. L. Taylor, Secretary, London, England; P. Schofield, Accountant, Princeton, B.C.; Francis Glover, General Manager, Princeton, B.C.

NEW SHAFT MINE.

Francis Glover, Manager; Allen Ford, Overman; Frank Lester and Robert Courtney, Firebosses.

This is a shaft operation situated near the Kettle Valley Railway in the town of Princeton. Operations were commenced during the year 1924 on the No. 1 seam of this property, which was reached at a vertical depth of 93 feet from the surface, found to be pitching south at an angle of 12°. *While the seam is of unusual thickness, operation was confined to the upper 7 feet of* the seam, which produced a good clean fuel and was in demand for domestic purposes.

A shaft was provided at the north side of this mine, from which slopes were driven to the dip, an approximate distance of 450 feet, provided with the necessary crosscuts and levels driven a limited distance on each side of the slopes.

The shaft was sunk a short distance to the north of the Similkameen river and as a result passed through a good thickness of river-silt, and notwithstanding the fact that the shaft was entirely cased with reinforced concrete, the measures above were impregnated with water, which greatly retarded the work. The maximum infiltration was found to be constantly at the working-faces that were advancing to the dip, the roadways behind gradually becoming dry as the faces advanced; the water problem was a costly matter to deal with, while the area of the mine and the general operations were small. The pumps were required to be in continuous operation and as a result of general adverse conditions these operations were suspended February, 1926, and the mine allowed to fill with water.

The following are the official returns from the Princeton Colliery for the year ended December 31st, 1926:—

Sales and Output for Year.	Coal.		Coke.	
(Tons of 2,240 lb.)	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	525			
Sold for export to United States				
Sold for export to other countries				
Total sales		525		
Used in making coke				
Used under colliery boilers, etc.	380			
Total for colliery use		380		
		905		
Stocks on hand first of year	92			
Stocks on hand last of year				
Difference taken from stock during year		92		
Output of colliery for year		813		

Company in receivership, April 30th. No men employed since.

Tulameen Valley Coal Co.

Chas. A. Hunter, General Manager; Alexander Bryden, Overman.

This mine is situated 2 miles west of the town of Princeton and is accessible by a wagon-road following the north bank of the Tulameen river, and has been developed by four well-maintained levels driven into the side of the hill, following the strike of the same from the surface outcrop, which is found to have an average pitch east of 12°.

The operations are being conducted on the pillar-and-stall system; the No. 1 or Lower level has been extended a distance of 800 feet from the portal; the No. 2 level a distance of 800 feet; while the upper two levels are some distance behind. All work being conducted to the raise, with stalls heading towards the surface croppings above, results in very little power being required at this mine. The seam has an average thickness of 24 feet, resembles and has the same characteristics as the No. 1 seam of the Princeton-B.C. Colliery, the lower portion being intersected with bands of clay, and as a result operations are confined to the upper portion of the seam, which consists of about 8 feet of good clean coal which is in demand for domestic purposes.

The mine is well timbered throughout with heavy framed sets. Preparation is being made for the installation of a new mine ventilating-fan, which has been delivered and is at present at the mine. This is expected to be in operation during the early part of 1927. Ventilation is at present produced naturally and, as is to be expected, is greatly affected by the surface temperature; when last visited ventilation measured showed 3,000 cubic feet of air a minute passing into this mine for the use of nineteen men, the stoppings and brattice being in good order. The working-places were well timbered, a sufficient supply of suitable timber was provided for the use of the workmen, and the roads were in good condition and well timbered.

The coal is loaded into cars having a capacity of 1 ton and are run by gravity from the faces to the entrance of the tunnels, where they are dumped over a bar-screen situated at the entrance to the No. 3 level, which is provided with a small bunker, where the coal is cleaned, sized, and loaded into motor-trucks and transported a distance of about half a mile to an elevated platform, provided with three loading-chutes, situated on a spur off the Kettle Valley Railway, where the coal is loaded into box cars.

Wheat electric head-lights are used by the workmen and flame safety-lamps of the Wolf type are used by the officials for inspection purposes. The coal is mined by hand and blasted when required by permitted explosives, and all shots are fired by certificated officials appointed for this purpose.

Mining conditions in this mine have been found to be most favourable, as the seam is overlaid with a good roof, is very free from any faulting, and may be generally considered, until the present time, as a gravity proposition. The entrance to the mine being on the same elevation and very accessible to the Kettle Valley Railway, little resort has been required in the past in regard to the installation of machinery. However, with a view of producing a larger percentage of lump coal and commencing operations to the dip of the No. 1 level, the following machinery has been secured and is being installed: One locomotive-type boiler, feed-water heater, feed-pump, steam-engine, hoist, 12- by 14-inch single-stage compressor, and mining-machines.

Copies of the "Coal-mines Regulation Act" and special rules are well posted near the entrance to this mine.

The following are the official returns for the Tulameen Valley mine for the year ended December 31st, 1926:—

Sales and Output for Year.	Coal.		Coke.	
(Tons of 2,240 lb.)	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	11,709	.....	.....	.....
Sold for export to United States	240	.....	.....	.....
Sold for export to other countries	.....	.....	.....	.....
Total sales	.....	11,950	.....	.....
Used in making coke	.....	.....	.....	.....
Lost in preparation	1,275	.....	.....	.....
Used under colliery boilers, etc.	.....	.....	.....	.....
Total for colliery use	.....	1,275	.....	.....
Stocks on hand first of year	.....	.....	.....	.....
Stocks on hand last of year	.....	.....	.....	.....
Difference added to (or taken from) stock during year	.....	.....	.....	.....
Output of colliery for year	.....	13,225	.....	.....

Number of Hands employed, Daily Wages paid, etc.

Character of Labour.	Underground.		Above Ground.		Totals.	
	No. employed.	Average Daily Wage.	No. employed.	Average Daily Wage.	No. employed.	Average Daily Wage.
		$		$		$
Supervision and clerical assistance	1	6.66	3	5.33–6.90	4	6.20
Whites—						
Miners	10	6.00	.....	.....	10	6.00
Miners' helpers	2	4.50	.....	.....	2	4.50
Labourers	.....	.....	5	4.00	5	4.00
Mechanics and skilled labour	.....	.....	1	5.50	1	5.50
Boys	.....	.....	.....	.....	.....	.....
Japanese	.....	.....	.....	.....	.....	.....
Chinese	.....	.....	.....	.....	.....	.....
Indians	.....	.....	.....	.....	.....	.....
Totals	13	.....	9	.....	22	.....

Southern Okanagan Collieries, Ltd.

G. R. Hookham, President, Vancouver, B.C.; C. J. Rippin, Vice-President, Summerland, B.C.; R. M. Grant, Secretary, Vancouver, B.C.; B. R. Barlow, Superintendent, Penticton, B.C.

This company has been conducting operations which may be considered of a prospective nature at the White Lake coal-basin, situated 16 miles south of the town of Penticton and 6 miles west of the Okanagan Falls. This is accessible by a good wagon-road passing through the centre of the basin between Penticton and Keremeos.

Development-work has been limited and of an intermittent nature, but a more aggressive policy is planned for the future. During the early part of 1926 a number of men were employed digging trial pits, sapping and trenching on the north side of the field for the purpose of following up the croppings of the No. 3 seam, which is the most important exposed at the present time. At the north-west side of the basin an adit-level was driven, with the necessary crosscuts to the surface, a distance of about 400 feet along the strike of the No. 3 seam, where the seam is found to have a pitch of about 60° towards the centre of the basin. A fair amount of open-work and also a little tunnelling was done on the No. 2 seam, which is situated about 200 feet behind the opening to the No. 3 seam. A small trestle and bunkers were erected and roads graded to these openings, from which the coal was loaded into trucks for shipment.

About 1 mile south of the above openings work of a permanent character has been conducted during 1926, where it is intended the chief operations for this portion of the basin will be carried on. An 8- by 10-foot well-timbered level was driven a short distance into the side of the hill for the purpose of intersecting the No. 3 seam and will be used as the main haulage, while a coal-washing equipment, engines, boilers, and other machinery necessary for the operation were shipped to the property and partly installed when work was again suspended during September.

The following are the official returns from the Southern Okanagan Collieries, Limited, for the year ended December 31st, 1926:—

Sales and Output for Year.	Coal.		Coke.	
(Tons of 2,240 lb.)	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	426			
Sold for export to United States				
Sold for export to other countries				
Total sales		426		
Used in making coke				
Used under colliery boilers, etc.				
Total for colliery use				
Stocks on hand first of year				
Stocks on hand last of year				
Difference added to (or taken from) stock during year				
Output of colliery for year		426		

Number of Hands employed, Daily Wages paid, etc.

Character of Labour.	Underground.		Above Ground.		Totals.	
	No. employed.	Average Daily Wage.	No. employed.	Average Daily Wage.	No. employed.	Average Daily Wage.
		$		$		$
Supervision and clerical assistance	1	7.25	2	7.87	3	15.12
Whites—						
Miners	5	5.20	.....	.....	5	.....
Miners' helpers	1	4.20	.....	.....	1	.....
Labourers	.....	.....	2	3.70	2	.....
Mechanics and skilled labour	.....	.....	2	5.20	2	.....
Boys	.....	.....	.....	.....	.....	.....
Japanese	.....	.....	.....	.....	.....	.....
Chinese	.....	.....	.....	.....	.....	.....
Indians	.....	.....	.....	.....	.....	.....
Totals	7	.....	6	.....	13	.....

EAST KOOTENAY INSPECTION DISTRICT.

REPORT BY ROBERT STRACHAN, SENIOR INSPECTOR.

I beg to submit the annual report covering the inspection of coal-mines in the East Kootenay District during 1926.

This district is under the direct charge of John MacDonald, with office in Fernie, and his report covering the general conditions in and around the mines, with a detailed description of the same, is attached.

The collieries in operation during 1926 were the same as in the past few years—namely, Coal Creek and Michel, operated by the Crow's Nest Pass Coal Company, Fernie, and the Corbin Colliery, operated by the Corbin Coals, Limited, Spokane, Wash., U.S.A.

At Coal Creek four mines—No. 1 East, No. 1 South, Nos. 2 and 3—were worked steadily all year. In the latter part of December No. 9 was added to the list.

Michel Nos. 3 and 8 operations were fairly steady all year; no coal was produced from No. 3 East, but repair-work was maintained.

At Corbin the No. 6 mine was abandoned temporarily; No. 4 worked all year; and the Big Showing, open-cut or No 3 mine, situated about a mile south of the No. 4 mine, was opened and shipped a considerable amount, the greater part of which was banked, available for washing and cleaning during the winter.

The No. 3 mine, or Big Showing, was closed down in November owing to weather conditions.

There was no interruption of work during 1926 with labour trouble, but considerable loss of time was due to lack of demand for coal. Coal Creek worked only 68 per cent. of the available working-days; Michel, 82 per cent.; and Corbin, 81 per cent.

Eight accidents, involving death or injuries to nine workmen, were reported to this office as provided for by section 71 of the "Coal-mines Regulation Act." All of these accidents came under subsection (*b*) of the Act and no accidents were reported under subsection (*a*), explosions of gas, powder, or steam-boilers.

In two cases the accidents resulted in death, the other seven cases causing serious injuries. Three of the accidents, involving four of the men killed or injured, occurred at Coal Creek Colliery, four at Michel Colliery, and one at Corbin Colliery. Six of these accidents, involving seven workmen, occurred underground, and two, involving two men, above ground. According to occupation, the accidents affected the following: Miners, 4; drivers, 2; rope-riders, 2; and haulage-man, 1.

The following table shows the colliery where the accidents occurred and the cause, so far as could be determined:—

Colliery.	Haulage.	Falls of Coal.	Total.
Coal Creek	1	3	4
Michel	2	2	4
Corbin	1	....	1
Totals	4	5	9

Dealing with the causes of the accidents, the fatal accident at Coal Creek was due to a trip entering the wrong room at a high speed, knocking out some timber and allowing the roof to cave, which buried the rope-rider. The rope-rider was supposed to go down the slope first and see that the switches were right, but he apparently failed to do so.

One of the accidents at this colliery, involving two men, was due to a fall of coal from the side of the place they were building a cog in. Greater attention to the sides and the placing of a support might have prevented this accident.

The other case was of a driver trying to rerail a car with his horse; the car partially ran over him, causing serious injuries. Drivers had instructions not to do this.

At Michel one fatal accident was due to a fall of side-coal while repairing an airway; the deceased had instructions and the special rules required him not to take out timbers without

using a timber-pulling device. Despite the instructions of the assistant managers, who had visited the place a short time previous, he attempted to knock out a post with a hammer, when the whole side came away, burying him. In this case the timber-pulling device (Sylvester) was quite convenient, and kept there, as the other shift used it regularly for this purpose.

The other case at Michel of falls of coal was due to a fall of roof-coal and shale while placing lagging ahead, and probably could not be avoided.

A haulage accident at Michel was due to the driver getting entangled with his horse, and another was due to getting entangled in a moving chain-haul. In the latter case the man ought to have stopped the chain-haul before cleaning the track, and this accident could have been avoided.

The only accident at Corbin was the case of a teamster, whose team ran away in the yard, and in attempting to catch them he got entangled and tripped over a loose box and the horses trampled on him.

It is worth noting that no fatal accidents and few serious have been reported at Corbin for six years, which denotes a very high state of discipline and efficiency.

From the foregoing it is very evident that the greater number of these accidents could be avoided if the workmen would exercise just a little more care and comply with the rules and regulations.

The general condition of the mines with respect to ventilation is dealt with in detail in the report attached by John MacDonald, Inspector for the district, and shows the conditions to be fair.

In the No. 1 East mine at Coal Creek the average percentage of methane is fairly high, notwithstanding every effort to reduce it. This condition is due to some extent to the great number of blow-outs, many of which are so small as to be deemed not worth reporting. These accompany the mining of the coal, and frequently when the top coal is broken down by the miner, or due to the weight of the strata, considerable quantities of methane is given off.

As in former years, full advantage was taken of the facilities afforded by the Dominion Department of Minues to have analyses made of samples of mine air, which service is appreciated for the analyses made, sample-bottles furnished, and mailing facilities. For the district 123 samples were taken, of which twenty-six were lost by accident either in the laboratory or in transit. Of the samples taken, ninety-one were taken in the Coal Creek Colliery, twenty-eight in Michel, and two in Corbin. In taking the samples the conditions of the mine determine to a great extent the number of samples taken, and this especially in regard to the methane given off.

The condition with respect to the presence of coal-dust has been kept very well in hand during 1926, and it is very important that this work should be maintained and improved on. The principal means for dealing with this danger is by using non-combustible dust and water. Tests have been made regularly during the year and conditions have been kept very good.

Better attention could be given to the mine-cars to prevent the spilling of coal or coal-dust on the roadways; many of the cars built of timber afford too many means whereby the fine coal is spilled on the roadways; in other cases the cars are loaded with coal too high and frequently some coal is drawn off when going through canvas doors. All this coal is ground into very fine dust by the wheels, and much of it could be prevented if adequate precautions were taken in this respect.

During the year, as provided for by section 71, subsections (*o*) to (*h*), of the regulations, notices of dangerous occurrences to the extent of nine were reported. These include five blow-outs of methane and dust, all in No. 1 East mine, Coal Creek, and one bump in the same mine; the breakage of a flange on the main air-line at the power-house and the fall of a trestle in the mine-yard, both at Coal Creek Colliery. At Michel an ignition of gas was reported in the No. 3 mine, which was considered to be due to a blown-out shot.

Advantage was taken by the workmen at all the collieries of Rule 37, section 101, of the regulations to inspect the mine, and appreciation is expressed to them for doing this. This inspection is of great service to the Inspectors and the officials as well as the workmen in maintaining safer conditions in and around the collieries. At Coal Creek fifty-nine inspections were made for the four mines; Michel, twenty-four inspections for two mines; and Corbin, seven inspections for two mines.

Searches of the workmen for articles contrary to the provisions of the regulations were made regularly during the year, and no prosecutions were required on this account. Under the special rules seven prosecutions were made—six at Michel for breach of Special Rule 114, failure to sprag the undermined coal—and a conviction was made in each case. At Coal Creek one man was prosecuted for a breach of Special Rule 110, fighting in the mine, and a conviction made.

Haulage inside the mine is either by compressed-air-driven hoists or locomotives, self-acting inclines or horses. In some cases the hoist is situated outside the mine and driven by steam or compressed air.

All the workmen underground use the Edison electric mine safety-lamp of the cap type, while the officials use both the electric and Wolf safety-lamp, the latter as a means of making a rapid determination of the mine air with respect to the presence of methane.

The Burrell gas-detector is in use at all the mines for determining lower percentages of methane in the mine air than can be detected with the Wolf safety-lamp, as required by section 101, Rule 4, of the regulations.

In regard to the use of explosives, at Coal Creek no explosives are used for the production of coal, and while these are permitted at Michel and Corbin, every precaution is taken to avoid accidents.

The amount of rescue apparatus at the rescue-station maintained by the Department here is similar to 1925. The interest in this work has been fairly well maintained at Coal Creek and Michel, but at Corbin has fallen off to some extent.

Classes in first aid to the injured were held during 1926 at Coal Creek and Michel and none at Corbin.

The report by John Puckey, Instructor at the rescue-station here, covers this work in detail and needs no mention here.

It is again desired to thank the workmen and officials for their co-operation and assistance during 1926 in carrying out the work of inspection and hope for a continuation of the same.

Attached is the report covering the inspections in detail by John MacDonald, Inspector, and the annual returns as required by section 66 of the "Coal-mines Regulation Act" from the collieries for 1926.

Report by John MacDonald, Inspector.

Crow's Nest Pass Coal Co., Ltd.

Head Office—Fernie, B.C.

W. R. Wilson, President, Fernie, B.C.; A. H. McNeill, Vice-President, Vancouver, B.C.; J. S. Irvine, Secretary, Fernie, B.C.; A. Klauer, Treasurer, Fernie, B.C.; H. P. Wilson, General Manager, Fernie, B.C.

The above company operated during 1926 the Coal Creek and Michel Collieries on the western slope of the Rocky mountains in the East Kootenay Inspection District.

Coal Creek Colliery is situated at Coal Creek, about 5 miles from the town of Fernie. Railway connection from the colliery is made with the Canadian Pacific Railway and the Great Northern Railway at Fernie by the Morrissey, Fernie & Michel Railway.

Michel Colliery is situated on both sides of Michel creek, on the Crowsnest branch of the Canadian Pacific Railway, about 24 miles in a north-easterly direction from Fernie.

The following are the aggregate returns from the Crow's Nest Pass Coal Company's mines for the year 1926:—

Sales and Output for Year.	Coal.		Coke.	
(Tons of 2,240 lb.)	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	371,280	.....	65,841	.....
Sold for export to United States	175,258	.....	26,296	.....
Sold for export to other countries	.....	.....	.....	.....
Total sales	.....	546,538	.....	92,137
Used in making coke	142,838	.....	.....	.....
Used under colliery boilers, etc.	45,511	.....	.....	.....
Total for colliery use	.....	188,349	.....	.....
		734,887		
Stocks on hand first of year	5,781	.....	506	.....
Stocks on hand last of year	745	.....	1,817	.....
Difference taken from stock during year	.....	5,036	.....	1,311
Output of colliery for year	.....	729,851	.....	93,448

Number of Hands employed, Daily Wages paid, etc.

Character of Labour.	Underground.		Above Ground.		Totals.	
	No. employed.	Average Daily Wage.	No. employed.	Average Daily Wage.	No. employed.	Average Daily Wage.
Supervision and clerical assistance	40	.....	21	.....	61	.....
Whites—						
Miners	454	.....	.....	.....	454	.....
Miners' helpers	.....	.....	.....	.....	.....	.....
Labourers	80	.....	170	.....	250	.....
Mechanics and skilled labour	303	.....	189	.....	492	.....
Boys	25	.....	14	.....	39	.....
Japanese	.....	.....	.....	.....	.....	.....
Chinese	.....	.....	.....	.....	.....	.....
Indians	.....	.....	.....	.....	.....	.....
Totals	902	.....	394	.....	1,296	.....

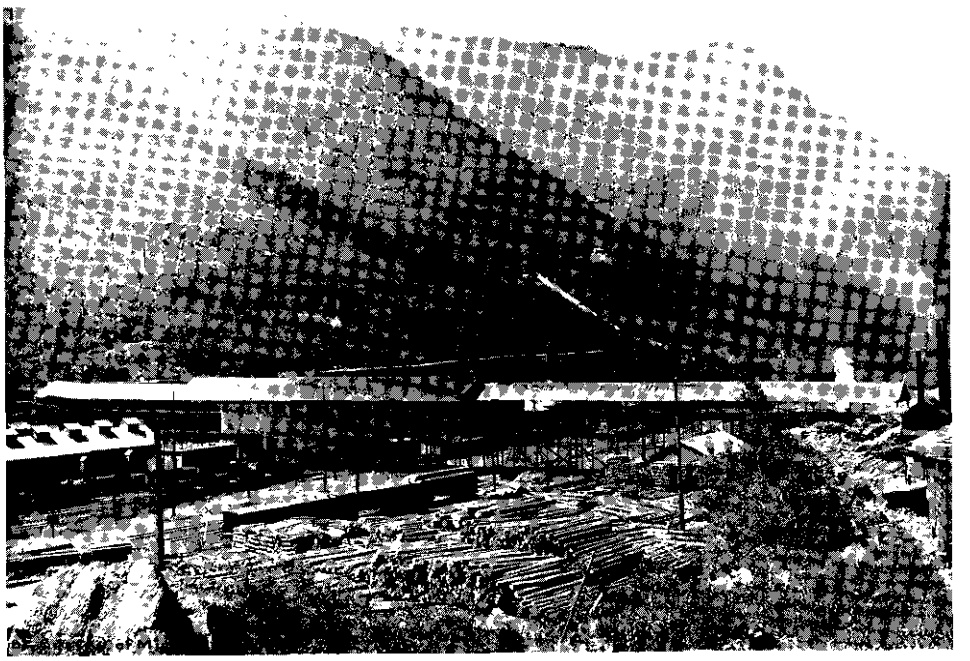
COAL CREEK COLLIERY.

B. Caufield, Manager; J. Taylor, Assistant Manager; E. Morrison, Safety Inspector.

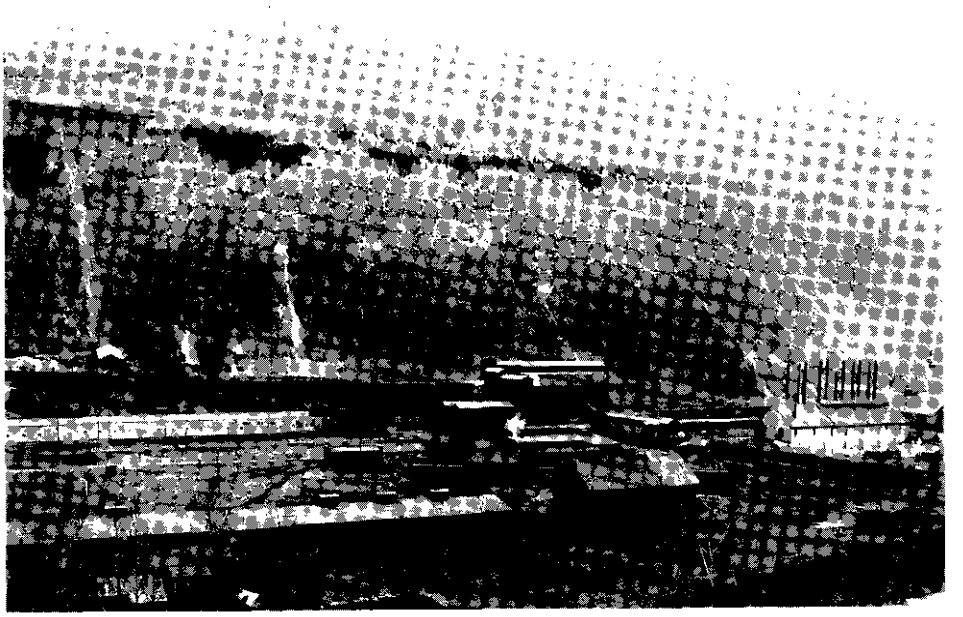
This colliery is situated on both sides of Coal creek and has railway connection with the Canadian Pacific and Great Northern Railways at Fernie by means of a branch line, 5 miles in length, called the Morrissey, Fernie & Michel Railway. The mines producing coal during 1926 were No. 1 East, No. 3, No. 2, and No. 1 South on the south side of the valley, the only one operated on the north side being No. 9; the principal work done in the latter consisted of repairs to the main roads and return airway, the face of the present workings being reached in the latter part of December, 1926.

A general description of the method of working, systems of haulage in and around the mines, and surface plant has appeared in previous Annual Reports of the Minister of Mines; the only addition to the plant has been the installation of an automatic self-starter on No. 1 East fan and the erection of a new distribution-station on the south side of the valley to take care of Nos. 2, 3, and 1 East fans.

The lamp used exclusively by the workmen is the Edison electric cap safety-lamp, while Wolf safety-lamps are used by the officials and bratticemen for testing purposes, all lamps being cleaned and repaired in a well-equipped lamp-room located in a central position at the colliery.



Coal Creek Colliery, B.C.



Michel Colliery, B.C.

Burrell gas-detectors are provided at all the mines for the purpose of detecting lower percentages of methane than that usually found by the ordinary safety-lamp.

A number of houses are provided at Coal Creek for the convenience of those who prefer living close to the mines, while a good train service is maintained with the town of Fernie, where the majority of the workmen reside.

Copies of the "Coal-mines Regulation Act" and special rules are posted up at all the mines. Following is a brief description of the conditions prevailing in the various mines during 1926:—

No. 1 East Mine.

J. Caufield, Overman; J. Duncan, J. Maltman, T. Reid, R. Fowler, and E. Rutledge, Firebosses.

This mine is operating the eastern portion of the No. 1 seam and is ventilated by an electrically driven 11- by 10-foot Sirocco fan, which, running at a speed of 174 r.p.m., produced an average quantity of 147,000 cubic feet of air a minute, under a water-gauge of 3.6 inches. It is divided into four splits, the quantities passing in each at the last inspection measuring as follows:—

No. 1 Split.—30,800 cubic feet of air a minute for the use of forty men and seven horses. Burrell gas-detector, 1.1 per cent. methane.

No. 2 Split.—15,600 cubic feet of air a minute for the use of twenty-five men and three horses. Burrell gas-detector, 1.1 per cent. methane.

No. 3 Split.—28,050 cubic feet of air a minute for the use of twenty-one men and four horses. Safety-lamp indicated 1 per cent. methane.

No. 4 Split.—20,240 cubic feet of air a minute for the use of twenty-seven men and four horses. Burrell gas-detector, 0.8 per cent. methane.

North Return.—103,500 cubic feet of air a minute for the use of eighty men and fifteen horses. Safety-lamp indicated 0.6 per cent. methane.

West side of fan-shaft, 112,450 cubic feet of air a minute; east side of fan-shaft, 41,000 cubic feet of air a minute; total return air, 153,450 cubic feet of air a minute.

Explosive gas has been found on several occasions in the course of inspection, generally in cavities in the roof above the timbers, while Burrell readings taken in the return air-currents have varied from 0.5 per cent. methane in the No. 2 split to 2.90 per cent. methane in the No. 3 split. The latter reading was taken the day following a blow-out, the whole of the district being fenced off at the time.

Roadways and timbering have been kept in a fairly good state of repair, a good supply of timber provided for the use of the workmen, and the requirements of the "special timbering" rules fairly well attended to at the working-faces.

Spraying systems are operated on all roads and working-faces where required, while the main roads are treated with inert dust. Two hundred and twenty-eight samples of dust have been taken in this mine in compliance with Regulation No. 4 of the Coal-dust Regulations, the resultant analysis proving that 178 of these were in keeping with the requirements of the above regulation.

No. 1 South Mine.

F. Landers, Overman; W. Hynds, W. Stockwell, M. Hilton, and J. Whyte, Firebosses.

This mine operates the upper and western portion of the No. 1 seam and is ventilated by an electrically driven 8- by 4-foot Keith fan, which, running at a speed of 254 r.p.m., produced an average quantity of 46,660 cubic feet of air a minute, under a water-gauge of 2.5 inches. The ventilation is divided into two splits, the quantities passing in each at the last inspection measuring as follows:—

No. 1 Split.—29,750 cubic feet of air a minute for the use of twelve men and two horses. Burrell gas-detector, 1 per cent. methane.

No. 2 Split.—9,500 cubic feet of air a minute for the use of twelve men and two horses. Burrell gas-detector, 0.6 per cent. methane.

Main Return.—53,400 cubic feet of air a minute for the use of twenty-four men and four horses. Safety-lamp indicated 0.6 per cent. methane.

Explosive gas has been found three times in the course of inspection, while Burrell readings taken in the return air-currents have varied from 0.3 per cent. methane in the No. 2 split to 1.5 per cent. in the No. 1 split.

Roadways and timbering have been kept in fairly good shape, a good supply of timber provided for the use of the workmen, and the requirements of the "special timbering" rules fairly well attended to at the working-faces.

Spraying systems are operated on all roads and working-places where required, while the main roads are treated with inert dust.

Two hundred and twenty-five samples of dust were taken in this mine in conformity with Regulation No. 4 of the Coal-dust Regulations, 167 of these being in keeping with the requirements of the above regulation.

No. 2 Mine.

C. McNay, Overman; J. Bushell, W. Clarkstone, R. Alstead, and J. Smith, Firebosses.

This mine is situated on the same level as the tipple and operates the upper and western portion of the No. 2 seam. It is ventilated by a 16- by 8-foot Wilson fan, which, running at a speed of 136 r.p.m., produced an average quantity of 37,570 cubic feet of air a minute, under a water-gauge of 3.4 inches. The ventilation in this mine is all on one split at present, the quantity passing at the last inspection measuring as follows:—

Main Return.—42,000 cubic feet of air a minute for the use of fifty-four men and ten horses. Safety-lamp indicated a very slight trace of methane travelling in the air.

Explosive gas has been found eight times in the course of inspection, while the percentage of methane in the return air-currents, as determined by the Burrell gas-detector, varied from 0.6 per cent. in the No. 4 Incline district to 1.2 per cent. in the Diagonal district.

Roadways and timbering have been kept in a fairly good state of repair, a good supply of timber provided for the use of the workmen, and the requirements of the "special timbering" rules fairly well attended to at the working-faces.

Spraying systems are in use on all roads and working-places where required, while all main roads are treated with inert dust.

Two hundred and fifty-six samples of dust were taken in this mine in accordance with Regulation No. 4 of the Coal-dust Regulations, 216 of these being in keeping with the standard set by the above regulation.

No. 3 Mine.

J. Biggs, Overman; R. S. Phillips, W. Brown, E. Caufield, and J. Chester, Firebosses.

This mine operates the lower and eastern portion of the No. 2 seam and is ventilated by a 16- by 8-foot Wilson fan, which, running at a speed of 160 r.p.m., produced an average quantity of 62,160 cubic feet of air a minute, under a water-gauge of 4.5 inches. Ventilation is divided into two splits, the quantities passing in each at the last inspection measuring as follows:—

No. 1 Split.—10,800 cubic feet of air a minute for the use of ten men and four horses. Burrell gas-detector, 0.45 per cent. methane.

No. 2 Split.—33,120 cubic feet of air a minute for the use of forty-five men and seven horses. Burrell gas-detector out of order; safety-lamp indicated 1.6 per cent. methane.

Main Return.—66,000 cubic feet of air a minute for the use of fifty-five men and eleven horses. Safety-lamp, 1 per cent. methane.

Explosive gas has been found six times in the course of inspection, while the percentage of methane in the return air-currents, as determined by the Burrell gas-detector, varied from 0.2 per cent. in the No. 1 split to 1.9 per cent. in the No. 2 split.

Roadways and timbering have been kept in fairly good shape, a good supply of timber provided for the use of the workmen, and the requirements of the "special timbering" rules fairly well attended to at the working-faces.

Spraying systems are in use on all roads and working-faces where required, while the main roads are treated with inert dust.

Two hundred and forty-one samples of dust were taken in this mine in accordance with Regulation No. 4 of the Coal-dust Regulations, 173 of these being in keeping with the requirements of the above regulation.

No. 9 Mine.

J. Worthington, Overman.

The principal work done in this mine during the year consisted of repairs to the main haulage-roads and main return airway, this being completed and development-work resumed

in Nos. 3 and 4 inclines in the latter part of December. It is ventilated by a fan of the Guibal type, the quantity of air passing at the last inspection measuring as follows:—

Main Intake.—14,000 cubic feet of air a minute for the use of five men and two horses.

Roadways and timbering have been kept in good shape and generally free from coal-dust at all our inspections.

No explosive gas has been found in the course of inspection and the methane content in the return air-current has always been under 0.5 per cent.

Following are the official returns from Coal Creek Colliery for the year ended December 31st, 1926:—

Sales and Output for Year.	Coal.		Coke.	
(Tons of 2,240 lb.)	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	112,948	.....	27,910	.....
Sold for export to United States	174,684	.....	6,833	.....
Sold for export to other countries	.....	.....	.....	.....
Total sales	.....	287,632	.....	34,743
Used in making coke	53,732	.....	.....	.....
Used under colliery boilers, etc.	29,436	.....	.....	.....
Total for colliery use	.....	83,168	.....	.....
		370,800		
Stocks on hand first of year	5,491	.....	89	.....
Stocks on hand last of year	745	.....	357	.....
Difference taken from stock during year	.....	4,746	.....	268
Output of colliery for year	.....	366,054	.....	35,011

Number of Hands employed, Daily Wages paid, etc. (Includes Fernie Coke-ovens.)

Character of Labour.	Underground.		Above Ground.		Totals.	
	No. employed.	Average Daily Wage.	No. employed.	Average Daily Wage.	No. employed.	Average Daily Wage.
Supervision and clerical assistance	24	.....	12	.....	36	.....
Whites—						
Miners	255	.....	.....	.....	255	.....
Miners' helpers	.....	.....	.....	.....	.....	.....
Labourers	47	.....	68	.....	115	.....
Mechanics and skilled labour	159	.....	106	.....	265	.....
Boys	9	.....	2	.....	11	.....
Japanese	.....	.....	.....	.....	.....	.....
Chinese	.....	.....	.....	.....	.....	.....
Indians	.....	.....	.....	.....	.....	.....
Totals	494	.....	188	.....	682	.....

MICHEL COLLIERY.

R. Bonar, Manager; M. McLean, Afternoon-shift Overman; J. Henney, Safety Inspector.

This colliery is situated on Michel creek, 24 miles north-east of Fernie, and has railway connection with the Canadian Pacific Railway. A general description of the methods of work, system of haulage in and around the mines, and surface plant has appeared in previous Annual Reports of the Minister of Mines.

A number of new machines, lathes, etc., have been added to the equipment in the machine-shop. Largely through the efforts of the Coal Company and the Local Centre of the St. John Ambulance Association, a very fine Studebaker ambulance was provided during 1926, thus

supplying a long-felt want at this colliery, especially when one considers the distance that injured men have to be transported to the hospital.

As in the previous three years, the whole of the output at this colliery has come from Nos. 3 and 8 mines, operations in No. 3 East being confined chiefly to repairs on main roads and attending to the pumps.

The Edison electric cap safety-lamp is used exclusively by the workmen, while Wolf safety-lamps are used by the officials and bratticemen for testing purposes, all lamps being cleaned and repaired in a well-equipped lamp-room located in a central position at the colliery. Burrell gas-detectors are provided at all the mines for the purpose of detecting lower percentages of methane than that usually found by the ordinary safety-lamp.

Copies of the "Coal-mines Regulation Act" and special rules are posted up at all the mines. Following is a brief description of the conditions prevailing in the various mines throughout 1926:—

No. 3 Mine.

M. Littler, Overman; J. Strachan, T. Owen, A. Ball, R. Beard, and O. Winstanley, Firebosses; W. H. Cartwright and F. Yates, Shotfirers.

This mine operates the Nos. 1, 2, and 3 seams and is ventilated by a 12- by 6-foot Sullivan fan, which, running at a speed of 148 r.p.m., produced an average quantity of 103,900 cubic feet of air a minute, under a water-gauge of 2.6 inches. The ventilation is divided into five splits, the quantities passing in each at the last inspection measuring as follows:—

No. 1 Split.—Operations were suspended in this split in September and since then only sufficient air has been allowed to circulate to keep the workings clear of gas.

No. 2 Split.—21,120 cubic feet of air a minute for the use of thirty men and five horses. Burrell gas-detector, 0.4 per cent. methane.

No. 3 Split.—16,900 cubic feet of air a minute for the use of fifteen men and one horse. Burrell gas-detector, 0.5 per cent. methane.

No. 4 Split.—23,100 cubic feet of air a minute for the use of twenty-four men and three horses. Burrell gas-detector, 0.45 per cent. methane.

No. 5 Split.—32,800 cubic feet of air a minute for the use of twenty-eight men and four horses. Safety-lamp, 0.7 per cent. methane.

Main Return.—112,000 cubic feet of air a minute for the use of ninety-seven men and thirteen horses. Safety-lamp, 0.6 per cent. methane.

Explosive gas has been found four times in the course of inspection, while the percentage of methane in the return air-currents, as determined by the Burrell gas-detector, varied from 0.2 per cent. in the No. 1 split to 1.7 per cent. in the No. 3 split.

Roadways and timbering have been kept in good shape, a good supply of timber provided for the use of the workmen, and, with the exception of three working-places, the requirements of the "special timbering" rules fairly well attended to at the faces. In the places mentioned above the miners were prosecuted for failing to set sufficient sprags to overhanging coal.

Spraying systems are in use on all roads and working-places where required, while the main roads are treated with inert dust.

One hundred and fifty-seven samples of dust were taken in this mine in conformity with Regulation No. 4 of the Coal-dust Regulations, 129 of which met the requirements of the above regulations.

No. 8 Mine.

C. Stubbs, Overman; E. Ainsworth, A. Almond, R. McFegan, R. Taylor, and J. Wallbank, Firebosses; W. McKay, J. Scales, and A. Davis, Shotfirers.

This mine operates the upper portion of the No. 8 seam and is ventilated by an 8- by 3½-foot double-inlet Jeffrey fan, which, running at a speed of 240 r.p.m., produced an average quantity of 71,600 cubic feet of air a minute, under a water-gauge of 3 inches. Ventilation is divided into two splits, the quantities passing in each at the last inspection measuring as follows:—

No. 1 Split.—18,750 cubic feet of air a minute for the use of fifty-two men and twelve horses.

No. 2 Split.—22,940 cubic feet of air a minute for the use of sixty-two men and fourteen horses.

Main Return.—73,600 cubic feet of air a minute for the use of one hundred and fourteen men and twenty-six horses.

No explosive gas was found on any of our inspections and the methane content in the return air-currents has always been well under 0.5 per cent.

Roadways and timbering have been kept in good shape, a good supply of timber provided for the use of the workmen, and the requirements of the "special timbering" rules well attended to at the working-faces.

Spraying systems are in use on all roads and working-places where necessary and all haulage-roads treated regularly with inert dust.

One hundred and twenty-four samples of dust were taken in this mine in accordance with Regulation No. 4 of the Coal-dust Regulations, eighty-nine of which contained 50 per cent. or over of incombustible matter.

No. 3 East Mine.

A. Frew, Fireboss.

Operations in this mine have been conducted along the same lines as in 1925, two repairmen and a fireboss being engaged in maintaining the main roadways and attending to the pumps. It is ventilated by a 16- by 8-foot Wilson fan, which, running at a speed of 90 r.p.m., produced an average quantity of 68,500 cubic feet of air a minute, under a water-gauge of 1.2 inches. This mine is divided into two splits, the quantities passing in each at the last inspection measuring as follows:—

No. 1 Split.—30,400 cubic feet of air a minute for the use of two men and one horse.

No. 2 Split.—25,000 cubic feet of air a minute.

Main Return.—69,300 cubic feet of air a minute for the use of three men and one horse.

Roadways and timbering have been kept in good shape and a good supply of timber provided to take care of the repair-work.

No explosive gas was found in this mine during the course of our inspections, while the percentage of methane in the return air-currents, as determined by the Burrell gas-detector, varied from 0.3 per cent. in the No. 1 split to 1.3 per cent. in the No. 2 split.

Although there are no spray-lines in use in this mine, frequent applications of inert dust have been given when required.

Following are the official returns from Michel Colliery for the year ended December 31st, 1926:—

Sales and Output for Year.	Coal.		Coke.	
(Tons of 2,240 lb.)	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	258,332	.....	37,931	.....
Sold for export to United States	574	.....	19,461	.....
Sold for export to other countries	.....	.....	.....	.....
Total sales	.....	258,906	.....	57,392
Used in making coke	89,106	.....	.....	.....
Used under colliery boilers, etc	16,073	.....	.....	.....
Total for colliery use	.....	105,179	.....	.....
		364,085	.....	.....
Stocks on hand first of year	290	.....	417	.....
Stocks on hand last of year	.....	.....	1,460	.....
Difference taken from stock during year	.....	290	.....	1,043
Output of colliery for year	.....	363,795	.....	58,435

NUMBER OF HANDS EMPLOYED, DAILY WAGES PAID, ETC. (INCLUDES COKE-OVENS.)

Character of Labour.	UNDERGROUND.		ABOVE GROUND.		TOTALS.	
	No. employed.	Average Daily Wage.	No. employed.	Average Daily Wage.	No. employed.	Average Daily Wage.
Supervision and clerical assistance	16	.....	9	.....	25	.....
Whites—						
Miners	199	.....	.....	.....	199	.....
Miners' helpers	.....	.....	.....	.....	.....	.....
Labourers	33	.....	102	.....	135	.....
Mechanics and skilled labour	144	.....	83	.....	227	.....
Boys	16	.....	12	.....	28	.....
Japanese	.....	.....	.....	.....	.....	.....
Chinese	.....	.....	.....	.....	.....	.....
Indians	.....	.....	.....	.....	.....	.....
Totals	408	.....	206	.....	614	.....

Corbin Coals, Ltd.

Head Office—Spokane, Wash.

Austin Corbin, President, Spokane, Wash.; E. J. Roberts, Vice-President, Spokane, Wash.; Geo. W. Evans, Vice-President, Spokane, Wash.; A. M. Allen, Secretary-Treasurer, Spokane, Wash.; E. L. Warburton, Superintendent, Corbin, B.C.

This colliery is situated 14 miles from McGillivray Junction on the Crowsnest branch of the Canadian Pacific Railway, to which it is connected by a branch line called the Eastern British Columbia Railway. It consists of four mines, Nos. 3, 4, 5, and 6, the latter being operated during the first six months of 1926 only; No. 3 from July to November, inclusive; no work of any description was done in No. 5, while No. 4 operated practically throughout 1926.

A general description of the method of working, system of haulage in and around the mines, and surface plant has appeared in previous Annual Reports of the Minister of Mines. Important additions to the surface plant during the present year are as follows: A new Climax locomotive was purchased to facilitate switching around the surface and for transportation purposes between the Roberts mine and the tipple. A 250-horse-power Babcock & Wilcox water-tube boiler was erected at the boiler plant, while one McEwan engine and one 200-k.v.a. generator was installed at the power-house.

At the tipple, electricity has replaced steam as the motive power, while two double-deck arm screens have been installed, together with the necessary elevators, conveyors, chutes, and one 210-ton storage-bin.

Further additions now under construction are one Ruggles-Cole dryer, Parrish screens, coal-crusher, Wilmot jigs, with all necessary chutes, bins, etc.

The lamp generally used by the workmen is the Edison electric cap safety-lamp, while Wolf safety-lamps are used by the officials and bratticemen for testing purposes, all lamps being cleaned and repaired in a fairly well-equipped lamp-room located in a central position at the colliery.

Copies of the "Coal-mines Regulation Act" and special rules are posted up at all the mines. Following is a brief description of the conditions prevailing in the various mines throughout 1926:—

No. 4. MINE.

W. Almond, Overman; W. Chapman, G. Elmes, and H. Ferryman, Firebosses.

This mine is operating the No. 4 seam, the system of working being the caving system on the retreat. It is ventilated by a single-inlet fan of the Guibal type, which, running at a speed of 90 r.p.m., produced an average quantity of 21,600 cubic feet of air a minute, under a water-

gauge of 0.5 inch. The ventilation is all on one split, the quantity passing at the last inspection measuring as follows:—

Main Intake.—24,500 cubic feet of air a minute for the use of twenty-three men and three horses.

No explosive gas has been found during the course of our inspections, while the percentage of methane in the return air-current has always been well under 0.5 per cent.

Roadways and timbering have been kept in good shape, a good supply of timber provided for the use of the workmen, and the requirements of the "special timbering" rules fairly well attended to at the working-faces. This mine, being naturally damp, has been generally free from coal-dust at all our inspections.

No. 3 or Roberts Mine.

J. Virgo, Fireboss.

This mine is operated on the open-cut principle and resumed operations in July, 1926, after having been closed down for some years. As weather conditions interfere greatly with operations in winter, coal production was suspended in the latter part of November, to be resumed again in the spring.

Conditions have been fairly good at this mine, all shots being prepared and fired under the direct supervision of a certificated official.

No. 6 Mine.

W. Almond, Overman; W. Chapman, G. Elmes, and H. Ferryman, Firebosses.

This mine operated only during the first six months of 1926, all work being suspended in the beginning of July. While in operation it was ventilated by a 36- by 54-inch Sirroco fan, which, running at a speed of 284 r.p.m., produced an average quantity of 31,700 cubic feet of air a minute, under a water-gauge of 0.6 inch.

Explosive gas was found on one occasion in the course of inspection, while the percentage of methane in the return air-currents has always been under 0.5 per cent.

Roadways and timbering have been kept in good shape, a good supply of timber provided for the use of the workmen, and the requirements of the "special timbering" rules well attended to at the working-faces.

This mine is naturally damp and has been generally free from coal-dust at all our inspections.

Following are the official returns from Corbin Colliery for the year ended December 31st, 1926:—

Sales and Output for Year.	Coal.		Coke.	
(Tons of 2,240 lb.)	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	47,444	.....	.....	.....
Sold for export to United States	21,975	.....	.....	.....
Sold for export to other countries	.....	.....	.....	.....
Total sales	.....	69,419	.....	.....
Used in making coke	.....	.....	.....	.....
Used under colliery boilers, etc.	6,166	.....	.....	.....
Total for colliery use	.....	6,166	.....	.....
		75,585	.....	.....
Stocks on hand first of year	3,110	.....	.....	.....
Stocks on hand last of year	46,124	.....	.....	.....
Difference added to stock during year	.....	43,014	.....	.....
Output of colliery for year	.....	118,599	.....	.....

NUMBER OF HANDS EMPLOYED, DAILY WAGES PAID, ETC.

Character of Labour.	Underground.		Above Ground.		Totals.	
	No. employed.	Average Daily Wage.	No. employed.	Average Daily Wage.	No. employed.	Average Daily Wage.
		$		$		$
Supervision and clerical assistance	4	6.16	10	4.40	15	5.28
Whites—						
Miners	35	5.80	.....	.....	35	5.80
Miners' helpers	10	4.50	.....	.....	10	4.50
Labourers	5	4.50	28	4.20	33	4.35
Mechanics and skilled labour	6	5.00	35	5.30	41	5.15
Boys	.....	.....	2	3.36	2	3.36
Japanese	.....	.....	.....	.....	.....	.....
Chinese	.....	.....	.....	.....	.....	.....
Indians	.....	.....	.....	.....	.....	.....
Totals	60	.....	75	.....	136	.....

GOVERNMENT MINE-RESCUE STATIONS.

Mine-rescue stations are established under the authority of section 117, "Coal-mines Regulation Act," for the purpose of supplementing in case of need the colliery installations of mine-rescue apparatus, and also for the purpose of training holders of certificates of competency in the use of mine-rescue apparatus. In cases of emergency these stations are available for the use of any trained corps of mine-rescuers, duly qualified medical practitioners, or corps trained in the work of first aid to the injured, subject always to the order of an Inspector.

Numerous calls were received during 1926 for the use of the oxygen resuscitation apparatus from different hospitals; in the case of Nanaimo Station a call was answered at Parksville and another at Qualicum, at the request of medical men, to give oxygen treatment in extremities. Nanaimo Hospital forwarded a letter expressing their appreciation of service received in emergencies requiring oxygen treatment. Four stations are established, as follows:—

Nanaimo.—J. D. Stewart, Instructor; serves the coal-mines in the Nanaimo area of the Vancouver Island Inspection District.

Cumberland.—John Thomson, Instructor; serves the coal-mines in the Comox area of the Vancouver Island Inspection District.

Middlesboro.—W. C. Stone, Instructor; serves the coal-mines in the Nicola-Princeton Inspection District.

Fernie.—John T. Puckey, Instructor; serves the coal-mines in the East Kootenay Inspection District.

MINE-RESCUE STATION, NANAIMO.

REPORT BY J. D. STEWART, INSTRUCTOR.

I have the honour to submit herewith my annual report as Instructor of Government Mine-rescue Station, Nanaimo, for the year ended December 31st, 1926.

There was one emergency call received from the Reserve mine in the case of two miners who were covered by a fall of coal, one being killed and the other seriously injured; I immediately went to the mine with the pulmotor, but found that the more seriously injured man had died.

There were a number of emergency calls for oxygen from the local medical men and the hospital; also calls from Parksville and Qualicum Beach; all were immediately answered.

A number of trained and registered holders of certificates in mine-rescue training went through a course of retraining during the year and one new man completed the course.

This station is equipped with six sets of the Gibbs apparatus, six sets of the Burrell all-service gas-masks, and fifty self-rescue machines. An ample supply of oxygen, cardoxide, and spare parts for machines are on hand and the whole is ready for immediate service.

MINE-RESCUE STATION, CUMBERLAND.

REPORT BY JOHN THOMSON, INSTRUCTOR.

I have the honour to submit my annual report for the year ended December 31st, 1926, Mine-rescue Station, Cumberland.

During the year two teams of six men carried out a practice with the Paul apparatus every week; all being employees of the Canadian Collieries (Dunsmuir), Limited.

The apparatus kept in readiness at this station consists of six sets of the Paul apparatus, six sets of the Burrell all-service gas-masks, and fifty self-rescue machines. There is also one Draeger pulmotor, one type B pulmotor, and one H.H. inhalator. In addition to above there are four sets of the Paul apparatus, owned by the Canadian Collieries (Dunsmuir), Limited, kept at this station. There is kept at all times an adequate supply of oxygen and supplies.

The teams which trained at this station competed at the annual mine-rescue and first-aid competitions held at Ladysmith.

MINE-RESCUE STATION, MIDDLESBORO.

REPORT BY WILLIAM C. STONE, INSTRUCTOR.

As caretaker and instructor of the Middlesboro Mine-rescue Station, I beg to submit the following report for the year 1926:—

There are five sets of the Paul apparatus and four sets of the Gibbs apparatus kept at this station, together with supplies of oxygen and cardoxide.

During the year a number of men who hold certificates in mine-rescue training went through a course of practice with the apparatus.

The rescue apparatus at Coalmont Collieries was examined and put in order during the year.

MINE-RESCUE STATION, FERNIE.

REPORT BY JOHN T. PUCKEY, INSTRUCTOR.

I have the honour to submit the following report of the work done at the Fernie Mine-rescue Station during the year 1926:—

The annual first-aid classes were started in January and carried on through till March; sixty-one took the examination for first aid and ten for home-nursing. This is the largest class that has ever been put through in Fernie. One senior and one junior team continued practising up to May 22nd, when they were examined by Colonel Hodgetts in the Dominion and Provincial competitions. Both teams worked hard and each was awarded second place in their respective classes in the Dominion competition.

The rescue apparatus at this station consists of the Gibbs machines and the Burrell all-service gas-masks; these are kept in readiness at all times; in addition to above there is a stock of the new self-rescue machines which were recently approved by the Bureau of Mines, U.S.A.

The Michel Branch of the East Kootenay Mine Safety Association got two moving pictures from the Bureau of Mines, Washington. These were shown twice in Michel and twice in Fernie. The titles were "First Aid as Applied in the Mine" and "Rock Dusting in the New Orient Mine"; they were both interesting and instructive and showed what can be accomplished by using modern safety methods in and around the mines.

Twenty employees of Coal Creek Colliery and ten at Michel Colliery took retraining with the Biggs apparatus, also five new men from Michel took a full course in mine-rescue work and were granted their certificates in December. During the training 800 cubic feet of oxygen and 160 lb. of cardoxide were used.

Six tanks of oxygen were received from the Liquid Air Company, of Calgary, Alta., and there are on hand at present nineteen tanks of oxygen (1,900 cubic feet) and 336 lb. of cardoxide, also spare parts, gaskets, etc., for replacing on the apparatus.

It is a pleasure to report that no emergency calls were received from any of the collieries for the use of the apparatus. There was a call from one of the local medical men to administer oxygen to a patient at the hospital.

BOARD OF EXAMINERS FOR COAL-MINE OFFICIALS.

FIRST-, SECOND-, AND THIRD-CLASS CERTIFICATES AND MINE-SURVEYING CERTIFICATES.

REPORT BY JAMES STRANG, SECRETARY TO THE BOARD.

I have the honour to submit herewith the annual report of the transactions of the above Board for the year ended December 31st, 1926.

The Board of Examiners, which was formed on July 1st, 1919, at present consists of James Dickson, Chief Inspector of Mines, as Chairman; Harry Ernest Miard, member; and James Strang, member and Secretary of the Board. The meetings of the Board are held in the office of the Mines Department, Victoria. The examinations are held in accordance with the rules made by the Provincial Board of Examiners and approved by the Minister of Mines, July 16th, 1919. As these rules were published in the report of 1922 there is no need to publish them again.

Two examinations were held in 1926; the first was held on May 26th, 27th, and 29th and the second on November 17th, 18th, and 19th.

The total number of candidates at these examinations was as follows: For First-class Certificates, 4 (2 passed and 2 failed); for Second-class Certificates, 5 (3 passed and 2 failed); for Third-class Certificates, 20 (14 passed and 6 failed); for Mine Surveyor Certificates, 5 (1 passed and 4 failed).

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

First-class Candidates.—John Bennett and E. H. Devlin.

Second-class Candidates.—Walter McKay, James McWhirter, and Robert Taylor.

Third-class Candidates.—Robert Barrass, Peter M. Hunter, Frank Bond, Robert Murray, James Littler, John G. Hindmarsh, Archibald McWhirter, Thomas Slee, John Stewart, Thomas McCourt, Fred Johnston, Horace Bate, William Cass, and Thomas Smith.

Mine Surveyor Candidate.—Robert Bonar.

A thorough knowledge of the elementary subjects on which the theory of mining is built is absolutely necessary to mining students and most of the candidates who failed to qualify in these examinations seemed to lack this fundamental knowledge.

The attention of mining students in British Columbia is directed to the course of mining provided by the Department of Education. To those who intend to qualify as mine officials this course of study would be of immense advantage.

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 a person employed underground in any coal-mine to cut, shear, break, or loosen coal from the solid, whether by hand or machinery.

The work of the Board of Examiners in examining candidates for coal-miners' certificates has been carried on in all mining districts at intervals of not less than sixty days, as required by the amendment of the Act.

No certificate has been granted in any case where the candidate failed to satisfy the Board as to his general fitness, experience in a coal-mine, and a working knowledge of the English language. During 1926 forty-six examinations have been held for candidates for certificates of competency as coal-miners in the various coal-mining districts of the Province.

One hundred and ninety-three candidates presented themselves for examination; 174 passed and nineteen failed to qualify. In addition to above, a number of duplicate certificates were issued to coal-miners who had lost their original certificate of competency.

The Board of Examiners desires to thank the different coal-mining companies for the use of their premises in holding these examinations.

The Inspector of Mines in each district has authority, under the amendment (1919) to "Coal-mines Regulation Act," to grant, after a satisfactory examination, a provisional certificate of competency 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 regular examination before the Board.

REGISTERED LIST OF HOLDERS OF CERTIFICATES OF COMPETENCY AS COAL-MINE OFFICIALS.

FIRST-CLASS CERTIFICATES OF COMPETENCY ISSUED UNDER "COAL-MINES REGULATION ACT, 1897."

Name.	Date.	Name.	Date.
Shepherd, Francis H.	Mar. 5, 1881	Stockett, Thomas, Jr.	Aug. 3, 1901
Honobin, William	May 1, 1882	Cunliffe, John	Aug. 3, 1901
Little, Francis D.	May 1, 1882	Evans, Daniel	Aug. 3, 1901
Chandler, William	Dec. 21, 1883	Browitt, Benjamin	Aug. 3, 1901
Priest, Elijah	Dec. 21, 1883	McEvoy, James	Oct. 17, 1902
Randle, Joseph	Jan. 18, 1888	Wilson, A. R.	Oct. 17, 1902
Matthews, John	Jan. 8, 1889	Simister, Charles	Oct. 17, 1902
Norton, Richard Henry	Aug. 26, 1889	Budge, Thomas	Oct. 17, 1902
Kesley, John	Mar. 4, 1892	Richards, James A.	Oct. 17, 1902
Wall, William H.	May 30, 1896	McLean, Donald	Jan. 21, 1904
Wilson, David	May 30, 1896	Wright, H. B.	Jan. 21, 1904
Smith, Frank B.	May 30, 1896	Coulthard, R. W.	Jan. 21, 1904
Bradshaw, George B.	June 12, 1899	Roaf, J. Richardson	Jan. 21, 1904
Simpson, William G.	June 12, 1899	John, John	Jan. 21, 1904
Hargreaves, James	Feb. 5, 1901	Manley, H. L.	Jan. 21, 1904
Drinnan, Robert G.	Feb. 5, 1901		

FIRST-CLASS CERTIFICATES ISSUED UNDER "COAL-MINES REGULATION ACT FURTHER AMENDMENT ACT," 1904–1911–1919.

Name.	Date.	Name.	Date.
Baxter, Andrew	June 10, 1911	Graham, Thomas	Nov. 9, 1907
Battey, Richard	May 27, 1913	Gray, James	Nov. 27, 1909
Bennett, John	Dec. 30, 1926	Henderson, Robert	Nov. 27, 1909
Biggs, J. G.	July 22, 1908	Hewlett, Howe	May 27, 1913
Bonar, Robert	Oct. 28, 1911	Higgins, Alexander	Dec. 19, 1918
Brace, Tom	May 13, 1915	Hodge, William K.	June 16, 1925
Bridge, Edward	July 22, 1908	Holden, James	May 1, 1909
Brown, David	May 21, 1914	Howden, Archibald	May 27, 1913
Brown, Robert Joyce	May 13, 1915	Howells, Nathaniel	Oct. 28, 1911
Caufield, Bernard	May 1, 1909	Hughes, John C.	May 17, 1917
Church, James A. H.	June 10, 1911	Humphries, Clifford	June 10, 1911
Cox, Richard	May 13, 1915	Hunter, Alex. B.	July 8, 1916
Crowder, James	June 10, 1911	Huntrods, Eustace S. F.	May 19, 1922
Cunningham, John Howard	May 9, 1912	Jackson, Thos. R.	Nov. 9, 1907
Davidson, W. A.	May 1, 1909	James, William	July 22, 1908
Davies, David	June 10, 1911	Jaynes, Frank	May 13, 1915
Davies, Stephen	Nov. 15, 1917	Jemson, Jas. W.	May 27, 1913
Davies, Thos. Owen	May 21, 1914	Kellock, George	June 10, 1911
de Hart, J. B.	May 17, 1917	Knox, T. K.	July 27, 1909
Derbyshire, James	Nov. 9, 1907	Laird, Robert	Nov. 15, 1917
Devlin, E. H.	Dec. 30, 1926	Leighton, Henry	May 9, 1912
Devlin, Henry	May 1, 1909	Mackinnon, Hugh G.	May 19, 1922
Dickson, James	Oct. 31, 1912	Macauley, D. A.	June 10, 1911
Elliott, Daniel	Nov. 9, 1907	McCulloch, James	Sept. 10, 1910
Emmerson, Joseph	Nov. 9, 1907	McDonald, John	Oct. 3, 1919
Ewart, William	May 19, 1922	McGuckie, Thomas	July 22, 1908
Fairfoull, Robert	June 10, 1911	McKendrick, Andrew	May 27, 1913
Foster, William R.	Dec. 31, 1925	McLean, Michael D.	June 16, 1925
France, Thos.	Nov. 22, 1906	McMillan, J. H.	Sept. 10, 1910
Fraser, Norman	Mar. 4, 1905	McVicar, Samuel	May 1, 1909
Freeman, H. N.	May 1, 1909	Mazey, William John	Oct. 31, 1912
Galloway, C. F. J.	July 22, 1908	Miard, Henry Ernest	May 9, 1912
Garman, Morris W.	Nov. 15, 1917	Millar, John K.	Nov. 22, 1906
Gascoyne, Rowland B.	May 21, 1914	Miller, Andrew Anderson	Oct. 31, 1912
Gillham, John	Jan. 5, 1925	Montgomery, John W.	May 1, 1909
Glover, Francis	Oct. 31, 1912	Moore, Wm. H.	May 17, 1917
Graham, Charles	Nov. 14, 1905	Mordy, Thomas	Sept. 10, 1910

FIRST-CLASS CERTIFICATES ISSUED UNDER "COAL-MINES REGULATION ACT FURTHER AMENDMENT ACT, 1904–1911–1919—*Continued.*

Name.	Date.	Name.	Date.
Morrison, Edward	June 24, 1924	Stevens, L. C.	Nov. 27, 1909
Mottishaw, Sam. K.	Nov. 15, 1917	Stewart, R. T.	Sept. 10, 1910
Murray, George	June 21, 1921	Strachan, Robert	Mar. 4, 1905
Newbury, Arthur	June 21, 1920	Strang, James	June 10, 1911
O'Brien, George	May 21, 1914	Taylor, James	May 16, 1918
Ovington, John	May 27, 1913	Thomas, J. D.	Sept. 10, 1910
Peacock, Frank David	Oct. 28, 1911	Thorne, B. L.	Sept. 10, 1910
Penman, Hugh	May 21, 1914	Touhey, James	May 21, 1914
Phelan, Arthur	May 27, 1913	Vincent, Thomas C.	June 24, 1924
Powell, J. W.	June 10, 1911	Walker, William	May 16, 1918
Quinn, John Graham	July 8, 1916	Wallbank, J.	Sept. 10, 1910
Ramsay, Peter Millar	May 16, 1918	Warburton, Ernest Leonard	July 8, 1916
Roper, William	May 13, 1915	Wark, Samuel David	Oct. 3, 1919
Russell, John	May 21, 1914	Wesnedge, William	Dec. 19, 1918
Scott, Thomas Wright	Dec. 22, 1921	Whittaker, John	Dec. 19, 1918
Shanks, John	May 1, 1909	Williams, Jahn Samuel	Dec. 19, 1918
Shenton, T. J.	Sept. 10, 1910	Williams, Thos. B.	May 17, 1917
Shone, Samuel	May 1, 1909	Williams, Thos. H.	Nov. 22, 1906
Smith, A. E.	Oct. 28, 1911	Wilson, Ridgeway R.	Nov. 15, 1917
Smith, Joseph	July 22, 1908	Wilson, William	May 16, 1918
Smith, Thos. Edwin	Dec. 19, 1918	Wylie, John	July 22, 1908
Spicer, J. E.	Oct. 28, 1911	Yates, Frank	Dec. 31, 1925
Spruston, T. A.	Nov. 27, 1909		

SECOND-CLASS CERTIFICATES OF SERVICE.

Name.	Date.	No.	Name.	Date.	No.
Lee, John S.	Mar. 4, 1905	B 9	Walker, David	Mar. 4, 1905	B 14
Millar, J. K.	Mar. 4, 1905	B 10	Powell, William Baden	Mar. 4, 1905	B 16
McCliment, John	Mar. 4, 1905	B 11	Bryden, Alexander	Mar. 4, 1905	B 18
Hunt, John	Mar. 4, 1905	B 13			

SECOND-CLASS CERTIFICATES OF COMPETENCY ISSUED UNDER "COAL-MINES REGULATION ACT FURTHER AMENDMENT ACT, 1904."

Name.	Date.	No.	Name.	Date.	No.
Adamson, Robert	Sept. 10, 1910	B 120	Brown, James L.	Oct. 28, 1911	B 136
Allan, Alex. McDiarmid	May 27, 1913	B 167	Brown, John C.	Oct. 23, 1906	B 39
Almond, Walter	Nov. 15, 1917	B 213	Brown, John Todd	May 9, 1912	B 150
Alstead, Robert	June 24, 1924	B 257	Brown, R. J.	Oct. 28, 1911	B 134
Archibald, William	Nov. 22, 1922	B 250	Brown, Robert	May 21, 1914	B 183
Ball, Benjamin	June 21, 1920	B 235	Brown, Robert Sneddon	May 13, 1915	B 196
Barclay, Andrew	July 29, 1905	B 25	Brown, William Gold	Dec. 19, 1918	B 228
Barlow, Benjamin Robt.	Dec. 19, 1918	B 229	Brownrigg, John H.	May 17, 1917	B 124
Bastian, Albert	Nov. 21, 1923	B 256	Bushell, J. P.	May 1, 1909	B 81
Baybutt, Thomas	July 8, 1916	B 206	Carroll, Henry	July 22, 1908	B 62
Bell, John	May 17, 1917	B 212	Caufield, Bernard	Oct. 23, 1906	B 30
Beveridge, William	June 21, 1920	B 233	Caufield, John	July 8, 1916	B 199
Bevis, Nathaniel	Sept. 10, 1910	B 123	Cawthorne, L.	May 1, 1909	B 93
Biggs, John	May 1, 1909	B 94	Challinor, Jno. Thomas	May 27, 1913	B 169
Biggs, John G.	Nov. 2, 1907	B 40	Challoner, Jno. Arthur	May 21, 1914	B 178
Blair, James	May 13, 1915	B 197	Churchill, James	July 22, 1908	B 65
Brace, Tom	Nov. 27, 1909	B 96	Clark, Robt.	June 21, 1921	B 242
Bridge, Edward	Oct. 23, 1906	B 33	Clarkstone, Wm. W.	May 21, 1914	B 180
Brown, David	Sept. 10, 1910	B 108	Commons, Wm.	Sept. 10, 1910	B 115
Brown, George	Dec. 19, 1918	B 225	Coupland, George	May 16, 1918	B 217

SECOND-CLASS CERTIFICATES OF COMPETENCY ISSUED UNDER "COAL-MINES REGULATION ACT FURTHER AMENDMENT ACT, 1904"—*Continued.*

Name.	Date.	No.	Name.	Date.	No.
Courtney, A. W.	Oct. 28, 1911	B 138	Joyce, Walter	May 27, 1913	B 168
Cox, *Richard*	May 9, 1912	B 143	*Kirkwood, John R.*	Oct. 31, 1912	B 160
Crawford, David	May 1, 1909	B 88	Knowles, James E.	Oct. 28, 1911	B 137
Cunliffe, Thomas	May 1, 1909	B 78	Laird, Robert	May 17, 1917	B 210
Dando, John	May 27, 1913	B 164	Lander, Frank	May 13, 1915	B 195
Daniels, David	Nov. 2, 1907	B 53	Lane, Joseph	May 9, 1912	B 142
Derbyshire, James	Oct. 23, 1906	B 32	Lee, Robert John	Sept. 10, 1910	B 110
Davidson, Hugh	May 27, 1913	B 165	Littler, Matthew	Oct. 31, 1912	B 157
Davies, Stephen	Sept. 10, 1910	B 113	Luck, George	June 10, 1911	B 128
Dennis, Fred. W.	May 21, 1914	B 174	Manifold, Albert	May 9, 1912	B 145
Devlin, Ernest H.	May 21, 1914	B 179	Marsh, John	Nov. 15, 1917	B 216
Devlin, Henry	Nov. 2, 1907	B 44	Mason, Joseph	May 13, 1915	B 193
Dewar, Alexander	Oct. 31, 1912	B 162	Massey, H.	Nov. 27, 1909	B 99
Dickenson, Clifford	May 13, 1915	B 189	Mather, Thomas	June 10, 1911	B 127
Dunsmuir, John	Nov. 14, 1905	B 26	Matusky, A.	May 1, 1909	B 91
Duncan, James	Nov. 21, 1923	B 255	Mayer, Ralph Waldo	May 9, 1912	B 144
Dykes, J. W.	May 1, 1909	B 77	Mazay, W. J.	Nov. 27, 1909	B 101
Eccleston, Wm.	May 1, 1909	B 87	Menzies, Fred	Dec. 22, 1921	B 244
Fairfoull, James	May 21, 1914	B 186	Merryfield, William	July 22, 1908	B 61
Fairfoull, R.	May 1, 1909	B 83	Miard, Hy. E.	Sept. 10, 1910	B 107
Finlayson, James	July 29, 1905	B 21	Michek, John	May 17, 1917	B 188
Ford, Allan	May 27, 1913	B 171	Middleton, Robert	July 22, 1908	B 72
Foster, W. R.	Nov. 27, 1909	B 102	*Mitchell, Henry*	July 8, 1916	B 201
France, Thos.	May 14, 1905	B 27	Monks, James	Nov. 2, 1907	B 55
Francis, David M.	May 21, 1914	B 182	Moore, Wm. H.	May 21, 1914	B 173
Francis, Enoch	May 1, 1909	B 86	Morgan, John	Nov. 2, 1907	B 43
Francis, James	July 22, 1908	B 63	Morgan, William	Dec. 19, 1918	B 224
Frater, George	July 8, 1916	B 204	Morgan, Daniel	Nov. 21, 1923	B 254
Freeman, Henry N.	Nov. 2, 1907	B 45	Morris, John	July 22, 1908	B 67
Garbett, Richard	Oct. 31, 1912	B 161	Morrison, Edward	Nov. 21, 1923	B 253
Garman, Morris Wilbur	Oct. 31, 1912	B 155	Morton, Robert W.	July 22, 1908	B 59
Gilham, John	June 21, 1920	B 237	Mottishaw, S. K.	Oct. 28, 1911	B 135
Gillespie, Hugh	July 29, 1905	B 24	Murray, George	Oct. 3, 1919	B 232
Gillespie, John	Oct. 23, 1906	B 36	Musgrave, J.	May 1, 1909	B 90
Gould, Alfred	May 13, 1915	B 190	*Myers, Peter*	May 9, 1912	B 149
Gourlay, Robert	Dec. 19, 1918	B 227	MacKinnon, Hugh G.	Dec. 22, 1921	B 243
Graham, Chas.	Mar. 4, 1905	B 1	McKay, Walter	June 30, 1926	B 262
Gray, David	May 1, 1909	B 76	McLaughlin, Alex	May 13, 1915	B 191
Gray, George	July 8, 1916	B 207	McDonald, J. A.	Oct. 28, 1911	B 133
Greenwell, Archibald	May 16, 1918	B 220	McDonald, John	May 27, 1913	B 172
Hamilton, Robert N.	May 21, 1914	B 175	McFegan, W.	Nov. 31, 1909	B 106
Hastings, Andrew P.	Dec. 19, 1918	B 223	McFegan, Robert	May 18, 1922	B 246
Henderson, Robert	July 22, 1908	B 60	McGarry, Martin	Oct. 31, 1912	B 156
Hodge, William K.	Jan. 5, 1925	B 259	McGuckie, Thomas M.	Oct. 23, 1906	B 35
Holliday, William	Dec. 19, 1918	B 230	McKelvie, J.	May 1, 1909	B 92
Horrocks, Abner G.	June 10, 1911	B 130	McKendrick, And.	Sept. 10, 1910	B 112
Houston, Robert	June 16, 1925	B 260	McLean, Michael D.	June 21, 1920	B 234
Howells, Nathaniel	Nov. 27, 1909	B 97	McMillan, D.	June 10, 1911	B 125
Hudson, George	Sept. 10, 1910	B 121	McNay, Carmichael	May 9, 1912	B 151
Hughes, John C.	Sept. 10, 1910	B 109	McPherson, James E.	July 22, 1908	B 73
Hutton, Isaac	May 21, 1914	B 185	McWhirter, James	June 30, 1926	B 263
Hutton, John	May 9, 1912	B 154	Neen, Joseph	June 10, 1911	B 129
Hynds, William	Dec. 14, 1920	B 240	Newbury, Arthur	May 21, 1914	B 184
Hynds, John	May 18, 1922	B 247	Newton, Wm.	Sept. 10, 1910	B 116
Jackson, Thos. R.	Mar. 4, 1905	B 5	Nicholl, Joseph O.	Dec. 31, 1925	B 261
James, David	Nov. 2, 1907	B 58	O'Brien, Charles	May 9, 1912	B 148
Jarrett, Fred	May 1, 1909	B 84	O'Brien, George	May 1, 1909	B 82
Jaynes, Frank	Sept. 10, 1910	B 111	Osborne, Hugh	Dec. 14, 1920	B 239
John, Francis	July 8, 1916	B 200	Ovington, John	Nov. 2, 1907	B 52
John, Howell	Sept. 10, 1910	B 122	Park, William	June 21, 1920	B 238
Johnson, Moses	May 1, 1909	B 75	Parkinson, T.	May 1, 1909	B 80
Jones, Samuel	May 16, 1918	B 221	Parnham, Charles	Nov. 2, 1907	B 49
Jones, William T.	July 22, 1908	B 66	Quinn, James	May 21, 1914	B 181
Jordon, Thos.	Nov. 27, 1909	B 104	Quinn, John	May 9, 1912	B 146

SECOND-CLASS CERTIFICATES OF COMPETENCY ISSUED UNDER "COAL-MINES REGULATION ACT FURTHER AMENDMENT ACT, 1904"—*Continued.*

Name.	Date.	No.	Name.	Date.	No.
Ramsay, Peter Millar	May 17, 1917	B 209	Sutherland, John	May 16, 1918	B 218
Rankin, Geo.	Nov. 27, 1909	B 103	Taylor, James	May 13, 1915	B 194
Raynes, M. T.	Oct. 28, 1911	B 139	Taylor, Robt.	Dec. 30, 1926	B 265
Reid, Wm.	Oct. 28, 1911	B 132	Taylor, Thomas	July 8, 1916	B 203
Renny, James	Oct. 28, 1911	B 140	Thomas, J. B.	Nov. 27, 1909	B 105
Richards, Thomas	Nov. 2, 1907	B 57	Thomas, Joseph D.	Oct. 23, 1906	B 38
Richards, Samuel	May 9, 1912	B 152	Thomas, Daniel W.	Nov. 22, 1922	B 249
Rigby, John	July 29, 1905	B 29	Thompson, Joseph	Sept. 10, 1910	B 114
Roberts, Ebenezer	Sept. 10, 1910	B 117	Touhey, James	May 9, 1912	B 147
Robinson, William	July 22, 1908	B 69	Touhey, William	July 8, 1916	B 205
Rogers, George	May 1, 1909	B 79	Tonge, Thomas	July 22, 1908	B 71
Roper, William	May 9, 1912	B 141	Tully, Thomas	Nov. 15, 1917	B 214
Rowbottom, Thomas	May 16, 1918	B 222	Vanhulle, Peter	Nov. 2, 1907	B 54
Russell, John	Nov. 2, 1907	B 47	Virgo, John	May 1, 1909	B 89
Rutherford, Jasper	May 16, 1918	B 219	Walker, William	May 13, 1915	B 192
Scarpino, Francis	Dec. 19, 1918	B 226	Warburton, Ernest L.	May 27, 1913	B 170
Scott, Thomas Wright	June 21, 1921	B 241	Watson, Adam G.	Nov. 14, 1905	B 28
Shanks, David	Oct. 31, 1912	B 159	Watson, Arthur W.	May 17, 1917	B 211
Shaw, Thomas John	May 27, 1913	B 166	Webster, James S.	June 24, 1924	B 258
Smith, John	Oct. 3, 1919	B 231	Wesnedge, William	Nov. 27, 1909	B 98
Smart, Robert K.	Nov. 22, 1922	B 248	White, John	Nov. 2, 1907	B 48
Somerville, Alex.	Mar. 4, 1905	B 4	Whitehouse, William	Oct. 31, 1912	B 163
Spruston, Robert Lecce	July 8, 1916	B 202	Williams, John Samuel	Nov. 15, 1917	B 215
Spruston, Thos. A.	Nov. 2, 1907	B 46	Williams, Watkin	Sept. 10, 1910	B 118
Stafford, Matthew	June 10, 1911	B 131	Wilson, Robinson	May 21, 1914	B 177
Stewart, J. M.	May 1, 1909	B 95	Wilson, Thomas	July 22, 1908	B 74
Stobbart, Jacob	May 9, 1912	B 153	Wilson, William	July 22, 1908	B 70
Stockwell, William	Nov. 2, 1907	B 56	Wood, Thos. James	May 21, 1914	B 176
Strang, Thomas	Oct. 31, 1912	B 158	Worthington, Joseph	May 1, 1909	B 85
Stubbs, Clement	May 18, 1922	B 245	Yates, Frank	Nov. 22, 1922	B 251

THIRD-CLASS CERTIFICATES ISSUED UNDER "COAL-MINES REGULATION ACT FURTHER AMENDMENT ACT, 1904."

Name.	Date.	No.	Name.	Date.	No.
Adamson, Robert	May 1, 1909	C 323	Bateman, Joseph William	Oct. 28, 1913	C 551
Adamson, Wm.	Dec. 22, 1921	C 721	Bauld, Wm.	June 10, 1911	C 422
Ainsworth, Edward	May 16, 1918	C 674	Baxter, Robert	Oct. 28, 1911	C 450
Allan, Alexander	Oct. 28, 1911	C 430	Baybutt, Thomas	May 27, 1913	C 548
Almond, Alex	Oct. 1, 1907	C 252	Beard, Henry C.	May 30, 1923	C 751
Almond, Walter	July 22, 1908	C 286	Beeton, D. H.	May 1, 1909	C 338
Alstead, Robt.	June 21, 1921	C 719	Bell, Fred	May 27, 1913	C 514
Anderson, John	Oct. 28, 1911	C 437	Bell, John	May 9, 1912	C 477
Anderson, Peter Blane	Nov. 15, 1917	C 660	Bennett, Andrew M.	Nov. 15, 1917	C 661
Anderson, Robt.	Oct. 14, 1914	C 599	Bennett, John	Oct. 14, 1914	C 597
Angell, William	May 21, 1914	C 591	Bennie, John	June 10, 1911	C 411
Arbuckle, John	May 13, 1915	C 622	Beveridge, Wm.	June 10, 1911	C 396
Archibald, Geo.	May 21, 1914	C 569	Biggs, John	Mar. 4, 1905	C 210
Archibald, Thomas	Oct. 28, 1911	C 454	Biggs, Thomas	Oct. 28, 1911	C 449
Ball, Alfred	May 17, 1917	C 635	Birchell, Richard	Oct. 1, 1907	C 266
Bann, Thomas	Oct. 31, 1912	C 494	Blair, James	Oct. 31, 1912	C 502
Baggaley, J.	July 22, 1908	C 300	Blas, Emil	June 24, 1924	C 774
Bain, James	May 27, 1913	C 546	Blewett, Ernest	July 22, 1908	C 298
Bainbridge, James	Nov. 21, 1922	C 744	Blinkhorn, Thomas	Dec. 19, 1918	C 681
Ball, Benjamin	May 21, 1914	C 583	Bond, Frank	June 30, 1926	C 797
Barker, Robert	June 10, 1911	C 415	Bradley, William	July 22, 1908	C 291
Barlow, B. R.	May 1, 1909	C 337	Bradley, Wilfred	May 17, 1922	C 733
Barrass, Robt.	June 30, 1926	C 795	Bridge, Edward	July 29, 1905	C 223
Bastian, Albert	May 30, 1923	C 750	Briscoe, F.	July 22, 1908	C 309
Bate, Horace	Dec. 30, 1926	C 802	Broderick, Matthew	Jan. 21, 1913	C 525

THIRD-CLASS CERTIFICATES ISSUED UNDER "COAL-MINES REGULATION ACT FURTHER AMENDMENT ACT, 1904"—*Continued.*

Name.	Date.	No.	Name.	Date.	No.
Brown, Arthur A.	Oct. 14, 1914	C 596	Davidson, Hugh	May 9, 1919	C 464
Brown, David	Nov. 1, 1909	C 348	Davies, Alfred	Oct. 3, 1912	C 691
Brown, George	July 8, 1916	C 626	Davies, Evan Thomas	May 9, 1912	C 463
Brown, George A.	Dec. 14, 1920	C 706	Davies, John H. C.	May 17, 1922	C 729
Brown, James	Sept. 10, 1910	C 364	Davis, John David	May 16, 1918	C 669
Brown, James	June 10, 1911	C 412	Davis, William	May 1, 1909	C 339
Brown, James	July 8, 1916	C 625	Dean, Andrew	Dec. 19, 1918	C 688
Brown, Jas. Millie	May 13, 1915	C 615	Dean, Joseph	May 13, 1915	C 611
Brown, John	Sept. 10, 1910	C 392	Derbyshire, A.	June 10, 1911	C 401
Brown, Robert	Oct. 28, 1911	C 451	Dewar, Alex.	Sept. 10, 1910	C 369
Brown, Robert D.	June 10, 1911	C 423	Devlin, Edward	Oct. 23, 1906	C 241
Brown, Robert S.	June 10, 1911	C 408	Devlin, Ernest Henry	May 27, 1913	C 538
Brown, Wm. A.	May 21, 1914	C 576	Devlin, John	Oct. 3, 1919	C 693
Brown, William Gold	July 8, 1916	C 629	Devoy, William	May 17, 1917	C 638
Bruce, Preston	Dec. 14, 1920	C 712	Dickenson, Clifford	May 27, 1917	C 532
Bullen, Thomas	Sept. 10, 1910	C 379	Dickie, Leslie	Nov. 20, 1923	C 762
Bushell, Jas. P.	Oct. 1, 1907	C 264	Dingsdale, Geo.	Oct. 28, 1911	C 459
Bysouth, Thomas	May 16, 1918	C 673	Dobie, Thomas	Dec. 22, 1921	C 726
Cairns, Andrew	June 10, 1911	C 420	Doherty, J. J.	May 1, 1909	C 340
Cairns, Robert	May 27, 1913	C 539	Doney, John	Mar. 4, 1905	C 211
Caldwell, Daniel	May 17, 1917	C 639	Donnachie, John	June 10, 1911	C 425
Caldwell, Peter	June 21, 1921	C 715	Doodson, Robert	Oct. 28, 1911	C 455
Calverly, Joseph	Sept. 10, 1910	C 375	Dorrance, Orlin William	Jan. 21, 1913	C 517
Camamile, Hollis	Oct. 28, 1911	C 443	Douglas, D. B.	Oct. 23, 1906	C 235
Campbell, Samuel	Nov. 15, 1917	C 662	Dow, And. Y.	May 21, 1914	C 587
Campbell, Andrew	Nov. 27, 1917	C 651	Drybrough, Robert	June 21, 1920	C 701
Carroll, George	Nov. 21, 1922	C 746	Dunn, Wm.	Oct. 14, 1914	C 606
Carr, Peter	Oct. 31, 1912	C 497	Dunnigan, Richard	June 21, 1921	C 716
Carson, George	Mar. 17, 1917	C 663	Dykes, Isaac	June 10, 1911	C 409
Cartwright, Wm. H.	June 24, 1924	C 768	Dykes, Joseph W.	Oct. 1, 1907	C 248
Cass, Wm.	Dec. 30, 1926	C 800	Eccleston, Thomas	May 17, 1917	C 482
Catchpole, Charles	July 29, 1905	C 227	Eccleston, John I.	May 30, 1923	C 757
Caufield, Edward	May 16, 1918	C 670	Edwards, John	May 27, 1913	C 542
Caufield, John	May 1, 1909	C 321	Elliott, John	May 27, 1913	C 541
Challoner, Arthur	Oct. 28, 1911	C 433	Elmes, George	Oct. 31, 1912	C 511
Chambers, Ralph H.	Dec. 14, 1920	C 709	Evans, D.	July 22, 1908	C 284
Chapman, Wm.	Dec. 22, 1921	C 720	Ewing, Robert	May 13, 1915	C 608
Chapman, John	May 30, 1923	C 753	Fairfoull, James	Oct. 28, 1911	C 453
Chapman, Thomas H.	Jan. 5, 1925	C 779	Farrow, John William	Dec. 19, 1918	C 683
Charnock, John	Nov. 15, 1917	C 653	Ferryman, Henry	June 21, 1920	C 697
Cheetham, Ben	July 22, 1908	C 311	Fitzpatrick, T. J.	Oct. 2, 1911	C 452
Chester, John	Oct. 28, 1911	C 440	Flockart, David	Jan. 21, 1913	C 531
Clark, Lewis	June 10, 1911	C 405	Ford, Allen	Oct. 28, 1911	C 445
Clark, Walter Pattison	May 9, 1912	C 480	Fowler, Robert	Oct. 31, 1912	C 495
Clarkson, Robert	June 21, 1920	C 696	Francis, David Morgan	Oct. 28, 1913	C 558
Clarkstone, Wm. W.	Oct. 28, 1911	C 431	Francis, James	Oct. 1, 1907	C 250
Clarkstone, Hugh	May 17, 1922	C 736	Frater, George	May 13, 1915	C 616
Cleaves, Walter	May 9, 1912	C 475	Freeman, H. N.	Nov. 14, 1905	C 230
Clifford, William	July 22, 1908	C 313	Frew, William M.	May 30, 1923	C 752
Cloke, Chas. E.	June 16, 1925	C 782	Frew, Andrew	Nov. 27, 1909	C 360
Coates, Frank	June 16, 1925	C 789	Frodsham, Vincent	July 22, 1908	C 282
Colgrove, Charles Henry	Dec. 19, 1918	C 679	Furbow, John	Jan. 21, 1913	C 528
Commons, William	July 22, 1908	C 304	Gabriel, Ernest P.	May 17, 1922	C 739
Coupland, David	June 21, 1921	C 713	Garbett, Richard	Sept. 10, 1910	C 377
Cooke, Joseph	Mar. 4, 1905	C 209	Gascoyne, Rowland B.	Jan. 21, 1913	C 513
Coomb, Alexander	May 27, 1913	C 533	Geater, Jas. Gordon	May 21, 1914	C 573
Cooper, John Andrew	Dec. 19, 1918	C 689	Gemmell, James	Oct. 31, 1912	C 505
Cope, Frank	Oct. 28, 1913	C 549	Gillham, John	May 13, 1915	C 623
Coulthard, James	June 10, 1911	C 407	Gillies, William	May 16, 1918	C 668
Crawford, David	Mar. 4, 1905	C 208	Glenn, James	Oct. 28, 1911	C 435
Cunningham, G. F.	Nov. 11, 1905	C 229	Gordon, Davis John	May 9, 1912	C 474
Cunliffe, Thos.	Oct. 1, 1907	C 265	Gourley, Robert	May 9, 1912	C 470
Dabb, Owen	May 21, 1914	C 578	Gray, George	May 9, 1912	C 467
Dando, John	May 9, 1912	C 465	Gregory, William	May 30, 1923	C 756
Davey, George	June 21, 1921	C 718	Gregson, John B.	Dec. 31, 1925	C 790

THIRD-CLASS CERTIFICATES ISSUED UNDER "COAL-MINES REGULATION ACT FURTHER AMENDMENT ACT, 1904"—*Continued.*

Name.	Date.	No.	Name.	Date.	No.
Green, William	Nov. 15, 1917	C 659	Joyce, Walter	Nov. 27, 1909	C 361
Greenhorn, John	May 21, 1914	C 575	Judge, Peter	Sept. 10, 1910	C 391
Groat, Ed. Murray	Nov. 20, 1923	C 764	Keenan, Wm. James	June 10, 1911	C 426
Griffiths, Edward	Oct. 31, 1914	C 508	Kelly, Ernest	May 17, 1917	C 646
Gunniss, Matthew	May 9, 1912	C 460	Kemp, Wm.	Oct. 14, 1914	C 594
Haile, Joseph G.	May 17, 1922	C 731	Kingham, Alfred	Oct. 28, 1913	C 559
Hallinan, William	May 1, 1909	C 343	Kirkeberg, H. S.	Nov. 27, 1909	C 350
Hall, Joseph	May 17, 1922	C 742	Klejko, Steve	Dec. 14, 1920	C 703
Halsall, J.	July 22, 1908	C 307	Lane, Joseph	Oct. 1, 1907	C 254
Hamilton, John	Oct. 28, 1911	C 444	Lavin, Joseph	June 21, 1920	C 700
Hamilton, Robert Nesbitt	Oct. 28, 1913	C 550	Leeman, T.	May 1, 1909	C 345
Hampton, Samuel	Nov. 15, 1917	C 650	Lester, Frank	May 17, 1922	C 734
Hancock, Arthur	Nov. 15, 1917	C 656	Lewis, Benj. J.	Sept. 10, 1910	C 386
Hardy, Edward	June 21, 1920	C 694	Leynard, Paul	May 17, 1917	C 637
Hartley, Thomas	Oct. 31, 1912	C 510	Liddle, John	July 29, 1905	C 228
Hart, Daniel M.	May 17, 1922	C 730	Lindsay, William	May 17, 1917	C 642
Harwood, Fred	Sept. 10, 1910	C 384	Linn, George Y.	May 17, 1922	C 737
Harvey, Thomas	May 9, 1912	C 466	Littler, James	June 30, 1926	C 792
Harvie, George	Sept. 10, 1910	C 378	Littler, John	June 10, 1911	C 410
Heaps, Robert	Sept. 10, 1910	C 373	Littler, Matthew	June 10, 1911	C 417
Hemer, Herbert	Oct. 14, 1914	C 595	Littler, Robert	June 10, 1911	C 418
Henney, Jonathan	June 10, 1911	C 424	Livingstone, Alex	Oct. 28, 1911	C 436
Hendry, James	May 9, 1912	C 471	Loxton, George	June 10, 1911	C 428
Herd, William	Dec. 19, 1918	C 682	Loxton, John	June 10, 1911	C 416
Heyes, Edward	May 1, 1909	C 320	Lloyd, Thomas	May 17, 1922	C 740
Hilley, Fred	July 22, 1908	C 290	Luck, George	May 1, 1909	C 318
Hilton, Mathias	Dec. 19, 1918	C 677	Lynch, Stewart	Oct. 28, 1911	C 432
Hilton, R. G.	Sept. 10, 1910	C 376	Mackie, John	June 10, 1911	C 421
Hindmarsh, John G.	June 30, 1926	C 799	Makin, J. Wm.	Sept. 10, 1910	C 385
Hindmarsh, Peter	May 30, 1923	C 755	Malone, John	May 21, 1914	C 585
Hodson, R. H.	Mar. 4, 1905	C 216	Malone, Patrick	Oct. 1, 1907	C 247
Hodge, William K.	Nov. 20, 1923	C 761	Maltman, James	Oct. 31, 1912	C 501
Holdsworth, William	May 16, 1918	C 671	Mansfield, A.	May 1, 1909	C 336
Holliday, William	July 8, 1916	C 634	Marrs, John	May 17, 1917	C 640
Hopkins, Harry	Dec. 31, 1925	C 791	Marsh, Daniel Parks	May 27, 1913	C 543
Horbury, Joseph W.	June 10, 1911	C 406	Marsh, John	Oct. 1, 1907	C 270
Horrocks, A. G.	May 1, 1909	C 324	Martin, James	June 10, 1911	C 398
Horwood, S.	July 22, 1908	C 312	Mason, Joseph	July 22, 1908	C 297
Houston, Robert	July 8, 1916	C 631	Massey, Henry	May 1, 1909	C 317
Howells, Nathaniel	May 1, 1909	C 316	Mather, Thomas	July 22, 1908	C 293
Hunter, Peter M.	June 30, 1926	C 798	Matusky, Andrew	Oct. 1, 1907	C 259
Hunter, Thomas	June 16, 1925	C 786	Mawson, J. T.	Nov. 27, 1909	C 359
Hutchison, Ben	Nov. 14, 1905	C 232	Maxwell, Geo.	May 21, 1914	C 571
Hutchison, Fred	Nov. 27, 1909	C 358	McAlpine, John	Mar. 4, 1905	C 217
Hynd, John	Dec. 14, 1920	C 707	McArthur, John Malcolm	May 17, 1917	C 648
Hynds, William	July 8, 1916	C 632	McArthur, Robert	Dec. 22, 1921	C 723
Ireson, John	Oct. 31, 1912	C 507	McBroom, Al.	July 2, 1908	C 287
Irvine, David	June 10, 1911	C 413	McCourt, John	Oct. 14, 1914	C 605
Jack, John	May 21, 1914	C 582	McCourt, Thos.	Dec. 30, 1926	C 805
Jackson, Harry	June 24, 1924	C 776	McCulloch, James	May 1, 1909	C 315
James, Thos.	May 21, 1914	C 588	McDonald, John	Oct. 28, 1911	C 448
Jardine, Geo. Edward	Jan. 21, 1913	C 521	McFagen, Alexander	May 9, 1912	C 490
Jarrett, Fred. J.	Oct. 1, 1907	C 256	McFegan, Robert	June 21, 1920	C 698
Jaynes, Frank	July 22, 1908	C 277	McFegan, W.	May 1, 1909	C 319
Jemson, J. W.	Mar. 4, 1905	C 205	McGarry, Martin	May 1, 1909	C 326
Jenkins, John	Sept. 10, 1910	C 390	McGrath, James	July 8, 1916	C 630
John, Howel	July 22, 1908	C 305	McGuckie, Jno. M.	May 21, 1914	C 562
Johnson, Moses	Oct. 1, 1907	C 258	McGuckie, Thomas	July 29, 1905	C 226
Johnston, Fred	Dec. 30, 1926	C 803	McGuire, Thomas	Oct. 28, 1913	C 553
Johnston, Robert	May 9, 1912	C 479	McIntyre, Neil	May 21, 1914	C 574
Jones, Alf. Geo.	May 21, 1914	C 584	McKay, Walter	Nov. 20, 1923	C 763
Jones, Samuel	May 27, 1913	C 518	McKelvie, J.	July 22, 1908	C 285
Jones, William C.	Jan. 21, 1913	C 556	McKenzie, Peter	June 10, 1911	C 427
Jones, William Ernest	Oct. 28, 1913	C 221	McKibben, Matthew	May 21, 1914	C 580
Jones, W. T.	Mar. 4, 1905	C 544	McKinley, John	Oct. 28, 1914	C 442

THIRD-CLASS CERTIFICATES ISSUED UNDER "COAL-MINES REGULATION ACT FURTHER AMENDMENT ACT, 1904"—*Continued.*

Name.	Date.	No.
McLaren, John	May 30, 1923	C 754
McLaughlin, James	May 9, 1912	C 485
McLachlan, Alex	June 10, 1912	C 419
McLean, M. D.	Sept. 10, 1910	C 389
McLellan, William	Mar. 4, 1905	C 219
McLeod, James	July 22, 1908	C 296
McLeod, John	May 13, 1915	C 609
McMeakin, James	May 13, 1915	C 612
McMillan, D.	Sept. 10, 1910	C 363
McMillan, Edward	Oct. 31, 1912	C 493
McMillan, Neil	Nov. 15, 1917	C 654
McNay, Carmichael	July 22, 1908	C 306
McNeill, Adam L.	July 22, 1908	C 281
McNeill, Robert	Sept. 10, 1910	C 387
McWhirter, Archibald	June 30, 1926	C 794
Meek, Matthew	May 9, 1912	C 484
Meikle, Harry Alexander	July 8, 1916	C 627
Menzies, Frederick	Dec. 14, 1920	C 704
Merrifield, George	Oct. 23, 1906	C 239
Merrifield, William	Oct. 23, 1906	C 236
Michek, John	May 21, 1914	C 563
Miles, John	June 10, 1911	C 414
Mitchell, Charles	May 1, 1909	C 322
Mitchell, Henry	Sept. 10, 1910	C 366
Monks, James	Nov. 14, 1905	C 234
Moore, George	Oct. 23, 1906	C 242
Moore, John	May 1, 1909	C 335
Moreland, Thomas	July 22, 1908	C 299
Morgan, John	July 29, 1905	C 224
Morgan, William	May 17, 1917	C 636
Morgan, Cornelius	Dec. 22, 1921	C 725
Morgan, John	June 24, 1924	C 773
Morris, David	May 9, 1912	C 472
Mottishaw, Samuel K.	Oct. 23, 1906	C 237
Murdock, Jno. Y.	May 21, 1914	C 564
Murray, Robt.	June 30, 1926	C 796
Myers, Peter	Oct. 28, 1911	C 446
Nanson, T. H.	July 22, 1908	C 280
Nash, George William	May 17, 1917	C 565
Nash, George F.	Dec. 22, 1921	C 727
Nee, Wm. R.	Dec. 22, 1921	C 724
Neen, Joseph	Nov. 27, 1909	C 352
Nelson, Horatio	Oct. 1, 1907	C 263
Neilson, William	May 9, 1912	C 481
Newman, John	Oct. 14, 1914	C 603
Nicholson, James	May 9, 1912	C 469
Nimmo, James	May 9, 1912	C 461
Norris, Joshua	Oct. 28, 1913	C 557
Nuttall, Wm.	June 16, 1925	C 780
Oakes, Robert	Oct. 31, 1912	C 498
O'Brien, Charles	Nov. 27, 1909	C 349
Odgers, Eli	Jan. 21, 1913	C 523
Orr, Alexander	Oct. 28, 1911	C 434
Osborne, Hugh	Oct. 28, 1913	C 555
Oswald, Geo. L.	Sept. 10, 1910	C 370
Owen, Thomas	May 1, 1909	C 347
Park, William	Dec. 19, 1918	C 684
Parks, Alexander	Jan. 21, 1913	C 519
Parker, L.	May 1, 1909	C 341
Parkinson, James Wm.	Nov. 15, 1917	C 655
Parkinson, T.	July 22, 1908	C 289
Parkinson, Thomas	June 24, 1924	C 769
Parrott, Jas. E.	May 21, 1914	C 590
Parson, Herbert	May 13, 1915	C 621
Pearson, Jonathan	May 9, 1912	C 473
Penman, Hugh	Oct. 28, 1913	C 552
Perry, Geo. Harewood	May 17, 1917	C 643
Phillips, Richard S.	May 17, 1917	C 620
Phillips, James	Nov. 21, 1922	C 749
Pickup, A.	July 22, 1908	C 310
Picton, W.	May 1, 1909	C 333
Plank, Samuel	Nov. 14, 1905	C 233
Pollock, John	May 30, 1923	C 760
Poole, Samuel	May 27, 1913	C 536
Price, Walter	Sept. 10, 1910	C 371
Puckey, John Thomas	Dec. 19, 1918	C 687
Quayle, Alex. B.	Jan. 5, 1925	C 778
Quinn, James	Oct. 28, 1911	C 441
Quinn, John	Oct. 28, 1911	C 429
Radford, Albert	May 21, 1914	C 579
Rallison, R.	July 22, 1908	C 279
Rallison, James	May 30, 1923	C 759
Rankin, George	July 22, 1908	C 275
Rankin, Wm. Shaw	May 9, 1912	C 489
Ratcliffe, Thomas	Oct. 1, 1907	C 253
Raynor, Fred	Oct. 1, 1907	C 257
Reid, Robert	Sept. 10, 1910	C 383
Reid, Thos.	May 21, 1914	C 592
Reid, Wm.	June 10, 1911	C 403
Reilly, Thomas	July 22, 1908	C 303
Renney, Jas.	Nov. 27, 1909	C 354
Richards, James	Nov. 1, 1907	C 249
Richards, Samuel	Oct. 23, 1906	C 244
Richardson, J. H.	Oct. 28, 1911	C 458
Rigby, John	July 29, 1905	C 225
Roberts, Arthur	June 24, 1924	C 772
Roberts, Ebenezer	May 1, 1909	C 327
Robinson, Michael	May 1, 1909	C 332
Robinson, Asa	June 16, 1925	C 787
Robson, James	June 16, 1925	C 788
Robson, Thomas	May 21, 1914	C 566
Rogers, Ellis	May 13, 1915	C 624
Roper, William	July 22, 1908	C 274
Ross, William	June 21, 1920	C 702
Rowan, Alexander	Oct. 31, 1912	C 500
Rowan, John	Oct. 14, 1914	C 602
Rowbottom, Thomas	Oct. 31, 1914	C 492
Royle, Edward	Oct. 31, 1912	C 506
Russell, Robert	Nov. 27, 1909	C 351
Rutherford, Jasper	May 17, 1917	C 644
Rutledge, Edwin	July 22, 1908	C 302
Scales, Joseph	May 17, 1922	C 738
Scott, Henry	July 22, 1908	C 294
Saunders, Eustace L.	Jan. 21, 1913	C 520
Scarpino, Francis	May 17, 1917	C 649
Seddon, James	Oct. 3, 1919	C 692
Shanks, David	Sept. 10, 1910	C 372
Sharp, James	May 1, 1909	C 325
Sharpe, Henry	June 16, 1925	C 783
Sharples, J. T.	Sept. 10, 1910	C 380
Shea, Thomas J.	Dec. 22, 1921	C 722
Shearer, L.	May 1, 1909	C 330
Shields, Thomas	May 16, 1918	C 667
Shipley, John W.	Oct. 28, 1911	C 456
Shooter, Joseph	Oct. 1, 1907	C 261
Shortman, J.	May 1, 1909	C 331
Simister, J. H.	Nov. 27, 1909	C 353
Simister, W.	May 1, 1909	C 334

THIRD-CLASS CERTIFICATES ISSUED UNDER "COAL-MINES REGULATION ACT FURTHER AMENDMENT ACT, 1904"—*Continued.*

Name.	Date.	No.	Name.	Date.	No.
Sim, James	Dec. 14, 1920	C 711	Thompson, Joseph	Oct. 1, 1907	C 269
Simms, Hubert Allan	Jan. 21, 1913	C 526	Thomson, Duncan	Mar. 4, 1905	C 218
Sinclair, William	Jan. 21, 1913	C 527	Tolley, John	Dec. 19, 1918	C 678
Skelton, Thos.	May 1, 1909	C 344	Touhey, William	May 27, 1913	C 547
Slee, Thomas	June 30, 1926	C 793	Travis, Joseph	June 21, 1920	C 699
Smith, A. E.	Sept. 10, 1910	C 367	Tully, Thomas	May 9, 1912	C 468
Smellie, John	May 29, 1923	C 755	Tune, Elijah	May 9, 1912	C 476
Smith, John Watterson	May 16, 1918	C 665	Unsworth, John	June 16, 1925	C 784
Smith, Joseph	Mar. 4, 1905	C 207	Vardy, Robt.	May 21, 1914	C 570
Smith, Richard Beveridge	Oct. 28, 1913	C 561	Vaughan, John Henry	Oct. 28, 1913	C 560
Smith, Thomas	Dec. 30, 1926	C 804	Vincent, Thomas C.	Nov. 21, 1922	C 745
Smith, Thos. J.	Oct. 1, 1907	C 271	Walker, George	July 8, 1916	C 633
Smith, Thomas	May 9, 1912	C 486	Walker, Jas. Alexander	Oct. 31, 1912	C 496
Smith, Thomas	Dec. 14, 1920	C 705	Walker, Robert C.	May 17, 1922	C 728
Snow, Aubrey	June 15, 1918	C 675	Walker, Wm.	May 21, 1914	C 586
Sopwith, Reginald Scott	Jan. 21, 1913	C 512	Wallace, Fred	Oct. 1, 1907	C 260
*Sparks, Edward	Oct. 1, 1907	C 255	Walls, John	Dec. 14, 1920	C 710
Spencer, G.	May 1, 1909	C 329	Warburton, Ernest L.	June 10, 1911	C 399
Spruston, R. L.	Nov. 27, 1909	C 355	Ward, Ernest Hedley	May 17, 1917	C 641
Spruston, Thomas A.	Mar. 4, 1905	C 206	Wardrop, James	Oct. 31, 1912	C 504
Stafford, M.	Sept. 10, 1910	C 382	Watson, Adam G.	Mar. 4, 1905	C 212
Starr, Wallace	May 9, 1912	C 488	Watson, Arthur W.	May 27, 1913	C 535
Staton, Edward	May 21, 1914	C 581	Watson, George	July 22, 1908	C 288
Steele, Walter	Oct. 28, 1911	C 439	Watson, Joseph	Jan. 21, 1913	C 515
Stewart, George	May 27, 1913	C 534	Watson, William	Oct. 22, 1906	C 246
Stewart, James M.	Oct. 23, 1906	C 240	Watson, William	May 17, 1917	C 645
Stewart, James B.	June 16, 1925	C 785	Watson, John	May 17, 1922	C 743
Stewart, John	Dec. 30, 1926	C 801	Weaver, William	Nov. 17, 1922	C 748
Stobbart, David	June 16, 1925	C 781	Webb, Herbert	Oct. 28, 1911	C 457
Stockwell, William	Oct. 23, 1906	C 238	Webster, James Stewart	Dec. 19, 1918	C 685
Stone, Wm. C.	June 21, 1921	C 714	Weeks, John	Mar. 4, 1905	C 214
Strachan, John	Oct. 14, 1914	C 604	West, James Gloag	May 16, 1918	C 676
Strang, James	May 13, 1915	C 614	Whalley, William	Dec. 19, 1918	C 686
Strang, Thomas	June 10, 1911	C 400	White, James	Oct. 31, 1912	C 499
Strang, Wm.	June 10, 1911	C 395	White, John	Oct. 22, 1906	C 245
Strang, William L.	Jan. 5, 1925	C 777	Wilkinson, Edward	Oct. 28, 1911	C 438
Sutherland, John	May 27, 1913	C 545	Williams, John Sam.	June 10, 1911	C 404
Sweeney, John	May 17, 1922	C 735	Williams, Watkin	June 22, 1908	C 301
Taylor, Charles M.	Mar. 4, 1905	C 213	Wilson, Joseph	June 24, 1924	C 767
Taylor, Hugh	Jan. 21, 1913	C 530	Wilson, Robinson	June 10, 1911	C 397
Taylor, James	May 21, 1914	C 567	Wilson, Thomas M.	Oct. 1, 1907	C 272
Taylor, Jonathan	Dec. 19, 1918	C 680	Wilson, William	Oct. 1, 1907	C 262
Taylor, J. T.	Oct. 28, 1911	C 447	Wilson, William	May 17, 1917	C 674
Taylor, Leroy	Sept. 10, 1910	C 381	Winstanley, Robert	Nov. 21, 1922	C 747
Taylor, Robert	June 21, 1920	C 695	Winstanley, Oliver	May 17, 1922	C 741
Taylor, Thomas	May 21, 1914	C 577	Winstanley, H.	July 22, 1908	C 283
Tennant, Joseph	June 24, 1924	C 770	Wintle, Thomas A.	July 29, 1905	C 222
Thacker, Geo.	May 27, 1913	C 537	Witherington, George	Oct. 28, 1913	C 554
Thomas, Thomas	Sept. 10, 1910	C 365	Wood, Thos. James	Oct. 31, 1912	C 491
Thomas, John B.	Nov. 14, 1905	C 231	Worthington, J.	July 22, 1908	C 295
Thomas, Joseph	Mar. 4, 1905	C 220	Wright, John	May 21, 1914	C 593
Thomas, Warriett	Oct. 1, 1907	C 273	Wright, Robert	May 21, 1914	C 589
Thomason, Charles	Nov. 15, 1917	C 657	Wright, William	Jan. 21, 1913	C 522
Thompson, Charles	June 24, 1924	C 765	Yates, Frank	May 17, 1922	C 732
Thompson, Thomas	Oct. 1, 1917	C 267	Yeowart, Hudson	June 24, 1924	C 771
Thompson, John	Oct. 31, 1912	C 509	Young, Alexander	May 16, 1918	C 666

* C 314 issued in lieu of C 255 destroyed by Fernie fire.

COAL-MINE OFFICIALS.

Third-class Certificates issued under "Coal-mines Regulation Act Further Amendment Act, 1904," sec. 38, subsec. (2), in exchange for Certificates issued under the "Coal-mines Regulation Act Amendment Act, 1901."

Name.	Date.	No.	Name.	Date.	No.
Adam, Robert	Oct. 12, 1904	C 42	Lewis, Thos.	Oct. 11, 1904	C 35
Addison, Thos.	Dec. 10, 1904	C 52	Marsden, John	May 3, 1904	C 21
Aitken, James	Oct. 24, 1904	C 44	Miard, Harry E.	Mar. 3, 1905	C 76
Allsop, Harry	Oct. 11, 1904	C 34	Middleton, Robt.	Feb. 11, 1905	C 71
Ashman, Jabez	Feb. 5, 1907	C 131	Miller, Thos. K.	Feb. 21, 1905	C 74
Auchinvole, Alex	Mar. 29, 1905	C 89	McKenzie, John R.	Oct. 12, 1904	C 40
Barclay, Andrew	April 27, 1904	C 19	McKinnon, Arch'd	April 3, 1905	C 102
Barclay, James	April 27, 1904	C 20	McMillan, Peter	Mar. 29, 1905	C 94
Barclay, John	April 17, 1905	C 111	McMurtrie, John	Mar. 29, 1905	C 96
Bickle, Thos.	Oct. 11, 1904	C 37	Moore, Wm. H.	June 17, 1905	C 119
Bowie, James	May 13, 1905	C 116	Morris, John	Dec. 27, 1904	C 57
Briscoe, Edward	Oct. 10, 1906	C 129	Myles, Walter	April 3, 1905	C 100
Campbell, Dan	Mar. 29, 1905	C 93	Nash, Isaac	June 1, 1904	C 120
Carr, Jos. E.	Oct. 11, 1904	C 36	Neave, Wm.	Oct. 12, 1904	C 43
Carroll, Harry	Mar. 29, 1905	C 98	Nelson, James	April 27, 1904	C 16
Clarkson, Alexander	April 27, 1904	C 18	Nimmo, Richard E.	April 18, 1911	C 133
Collishaw, John	Feb. 7, 1905	C 68	O'Brien, Geo.	Feb. 6, 1905	C 66
Comb, John	Mar. 23, 1904	C 2	Pearse, Thomas W. H.	April 14, 1916	C 138
Courtney, A. W.	Nov. 2, 1904	C 45	Power, John	Sept. 8, 1920	C 142
Crawford, Frank	April 6, 1904	C 7	Price, Jas.	Nov. 8, 1904	C 50
Daniels, David	April 27, 1904	C 12	Rafter, Wm.	Mar. 29, 1905	C 95
Davidson, David	April 3, 1905	C 106	Reid, James	Mar. 23, 1904	C 1
Davidson, John	Mar. 29, 1905	C 87	Richards, Thos.	April 27, 1904	C 14
Devlin, Henry	Oct. 12, 1904	C 41	Ross, John	April 3, 1905	C 101
Dobbie, John	Nov. 27, 1905	C 126	Roughead, George	Jan. 30, 1907	C 130
Dudley, James	Mar. 22, 1905	C 114	Ryan, John	Dec. 28, 1904	C 59
Duncan, Thomas	Aug. 29, 1906	C 128	Sanders, John W.	April 3, 1905	C 107
Dunlap, Henry	Nov. 21, 1904	C 51	Shenton, Thos. J.	July 25, 1904	C 30
Dunn, Geo.	Dec. 19, 1904	C 56	Shepherd, Henry	June 13, 1904	C 26
Dunsmuir, John	Mar. 29, 1905	C 90	Smith, Geo.	Mar. 29, 1905	C 84
Eccleston, Wm.	Mar. 15, 1905	C 80	Somerville, Alex.	Mar. 24, 1904	C 3
Fagan, David	April 6, 1905	C 109	Stauss, Chas. F.	Feb. 9, 1905	C 69
Farquharson, John	April 27, 1904	C 17	Steele, Jas.	Mar. 29, 1905	C 92
Findlayson, James	June 6, 1904	C 25	Steele, John	June 4, 1913	C 4
Fulton, Hugh T.	April 3, 1905	C 105	Stewart, Duncan H.	Mar. 28, 1904	C 137
Gibson, Edward	May 30, 1905	C 118	Stewart, John	April 3, 1904	C 104
Gilchrist, Wm.	Mar. 29, 1905	C 85	Stewart, Daniel W.	May 16, 1904	C 23
Gillespie, Hugh	April 6, 1904	C 8	Stoddart, Jacob	Feb. 21, 1905	C 73
Gillespie, John	April 6, 1904	C 5	Strachan, Robt.	April 27, 1904	C 15
Gould, Alfred	April 17, 1906	C 112	Strang, James	April 27, 1904	C 10
Green, Francis	Oct. 11, 1904	C 38	Sullivan, John	July 4, 1916	C 139
Handlen, Jas.	June 16, 1904	C 122	Summers, Joseph	May 17, 1920	C 141
Harmison, Wm.	Feb. 3, 1905	C 65	Thomas, John	Mar. 29, 1905	C 97
Hescott, John	Jan. 16, 1905	C 62	Vass, Robt.	Dec. 12, 1904	C 53
Hoggan, Wm.	June 6, 1911	C 134	Vater, Charles	April 6, 1904	C 66
John, David	Nov. 8, 1904	C 49	Webber, Chas.	Sept. 13, 1904	C 32
*John, Evan	July 25, 1916	C 140	Webber, Charles F.	Sept. 13, 1904	C 33
Johnson, Geo.	May 9, 1904	C 124	Whiting, Geo.	May 29, 1905	C 117
Johnson, Wm. R.	Mar. 1, 1905	C 75	Wilson, Austin	Feb. 7, 1905	C 67
Jones, Evan	April 30, 1913	C 136	Wilson, Thos.	April 27, 1904	C 11
Lander, Frank	Jan. 9, 1905	C 61	Woodburn, Moses	Mar. 29, 1905	C 83
Lanfear, Herbert	Jan. 27, 1905	C 63			

MINE SURVEYOR CERTIFICATES ISSUED UNDER THE "COAL-MINES REGULATION ACT AMENDMENT ACT, 1919."

Name.	Date.	No.	Name.	Date.	No.
Anderson, Harry C.	May 19, 1922	59	Lymn, Albert Crompton	Oct. 3, 1919	17
Baile, Wynne Jeffreys	Oct. 3, 1919	16	MacDonald, John	May 19, 1922	46
Bonar, Robert B.	Dec. 30, 1926	64	Miard, Harry Ernest	Oct. 3, 1919	2
Bowerman, Everard S.	Dec. 14, 1920	39	McCulloch, Robert	Oct. 3, 1919	6
Boyce, Joseph Patrick	Oct. 3, 1919	5	Owen, Wm. Arthur	Oct. 3, 1919	10
Caufield, Bernard	May 19, 1922	54	Priest, Elijah	May 19, 1922	53
Corbett, Garnett S.	May 19, 1922	49	Rafter, Wm.	May 19, 1922	51
Cox, Richard	May 19, 1922	57	Reger, Frederick Wm.	Oct. 3, 1919	7
Crosscombe, James S.	May 31, 1923	60	Richards, Chas. Clifton	Oct. 3, 1919	19
Daniell, Geo. W. B.	Oct. 3, 1919	29	Ridley, James	Oct. 3, 1919	18
Davis, Gerald D.	Oct. 3, 1919	28	Roaf, Jos. R.	Oct. 3, 1919	14
Delaney, James	Oct. 3, 1919	21	Richards, James A.	Oct. 3, 1919	15
Dickson, James	Oct. 3, 1919	3	Scott, Thos. Wright	Oct. 3, 1919	4
Devlin, Henry	May 19, 1922	44	Strachan, Robert	June 21, 1920	36
Drewry, Wm. Stewart	May 19, 1922	56	Spruston, Thos. A.	May 19, 1922	52
Freeman, Harry N.	May 19, 1922	49	Strachan, Robert	May 19, 1922	45
Garman, Maurice W.	Oct. 3, 1919	11	Sandland, Joseph	May 31, 1923	61
Gregory, P. W.	Nov. 17, 1919	32	Stewart, R. T.	Nov. 17, 1923	62
Graham, Charles	May 19, 1922	50	Townsend, Neville F.	Nov. 17, 1919	31
George, Frank J.	May 19, 1922	48	Vallance, Wm. Dixon	Oct. 3, 1919	8
Hargreaves, James	Nov. 29, 1920	33	Verkirk, Lucas	June 21, 1921	42
Hepburn, James T.	Dec. 14, 1920	37	Waddington, Geo. W.	June 21, 1920	35
Holdsworth, William	Oct. 3, 1919	9	Wark, Samuel David	Oct. 3, 1919	20
Hughes, Edward	Dec. 14, 1920	38	White, Harold	Oct. 3, 1919	25
Hunter, George	Oct. 3, 1919	30	Wilson, R. Robinson	Oct. 3, 1919	12
Howden, Archibald	May 19, 1922	55	Wilson, Arthur Rupert	Oct. 3, 1919	13
Jackson, Thos. R.	May 19, 1922	43	Wilson, Chas. Jas.	Oct. 3, 1919	22
King, Alfred Geo.	Oct. 3, 1919	27	Wilson, Hartley Paul	Oct. 3, 1919	24
Lancaster, Peter	Oct. 3, 1919	23	Wilton, Douglas D.	May 19, 1922	59
Lauderbach, Wilfrid P.	June 16, 1925	63	Wilkie, Octavius B. N.	Oct. 3, 1919	26
Lindoe, Luke	June 21, 1921	41	Wright, Austin	Dec. 14, 1920	40

LIST OF ACCIDENTS IN B.C. COLLIERIES, 1926.

(Reported as required by Section 71, "Coal-mines Regulation Act.")

VANCOUVER ISLAND, NICOLA-PRINCETON, AND NORTHERN INSPECTION DISTRICTS.

REPORTED BY HENRY DEVLIN, THOS. R. JACKSON, JAS. W. JEMSON, H. E. MIARD, J. G. BIGGS, AND T. J. SHENTON, INSPECTORS.

No. and Date.	Colliery.	Name.	Occupation.	Details.
1. Feb. 3	No. 1 mine (W.F.C.)	William H. Vater	Miner	Right tibia fractured when quantity of loose coal fell.
2. April 21	Ditto	James Salmon	Machine-man helper	Toes and middle of foot fractured when piece of coal fell.
3. „ 24	Ditto	Alexander Rowan	Rock foreman	Back of left thigh punctured when struck by flying debris from shot.
4. May 28	Ditto	John Hamilton	Fireboss	Back injured when piece of cap-rock fell.
5. July 26	Ditto	Ernest Bennett	Miner	Back fractured when piece of rock fell from a slip.
6. „ 30	Ditto	William Burt	Miner	Left rib fractured and left ankle bruised by piece of rock from roof.
7. Sept. 22	Ditto	John Nicholson	Motorman	Left arm fractured when jammed between motor and first car.
8. Oct. 14	Ditto	Joseph Salmon	Machine-runner	Right leg broken when coal-cutting machine swung around.
9. Nov. 25	Ditto	Wong Foy	Car-runner	Fracture of second lumbar vertebræ when slipping off car on to rail.
10. Dec. 24	Ditto	Horace Kingswood	Driver	Right hip-bone fractured when kicked by mule.
11. Feb. 4	Reserve (W.F.C.)	John W. Gray	Miner	Instantly killed by fall of coal.
12. „ 4	Ditto	William Paul	Miner	Right leg and ribs fractured by fall of top coal.
13. Mar. 5	Ditto	William Raines	Rope-rider	Compound fracture of left leg when jammed between car and timbers.
14. „ 30	Ditto	William English	Miner	Left shoulder dislocated and badly bruised when struck by falling timber.
15. June 2	Ditto	Robert Noble	Driver	Nose broken and face badly bruised when kicked by horse.
16. Aug. 4	Ditto	John Keaist	Rope-rider	Right elbow fractured when jumping off car when rope broke.
17. „ 19	Ditto	Glyn Lewis	Miner	Right leg broken when jammed between post and car.
18. „ 21	Ditto	Robert Wilson	Miner	Back fractured when piece of rock fell from roof.
19. „ 23	Ditto	William Foy	Miner	Instantly killed by fall of roof rock at face.
20. Sept. 16	Ditto	Thomas Sampson	Miner	Nose broken and fractured left ankle, caused when braces broke and he fell into car.
21. June 28	Wakesiah (W.F.C.)	John F. Webber	Fireboss	Left leg fractured when struck by car.
22. Jan. 6	No. 1, Well.-Extension (C.C. (D.), Ltd.)	William Allen	Miner	Right foot fractured when struck by piece of rock.
23. Oct. 15	Ditto	John Michek	Loader	Fractured spine when struck by stringer while riding up slope.

VANCOUVER ISLAND, NICOLA-PRINCETON, AND NORTHERN INSPECTION DISTRICTS
—*Continued.*

No. and Date.	Colliery.	Name.	Occupation.	Details.
24. April 5	No. 2, Well.-Extension (C.C. (D.), Ltd.)	George Simpson	Miner	Right leg broken when crushed between rock and post.
25. „ 21	Ditto	William Bowater	Miner	Middle finger of left hand crushed between stringer and brushing.
26. Nov. 17	Ditto	Dominic Montella	Miner	Left scapula and sixth rib fractured when piece of rock fell.
27. May 13	No. 6, Well.-Extension (C.C. (D.), Ltd.)	J. Tonkin	Miner	Small toe of right foot fractured when piece of cap-rock fell.
28. Dec 22	Ditto	James McDonald	Miner	Left first and third ribs fractured when struck by piece of cap-rock.
29. May 27	No.5, Well.-Extension (C.C. (D.), Ltd.)	August Van Larkin	Miner	Left ankle fractured when struck by piece of cap-rock.
30. July 26	Ditto	Tony Turk	Miner	Two fractured ribs when plank broke, causing him to fall.
31. Nov. 23	Ditto	Arthur Godfrey	Labourer	Left foot crushed when struck by large piece of rock.
32. April 16	No. 4, Comox (C.C. (D.), Ltd.)	Chas. Walker	Miner	Right leg broken when piece of rock fell from roof.
33. May 19	Ditto	Gee Yip	Miner	Leg broken when piece of cap-rock fell.
34. „ 22	Ditto	How Tai	Driver	Instantly killed when struck by derailed car.
35. Oct. 28	Ditto	Wong Bill	Miner's helper	Right leg broken when struck by piece of rock.
36. Nov. 25	Ditto	Joseph Bardesona	Timberman	Right arm and leg broken when top coal fell.
37. Jan. 25	No. 1 mine (Granby C.M.S. & P. Co.)	Charles Dowling	Miner	Fractured left leg when struck by car.
38. Feb. 22	Ditto	Alex. Aigner	Rope-rider	Right leg fractured by slipping in front of car.
39. Mar. 25	Ditto	David Alton	Miner	Instantly killed by blow-out of gas and coal.
40. April 6	Ditto	Bert Conti	Miner	Instantly killed by blow-out of gas and coal.
41. „ 6	Ditto	Frank Sundberg	Miner	Instantly killed by blow-out of gas and coal.
42. June 12	Ditto	John Dean	Fireboss	Left foot crushed by car.
43. Aug. 12	Ditto	David Morris	Miner	Crushed pelvis when jammed between post and car.
44. Sept. 13	Ditto	Thos. C. Wales	Rope-rider	Instantly killed when car ran over him.
45. Nov. 10	No. 1 mine (East Well. Coal Co., Ltd.)	George Edgar	Miner	Instantly killed when struck by falling rock.
46. Feb. 11	King & Foster Coal Co.	Henry Shepherd	Miner	Severely bruised and cut when plank broke.
47. „ 11	Ditto	Robert Pringle	Carpenter	Collar-bone, ribs, and pelvis fracture when plank broke.
48. „ 25	No. 3 mine (Coalmont Col., Ltd.)	K. Prokoff	Miner	Left ankle fractured when struck by piece of coal.
49. Jan. 28	No. 4 mine (Coalmont Col., Ltd.)	Fred Gilderdale	Driver	Left foot fractured when struck by piece of lagging.
50. July 5	Ditto	E. Hunter	Miner	Fractured pelvis when jammed between post and car.

EAST KOOTENAY INSPECTION DISTRICT.

REPORTED BY ROBERT STRACHAN AND JOHN MACDONALD, INSPECTORS.

No. and Date.	Colliery.	Name.	Occupation.	Details.
51. July 15	No. 1 East, C.C. (C.N.P.C. Co.)	Nick Tonick	Rope-rider	Instantly killed by cave.
52. Oct. 23	Ditto	I. Steele	Miner	Injured by fall of coal.
53. „ 23	Ditto	W. Cockburn	Miner	Head, breast, and ribs injured by fall of coal.
54. Mar. 22	No. 2 mine, C.C. (C.N.P.C. Co.)	Fred Slusar	Driver	Ribs fractured and badly bruised when run over by car.
55. June 4	No. 3, Michel (C.N.P.C. Co.)	A. Klemuk	Miner	Fractured thigh when large piece of rock fell from side.
56. July 17	Ditto	Joseph Burns	Rockman	Instantly killed by fall of coal.
57. Nov. 6	Ditto	H. Travis	Rope-rider	Arm broken when trampled on by horse.
58. Dec. 7	Tipple, Michel (C.N.P.C. Co.)	D. D'Andrea	Car-haul man	Ankle crushed when caught between chain and iron guide.
59. Oct. 15	Opposite office (Corbin Coals, Ltd.)	Thomas Collins	Teamster	Fractured right shoulder and right hip bruised by falling over box while trying to catch a runaway team.

LIST OF ACCIDENTS IN METALLIFEROUS MINES, 1926.

(Reported as required by Section 19, "Metalliferous Mines Regulation Act.")

NORTHERN, SOUTHERN COAST, AND VANCOUVER ISLAND INSPECTION DISTRICTS.

REPORTED BY THOS. J. SHENTON AND JAMES DICKSON, INSPECTORS.

No. and Date.	Colliery.	Name.	Occupation.	Details.
1. July 27	Nickel Plate (Hedley Gold Mining Co.)	Charles Giesecke	Mucker	Left leg crushed and both eyes lost when powder exploded.
2. Aug. 14	Stemwinder (Porcupine Goldfields Co.)	Ogilvie Robertson	Motorman's helper	Instantly killed when struck on head by crowbar.
3. June 4	Hidden Creek (Granby C.M.S. & P. Co.)	Ed. Carlson	Miner	Instantly killed when falling down chute.
4. Oct. 10	Ditto	Vagn Theisan	Miner pluggerman	Skull fractured when struck by flying rock from explosion. Fatal.
5. Feb. 10	Victoria (Britannia M. & S. Co., Ltd.)	R. E. Matthews	Shiftboss	Face, neck, and eyes injured by small pieces of rock from shot.
6. April 20	Ditto	J. B. McLean	Miner	Both eyes injured when shot went off.
7. May 3	Ditto	S. Urata	Labourer	Left leg fractured when struck by rolling timber.
8. Oct. 10	Ditto	J. Kelly	Electrician	Badly shocked and left hand burned by catching charged cable.
9. Feb. 9	Fairview (Britannia M. & S. Co., Ltd.)	B. J. Smiljanich	Miner	Instantly killed when falling down stope.
10. July 9	Ditto	Melick Boris	Mucker	Both eyes severely injured when bulldoze was dislodged by rock.

NORTHERN, SOUTHERN COAST, AND VANCOUVER ISLAND INSPECTION DISTRICTS —*Continued.*

No. and Date.	Colliery.	Name.	Occupation.	Details.
11. Sept. 22	Fairview (Britannia M. & S. Co., Ltd.)	D. Banich	Mucker	Ear-drums ruptured, eyes filled with small particles of rock, and leg bruised when shot exploded.
12. „ 22	Ditto	W. H. Smith	Miner	Similar accident to above.
13. Mar. 5	Tunnel Camp (Britannia M. & S. Co., Ltd.)	F. McDowell	Miner	Scalp-wound, bruised face and neck when shot exploded.
14. „ 5	Ditto	B. Gallagher	Mucker	Face bruised when shot exploded.
15. „ 5	Ditto	G. A. Robinson	Hoist mechanic	Scalp-wound when shot exploded.
16. „ 25	Barbara Camp (Britannia M. & S. Co., Ltd.)	K. Bjerkan	Trammer	Right arm bruised and scalp wounded when large rock fell.
17. Nov. 4	Britannia Beach (Britannia M. & S. Co., Ltd.)	Bruce Gilmore	Mucker	Right leg fractured and left ankle sprained when knocked down by skip.

EAST KOOTENAY AND WEST KOOTENAY AND BOUNDARY INSPECTION DISTRICTS.

REPORTED BY ROBERT STRACHAN AND H. H. JOHNSTONE, INSPECTORS.

No. and Date.	Colliery.	Name.	Occupation.	Details.
18. Jan. 3	Sullivan (Cons. M. & S. Co., Ltd.)	A. Claussen	Electrician	Broken fibula of left leg, caused by stepping on rail.
19. Jan. 12	Ditto	David Clark	Timberman	Fractured left ribs and right shoulder dislocated by fall of rock.
20. Feb. 16	Ditto	John Petrucka	Machine operator	Left leg fractured when struck by piece of falling rock.
21. „ 25	Ditto	Charles Onofricius	Miner	Toes on right foot fractured when crushed by rock.
22. Mar. 18	Ditto	J. Mule	Mucker	Left leg fractured when struck by piece of rock.
23. April 26	Ditto	A. A. Martinen	Mucker	Left side of pelvis fractured when jammed between timber and car.
24. May 28	Ditto	L. Benvenutti	Mucker	Right shoulder fractured by falling from ladder.
25. Oct. 4	Ditto	C. Pontoni	Miner	Skull fractured when falling down grizzly. Fatal.
26. Dec. 11	Molly Claims (Cons. M. & S. Co., Ltd.)	Reginald Rushton	Miner	Body badly bruised when detonators exploded.
27. June 12	Carnation (Victoria Syndicate, Ltd.)	Jacob Hansen	Miner	Skull fractured and neck broken when large rock fell. Fatal.
28. Oct. 26	Rambler (Lawrence & Renta, Lessees)	Arne Palojarve	Mucker	Instantly killed when struck by large rock.
29. Mar. 11	Beaverdell (Wells Syndicate, Ltd.)	Allan J. Morrison	Miner	Hips and abdomen badly bruised by large piece of rock.
30. April 19	Copper Mountain (Allenby Copper Co.)	Thomas Kelling	Nipper	Right arm broken and body badly bruised when shot exploded.
31. Aug. 10	Ditto	Max Potkoryok	Barman	Instantly killed when falling down glory-hole into chute.
32. June 21	Pioneer (David Sloan, Lessee)	Peter Hagberg	Miner	Fatally injured when bucket of muck fell on him.

PROSECUTIONS UNDER "COAL-MINES REGULATION ACT."

Mine and Date.	Name and Occupation.	Offence charged.	Judgment.
Crow's Nest Pass Coal Co., Ltd.—			
Michel mines, July 21	M. Galla	Breach of Special Rule 115 (defective timbering)	$10 and costs.
Michel mines, July 21	D. Martinilla	Ditto	$10 and costs.
Michel mines, July 23	W. Dootson	Ditto	$15 and costs.
Michel mines, July 23	M. Komar	Ditto	$15 and costs.
Michel mines, Aug. 17	P. Mikolenuk	Ditto	$10 and costs.
Michel mines, Aug. 17	J. Mikolenuk	Ditto	$10 and costs.
Coal Creek mines	T. Strong	Breach of Special Rule 110	$1 and costs.
Western Fuel Corp. of Canada—			
Reserve mine, Aug.	Richard Rallison, fireboss	Failure to withdraw men from place that was insufficiently timbered	$5 and costs.
Reserve mine, Aug.	David Scott, miner	Failure to securely timber place or withdraw	Case dismissed.
Canadian Collieries (D.), Ltd.—			
No. 4 Comox mine, Aug. 20	Kor Pong	Had matches and tobacco in his possession	$25 and costs.
East Wellington Coal Co., Ltd.—			
No. 1 mine, April 1	Alex. Hamilton, miner	Explosives left in mine	$10 and costs.
No. 1 mine, April 1	William Lektnen, miner	Explosives left in mine	$10 and costs.
No. 1 mine, April 1	Joseph Jenkinson, miner	Explosives left in mine	$10 and costs.
No. 1 mine, April 1	George Stafford, miner	Explosives left in mine	$10 and costs.
No. 1 mine, April 1	John Polberg, miner	Explosives left in mine	$10 and costs.
No. 1 mine, April 1	John Wilson, miner	Explosives left in mine	$10 and costs.
No. 1 mine, April 1	Alex. Logan, miner	Explosives left in mine	$10 and costs.

METALLIFEROUS MINES SHIPPING IN 1926.

NORTH-WESTERN DISTRICT (No. 1).

ATLIN MINING DIVISION.

Mine or Group.	Locality.	Owner or Agent.	Address.	Character of Ore.
Cherokee	Atlin	Atlin Silver-Lead Mines, Ltd	Atlin	Silver, gold, lead.
Engineer	Atlin	Engineer Gold Mines, Ltd.	Engineer	Gold, silver.

SKEENA MINING DIVISION.

Belmont-Surf Inlet	Surf inlet	Belmont-Surf Inlet Mines, Ltd	Surf Inlet	Gold, silver, copper.
Golden Nib	Thornhill	O. P. Brown	Terrace	Gold, silver, copper.
Paisley Point	Hartley Bay	Paisley Point Mines, Ltd	1416 Dominion Bank Bldg., Vancouver	Silver, gold, copper.
Trixie (Patterson)	Porcher island	Frank Patterson	Refuge Bay	Gold, silver.

NASS RIVER MINING DIVISION.

Esperanza	Kitsault river	P. Gordon	Box 238, Anyox	Silver, gold, lead.
Golskeish	Anyox	Granby Cons. M. S. & P. Co.	Anyox	Gold, silver.
Hidden Creek	Anyox	Granby Cons. M. S. & P. Co.	Anyox	Silver, copper, gold.
La Rose	Kitsault river	Alice Arm-La Rose Mining Co.	Box 203, Pr. Rupert.	Silver, gold, lead.

PORTLAND CANAL MINING DIVISION.

B.C. Silver	Salmon river	B.C. Silver Mines, Ltd	Premier	Silver, gold.
Dunwell	Glacier creek	Dunwell Mines, Ltd	Stewart	Silver, gold, lead, zinc.
I.X.L.	Glacier creek	L. & L. Consolidated Mines, Ltd.	Stewart	Silver, gold, lead.
Outland-Silver Bar	Salmon River glacier	Outland Silver Bar Mines, Ltd.	Seattle, Wash.	Silver, lead.
Outsider	Portland canal	Granby Cons. M. S. & P. Co.	Anyox	Copper, gold.
Porter-Idaho	Glacier creek	Porter-Idaho Mining Co.	Stewart	Silver, lead, gold.
Prosperity	Portland canal	F. R. Jancowski	Stewart	Silver, lead, gold.
Premier	Cascade river	Premier Gold Mines, Ltd.	Premier	Silver, gold, lead.

NORTH-EASTERN DISTRICT (No. 2).

OMINECA MINING DIVISION.

Fiddler	Dorreen	J. Tredway	Dorreen	Silver, gold, lead.
Hazelton View	Rocher Déboulé mount.	New Hazelton Gold Cobalt Mines, Ltd.	New Hazelton	Silver, gold.
Henderson	Hudson Bay mountain	Duthie Mines, Ltd	Smithers	Silver, lead, gold.
Seel	Wisteria	Seel, Geo	Wisteria	Silver, lead.
Silver Cup	Nine-mile mountain	L. W. Patmore	Prince Rupert	Silver, lead.

CENTRAL DISTRICT (No. 3).

LILLOOET MINING DIVISION.

Pioneer	Cadwallader creek	David Sloan	Shalalth	Gold.

NICOLA MINING DIVISION.

Aberdeen	10 miles from Coyle	Merritt Mines, Ltd	Standard Bank Bldg., Vancouver	Copper, silver.
Almeda	Nicola	O. A. Schmidt	Nicola	Silver, lead.
Planet	Stump lake	Planet Mines & Red. Co. of Nicola, Ltd.	522 Standard Bank Bldg., Vancouver	Silver, gold, lead.
Thelma	Merritt	F. W. Humble & Co.	914 Granville St., Vancouver	Silver, lead.

YALE MINING DIVISION.

Emancipation	Jessica	Director Gold Mining Co	P.O. Box 149, Hope.	Gold, silver.

CENTRAL DISTRICT (No. 3)—*Continued.*

VERNON MINING DIVISION.

Mine or Group.	Locality.	Owner or Agent.	Address.	Character of Ore.
Kelly	West Summerland	J. W. S. Logie	West Summerland	Silver, lead.

KAMLOOPS MINING DIVISION.

Homestake	Adams lake	W. L. Bell	Box 341, Kamloops	Gold, silver, zinc, lead.
Rhode Island	Adams lake	J. A. Dowding	Kamloops	Silver, gold, lead.
Smuggler	Birch island	Smuggler Hill Dev. Co., Ltd.	215 Third Ave., Kamloops	Silver, lead.

SOUTHERN DISTRICT (No. 4).

GREENWOOD MINING DIVISION.

Ames Company	Rock creek	Ames Co	Grand Forks	Silver, gold, lead.
Beaver	Beaverdell	Beaver Silver Mines, Ltd.	Victoria	Silver, lead.
Bell	Beaverdell	McIntosh & Lee	Beaverdell	Silver, lead, gold.
Bounty	Beaverdell	S. B. Davis	Beaverdell	Silver, lead.
Brooklyn	Phoenix	R. Forshaw	Greenwood	Copper, silver, gold.
Crescent	Greenwood	J. H. Duhamel	Greenwood	Silver, lead, gold.
D.A.	Greenwood	D.A. Mines, Ltd.	Greenwood	Silver, lead.
Elkhorn Fraction	Greenwood	Elkhorn Mines, Ltd.	Victoria	Silver, lead, gold.
Enterprise	Paulson	E. Terzick	Paulson	Silver, gold.
Greenwood Smelter	Greenwood	W. J. Clark	Greenwood	Copper, silver, gold.
Gold Drop	Greenwood	Louis Bosshart	Greenwood	Silver, gold, lead.
Imperial	Rock creek	W. J. Clark	Greenwood	Silver, gold, lead, zinc.
Jewel	Eholt	Manager	Eholt	Silver, gold.
Lizard Creek				Silver, lead.
Penticton Mng. Co.	Beaverdell	Penticton Mining Co	Penticton	Silver, lead.
Providence	Greenwood	W. J. Clark	Greenwood	Silver, gold, lead.
Revenge	Beaverdell	Beaver Silver Mines, Ltd.	Victoria	Silver, lead.
Sally	Beaverdell	Sally Mines, Ltd.	Penticton	Silver, lead.
Wellington	Beaverdell	The Wellington Syndicate	Greenwood	Silver, lead, gold.

GRAND FORKS MINING DIVISION.

Yankee Girl	Ymir	Yankee Girl, Ltd.	Ymir	Gold, silver.

OSOYOOS MINING DIVISION.

Horn Silver	Similkameen	Horn Silver Mining Corp., Ltd.	Bank of Toronto Bldg., Vancouver	Gold, silver.
Nickel Plate	Hedley	Hedley Gold Mining Co	Hedley	Gold, silver, arsenic.
Silver Star	Similkameen	Fred Bowden	Similkameen	Silver, gold.
Summit	Salmo	Imperial Bank	Nelson	Gold, silver.

SIMILKAMEEN MINING DIVISION.

Copper Mountain	Allenby	Granby Cons. M. S. & P. Co.	Allenby	Copper, silver, gold.
Eureka	Summit camp	Lynden Mining Syndicate	Tulameen	Silver, zinc, lead.
Renfrew	Siwash creek	Lade Bros. & J. Otto	J. B. Otto, 501 Gorge Rd., Victoria	Silver, lead, gold.

EASTERN DISTRICT (No. 5).

WINDERMERE MINING DIVISION.

Daisy		Alfred M. Larrabee	Wilmer	Silver, lead.
Key	Toby creek	W. A. Drayton	Fort Steele	Silver, lead, zinc.
Lead Queen	Frances creek	Lead Queen Mine	Brisco	Silver, lead.
Paradise	Windermere	R. Randolph Bruce	W. H. Cleland, Invermere	Silver, lead.
Silver Spray and Hot Punch	North fork, Toby creek	Silver Spray Mining Co.	Dominion Bank Bldg., Vancouver	Silver, lead.
Star	North fork, Toby creek	J. E. Stoddart	Windermere	Silver, lead.
White Cat	Slade creek	Galena Ghat Mines, Ltd.	J. C. Pitts	Silver, lead.

EASTERN DISTRICT (No. 5)—*Continued.*

FORT STEELE MINING DIVISION.

Mine or Group.	Locality.	Owner or Agent.	Address.	Character of Ore.
Aurora	Moyie lake	Aurora Syndicate	A. H. Smith, Box 42, Moyie	Silver, zinc, lead.
Comet	Galloway	J. D. Simmons	Box 406, Elko	Silver, copper.
Stemwinder	Mark creek	E. P. Crawford	Kimberley	Silver, gold, zinc, lead.
St. Eugene	Moyie	Consolidated M. & S. Co.	Moyie	Silver, gold, zinc, lead.
Sullivan	Kimberley	Consolidated M. & S. Co.	Kimberley	Silver, lead, zinc.

AINSWORTH MINING DIVISION.

Bluebell	Riondel	Blue Bell Mine	S. S. Fowler, Riondel	Silver, lead, zinc.
Charleston	Zincton	Charleston Mining Co.	A. J. Harris, Zincton	Silver, zinc.
Cork-Province	Keen creek	Cork-Province Mines	W. H. Burgess, Kaslo	Silver, gold, zinc, lead.
Daybreak	Zwicky	Daybreak Mining Co	J. C. Roberts, Wilcox Bldg., Portland	Silver, lead.
Jeanette	Ainsworth	Manager	Ainsworth	Silver, lead.
Lake Shore	Ainsworth	Lakeshore Mining Co.	E. J. Edwards, Ainsworth	Silver, lead.
Metals Recovery	Kaslo creek	Metals Recovery, Ltd.	M. S. Davys, Kaslo	Silver, zinc, lead.
Rainbow	Ainsworth	Wm. Anderson	Kaslo	Silver, lead.
Silver Hill	Crawford bay	W. J. Williams	1003 Water St., Nelson	Silver, lead.
Silver Hoard	Cedar creek	Delhi Mining Co.	H. Giegerich, Kaslo	Silver, zinc, lead.
Spokane-Trinket	Ainsworth	McPherson & Bridges	Ainsworth	Silver, lead.
Surprise	Ainsworth	Howser Mining Co.	R. K Waite, Nelson.	Silver.
Tariff	Ainsworth	C. E. Harmon	Box 552, Ainsworth	Silver, lead, zinc.
Whitewater	Whitewater	Whitewater Mines, Ltd.	W. H. Burgess, Kaslo	Gold, silver, zinc, lead.

SLOCAN MINING DIVISION.

Alamo	Alamo	Cunningham Mines, Ltd.	Alamo	Gold, silver, zinc, lead.
Alpha	Silverton	Manager	Silverton	Silver, lead.
Black Coalt	Sandon	G. A. Petty	Sandon	Silver, lead, zinc.
Bosun	Sandon	Rosebery-Surprise Mining Co.	New Denver	Gold, silver, lead, zinc.
Canadian	Silverton creek	Ontario & Slocan Mining Co.	J. M. Brandon, Silverton	Silver, lead.
Carnation	Sandon	Victoria Syndicate	Sandon	Gold, silver, lead.
Colonial	Sandon	H. E. Singel	Box 153, Sandon	Silver, lead.
Dora	Three Forks	Manager	Three Forks	Silver, lead.
Dougherty	Sandon	A. T. Garland	Kaslo	Silver, lead.
Echo	Silverton	L. J. McAtee	27 E. Boone Ave., Spokane	Gold, silver, lead.
Galena Farm	Silverton	Galena Mining and Milling Co.	Clark Bros., Old Nat. Bank, Spokane	Silver, zinc, lead.
Hewitt	Silverton	Victoria Syndicate	Silverton	Silver, zinc, lead.
Lucky Jim	Zincton	Lucky Jim Lead and Zinc Mining Co.	Zincton	Silver, zinc, lead.
Mammoth	Silverton	Porcupine Gold Fields Co.	Silverton	Silver, zinc, lead.
Metallic	Silverton	Robert McFarlane	Silverton	Silver, zinc, lead.
Mollie Hughes	New Denver	Bigelow Bay Mining Co.	New Denver	Gold, silver, lead.
Monitor	Three Forks	Rosebery-Surprise Mining Co.	New Denver	Gold, silver, zinc, lead.
Mountain Chief	Alamo	John Cechelero	New Denver	Silver, lead, zinc.
McAllister	Three Forks	Slocan Silver Mines, Ltd.	Sandon	Silver.
Noble Five	Cody	Paul Lincoln	Sandon	Silver, lead, zinc.
Queen Bess	Alamo	Cunningham Mines, Ltd.	Sandon	Gold, silver, lead.
Rambler-Cariboo	Rambler	Rambler-Cariboo Mines, Ltd.	Box 443, New Denver	Gold, silver, lead.
Richmond-Eureka	Sandon	Cunningham Mines, Ltd.	Sandon	Gold, silver, lead.
Ruth-Hope	Sandon	Ruth-Hope Mines, Ltd.	Sandon	Gold, silver, lead, zinc.
Silversmith	Sandon	Silversmith Mines, Ltd	Sandon	Silver, lead, zinc.
Sovereign	Sandon	Cunningham Mines, Ltd.	Sandon	Silver, lead.
Standard	Silverton	Standard Silver Lead Co.	Silverton	Silver, zinc, lead.
Surprise	Sandon	Rosebery-Surprise Mining Co.	New Denver	Silver, lead, zinc.
Trade Dollar	Sandon	Einar Granling	Box 59, Sandon	Silver, lead, zinc.
Van Roi	Silverton	Cunningham Mines, Ltd.	Sandon	Gold, silver, lead, zinc.
Victor	Three Forks	G. A. Petty	Sandon	Gold, silver, lead.
Wonderful	Sandon	Cunningham Mines, Ltd.	Sandon	Gold, silver, zinc, lead.

SLOCAN CITY MINING DIVISION.

Enterprise	Enterprise creek	P. McGuire	Slocan	Gold, silver, zinc, lead.
Ottawa	Springer creek	P. McGuire	Slocan	Silver.

EASTERN DISTRICT (No. 5)—*Continued.*

NELSON MINING DIVISION.

Mine or Group.	Locality.	Owner or Agent.	Address.	Character of Ore.
Alice	Creston	Guy Constable	Creston	Gold, silver, lead.
Blue Bird	Deer Park	Paul Knabe	Deer Park	Silver, lead.
Boulder City	Salmo	L. H. Clubine	Salmo	Gold, silver.
Goodenough	Ymir	A. McDonald	Ymir	Gold, silver, lead.
Granite	Taghum	W. W. Philbrick	319 Kuhn Bldg., Spokane	Gold, silver, lead.
Molly Gibson	Kitto Landing	A. Bruce Ritchie	Trail	Silver, lead.
Porcupine	Ymir	R. K. Waite	Ymir	Gold, silver, lead.
Queen	Salmo	W. B. deWitt	Salmo	Gold, silver.
Queen Victoria	Taghum	Oscar Schaer	Taghum	Gold, silver, copper.
Silver Reef	Anderson creek	R. K. Waite	Ymir	Gold, silver, lead.
Starkey	Nelson	F. A. Starkey	Nelson	Silver, lead.
Yankee Girl	Ymir	Yankee Girl, Ltd.	Ymir	Gold, silver, zinc, lead.

TRAIL CREEK MINING DIVISION.

Centre Star, etc.	Rossland	Consolidated M. & S. Co.	Trail	Gold, silver, copper.
I.X.L.	Rossland	R. B. Shellady	Rossland	Gold, silver.
Velvet	Rossland	J. W. Gregory	Box 421, Rossland	Gold, copper, silver.

LARDEAU MINING DIVISION.

Multiplex	Camborne	O. T. Bibb	Revelstoke	Gold, silver, lead, zinc.

REVELSTOKE MINING DIVISION.

Mastodon	Revelstoke	Green Bros. & Burdon	Nelson	Silver, lead.

WESTERN DISTRICT (No. 6).

VANCOUVER MINING DIVISION.

Britannia	Britannia Beach	Britannia M. & S. Co.	Britannia Beach	Gold, silver, copper.

NEW WESTMINSTER MINING DIVISION.

Silver Chief	Chilliwack	Silver Chief Mining Co.	Chilliwack	Silver, copper.

LIST OF CROWN-GRANTED MINERAL CLAIMS.

CROWN GRANTS ISSUED IN 1926.

NORTH-WESTERN DISTRICT (No. 1).

Claim.	Mining Division.	Grantee.	Lot.	Acres.	Date.
Big Canyon	Atlin	John Molloy	4660	29.43	Nov. 23
Big Canyon No. 2	"	Ellen Molloy	4661	51.61	Nov. 23
Blacksmith	"	Peter Gabrio	4633	39.62	Nov. 23
Mineral Hill No. 1	Skeena	William J. Goodwin	6811R.5	51.65	Aug. 27
Mineral Hill No. 2	"	Charles E. Moore	6812R.5	49.05	Aug. 27
Mineral Hill No. 3	"	"	6813R.5	49.69	Aug. 27
Sight	"	Swan Dalin	6820R.5	49.86	July 6
Summit	"	Charles E. Moore	6814R.5	51.60	Aug. 27
Cape Nome	Nass River	Sid Miller	939	51.65	Jan. 27
Hill Billy	"	Angus Beaton, George Rattray, Allan F. Crow, Charles Morrow, Wm. MacIver, Alexander G. Murray, John McCallum, Alex. McDonald, Lanchy McKay, Joseph D. McIsaac, Athol L. Ployart, Frank Stringham, John Smith, and Paul Stievenard	4263	42.71	Feb. 8
Hill Billy No. 2	"	Ditto	4264	47.68	Feb. 8
Mutt & Jeff Fraction	"	"	4265	50.71	Feb. 8
Royal No. 1	"	Jack Miller	1080	6.00	July 5
Royal No. 2	"	"	1081	25.02	July 5
Royal No. 3	"	"	1082	38.45	July 5
Royal No. 4	"	"	1083	29.27	July 5
Royal No. 5	"	"	1084	5.71	July 5
Royal No. 7	"	"	1085	22.15	July 5
Royal No. 8	"	"	1086	32.45	July 5
Silverado Fraction	"	Angus Beaton, George Rattray, *et al*	4266	34.55	Feb. 8
Ariel	Portland Canal	Silverado Mines, Ltd.	4513	51.65	June 8
Baby Rufus Fraction	"	Rufus Silver Lead Mines, Ltd.	3793	39.29	Dec. 20
Banana Fraction	"	Outland Silver Bar Mines, Ltd.	4601	3.56	June 11
Bar Silver	"	" "	4193	22.45	June 11
Canyon	"	Silverado Mines, Ltd.	4524	40.29	June 8
Climax	"	" "	4509	36.77	June 8
Contact Fraction	"	" "	4525	45.84	June 8
Duck Fraction	"	Charles Bertram Flewin	938	29.34	Dec. 22
Forrest	"	Prince John Mining Co.	4398	14.28	April 19
Forrest No. 2	"	" "	4399	50.83	April 19
Forrest Wedge Frac.	"	" "	4404	1.84	April 19
Fortune	"	Silverado Mines, Ltd.	4512	51.65	June 8
Glacier Fraction	"	" "	4515	46.11	June 8
Glencarn	"	" "	4510	34.00	June 8
High Grade	"	Edward Henry Fernald, Jessie Kilpatrick Jamieson, Angus Laughlin McDonald, and William McGraw	4605	42.45	Nov. 6
High Grade No. 1	"	Ditto	4604	23.45	Nov. 6
High Grade No. 2	"	"	4603	39.31	Nov 6
Ida O.	"	Outland Silver Bar Mines, Ltd.	4602	45.17	June 11
Iron Hill	"	Silverado Mines, Ltd.	4508	22.34	June 8
Jim Fraction	"	Prince John Mining Co.	4403	28.32	April 19
Lens	"	Outland Silver Bar Mines, Ltd.	3624	5.45	June 11
Long Fraction	"	Rufus Silver Lead Mines, Ltd.	4556	36.59	Dec. 20
Mons	"	Outland Silver Bar Mines, Ltd.	3625	38.88	June 11
Murdock Fraction	"	John Arthur Murdock, Duncan Douglas Murdock, John Murdock Mercer, Antoine Winfred Vassar, George McHugo, and James Edward Douville	3446	38.52	Nov. 5
Murdock Group No. 1	"	Ditto	3440	40.46	Nov. 5
Murdock Group No. 2	"	"	3441	32.24	Nov. 5
Murdock Group No. 3	"	"	3442	42.66	Nov. 5
Murdock No. 8	"	"	3443	47.89	Nov. 5
Murdock No. 9	"	"	3444	46.55	Nov. 5
Murdock No. 10	"	"	3445	51.65	Nov. 5
P.J. No. 10 Fraction	"	Prince John Mining Co.	4405	0.59	April 19
Prince John No. 1	"	" "	4387	35.07	April 19
Prince John No. 2	"	" "	4388	40.24	April 19
Prince John No. 3	"	" "	4389	42.44	April 19
Prince John No. 4	"	" "	4390	48.81	April 19
Prince John No. 5	"	" "	4391	43.74	April 19
Prince John No. 6	"	" "	4392	32.16	April 19
Prince John No. 7	"	" "	4393	20.35	April 19
Prince John No. 8	"	" "	4394	46.32	April 19
Prince John No. 9	"	" "	4395	45.25	April 19
Prince John No. 10	"	" "	4400	42.14	April 19
Rainier Fractional	"	Silverado Mines, Ltd.	4511	45.93	June 8
Red Bluff	"	Prince John Mining Co.	4396	38.84	April 19
Red Bluff No. 2	"	" "	4397	36.33	April 19
Red Bluff No. 3	"	" "	4401	43.02	April 19
Renown	"	Silverado Mines, Ltd.	4507	22.58	June 8
Rufus	"	Rufus Silver Lead Mines, Ltd.	3786	40.51	Dec. 20
Rufus No. 1	"	" "	3787	50.64	Dec. 20
Rufus No. 2	"	" "	3788	47.55	Dec. 20

NORTH-WESTERN DISTRICT (No. 1)—*Continued.*

Claim.	Mining Division.	Grantee.	Lot.	Acres.	Date.
Rufus No. 3	Portland Canal.	Rufus Silver Lead Mines, Ltd.	3789	46.07	Dec. 20
Rufus No. 4	"	" "	3290	51.65	Dec. 20
Rufus No. 5	"	" "	3791	47.11	Dec. 20
Rufus No. 6	"	" "	3792	37.54	Dec. 20
Silverado Fraction	"	Silverado Mines, Ltd.	4522	5.30	June 8
Silverado No. 3	"	" "	4520	45.30	June 8
Silverado No. 4	"	" "	4521	50.63	June 8
Silverado No. 4 Fraction	"	" "	4523	33.88	June 8
Silver Bars	"	Outland Silver Bar Mines, Ltd.	4191	19.77	June 11
Silver Bell No. 4	"	Silverado Mines, Ltd.	4517	49.92	June 8
Silver Bow No. 1	"	" "	4518	51.65	June 8
Silver Bow No. 2	"	" "	4516	51.65	June 8
Silver Bow No. 3 Fraction	"	" "	4514	47.71	June 8
Silver Fraction	"	Rufus Silver Lead Mines, Ltd.	4555	48.36	Dec. 20
Slide Fraction	"	" "	4553	3.15	Dec. 20
Spokane	"	Hugh Crawford Magee and Robert McKechnie	4436	42.63	Mar. 5
Sunshine	"	Alfred Edward Young and Jacob Philip Hawkinson	4499	44.07	Mar. 5
Sunshine No. 1	"	" " " "	4500	39.12	Mar. 5
Sunshine No. 2	"	" " " "	4504	50.31	Mar. 5
Sunshine No. 4	"	Alfred Edward Young	4505	29.23	Mar. 5
Tenas Fraction	"	Prince John Mining Co.	4402	0.22	April 19
Tiger	"	Harold Morrison and Wellington Beaton	4152	10.95	Nov. 5
Tram Fraction	"	Silverado Mines, Ltd.	4519	21.55	June 8
Vandal Fraction	"	Frederick Charles Winkler	3785	6.34	Feb. 10
Vimy No. 1	"	Outland Silver Bar Mines, Ltd.	3623	8.09	June 11
Wide Fraction	"	Rufus Silver Lead Mines, Ltd.	4554	33.81	Dec. 20

NORTH-EASTERN DISTRICT (No. 2).

None.

CENTRAL DISTRICT (No. 3).

Golden King	Lillooet	Herbert Howard Shandley	587 G. 1	45.44	Nov. 18
Lorne	"	" "	588 G. 1	50.25	Nov. 18
Marquis	"	" "	586 G. 1	24.50	Nov. 18
Telephone	"	" "	670 G. 1	28.70	Nov. 18
Woodchuck	"	" "	579 G. 1	38.20	Nov. 18
Wood Duck	"	" "	671 G. 1	24.58	Nov. 18
Belfast	Kamloops	Windpass Gold Mining Co.	3980	26.23	Mar. 5
Brenda Fraction	"	" "	3977	22.18	Mar. 5
Dolly Varden	"	" "	3975	33.93	Mar. 5
Donegal	"	" "	3979	24.16	Mar. 5
Elise	"	" "	3972	42.58	Mar. 5
Erin	"	" "	3974	8.19	Mar. 5
Gott	"	" "	3842	26.44	Mar. 5
Jupiter	"	" "	3971	33.93	Mar. 5
Maple Leaf	"	" "	3976	26.81	Mar. 5
North Dunn	"	" "	3843	20.90	Mar. 5
Premier	"	" "	3973	34.23	Mar. 5
Signe	"	" "	3978	33.28	Mar. 5
Sweet Home	"	" "	3844	39.03	Mar. 5
Windpass No. 1	"	" "	3839	42.22	Mar. 5
Windpass No. 2	"	" "	3840	35.09	Mar. 5
Windpass No. 3	"	" "	3841	26.10	Mar. 5

SOUTHERN DISTRICT (No. 4).

Black Diamond	Greenwood	Joseph P. Kelly	2275	37.50	Mar. 20
E.P.U. Fraction	"	George A. Jackson	3254	3.44	Sept. 28
E Pluribus Unum	"	Henry P. Jackson	3253	42.00	Sept. 28
Jo Dandy	"	Arthur Mellor	2120	51.21	Nov. 23
Lancashire Fraction	"	Henry P. Jackson	3255	8.23	Sept. 28
Montezuma	"	Walter Forshaw	915	45.00	May 17
New York	"	Robert Forshaw	901	47.65	May 21
Old England	"	Henry James Uptigrove	658	51.30	May 7
Richelieu	"	Eugene Saunier	942	51.65	Feb. 12
Standard	"	Walter Forshaw	982	7.98	May 17
Stemwinder	"	Agnes Forshaw	588	13.87	May 17
St. Louis	"	Frank Lant Neilson	2855	41.92	July 6
Athelstan	Grand Forks	Robert Denzler	1065	18.85	Dec. 29
Blue Bell	"	Malcolm Morrison	2136	48.40	Oct. 16
British	"	Gertrude Shobe Armstrong	3054s	31.24	Aug. 26
Cannon Ball	"	John William Spaulding	1036 G. 1	51.65	May 17
Evening Star	"	Edwin Dixon Carder	1321s	42.79	June 25
Humming Bird	"	Carl Anderson	1369	33.93	July 12
Humming Bird Fraction	"	Carl Adolph Anderson	1249	25.12	Sept. 28
Jasper Fraction	"	William Wilson	3029s	23.18	Jan. 7
Lucky Jim Fractional	"	James Anderson O'Reilly	4639	43.33	Oct. 28
Meadow Lark	"	James Cordy	1712	51.00	May 7

SOUTHERN DISTRICT (No. 4)—*Continued.*

Claim.	Mining Division.	Grantee.	Lot.	Acres.	Date.
Neta	Grand Forks	Richard James Gardner	996	50.59	May 21
Rio	"	Frank Lant Neilson	4418	35.33	July 6
Strawberry	"	Stanley Thomas Hull and George John Mattocks	1765	51.65	Dec. 29
Acacia	Osoyoos	Charles F. Law	6948	43.35	Oct. 29
Acadia	"	"	6958	51.65	Oct. 29
Alpha	"	John D. Bell	6918	51.65	Oct. 29
Australian	"	John H. Redden	6908	51.65	Oct. 29
Orphan	"	Clement Vacher	1106	44.16	July 6
Utopia	"	John H. Redden	6928	43.36	Oct. 29

EASTERN DISTRICT (No. 5).

Atlanta	Golden	Henry Robertson Moodie	134	19.46	June 16
Horse Shoe	"	" "	266 G. 1	20.61	June 16
Broken Hill	Windermere	R. S. Gallop and Wm. Heap-Holland	9992	47.41	Mar. 5
Butler	"	" "	9989	47.22	Mar. 5
Copper King	"	" "	9988	46.18	Mar. 5
Imperial	"	" "	9993	38.43	Mar. 5
Iron Mask	"	" "	9991	49.62	Mar. 5
North Light	"	" "	9994	32.66	Mar. 5
Master	"	" "	9990	42.64	Mar. 5
White Bear	"	" "	9987	49.74	Mar. 5
Alpha No. 1	Fort Steele	Russell Howard Bennett	13400	51.65	Aug. 17
Angus	"	Consolidated M. & S. Co	13346	51.65	Nov. 25
Beta No. 1	"	Russell Howard Bennett	13419	51.65	Aug. 18
Bush	"	Consolidated M. & S. Co	13295	51.65	Nov. 25
Bute No. 1	"	Russell Howard Bennett	13415	51.65	Aug. 18
Bute No. 2	"	" "	13414	51.57	Aug. 18
Bute No. 3	"	" "	13416	51.65	Aug. 18
Bute No. 4	"	" "	13413	51.57	Aug. 17
Bute No. 5	"	" "	13417	51.65	Aug. 18
Bute No. 6	"	" "	13412	51.57	Aug. 17
Bute No. 7	"	" "	13418	51.65	Aug. 18
Bute No. 8	"	" "	13411	51.57	Aug. 17
Canem	"	Consolidated M. & S. Co	13341	51.63	Nov. 25
Cave	"	" "	13342	51.65	Nov. 25
Cave	"	Canada Cement Co	8597	48.62	Sept. 24
Chance No. 1	"	Russell Howard Bennett	13391	51.65	Aug. 17
Chance No. 2 Frac	"	" "	13390	50.59	Aug. 17
Chance No. 3	"	" "	13394	51.65	Aug. 17
Chance No. 4	"	" "	13389	51.65	Aug. 17
Cinnabar	"	Consolidated M. & S. Co	13349	47.48	Nov. 25
Denver No. 1	"	Russell Howard Bennett	13403	51.65	Aug. 17
Denver No. 2	"	" "	13402	51.65	Aug. 17
Denver No. 3	"	" "	13404	51.65	Aug. 17
Denver No. 4	"	" "	13401	51.65	Aug. 17
Denver No. 5	"	" "	13405	51.65	Aug. 17
Dinkum Frac	"	Consolidated M. & S. Co	5585	22.25	Nov. 25
Dorothy	"	" "	2167	43.05	Feb. 8
Dull	"	" "	13301	51.65	Nov. 24
Durango	"	Edward J. Paterson	7016	51.65	Aug. 10
Etna	"	" "	7015	38.71	Aug. 10
Finis	"	Consolidated M. & S. Co	13320	51.65	Nov. 25
Flotsam	"	" "	13310	51.65	Nov. 24
Harvard	"	" "	13292	51.65	Nov. 24
Jetsam	"	" "	13307	51.65	Nov. 24
Jure Fraction	"	" "	13345	34.57	Nov. 25
Lilac	"	" "	13294	51.65	Nov. 24
Mace	"	Russell Howard Bennett	13427	51.65	Aug. 18
Mesabi Fraction	"	" "	13426	51.58	Aug. 18
Mex Fraction	"	" "	13429	31.15	Aug. 18
Morning Fraction	"	Jacob P. Fink	3909	8.25	Feb. 3
Neptune Fraction	"	Consolidated M. & S. Co	13350	37.17	Nov. 25
Old	"	" "	13306	51.65	Nov. 24
Ontario Fraction	"	Russell Howard Bennett	13428	37.48	Aug. 18
Parr	"	Consolidated M. & S. Co	13316	51.65	Nov. 25
Point	"	" "	13304	51.65	Nov. 25
Portland	"	Fred W. Adolph	7205	45.11	Aug. 10
Post Fractional	"	Consolidated M. & S. Co	13309	47.13	Nov. 25
Rim	"	" "	13302	51.65	Nov. 24
Round	"	" "	13303	51.65	Nov. 25
Sand	"	" "	13305	51.65	Nov. 25
Shrub	"	" "	13281	51.65	Nov. 24
Silver Queen	"	William Stephen Santo	4053	51.38	Feb. 8
S.P.S.	"	Consolidated M. & S. Co	13293	51.65	Nov. 25
Star No. 1	"	Russell Howard Bennett	13379	50.67	Aug. 17
Star No. 2	"	" "	13378	45.62	Aug. 17
Star No. 3	"	" "	13380	51.65	Aug. 17
Star No. 4	"	" "	13421	51.65	Aug. 18
Sunrise	"	Canada Cement Co	8598	49.20	Sept. 24
Tire	"	Consolidated M. & S. Co	13297	51.65	Nov. 24
Top	"	" "	13321	51.65	Nov. 25
Venus	"	" "	13344	40.70	Nov. 25

EASTERN DISTRICT (No. 5)—*Continued.*

Claim.	Mining Division.	Grantee.	Lot.	Acres.	Date.
Wire	Fort Steele	Consolidated M. & S. Co.	13296	51.65	Nov. 25
Barnett	Ainsworth	Robert Garvin McLeod	2888	39.33	Feb. 9
Black Bear	"	George Bentley Gerrard	10723	36.30	June 11
Connie Frac. No. 2	"	William Henry Rothery Collister	5818	50.70	June 1
Franklin	"	Charles Nelson Ecclestone	3645	35.51	Feb. 23
Galt	"	Elizabeth Christina Collister	1650	20.24	June 1
Havana	"	Ethel Alexander Collister	5610	35.84	June 1
Hillside	"	Gertrude Ecclestone	1651	21.90	June 1
Iron Duke	"	James Arthur Carter	3190	51.65	Mar. 26
Last Chance	"	Ethel Alexander Collister	1649	48.34	June 1
Whistler	"	William Henry Rothery Collister	5614	48.51	June 1
Allouez	Slocan	Margaret Mollieres	4480	51.65	Mar. 8
Altoona	"	Andrew J. Murphy	1918	46.35	April 15
Aunty Lalla	"	Brian Russell Bland	2368	51.15	Mar. 30
Chetopha	"	Elizabeth Christina Collister	3534	45.56	June 1
Comstock	"	Ethel Woodburn Benzie	1027	41.32	June 1
Crawford Fraction	"	James Anderson Benzie	5197	19.45	June 1
Crested Butte	"	Margaret Mollieres	4481	51.65	Mar. 8
Crown Point	"	Gertrude Ecclestone	4488	14.04	June 1
Dalkeith	"	The Victoria Syndicate, Ltd.	2603	41.63	July 16
Erie	"	Ethel Woodburn Benzie	1029	50.68	June 1
Gladstone	"	Charles Nelson Ecclestone	2286	34.47	Feb. 23
Gordon	"	James Anderson Benzie	5196	26.88	June 1
Grace	"	Robert Holden Stewart	5532	44.92	July 16
Hazard Fraction	"	Peter Murray Elder	1400	12.61	Dec. 7
Hazard	"	Patrick James Keogan	1397	40.50	Dec. 7
Little Estella	"	The Victoria Syndicate, Ltd.	5534	19.68	July 16
Minnie	"	Robert Holden Stewart	5525	39.39	July 16
Minnie ha-ha	"	William George Clark	[1]3006	13.66	May 21
Mountain Chief No. 3	"	Patrick James Keogan	4470	25.02	Dec. 7
Negaunee	"	Alice Maud Mollieres	4477	39.87	Mar. 8
New Park	"	Sebastian John Renter	1398	38.12	Dec. 7
Pembroke	"	Peter Murray Elder	1399	51.65	Dec. 7
Pewabic	"	Ethel Mollieres	4478	51.65	Mar. 8
Revelstoke	"	Alice Maud Mollieres	4476	51.65	Mar. 8
Shoe Swap	"	Charles Nelson Ecclestone	3158	48.39	June 1
Silver Band	"	Edward Herbert Latham	5878	51.65	Dec. 7
Silver Glance Fr.	"	John Wesley Power	[1]2633	47.89	Sept. 7
Virginia	"	Charles Nelson Ecclestone	1028	50.54	June 1
Western Fraction	"	William George Clark	[1]3033	51.20	May 21
Western Frac. No. 2	"	" "	[1]3027	31.63	May 21
W.H.R.	"	Frank Lant Neilson	2535	45.33	Mar. 6
Ell	Slocan City	John Leslie Bland	5505	43.97	Mar. 20
Exe	"	Edith Bland	5504	44.80	Mar. 20
Eye Fraction	"	John Leslie Bland	5506	39.15	Mar. 20
Little Dorrit	"	Edith Bland	2370	51.65	Mar. 20
Little Dorrit Fr. No. 2	"	Brian Russell Bland	2369	10.72	Mar. 20
Scorpion	"	Mary Eleanor Bland	2894	51.65	Mar. 20
Silver Star	"	Audrey Dickinson	5495	29.17	Mar. 20
Blue Belle	Nelson	Joseph Henry Dunn	3843	51.65	April 9
Blue Jack	"	Percy Ferdinand Horton	2688	30.88	Nov. 23
Blue Jack Fraction	"	Adolph Edwin Place	2691	2.89	Nov. 23
Champane	"	Nels Helmer Peterson	5131	18.36	June 4
Dome Fraction	"	Archibald Bremner and James Buchanan Bremner	13051	30.01	April 15
Ella J	"	Clarence W. Rockwell	12611	51.65	Jan. 6
Farnham	"	Archie Bremner	5423	46.00	Dec. 1
Franklin	"	George Peder Haukedahl	4635	23.07	Feb. 3
Government	"	Associated Mining and Milling Co., Ltd.	4908	43.70	Nov. 16
Martilda	"	William Frampton	3870	51.58	Dec. 8
Red Fraction	"	Michael Egan	12701	30.49	April 15
Schmilka	"	George Goddard	3871	51.65	Dec. 8
Sitting Bull	"	William Walter Hartman	2690	51.37	Nov. 23
Sunrise	"	George Peder Haukedahl	4385	38.17	Feb. 3
Tea Pot	"	Archibald Bremner and James Buchanan Bremner	13052	45.17	April 15
Thorn Fraction	"	Axel Leaf	2237 G. 1	35.23	Sept. 28
Valparaso	"	William Frampton	4907	29.73	Oct. 30
White Cloud	"	Percy Ferdinand Horton and Adolph Edwin Place	2687	47.89	Nov. 23
Yellow Jack	"	Percy Ferdinand Horton	2689	31.58	Nov. 23
Yellow Jack Fraction	"	William Walter Hartman	2692	0.20	Nov. 23
Great Western	Arrow Lake	Philip Arthur Kittan	4503 G. 1	33.59	May 21
Norway	Trail Creek	Thomas Brown, Kurt Raht, Henry Carmichael, William Wallace MacKay, and Edward C. Perrott	1628	48.25	June 1
Hunter	Lardeau	Sophia Anna Bennett	4495	36.94	Mar. 8
L.V. Fractional	"	Alex. Carrie	5401	23.07	June 9
Last Chance	"	Emily Schofield	8665	51.34	Mar. 11
Lost Chord	"	"	8864	51.65	Mar. 17
Trapper	"	Sophia Anna Bennett	4494	51.65	Mar. 8
Canadian	Trout Lake	Alice Beatrice Purdy	4737	41.26	Mar. 17
Copper Queen	"	Charles Mason Oliver	6477	45.00	Mar. 8
Glooscap	"	Elmer Hadley Purdy	7257	32.02	Mar. 17
Galilleo	"	Richard Howard Graves	8659	28.43	Aug. 9
Kootenay No. 1	"	Adeline Matilda Purdy	7247	34.90	Mar. 17
Kootenay No. 2	"	" "	7248	18.00	Mar. 17
Pluto	"	Bullock Gold Mines, Ltd.	8658	32.43	Sept. 30
Silver Pick	"	John Lawrence Pridham	8711	44.46	Mar. 17
Silver Bell	Revelstoke	Alexander Wesley McIntosh	7493	50.96	July 2

WESTERN DISTRICT (No. 6).

Claim.	Mining Division.	Grantee.	Lot.	Acres.	Date.
Arcadian	Nanaimo	William Ernest Burns	142	51.10	July 2
Blue Jacket	"	George Saunders Mason	1833 G. 1	39.36	Jan. 7
Copper Chief	"	" "	1834 G. 1	45.55	Jan. 4
Copper King	"	Thomas Cobb	1835 G. 1	45.14	Jan. 4
Enid	"	Williams Adams Glasgow	280R1	46.25	Jan. 9
Flame	"	William Ernest Burns	143	44.23	July 2
Hemlock Fraction	"	Bertram Boyd-Wallis, Thomas H. Service, Richard Gerald Gore-Langton, and Edward F. Miller	30G	0.61	Sept. 4
Iron Horse	"	James E. Black	176	37.76	Jan. 7
Mountain Ash	"	Bertram Boyd-Wallis, Thomas H. Service, Richard Gerald Gore-Langton, and Edward F. Miller	28G	47.34	Sept. 4
Multo Christo	"	Daisy Violet Crowe-Swords	344	36.40	Feb. 3
Silver King	"	George Jorgenson	1832 G. 1	44.21	Jan. 5
Silver Leaf	"	Bertram Boyd-Wallis, Thomas H. Service, Richard Gerald Gore-Langton, and Edward F. Miller	29G	37.41	Sept. 4
Stella	"	Williams Adams Glasgow	281R1	25.60	Jan. 9
Theodosia	"	George Jorgenson	1831 G. 1	44.02	Jan. 5
Venus Fraction	"	Frank Barnes	152	4.58	Sept. 7
Big I No. 1	Alberni	Joseph A. Drinkwater and Michael Tebo	1640	51.65	Feb. 3
Big I No. 2	"	" " "	1641	38.91	Feb. 3
Big I No. 3	"	" " "	1642	41.31	Feb. 3
Big I No. 4	"	" " "	1643	51.65	Feb. 3
Union	"	Charles Elheck Wilson	54	15.10	Aug. 10
Birch No. 2	Quatsino	Coast Copper Co.	1109	51.65	May 7
Black Bird	"	"	1098	45.29	May 7
Blue Jay	"	"	1099	45.73	May 7
Canary	"	"	1097	47.26	May 7
Cedar No. 2	"	"	1105	33.58	May 7
Eagle No. 11	"	"	1153	48.03	Mar. 15
Eagle No. 12	"	"	1154	46.82	Mar. 15
Eagle No. 13	"	"	1155	23.05	Aug. 10
Fir No. 2	"	"	1111	47.22	May 7
Hawk Fraction	"	"	1118	51.65	May 7
Hemlock No. 2	"	"	1104	50.04	May 7
Lark	"	"	1100	46.23	May 7
Locust	"	"	1114	46.39	May 7
Long Fraction	"	"	1116	31.00	May 7
Loon	"	"	1117	48.74	May 7
Maple No. 2	"	"	1112	51.64	May 7
Martin	"	"	1120	41.73	Sept. 23
Mink	"	"	1119	25.11	Sept. 23
Oak Fraction	"	"	1113	41.47	May 7
Pine No. 2	"	"	1110	46.71	May 7
Raven No. 2	"	"	1109	42.94	May 7
Red Bird	"	"	1096	45.44	May 7
Robin	"	"	1095	45.61	Mar. 12
Snowbird	"	"	1102	46.37	May 7
Spruce No. 2	"	"	1106	48.06	May 7
Swan No. 2	"	"	1108	42.31	May 7
Tamarack No. 2	"	"	1107	48.88	May 7
Teal Fraction	"	"	1094	11.37	Mar. 5
Quatsino King	"	Ole Anderson Sherberg	676	51.65	Aug. 10
Wren	"	Coast Copper Co.	1101	47.18	May 7
Beach	Vancouver	Charles Mason Oliver	5560	32.23	Nov. 29
Cougar	"	Fraser Sanderson Keith	3408 G. 1	37.37	Aug. 23
Eldorado	"	Olive Graef Treat	5543	26.00	Sept. 30
Empress	"	John Hamilton Thompson	3407 G. 1	40.01	Aug. 23
Iron King	"	" "	3402 G. 1	22.86	Aug. 23
Iron King No. 2 Fraction	"	Fraser Sanderson Keith	3410 G. 1	10.79	Aug. 23
Morning Star	"	" "	3403 G. 1	27.14	Aug. 23
Nellie F	"	Charles Mason Oliver	5558 G. 1	51.59	Nov. 29
Peacock	"	" "	5561 G. 1	45.98	Nov. 29
Peacock No. 1	"	" "	5562 G. 1	51.51	Nov. 29
Snug Cove	"	" "	5557 G. 1	47.29	Nov. 29
Summit	"	John Hamilton Thompson	3404 G. 1	48.32	Aug. 23
Topsy	"	Charles Mason Oliver	5559 G. 1	38.45	Nov. 29
Vulcan	"	John Hamilton Thompson	3406 G. 1	33.43	Aug. 23
Vulcan	"	Fraser Sanderson Keith	3411 G. 1	21.10	Aug. 23
Wisconsin	"	Olive Graef Treat	5544	28.40	Sept. 30
Providence	New Westm'r	Claude Daniel Morgan	1737 G. 1	41.57	Mar. 8
Silver Bell	"	" "	1738 G. 1	51.65	Mar. 8

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