ANNUAL REPORT

OF THE

MINISTER OF MINES

FOR THE

YEAR ENDING 31st DECEMBER,

1910,

BEING AN ACCOUNT OF

MINING OPERATIONS FOR GOLD, COAL, ETC.,

IN THE

PROVINCE OF BRITISH COLUMBIA.

PRINTED BY AUTHORITY OF
THE LEGISLATIVE ASSEMBLY OF BRITISH COLUMBIA.

VICTORIA, B. C.:
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1911.

ANNUAL REPORT

OF THE

MINISTER OF MINES,

1910.

To His Honour the Honourable THOMAS W. PATERSON,
Lieutenant-Governor of the Province of British Columbia:

MAY IT PLEASE YOUR HONOUR:

The Annual Report of the Provincial Mineralogist upon the Mining Industries of the Province for the year 1910 is herewith respectfully submitted.

RICHARD McBRIDE,
Minister of Mines.

Minister of Mines' Office,
March, 1911.

McGillvray Creek—looking down from Summit.

REPORT OF BUREAU OF MINES

—BY—

WILLIAM FLEET ROBERTSON, PROVINCIAL MINERALOGIST.

To the Hon. Richard McBride,
Minister of Mines.

SIR,—I have the honour to submit herewith my Annual Report on the Mining Industry of the Province for the year ending December 31st, 1910.

The statistical tables give the total mineral output of the Province to date, and show in considerable detail the actual mineral production of the past year, as based on smelter or mill returns; also, a summary of the production of each of the last four years, thus illustrating by comparison the progress made in productive mining during this period.

To facilitate comparison with information previously given, I have retained, as closely as was possible, the general form already established for such tables and for the Report.

I have the honour to be,
Sir,
Your obedient servant,
WILLIAM FLEET ROBERTSON,
Provincial Mineralogist.

Bureau of Mines, Victoria, B. C.,
March, 1911.

MINERAL PRODUCTION OF BRITISH COLUMBIA.

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METHOD OF COMPUTING PRODUCTION.

In assembling the output for the lode mines in the following tables, the established custom of this Bureau has been adhered to, viz.: The output of a mine for the year is considered that amount of ore for which the smelter or mill returns have been received during the year. This system does not give the exact amount mined during the year, but rather the amounts credited to the mine on the company's books during such year.

For ore shipped in December the smelter returns are not likely to be received until February in the new year, or later, and have, consequently, to be carried over to the credit of such new year. This plan, however, will be found very approximate for each year, and ultimately correct, as ore not credited to one year is credited in the next.

In the lode mines tables, the amount of the shipments has been obtained from certified returns received from the various mines, as provided for in the "Inspection of Metalliferous Mines Act, 1897." In calculating the value of the products, the average price for the year in the New York Metal Market has been used as a basis. For silver 95 per cent., for lead 90 per cent., and for zinc 85 per cent., of such market price has been taken. Treatment and other charges have not been deducted, except an allowance of 5 lbs. of copper to the ton of ore for loss in slags.

TABLE I.—TOTAL PRODUCTION FOR ALL YEARS UP TO AND INCLUDING 1910.

Gold, placer	$ 71,213,103
Gold, lode	60,811,067
Silver	31,095,602
Lead	24,645,605
Copper	60,743,405
Coal and Coke	114,012,596
Building stone, bricks, etc.	10,593,100
Other metals, zinc, etc.	1,083,172
Total	$374,197,650

TABLE II.—PRODUCTION FOR EACH YEAR FROM 1890 TO 1910 (INCLUSIVE).

1852 to 1889 (inclusive)	$ 71,981,634
1890	2,608,803
1891	3,521,102
1892	2,978,530
1893	3,588,413
1894	4,225,717
1895	5,643,042
1896	7,507,956
1897	10,455,268
1898	10,906,861
1899	12,393,131
1900	16,344,751
1901	20,086,780
1902	17,486,550
1903	17,495,954
1904	18,977,359
1905	22,461,325
1906	24,980,546
1907	25,882,560
1908	23,851,277
1909	24,443,025
1910	26,377,066
Total	$374,197,650

TABLE III.

SHOWING MINERAL PRODUCTION

OF

BRITISH COLUMBIA.

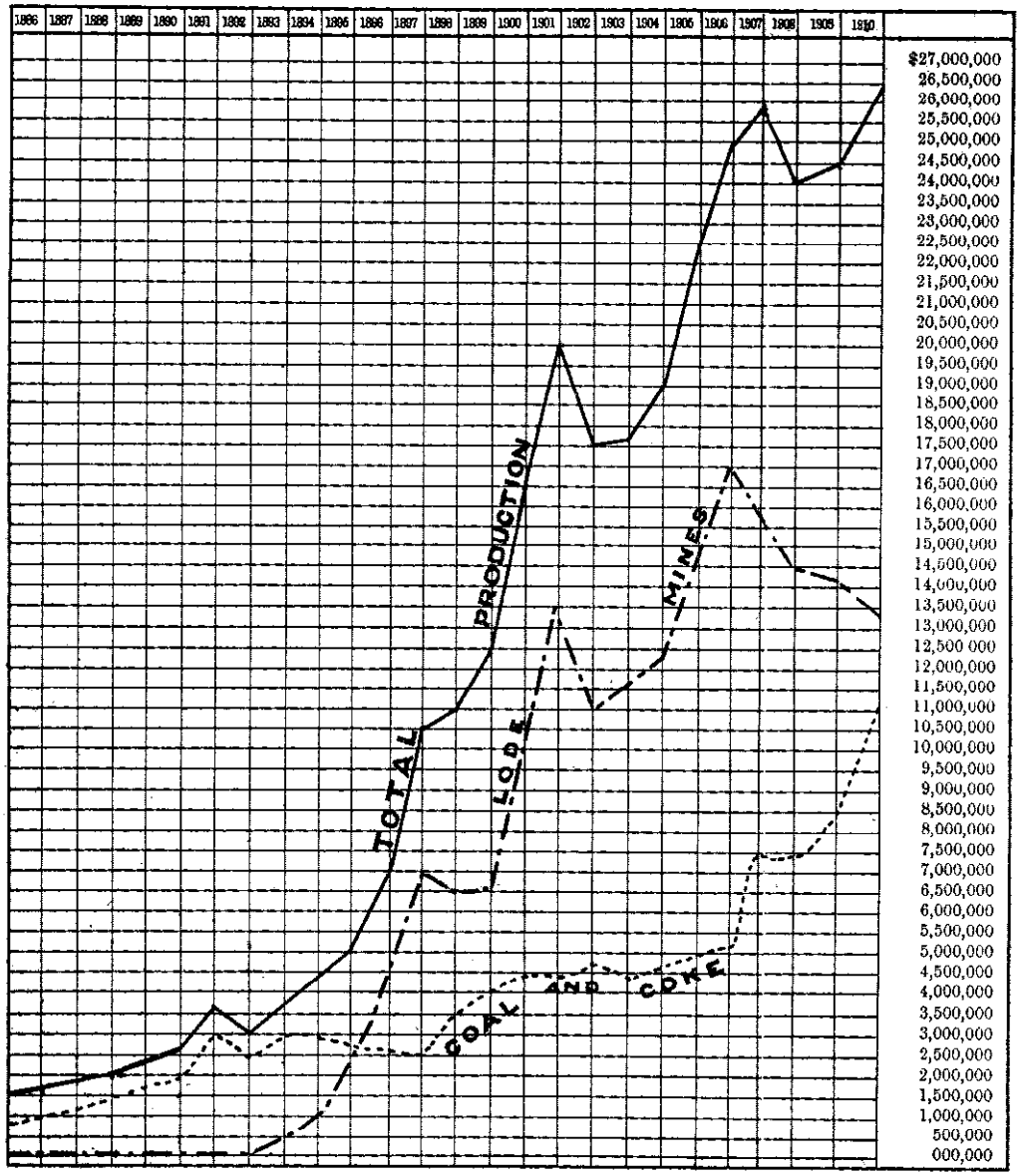


Table IV. gives a statement in detail of the quantities and value of the different mineral products for the years 1908, 1909, and 1910. As it has been impossible as yet to collect accurate statistics regarding building-stone, lime, bricks, tiles, etc., these are estimated.

TABLE IV.

QUANTITIES AND VALUE OF MINERAL PRODUCTS FOR 1908, 1909, AND 1910.

	Customary Measure.	1908.		1909.		1910.	
		Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Gold, placer	Ounces.	.....	$ 647,000	.....	$ 477,000	.....	$ 540,000
" lode	"	255,582	5,282,880	238,224	4,924,090	267,701	5,533,380
Silver	"	2,631,389	1,321,483	2,532,742	1,239,270	2,450,241	1,245,016
Lead	Pounds	43,195,733	1,632,799	44,396,346	1,709,259	34,658,746	1,386,350
Copper	"	47,274,614	6,240,249	45,597,245	5,918,522	38,243,934	4,871,512
Zinc	"	.....	170,000	.....	400,000	4,184,192	192,473
Coal	Tons, 2,240lbs	1,677,849	5,872,472	2,006,476	7,022,666	2,800,046	9,800,161
Coke	" "	247,399	1,484,394	258,703	1,552,218	218,029	1,308,174
Other materials	.....	.....	1,200,000	.....	1,200,000	.....	1,500,000
			$23,851,277		$24,443,025		$26,377,066

TABLE V.

PRODUCTION OF MINERAL BY DISTRICTS AND DIVISIONS.

NAMES.	DIVISIONS.			DISTRICTS.		
	1908.	1909.	1910.	1908.	1909.	1910.
CARIBOO DISTRICT	.....	.....	.....	$ 405,000	$ 247,000	$ 239,000
Cariboo Mining Division	$ 355,000	$ 220,000	$ 218,000	.....	.....	.....
Quesnel "	30,000	12,000	6,000	.....	.....	.....
Omineca "	20,000	15,000	15,000	.....	.....	.....
CASSIAR DISTRICT	.....	.....	.....	298,234	234,498	283,807
EAST KOOTENAY DISTRICT	.....	.....	.....	4,802,680	4,766,215	6,121,832
WEST KOOTENAY DISTRICT	.....	.....	.....	5,448,224	5,169,749	5,088,186
Ainsworth Division	422,181	867,340	318,058	.....	.....	.....
Slocan "	766,580	704,737	845,106	.....	.....	.....
Nelson "	412,836	584,955	876,002	.....	.....	.....
Trail Creek "	3,693,392	2,875,084	2,966,096	.....	.....	.....
Other parts	153,235	137,633	82,924	.....	.....	.....
BOUNDARY DISTRICT	.....	.....	.....	7,649,963	7,728,256	6,998,519
Osoyoos, Grand Forks & Greenwood Divisions	7,545,380	7,501,046	6,442,063	.....	.....	.....
Similkameen, Nicola, Vernon	101,583	225,210	556,456	.....	.....	.....
Yale, Ashcroft, Kamloops	3,000	2,000	.....	.....	.....	.....
LILLOOET DISTRICT	.....	.....	.....	13,779	16,676	9,832
COAST DISTRICTS (Nanaimo, Alberni, Clayoquot, Quatsino, Victoria)	.....	.....	.....	5,233,397	6,280,631	7,635,890
				$23,851,277	$24,443,025	$26,377,066

TABLE VI.—PLACER GOLD.

Table VI. contains the yearly production of placer gold to date, as determined by the returns, sent in by the banks and express companies, of gold transmitted by them to the mints, and from returns sent in by the Gold Commissioners and Mining Recorders. To these yearly amounts one-third was added up to the year 1878, from then to 1895 and from 1898 to 1909, one-fifth, and since then one-tenth, which proportions are considered to represent, approximately, the amount of gold sold of which there is no record. This placer gold contains from 10 to 25 per cent. silver, but the silver value has not been separated from the totals, as it would be insignificant.

YIELD OF PLACER GOLD PER YEAR TO DATE.

1858	$ 705,000	1876	$1,786,648	1894	405,516
1859	1,615,070	1877	1,608,182	1895	481,683
1860	2,228,543	1878	1,275,204	1896	544,026
1861	2,666,118	1879	1,290,058	1897	513,520
1862	2,656,903	1880	1,013,827	1898	643,346
1863	3,913,563	1881	1,046,737	1899	1,344,900
1864	3,735,850	1882	954,085	1900	1,278,724
1865	3,491,205	1883	794,252	1901	970,100
1866	2,662,106	1884	736,165	1902	1,073,140
1867	2,480,868	1885	713,738	1903	1,060,420
1868	3,372,972	1886	903,651	1904	1,115,300
1869	1,774,978	1887	693,709	1905	969,300
1870	1,336,956	1888	616,731	1906	948,400
1871	1,799,440	1889	588,923	1907	828,000
1872	1,610,972	1890	490,435	1908	647,000
1873	1,305,749	1891	429,811	1909	477,000
1874	1,844,618	1892	399,526	1910	540,000
1875	2,474,004	1893	356,131		
				Total	$71,213,103

TABLE VII.—PRODUCTION OF LODE MINES.*

YEAR.	GOLD.		SILVER.		LEAD.		COPPER.		TOTAL VALUE
	Oz.	Value.	Oz.	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	*Nil.*	*Nil.*	.....	.....	73,948
1891	.....	.....	4,500	4,000	*Nil.*	*Nil.*	.....	.....	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	5,662,523	169,875	324,680	16,234	781,342
1895	39,264	785,271	1,496,522	977,229	16,475,464	532,255	952,840	47,642	2,342,397
1896	62,259	1,244,180	3,135,343	2,100,689	24,199,977	721,384	3,818,556	190,926	4,257,179
1897	106,141	2,122,820	5,472,971	3,272,836	38,841,135	1,390,517	5,325,180	266,258	7,052,431
1898	110,061	2,201,217	4,292,401	2,375,841	31,693,559	1,077,581	7,271,678	874,781	6,529,420
1899	138,315	2,857,573	2,939,413	1,663,708	21,862,436	878,870	7,722,591	1,351,453	6,751,604
1900	167,153	3,453,381	3,958,175	2,309,200	63,358,621	2,691,887	9,997,080	1,615,289	10,069,757
1901	210,384	4,348,603	5,151,333	2,884,745	51,582,906	2,002,733	27,603,746	4,446,963	13,683,044
1902	236,491	4,888,269	3,917,917	1,941,328	22,536,381	824,832	29,636,057	3,446,673	11,101,102
1903	232,831	4,812,616	2,996,204	1,521,472	18,089,283	689,744	34,359,921	4,547,535	11,571,367
1904	222,042	4,589,608	3,222,481	1,719,516	36,646,244	1,421,874	35,710,128	4,578,037	12,309,035
1905	238,660	4,933,102	3,439,417	1,971,818	56,580,703	2,399,022	37,692,251	5,876,222	15,180,164
1906	224,027	4,630,639	2,990,262	1,897,320	52,408,217	2,667,578	42,990,488	8,288,565	17,484,102
1907	196,179	4,055,020	2,745,448	1,703,825	47,738,703	2,291,458	40,832,720	8,166,544	16,216,847
1908	255,582	5,282,880	2,631,389	1,321,483	43,195,733	1,632,799	47,274,614	6,240,249	14,477,411
1909	238,224	4,924,090	2,532,742	1,239,270	44,396,346	1,709,259	45,597,245	5,918,522	13,791,141
1910	267,701	5,533,380	2,450,241	1,245,016	34,658,746	1,386,350	38,243,934	4,871,512	13,036,258
To'l	2,952,736	60,811,067	54,648,387	31,095,602	613,914,820	24,645,605	415,353,709	60,743,405	177,295,679

* In addition to the above, there was mined in 1910 zinc-ore containing some 4,184,192 lbs. of zinc, valued at $192,473—which makes the total production of lode mines for 1910 $13,228,731, and the total to date $177,488,152.

TABLE VIII.—COAL AND COKE PRODUCTION PER YEAR TO DATE.

COAL.

YEAR.	TONS (2,240 lbs).	VALUE.
1836-75	672,564	$ 2,399,216
1876	139,192	417,576
1877	154,052	462,156
1878	170,846	512,538
1879	241,301	723,903
1880	267,595	802,785
1881	228,357	685,071
1882	282,139	846,417
1883	213,299	639,897
1884	394,070	1,182,210
1885	265,596	796,788
1886	326,636	979,908
1887	413,360	1,240,080
1888	489,301	1,467,903
1889	579,830	1,739,490
1890	678,140	2,034,420
1891	1,029,097	3,087,291
1892	826,335	2,479,005
1893	978,294	2,934,882
1894	1,012,953	3,038,859
1895	939,654	2,818,962
1896	896,222	2,688,666
1897	882,854	2,648,562
1898	1,135,865	3,407,595
1899	1,306,324	3,918,972
1900	1,439,595	4,318,785
1901	1,460,331	4,380,993
1902	1,397,394	4,192,182
1903	1,168,194	3,504,582
1904	1,253,628	3,760,884
1905	1,384,312	4,152,936
1906	1,517,303	4,551,909
1907	1,800,067	6,300,235
1908	1,677,849	5,872,472
1909	2,006,476	7,022,666
1910	2,800,046	9,800,161
Total	32,429,071 tons.	$101,810,957

COKE.

1895-97	19,396	$ 96,980
1898 (estimated)	35,000	175,000
1899	34,251	171,255
1900	85,149	425,745
1901	127,081	635,405
1902	128,015	640,075
1903	165,543	827,715
1904	238,428	1,192,140
1905	271,785	1,358,925
1906	199,227	996,135
1907	222,913	1,337,478
1908	247,399	1,484,394
1909	258,703	1,552,218
1910	218,029	1,308,174
Total	2,250,919 tons.	$12,201,639

TABLE IX.—PRODUCTION IN DETAIL OF THE

DISTRICT.	YEAR	TONS.	GOLD—PLACER.		GOLD—LODE.		SILVER.		LEAD.	
			Ounces.	Value.	Ounces.	Value.	Ounces.	Value.	Pounds.	Value.
				$		$		$		$
Cariboo										
Cariboo Division	1907		15,325	306,500						
	1908		17,750	355,000						
	1909		11,000	220,000						
	1910		10,900	218,000						
Quesnel "	1907		2,200	44,000						
	1908		1,500	30,000						
	1909		600	12,000						
	1910		300	6,000						
Omineca "	1907		500	10,000						
	1908		1,000	20,000						
	1909		750	15,000						
	1910		750	15,000						
Cassiar										
Atlin Division	1907		20,400	408,000						
	1908	2	10,150	203,000						
	1909	9	10,000	200,000			90	45		
	1910		13,750	275,000			353	178		
Liard, Stikine, Skeena, Queen Charlotte, Portland Canal Divisions.	1907	9,611	1,250	25,000	165	3,419	2,291	1,422		
	1908	6,928	450	9,000	693	14,324	14,079	7,070		
	1909	4,260	450	9,000	261	5,395	4,216	2,063		
	1910	4	400	8,000			1,454	739	1,695	68
East Kootenay										
Fort Steele Division	1907	154,963	500	10,000	6	124	821,367	509 740	37,526,194	1,801,257
	1908	165,313	170	3,400			641,855	322,340	30,204,788	1,141,741
	1909	149,680	150	3,000			580,240	283,911	27,004,528	1,039,674
	1910	115,762	150	3,000			501,475	254,809	23,874,562	964,983
Windermere-Golden	1907	64					3,955	2,455	73,842	3,544
	1908	714	20	400			3,384	1,699	358,270	13,543
	1909	20					825	404	18,724	721
	1910	53					243	124	66,010	2,640
West Kootenay										
Ainsworth Division	1907	17,781			118	2,469	301,322	187,000	3,654,775	175,429
	1908	38,282			162	3,349	314,142	157,762	4,790,216	181,070
	1909	97,698			162	3,349	352,555	172,505	10,298,343	396,486
	1910	21,850			71	1,468	233,010	118,337	2,558,353	102,334
Slocan & Slocan City	1907	18,412			14	289	590,998	366,773	4,305,826	206,680
	1908	23,309			96	1,984	848,596	426,164	6,572,268	248,432
	1909	28,306			95	1,964	738,175	361,189	4,976,199	191,584
	1910	44,466			101	2,088	964,634	490,150	6,406,358	256,254
Nelson Division	1907	52,603	50	1,000	13,883	276,627	286,837	146,981	1,582,113	75,942
	1908	24,864	50	1,000	17,376	359,162	25,067	12,589	345,424	13,057
	1909	36,814	50	1,000	21,909	452,859	75,908	37,142	1,097,069	42,237
	1910	36,203	100	2,000	38,834	761,359	45,787	23,265	1,245,344	49,834
Trail Creek Division	1907	285,923			94,573	1,954,824	126,661	78,606	4,514	217
	1908	302,419			142,314	2,941,630	129,558	65,064	29,692	1,122
	1909	237,656			115,153	2,380,213	80,026	39,157	3,315	128
	1910	253,471			119,277	2,465,456	87,833	44,630	6,946	278
Revelstoke, Trout Lake and Lardeau Divisions.	1907	5,845	250	5,000	1,168	24,143	122,232	75,857	566,020	27,169
	1908	2,819	250	5,000	870	17,983	173,675	87,220	878,860	33,082
	1909	1,750	100	2,000	732	15,130	169,435	82,904	976,601	37,599
	1910	971	50	1,000	418	8,640	107,753	54,752	463,295	18,532
Boundary										
(Grand Forks, Greenwood and Osoyoos Divisions.)	1907	1,173,416	75	1,500	81,218	1,678,776	469,206	291,189	25,419	1,220
	1908	1,491,063	100	2,000	91,551	1,892,359	451,323	226,654	21,215	802
	1909	1,461,553	50	1,000	93,229	1,927,043	492,333	240,898	21,567	830
	1910	1,701,113	50	1,000	105,294	2,176,427	460,945	234,215	35,584	1,423
Similkameen, Nicola, and Vernon Div'ns.	1907	11	50	1,000			14	9		
	1908	57	50	1,000			23	12		
	1909		50	1,000						
	1910		50	1,000						
Yale, Ashcroft and Kamloops Divisions	1907	348	150	3,000	20	413	209	130		
	1908		150	3,000						
	1909		100	2,000						
	1910	12	100	2,000			3	1	99	4
Lillooet										
Lillooet and Clinton M. D.	1907	309	600	12,000	180	3,721				
	1908	15	660	13,200	28	579				
	1909	436	500	10,000	323	6,676				
	1910	443	350	7,000	137	2,832				
Coast (Nanaimo, Alberni, Clayoquot, Quatsino, New Westminster and Victoria Divisions).	1907	84,738	50	1,000	5,334	110,254	70,356	43,663		
	1908	27,831	50	1,000	2,402	51,510	29,698	14,864		
	1909	39,557	50	1,000	6,360	131,461	38,676	18,924		
	1910	42,080	50	1,000	5,569	115,111	47,104	23,934		
TOTALS	1907	1,808,114	41,400	828,000	196,179	4,055,020	2,745,448	1,703,825	47,738,703	2,291,458
	1908	2,083,606	32,350	647,000	265,582	5,282,880	2,631,389	1,321,483	48,195,733	1,682,799
	1909	2,057,713	23,850	477,000	238,224	4,924,090	2,532,742	1,239,270	44,396,346	1,709,259
	1910	2,216,428	27,000	540,000	287,701	5,533,380	2,450,241	1,245,016	34,658,746	1,386,350

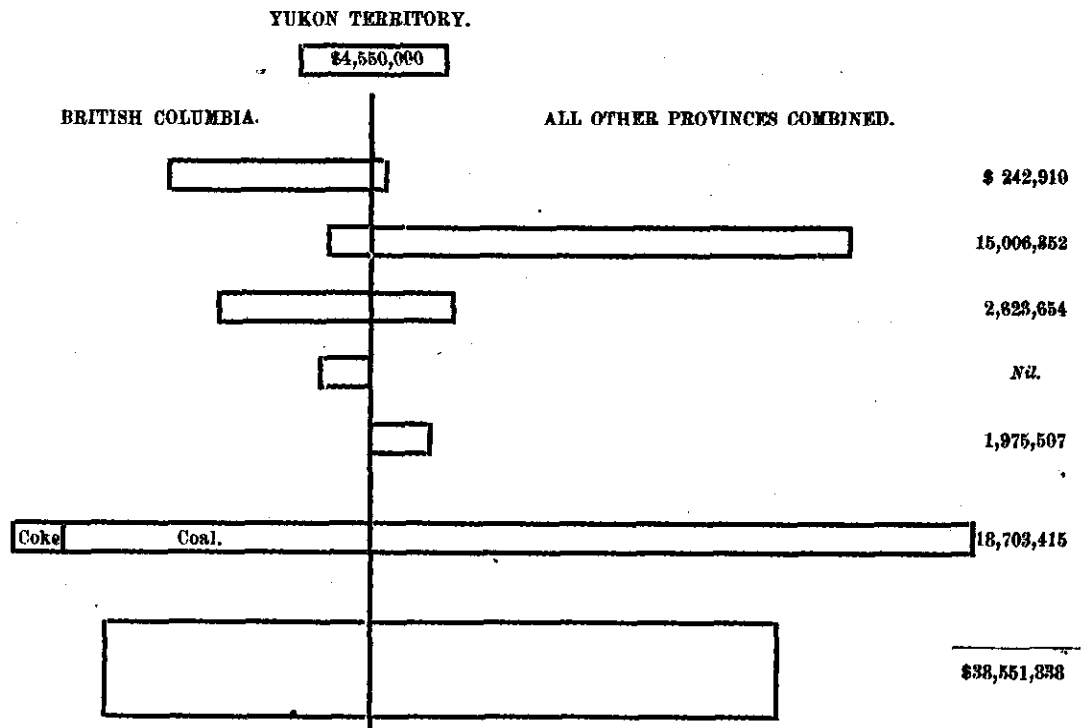
METALLIFEROUS MINES, ETC., FOR 1907, 1908, 1909, AND 1910.

COPPER.		ZINC.		MISCELLANEOUS.	TOTALS FOR DIVISIONS.				TOTALS FOR DISTRICTS.
Pounds.	Value.	Pounds.	Value.	Bldg. Stone, Brick, Cement, Pottery, etc.	1907.	1908.	1909.	1910.	1910.
	$		$	$	$	$	$	$	
					306,500				239,000
						355,000			
							220,000		
								218,000	
					44,000				
						30,000			
							12,000		
								6,000	
					10,000				
						20,000			
							15,000		
								15,000	
									283,807
					408,000				
						203,179			
1,014	134						200,730		
4,291	557							275,000	
					164,809				
874,887	134,977					95,055			
489,859	64,661						33,768		
133,360	17,310							8,807	
									1,220,556
				44,000	2,365,121				
				80,000		1,547,481			
				14,000			1,340,585		
				5,000				1,217,792	
					5,999				
						15,642			
							1,125		
								2,764	
									5,088,186
					364,868				
						422,181			
			80,000				867,340		
			250,000	45,000				318,058	
		2,083,396	95,859						
			46,100		619,842				
			90,000			786,580			
			150,000				704,737		
								845,106	
		2,100,296	96,614						
434,222	86,845			27,000	614,395				
53,243	7,028			20,000		412,336			
186,572	24,217			27,500			584,955		
231,936	29,544			10,000				876,002	
5,080,275	1,016,055				3,049,702				
5,042,244	665,576			20,000		3,693,392			
3,509,909	455,586						2,875,084		
3,577,745	455,733							2,966,096	
				12,000	144,169				
				10,000		153,235			
							137,633		
								82,924	
									6,445,218
				78,000	8,354,995				
31,521,550	6,304,310			120,000		7,545,380			
40,178,521	5,303,565			61,000			7,501,046		
40,603,042	5,270,275			35,000				6,442,063	
31,354,985	3,993,998			17,000	18,526				
2,586	517					1,444			
3,269	432						1,000		
								1,000	
				22,000	32,767				
36,120	7,224					3,000			
							2,000		
								2,155	
1,178	150								9,832
					15,721				
						13,779			
							16,676		
								9,832	
									1,982,132
				953,900	1,725,433				
3,083,080	616,616			950,000		1,216,227			
1,506,464	198,853			1,052,500			1,354,462		
1,160,071	150,577			1,450,000				1,982,132	
3,078,090	392,087								
40,832,720	8,166,544		46,100	1,153,900	18,244,847				
47,274,614	6,240,249		170,000	1,200,000		16,494,411			
45,597,245	5,918,522		400,000	1,200,000			15,868,141		
38,243,934	4,871,512	4,184,192	192,473	1,500,000				15,268,731	15,268,731

TABLE X.

Showing Comparative Production in 1910 of Certain Minerals by British Columbia and Other Provinces of Dominion.

	Aggregate of Provinces.*		
Gold			
Gold	$6,316,290	$6,073,380	$ 242,910
Silver †	16,251,368	1,245,016	15,006,352
Copper	7,495,166	4,871,512	2,623,654
Lead †	1,386,350	1,386,350	*Nil.*
Iron	1,975,507	*Nil.*	1,975,507
Coal	29,811,750	9,300,161	18,703,415
Coke		1,308,174	
Total	$63,236,431	$24,684,593	$38,551,338



* Taken from "Preliminary Report on the Mineral Production of Canada in 1910," corrected by final figures of British Columbia Statistics.

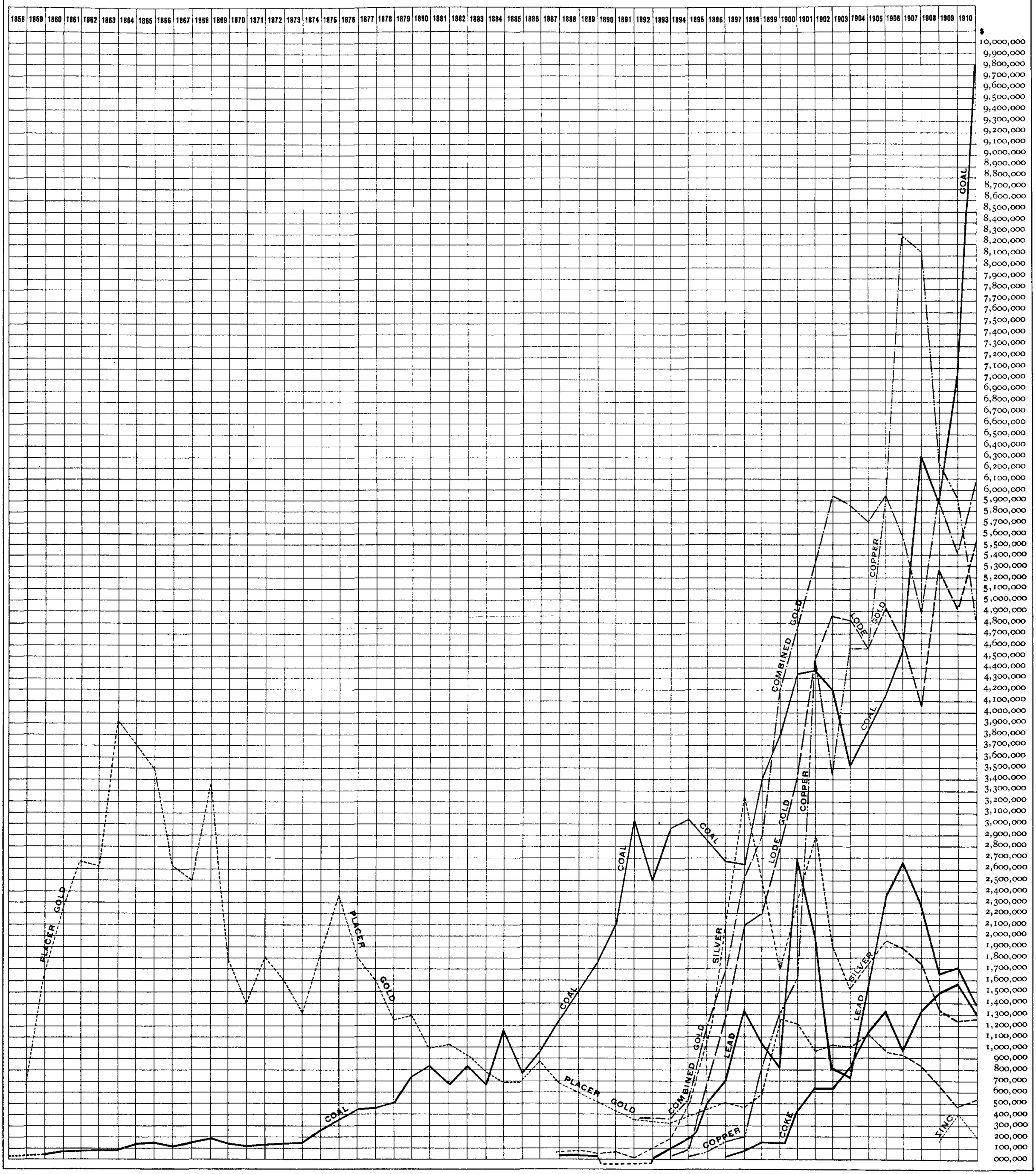
† At the British Columbia valuation.

TABLE

SHOWING MINERAL PRODUCTION

OF

BRITISH COLUMBIA



PROGRESS OF MINING.

—:o:—

The value of the mineral products of the Province for the year 1910 amounts to $26,377,066, which is considerably greater than that of any previous year.

The tonnage of ore mined in the lode mines of the Province during the year 1910 was 2,216,428 tons, an increase over the preceding year of 158,715 tons, or 7.7 %.

This total tonnage was produced by the various districts in the following proportions: Boundary, 76.75 %; Rossland, 11.35 %; Fort Steele, 5.22 %; Coast District, 1.90 %; all other districts, 4.7 %.

The number of mines from which shipments were made in 1910 was 83, and of these only 50 shipped more than 100 tons each during the year, while but 32 shipped in excess of 1,000 tons each. Of these latter, 8 were in the Nelson Mining Division, 8 in the Boundary District, 3 in the Ainsworth Division, 4 in the Slocan District, 3 in the Coast District, 3 in the Trail Creek (Rossland) Division, 2 in the Fort Steele Division, and 1 in the Trout Lake Division.

The following table shows the number of mines which shipped ore during the year 1910; the districts in which they are situated, and the tonnage produced in each district, together with the number of men employed, both above ground and underground:—

TABLE SHOWING DISTRIBUTION OF SHIPPING MINES IN 1910.

	Tons of Ore shipped.	No. of Mines shipping.	No. of Mines shipping over 100 Tons in 1910.	MEN EMPLOYED IN THESE MINES.		
				Below.	Above.	Total.
CASSIAR:						
Atlin, Skeena & Queen Charlotte	4	1	.....	4	4	8
EAST KOOTENAY:						
Fort Steele	115,762	5	3	229	84	313
Windermere-Golden	53	1	.....	6	4	10
WEST KOOTENAY:						
Ainsworth	21,850	11	5	66	39	105
Slocan	44,466	20	11	220	79	299
Nelson	36,203	14	10	178	77	255
Trail Creek	253,471	9	5	492	149	641
Other Divisions	971	1	1	40	12	52
BOUNDARY:						
Grand Forks, Greenwood, and Osoyoos	1,701,113	13	10	781	374	1,155
Ashcroft-Kamloops	12	1	.....	6	3	9
Similkameen-Vernon	.....	.....	.....	.....	.....	.....
LILLOOET	443	3	2	9	4	13
COAST	42,080	4	3	143	104	247
Total	2,216,428	83	50	2,174	933	3,107

In explanation of the table it should be said that, in its preparation, a mine employing twelve men for four months is credited in the table with four men for twelve months, so that the total given is less than the actual number of individuals who worked in the mines during the year.

The "labour employed to the ton of ore mined" forms some criterion of the total cost of mining in a camp, since the cost of labour is in a more or less constant proportion to such total cost. In this respect it is interesting to note in the various districts the number of tons of ore mined to each man employed.

An analysis of the above table shows, approximately, that, taking the Province as a whole, there were 713 tons of ore mined a year for each man employed about the mines. In this respect, however, the districts vary very materially, since, in the Slocan, the figures show 148 tons mined to the man in a year; in the Nelson District, 142 tons; in Trail Creek District, 395 tons; and in the Boundary, 1,472 tons mined to the man employed.

Such generalisation, of course, does not apply exactly to any one mine, but only to the district, and in the first two districts mentioned the mines vary in character so greatly, some having high-grade shipping ores and others low-grade concentrating ores, that care must be taken not to carry these average figures too far.

TABLE SHOWING NON-SHIPPING MINES AND MEN EMPLOYED.

DISTRICT.	NUMBER OF MINES.			MEN EMPLOYED.		
	Working.	Idle.	Total.	Above.	Below.	Total.
COAST AND CASSIAR	23	11	34	178	160	338
EAST KOOTENAY	1	3	4	5	.....	5
AINSWORTH	7	13	20	16	22	38
SLOCAN	11	32	43	12	32	44
NELSON	7	10	17	54	29	83
TRAIL CREEK	.....	5	5	.....	.....	.....
LARDEAU AND TROUT LAKE	1	5	6	5	12	17
BOUNDARY	6	18	24	34	43	77
Total	56	97	153	304	298	602

STATISTICAL TABLES.

Referring to the preceding tables of 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 1910, aggregating $374,197,650. From this table it will be seen that coal-mining has produced more than any other separate class of mining, a total of $114,012,596; followed next in importance by placer gold at $71,213,103, and third by lode gold at $60,811,067.

The metal gold, obtained from both placer and lode mining, amounts to a value of $132,024,170, the greatest amount derived from any one mineral, the next important being coal, the total gross value of which, combined with that of coke, is $114,012,596, followed by copper at $60,743,405, silver at $31,095,602, and lead at $24,645,605.

TABLE II. shows the value of the total production of the mines of the Province for each year from 1890 to 1910 (inclusive), during which period the output has increased about tenfold, and has now reached a production, for the past year, valued at $26,377,066, or more than double what it was in 1899. The value of the total products of the mines of the Province up to the end of 1910 is $374,197,650.

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

It will be seen that, although coal-mining has been a constantly increasing industry during this whole period of twenty years, lode-mining did not begin, practically, until 1894, since when it has risen with remarkable rapidity, though not without interruption, until it reached, in 1906, the $17,000,000 line, and the total production has reached the $26,000,000 line.

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

The table shows that there has been this year an increase in the production of placer gold of some $63,000, and at the same time an increase in the output of lode gold of $609,290, making a total increase of $672,290 in the production of the metal.

The amount of silver produced this year was 2,450,241 ounces, having a gross value of $1,245,016, a decrease in the number of ounces produced of 82,501, due to a greatly decreased production in the Fort Steele and Nelson Mining Divisions, and only partly compensated for by an increase in the Slocan District. The gross value of the product, however, this year shows an increase over that of last year of $5,746, which is accounted for by a slightly higher market price of silver during this last year.

The table shows an output of lead in 1910 amounting to 34,658,746 pounds, valued at $1,386,350, which is a decrease from the production of the preceding year of 9,737,600 pounds of lead.

The production of copper this year was 38,243,934 pounds, valued at $4,871,512, a decrease in amount of 7,353,311 pounds, or about 16.1 per cent. The value of the product was less than that of the preceding year by $1,047,010—a decrease of 17.6 per cent.

TABLE V. 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 this year, for the first time in many years, the Coast District has the honour of first place on the list, followed, in order of importance, by the Boundary and East Kootenay Districts, while West Kootenay—for many years our greatest producer—is relegated to fourth place on the list. The Coast and East Kootenay Districts owe a considerable percentage of their output to the coal-mines situated within their limits, whereas, in the other districts, the production is almost entirely from metal mining.

In this table, this year, the values of zinc and building materials have been distributed to the districts producing them, which has occasioned some changes in the 1908 and 1909 columns, thus making them differ from these columns in previous reports.

TABLE VI. gives the statistical record of the placer mines of the Province from 1858 to 1910, and shows a total production of $71,213,103. The output for 1910 was $540,000, an increase, as compared with the previous year, of about 13.2 per cent.

TABLE VII. 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 $177,295,679, or, including the zinc production of 1910, valued at $192,473, $177,488,152. The production of 1910, including zinc, was $13,228,731, a decrease from the previous year of $562,410, or about 4.0 per cent.

TABLE VIII. contains the statistics of production of the coal-mines of the Province. The total amount of coal mined to the end of 1910 is 32,429,071 tons (of 2,240 lbs.), worth $101,810,957. Of this, there was produced in 1910 some 2,800,046 tons, valued at $9,800,161, an increase of 793,570 tons in quantity and of $2,777,495 in value over the preceding year.

In these figures of coal production, the coal used in making coke is not included, as such coal is accounted for in the figures of output of coke. The amount of coal used in making coke in 1910 was 339,189 tons, from which was made 218,029 tons of coke, having a value of $1,308,174, a decrease from the preceding year of 40,674 tons, or 15.7 per cent., with a decrease in value of $244,044. While only 218,029 tons of coke were actually made, 222,004 were actually sold; 4,054 tons being taken from the stocks at the mines, and 79 tons were used under the company's boilers. The total value of the output of the collieries of the Province in 1910 was $11,108,335.

The average selling prices taken this year in the calculation of value of product are the same as those used last year; that for coal being $3.50 and for coke $6 per ton of 2,240 lbs. The prices used in calculations prior to 1907 were $3 and $5, respectively.

More detailed statistics as to the coal production of the Province and of the separate districts are given elsewhere in this Report.

TABLE IX. gives the details of production of the mines of the Province (excepting coal mines) for the years 1907, 1908, 1909, and 1910, and the districts in which such productions were made, showing the tonnage of ore mined in each district, with its metallic contents and its market value.

The total tonnage of ore mined in the Province during the year 1910 was 2,216,408 tons, having a gross value, including building materials, of $15,268,731.

The following table shows the percentages of such tonnage and values derived from the various districts of the Province:—

Boundary District	76.75	per cent. of tonnage.
Trail Creek M. D.	11.36	" "
Fort Steele M. D	5.23	" "
Slocan District	2.06	" "
Nelson	1.63	" "
Coast District	1.92	" "
Other Divisions	1.05	" "
	100	

TABLE X. compares graphically the output of certain mineral products in British Columbia with that of similar products in all the other Provinces of the Dominion, and shows that in 1910 British Columbia produced, in the minerals shown, an amount equal to over 64.0 per cent. of all the other Canadian Provinces combined.

COAL.

The production of coal made by the B. C. collieries during the year 1910 was the greatest in the history of coal-mining in the Province, amounting to 3,139,235 tons (2,240 lb.).

The coal production of British Columbia in 1910 was chiefly mined by three companies—the Canadian Collieries (Dunsmuir), Ltd., and the Western Fuel Co. on Vancouver Island, and the Crow's Nest Pass Coal Co. in East Kootenay—these companies producing about 79.3 per cent of the total coal mined.

Of the smaller collieries of the Coast District, the Pacific Coast Coal Mines, at South Wellington and Suquash, V. I., mined 174,810 tons of coal, and the Nicola Valley C. & C. Co. 141,487 tons, while the Vancouver-Nanaimo produced about 29,442 tons, and the Diamond Vale Co. about 2,431 tons.

In the East Kootenay field, the Hosmer Collieries produced 158,123 tons, and the Corbin Collieries 126,851 tons of coal during the year; neither of these collieries is as yet in full operation.

The colliery opened at Princeton, in the Similkameen Mining Division, by the Princeton Coal & Land Co., during the year shipped 11,868 tons of lignitic coal.

The Coal Hill Syndicate has opened a colliery near Merritt, in the Nicola District, and has this year mined 2,300 tons of coal.

The Pacific Coast Coal Co. has operated its colliery at South Wellington, shipping over its own railway to its dock and bunkers at Boat harbour.

The collieries of the Coast District mined about 56 per cent. of the total output, and about 61 per cent. of the coal, sold as such, was from this district. These collieries produced only about 1 per cent. of the coke made in the Province this past year.

The gross output of the coal mines of the Province for the year 1910 was 3,139,235 tons (of 2,240 lbs.), of which 33,360 tons were added to stock, making coal disposed of 3,105,875 tons. Of this gross amount, 1,238,439 tons were sold for consumption in Canada, 1,114,809 tons were exported to the United States, and 60,290 tons were exported to other countries, making the total amount of coal sold 2,413,538 tons.

In addition to the coal sold there was used in making coke 339,189 tons of coal, while 206,871 tons were consumed under colliery boilers, and 146,277 tons were lost in washing. From the 339,189 tons of coal there was produced 218,029 tons of coke, while 4,054 tons of coke were taken from stock, and 79 tons were used under colliery boilers, making the net coke sales 222,004 tons. Of this amount 213,274 tons were sold for consumption in Canada, while the remainder, 8,730 tons, was exported to the United States.

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

COAL.	Coast District.	Crow's Nest Pass District.	Total for Province.
Sold for consumption in Canada.....(Tons—2,240 lbs)	1,055,861	182,578	1,238,439
" export to United States..... "	363,722	751,087	1,114,809
" export to other countries..... "	60,290	.....	60,290
Total coal sales.....	1,479,873	933,665	2,413,538
COKE.			
Sold for consumption in Canada.....(Tons—2,240 lbs)	8,327	204,947	213,274
" export to United States..... "	.....	8,730	8,730
" export to other countries..... "	.....	.....	.....
Total coke sales.....	8,327	213,677	222,004

COAST COLLIERIES.

The Coast collieries mined 1,774,116 tons of coal in 1910, of which 29,821 tons were added to stock, making 1,744,295 tons distributed from these collieries in 1910. This amount was distributed thus:—

Sold as coal in Canada	1,055,861	tons.
" United States	363,722	"
" other countries	60,290	"
Total sold as coal	1,479,873	tons.
Used under companies' boilers, etc	124,548	"
Used in making coke	4,670	"
Lost in washing	135,204	"
	1,744,295	"

The total coal sales of the Coast collieries for the year show, as compared with the sales of the previous year, an increase of 229,528 tons, equivalent to 18.3 per cent.

The consumption of coal in that portion of British Columbia served by the Coast collieries shows in 1910 an increase of 193,773 tons, equal to 22.5 per cent over the preceding year, while the amount sold for export to countries other than the United States shows a decrease of 3,219 tons, equal to 5.0 per cent. Export sales to the United States in 1910 show an increase of 38,974 tons, or 12.0 per cent.

The production of coke in the Coast District in 1910 was confined to the one company producing the article, the Canadian Collieries, Ltd., and only 2,333 tons was made, as the company had a large stock on hand. This company, however, sold 8,327 tons of coke, taking 5,994 tons from stock. This was entirely disposed of locally in British Columbia, no export having been made to the United States in 1910, nor in 1909, due to the fact that the smelters formerly operating in Alaska have been shut down for the past two years; these smelters in 1908 consumed over 3,000 tons of British Columbia coke.

In the Coast District, among the newer collieries that are beginning to make an appreciable output may be mentioned the Nicola Valley Coal & Coke Co., which mined in 1910 some 141,487 tons of coal, and this production was limited by the market which the C. P. R. freight rates would allow it to reach, rather than by the capacity of the mines. Adjoining this colliery is the Diamond Vale Colliery Co.'s property, which, though still in a state of development, mined in 1910 some 2,431 tons of coal; and the Princeton Coal & Land Co., of Princeton, mined 11,868 tons of coal in 1910, and the Coal Hill Syndicate, of Nicola, 2,300 tons.

On Vancouver Island, the Pacific Coast Coal Mines, Ltd., mined at South Wellington, a few miles south of Nanaimo and at Suquash, some 174,810 tons of coal. Railway and bunkers have been built at Boat Harbour.

East Kootenay Coalfield.

The annual returns of the eastern slope, or Alberta side, of the Rocky Mountains are made to the Government of that Province, whence they may be obtained by any one interested. Three companies were operating on the British Columbia side in 1910, viz.: The Crow's Nest Pass Coal Co., Hosmer Mines, Ltd., and the Corbin Coal & Coke Co., Ltd. The details of their several operations are given elsewhere, together with particulars of other properties at present under development. A description of this coalfield, by the Provincial Mineralogist, was given in the Report of 1909, under the heading of "Coal Mining."

By far the greatest proportion of coal is produced by the Crow's Nest Pass Coal Co., operating collieries at Michel and Coal Creek (Fernie), the united gross output of which, in 1910, was 1,080,145 tons. Of this output, 265,566 tons were used in making coke; the resulting coke amounting to 173,659 tons. The Hosmer Mines mined 158,123 tons of coal and made 42,037 tons of coke. The Corbin Coal Co. produced 126,851 tons of coal and no coke.

The collieries in the East Kootenay District made in 1910 a gross production of 1,365,119 tons of coal, of which 3,539 tons were added to stock during the year, leaving the amount of coal distributed 1,361,580 tons. Of this amount 334,519 tons were used for making coke, the resulting coke being 215,696 tons.

The amount of coke actually produced in 1910 was 215,696 tons; of this 79 tons were used under boilers, and 1,940 tons added to stock, making total coke sales for the year 213,677 tons.

As compared with the previous year, the coke production of 1910 shows a decrease of 29,321 tons, or 12 %. Total coke sales show a decrease of 32,192 tons, or 13 %. Coke sales in Canada show a decrease of 534 tons. Coke sales to the United States show a decrease of 31,748 tons, or 78.4 %.

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

Sold as coal in Canada	182,578 tons.	
" United States	751,087 "	
Total sold as coal		933,665
Used by the company in making coke		334,519
" " under boilers		82,323
Lost in washing		11,073
		1,361,580 tons.

GOLD.

Placer Gold.

The production of placer gold during the past year was about $540,000 as nearly as can be ascertained, which is $63,000 more than was produced in 1909, being an increase of 13 %. Placer-mining is entirely dependent upon the water-supply, which in turn depends upon the snowfall of the previous winter and the character of the spring weather—variables upon which it is impossible to forecast—and the conditions this past season have not been favourable.

There is no question but what, in the known placer camps of the Province, most of the more easily available deposits have been worked out, leaving only those the operation of which calls for greater capital and plant, with greater attendant risks and less security of immediate profits.

The Atlin District shows this past year a marked increase in the production of placer gold—about $75,000—directly due to the installation of facilities for the storage of water, for, in a hydraulic camp, the output in gold is in direct proportion to the number of days in which a full supply of water is available; hence the necessity of storing the surplus water of the early part of the season for use later.

On Pine creek, the North Columbia Gold Mining Company (Ruffner's holdings) has so conserved its water-supply by a dam across the outlet of Surprise lake, making a sufficient ditch-line from the dam to the workings, and has this season reaped the reward, by taking out about $150,000 worth of gold, with a fair expectation of a greater output next season.

The Atlin Consolidated Mining Company (Guggenheim Company) did no work in the district, but leased its ground to the North Columbia Company, by whom it was worked.

The Pittsburg-British Gold Company has control of the whole of McKee creek, and made a very good "clean-up."

Individual mining in this district is now comparatively unimportant.

In the Stikine District none of the hydraulic plants were operated, while individuals produced but a small amount of gold.

In the Omineca District, the Ingenika and McConnell creek camps failed to produce; one partnership is still working there, though without much encouragement. In the Manson creek section some work was in progress, but the results this year have been small.

In the Cariboo District the output this year has been slightly less than in 1910, due to a very light snowfall the previous winter, with a consequent shortage of water during the summer. In the Barkerville section the water shortage was such that in some instances the sluices could not be cleaned up at the end of the season, but the gold in them will be recovered in 1911 and should considerably augment that year's output.

In the Quesnel Division, while a little individual work is still carried on, hydraulicking is the important feature, and at the present time J. B. Hobson is equipping a plant on Spanish creek, which should be operating within a year, and the Quesnelle Hydraulic Gold Mining Co. (H. W. DuBois, manager) is completing a very extensive hydraulic plant on Twenty-mile creek, where it flows into Quesnel river; the plant is expected to be in operation in August, 1911. So that, although the output for 1910 is comparatively small, there is every probability of a large production next season.

East and West Kootenay and the Yale District each produce a little placer gold, but the quantity seems to diminish each year.

Dredging does not seem to have proved a success, as there has been no plant of this description at work in the Province.

Gold from Lode-mining.

The value of the gold produced from lode-mining in the Province during the year 1910 was $5,533,380, an increase, as compared with the previous year, of $609,290, or about 12.3 %. This increase is due chiefly to the greater production of the Nelson Division, together with an increased tonnage of ore in the Boundary and Trail Creek (Rossland) Divisions, in the latter of which the gold tenure of the ore was also slightly higher. The following are the values of the gold product of the three most important camps: Rossland, $2,465,455; Boundary, $2,176,427; and Nelson, $761,359. About 76 % of the gold production of the Province is obtained from the smelting of copper-bearing ores, the remainder from stamp-milling.

The only large stamp-mill in operation in the Province is at the *Nickel Plate* mine at Hedley, in the Osoyoos Mining Division, which, this past year, milled some 47,000 tons of ore having a value of about $530,000. There are smaller stamp-mills operating at the *Poorman*, *Queen*, *Athabasca*, *Nugget*, and other mines in the Nelson Division, and also a couple of quite small ones in the Lillooet Mining Division.

SILVER.

The total amount of silver produced in the Province during the year 1910 was 2,450,241 ounces, valued at $1,245,016, a decrease in amount, as compared with the previous year, of 82,501 ounces; but, owing to a higher average market price, the value of the gross product produced this year proves to be greater than last year by some $5,746.

A very large proportion of the silver produced in the Province is found associated with lead-bearing ores, chiefly in the Slocan District, where the important mines were forced to suspend work for the best portion of the year, owing to forest fires destroying the Kaslo and Slocan railway and, in some instances, the plants of the mines.

The *St. Eugene* mine in East Kootenay, formerly a large producer of silver and lead, has, temporarily at least, run out of the ore-shoot, and made a very much decreased output, which was, however, partly compensated for by the reopening, by the Consolidated Company, of the *Sullivan* mines.

The Slocan District—including the Ainsworth, Slocan, Slocan City, and Trout Lake Mining Divisions—produced about 54 % of the total Provincial output of silver this year, and the Fort Steele Mining Division about 20 %, all from argentiferous galena.

LEAD.

The lead production of the Province for the year 1910 was 34,658,746 lbs. of lead, having a market value of $1,386,350, showing, as compared with the previous year, a decrease in amount of 9,737,600 lbs. of lead, or 21.9 %, and a decrease in value of $322,909, or 18.8 %.

The average market price of this metal for the year 1910 was a little higher than for the previous year.

The causes militating against the output of silver even more seriously affected the production of lead; but it is expected that this trouble will be largely remedied by next year.

The lead production is this year, as usual, derived chiefly from the Fort Steele Mining Division, as is shown in the following table:—

Fort Steele M. D. produced.....	23,874,562 lbs.	lead = 68.88 %	of total.
Ainsworth "	2,558,353 "	7.38 "
Slocan " ...	6,406,358 "	18.49 "
Nelson "	1,245,844 "	3.59 "
Trout Lake "	463,295 "	1.34 "
All others "	110,334 "	.32 "
	34,658,746	100.00

COPPER.

The amount of copper in ores mined in the Province in 1910, and smelted during the year, was 38,243,934 lbs. fine copper, valued at the average New York market price for copper at $4,871,512. These figures do not take into account smelter charges; but a deduction of 5 lbs. of copper to the ton of ore has been made, approximately the amount of copper lost in slags at smelting.

As compared with the preceding year, there is, therefore a decreased production in amount of 7,353,311 lbs., and in value of $1,047,010. There is a proportionately large increase in the Coast District and slighter increases in the Nelson and Trail Creek (Rossland) Divisions, while the Boundary District shows a decrease.

The following table shows the production of the various districts for the years 1908, 1909, and 1910:—

	1908.	1909.	1910.	
Boundary District..	40,181,790 lbs.	40,603,042 lbs.	31,354,985 lbs.	= 82.00 %
Rossland " ..	5,042,244 "	3,509,909 "	3,577,745 "	9.35 "
Coast & Cassiar " ..	1,997,337 "	1,297,722 "	3,078,090 "	8.05 "
Yale-Kamloops " ..	.....	.....	1,178 "	....
Nelson " ..	53,243 "	186,572 "	231,936 "	0.60 "
Other Districts.....	.....	.....	.....	....
	47,274,614 "	45,597,245 "	38,243,934 "	100.00 "

The average assays of the copper ores of the various camps, based upon the copper recovered, were as follows:—

Boundary, 0.995 %; Coast, 3.67 %; and Rossland, 0.705 %.

ZINC.

The total quantity of zinc produced in 1910 was 4,184,192 pounds, valued at $192,473, the New York price, less 15 per cent., being taken as the basis of valuation.

The expectation that the output of zinc in 1910 would be greatly in excess of the preceding year has not been realised, but, on the contrary, the output this year is only about half of that made in 1909. This is not due to failure of the mines, but is chiefly caused by forest fires, occurring in July of 1910, which destroyed bridges and trestles along the Kaslo and Slocan Railway, so that the road has not since been operated, and as the most important zinc-producing properties are tributary to this railway, shipments from these mines have for the time ceased.

The same fires completely destroyed the plants of the *Lucky Jim* and the *Whitewater* concentrator, both large producers of zinc. The largest producers of zinc were the *Whitewater* and *Whitewater Deep* mines, the *Van Roi* and the *Lucky Jim*.

The total zinc output is from the Ainsworth and Slocan Divisions; there has been no production made by the claims near Arrow lake nor by those in East Kootenay.

OTHER MINERALS.

Iron-ore. There has been no iron-ore mined in the Province this past year, other than that necessarily mined in development work, and none of this has been shipped, the reason being that there is no iron blast-furnace in operation within the district, and, consequently, no market for iron-ore.

There appears to be in the Coast District a large amount of magnetite iron-ore, but, so far, there has not been discovered any sufficient quantity of hematite or other ore of iron, which fact, coupled with the price of coke of from $7 to $8 a ton on the Coast, as compared with from $1.50 to $2 a ton in Pennsylvania, does not seem to justify the expectation of an iron-smelting industry here until these conditions are altered.

Platinum. While platinum is found in many of the alluvial gold-workings, where it can be saved as a by-product, the saving of it, in a small way, is attended with so much trouble that it has been practically neglected and no appreciable production made.

Building-stone. Excellent building-stone of various sorts is found in abundance in almost every part of the Province, but the fact of its widespread distribution has, however, been somewhat against the establishment of large quarrying industries, as a sufficient local supply could always be obtained, and, except within reach of the larger cities, few regularly equipped quarries have been opened.

On the Coast, chiefly between Vancouver Island and the Mainland, there are several well-equipped quarries taking out granite, sandstone, and andesite, all of excellent quality. These quarries supply the stone building material of the Coast cities, and also export to the United States.

A detailed description of the more important quarries was given in a previous report of this Bureau.

Marble. In the interior of the Province, the Canadian Marble & Granite Company opened a marble quarry on the line of the Lardo-Trout Lake Railway, about eight miles from Lardo, and took during 1909 block marble which, when sawn into slabs, amounted to some $30,000 in value. This company has, so far, shipped only the rough blocks of the marble which were elsewhere sawn into slabs, etc., but

during the past year the company has been busily engaged in erecting at the quarries large and well-equipped dressing-works, which are not yet in running order, so that during this period of construction the product shipped from the quarry has been comparatively small.

A coarsely crystalline whitish marble, not suitable for cutting into slabs, has been quarried on the shore of Kootenay lake, and used for building purposes in Nelson, the new Court-house being built of this stone.

The Nootka Marble Quarries, on Nootka sound, on the west coast of Vancouver Island, that were opened up in 1908, have not made any important shipments. Information, as presented by the Report of Directors in 1909, indicated that some $3,000 worth of marble was on hand at the quarry, but did not show that any sales had been made. The mine and quarry have not been operated since July, 1909.

Red Brick. The demand for brick is rapidly increasing with the growth of cities, in which fire-proof building construction is demanded, but the manufacture does not seem to have kept pace with the demand, as large importations of brick have been made from Puget sound points. A special report by the Provincial Assayer, published in the 1908 Report, shows that there are unlimited clay deposits available, but that the brick-yards of the Province are, for the most part, worked on rather primitive lines, and that the price of even the cheapest class of red brick is such as to invite serious competition from concrete in building operations. The actual figures of production cannot be obtained from the manufacturers for publication, but, as nearly as can be estimated, the number of red brick produced in the Province during the past year was about 40,000 M.

Fire-brick and Fire-clay. The fire-brick plant at Comox has not been in operation. The Vancouver Fire-clay Company's plant at Clayburn has been somewhat remodelled, and is now producing a brick of much higher class and of more uniform grade. The deposits consist of clays of various qualities—described in Report of 1908—and the product varies from a superior quality of common or building brick up to a good quality fire-brick and fire-tile. The Clayburn Company manufactured last year over $35,000 worth of fire-brick, and over $105,000 worth of pressed front brick, as well as other products.

Pottery and Drain Pipe. The B. C. Pottery Co. at Victoria West derives its supply of fire-clay chiefly from the coal-mines of the Canadian Collieries Co., and manufactures drain- and sewer-pipe, chimney-tiles, etc., the sales for the year being chiefly of drain-pipe, and amounting to over $125,000. The company has recently opened up a shale quarry on the West Coast of Vancouver Island, the product of which can be and is used in the manufacture of sewer-pipe.

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, Raymond & Sons have three kilns in operation, and there are kilns on Saanich arm. On Texada island—in addition to the old plant at Marble bay—a new and extensive plant has been erected at Blubber bay. The limestone being used is of exceptional purity, but in some instances the limestone beds are cut by igneous dykes which have to be rejected and this somewhat increases the costs of quarrying.

Portland Cement. The only company manufacturing cement in the Province is the Vancouver Portland Cement Co., with works at Tod inlet, on the Saanich arm, about twelve miles from Victoria. The capacity of these works at present is about 300,000 barrels a year, and this past year the company manufactured over 260,000 barrels of cement, valued in the neighbourhood of $395,000. The raw materials,

limestone and clay, are quarried on the company's property adjoining the works. The company is at present doubling the capacity of the plant, installing electric power to take the place of, or supplement, the steam plant, and introducing many labour-saving appliances.

Petroleum and Oil Shales.

In the Flathead valley of East Kootenay, where seepages of oil occur and where a great number of oil claims have been taken up, no serious attempt has as yet been made to prove the value of the claims, and the district is in this respect no further advanced than it was four years ago.

In the vicinity of Sooke, Vancouver Island, some oil locations have been made, but have yet to be proved of value; drilling is now in progress.

A deposit of oil-shales has been found on the North Thompson river, which carries a fair percentage of oil, and it is probable that serious attempts will be made to prove the value of the deposits from a commercial point of view, as soon as the Canadian Northern Railway, up the valley, is in operation.

Crushed Rock and Gravel.

Concrete construction has become so extensive on the Coast that companies have been formed to supply suitable material for such work. Near Vancouver harbour four companies have opened up quarries in a granite rock, and have erected crushing and sizing plants and bins for the manufacture of crushed rock for concrete-making and for road-making in Vancouver. The output of these stone quarrying and crushing plants, in the vicinity of Vancouver alone, amounted last year to about 130,000 cubic yards of stone, valued at $175,000.

Near Vancouver and Victoria, companies have been formed for supplying washed sand and gravel, properly screened to size; at least some of those companies have installed a system of mining the gravel by hydraulic streams and the carrying of the product to the screens by the water used.

BUREAU OF MINES.

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WORK OF THE YEAR.

The work of the Bureau of Mines increases, of necessity, year by year, and this growing activity is due to the following causes: the extension of the mining area of the Province, with the proportional increase in the number of mines; the increasing desire of the outside public for the free information which the Bureau supplies with regard to the various mining districts and camps, and the appreciation by the prospector of the fact that he may obtain, gratis, a determination of any rock or mineral which he may send to the Bureau.

The routine work of the office, and the preparation and publication of the Report for the year just ended, followed by the examination in the field of as many of the mines and mining districts as the season would permit, together with the work of the Laboratory and instruction of students, fully occupied the staff for the year. The staff of the Bureau consists of the Provincial Mineralogist, the Provincial Assayer, and a junior assistant in the Laboratory, with a clerk as temporary assistant during the publication of the Report.

Provincial Mineralogist.

After the Report for the preceding year had been issued, the Provincial Mineralogist, with assistants, held an examination at Victoria of candidates for Certificates of Competency as Assayers, which lasted a week, after which he was fully occupied with necessary office work until the season was sufficiently advanced for field-work.

In May, 1910, the Provincial Mineralogist made a trip to the Boundary, attending a meeting, at Grand Forks, of the Western Branch of the Canadian Mining Institute, of which he is chairman, and afterwards proceeded to Midway to make an examination into a reported seam of coal which was being there opened up by a local syndicate. An examination was made of this property, a number of samples being taken, and, after returning to Victoria, a report on the property was made and submitted to the Government.

In June a short trip was made to Mayne island to examine a deposit of volcanic scoriæ, or crude pumice, occurring there. This had been located by prospectors, who thought it was "fossil coke," or coke produced from the burning-over of a coal out-cropping by forest fires; the idea of trying whether it would burn not having occurred to them.

The first long trip of the season, to Tatlayoko lake, the headwaters of the Homathko river, which flows into Bute inlet, was made at the special request of the Government, to determine what the immediate requirements of the district were as regards a direct waggon-road to the Coast, for the transportation of ore and mining supplies.

The investigation was extended to embrace a preliminary survey as to the mineral probabilities of the district, the notes of which will be found under the heading of the Nanaimo Mining Division, in which district the territory is included.

The trip was started on July 11th, the date set by the owners of the claims for the examination of the mineral claims there, and as early as it was probable the snow would be off the claims, which are at a considerable altitude.

It was intended that this trip should be extended from Chilko lake, south-east, along the line of the contact of the Coast granites with the interior sedimentary rocks, to the Lillooet

District; but this was found to be impossible at that season of the year, as the rivers were in highest flood. Consequently, a return had to be made *viâ* Chilcotin and the Cariboo waggon-road, the Provincial Mineralogist returning to Victoria to make his report, while his assistant, Mr. Nation, with the baggage, proceeded to Lillooet.

On August 24th the Provincial Mineralogist left Victoria for Lillooet, arriving there on the 27th. Mr. Nation had a pack-train arranged, so that a start was made from Lillooet on Monday, August 29th. The various mineral claims on Bridge river and its tributaries were examined, after which, from Cadwallader creek, the summit was crossed over to McGillvray creek, when the mines on that creek were visited; then proceeding westward, *viâ* Anderson lake and Pemberton meadows, the Squamish trail was followed to tide-water, a stop being made to look over a group of claims near Green lake, and a return was made to Victoria on September 20th. The notes of this trip will be found under the heading of the Lillooet Mining Division.

Leaving Victoria on September 27th, the Provincial Mineralogist, accompanied by Mr Nation, proceeded to the Portland Canal Mining Division, arriving there on October 3rd, and subsequently making an examination of the more developed properties on Bear river, returning to Victoria on October 22nd, after which the report of the Portland canal trip was prepared and published as Bulletin No. 2, 1910, and is included in this Report under the heading of the Portland Canal Mining Division.

In December, together with the Provincial Assayer and Assistant Assayer, the Provincial Mineralogist held a second examination for assayers in the Government Laboratory.

ASSAY OFFICE.

The following is a summary of the work of the Assay Office of the Bureau for the year 1910, as reported by the Provincial Assayer, Mr. Herbert Carmichael:—

During the year 1910 there were made by the staff in the Government Assay Office 1,941 assays or quantitative determinations, which is slightly in excess of the number made during the previous year; of these, a number were for the Bureau of Mines, or for the Department, for which no fees were received. The fees collected by the office were as follows:—

Fees from assays	$ 673 00
" melting and assaying gold dust and bullion	126 00
" assayers' examinations	275 00
Total cash receipts	$1,074 00
Determinations and examinations made for other Government Departments for which no fees were collected	500 00
Value of assaying done	$1,574 00

The value of gold melted during the year was $15,163, in 39 lots, as against $22,860 in 63 lots in 1909.

Free Determinations.

In addition to the above quantitative work, a large number of qualitative determinations, or tests, were made in connection with the identification and classification of rocks or minerals sent to the Bureau for a report; of these no count was kept, nor were any fees 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, so that the distribution of mineral over the Province may be put on record.

A considerable number of clays were tested during the year; all were found to be of clays of the Glacial age.

A number of tests were made for the Departments of the Government of certain sands, from various parts of the Province, as to their suitability for use in the making of concrete.

EXAMINATIONS FOR ASSAYERS.

REPORT OF HERBERT CARMICHAEL, SECRETARY OF BOARD OF EXAMINERS.

I have the honour, as Secretary, to submit the Annual Report 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 Amendment Act, 1899."

The Act requires that at least two examinations shall be held each year, and such have duly taken place.

Both these examinations were held in the Government Laboratory at Victoria, each occupying a week; the first examination began on May 13th, and the second on December 12th, 1910.

At the first examination the Board consisted of the Provincial Mineralogist, Mr. D. E. Whittaker, Assistant Assayer, and Mr. Robert R. Hedley. At this examination two candidates came up for examination, but both failed to pass the required examination. At the December examination, the Board consisted of the Provincial Mineralogist, the Provincial Assayer, and Mr. D. E. Whittaker, the Assistant Assayer, at which three candidates stood for examination and all successfully passed.

In addition to the three candidates, mentioned above, who successfully passed the examinations, the Board recommended, during the year, the granting of six certificates by exemption, under subsection (2) of section 2 of the Act. In accordance with these recommendations, all these nine certificates have been duly issued by the Honourable the Minister of Mines.

The following is a list, up to December 31st, 1910, of those to whom Certificates of Competency have been issued:—

LIST OF ASSAYERS HOLDING PROVINCIAL CERTIFICATES OF EFFICIENCY UNDER THE "BUREAU OF MINES ACT AMENDMENT ACT, 1899."

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

Under section 2, subsection (1).

Austin, John W.	Prince Rupert.
Baker, C. S. H.	Greenwood.
Barke, A. C.	Greenwood.
Belt, Sam'l Erwin	Greenwood.
Bernard, Pierre	Monte Christo, Wash.
Bishop, Walter	Grand Forks.
Buchanan, James	Trail.
Campbell, Colin	New Denver.
Carmichael, Norman	Clifton, Arizona.
Church, George B	
Cobeldick, W. M.	Scotland.
Collinson, H.	Stewart.
Comrie, George H.	Vancouver.
Crerar, George	
Cruickshank, G.	Moyie.
Day, Athelstan	Dawson.
Dedolph, Ed.	Kaslo.
Dockrill, Walter R.	Chemainus.
Dunn, G. W.	Rossland.
Farquhar, J. B.	Vancouver.
Fingland, John J.	Sandon.
Grosvenor, F. E.	Riondel.
Hannay, W. H	Rossland.
Hart, P. E.	
Hawkins, Francis	Vancouver.
Hawes, F. B.	Ladysmith.
Hook, A. Harry	Greenwood.
Hurter, C. S.	
Irwin, Geo. E.	Vancouver.
John, D.	Haileybury, Ont.
Kiddie, Geo. R.	Observatory Inlet.
King, R.	Greenwood.
Kitto, Geoffrey B.	Ladysmith.
Lang, J. G.	
Langley, A. S.	Crofton.
Ley, Richard N.	

Under section 2, subsection (1)—Concluded.

Lindsay, W. W ..... Rossland.
Lougworth, F. J ..... Greenwood.
Martin, S. J ..... Prince Rupert.
Marsh, Richard ..... Spokane, Wash.
Marshall, H. Jukes. ..... Vancouver.
Marshall, William S ..... Ladysmith.
Miles, Arthur D ....
Mitchell, Charles T ..... Grand Forks.
McCormick, Alan F ..... Ruth, Nevada.
MacDonald, Alex. C ..... Vancouver.
Nicholls, Frank ..... Norway.
O'Sullivan, John ..... Vancouver.
Parker, Robt. H. ..... Rossland.
Parsenow, W. L ..... Victoria.
Perkins, Walter G ..... Basin, Montana.
Pickard, T. D .....
Richmond, Leigh ..... Duncan, B. C.
Robertson, T. R .....
Rodgers, Ch. B ..... Vancouver.
Rombauer, A. B ..... Butte, Mont.
Schroeder, Curt. A .....
Segsworth, Walter ..... Toronto, Ont.
Sharpe, Bert N .....
Sim, Charles John ..... England.
Snyder, Blanchard M .....
Steven, Wm. Gordon .....
Stewart, James W ..... Portland Canal.
Stimmel, B. A ..... Trail.
Sundberg, Gustave ..... Mexico City.
Tally, Robert E ..... Spokane, Wash.
Thomas, Percival W .....
Tretheway, John H .....
Turner, H. A .....
Vance, John F. C. B ..... Vancouver.
Van Agnew, Frank ..... Siberia.
Vaughan-Williams, V. L .... California.
Wales, Roland T .....
Watson, Wm. J ..... Ladysmith.
Welch, J. Cuthbert ..... Butte, Mont.
Wells, Ben T ..... Ladysmith.
West, Geo. G ..... Vancouver.
Whittaker, Delbert E ..... Victoria.
Widdowson, E. Walter ..... Nelson.
Williams, W. A ..... Grand Forks.
Williams, Eliot H ..... Nelson.
Wimberly, S. H ..... Nevada, U. S. A.

Under section 2, subsection (2).

Archer, Allan .....
Brennan, Charles Victor .... Nova Scotia.
Browne, D. J ..... Rossland.
Bryant, Cecil M ..... Vancouver.
Blaylock, Selwyn G ..... Trail.
Burwash, N. A .....
Cartwright, Cosmo T .....
Cavers, Thomas W ..... Rossland.
Clothier, George A ..... Stewart.
Cole, Arthur A ..... Cobalt, Ont.
Cole, G. E ..... Rossland.
Cole, L. Heber ..... Ottawa, Ont.
Conway, E. J .....
Coulthard, R. W ..... Bellevue, Alta.
Cowans, Frederick .....
Dawson, V. E ..... Trail.
Dixon, Howard A ..... Toronto, Ont.
Galbraith, M. T .....
Gilman, Ellis P ..... Vancouver.
Green, J. T. Raoul ..... Blairmore, Alta.
Guess, George A ..... Trail.
Gwillim, J. C ..... Kingston, Ontario.
Heal, John H .....
Hilliary, G. M ..... Idaho, U. S. A.
Holdich, Augustus H ..... England.
Johnston, William Steele .... Lachine, Que.
Kaye, Alexander ..... Vancouver.
Kendall, George ..... Vancouver.
Kilburn, Geo. H .....
Lathe, Frank E ..... Grand Forks.
Lay, Douglas .....
Lewis, Francis B ..... South Africa.
Merrit, Charles P .....
Murphy, C. J .....
Musgrave, William N ..... Mexico City.
Mussen, Horace W ..... Siberia.
McArthur, Reginald E .....
McDiarmid, S. S .....
McGinnis, Wm. C ..... Queen Charlotte Islands.
McLellan, John ..... " "

Under section 2, subsection (2).—Concluded.

McMurtry, Gordon O .....
McNab, J. A ..... Trail.
McPhee, W. B ....
McVicar, John ..... Edmonton, Alta.
Maclennan, F. W ..... Rossland.
Outhett, Christopher ..... Kamloops.
Pemberton, W. P. D ..... Victoria.
Reid, J. A ..... Greenwood.
Ritchie, A. B ....
Rose, J. H ....
Scott, Oswald Norman .....
Shannon, S .....
Sharpe, G. P ..... Midland, Ont.
Sloan, David ..... Three Forks.
Stevens, F. G ..... Mexico.
Sullivan, Michael H ..... Trail.
Sutherland, T. Fraser .....
Swinney, Leslie A. E .....
Thomson, H. Nellis ..... Anaconda, Montana.
Thomson, Robt. W. .....
Watson, A. A ..... Olalla.
Watson, Henry .....
Workman, Ch. W .....
Wright, Richard ..... Rossland.
Wynne, Lewellyn C .....
Yuill, H. H ..... Silverton.

Under section 2, subsection (3).

Carmichael, Herbert ..... Victoria.
(Provincial Assayer.)
Harris, Henry ..... Australia.
Hedley, Robt. R ..... Vancouver.
Kiddie, Thos ..... Vancouver.
Sutton, W. J ..... Victoria.
McKillop, Alexander ..... Vancouver.
Pellew-Harvey, Wm ..... London, England.
Robertson, Wm. F ..... Victoria.
(Provincial Mineralogist.)
Marshall, Dr. T. R ..... London, England.

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

Pinder, W. J ..... Dawson, Y. T.
Thompson, James B ..... Vancouver.

EXAMINATIONS FOR COAL-MINE OFFICIALS.

The "Coal-mines Regulation Act," as now consolidated and amended, provides that all officers of a coal-mining company having any direct charge of work underground shall hold Government Certificates of Competency, which are to be obtained only after passing an examination before a duly qualified Board, appointed for the purpose of holding such examinations, and known as the Managers' Board.

The certificates granted on the recommendation of such Board and the requirements shall be as follows:—

"In no case shall a certificate of competency be granted to any candidate until he shall satisfy the Board of Examiners—

"(*a.*) If a candidate for a manager, that he is a British subject and has had at least five years' experience in and about the practical workings of a coal-mine, and is at least twenty-five years of age; or, if he has taken a degree in scientific and mining training, including a course in coal-mining at a university or mining school approved by the Minister of Mines, that he has had at least four years' experience in and about the practical working of a coal-mine:

"(*b.*) If a candidate for overman, that he has had at least five years' experience in and about the practical working of a coal-mine, and is at least twenty-three years of age:

"(*c.*) If a candidate for shiftboss, fireboss, or shotlighter, that he has had at least three years' experience in and about the practical working of a coal-mine, is the holder of a certificate of competency as a coal-miner, and is at least twenty-three years of age:

"(*d.*) A candidate for a certificate of competency as manager, overman, shiftboss, fireboss, or shotlighter shall produce a certificate from a duly qualified medical practitioner or St. John's or other recognised ambulance society, showing that he has taken a course in ambulance work fitting him, the said candidate, to give first aid to men injured in coal-mining operations.

"For the purposes of this section the experience demanded by such section shall be of such character as the Board shall consider of practical value in qualifying the candidate for the position to which such class of certificate applies.

"Experience had in a mine outside of the Province may be accepted should the Board consider such of equal value."

Any certificate is considered as including that of any lower class.

EXAMINATION FOR MINERS.

In addition to the examinations and certificates already specified as coming under the Managers' Board, 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."

Examinations for a miner's certificate are held each month at each colliery by a Board of Examiners, known as the Miners' Board, and consisting of an examiner appointed by the owners, an examiner elected by the miners of that colliery, and an examiner appointed by the Government.

BOARD OF EXAMINERS FOR COAL-MINE OFFICIALS.

FIRST-, SECOND-, AND THIRD-CLASS CERTIFICATES.

Report of Secretary of Board, Francis H. Shepherd.

I beg to submit the Annual Report covering the transactions of the above Board for the year ending December 31st, 1910.

The Board of Appointment of Examiners consists of Messrs. Andrew Bryden, of Merritt, Chairman; Tully Boyce, of Nanaimo, Vice-Chairman; Thomas R. Stockett, George Williams, and Francis H. Shepherd, of Nanaimo; David Wilson, of Hosmer; and John John, of Wellington.

The meetings are held in the office of the Chief Inspector of Mines at Nanaimo.

Examinations were held for First-, Second-, and Third-class Certificates at Nanaimo, Fernie, Cumberland, and Merritt, on August 16th, 17th, and 18th, 1910.

The total number of candidates was as follows: For first-class, 20 (10 failed); for second-class, 20 (3 failed); for third-class, 38 (8 failed); total, 78.

The above total was as large as at any previous examination, which would emphasize the fact that examinations must be held sufficiently frequent to meet the evidently increasing demand for coal-mine officials. With this fact in view, the Board has appointed May 9th, 10th, and 11th, 1911, as the date of the next examinations, to be held at Nanaimo, Fernie, Cumberland, and Merritt, for First-, Second-, and Third-class Certificates. The fullest information is afforded the intending candidates as to the standard of efficiency required, and copies of previous questions may be had in printed form by applying to the Secretary at Nanaimo.

Our present standard seems to be all that is required to bring out the necessary qualifications, and it may be stated that the general result has been that our certificated officials have given good satisfaction where they have been employed.

The present-day facilities for obtaining technical education are greater than they were a few years ago. Local technical classes have at various times been started at the large mines, but generally failed for lack of financial support, and it would be pertinent to suggest that the Government might subsidise these classes in the interest of greater efficiency, and consequently increased safety.

The correspondence schools, with their excellent text-books, have done much good as a preparatory course to our examinations, but this method must be accompanied by faithful and conscientious application, and it would seem that a combination of these two methods would be preferable.

I append hereto a list of the candidates who successfully passed the examinations in the various classes.

LIST OF SUCCESSFUL CANDIDATES. EXAMINATIONS HELD AUGUST 16TH, 17TH, AND 18TH, 1910.

FIRST-CLASS CANDIDATES.

NAME.	DATE.	No.
Thomas Mordy	September 10th, 1910.	
J. McCulloch	"	
B. L. Thorne	"	
*F. D. Alderson	"	
T. J. Shenton	"	
A. D. Kineman	"	
J. H. McMillan	"	
R. T. Stewart	"	
J. Wallbank	"	
J. D. Thomas	"	

* Dead. Killed at rescue work, Bellevue Mine, Alberta.

LIST OF SUCCESSFUL CANDIDATES. EXAMINATIONS HELD AUGUST 16TH, 17TH, AND 18TH, 1910.—*Concluded.*

SECOND-CLASS CANDIDATES.

NAME.	DATE.	No.
Harry E. Miard	September 10th, 1910.	B 107
David Brown	"	B 108
John Cobden Hughes	"	B 109
Robert John Lee	"	B 110
Frank Jaynes	"	B 111
Andrew McKendrick	"	B 112
Stephen Davies	"	B 113
Joseph Thompson	"	B 114
Wm. Commons	"	B 115
Wm. Newton	"	B 116
Ebenezer Roberts	"	B 117
Watkin Williams	"	B 118
Robert Anderson	"	B 119
Robert Adamson	"	B 120
George Hudson	"	B 121
Howell John	"	B 122
Nathaniel Bevis	"	B 123

THIRD-CLASS CANDIDATES.

NAME.	DATE.	No.
D. McMillan	September 10th, 1910.	C 363
James Brown	"	C 364
Thos. Thomas	"	C 365
Henry Mitchell	"	C 366
A. E. Smith	"	C 367
Wm. R. Puckey	"	C 368
Alex. Dewar	"	C 369
Geo. L. Oswald	"	C 370
Walter Price	"	C 371
David Shanks	"	C 372
Robert Heaps	"	C 373
Alex. Ewart	"	C 374
Jos. Calverly	"	C 375
R. G. Hilton	"	C 376
Richard Garbett	"	C 377
Geo. Harvie	"	C 378
Thos. Bullen	"	C 379
J. T. Sharples	"	C 380
Leroy Taylor	"	C 381
M. Stafford	"	C 382
Robert Reid	"	C 383
Fred Harwood	"	C 384
J. Wm. Makin	"	C 385
Benj. J. Lewis	"	C 386
Robt. McNeill	"	C 387
Peter Millar	"	C 388
M. D. McLean	"	C 389
John Jenkins	"	C 390
Peter Judge	"	C 391
John Brown	"	C 392

Registered List of Holders of Certificates of Competency as Coal-mine Officials.

FIRST-CLASS CERTIFICATES.—SERVICE CERTIFICATES ISSUED UNDER SECTION 39, "COAL MINES REGULATION ACT, 1877."

John Bryden, Victoria.
Edward G. Prior.
Thomas A. Buckley.
Archibald Dick, Government Inspector of Mines.
James Dunsmuir, Victoria.
James Cairns, Comox, Farmer.

FIRST-CLASS CERTIFICATES OF COMPETENCY ISSUED UNDER "COAL MINES REGULATION ACT, 1897."

NAME.	DATE.
Shepherd, Francis H	March 5th, 1881
Honobin, William	May 1st, 1882
Little, Francis D	" 1st, "
Martell, Joshua	" 1st, "
Chandler, William	December 21st, 1883
Priest, Elijah	" 21st, "
McGregor, James	January 18th, 1888
Randle, Joseph	" 18th, "
Matthews, John	" 8th, 1889
Norton, Richard Henry	August 26th, "
Bryden, Andrew	December 30th, "
Russell, Thomas	April 20th, 1891
Sharp, Alexander	October 27th, "
Kesley, John	March 4th, 1892
Wall, William H	May 30th, 1896
Morgan, Thomas	" 30th, "
Wilson, David	" 30th, "
Smith, Frank B	" 30th, "
Bradshaw, George B	June 12th, 1899
Simpson, William G	" 12th, "
Hargreaves, James	February 5th, 1901
Drinnan, Robert G	" 5th, "
Browitt, Benjamin	August 3rd, "
Stockett, Thomas, Jr	" 3rd, "
Pearson, Robert	" 3rd, "
Cunliffe, John	" 3rd, "
Evans, Daniel	" 3rd, "
McEvoy, James	October 17th, 1902
Wilson, A. R	" 17th, "
Simister, Charles	" 17th, "
Budge, Thomas	" 17th, "
Mills, Thomas	" 17th, "
Faulds, Alexander	" 17th, "
Richards, James A.	" 17th, "
McLean, Donald	January 21st, 1905
Wilkinson, Geo	" 21st, "
Wright, H. B	" 21st, "
Coulthard, R. W	" 21st, "
Roaf, J. Richardson	" 21st, "
John, John	" 21st, "
Manley, H. L	" 21st, "

FIRST-CLASS CERTIFICATES ISSUED UNDER "COAL MINES REGULATION ACT FURTHER AMENDMENT ACT, 1904."

NAME.	DATE.
*Alderson, F. D.	September 10th, 1910
Biggs, J. G.	July 22nd, 1908
Bridge, Edward	" 22nd, "
Caufield, B.	May 1st, 1909
Darbyshire, James	November 9th, 1907
Davidson, W. A.	May 1st, 1909
Devlin, Henry	" 1st, "
Elliott, Daniel	November 9th, 1907
Emmerson, Joseph	" 9th, "
Evans, Evan	" 9th, "
France, Thos	" 22nd, 1906
Fraser, Norman	March 4th, 1905
Freeman, H. N.	May 1st, 1909
Galloway, C. F. J.	July 22nd, 1908
Graham, Charles	November 14th, 1905
Graham, Thomas	" 9th, 1907
Gray, James	" 27th, 1909
Heathcote, Elijah	March 4th, 1905
Henderson, Robert	November 27th, 1909
Holden, James	May 1st, "
Jackson, Thos. R.	November 9th, 1907
James, William.	July 22nd, 1908
Keith, Thomas	November 9th, 1907
Kinsman, A. D.	September 10th, 1910
Knox, T. K	July 27th, 1909
Lancaster, W	July 22nd, 1908
Lockhart, Wm.	May 1st, 1909
McCulloch, J.	September 10th, 1910
McGuickie, Thomas.	July 22nd, 1908
McMillan, J. H.	September 10th, 1910
McVicar, Samuel	May 1st, 1909
Millar, John K	November 22nd, 1906
Montgomery, J. S.	May 1st, 1909
Mordy, Thomas.	September 10th, 1910
Newton, John	July 22nd, 1908
Saville, Luther	" 22nd, "
Shanks, John	May 1st, 1909
Shaw, Alex	November 14th, 1905
Shenton, T. J.	September 10th, 1910
Shone, Samuel	May 1st, 1909
Sloan, Hugh	November 27th, "
Smith, Joseph	July 22nd, 1908
Spruston, T. A.	November 7th, 1909
Stevens, L. C	" 27th, "
Stewart, R. T.	September 10th, 1910
Strachan, Robert	March 4th, 1905
Thomas, J. D.	September 10th, 1910
Thorne, B. L.	" 10th, 1910
Wallbank, J.	" 10th, 1910
Williams, Thos. H.	November 22nd, 1906
Wylie, John	July 22nd, 1908

* Killed, Bellevue Mine, Alberta.

FIRST-CLASS CERTIFICATES ISSUED UNDER "COAL MINES REGULATION ACT FURTHER AMENDMENT ACT, 1904."—*Concluded.*

SECOND-CLASS CERTIFICATES OF SERVICE.

NAME.	DATE.	Cer. No.
Corkhill, Thomas	March 4th, 1905	B 7
Morton, T. R	" 4th, "	B 8
Loe, John S	" 4th, "	B 9
Millar, J. K	" 4th, "	B 10
McCliment, John	" 4th, "	B 11
Martin, David	" 4th, "	B 12
Hunt, John	" 4th, "	B 13
Walker, David	" 4th, "	B 14
Short, Richard	" 4th, "	B 15
Powell, William Baden	" 4th, "	B 16
Sharp, James	" 18th, "	B 17
Bryden, Alexander	" 4th, "	B 18

SECOND-CLASS CERTIFICATES OF COMPETENCY ISSUED UNDER "COAL MINES REGULATION ACT FURTHER AMENDMENT ACT, 1904."

NAME.	DATE.	Cer. No.
Adamson, Robert	September 10th, 1910	B 120
Alderson, F. D	November 29th, 1909	B 100
Anderson, Robert	September 10th, 1910	B 119
Barclay, Andrew	July 29th, 1905	B 25
Bastian, John	November 2nd, 1907	B 42
Bevis, Nathaniel	September 10th, 1910	B 123
Biggs, J.	May 1st, 1909	B 94
Biggs, John G	November 2nd, 1907	B 40
Brace, Thomas	" 27th, 1909	B 96
Bridge, Edward	October 23rd, 1906	B 33
Brown, David	September 10th, 1910	B 108
Brown, John C	October 23rd, 1906	B 39
Bushell, J. P	May 1st, 1909	B 81
Carroll, Henry	July 22nd, 1908	B 62
Caufield, Bernard	October 23rd, 1906	B 30
Cawthorne, L.	May 1st, 1909	B 93
Churchill, James	July 22nd, 1908	B 65
Commons, Wm	September 10th, 1910	B 115
Cook, Joseph	July 22nd, 1908	B 64
Crawford, David	May 1st, 1909	B 88
Cunliffe, T.	" 1st, "	B 78
Daniels, David	November 2nd, 1907	B 53
Darbyshire, James	October 23rd, 1906	B 32
Davies, Stephen	September 10th, 1910	B 113
Devlin, Henry	November 2nd, 1907	B 44
Dunsmuir, John	" 14th, 1905	B 26
Dykes, J. W	May 1st, 1909	B 77
Eccleston, Wm	" 1st, "	B 87
Evans, Evan	March 11th, 1905	B 2
Fairfoyll, R	May 1st, 1909	B 83
Finlayson, James	July 29th, 1905	B 21
Foster, W. R	November 27th, 1909	B 102
France, Thos	" 14th, 1905	B 27
Francis, Enoch	May 1st, 1909	B 86
Francis, James	July 22nd, 1908	B 63
Freeman, Henry N	November 2nd, 1907	B 45
Gardner, John	July 22nd, 1908	B 68
Gillespie, Hugh	" 29th, 1905	B 24
Gillespie, John	October 23rd, 1906	B 36
Graham, Chas	March 4th, 1905	B 1
Gray, David	May 1st, 1909	B 76
Henderson, Robert	July 22nd, 1908	B 60
Howells, N	November 27th, 1909	B 97
Hudson, George	September 10th, 1910	B 121
Hughes, John C.	" 10th, "	B 109

SECOND-CLASS CERTIFICATES OF COMPETENCY ISSUED UNDER "COAL MINES REGULATION ACT FURTHER AMENDMENT ACT, 1904."—*Concluded.*

NAME.	DATE.	Cer. No.
Jackson, Thos. R	March 4th, 1905	B 5
James, David	November 2nd, 1907	B 58
Jarrett, Fred	May 1st, 1909	B 84
Jaynes, Frank	September 10th, 1910	B 111
John, Howell	" 10th, "	B 122
Johnson, Moses	May 1st, 1909	B 75
Jones, William	July 29th, 1905	B 20
Jones, William T	" 22nd, 1908	B 66
Jordon, Thos	November 27th, 1909	B 104
Lancaster, William	" 2nd, 1907	B 50
Lee, Robert John	September 10th, 1910	B 110
Lockhart, William	October 23rd, 1906	B 34
Massey, H	November 27th, 1909	B 99
Matusky, A	May 1st, "	B 91
Mazay, W. J	November 27th, "	B 101
Merryfield, William	July 22nd, 1908	B 61
Miard, Hy. E	September 10th, 1910	B 107
Middleton, Robert	July 22nd, 1908	B 72
Monks, James	November 2nd, 1907	B 55
Morgan, John	" 2nd, "	B 43
Morris, John	July 22nd, 1908	B 67
Morton, Robert W	" 22nd, "	B 59
Musgrove, J	May 1st, 1909	B 90
McFegan, W	November 27th, "	B 106
McGuckie, Thomas M	October 23rd, 1906	B 35
McKelvie, J	May 1st, 1909	B 92
McKendrick, And	September 10th, 1910	B 112
McKinnell, David	October 23rd, 1906	B 37
McPherson, James E	July 22nd, 1908	B 73
Nellist, David	March 4th, 1905	B 6
Newton, John	October 23rd, 1906	B 31
Newton, Wm	September 10th, 1910	B 116
O'Brien, George	May 1st, 1909	B 82
Ovington, John	November 2nd, 1907	B 52
Parkinson, T	May 1st, 1909	B 80
Parnham, Charles	November 2nd, 1907	B 49
Rankin, Geo.	" 27th, 1909	B 103
Reid, Thomas	July 29th, 1905	B 23
Richards, Thomas	November 2nd, 1907	B 57
Rigby, John	July 29th, 1905	B 29
Roberts, Ebenezer	September 10th, 1910	B 117
Robinson, William	July 22nd, 1908	B 69
Rogers, George	May 1st, 1909	B 79
Russell, Daniel	November 2nd, 1907	B 41
Russell, John	" 2nd, "	B 47
Saville, Luther	" 2nd, "	B 51
Shaw, Alex	July 29th, 1905	B 19
Somerville, Alex	March 4th, "	B 4
Spruston, Thos. A	November 2nd, 1907	B 46
Stewart, J. M	May 1st, 1909	B 95
Stockwell, William	November 2nd, 1907	B 56
Thomas, J. B	" 27th, 1909	B 105
Thomas, Joseph D	October 23rd, 1906	B 38
Thompson, Joseph	September 10th, 1910	B 114
Tonge, Thomas	July 22nd, 1908	B 71
Vanhulle, Peter	November 2nd, 1907	B 54
Virgo, J	May 1st, 1909	B 89
Watson, Adam G	November 14th, 1905	B 28
Webber, John Frank	March 4th, "	B 3
Wesnedge, W	November 27th, 1909	B 98
White, John	" 2nd, 1907	B 48
Williams, Watkin	September 10th, 1910	B 118
Wilson, Thomas	July 22nd, 1908	B 74
Wilson, W	" 22nd, "	B 70
Worthington, Joseph	May 1st, 1909	B 85
Wyllie, John B	July 29th, 1908	B 22

THIRD-CLASS CERTIFICATES ISSUED UNDER "COAL MINES REGULATION ACT FURTHER AMENDMENT ACT, 1904."

NAME.	DATE.	Cer. No.
Adamson, R.	May 1st, 1909	C 323
Almond, Alex	October 1st, 1907	C 252
Almond, W.	July 22nd, 1908	C 286
Baggaley, J.	" 22nd, "	C 300
Barlow, B. R.	May 1st, 1909	C 337
Barnes, B. J.	" 1st, "	C 346
Beeton, D. H.	" 1st, "	C 338
Biggs, John	March 4th, 1905	C 210
Birchell, Richard	October 1st, 1907	C 266
Blewett, Ernest	July 22nd, 1908	C 298
Bradley, William	" 22nd, "	C 291
Bridge, Edward	" 29th, 1905	C 223
Briscoe, F.	" 22nd, 1908	C 309
Brown, David	November 1st, 1909	C 348
Brown, James	September 10th, 1910	C 364
Brown, John	" 10th, "	C 392
Brown, Thomas	July 22nd, 1908	C 278
Brownrigg, J. H.	" 22nd, "	C 276
Bullen, Thomas	September 10th, 1910	C 379
Bushell, Jas. P	October 1st, 1907	C 264
Calverly, Joseph	September 10th, 1910	C 375
Catchpole, Charles	July 29th, 1905	C 227
Caufield, J.	May 1st, 1909	C 321
Cheetham, Ben	July 22nd, 1908	C 311
Clifford, William	" 22nd, "	C 313
Commons, William	" 22nd, "	C 304
Cooke, Joseph	March 4th, "	C 209
Crawford, David	" 4th, "	C 208
Cunningham, G. F	November 11th, "	C 229
Cunliffe, Thos	October 1st, 1907	C 265
Davis, William	May 1st, 1909	C 339
Dewar, Alex.	September 10th, 1910	C 369
Devlin, Edward	October 23rd, 1905	C 241
Doherty, J. J.	May 1st, 1909	C 340
Dollemore, F. J. G.	" 1st, "	C 328
Doney, John	March 4th, 1905	C 211
Douglas, D. B	October 23rd, 1906	C 235
Dykes, Joseph W.	" 1st, 1907	C 24
Evans, D.	July 22nd, 1908	C 28
Ewart, Alex.	September 10th, 1910	C 374
Francis, James	October 1st, 1907	C 25
Freeman, H. G	November 14th, 1905	C 230
Frew, A.	" 27th, 1909	C 360
Frodsham, Vincent	July 22nd, 1908	C 282
Garbett, Richard	September 10th, 1910	C 377
Graham, John	July 22nd, 1908	C 292
Hallinan, W.	May 1st, 1909	C 343
Halsall, J.	July 22nd, 1908	C 307
Harwood, Fred	September 10th, 1910	C 384
Harvie, George	" 10th, "	C 378
Hayes, Edward	May 1st, 1909	C 320
Heaps, Robert	September 10th, 1910	C 373
Hilley, Fred.	July 22nd, 1908	C 290
Hilton, R. G.	September 10th, 1910	C 376
Hodson, R. H	March 4th, 1905	C 216
Horrocks, A. G.	May 1st, 1909	C 324
Horwood, S.	July 22nd, 1908	C 312
Howells, Nathaniel	May 1st, 1909	C 316
Hutchison, Ben	November 14th, 1905	C 232
Hutchison, F.	" 27th, 1909	C 358
Jarrett, Fred. J.	October 1st, 1907	C 256
Jaynes, Frank	July 22nd, 1908	C 277
Jemson, J. W	March 4th, 1905	C 205
Jenkins, John	September 10th, 1910	C 390
John, Howel	July 22nd, 1908	C 305
Johnson, Moses	October 1st, 1907	C 258

THIRD-CLASS CERTIFICATES ISSUED UNDER "COAL MINES REGULATION ACT FURTHER AMENDMENT ACT, 1904."—*Continued.*

NAME.	DATE.	Cer. No.
Jones, W. T	March 4th, 1905	C 221
Joyce, W	November 27th, 1909	C 361
Judge, Peter	September 10th, 1910	C 391
Kirkeberg, H. S	November 27th, 1909	C 350
Lancaster, William	October 23rd, 1906	C 243
Lane, Joseph	" 1st, 1907	C 254
Leeman, T	May 1st, 1909	C 345
Lewis, Benj. J	September 10th, 1910	C 386
Liddle, John	July 29th, 1905	C 228
Makin, J. Wm	September 10th, 1910	C 385
Malone, Patrick	October 1st, 1907	C 247
Mansfield, A	May 1st, 1909	C 336
Manson, T. H	July 22nd, 1908	C 280
Marsh, John	October 1st, 1907	C 270
Mason, J	July 22nd, 1908	C 297
Massey, Henry	May 1st, 1909	C 317
Mather, Thomas	July 22nd, 1908	C 293
Mattishaw, Samuel K	October 23rd, 1906	C 237
Matusky, Andrew	" 1st, 1907	C 259
Mawson, J. T	November 27th, 1909	C 359
Merrifield, George	October 23rd, 1906	C 239
Merrifield, William	" 23rd, "	C 236
Millar, Peter	September 10th, 1910	C 388
Mitchell, C	May 1st, 1909	C 322
Mitchell, Henry	September 10th, 1910	C 366
Monks, James	November 14th, 1905	C 234
Moore, George	October 23rd, 1906	C 242
Moore, J	May 1st, 1909	C 335
Moreland, Thomas	July 22nd, 1908	C 299
Morgan, John	" 29th, 1905	C 224
McAlpine, John	March 4th, "	C 217
McBroom, Al	July 2nd, 1908	C 287
McCulloch, James	May 1st, 1909	C 315
McFegan, W	" 1st, "	C 319
McGarry, M	" 1st, "	C 326
McGuckie, Thomas	July 29th, 1905	C 226
McKelvie, J	" 22nd, 1908	C 285
McLean, M. D	September 10th, 1910	C 389
McLellan, William	March 4th, 1905	C 219
McLeod, James	July 22nd, 1908	C 296
McMillan, D	September 10th, 1910	C 363
McNay, Carmichael	July 22nd, 1908	C 306
McNeill, Adam T	" 22nd, "	C 281
McNeill, Robert	September 10th, 1910	C 387
Neen, Joseph	November 27th, 1909	C 352
Nelson, Horatio	October 1st, 1907	C 263
O'Brien, Charles	November 27th, 1909	C 349
Oswald, Geo. L	September 10th, 1910	C 370
Owen, T	May 1st, 1909	C 347
Parker, L	" 1st, "	C 341
Parkinson, T	July 22nd, 1908	C 289
Perry, James	March 4th, 1905	C 215
Philips, T	November 27th, 1909	C 356
Pickup, A	July 22nd, 1908	C 310
Picton, W	May 1st, 1909	C 333
Plank, Samuel	November 14th, 1905	C 233
Price, Walter	September 10th, 1910	C 371
Puckey, Wm. R	" 10th, "	C 368
Rallison, R	July 22nd, 1908	C 279
Rankin, George	" 22nd, "	C 275
Ratcliffe, Thomas	October 1st, 1907	C 253
Raynor, Fred	" 1st, "	C 257
Reid, Robert	September 10th, 1910	C 383
Reilly, Thomas	July 22nd, 1908	C 303
Renny, Jas	November 27th, 1909	C 354
Richards, James	" 1st, 1907	C 249

THIRD-CLASS CERTIFICATES ISSUED UNDER "COAL MINES REGULATION ACT FURTHER AMENDMENT ACT, 1904."—*Concluded.*

NAME.	DATE.	Cer. No.
Richards, Samuel	October 23rd, 1906	C 244
Rigby, John	July 29th, 1905	C 225
Roberts, E	May 1st, 1909	C 327
Robinson, M	" 1st, "	C 332
Roper, William	July 22nd, 1908	C 274
Russell, Robert	November 27th, 1909	C 351
Rutledge, Edwin	July 22nd, 1908	C 302
Saville, E. O	October 1st, 1907	C 251
Scott, Henry	July 22nd, 1908	C 294
Shanks, David	September 10th, 1910	C 372
Sharp, James	May 1st, 1909	C 325
Sharples, J. T	September 10th, 1910	C 380
Shearer, L	May 1st, 1909	C 330
Shenfield, W	November 27th, "	C 357
Shooter, Joseph	October 1st, 1907	C 261
Shortman, J	May 1st, 1909	C 331
Simister, J. H	November 27th, "	C 353
Simister, W	May 1st, "	C 334
Skelton, Thos	" 1st, "	C 344
Smith, A. E	September 10th, 1910	C 367
Smith, Joseph	March 4th, 1905	C 207
Smith, Thos. J	October 1st, 1907	C 271
Sparks, Edward (C 314 issued in lieu of C 255 destroyed by Fernie fire)	" 1st, "	C 255
Spencer, G	May 1st, 1909	C 329
Sprusten, R. L	November 27th, "	C 355
Spruston, Thomas A	March 4th, 1905	C 206
Stafford, M	September 10th, 1910	C 382
Stewart, James M	October 23rd, 1906	C 240
Stockwell, William	" 23rd, "	C 238
Suik, George	May 1st, 1909	C 318
Taylor, Charles M	March 4th, 1905	C 213
Taylor, Leroy	September 10th, 1910	C 381
Thomas, Thomas	" 10th, "	C 365
Thomas, John B	November 14th, 1905	C 231
Thomas, Joseph	March 4th, "	C 220
Thomas, Warriett	October 1st, 1907	C 273
Thompson, Thomas	" 1st, "	C 267
Thompson, Joseph	" 1st, "	C 269
Thomson, Duncan	March 4th, 1905	C 218
Wallace, Fred	October 1st, 1907	C 260
Watson, Adam G	March 4th, 1905	C 212
Watson, George	July 22nd, 1908	C 288
Watson, William	October 22nd, 1906	C 246
Weeks, John	March 4th, 1905	C 214
White, John	October 22nd, 1906	C 245
Wilcock, J	July 22nd, 1908	C 308
Williams, Watkin	" 22nd, "	C 301
Wilson, Thomas	October 1st, 1907	C 272
Wilson, William	" 1st, "	C 262
Winstanley, H	July 22nd, 1908	C 283
Wintle, Thomas A	" 29th, 1905	C 222
Worthington, J	" 22nd, 1908	C 295

COAL-MINES 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.	Certificate No.	Name.	Date.	Certificate No.
Adam, Robert	Oct. 12, 1904	C 42	Malpass, James	Nov. 7, 1904	C 113
Addison, Thos	Dec. 10, 1904	C 52	Marsden, John	May 3, 1904	C 21
Aitken, James	Oct. 24, 1904	C 44	Marshall, Howard	Dec. 6, 1905	C 127
Alexander, Wm	Feb. 17, 1905	C 72	Matthews, Chas	April 27, 1904	C 9
Allsop, Harry	Oct. 11, 1904	C 34	Miard, Harry E	March 3, 1905	C 76
Ashman, Jabez	Feb. 5, 1907	C 131	Middleton, Robt	Feb. 11, 1905	C 71
Aughinvole, Alex	March 29, 1905	C 89	Miles, Thos	Aug. 10, 1904	C 31
Barclay, Andrew	April 27, 1904	C 19	Miller, Thos. K	Feb. 21, 1905	C 74
Barclay, James	April 27, 1904	C 20	McKenzie, John R	Oct. 12, 1904	C 40
Barclay, John	April 17, 1905	C 111	McKinnell, David	March 29, 1905	C 99
Berry, James	Feb. 11, 1905	C 70	McKinnon, Arch'd	April 3, 1905	C 102
Bickle, Thos	Oct. 11, 1904	C 37	McMillan, Peter	March 29, 1905	C 94
Biggs, Henry	April 10, 1905	C 110	McMurtrie, John	March 29, 1905	C 96
Black, John S	April 3, 1905	C 108	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	March 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	March 29, 1905	C 98	Nellist, David	April 27, 1904	C 13
Clarkson, Alexander	April 27, 1904	C 18	Nelson, James	April 27, 1904	C 16
Collishaw, John	Feb. 7, 1905	C 68	Newton, John	Oct. 12, 1904	C 39
Comb, John	March 23, 1904	C 2	Nimmo, Jas. P	April 3, 1905	C 103
Cosier, Wm	March 29, 1905	C 86	O'Brien, Geo	Feb. 6, 1905	C 66
Courtney, A. W	Nov. 2, 1904	C 45	Pengelly, Richard	Dec. 27, 1904	C 58
Crawford, Frank	April 6, 1904	C 7	Perrie, Jas	March 15, 1905	C 81
Daniels, David	April 27, 1904	C 12	Perry, James	June 13, 1904	C 27
Davidson, David	April 3, 1905	C 106	Pounder, Geo	Oct. 16, 1905	C 125
Davidson, John	March 29, 1905	C 87	Price, Jas	Nov. 8, 1904	C 50
Devlin, Henry	Oct. 12, 1904	C 41	Ratter, Wm	March 29, 1905	C 95
Dobbie, John	Nov. 27, 1905	C 126	Reid, Thos	Nov. 3, 1904	C 47
Dudley, James	March 22, 1905	C 114	Reid, James	March 23, 1904	C 1
Duncan, Thomas	Aug. 29, 1906	C 128	Reid, Wm	Dec. 15, 1904	C 54
Dunlap, Henry	Nov. 21, 1904	C 51	Richards, Thos	April 27, 1904	C 14
Dunn, Geo	Dec. 19, 1904	C 56	Ross, John	April 3, 1905	C 101
Dunsmuir, John	March 29, 1905	C 90	Roughead, George	Jan. 30, 1907	C 130
Eccleston, Wm	March 15, 1905	C 80	Ryan, John	Dec. 28, 1904	C 59
Evans, Evan	March 13, 1905	C 78	Sanders, John W	April 3, 1905	C 107
Evans, W. H	March 14, 1905	C 79	Shenton, Thos. J	July 25, 1904	C 30
Fagan, David	April 6, 1905	C 109	Shepherd, Henry	June 13, 1904	C 26
Farmer, Bernard	Jan. 31, 1905	C 64	Smith, Ralph	March 7, 1905	C 77
Farquharson, John	April 27, 1904	C 17	Smith, Geo	March 29, 1905	C 84
Findlayson, James	June 6, 1904	C 25	Somerville, Alex	March 24, 1904	C 3
Fulton, Hugh T	April 3, 1905	C 105	Stauss, Chas. F	Feb. 9, 1905	C 69
Gibson, Edward	May 30, 1905	C 118	Steele, Jas	March 29, 1905	C 92
Gilchrist, Wm	March 29, 1905	C 85	Stewart, Duncan H	March 28, 1904	C 4
Gillespie, Hugh	April 6, 1904	C 8	Stewart, John	April 3, 1904	C 104
Gillespie, John	April 6, 1904	C 5	Stewart, Daniel W	May 16, 1904	C 23
Gould, Alfred	April 17, 1906	C 112	Stoddart, Jacob	Feb. 21, 1905	C 73
Green, Francis	Oct. 11, 1904	C 38	Strachan, Robt	April 27, 1904	C 15
Handlen, Jas	June 16, 1904	C 122	Strang, James	April 27, 1904	C 10
Harmison, Wm	Feb. 3, 1905	C 65	Thomas, John	March 29, 1905	C 97
Haworth, Geo	March 29, 1905	C 88	Tunstall, James	June 15, 1904	C 121
Hescott, John	Jan. 16, 1905	C 62	Vass, Robt	Dec. 12, 1904	C 53
Hutchison, Archie	Sept. 8, 1905	C 123	Vater, Charles	April 6, 1904	C 66
John, David	Nov. 8, 1904	C 49	Walkem, Thos	Dec. 16, 1904	C 55
Johnson, Geo	May 9, 1904	C 124	Webber, Chas	Sept. 13, 1904	C 32
Johnson, Wm. R	March 1, 1905	C 75	Webber, Charles F	Sept. 13, 1904	C 33
Kerr, Wm	March 29, 1905	C 91	Whiting, Geo	May 29, 1905	C 117
Lander, Frank	Jan. 9, 1905	C 61	Wilson, Austin	Feb. 7, 1905	C 67
Landfear, Herbert	Jan. 27, 1905	C 63	Wilson, Thos	April 27, 1904	C 11
Lewis, Thos	Oct. 11, 1904	C 35	Woodburn, Moses	March 29, 1905	C 83
Lockhart, Wm	Jan. 6, 1905	C 60	Yarrow, Geo	Nov. 3, 1904	C 46

CARIBOO DISTRICT.

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CARIBOO AND QUESNEL MINING DIVISIONS.

REPORT BY GEORGE WALKER, GOLD COMMISSIONER.

I have the honour to submit herewith my report on the progress of the mining industry in the Cariboo Mining Division for the year ending 31st December, 1910.

THE CARIBOO MINING DIVISION.

I regret to report that the output of the division has fallen slightly below that of 1909. However, this is not owing to lack of interest or activity, but, the operations carried on at present being almost exclusively hydraulic, is due rather to the light snowfall experienced during the winter, followed by a consequent scarcity of water, and, therefore, a short season of piping.

There are in good standing in this division at the present time 306 placer-mining leases. Of this number, about thirty-five were in active operation during the mining season, which, with about twenty-three placer claims actively operated, employed in the neighbourhood of 450 men, and produced approximately $200,000 in gold. In addition to this, there was considerable individual placer-mining done, concerning which little or no information is available.

Construction has progressed on the properties of the Lightning Creek Gold Gravels and Drainage Co., Ltd.; the Lightning Creek (British Columbia) Hydraulic Mining Co., Ltd.; the West Canadian Deep Leads, Ltd.; and several other companies who are installing large and expensive plants, and it may be expected that, in the near future, a number of new and important producers will be added to the list.

During the year fifty-seven mineral claims were recorded, which make a total of about 110, held in good standing. Ore carrying galena and gold values was obtained from some of these prospects. However, under present conditions, with transportation charges at the rate of $160 a ton to Ashcroft (the nearest railway point), the operation of these properties is impracticable. With railway transportation, however, these properties, as well as considerable placer ground which would not pay under prevailing conditions, might be profitably worked.

WILLIAMS CREEK AND TRIBUTARIES.

The *Mucho Oro* hydraulic mine on Stouts gulch, operated by Mr. John Hopp, was worked with the same equipment as in previous years, but the shortness of the water season greatly lessened the amount of gravel moved.

On the *Forest Rose* hydraulic mine, situated on the east bank of Williams creek, near Barkerville, and also operated by Mr. Hopp, the same plant, and approximately the same number of men, were employed as last year; but with the decreased water-supply, the output suffered a proportionate decrease.

Another of Mr. Hopp's properties, the *Lowhee* hydraulic mine, situated on Lowhee creek, was operated during the season with the new plant installed last fall (a description of which was given in last report), resulting in the moving of approximately 200,000 cubic yards of

gravel. On this property, during the year, the main ditch was extended from the penstock to Watson gulch, a distance of three-fifths of a mile; and a dam was constructed on Lowhee creek, below the gulch mentioned, 320 feet in length by 20 feet high, to make a storage reservoir. A ditch two miles long and 3½ feet wide at bottom was constructed from Jack of Clubs creek to the Ella lake reservoir, and the Ella lake dam was built up to a total height of 41 feet. Another ditch 1,250 feet long and 3 feet wide at the bottom was built from Lightning creek to the Ella lake summit, with the object of taking the water from this creek and storing it also in the Ella lake reservoir. A new double-compartment sluice, with 3-foot and 4-foot compartments, 1,860 feet in length, has been constructed ready for next season's operations.

The new plant installed last year on the Mosquito Creek hydraulic mine, also operated by Mr. Hopp, proved very satisfactory. During the season's run approximately 50,000 cubic yards of gravel was moved. The new sluice-flume was extended to Willow river, and now has a total length of 1,700 feet.

I am informed by Mr. Hopp that the result of the season's operations on his various properties was most satisfactory, considering the short hydraulic season, and that the outlook for future operations is most encouraging.

LIGHTNING CREEK AND TRIBUTARIES.

On the property of the Lightning Creek Gold Gravels and Drainage Co., Ltd., at Wingdam, on Lightning creek, which is already equipped with water-power, as well as an auxiliary steam plant, air-compressors, Keystone drills, centrifugal and Cornish pumps, electric lights, etc., the company has added 140 horse-power to its boiler capacity and has installed a three-stage turbine pump with a daily capacity of 2,000,000 gallons, which is considered ample to handle the heaviest water likely to be encountered. This company is sinking shafts with the object of working out the bed-rock gravel, which, in the early days, was found to be very rich. It employed about twenty men during the year.

The Lightning Creek (British Columbia) Hydraulic Mining Co., Ltd., is running an 8 by 8-foot flume-tunnel from Spruce canyon through a rock spur to Amador flat, a distance of some 600 feet. A shaft will be sunk to connect with the upper end of this tunnel and a hydraulic pit opened, in which hydraulic elevators will be placed, the object being to work as a hydraulic mine some 5,500 feet of the bed of Lightning creek. A ditch, with a capacity of 2,000 miners' inches, has been completed, giving a head of about 300 feet.

Work of a prospecting nature, consisting of 220 feet of tunnelling, a 10-foot shaft, and 100 feet of ground-sluicing, was done on Lease No. 1,258, Dunbar flat, owned by W. M. Ogden.

During the year the Venture Mining Co., operating on Peters creek, sunk a line of bore-holes cross-sectioning the channel and thereby determining the depth and location of the deep run. This cross-section proved the bed-rock tunnel, which was run out from the shaft last year, to be several feet too deep. An upraise was therefore made from this tunnel into the gravel, where a "prospect" was obtained, which would indicate about 5 oz. to the set. The drive was then continued for several sets, rising up on the left-hand rim, then turning to the right and following the left-hand rim down-stream for about 40 feet. The company was then preparing to crosscut the channel from this point, when, owing to an accident to the wheel, operations had to be temporarily suspended; work will be resumed in the early spring.

The property of the Wormwold Creek Mining Co., Ltd., consists of four creek leases on Wormwold creek and one on the west branch of the creek. The works of the company are located about one mile from the mouth of Wormwold creek, and are reached by waggon-road from Beaver pass, a distance of about three miles. An overshot water-wheel 21 feet by 4 feet furnishes power to operate the hoist, as well as a 12¼-inch Cornish pump. Shaft No. 1 was

sunk to a depth of 85 feet and then abandoned, owing to the large quantity of slum and water encountered. Shaft No. 2 has been sunk 135 feet to bed-rock with several drives, run for short distances therefrom, but the deep ground was not reached. A tunnel is now being run into the west branch of Wormwold creek to tap this ground. Two hundred and ninety feet have been driven to date, and it is estimated 150 feet more will reach the objective point. This work will not only prospect the west branch, but will also drain off a portion of the underground water, thus aiding work in the shafts. Upwards of $40,000 has been expended on this property to date.

The Four Leaf Clover Hydraulic Mining Co. has acquired four creek leases on Perkins gulch, and has built a ditch, about one-quarter of a mile long, 3 feet wide on bottom, with a one-to-one slope of bank, and also a small reservoir. A hydraulic head of 150 feet is secured, and it is expected that piping and a No. 1 monitor will be installed in the early spring.

The Kwong Lung Kee placer claim on Last Chance creek has been acquired by H. H. Jones, who has constructed about three miles of ditch, thus bringing water from Poorman and Van Winkle creeks, and securing a pressure-head of 235 feet. Six hundred feet of sluice was built and a No. 3 hydraulic plant installed. Mr. Jones also acquired the *Strand* property on Donovan creek; in connection with which a 2¾-mile ditch has been run during the year, tapping Anderson and intermediate creeks. About 500 feet of 30-inch sluice was also built and considerable additional pipe installed.

Stewart Creek.

On Lease No. 317, situated on Stewart creek, and owned by W. J. Southam, a ditch about one mile long, with a 4-foot bottom and one-to-one slope, has been run; a 40-inch sluice built; and a No. 5 hydraulic plant, with a 220-foot pressure-head, installed.

Little Valley Creek.

The work of the West Canadian Deep Leads, Ltd., on Little Valley creek, has progressed steadily during the year. This company is sinking a three-compartment shaft to reach bed-rock at a depth of 260 feet—the position, depth, and gradient of a presumed channel having been established by means of Keystone drill cross-sections. The shaft, which contains two hoisting compartments, each 4 feet 4 inches by 6 feet, and one pumping compartment, 7 feet 6 inches by 6 feet in the clear, has attained a depth of 120 feet. A great deal of water was encountered in the surface gravels; but at a depth of 110 feet an impervious stratum of hard-pan was struck, below which no great water difficulty was experienced, Cameron sinking-pumps being employed throughout. However, owing to the steam-extravagance of the sinking-pumps, it was decided to put in a permanent plant; for this purpose a cross-compound Corliss pumping-engine, operating two 18-inch Cornish pumps, was obtained, and is now being installed. Sinking will be resumed about the first of the new year, employing approximately thirty men.

The usual hydraulic operations were continued during the season on the properties of the China Creek Hydraulic, the Nugget Gulch, the Waverley, and several other companies, with satisfactory results, considering the short season of water; no development work was done on these properties or new plant added, neither being required.

Quesnelle Hyd. Mng. Co.'s Camp—20-Mile Creek and Quesnel River.

OFFICE STATISTICS—CARIBOO MINING DIVISION.

Free miner's certificates issued to individuals	367
" " " companies	8
Mineral claims recorded	57
Placer " "	9
" " re-recorded	35
Miner's leave of absence	25
Certificates of work issued	18
" improvements issued	2
Placer-mining leases issued	26
Water licences issued	1
Conveyances and other documents of title recorded	68

General Revenue Receipts.

Free miner's certificates	$ 2,875 75
Mining receipts, general	18,500 22
Leaves of absence	62 50
Land sales	660,728 85
Land revenue	1,060 00
Revenue tax	3,594 00
Real-property tax	3,930 13
Personal-property tax	2,297 45
Wild-land tax	33,961 33
Income-tax	123 79
Licence, spirits	3,342 50
" trades	760 00
" game	150 00
J. P. Court fines	607 50
Miscellaneous	5,285 62
Total	$737,279 64

QUESNEL MINING DIVISION.

REPORT BY C. W. GRAIN, MINING RECORDER.

I have the honour to submit herewith my report on mining operations in the Quesnel Mining Division of the Cariboo District for the year ending December 31st, 1910. The past year has been much the same as the year before as regards revenue; as regards actual mining, rather less work has been carried on than was the case last year. The principal work carried on in the district this year was construction or preparatory work—that is, dams, ditches, and fluming and work connected therewith.

In the Quesnel Forks District, which in former years provided the main revenue of the division, I regret to report that actual mining work was practically at a standstill. No work was done on the properties of the Cariboo Gold Mining Company, situated on the South fork of the Quesnel river; the company in former years employed a large staff of men.

SPANISH CREEK.

On this creek, J. B. Hobson, who for many years has operated in this division, started work on his properties on Spanish and Black Bear creeks. He informs me that this summer he put in a dam below the mouth of Black Bear creek at a cost of between $5,000 and $6,000, and constructed over 1,000 feet of flume, to bring water on to the properties owned by him

in that vicinity. Next year he intends putting in 4,000 feet more flume and pipe, which will enable him to work his ground, which fronts on to the North fork of the Quesnel river, west of Spanish creek.

SNOW-SHOE CREEK.

The *Luce* hydraulic operated as usual, employing a force of ten men. Mr. Graham, part owner of this mine, informs me "that the water season was the shortest for many years. With two weeks' piping we cleaned up about 100 oz. We are putting in this fall a small dam to conserve the water-supply; if this expenditure yields satisfactory results, we contemplate installing next year a comprehensive system of water-storage." There were no other hydraulic plants operated in this district this year, but there was some desultory prospecting both for quartz and gravel going on.

KEITHLEY CREEK.

This creek in former years generally made a good showing, but this year practically nothing was done, partly owing to the shortage of water and partly to the difficulty in getting in supplies—drawbacks which tend to discourage prospectors—so that practically the only real mining work done was that done in a desultory way by the Chinamen.

At and near Twenty-mile creek, on the Quesnel river, H. W. DuBois, manager of the Quesnelle Hydraulic Gold Mining Company, continued his construction work, consisting of dams, ditches, flumes, and pipe-lines, which, in fact, was the chief mining work done in this district this year. This company has had a large staff of men employed in construction work for the last year or more; but as yet they have done very little as regards real mining, all their energies being expended in getting in shape for the coming season. I have not entered into details regarding the work of this company, as Mr. DuBois, their engineer, informed me that he was handing in a report to Mr. Walker, Gold Commissioner, which I presume will appear in Mr. Walker's report.

In the Horsefly river country a small local company took hold of the property formerly worked by the Horsefly Gold Mining Company, and, employing a staff of twelve men, started in by repairing twenty-six miles of ditch connected with the property and six miles of the old *Ward* ditch to act as an auxiliary, also relaying considerable of the old pipe-line. E. I. West, who was in charge of the work, informs me "that we worked two No. 6 monitors, put in 500 feet of flume, moved about 15,000 yards of gravel, and opened up a new pit; by so doing we gained 25 feet more grade and still retained the same height of dump. In opening up the new pit, and generally cleaning up, we recovered about $3,000." Mr. West also informs me that they are now in good shape for next season, feeling very well satisfied with the present season's work and very hopeful for the result of the coming season.

LODE-MINING.

As regards lode-mining, eighty-four mineral claims were staked in the vicinity of the Quesnel river; these properties are mostly copper-bearing properties. I have seen good specimens from some of the claims, and I understand that some very favourable assays have been made; but, as practically no work has yet been done on these claims, it is too early to say anything definite concerning them.

In the Clearwater country a good deposit of mica has been discovered and eleven claims staked, but I have been unable to obtain any very definite information concerning these.

In conclusion, I may say that, although, as regards revenue and work done, this season shows very little improvement over last season, yet the outlook for the season of 1911 is far brighter, and more interest is being taken in this part of the country by outside parties. I think that when railroads get into this country, with cheaper transportation, this division will show that it is by no means worked out, either as regards placer or mineral mines.

QUESNEL MINING DIVISION.

NOTES BY THE PROVINCIAL MINERALOGIST.

The Quesnelle Hydraulic Gold Mining Company's installation, just being completed at Hydraulic, on Twenty-mile creek, where it flows into the Quesnel river, is one of the most extensive to be installed in British Columbia, and as such is deserving of special notice. The following description of the enterprise, prepared from notes and data kindly furnished by Mr. Howard W. DuBois, the general manager, has been written by Mr. E. Jacobs:—

Q. H. G. M. Co.'s Enterprise.

The Quesnelle Hydraulic Gold Mining Company, which is financed by Philadelphia and New York capitalists, has in hand one of the most important hydraulic gold-mining enterprises yet undertaken with the object of working the auriferous gravels occurring in the Cariboo District. It owes its inception primarily to Mr. Howard W. DuBois (of the firm of DuBois & Mixer, mining engineers, Philadelphia, Pa.), who, while making investigations relative to the occurrence of platinum in Quesnel Mining Division of Cariboo District, "discovered" a source of water-supply on upper Swift river that seemingly had been overlooked by others, and ascertained that it would be practicable to bring this water on to deposits of gravel on the Quesnel river slope, since acquired under lease from the Provincial Government by the company now energetically engaged in preparing to recover gold therefrom. The company has been organized under the laws of the State of Delaware, U. S. A.; it has a paid-up capital of $1,750,000, and its head office is in the City of Dover, Delaware.

The chief problem was not to find gold, but water, and this has been done. The widespread occurrence of gold in the gravel-deposits of Quesnel Mining Division had long been known, but the difficulty of getting sufficient water for hydraulicking these gravels on a large scale had also been recognised. Mr. DuBois found, though, when on one of his exploratory trips, that the quantity of water flowing in the upper part of Swift river, where it had escaped the notice of others interested in hydraulic mining in the district, is much larger than lower down the river, in the vicinity of ground suitable for hydraulic placer-mining. The explanation of the circumstance that heretofore this stream had always been regarded as too small to be taken into consideration as a source of supply adequate for large operations in gravel-washing, lies in the fact that when the water reaches the gravel country most of it sinks into the gravel, the stream consequently becoming comparatively insignificant. It was found, on the other hand, that before the water reaches the gravel country the stream has a flow varying from 10,000 to 30,000 miners' inches, with an average through the season of fully 15,000 miners' inches. Gauging, with a current meter, during three seasons indicated that the minimum flow of water is considerably in excess of the quantity required to be diverted for hydraulic-mining purposes. The great advantage that would result from using water from this source for hydraulicking the big gravel-beds bordering Quesnel river was realised, and upon taking levels it was found that physical conditions were favourable to this water being brought over the divide and utilised at a cost that, although large, could hardly be considered prohibitive.

The requisite financial arrangements having first been made, about three years were occupied in prospecting the gravels about Twenty-mile creek and surveying the country between Quesnel and Swift rivers. Eventually the larger enterprise was launched, and the work now approaching completion was undertaken. There were many preliminary difficulties to be overcome, and prominent among these were—(1) the long distance the scene of the enterprise is from a railway (more than 200 miles by waggon-road), and (2) the entire lack of waggon-roads in that part of the district. The magnitude of this latter obstacle to speedy progress will be made evident when it is stated that about forty miles of waggon-road has been

constructed by the company, at a cost of nearly $60,000, in order to make different parts of its property and works accessible from the Government road system established in other parts of the district. Apart from the prospective importance of this enterprise to the company, the exploratory and development work done, together with the extensive road-construction undertaken, is of much value to the district as a whole.

Mr. DuBois, who is the company's general manager and engineer, is quite confident that the enterprise will be successful. He maintains that it possesses the four chief features essential to profitable hydraulic mining, namely—(1) an abundance of water under adequate head; (2) extensive dumping facilities; (3) ample grade for sluicing; and (4) gold in the gravel in payable quantity. With only a very moderate supply of water, Mr. John B. Hobson has demonstrated what can be done in hydraulicking the low-grade gravels of this district, so there is little room for doubt that, with an abundant supply of water available, such as is possessed by the Quesnelle Hydraulic Gold Mining Company, success seems assured. By the time this company's water system shall have been completed, there will have been expended on the whole undertaking nearly $1,000,000, which comparatively large expenditure would not have been justified had it not been for the favourable results obtained from the outlay of a large sum of money in preliminary investigations and tests previous to the construction work being commenced.

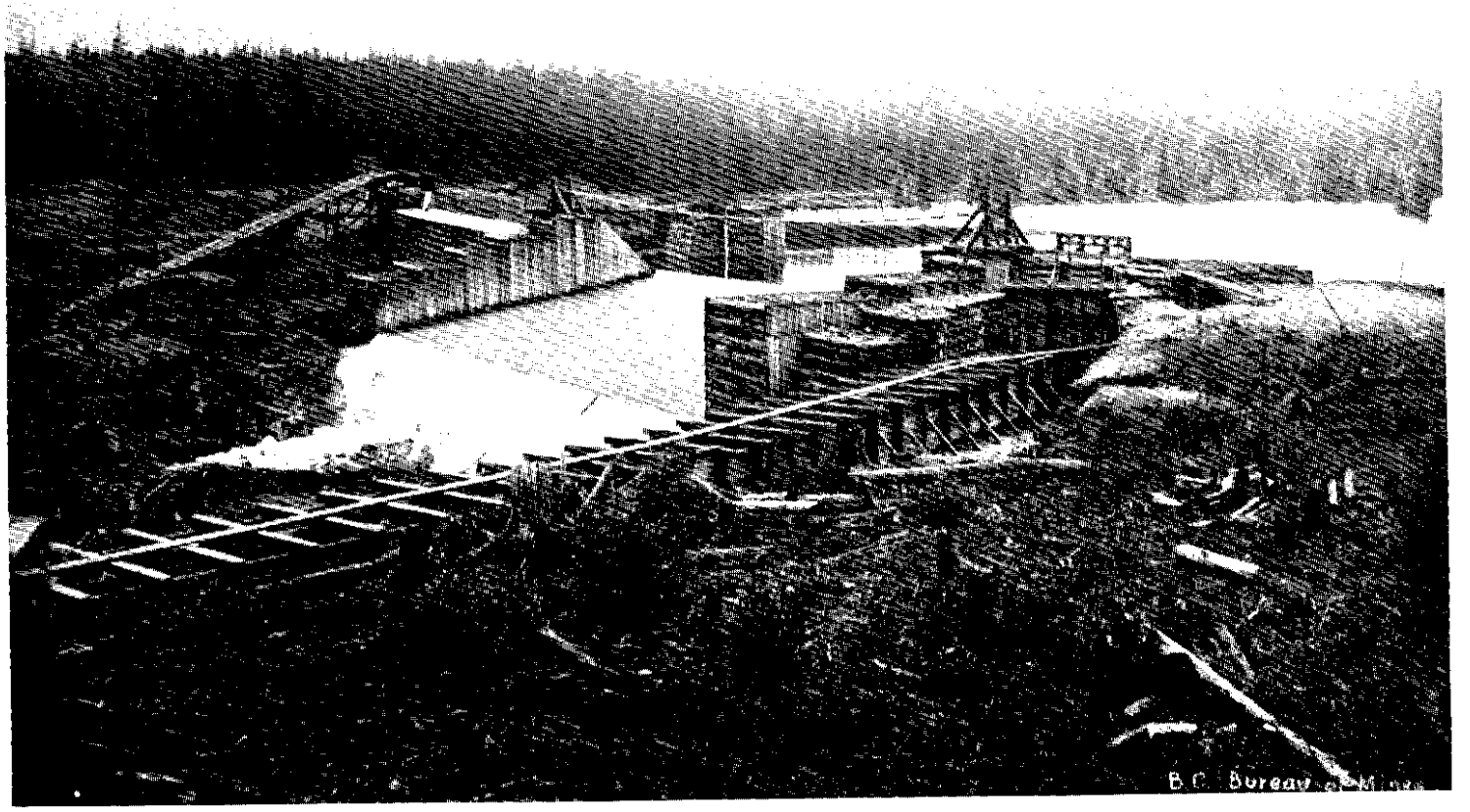
Physical Features of Country.

Between the upper part of Swift river and Quesnel river there is elevated country, forming a divide, previously taken for granted as being an obstacle to bringing water from Swift river to the Quesnel slope. Swift river flows north-west into Cottonwood river, and the latter stream, continuing in a similar general direction, enters the Fraser some distance above Quesnel, the town at the junction of Quesnel river with the Fraser. Quesnel Forks is approximately fifty miles south-east of Quesnel, at the confluence of the north and south branches of Quesnel river. The placer-gold mines of the old Consolidated Cariboo Hydraulic Mining Company (of which Mr. Hobson was for years general manager), subsequently acquired by the "Guggenheims," are at Bullion, in the vicinity of Quesnel Forks, and the sources of their main water-supply are east and south-east of the Forks, within a radius of about fifteen miles. Twenty-mile creek, along which are situated the gravel-deposits of the Quesnelle Hydraulic Gold Mining Company, joins Quesnel river about twenty-five miles below Bullion, the centre of the Consolidated Cariboo Company's operations.

The company's ten hydraulic leases cover approximately 800 acres of gravel-beds situated about the lower part of Twenty-mile creek to its junction with Quesnel river, and thence down the river. In places the gravel-banks are 500 feet high; an excellent photograph of one part, where about 100 feet of gravel is exposed, is reproduced herewith. It is estimated that there is, along a well-defined old river-channel, a body of auriferous gravel approximating 100,000,000 cubic yards in quantity; detailed testing of the gravel was restricted to only a part of the property, estimated at 30,000,000 cubic yards in extent. This part was found to contain value considered sufficient to justify the expense of the works and equipment now being provided for operating by the hydraulic process.

The flow of water was found to be so much in excess of actual requirements for the purposes of hydraulic mining that it was not thought necessary to make provision for storing water, so the dam on Swift river, which is 600 feet long and 35 feet high, was constructed only for the purpose of diverting it. An accompanying view shows the dam, waste weir, and intake at Swift river.

The catchment-area above the point of diversion is more than 200 square miles in extent; it is well wooded, and the snow does not disappear until late in the season, its gradual melting



Quesnelle Hyd. Mng. Co.'s Dam—Swift River.

thus maintaining an abundant supply of water during even the driest years. In its application to the Government for the right to use the water, the company petitioned for permission to divert 250 cubic feet of water per second.

The ditch-line is approximately nineteen miles in length; it is being constructed across public lands, and the difference in altitude between the point of diversion and that at which the water will be returned is about 1,000 feet. From Swift river to Pass lake, at the head of Twenty-mile creek, the distance is 17½ miles. Construction of about thirteen miles of the water system had been completed by the beginning of last winter, and water has been run through this length. During the winter months much material was prepared, ready for a resumption of construction work in the spring, when the weather would be suitable for it.

Conditions for both construction and maintenance of the ditch are generally most favourable. First, the country through which it passes is nearly level, except at several depressions where inverted syphons had to be provided, and at one place, a summit, where a tunnel had to be driven 550 feet in hardpan and clay; next, the ground is, for the most part, compact, at least half the ditch being in hardpan, which, while costing more to excavate, insures an important saving in maintenance, beside rendering the loss of water from seepage unusually small.

Some of the accompanying illustrations will serve to convey a good idea of the pipes, or "inverted syphons," used to cross depressions in the ground. In all, about 10,000 feet of wood-stave pipe, 60 inches in diameter, has been used. This pipe has been constructed from spruce-wood cut in the neighbourhood and made into staves on the spot. The staves are bound together by ½-inch steel bands, suitably spaced according to the pressure to be provided against. About 200 tons of steel has been used in the bands on these syphons. The longest syphon is 5,635 feet, and is used to pass over a depression having a maximum depth of 110 feet. Another length of pipe is 2,290 feet, crossing uneven ground, the lowest part of which is about 80 feet below the grade-line. A third syphon is 1,050 feet long, and its maximum depth below standard grade is 30 feet. There is but little flume-work between Swift river and Pass lake, though there is more than a third of a mile beyond the lake, as stated below.

From Pass lake Twenty-mile creek channel is to be used for three miles and a half to a flume intake, the water-line being continued thence by, first, a flume 5 feet wide by 4 feet high and 2,000 feet in length; then a ditch for about 4,000 feet; and finally from the penstock by 6,500 feet of steel pipe to the gravel pits. This pipe will be 30 inches in diameter where it leaves the penstock, and of sections of lessened sizes down to 16 inches at the mine, where, under a 300-foot effective head, two No. 6 monitors of the Hendy-Bouery type will be used. The water system is designed to deliver 3,500 miners' inches of water per diem, and it is calculated that from 12,000 to 15,000 cubic yards of gravel will be moved daily.

Below the pits there will be a double sluiceway, about 600 feet in length, on a 5-per-cent. grade, and with each sluice 6 by 4 feet. Having two sluices will permit of operations being carried on without the delays usually occurring where there is only a single sluiceway. The upper parts of the sluices will be paved with cottonwood blocks (which in Cariboo District have been found to wear well) and the lower parts with stone. It is intended next season to put in high-percentage carbon-steel plates, which wear well and increase the capacity of the sluices. In Atlin District, also in British Columbia, sluices lined with such steel have been found effective. The short length of the sluices is a favourable feature; they are much shorter than some that have had to be used in the district, which will be a factor in diminishing

upkeep charges. Conditions as regards dump are stated to be unusually advantageous, for Quesnel river, into which the tailing will be discharged, is a strong-flowing stream, so that it is expected it will rapidly carry away the debris.

The length of the season for hydraulicking will, it is thought, be at least 200 twenty-four-hour days, the open season in this part of Cariboo District being much longer than in the northern portion, and the ditch has been constructed along a route that will allow the water to run both earlier and later in the season than is usual in most parts of this region. Construction work at the lower end will not be completed, however, until the middle of the ensuing summer, so there is not reasonable probability of the run of gravel-washing lasting longer than 100 days of the 1911 season. When in full working order about thirty men, in all, including those attending to the water-supply system, will suffice to carry on mining operations under ordinary conditions.

The company's headquarters in British Columbia are at Hydraulic, a town in embryo, situated near the junction of Twenty-mile creek with Quesnel river. This is reached from 150-Mile House, on the main road from Ashcroft to Quesnel; also by a newly constructed road that branches off from the main road at a point about thirteen miles south of Quesnel. Ashcroft is 203 miles distant from the City of Vancouver, on the main transcontinental line of the Canadian Pacific Railway Company. When the Grand Trunk Pacific Railway, now in course of construction, shall be completed, the nearest railway-station northwards will be less than half the distance from Hydraulic that Ashcroft is southwards. There are at the settlement telegraph-station and post-office, both named Hydraulic; the Dominion Government telegraph system established in Cariboo affords telegraphic communication with outside places. The company has its own telephone system, connecting with all parts of its property. The aggregate length of telegraph and telephone lines is about forty miles. It has been decided to equip the property throughout with facilities for lighting with acetylene, which is considered for local requirements both cheaper and more effective than electric light.

As already mentioned, Mr. Howard W. DuBois is general manager of the company. The engineering work was commenced under the supervision of Mr. H. B. Fergusson, of Vancouver, B. C., but who has been succeeded by Mr. W. W. Edwards as chief engineer.

CASSIAR DISTRICT.

:o:

ATLIN MINING DIVISION.

REPORT OF J. A. FRASER, GOLD COMMISSIONER.

I have the honour to submit my report on mining operations in the Atlin Mining Division of Cassiar District for the year ending December 31st, 1910.

There were fewer men engaged in mining this season than in any previous year, and of those who were so engaged a larger proportion than usual was employed in prospecting new ground or installing hydraulic plants, so that the number who were actually producing was very small indeed. Notwithstanding this, the output and revenue derived therefrom was greater than for several seasons past, and the per capita production the best we have had.

The scarcity of water is still the great drawback to more successful operations in this district, and it will doubtless so continue until some better methods are adopted for conserving and controlling the available supply, the bulk of which too often escapes in the turbulent rush of the (so-called) "high-water" period, causing loss and damage to the unready and creating a water famine for the balance of the season. Various schemes, however, are under consideration by different companies, and it may be that material relief will be afforded on some of the creeks, at least, by the diversion of some of the outlying streams at an early date.

OUTPUT.

As usual, the operators who recovered only small quantities of gold did not consider it necessary to report what they secured, so that, while the reported output is noticeably greater than that of the two preceding years, it would doubtless be considerably larger if we could secure proper returns.

The lode-quartz deposits of the district are gradually, but slowly, attracting more attention, and, almost invariably, with gratifying results wherever intelligent investigation has been undertaken.

The existence of coal in the district is now an assured fact, although no development or exploration worth mentioning has yet been reported.

In the matter of revenue there has been a slight falling-off from last year, but that is accounted for by one item (lease rentals), under which head an unusual amount was collected in 1909.

On the whole, I consider that the year just closed has shown satisfactory progress and results, and offers a more hopeful outlook for the future than did the year before.

MCKEE CREEK.

On this creek the Pittsburg-British Gold Company commenced operations about 1st March, under the management of Clarence M. Hamshaw, and closed down on October 22nd. A force varying from five to twenty-four men—an average of seventeen—was employed throughout the season, with very gratifying success while the water-supply held good, and the early returns gave promise of a banner yield—in fact, one "clean-up" realised nearly $25,000; but the water-supply failed about midsummer, and during the latter portion of the season they had only sufficient water to permit of about two hours' piping per day.

A very regrettable accident occurred about midsummer, through which the then manager, C. M. Hamshaw, was so seriously injured as to be absolutely incapacitated for the time being, and Fletcher T. Hamshaw had to assume the management for the balance of the season.

Notwithstanding all those drawbacks, over 400,000 cubic yards of gravel were moved and very nearly as much gold recovered as in the previous season; sufficient, in any event, to provide a handsome profit for the season's operations.

Incidentally, the operations disclosed the existence, to the south of the present creek channel, of what, so far as investigated, appears to be a deeper channel carrying richer gravel than any hitherto discovered on the creek, and the results of further exploration in that direction are eagerly awaited. This company has the whole creek to itself.

PINE CREEK.

On Pine creek the North Columbia Gold Mining Company, under the management of J. M. Ruffner, had a very successful season. A considerable force of men (from twenty-five to forty) was employed during the season, which lasted for more than six months, and from eight to fourteen monitors were kept pretty constantly employed tearing down the gravel and stacking up the "tailings," with the result that the gold won was nearly $100,000 in excess of what had been recovered by them in any previous season. This company also worked the ground of the Atlin Consolidated Mining Company (Guggenheims), situated on the north bank of Pine creek, and incidentally demonstrated what may be done with a good supply of water; of which they had a fair amount, but still not as much as they claim they need and could use.

A few individual miners operated on this creek during the season, principally working over old "tailings," but with indifferent results.

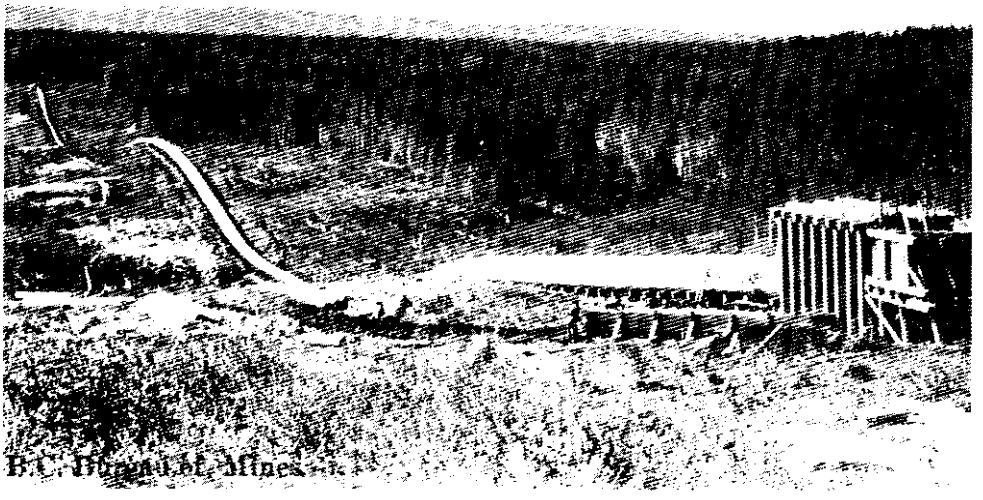
On the upper part of Gold Run L. B. Harris continued prospecting with his Keystone driller, but has not as yet located the rich "pay-streak" for which he has been searching; he will probably continue next season. There are seven men mining on Gold Run this winter.

SPRUCE CREEK.

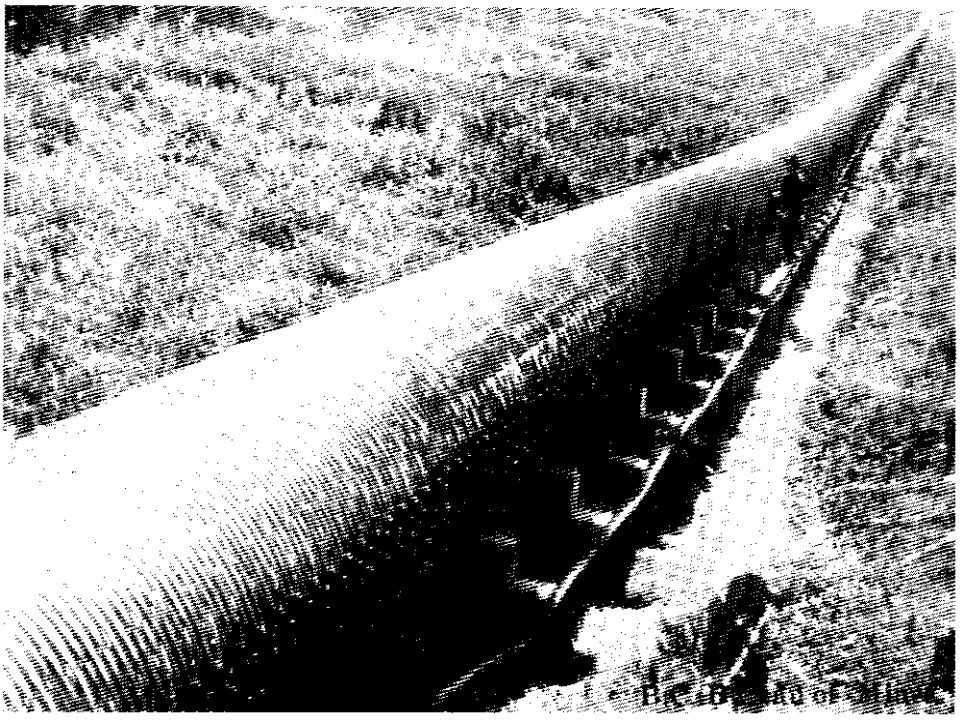
About seventy men were engaged in mining on Spruce creek, of whom from forty to sixty were operating by individual methods, viz.: drifting, sluicing, etc., with water-wheels for pumping and hoisting.

On the *Gladstone* lease McCloskey and Foley carried on drifting operations, and in this way mined and sluiced a considerable quantity of gravel, which yielded an average of nearly $4 to the cubic yard, which proved very satisfactory to all concerned. They employed an average of eighteen men from May 1st to October 22nd, when they closed down the sluicing operations. They have a force of four men during this winter prospecting the ground and preparing for the resumption of sluicing operations on a much larger scale next season. Mr. Foley unfortunately met with a serious accident, which necessitated his going "outside" for medical treatment before the close of the season, and this to some extent embarrassed the operations, and, with the scarcity of water, caused them to close down earlier than they would otherwise have done.

The Spruce Creek Power Company, Limited, under the superintendence of W. C. Hall, with a force of from ten to twenty-five men—an average of fifteen—commenced operations on the 1st day of May and continued until the 12th day of October, when work was closed down, principally for want of water. This company operated chiefly by hydraulic methods, but also carried on some drift-mining, principally for prospecting purposes. A landslide which occurred in July carried away a considerable portion of the flume and cut off the water-supply for some days, in consequence of which, coupled with the general scarcity of water, they were reduced



Quesnelle Hyd. Mng. Co.'s Wood-stave Pipe Siphon.



Quesnelle Hyd. Mng. Co.'s Wood-stave Pipe Line.

to the use of ordinary (individual miners') sluice-boxes during the latter portion of the season, which materially reduced the expected output. Notwithstanding these embarrassments, they moved about 160,000 cubic yards of gravel and won more gold therefrom than in any previous season. It is regrettable that this company has not yet been able to secure a sufficient supply of water to demonstrate what the gravels of Spruce creek will yield when mined with water under pressure. It is assumed that the results would be very gratifying, and it is to be hoped that the supply may be secured and the company amply rewarded for its tenacity in continuing operations under adverse conditions.

On the portions of Spruce creek a little higher up, between twenty and thirty men were engaged in prospecting various properties, with more or less encouraging results; but long stretches farther up still remain practically untouched, although known to be rich in parts.

BIRCH CREEK.

On this creek from twelve to fifteen men were engaged throughout the season, and with very gratifying results, for, although a lesser number of men was employed, the output exceeded that of last year by about 25 per cent. The spring freshet caused some damage and delay by carrying away some of the flumes, but, nevertheless, the results were as above stated and would doubtless have been much better but for said damages and loss of time. Scarcity of water during the latter part of the season was again an embarrassing factor. Two men are wintering on the creek.

BOULDER CREEK.

About eighteen men operated on this creek during the summer, and, as usual, with very satisfactory results. On the Société Minière de la Colombie Britannique Co.'s ground an elaborate system of drainage has been put in, at heavy expense, with a view to working the deep ground immediately below the scene of the recent hydraulic operations. When completed, a rather ingenious system of underground placer-mining will have been installed which will permit of the much more economical operation of the deep gravels than any hitherto attempted here, and should repay the cost of the enterprise, if the ground carries values equal to what was found some years ago in the ground immediately above and adjacent. From fifteen to eighteen men operated on the creek last winter, and from twelve to fifteen are there this winter again.

RUBY CREEK.

On this creek the Placer Gold Mines Co., under the superintendence of T. M. Daulton, continued prosecuting the "dead-work" commenced last season, using water under pressure to work down to "bed-rock." A force of from eight to twenty men—an average of seventeen—was employed throughout the season, and a large amount of permanent development work was performed, without, however, reaching bed-rock with the open-cuts. It is expected they will be properly on bed-rock at an early date next season, after which larger "clean-ups" may be expected, for the ground is believed to be rich.

WRIGHT CREEK.

The results of the season's operations on this creek were very satisfactory indeed, the output being over 50 per cent. greater than in 1909, although a smaller force was employed. Not more than six men were engaged in placer-mining on this creek during the season.

OTTER CREEK.

On the upper portion of this creek the Otter Creek Development Co., under the superintendence of J. E. Moran, operated from the 28th of April until October 17th with a force of four men, and during that period moved about 30,000 cubic yards of gravel and uncovered about 1,000 square yards of bed-rock. The results were rather disappointing, the expectations expressed at the close of the previous season not being realised.

On the lower part of Otter creek the Maluin Syndicate, with a force of from eight to eighteen men—an average of fourteen—under the superintendence of W. H. Brethour, continued the search for bed-rock, in the prosecution of which a large amount of overburden (over 250,000 cubic yards) was moved, but, owing to a succession of unfortunate accidents, the hydraulic operations were suspended about the 1st of August and the desired goal was not reached. This outfit commenced operations on the 8th of May and things were going along satisfactorily until June 29th, when a reservoir dam, situated about three miles up-stream, collapsed, and the consequent rush of water destroyed the intake and a portion of the supply ditch, carrying away about 600 feet (lineal) of the lower end of the sluice-boxes and filling the pits with debris many feet deep. About the end of July another reservoir dam, located about five miles up-stream, gave way, and with it all the reserve water was lost, and so hydraulic operations were compelled to cease. For the balance of the season all energies and resources were directed to repairing and rebuilding the ditch, dams, and flumes, digging other ditches, sinking and driving prospecting shafts and tunnels, etc., until, finally, they were compelled to close down because the pumps used in the prospecting shaft were unable to control and dispose of the inflow of water. Operations are expected to commence very early next season, with the hope of reaching bed-rock and washing considerable pay-gravel before the close of the season.

WILSON CREEK.

About six, possibly eight, men spent the open season on this creek, but, with the exception of two men on *Discovery* claim, do not appear to have recovered much gold; in any event, they did not report their winnings. On *Discovery* claim Andrew Greer and another man worked from April 20th to October 22nd with fair success. There are three men wintering on the creek.

O'DONNELL RIVER.

No work was done on this stream during the summer, but there are three men prospecting there this winter. A steam-boiler has already been hauled over there as an evidence of the *bonâ-fide* intentions of some Eastern capitalists who propose bringing in a pumping plant, over the ice, with a view to undertaking systematic prospecting work as soon as the departure of snow and frost will permit.

LINCOLN CREEK.

A group of ten leases was located on this creek early in the season, and some prospecting was done during the latter part of the summer, the results of which were very encouraging. Although bed-rock was not struck at a depth of 36 feet, coarse gold was recovered at the bottom of the shaft and the wash-gravel there found was very promising. The creek is described as carrying nearly as much water as Pine creek, but has a much steeper grade; the banks are high and there is excellent timber and dump. If sufficient gold is found, there appears to be everything else necessary for a first-class hydraulic proposition. Further development will be undertaken as early as climatic conditions will permit.

Some prospecting work—but of a desultory nature—was performed on Consolation, Davenport, Horse, and Hemlock creeks during the season, but evidently with indifferent success, for no results were reported, although I have learned indirectly that the parties interested contemplate the installation of a hydraulic plant on Horse creek next season.

New Discoveries.—No new discoveries have been reported, except upon some tributaries of the Taku river, near the southern end of this Mining Division. Certain prospectors from Juneau, Alaska, who went up the Taku river, claimed to have discovered "pay" on some of the bars on the Inklin river and recorded some claims thereon. They also located some placer claims upon a tributary of the same, which they named Canyon creek and which enters the Inklin from the south, running parallel to and not far from the Sheslay river, but to the west

of it. The ground appears to be deep, and in endeavouring to sink shafts they encountered the inevitable "seepage" which seems ever present in deep diggings, and they were compelled to suspend operations and go "outside" for pumping apparatus with which to continue work. I am informed that they have again gone up the river with more complete outfits and appliances, determined to thoroughly explore the ground which, from the prospects already secured, they believe to be well worth operating. There is a large area of similar ground in that vicinity, and, if these men demonstrate the existence of "pay" where they are located, it will doubtless lead to many locations being made in that part of the district. For the accommodation of any prospectors who may wish to investigate the mineral resources of that locality, the Government has been pleased to appoint a Deputy Mining Recorder who makes his head-quarters at Nahlin station, on the Government telegraph-line, which is within twenty-five miles of the locations above referred to and easily accessible from every direction.

MINERAL CLAIMS.

Not much development has been performed upon quartz properties throughout this portion of the district, beyond the assessment work necessary to protect the title, except upon the property known as the *Engineer* group, on Taku arm (of Tagish lake), and on certain properties located near the head of the Big Horn creek. Both properties have been examined, and, the *Engineer* group in particular, reported upon during the past summer by the Provincial Assayer and by the Dominion Geological Survey. I will say, with reference to the properties on the Big Horn, that as development progressed the holders became more enthusiastic and sanguine as to the value of their respective holdings; and with reference to the *Engineer* group, whilst shipments made to the smelter gave returns running upwards of $6,000 to the ton, and the first lot of 800 lb. of ore milled on the ground yielded about $3,000, the season's run of all classes of rock, milled for all purposes, was approximately 140 tons, and yielded about $8,000. This of course included much very low-grade rock milled for prospecting purposes. Those results were obtained from a small two-stamp mill which the owners had erected on the property early last spring, and which was operated at intervals throughout the season as they had rock ready for milling.

Some quartz properties located between Bennett lake and the head of Tutchi lake were being developed throughout the summer, and, I expect, will be throughout the winter also, the intention of the owners being to prospect for that period and then install such plant as the results of the development suggest or warrant. High assays had been obtained from the ore and the operators were sanguine when last heard from.

KLEHINI—RAINY HOLLOW.

In this section of the district development was not prosecuted as actively as was anticipated, but what *was* done simply increased the confidence of the owners in the value of their respective properties.

On the *Fairfield* mineral claim, which adjoins the *State of Montana*, development work was prosecuted during the summer, by the interests represented by Capt. Brown and R. C. Turner, with very satisfactory results. On other properties not much more than assessment work was performed.

In my last report I mentioned the discovery of high-grade ore about five miles to the east or south-east of the principal properties in Rainy Hollow, and that several claims have been located thereon. Those were at the base of what is locally known as the Three Guardsmen mountain, and were so near the International Boundary that the locators were in doubt as to whether some of the properties were in British Columbia or Alaska. I am pleased to say that all the locations are now found to be in British Columbia, and development has disclosed deposits of high-grade ore. As soon as railway transportation to tide-water is assured there

is encouragement to hope for the establishment of a copper camp at this point, as all those properties, as well as a large number of the older properties to the westward, have been bonded to parties who are promoting the railway from Haines to the Interior.

A number of quartz properties on Taku arm and near Atlin have been bonded to American capitalists within the last few months, and some development work is being performed under such bonds this winter.

COAL.

The existence of coal at different points within the Atlin Mining Division is now an assured fact, though the extent of the deposits has not been ascertained at any of those points. The prospecting work expended upon the deposit near Sloko lake, at the south end of Atlin lake, was disappointing in its meagreness; still, sufficient has been done to disclose the existence of coal "in place," but from its location it can be properly and economically prospected only with a diamond drill. A fine sample of coal was brought to this office last summer from a deposit located near the Inklin river, and development, so far as prosecuted, indicated the existence of a large deposit. Near the northern boundary of the district and Province and a few miles to the east of Rainy Hollow a new discovery was reported, and a number of locations (about forty, I believe) staked on it, but for some reason, unknown to me, they have not been advertised. The various samples shown and the reports of the locators, however, indicate the presence of coal there in some quantity, and should development prove its existence in commercial quantities it will enhance the value of the ore-deposits already mentioned as lying a little farther westward.

I regret to say that the deposits of hydro-magnesite which lie within and adjacent to Atlin townsite are still untouched from the development standpoint, the chief reason appearing to be the inability of the present owners and certain would-be purchasers to agree upon a price. The quality is admittedly excellent, the quantity considerable, the uses to which it could be put are apparent, but it is still lying in an undeveloped condition.

Following is a statistical report of revenue collected for the year 1910, etc., all of which is respectfully submitted :—

OFFICE STATISTICS, 1910—ATLIN MINING DIVISION.

Free miner's certificates (individual)			477
" " (companies)			9
Placer records			60
" re-records (300) representing claims			318
Leaves of absence (51) " "			174
Groupings			9
Permissions			4
Bills of sale, placer			67
" hydraulic			42
" mineral			55
Mineral records			182
Certificates of work			155
Filings			19
Certificates of improvements			8
Crown grants issued			22
Certificates of improvements (advertised but not issued)			14
Gold reported (individuals)—2,642 oz.	Value	$	41,920 00
" (companies) 13,503 "	"		210,255 00
Totals 16,143 "		$	252,175 00
Royalty paid (individuals)			577 70
" (companies)			3,915 60
Total		$	4,493 30

Revenue collected during 1910.

Land sales	$ 91 70
" revenue	2 00
Timber royalty	184 40
Free miner's certificates (individual)	2,184 00
" " (companies)	800 00
Mining receipts (lease rentals)	7,380 00
" (" deposits)	620 00
" (water records and rentals)	1,995 90
" (other sources)	3,580 80
Leaves of absence	435 00
Licences (spirit)	1,775 00
" (trade)	205 00
" (game)	100 00
Fines and forfeitures	112 70
Registry fees	14 00
Probate fees	1 90
Law stamps	42 10
Revenue tax	849 00
Assessment Act—real-property tax	3,403 75
" personal-property tax	175 35
" wild-land tax	25 55
" income tax	30 35
" mineral tax	4,493 30
" Crown-granted mineral-claim tax	540 75
" interest	12 25
Tax sales, Crown-granted mineral claims	28 50
Miscellaneous receipts	80 50
Total	$ 29,163 80

ATLIN MINING DIVISION.

NOTES BY THE PROVINCIAL ASSAYER.

Northern Partnership Group.

This property is better known by its old name of the "*Engineer* group"; the claims now included in the group are: *Engineer No. 1*, *Northern Partnership No. 1*, *Northern Partnership No. 2*, *Northern Partnership No. 3*, *Haddon*, *Big Engineer Fraction*, *Little Engineer Fraction*, *Plato*, and *Mickey*. The owners are the Northern Partnership Syndicate, with head office at Atlin, B.C. The mines are situated on the east side of Taku arm of Tagish lake, ten miles farther up the lake than Golden Gate, in Atlin District. This property, then known as the "*Engineer* group," was reported on by the Provincial Mineralogist in 1904; since then it has changed hands, having been purchased by the present owners in 1907. The country-rock on this group of claims is slate, cut by igneous dykes and traversed by numerous quartz veins, some mere stringers and others up to 30 feet wide. A very considerable amount of surface prospecting and development of these veins has been done, consisting of numerous open-cuts and shots put in at different points; in all cases this work has shown up clearly defined quartz veins, traversing the slate formation, cutting through both the country-rock and the dykes before referred to. The general strike of the country-rock is N. 65° W., with a dip of 35° to the north-east; the majority of the dykes seem to have a strike 15° farther north, and to have a much greater dip, being 80° to the south-west. These dykes are clearly marked, as, owing to their harder nature, they have been left standing, while the softer slate-rock has been eroded

away. The main quartz veins seem to have a general strike of about N. 10° W., and a dip of 70° to the east, but there are numerous cross-veins whose dip and strike vary considerably. The actual mining done by the present owners has been confined to the smaller quartz veins, from 6 inches to 2 feet wide, the ore from these veins yielding high values in free gold and tellurides. According to the statement of the owners, 800 lb. of the selected ore yielded 240 oz. of gold, and from the appearance of this ore, which is in places crusted with free gold, there does not seem any reason to doubt the statement.

The larger veins are being opened up by shots and open-cuts, and are said to give values from $20 to $100 to the ton, but as none of this ore has yet been run through the mill, and until such test has been made, it is impossible to form any safe idea of their value. The quartz looks good, the veins are clearly defined and have been traced for considerable distances, and they can be easily worked, so there is a fair prospect that they will yield fair, if not high, returns.

From the shore of the lake the ground rises abruptly to a bench some 500 feet above the lake; this bench extends back some distance, when the mountains rise to snow-capped peaks 4,500 feet high. At 300 feet above the lake a quartz vein has been worked by two open-cuts, one a little below the other, and having a total length of 170 feet; in these cuts the vein is clearly defined, and has an average width of about 2 feet 6 inches; the quartz carries a considerable amount of calcite and shows free gold in both the quartz and the calcite, with specks of tellurides through the former. The ore is generally quartz with calcite, but in places it is a slate breccia which, from the thin intersecting seams, has yielded high values. The ore from these open-cuts is being carefully sacked and hauled to the stamp-mill on the shore of the lake, and forms the base of the present ore-supply.

A short distance to the north-west a small cross-vein, running towards the vein just mentioned, is being worked by an open-cut, and similar ore has been taken out. About 1,000 feet south of the large open-cuts, and at 100 feet lower altitude, is what is locally known as the "South Vein." This is a brecciated quartz vein 6 feet wide with well-defined walls, but as yet, no work has been done on it. A small cross-vein runs from this vein to the lake, and from the lake-shore a tunnel is being started which will follow the strike of the vein, which, at this point, is some 18 inches wide, and carries a very large proportion of calcite with free gold crusted on the calcite. Work was commenced on this vein as it showed high values, was close to the stamp-mill, and easy to work.

On the *Big Fraction* claim, 2,000 feet north of the large open-cuts and 500 feet above the lake, what may be called the main vein has been uncovered by a few shots. This is a quartz vein with a north-and-south strike, and includes an amount of slate breccia; the width of this vein is still undetermined, but may be taken as at least 30 feet, while it has been prospected by an open-cut 1,000 feet farther north and traced still farther through several claims. It is proposed to run a few tons of this ore through the mill to ascertain its value, which is at present unknown.

About 100 feet back from the shore-line and 100 feet above the lake is a quartz vein of undetermined width, but probably 8 to 10 feet wide, to crosscut which the former owners ran a tunnel in 150 feet and did some 150 feet of drifting. They did not get in far enough to cut the ledge seen above, but cut a number of small stringers, which they drifted on, in one place cutting through about 10 feet of quartz-slate breccia. The present owners intend pushing the tunnel till the vein is reached.

A short distance to the south, where this vein outcrops on the lake-shore, the former owners sunk a shaft, said to be down 70 feet, but it is now full of water, and no data was obtainable from it. Close to this shaft on the lake-shore a two-stamp mill was set up in March

of this year, and commenced running in June on the rich ore from the open-cuts, yielding, it is stated, 240 oz. of gold from 800 lb. of ore treated; lower-grade quartz was being run through on August 5th, and was said to be yielding $100 to the ton.

The plant consists of two heavy stamps and a double-discharge battery, discharging over two amalgamated plates; a vanner is being set up to save the concentrates, which, at the present time, are going into the lake. Power is furnished by a small engine and boiler, but, when a larger plant is installed, ample water-power is to be had from a stream near the mill.

Summary. The property contains a number of small quartz veins carrying high values in free gold, which give good returns under the present primitive method of working. There are larger veins, which, with a well-equipped plant and economical methods, would probably yield a large tonnage of low-grade quartz which might pay for treatment; these veins should first, however, be prospected and carefully sampled.

STIKINE AND LIARD MINING DIVISIONS.

FROM REPORT OF JAMES PORTER, GOLD COMMISSIONER.

I have the honour to submit the annual report on mining operations in the Stikine and Liard Mining Divisions of Cassiar District for the year ending December 31st, 1910.

There has been practically no change for the last couple of years. There has been very little mining done, and I have nothing new, of importance, to report regarding placer-mining. The Thibert Creek Mining Company, Limited, has ceased all operations for the present, but intends to start up again next spring. It is, however, encouraging to note that applications for six hydraulic leases on McDame creek have recently been granted.

The total yield of gold, so far as I have ascertained, is $6,500.

A certain amount of prospecting has been done on the group of nine mineral claims on the Iskut river, with promising results. The holders of these claims have recorded other claims on an adjacent ledge, which should, at least, signify their faith in the locality. Nothing beyond assessment work was recorded on other mineral claims.

In spite of the fact that the production of gold in the divisions for the past two seasons has been unsatisfactory, this is undoubtedly attributable only to temporary conditions, and it is believed that the district will again retrieve its reputation under more favourable conditions.

As previously stated, it must be understood that, under present conditions, the whole of this interior country will have to remain undeveloped, as the short season, high prices, slow and excessive transportation rates, all tend to retard its growth.

The receipts of the office will be greatly augmented in the succeeding years from land sales alone, which up to the present have, practically speaking, been nothing.

OFFICE STATISTICS—STIKINE AND LIARD MINING DIVISIONS.

Revenue collected from free miner's certificates	$	474 00
" " mining receipts, general		1,618 30
" " other sources		2,657 41
Total	$	4,749 71

SKEENA DISTRICT.

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SKEENA MINING DIVISION.

REPORT BY J. McMULLIN, GOLD COMMISSIONER.

I have the honour to submit herewith annual report as Gold Commissioner for the Skeena and Portland Canal Mining Divisions. These two divisions were included in the Skeena Division up to August the 1st last, when Portland Canal was made a separate Mining Division and a Mining Recorder's Office established at Stewart.*

In reference to the Portland Canal Mining Division, I beg to forward you herewith a full report from John Conway, Mining Recorder at Stewart.

In the Skeena Division a number of new locations were made on Alice arm during the past summer, and this district promises well.

OFFICE STATISTICS—SKEENA MINING DIVISION.

Free miner's certificates	1,872
Mineral claims recorded	543
Certificates of work issued	219
Bills of sale recorded	134
Certificates of improvements	21

Revenue.

Free miner's certificates	$9,510 00
Mining receipts	9,303 00
Total	$18,813 00

PORTLAND CANAL MINING DIVISION.†

REPORT BY JOHN CONWAY, MINING RECORDER.

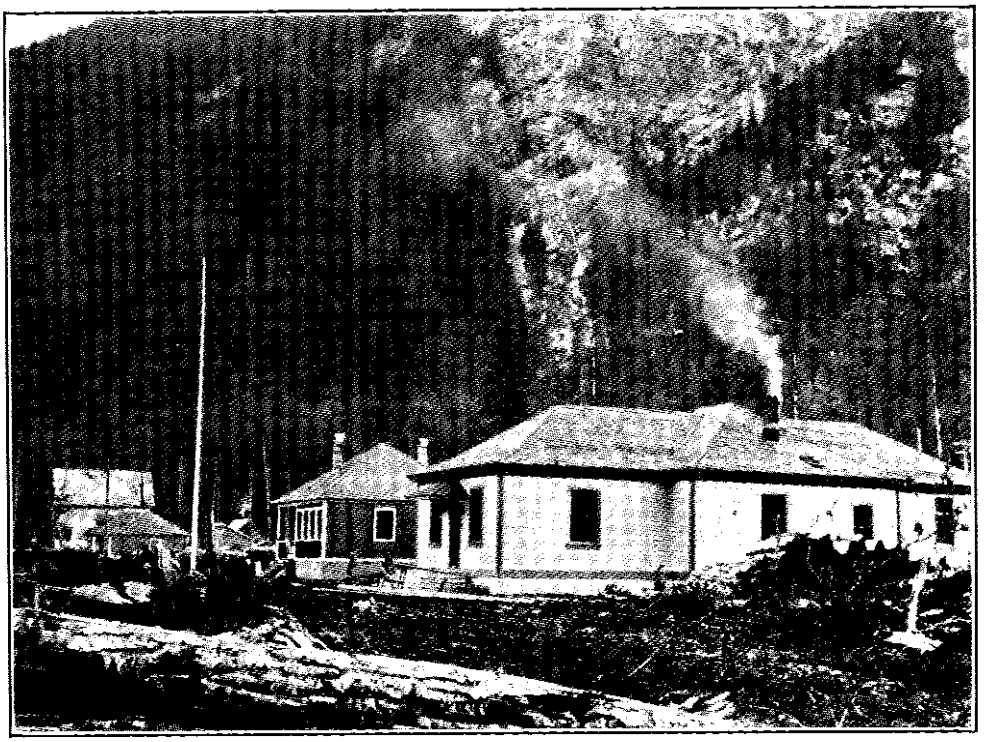
I have the honour to submit herewith my annual report for the Portland Canal Mining Division for the year ending December 31st, 1910.

During the past year, 1,427 mineral claims have been recorded, and, according to the reports of prospectors, many valuable discoveries have been made, especially on the Marmot and Georgia rivers, which flow into Portland canal, respectivelv three and fifteen miles south of Stewart. Development work has been actively carried on during the season on a large number of properties, and the results, on the whole, have been very satisfactory.

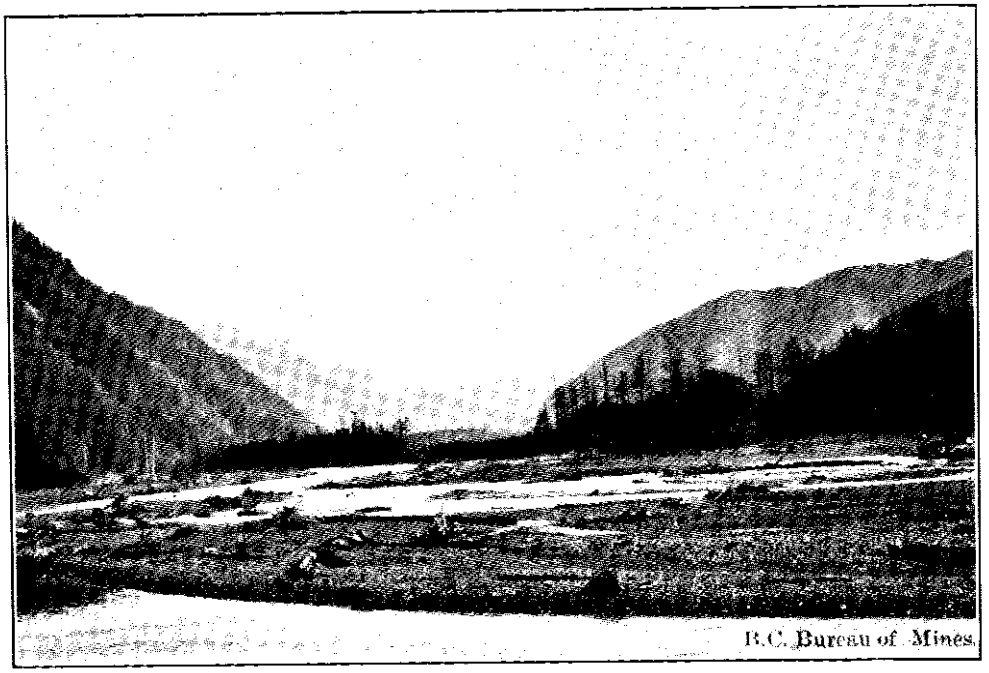
The following statement shows the actual work recorded on the principal properties in the district:—

* The Portland Canal Mining Division came into legal existence by Order in Council on August 1st, 1910, with the Mining Recorder's Office in the town of Stewart, at the head of Portland canal. The notice appearing in the Official Gazette of July 21st, 1910, gives the official description of the boundaries of the new division, which may, however, be summarised as "the drainage-area of all streams, in British Columbia, flowing into the Portland canal."

† *See* also Report of Provincial Mineralogist, page 66



B. C. Government Mining Recorder's Office and Court House—Stewart.



Looking up Bear River from bridge near Stewart.

MAPLE BAY.

Princess group—Series of open-cuts. *Comstock*—Open-cut in rock, 75 x 6 x 2 feet. *Copper King Fraction* and *Hope Fraction*—Two open-cuts, 38 x 11 x 4 feet and 50 x 8 x 3 feet. *Star Fraction* and *Star Fraction No. 1*—Open-cuts, 15 x 8 x 2 feet, 36 x 12 x 4 feet, and 40 x 10 x 5 feet. Above properties are owned by Messrs. Collison and Noble.

Blue Point Group.—This property consists of two claims—*Black Knight* and *Black Knight No. 1*—situated about twenty miles from Stewart and one mile and a half from saltwater, and is owned by the Blue Point Mines, Limited. During the past season development work was energetically pursued, with the result that 275 feet of underground work and a large number of open-cuts, prospect-shafts, etc., were completed. The vein is said to be 52 inches wide, carrying galena, blende, and iron-pyrite, and running from $16 to $50 per ton in silver and lead. In the lower tunnel the zinc-blende shows a tendency to disappear, being replaced by chalcopyrite. In addition to rock-work, the company built a good camp, blacksmith's shop, etc., and is now prepared for a good campaign during 1911.

BEAR RIVER.

Copper Cliff Mines, Ltd.—This property consists of three mineral claims—viz., *Copper Cliff*, *Copper Cliff No. 1*, and *Copper Cliff No. 2*—and is situated directly opposite the town of Stewart, on the east side of Bear river, about half a mile from its mouth and tide-water.

The following report was furnished by Geo. A. Clothier, the engineer in charge:—

"Four years' assessment work has been recorded on the claims; surveys will be made as soon as practicable in the spring and Crown grants applied for. The croppings show a well-defined vein of from 1 to 4 feet in width and traceable for 500 or 600 feet; the vein is crossed by several intruding granite dykes which run nearly parallel with the river. These intrusions are of later period than the vein-fillings, and do not appear to have had any effect on the vein itself in so far as can be seen on the surface. The work done on the property during the past season consists of a tunnel, at an elevation of approximately 200 feet above Bear river, with a crosscut from its end into the hanging-wall. This tunnel was run 35 feet on the vein, which is shown to average from 1 to 2 feet in width of ore on the foot-wall side, which will assay from $4 to $24 in gold, silver, and copper; the balance of the width of the tunnel is mineralised throughout, but of low values. A crosscut was then run to the right or hanging-wall side a distance of 25 feet, cutting several small stringers of copper, but nothing of sufficient size to be of value. Work was again started on the face of the tunnel to extend it under the best surface showing, but operations had to be abandoned on account of unfavourable snow conditions. The tunnel will be extended as soon as work can be commenced in the spring."

Franklin Consolidated Mines, Ltd.—This property consists of seven claims—viz., *Franklin*, *Alice*, *Granite*, *Surprise*, *Contact No. 1*, *Contact No. 2*, *Franklin Fract.*, and *Surprise Fract.*—situated on east side of Bear river. Work done, 42 feet of tunnel, 18 feet crosscut tunnel, and two open-cuts.

Little Cave Group.—This property consists of the *Little Cave*, *Gordon*, and *Lucknow Fract.* claims, situated on west side of Bear river; owned by Vyvyan and Chalmers. Work done, 30 feet of tunnel and a series of open-cuts.

Portland Dreadnought Mining Co., Ltd.—This property consists of the *Magnet*, *Astrid*, and *Dreadnought* claims, situated on Mosquito creek, Bear river. Work done, 53 feet of tunnel and an open-cut 20 x 4 x 5 feet.

Portland Star Mining Co., Ltd.—This property consists of the *Abitibi*, *Temagami*, and *Nippissing* claims, situate on east side of Bear river. Work done, 30 feet of tunnel.

Portland Bear River Mining Co., Ltd.—This property consists of the *Bear River* and *Bear River Nos. 1, 2,* and *3,* situated on east side of Bear river. Work done, a series of open-cuts.

International Mining Co., Ltd.—This property consists of the *Dundee, Algonquin. Mammoth, Erie, Tecumseh, Ben Lomond, Wentworth,* and *Penetang,* situated on the west side of Bear river. Work recorded, 30 feet of tunnel and two open-cuts, 20 x 15 x 10 feet and 15 x 20 x 25 feet. The company is continuing work during the winter.

Red Cliff Mining Co., Ltd.—(*See* Report of Provincial Mineralogist.) Since then the main tunnel was continued to 1,300 feet, when the mineral zone was struck; the tunnel is now in 1,450 feet and shows a well-defined ledge. The company at the present time has about forty men working on the property.

Red Cliff Extension Mining Co., Ltd.—This property consists of the *Red Cliff Extension, Copper Hill No. 1,* and *Combination Fraction* claims, situated on the west side of Bear river, at the forks of American creek and Bear river. Work done, a series of open-cuts and trenches.

Bear River Mining Co., Ltd.—This property consists of the *New York, London, Chicago, Elgin, Chicago Kid, Kensington, Paris,* and *Boston* claims, situated on east side of Bear river. Work done, 104 feet of tunnel and open-cuts, 20 x 6 x 6, 21 x 14 x 18 inches, 40 x 5 x 20 inches, 35 x 8 x 4 feet and 42 x 42 x 18 inches.

Portland Bear River Mining Co., Ltd.—This property consists of the *Ruby Fract. No. 1, Ruby Fract. No. 2, Signal, Sicker, Eureka, Harrold, Snowslide,* and *Rock Creek,* situated on the east side of Bear River, above the forks of American creek. Work done, 57 feet of tunnel and open-cuts, 25 x 15 x 5 feet and 30 x 10 x 8 feet.

Bear River Canyon Mining Co., Ltd.—This property consists of the *Victor No. 1, Victor No. 2, Pasco, Independence, Kenniwick,* and *Provident* claims, situated on the east side of Bear river, above the forks of American creek. Work done, 40 feet of tunnel and a series of open-cuts.

Superior Group.—This property consists of the *Superior No. 1, Superior, Red Top, Red Top No. 1, Red Top No. 3 Fract.,* and *Hector No. 1* claims, situated on east side of Bear river, above forks of American Creek, and is owned by Erickson and McNeil. Work done, 14 feet of tunnel and a series of open-cuts.

Copper Queen Group.—This property consists of the *Copper Queen, Copper King,* and *Blue Rock* claims, situated on the west side of Bear river, ten miles from Stewart, and is owned by Harold Jardine. Work done, a series of fourteen open-cuts in solid rock.

Red Reef Group.—This property consists of the *Red Reef Nos. 1, 2, 3,* and *4,* and *Red Reef Fract.,* situated on the east side of Bear river, opposite the town of Stewart, and is owned by H. E. Newton. Work done, 20 feet of tunnel and various open-cuts. This property has been surveyed and application made for certificates of improvement.

Main Reef Mining Co., Ltd.—(Report furnished by T. J. Vaughan-Rhys, engineer in charge.) The property consists of the *Main Reef Nos. 1, 2, 3,* and *4* and three fractions, situated about six miles and a half north of Stewart, on the east side of Bear river, at an elevation of 1,500 feet above Bear river. During the past year the underground development consisted of about 700 feet of tunnels, a winze 45 feet, and numerous open-cuts and crosscuts. Most of the underground work was done on the main vein, which has now been followed underground for over 400 feet, and from which ore averaging $50 has been taken. In the winze which was sunk on this vein the ore averaged over $70 in gold, silver, and lead, the

gold values being on the average ¾ oz. In addition to the main vein, two other veins have been proved; one of them averaging 5 feet in width and carrying $15 in gold and silver, the other, 12 feet wide, with $4 in gold and silver. The *Main Reef* is one of the properties upon which work can be carried on steadily, the workings being situated in good timber and free from snowslides.

GLACIER CREEK.

Portland Canal Mining Co., Ltd.—(*See* Report of the Provincial Mineralogist.) The total amount of development for the past year represents 650 feet of drifting and crosscutting; 500 tons of concentrates are ready for shipping. Shipment will commence before spring.

Stewart Mining and Development Co., Ltd.—The company continued working throughout the year, over 1,000 feet of underground work having been driven, with a force of twelve men during the summer and eight men in the winter. The main work consists of drifting on the four parallel veins traversing the company's property. A winze is now being sunk on the ore-shoot on the No. 4 vein, the ore averaging 3 feet in thickness.

Glacier Creek Mining Co., Ltd.—This property consists of the *Lulu, Nellie V., Riverside, Lucky Boy,* and *Last Chance* claims. The company commenced work in the beginning of June with a force of ten men; a substantial bunk-house and a mess-house were erected, and work begun on the crosscut tunnel, 35 feet of which had already been done by the former owners. In October, when the work was closed down for the season, the face of the tunnel was in 160 feet. It is expected that in a few feet farther the No. 3 vein of the *Stewart* property adjoining should be struck. The property has been surveyed for Crown grants.

Rush-Portland Mining Co., Ltd.—This property consists of the *Katherine, Elsie, Ne Plus Ultra, Empress Fract.,* and *Kœnig Fract.* claims, situated at the head of Glacier creek, at an elevation of 3,500 feet above sea-level. Work on the property was commenced on the 15th June, 1910, since when a tunnel has been driven on the *Katherine* for a distance of 110 feet, and a considerable number of open-cuts have been made on the *Ne Plus Ultra.* The vein on the *Katherine,* carrying galena, runs from 15 inches to 5 feet in width in lenses. Some 2 tons of high-grade silver-lead ore is sacked, awaiting shipment. The company has also built two miles of horse-trail to connect with the trail on the south fork of Glacier creek.

Lordigordy Mines, Ltd.—(Report furnished by H. B. Williams, manager for the company.) This property consists of the *Evening Sun, Columbia,* and *Lallapalooser* claims, situated at the head of Glacier Creek, at an elevation of 2,400 feet above sea-level. Work was commenced by the company on the 1st July, 1910; boarding and bunk houses to accommodate twenty men have been built, as well as foreman's cabin, stable, etc. The development work done consists of three tunnels on the *Evening Sun,* 80, 85, and 20 feet respectively, and a tunnel on the *Columbia,* 45 feet. The ledge matter on the main vein is a quartz gangue, with considerable siderite; some stibnite, arsenopyrite, and iron-pyrites. The grey copper is associated mainly with the siderite. A pay-streak from 2 to 12 inches in width, consisting of galena carrying grey copper, with silver values. A trial shipment in September of 4 tons of hand-picked ore, sent to the Tacoma smelter, gave returns as follows: Gold, 0.02 oz.; silver, 375 oz.; lead, 23 per cent.; copper, 1.68 per cent.; total gross value, $202 per ton. A good pack-trail has been built by the company for a distance of three miles and a half from the railroad grade, at a point three miles and a half up Bear river from Stewart. It is the intention to rawhide ore from the mine to the railroad during the winter.

Portland Wonder Mining Co., Ltd.—This property consists of the *Little Wonder, Mint, Copper Queen No. 1, Copper Queen No. 2,* and *Big Four Fract.* claims. Work recorded, 150 feet of tunnel; development work was continued until the early part of December with a force of ten men. It is the intention of the company to resume development work shortly.

Ben Bolt Group.—This property consists of the *Ben Bolt*, *Jumbo*, *Rex*, and *Ajax* claims, and is at present under bond to the Pacific Coast Exploration Co., Ltd. About forty men are at work; the development work to the end of the year consisted of 467 feet of tunnel and 25 feet of sinking.

O. K. Fract.—The Little Joe Mining Co., Ltd., have driven 150 feet of tunnel on the property, but closed down the latter end of the summer.

Northern Consolidated Mining & Development Co., Ltd.—This company had a bond on the *Grandview*, *Jean T*, *Valley Creek*, *Tyee*, and *Portland* claims. The work recorded is as follows: Shaft, 27 x 6 x 8 feet; open-cuts, 10 x 12 x 8 feet, 8 x 10 x 10 feet, 12 x 4 x 5 feet, 5 x 5 x 15 feet, and 30 x 5 x 3 feet, all in solid rock. The bond has since been allowed to lapse.

BITTER CREEK.

Washington Group.—This property consists of the *Washington*, *Washington No. 1*, *Washington No. 2*, and *Washington No. 3* claims, and is held by the Olga Mines, Ltd. Work done, 24 feet of tunnel.

Olga Group.—This property, also held by the Olga Mines, Ltd., consists of the *Olga*, *Olga No. 1*, *Star*, *Lorne*, *Rupert City*, *Skyline*, and *Skyline No. 1*. Work done, 60 feet of tunnel.

Swede American Group.—This property, owned by the Crown Mining Co., Ltd., consists of the *Swede American Nos. 7*, *8*, *9*, *10*, *12*, and *13*, and *White Goat*. Work done, 89 feet of tunnel and a series of open-cuts.

Maggie Group.—This property, held by the Crown Mining Co., Ltd., consists of the *Maggie*, *Happy Jack*, *Grizzly Bear Nos. 1* and *2*, and *Standby*. Work done, 55 feet of tunnel and open-cut 20 x 8 x 3 feet.

White Mike Group.—This property, held by the Bitter Creek Mining Co., Ltd., consists of the *White Mike*, *Swede American Nos. 5*, *6*, and *14*, and *High Line*. Work done, 170 feet of tunnel and 14 feet shaft, 8 x 8 feet.

Cuprum Group.—This property, held by the Bitter Creek Mining Co., Ltd., consists of the *Cuprum*, *Cuprum No. 1*, *Waterloo*, *Northern Crown*, *I. X. L.*, and *Swede American Nos. 3*, *4*, and *11*. Work done, 395 feet of tunnel, and shaft, 10 x 8 x 8 feet.

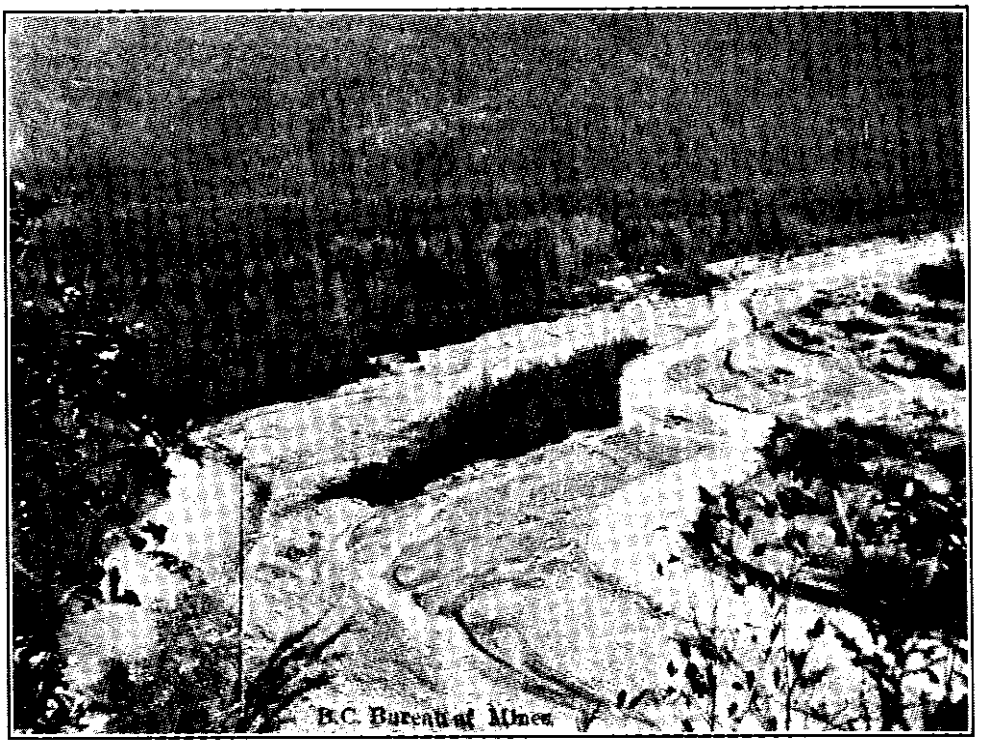
Old Chum Group.—This property consists of the *Old Chum Nos. 1*, *2*, and *3*, and *Arrowhead* claims, owned by Lydden, Hartley, and Lade. Work done, 8 feet of tunnel and a series of open-cuts and strippings.

Union Jack Group.—This property consists of the *Union Jack*, *Famous*, *Skylark*, *Sunshine*, *Ptarmigan*, *Red Mountain*, and *Forget-me-not* claims. Work done, 30 feet of tunnel and a series of open-cuts and strippings. Owned by Lydden, Hartley, and Lade.

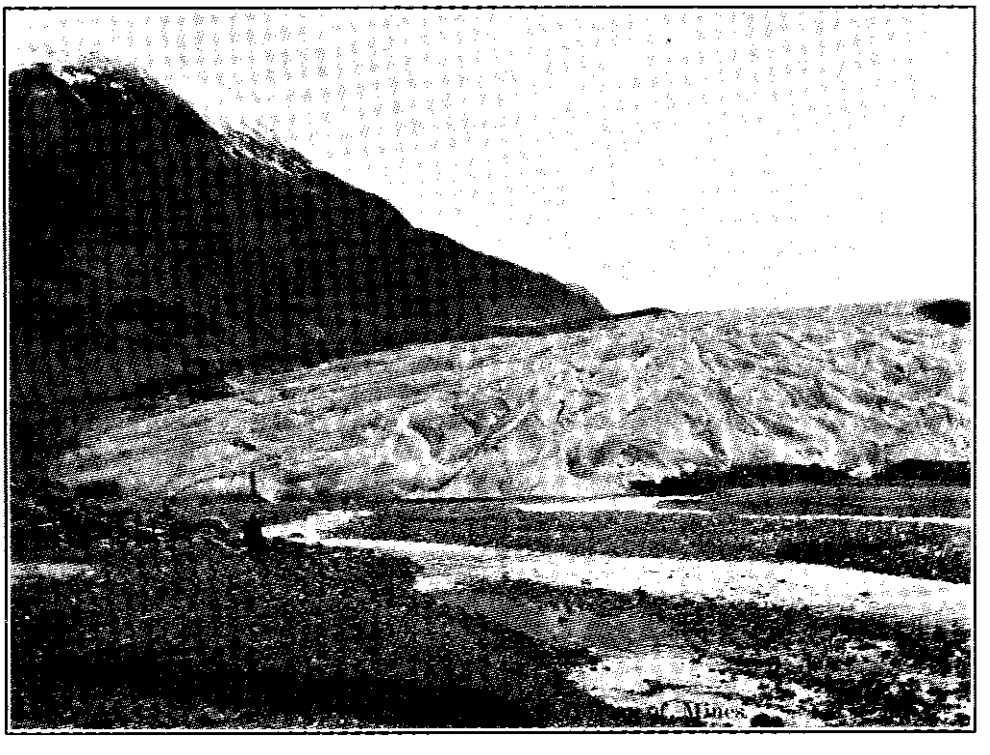
Good Enough Group.—This property consists of the *Good Enough*, *Big Boulder*, *Gold Bar*, *Blue Bell*, and *Blue Bell No. 1* claims. Work done, 40 feet of tunnel. Owned by A. E. Crosset and associates.

AMERICAN CREEK.

Bonanza Group.—This property consists of the *Bonanza Nos. 1*, *2*, *3*, and *4* claims, situated on the north side of American creek. During the past season the development work consisted of two shafts and considerable surface-stripping. The results of this work were the proving of the vein to be at least 250 feet in length, and the existence of a pay-streak 10 inches wide, carrying silver and lead with small gold values.



Bitter Creek at Junction of Bear River—from Mt. Dolly.



Foot of Glacier—the source of Bitter Creek.

Kansas Group.—This property consists of the *Stop and Rest*, *Sunshine*, and *Ketchum* claims, situated on the north side of American creek. Work done, 18 feet of tunnel and open-cut in rock, 8 x 4 x 6 feet.

Big Casino Mining Co., Ltd.—This property consists of the *Big Casino*, *Little Casino*, *Ouray*, *Jack of Clubs*, and *Lookout Frac.* claims, situated above the forks of Bear river and American creek, on the west side. Work done, 20 feet of tunnel and rock-cut, 22 x 16 x 7 feet.

Mountain Boy Mining Co., Ltd.—(*See* Report of the Provincial Mineralogist.) The total amount of work done for the season is 195 feet of tunnel, and a winze 52½ feet.

American Creek Mining Co., Ltd.—This property consists of the *Bandolier*, *Rangoon*, *May Bee*, and *Louise* claims, and two fractional claims, *Top Notch* and *Lower Notch*. Annual assessment work only has been done on the property, as the company decided not to commence operations on a larger scale until arrangements had been made whereby desirable additional claims were absorbed. The negotiations are now completed, and work will be commenced in the early spring.

SALMON RIVER.

Hercules Mines, Ltd. (until recently known as the Salmon River Glacier Mining Co., Ltd.). (Report furnished by H. B. Williams, manager of the company.) This property consists of the *Glacier*, *Martha Ellen*, *Cornelius*, *Empire*, and *Leckie Frac.* claims, situated sixteen miles from the mouth of Salmon river and a total of eighteen miles from Stewart. Work was commenced by the company on the 1st July, 1910. The elevation of the outcrops is 3,500 feet above sea-level; the main ore-bearing formation consists of a green schistose rock cut by igneous dykes. Ore-bodies occur in a zone opened up on the surface by a series of open-cuts over 1,700 feet along the outcrops. Seven open-cuts across the ore show widths of payable ore to be from 5 to 30 feet. Values are carried by galena with considerable chalcopyrite having gold and silver values. The development work done consists of some 400 feet of open-cutting, trenching, and shaft-sinking, while two crosscut tunnels to cut the ore-bodies at a depth of 100 feet vertically have been commenced. Considerable ore of shipping grade lies on the dumps awaiting completion of transportation facilities. Nine men have been employed during the season, and a good pack-trail will be constructed in the spring.

Dickens and Dawson Claims.—This property is under bond to the Pacific Coast Exploration Co., Ltd. The work done consists of 25 feet of tunnel and a series of open-cuts.

Golden Crown Group.—This property, consisting of fourteen claims, is also under bond to the above company. The work done consists of 113 feet of tunnel, 17 feet shaft, and a series of open-cuts and trenches.

Portland Nos. 1 and 2.—This property is owned by Denomie and Guzman. The work done consists of 42 feet of tunnel and a series of open-cuts.

In addition to the above list, annual assessment has been done on a large number of claims owned by individuals in the district, the total number of certificates of work issued being 595.

OFFICE STATISTICS—PORTLAND CANAL MINING DIVISION.

(From 1st August to 31st December, 1910.)

Free miner's certificates (individual)	108
" " (company)	2
Mineral claims recorded	356
Certificates of work issued	485
Bills of sale, etc	141
Filings	62

Revenue.

Free miner's certificates	$ 544 50
Mining receipts, general	4,168 85
Other sources	1,179 50
Total	$5,892 85

PORTLAND CANAL MINING DIVISION.

PRELIMINARY REPORT BY WM. FLEET ROBERTSON, PROVINCIAL MINERALOGIST.

The large number of mining claims staked and the amount of development and prospecting taking place in the district comprising the drainage area of the Portland canal influenced the Provincial Government in making this area into a separate mining division, subtracting it from the area formerly contained and included in the Skeena Mining Division.

The Portland Canal Mining Division came into legal existence by Order in Council on August 1st, 1910, with the Mining Recorder's office in the town of Stewart, at the head of Portland canal. The notice appearing in the Official Gazette of July 21st, 1910, gives the official description of the boundaries of the new division, which may, however, be summarised as "the drainage area of all streams, in British Columbia, flowing into the Portland canal."

While the history of mining in the district only began this fall, prospecting has been going on steadily and quietly for ten or twelve years, and the district has been twice visited by the Provincial Assayer, whose reports have been published by this Department—the last in 1909—so that the writer confined his attention this season to seeing what had been done on the more developed claims and on those which report credited with more nearly approaching the production stage. The time available for the inspection was limited, and the season at which it had to be made—in October—was so late in the year that many of the claims at higher altitudes were covered with snow, while on others work had been temporarily abandoned for the winter, so that, but comparatively few of the many claims recorded and partially developed could be inspected; consequently this preliminary report must be taken, not as a complete review of the camp, but as an impression gained from a short visit and the inspection of a few claims.

The Portland Canal camp cannot, as yet, be taken as proven, for, although some prospecting has been going on for years, the great majority of the claims have been staked within the past couple of years, and consequently have not and could not have had sufficient development done on them to prove their value. Only two or three of the older claims have done serious development, and of these, at least one property has shown by such that ore is present in quantity and quality sufficient to justify its being called a mine, and to guarantee extraction from present development for at least two years. On other properties where the actual development is slight, the work done by Nature has exposed such an amount of mineral as to give considerable hope for future development.

The camp contains a large number of properties from the prospect workings of which exceptionally high assays have been obtained, giving rise to unwarranted hopes and statements which cannot be borne out on a strict examination. The camp justifies reasonable expectations, for the development done, without exaggeration by well-intending though injudicious friends whose wild statements nearly "killed with kindness" the best endeavours of legitimate workers.

The reports circulated in the newspapers of a "mountain of gold" were of course unjustified and did the whole camp much harm, but apparently did not originate with the prospectors. There was, however, some small foundation for the reports; a very large ledge of quartz had been located, containing small gold values—the ledge is large and the values obtained justify further prospecting—that is all that is claimed for it by the locators.

Portland inlet and its inner extension, known as Portland canal, form a great continuous fiord or arm of the sea, extending from the Pacific ocean, at Dixon entrance, in a northerly direction for about 110 miles, and so almost penetrating the Coast range of mountains—a granite range which follows the entire coast-line of British Columbia, and extends northwards into Alaska. This is the only arm of the sea so cutting the mountain range, although the range is cut elsewhere by certain rivers flowing westward from the interior, notably the Stikine, Skeena, and Fraser rivers, the latter two having already been utilised as railway locations.

The Portland canal for its entire length forms the International boundary—the land to the westward belonging to Alaska, while that to the east is in British Columbia. From the head of the canal this boundary-line follows northerly along the summit of the range of mountains between the Bear and Salmon rivers for a distance of about ten miles, to Mount Dolly; thence striking in a north-westerly direction, crosses the Salmon river some fourteen miles from its mouth, leaving the watershed of Bear river and of the headwaters of Salmon river in British Columbia, while the lower part of Salmon river is in Alaska.

The importance of this arm, from a mining point of view, is that it gives deep seawater navigation to, and so renders easily accessible, a district in which the granites of the Coast range came in contact with the sedimentary formations lying to the eastward and farther inland. This region of contact extends for the whole length of the Coast range and, from its geological features, forms a zone of *probable mineralisation*, as has been repeatedly pointed out in these reports and is here again emphasized.

That this conclusion—which is sometimes considered by the prospector as academic, but is really based upon the wide observations of geologists—is borne out by facts, is demonstrated on this eastern border of the Coast range by the mineral discoveries at White Horse and vicinity, in the Yukon, on Unuk river, as noted in reports of United States geologists; at Portland Canal camp; on the Telkwa and the Zymoetz (Copper river) rivers and vicinity of Hazelton; at Tatlayoko lake, and, possibly, farther south in the Similkameen District and Steamboat mountain. None of these localities have been thoroughly prospected, all of them have shown good mineral prospects, many promise exceedingly well for the amount of development done, and a few have developed mines already.

The zone of contact on the western side of the Coast range is marked as mineralised by the Britannia Mine, at Howe sound; probably on Texada island and other islands between Vancouver Island and the mainland, but in the more northerly stretch of the British Columbia coast it is, for the most part, submerged in the ocean.

A second zone of contact, probably with another, although similar, and parallel granitic uplift, accounts for the mineralisation found on Vancouver Island and in the Queen Charlotte islands.

The steep-sided depression occupied by the Portland canal and its northerly extension of some twenty miles, the valley of Bear river, represents a tremendous earth-cleft, of which the Canal is to-day the submerged portion, while the Bear river valley has been recently,

geologically speaking, filled in to its present level by the detritus from the numerous glaciers, formerly undoubtedly of enormous extent, but to-day represented by comparatively small remnants which head every creek and crown the surrounding hills.

The receding and diminishing of these ice-fields and glaciers, while traceable in many parts of the Province, is particularly noticeable in the Portland Canal district, possibly because more recent. The grinding effect of the ice-fields is in evidence over the whole district, and, with the help of other agencies of Nature, has so worn down the mountains that to-day but a remnant of the original uplift is left; and the present surface, with its veins and dykes, was not the surface at the time of formation, but represents a deep-seated irregular section of the rock formations—how deep below the original surface is a matter of conjecture; but certain it is that the present manifestation of vein formation represents only the deep-seated roots of the old veins, and that this cutting-down action has been so recent and continuous as to leave no surface zone of oxidation—a fact it would be well for prospectors, etc., from the South and Interior to note—although there may be a surface enrichment, particularly in gold, in some of the more porous veins or fissures of mineralisation.

The geology of the Bear River district may be generalised as follows, subject to certain exceptions and variations which will be fully demonstrated in the detailed map and report of Mr. R. G. McConnell, of the Geological Survey, who, with a party, spent the summer of 1910 in making a detailed geological study of the field.

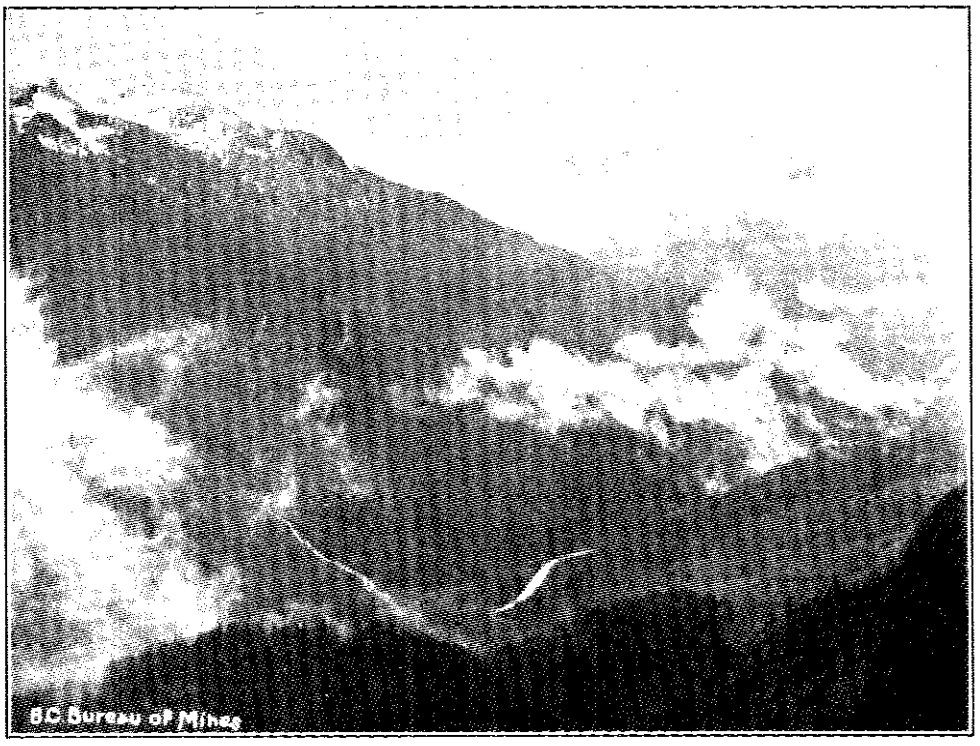
The earth-cleft referred to as forming the valley of Bear river was probably accompanied by considerable movement, and, although the line of the cleft is covered by the valley filling, its effect is noted in the contrasting geological formation of the east and west sides of the valley.

The west side of the valley is essentially and fundamentally of plutonic and volcanic origin, granites on the lower part of the valley, changing to a dark igneous rock—probably a diabase—farther up the river and showing in the wash from the higher elevations, not visited, fragments of volcanic agglomerates.

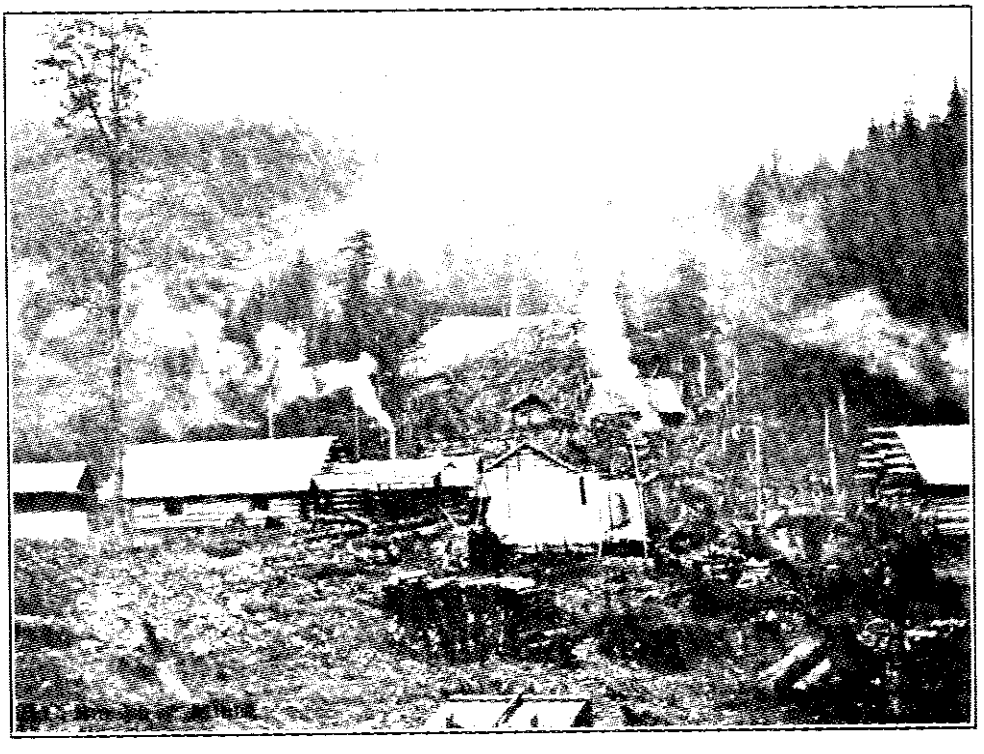
This igneous mass has been but little cut by dykes, but the diabase is seamed in all directions by small stringers of white quartz, very sparsely mineralised, while at intervals more important east and west cross-fissurings occur, frequently quartz-filled, and sometimes important lenses or shoots of ore occur, as is demonstrated in several partially developed properties.

The geological formation of the east side of the valley is essentially and fundamentally an argillite, a sedimentary deposit, cut by intrusions of greenstone, and numerous dykes, both basic and acidic, are in evidence, the former being the larger and more plentiful, and seemingly the older, the latter the more recent—apparently in places cutting the older dykes, and also the vein-fissures; these latter are probably connected in some way with an underlying granitic batholith, and seemingly are associated with the silicification which is apparently responsible for the mineralisation found. The dyke systems and lines of fissuring on the east side of the valley seem to nearly conform to the bedding planes of the argillite, and have a course approximately north and south, or roughly parallel with Bear river valley.

This generalisation applies to the valley of the Bear river below American creek, whether it will be found applicable to the country back of the first range of hills and surrounding the heads of the smaller tributary streams, at altitudes of from 3,000 to 4,000 feet, cannot be stated from personal observation.



Looking down American Creek—from Mountain Boy Claim.



Main tunnel and camp of Red Cliff Mine.

On this eastern slope the, at present, more important properties, such as that of the Portland Canal Mining Company, the *Stewart*, *Main Reef*, *Jumbo*, and many others, lying south of Bitter creek, seem to be all located upon the one general zone of fissuring, which is continuous for at least four or five miles, and in this the veins are found. Sometimes the vein formation is represented by a single quartz vein, while farther along it presents four or more veins; the transition from one to more veins is not shown by the work done, nor yet is it exposed by the valley of Glacier creek, which cuts across and into the formation to a depth of some 1,500 feet, although the latter does demonstrate the veins to continue to that depth. At the present stage of prospecting and development this one main zone of fissuring seems to contain all the more important ore showings, although it is premature to conclude that it is the only zone on this hillside.

While this general fissure continues, as stated, for such a great distance, and the vein formation in it is at least seemingly nearly continuous, as far as demonstrated, the veins being more or less mineralised throughout, still it does not follow that for all this distance the mineralisation is sufficiently intense to form profitable ore; such could not be expected and does not occur, but there are parts in these veins in which the amount of mineral in the vein occurs in sufficient quantity to render it workable ore. It is as yet too early in the development to say whether the ore occurs in shoots, chimneys, or some other form, but the tunnel workings of the Portland Canal Mining Company have demonstrated that the "pay-ore," first proved on the surface, extends downward along a defined "pitch" which would seem to mark the northern end of an ore-shoot, while the tunnels have not as yet at their faces reached the limit of the body of "pay-ore" to the south. By the term "ore-shoot" it is not intended to imply a body of solid ore, but a portion of the length of the vein sufficiently heavily mineralised to be profitably workable.

The chances are that mineralisation, generally similar in character, although varying as to quantity, occurs throughout this main fissure. The character of this mineralisation is best demonstrated by the actual extraction of the only producing mine—the Portland Canal Mining Company's—described later, and may be summarised briefly as iron-sulphides carrying gold and silver, galena carrying silver and some gold, and a small quantity of zinc-blende carrying small silver and still smaller gold values. These are essentially the ores upon which the values of the properties will probably be based, although, particularly in the upper or surface workings, specimens of exceedingly rich silver-sulphides and oxides, with also native silver and possibly gold, have been found.

In the opinion of the writer, this portion of the camp will be comparatively low-grade concentrating propositions, from $10 to $20 ore, the high-grade minerals being difficult to concentrate and not sufficient in quantity to dispense with this process.

SHIPPING FACILITIES.

Seldom in British Columbia has the truth been so clearly demonstrated as at Stewart, that the value of an ore-body is dependent upon the facility of getting its contents to market, and still more seldom have the facilities been so quickly obtained. Portland canal affords a land-locked waterway by which any vessel may approach the town of Stewart, where the tidal mud-flats offer proper holding-ground for pile wharves; this has been taken advantage of, and a pile wharf, with a pile approach from the shore, a mile long, is now nearing completion; while a local railway company has built a splendid railway dock and approach, over a mile long, and has equipped it with standard-gauge tracks. The same company has about completed a railway-grade up the valley of Bear river to the mouth of American creek—

a distance of approximately fifteen miles—and could, should it desire to push matters, easily have the rails laid over this length before snow falls. A locomotive and a number of cars are now on the ground ready for use, and rails have been laid from the landing as far as the railway-station.

The valley of Bear river on the flat will average about half a mile wide, being rather more than this near its mouth; its course is nearly straight, and it rises at an almost uniform grade—about 500 feet in fifteen miles. The valley bottom is gravel, permitting of cheap railway construction, while the first nine miles of the railway-grade contains one tangent of four and a half miles in length and many shorter ones. The hills rise abruptly from the valley, affording the best of opportunities for aerial tramways, with ample room on the flat for requisite mill-sites.

The tributary streams are all too steep to admit of railway construction up them; an exception to this rule is, however, presented in Bitter creek, up which a railway might easily be built for a distance of from six to seven miles, or possibly to the foot of the glacier, with aerial tributaries from the side creeks. Bitter creek valley is really a branch extension of the river valley, and is similarly filled with detritus from the glacier. The Provincial Government has built a waggon-road, with necessary bridges, from Stewart up the river valley, as far as and across Bitter creek, over which two stages travel daily each way. A further extension of this road as far up as American creek, including a bridge across Bear river, was under construction this autumn and promised to be completed before snow falls.

Steamer service is maintained from Seattle, Victoria, Vancouver, and Prince Rupert twice a week by the G. T. P. Railway, their fine boats having gone right through to Stewart during the summer months, but in the winter a transfer of passengers and freight is made at Prince Rupert to a small steamer, which serves as a tender to the larger ones. The Union S.S. Co. runs its steamer "Camosun" from Vancouver through to Stewart direct without transfer, making a round trip each week. Beside these regular steamers, several coasting and freight boats make Stewart a place of call but at irregular intervals.

Town of Stewart.

The townsite of Stewart occupies the middle portion of the gravel flat at the head of the Canal, and is platted to cover a considerable portion of the tidal flats which it is thought might eventually be filled in. The town contains three good hotels—much better than one would expect to find in so new a town—and innumerable boarding-houses; there are several exceedingly well-equipped and stocked stores supplying all the necessities and many of the luxuries of life and requisites for mining or prospecting. There are a number of office buildings occupied by brokers, real-estate agents, etc. The town has its own newspaper, two competent assayers, two doctors, and a well-equipped hospital. There are several good private houses and many temporary structures; but the population is, as yet, essentially composed of men who board out.

Of public buildings, there is the Provincial Government Mining Recorder's office, a Land Registry office, Court-house and lock-up. The Dominion Government maintains a post-office, and the town hopes soon to be connected with the outside world by telegraph, the Government now having a construction gang at work building a branch line of wire in from the Yukon line between Hazelton and Telegraph Creek.

In addition to the Stewart townsite, the railway company has platted a townsite adjoining it on the east, where are located its depot and freight-sheds, etc.; the lots of this other townsite have not yet been placed on the market.

Portland Canal Mining Co.

Interest in the Portland Canal camp at present naturally centres in the operations of the Portland Canal Mining Company, N.P.L., since the development of this company's property is the furthest advanced and it is the only company as yet in a position to make shipments. The company is a local organization, with head office at Duncan, V. I., the president being Mr. C. H. Dickey, of Duncan. The capital of the company is $1,000,000, divided into shares of a par value of 25 cents. The operations of the company at the property are in charge of Mr. W. J. Elmendorf as engineer and general manager, with Mr. N. C. Sheridan as mine superintendent, while Mr. Otto Abeling has been responsible for the construction and equipment of the concentrator. The company owns some twelve claims and fractions, viz.: *Gipsy*, *Extension*, *Herbert*, *Mayflower*, *Mosquito*, *Richard II.*, *Barney*, *Sadie*, *Eclipse*, *Little Joe*, *Little Joe Fraction*, and *Lucky Seven*, all adjoining and situated on the hill forming the eastern slope of Bear river and the southern slope of Glacier creek valleys. Serious development work has as yet been confined to the *Lucky Seven* and *Little Joe* mineral claims.

As has already been noted, the mineralisation on these claims is along the line of a great fractured zone which runs in a general north and south direction, about parallel with Bear river, not only for the length of this group of claims, but continues, both to the north and south, through a number of other claims. This zone is of variable and not clearly defined width, but is in places several hundred feet across, and runs through an argillite formation, conforming, at least very nearly, to both the strike and dip of the argillite. Within this zone the argillite has been more or less crushed, and presents, when cemented together by the quartz-vein matter, a brecciated mass. Within this zone there are a number of comparatively small felsitic dykes, running with the fissure, apparently injections after the formation of the fissure, and these dykes seem to be present wherever important mineralisation has taken place. Through this general zone of crushing, siliceous infiltration has taken place, the solution naturally following certain channels which the crushing had rendered more open—lines of least resistance to the flow of the solution—and these channels of silicification now form the quartz veins in which the mineral is found.

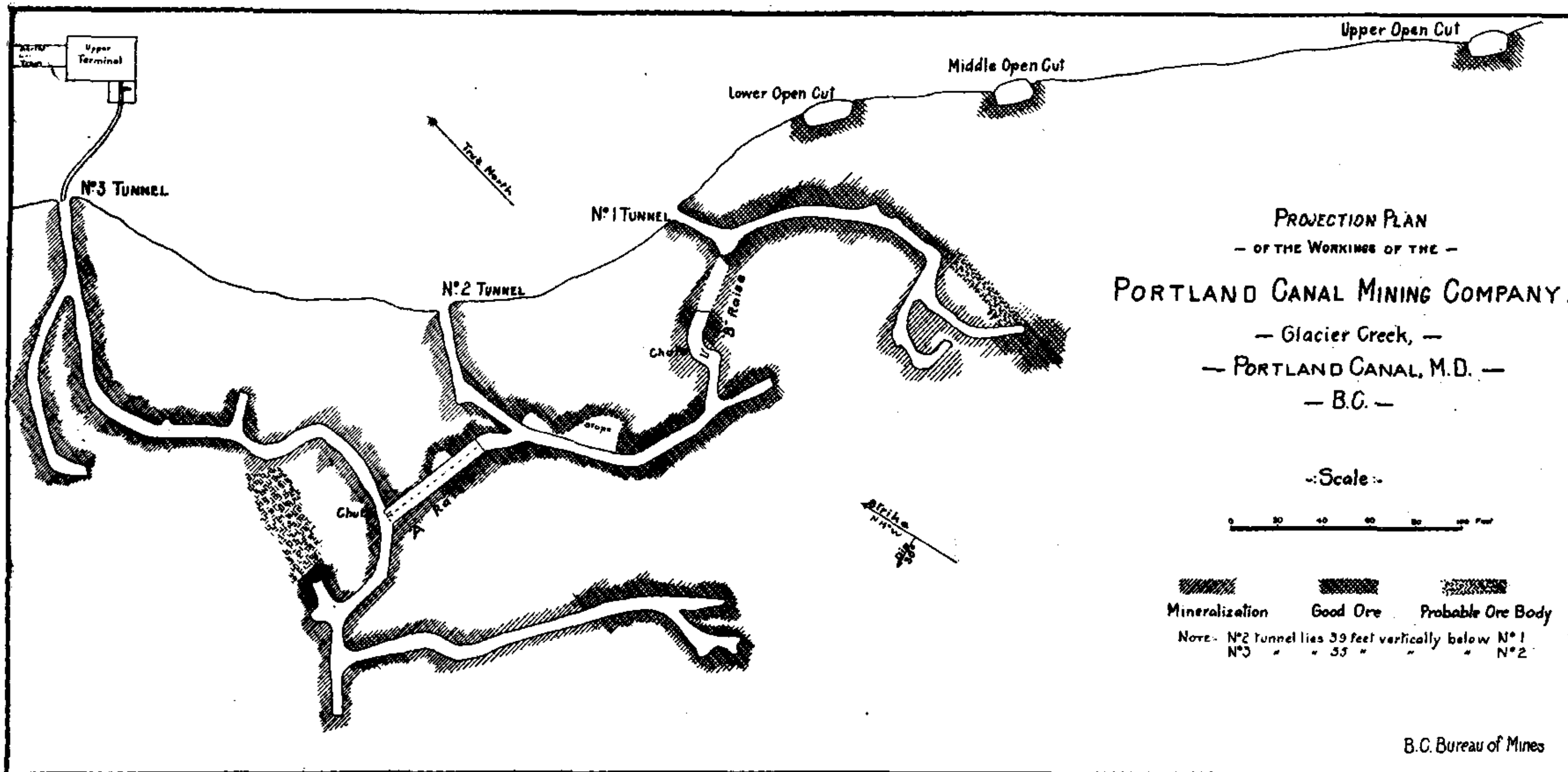
On the *Lucky Seven* and *Little Joe* the silicification seems to be confined to one main vein, as far as present development shows. In the earlier stages there were supposed to be two veins, but the management now considers the second vein as merely an offshoot of the main vein.

Mine.—The mine workings are at an elevation of about 2,400 feet above sea-level, and consist of three tunnels with connecting raises, as shown on accompanying plan.

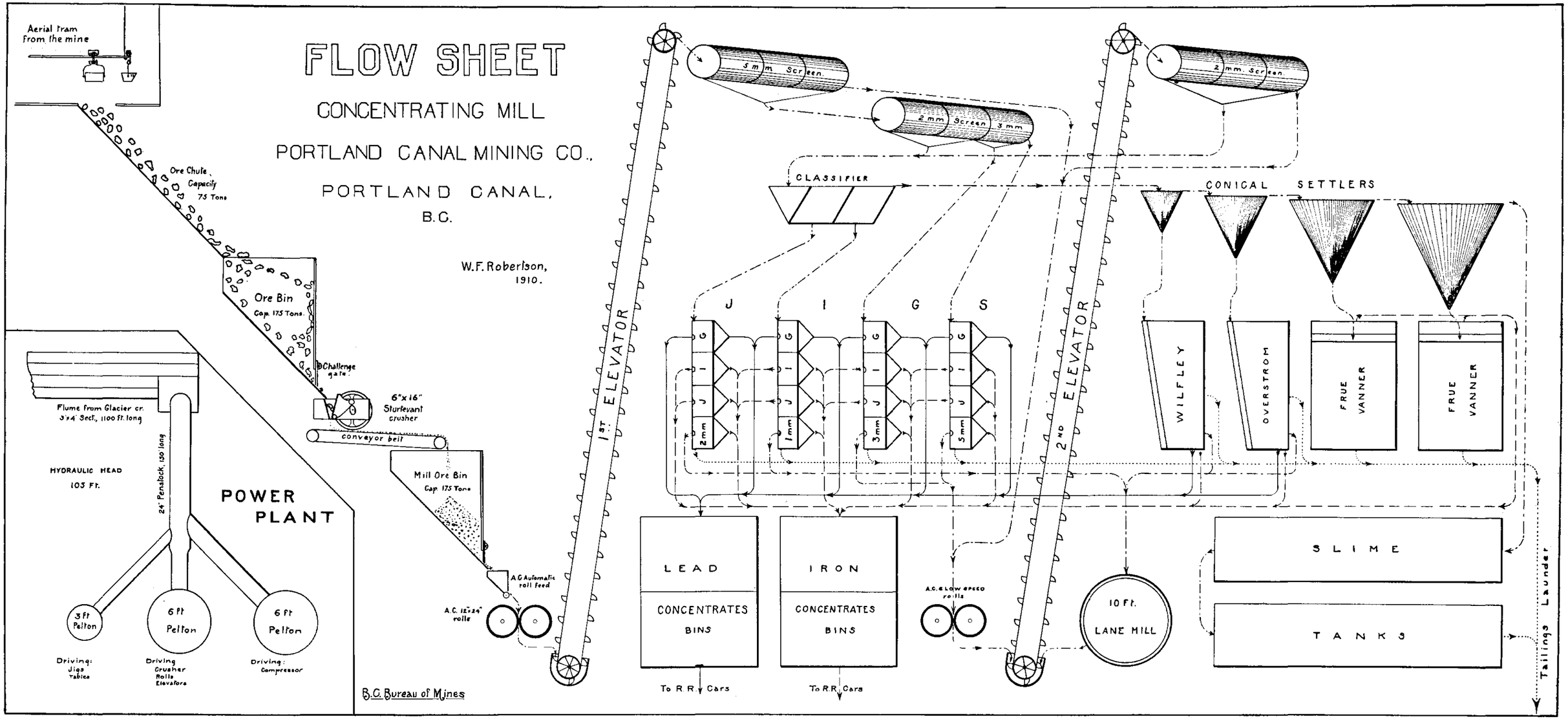
The lowest, or No. 3 tunnel, is the working tunnel, the tramway therefrom going directly to the bunkers at the upper terminal of the aerial tramway. This tunnel, in October, 1910, was in about 500 feet, and follows in on the vein, which is mineralised all the way; but what is considered pay-ore was only struck at about 100 feet in, from which point it apparently continues to the face, although the tunnel in a couple of places seems, in the driving, to have run away from the ore. From this level a raise has been put up to the No. 2 tunnel, and this acts as an ore-chute from the upper levels.

The No. 2 tunnel is about 55 feet vertically higher than No. 3, the vein dipping at an angle of about 30 degrees, and was in about 200 feet, with a raise being put up to the No. 1 tunnel, and which, in October, was almost through. At about 25 feet in from the portal the tunnel entered on pay-ore, in which it has continued to the face.

The No. 1 tunnel is about 40 feet higher than No. 2, and has been driven about 180 feet and developing pay-ore for its entire length, the face being in such ore. At one point in the driving the tunnel was deflected to the right and ran out of the ore-shoot, but, upon being brought back to the original course, picked up the ore again.


Upper Terminal
Nº 3 Tunnel
True North
Nº 1 Tunnel
Nº 2 Tunnel
Lower Open Cut
Middle Open Cut
Upper Open Cut
Raise
Chute
Stope
Chute
Strike N.W.
Projection Plan
— of the Workings of the —
Portland Canal Mining Company.
— Glacier Creek, —
— Portland Canal, M.D. —
— B.C. —
Scale
0 20 40 60 80 100 Feet
Mineralization
Good Ore
Probable Ore Body
Note.- Nº2 tunnel lies 39 feet vertically below Nº1
Nº3 " " 35 " " " Nº2
B.C. Bureau of Mines

Concentrator—Portland Canal Mining Co.


FLOW SHEET
CONCENTRATING MILL
PORTLAND CANAL MINING CO.,
PORTLAND CANAL,
B.C.
W.F. Robertson,
1910.
Aerial tram from the mine
Ore Chute, Capacity 75 Tons
Ore Bin Cap. 175 Tons
Challenge gate
6"x16" Sturtevant crusher
conveyor belt
Mill Ore Bin Cap. 175 Tons
A.C. 12"x24" rolls
A.C. Automatic roll Feed
1ST ELEVATOR
3 m.m. Screen.
2 m.m. Screen 3 m.m.
2 m.m. Screen.
CLASSIFIER
CONICAL SETTLERS
J
I
G
S
WILFLEY
OVERSTROM
FRUE VANNER
FRUE VANNER
2ND ELEVATOR
LEAD CONCENTRATES BINS
IRON CONCENTRATES BINS
To R.R. Cars
To R.R. Cars
A.C. & Low speed rolls
10 Ft. LANE MILL
SLIME
TANKS
Tailings Launder
Flume from Glacier cr. 3'x4' Sect., 1100 ft. long
HYDRAULIC HEAD 103 Ft.
24" Penstock, 150 long
POWER PLANT
3 Ft Pelton
6 Ft Pelton
6 Ft Pelton
Driving: Jigs Tables
Driving Crusher Rolls Elevators
Driving: Compressor
B.C. Bureau of Mines

Above the No. 1 tunnel several open-cuts, sunk on the outcrop, have disclosed pay-ore, indicating that this ore-shoot continues for at least 350 feet to the south of the portal of No. 1 tunnel. The development work on this ore-shoot, as stated, would seem to indicate an ore-shoot at least 350 feet long, developed below the outcrops, along the plane of the vein for a distance of about 400 feet; the thickness of the pay-ore has been estimated by the management as averaging about 5 feet; this figure being, in the opinion of the writer, under the mark, rather than over it. Should the ore-shoot prove to be as long in the tunnels as the open-cuts directly above them seem to indicate, this would argue an amount of ore, from present development, sufficient to keep the present mill busy for three years. The faces of all the tunnels were found to be in ore which was apparently richer than the average of the ore-shoot.

The monthly average assay for September of the face of No. 2 tunnel is reported as being: Gold, $5.20; silver, 61 oz.; lead, 2.5 per cent.; and of face of No. 3 tunnel, about, gold, $4; silver, 15 oz.; lead, 4 per cent. These values vary from month to month, and are quoted merely as an indication of the grade of ore met with.

The ore mined and milled consists of iron-sulphides and galena, both carrying gold and silver, with a small quantity of zinc-blende and occasionally some copper-pyrites, all contained in a quartz gangue and mixed with fragments of argillite.

Specimens of the higher sulphides and oxides of silver and of metallic silver are frequently seen in the vein in all the levels, and, though of interest, are not taken into account by the management, nor is any special attempt made to save them. The mine depends entirely on the iron-sulphides and galena for its ore values, which are stated to be in the neighbourhood of $12 a ton of ore. The ore is conveyed from the mine to the mill by an aerial tramway of the Bleichart system.

All mining has as yet been hand drilling, but the company was engaged in laying, and had nearly completed, a pipe-line from the mill to the mine for the conveyance of compressed air, and when this is completed an equipment of power-drills will be installed in the mine. The compressor was on the ground all ready to be set up at the mill, where it will be driven by water-power.

The mine is provided with good and substantial cook- and bunk-houses and other buildings, including a house for the mine superintendent.

The development accomplished by the mine workings covers but a small part of the main fissure contained within the company's property, in other portions of which important surface showings of ore have been found, but these have, for the time being, been left dormant, pending the development in the mine workings.

Of these minor developments, one, however, deserves special mention; it is located some distance, about 1,000 feet, to the north of the mine workings and on the same vein, but, owing to the contour of the hill, at a considerable lower elevation, and is so situated that ore mined there could, with slight expense, be delivered to the present tramway for transmission to the mill. At this point the main vein outcrops strongly and is heavily mineralised; it is further developed by a short tunnel in which the mineralisation of the vein is satisfactory. This development would seem to indicate another ore-shoot, easy of exploitation, but requires further development to show its extent and ultimate value; it, however, gives ground for the belief that between this point and the mine other ore-shoots will eventually be developed.

Mill.—The company had, in October, just about completed a concentrating-mill for the treatment of the ores from the mine; this mill is situated in the Bear river valley, at the mouth of Glacier creek, the lower terminal of the aerial tramway being some 2,200 feet lower than the upper terminal. The mill building is a substantially framed structure, sheathed with double boarding with paper between, built on the lowest slope of the hill. The mill

consists of a receiving-chute capable of holding 75 tons of ore and a bin holding 175 tons. From this latter the ore is fed through a Challenge gate to a 6-inch by 16-inch Sturtevant crusher, which reduces the ore to 1 inch size. The crusher discharges on to a rubber belt-conveyor, set with a slight fall, which conveys the ore to another bin holding 175 tons of crushed ore. From the crushed-ore bin the ore is fed by an Allis-Chalmers roll-feed automatic feeder to a set of slow-running Allis-Chalmers 12-inch by 24-inch rolls, from which it passes to No. 1 elevator, is thus raised to the top of the mill, and is discharged into a revolving trommel, with 5 mm. screen. The oversize from the trommel is returned by a chute to the second rolls, the discharge going to a second trommel which is fitted with two panels of 2 mm. screen and one panel of 3 mm. The oversize from this trommel goes direct to 5 mm. jig, and the 3 mm. screenings to the 3 mm. jig. The 2 mm. screenings go to a classifier, which separates out the 2 mm. and 1 mm. sizes, which go respectively to the 2 mm. and 1 mm. jigs, while the overflow passes on to four suspended iron conical settlers, which in turn distribute their product, the first to a Wilfley table, the second to an Overstrom table, and the third and fourth each to a Frue vanner. The overflow from these settlers passes on to a series of large settling-tanks on a lower floor. The middlings from the 5 and 3 mm. jigs go to the second, a finer, set of rolls; thence to the second elevator. The middlings from 1 and 2 mm. jigs go to a 10-foot Lane mill, and after recrushing, pass on to No. 2 elevator.

All these recrushed middlings are then elevated to the top of the mill and discharged into a third trommel, the oversize from which is returned for recrushing, and the screenings go to the classifier, so entering the process again. The tailings from all the jigs and tables, being sufficiently clean, go to the tailings-dump. The concentrates from the jigs and tables discharge by gravity into receiving-bins on the lower floor.

The capacity of the crushing, screening, and elevating part of the mill is 100 tons of ore a day; the installation of jigs and tables now in place is for 50 tons only, but provision has been made for doubling this as soon as it is required, so that, while now the mill as a whole has a nominal capacity of 50 tons, this could be doubled at a comparatively small expense. In the construction of the mill the very best and most efficient construction has been employed, and the machines are of the most modern type.

To accompany this report a flow sheet has been prepared to show graphically the process of concentration employed.

An electric-light dynamo to be driven by water-power was being installed, which would light the mill and other surrounding buildings.

Concentration effected.—The concentrating plant was only started about October 1st, and when visited by the writer, some ten days later, was only being "tuned up" on a low-grade feed, so that no definite final results as to the ultimate percentage of saving, the average assay of tailings, or the rate of concentration could be obtained. The work being done, therefore, represents only the "first try," and, as this was good, better results may be expected after adjustment.*

The rate of concentration will be approximately from 3 to 3½ tons of ore into 1 ton of concentrates; these concentrates consist of iron-sulphides and galena, collected separately, in what proportion is not yet definitely demonstrated, but a very clean separation between the two was being effected.

*A letter from the general manager to the president of the company, dated Nov. 22nd, received as this goes to press, places the mill feed at that time as about: Gold, $3.00; silver, 14 oz. to the ton; lead, 3.7%—about $13.00 ore. "Our extraction at this time is about 80%, but with the Lane mill in operation and several small changes, now completed, we will raise this to 85%, and I think ultimately to 87%."

LATER.—After running the mill for some time, it was decided to increase the jig capacity of the plant and to provide a proportionately larger table equipment. The plant was shut down most of the winter while such alterations were being made, but the mine development has been kept on continuously.

The tailings from each of the machines contained but small values in gold and silver, even with the incomplete adjustment, showing that the process was satisfactory, the separation of the mineral from the gangue being easily and very completely effected.

The separation on the Wilfley table was very nearly theoretically perfect, the lines of galena, iron-sulphides, zinc-blende, and tailings on the table being the most clearly defined that the writer has ever seen.

The concentrates being made, from the class of ore being experimented with, ran about as follows: Iron concentrates—gold, from $8 to $10; silver, 15 to 20 oz. per ton. Lead concentrates—gold, from $8 to $10; silver, from 35 to 45 oz. per ton; lead, from 65 to 75 per cent. No zinc concentrates are saved, as they were found by actual test to contain but low assay values in silver—about 1½ oz. to the ton.

The slime-tanks were not at that time in operation, so that it is not as yet known whether any saving will be made of the small quantities of higher silver-sulphides and oxides which are visible occasionally in the ore and which, from their nature, would slime.

Power Plant.—The company owns a water record on Glacier creek which has been developed to supply all the power necessary for the mine and the mill. The water is taken out of the creek in a rocky canyon at the head of a fall, the intake being well protected by projecting rock from any drift-wood or drift-ice. The intake is for the first few feet in solid rock, when the water enters a flume 3 feet deep by 4 feet wide, built of 2-inch plank with battens, laid on a grade of 1-inch fall in 4 rods. From the intake to the pressure-box the flume is 1,100 feet long; it follows down the north side of the creek for some distance, when it crosses over to the south side on a trestle 100 feet above the creek-bed. The pressure-box is 105 feet above the Pelton wheels, to which the water is conveyed in a wrought-iron penstock 24 inches in diameter and 150 feet long, with suitable branches and valves. The power is developed by two 6-foot and one 3-foot Pelton wheels. One 6-foot wheel drives the main counter-shaft from which is belted the crusher, rolls, Lane mill, and conveyors; the other 6-foot wheel was being held for the compressor. The 3-foot wheel was used exclusively for the jigs and tables, thereby obtaining a steady and constant motion for these machines.

Other Buildings.—The company has erected near the mill a large and very complete boarding-house, kitchen, dining-room, sitting-rooms, and bedrooms for the men; there is also a well-equipped laboratory building with rooms for the assayers. The office contains public and private office rooms and living quarters for the manager. Stable, blacksmith, and carpenter shops have been planned out and will be erected at an early date.

Transportation.—The Portland Canal Short Line Railway has laid out a spur from its main line to directly in front of the concentrator building, so that ore will eventually be loaded direct from the mill into the cars.

In addition to this, there is from the mill a good Government waggon-road to the town of Stewart, distant about three miles and a half; this road is practically level and has a good hard gravel bottom.

All supplies for the mine are received at the mill and taken up on the aerial tramway.

The mine office and various mill offices are connected by telephone and also with an office in Stewart.

Stewart Mining & Development Co.

The Stewart Mining & Development Company has eight or nine claims on the north side of Glacier creek at an altitude of about 1,000 feet. The company has been at work for the past three years steadily developing its property by means of tunnels, etc. There has been a great deal of surface work done as well, but this becomes of secondary importance since

the veins have been cut by the tunnel workings. There is little doubt but that the same general zone of crushing or fissure upon which the Portland Canal mine ore-body is located passes northward, through the intervening properties, into and through the Stewart claims. In such a crushed zone the mineral-bearing solutions would follow the lines of least resistance, and while in the Portland Canal property these solutions appear to have been confined to one channel, producing one vein, in the Stewart they appear to have produced four veins, all parallel as to strike, though not as to dip, and all contained within the zone of fracture, which here has a width of about 400 feet.

From Glacier creek northward, following the fracture zone, there are a couple of deep and precipitous-sided gulches extending up as far as the cabins of the Stewart Mining Company. In the sides of these gulches Nature has caused exposures of the veins, so that but little work had to be done to prove their general conditions. From the bottom of the deepest of these gulches, on the *George E.* claim, the company has driven a crosscut tunnel to the east, into the bank, for a distance of about 300 feet, and in so doing has crosscut three veins, known locally, in order of sequence, as No. 1, No. 2, and No. 3 veins—the last being also called the "Green Vein" or "East Vein." The No. 1 vein was struck at 50 feet in, and on this a drift was run to the right for 60 feet, but does not determine the full size of the fissure or vein, which, however, is more fully exposed in a series of cuts higher up the very steep hillside, and there seems to be a well-defined quartz vein, 2 feet to 4 feet wide, and dipping to the west at an angle of about 55 degrees. The vein contains some heavy sulphides of iron, carrying gold values, but no large body of ore has been encountered.

At 100 feet in from the portal of the tunnel the No. 2 vein was cut, and has been drifted upon for 60 feet on either side of the tunnel. The fissure of this No. 2 vein is from 6 to 7 feet wide, and shows a quartz infiltration and replacement of the fractured argillite carrying more or less mineral.

At 300 feet in from the portal, and 150 feet from No. 2 vein, the No. 3 vein was cut, and its general fissure is about 25 to 30 feet wide, while the dip is nearly vertical. On this vein a drift had been made to the right for 50 feet, while to the left one had been driven for 200 feet, and was still being pushed forward, receiving the greater part of the attention of the management; several crosscuts had been put off from the drift at various points to test the width of the fissure. This vein is similar in general character to the others, but in addition to the quartz-gangue matter there was apparent a considerable quantity of calcite. There were some heavy sulphides visible in the vein-matter, but no commercial body had as yet been struck. There were, however, numerous showings of native silver and of the higher silver-sulphides, which, although they gave great encouragement to the management, were not sufficiently plentiful to constitute ore.

On the west side of the gulch, directly opposite to the mouth of the crosscut tunnel already mentioned, No. 4 vein has been opened up by a tunnel driven in along the vein for some 200 feet. This is a large strong vein and seems to carry a greater percentage of heavy iron-sulphides than was then visible in any of the other veins. This vein dips to the west at a flatter angle than the other veins, and the mineralisation more nearly approaches in character that found on the Portland Company's property, giving rise to the belief that this vein is the continuation of the Portland vein. This belief, however, lacks definite confirmation, and it is not at all improbable but that all the veins are equally continuations of the Portland vein.

Portland Wonder.

The *Little Wonder* mineral claim, being developed by the Portland Wonder Mining Company, is situated to the south of the eastern portion of the *George E.* claim of the Stewart Mining Company, and contains within its borders a continuation of the No. 3 vein of the Stewart, which here also is found dipping nearly vertical and is easily traced from the Stewart down Lucky gulch to the *Little Wonder* workings. These workings are only a short distance up the gulch from Glacier creek and at an altitude of 700 feet above sea-level; the No. 2 tunnel has been driven in for about 360 feet, of which the first 150 feet is through slide material. Practically all the work is now being done in this tunnel, from which a raise has been put up to the old workings on No. 1 tunnel.

The vein here is very similar to the same vein on the Stewart, but seems to have been subjected to a severe disturbance and crushing, subsequent to the formation and deposition of the ore in the vein, since small masses and lenses of solid iron-sulphide are encountered showing straight parallel striæ, which have been crushed by movement into small lenses covered with "slicken-siding" and occurring in a mass of broken and polished graphitic argillite. This latter movement would appear to be local in character and has so disturbed the vein in the present workings that little can be definitely said about it, beyond the fact that the amount of solid sulphide present in the crushed vein-matter gives reasonable hope that when the crushed portion of the vein has been passed, a more than usual amount of sulphide ore may be looked for.

The development was being carried on by a force of eight men, with Mr. McCrimmon as foreman. Comfortable cabins had been erected, which would enable work to be carried on during the winter. On the dump at the mouth of the tunnel there was a pile containing a number of tons of solid sulphides of iron and lead, from which a rough sample was taken which assayed: Gold, $16.80; silver, 19.4 oz. to ton; lead, 36.5 per cent.

Lulu Mineral Claim.

The *Lulu* mineral claim lies south of the western portion of the *George E.* claim, and undoubtedly contains within its borders some of the veins developed on the Stewart property, but the development has not as yet proceeded far enough to demonstrate what they may there contain. A crosscut tunnel is being driven in from a small gulch, with the intention of crosscutting the ledges, and had proceeded some 180 feet.

BITTER CREEK.

Old Chum Group. L. L. & H. Group.

Hartley gulch enters Bitter creek some eight or nine miles from its mouth and about a mile above the foot of the glacier, over which it is necessary to pass to reach the mouth of the gulch. On this gulch, about a mile up from the glacier, James Lydden and partners have staked a couple of groups of claims, the *Old Chum* group on the east side, and the *L. L. & H.* group on the west side of the gulch.

As yet very little work has been done on the properties, and they are only prospects with undetermined futures, but are of interest as indicating promising mineralisation in that vicinity; the great "gold reefs," of which so much has been written this past year, lie on the opposite side of Bitter creek, about two miles farther up. The country-rock here is an argillite, somewhat altered and broken up, through which run, in a general east and west direction, crushed zones usually accompanied by dykes and quartz veins, dipping to the south at high angles and carrying varying quantities of white iron-sulphide, galena, and copper-pyrites. On the *Old Chum* group, at an altitude of 3,300 feet, a tunnel has been driven in for about 15 feet in an easterly direction on a crushed zone in the argillite, in which occurs a

quartz vein about 4 feet wide, with a heavy gouge on either side, carrying white iron sulphides, galena, and some copper-pyrites. A sample taken completely across this 4 feet of vein exposed, merely as an indication of the surface prospect, gave, upon assay: Gold, $1; silver, 6.6 oz.

Some 120 feet higher than the tunnel and 150 feet to the south an open-cut has been made across a crushed zone, here from 8 to 10 feet wide, and showing a general mineralisation as described, with possibly a larger percentage of copper-pyrites and less galena. From this cut the owners report fair values in gold and copper, with a little silver. The examination of other surface exposures was prevented by a fall of snow which had just set in.

On the opposite side of the gulch, and adjoining, is the *L. L. & H.* group, the principal work on which could not at the time be reached, as a light fall of snow on the ground rendered the foothold dangerous on the very steep hillside; enough, however, could be seen from near the gulch to show that several strong quartz ledges, running in an east and west direction, cut through the hillside, and that the outcrops exposed on the surface were in places quite heavily mineralised. The owners report from the more advanced workings average assays of over $20 in gold. A rough sample taken from an outcrop near the gulch, as an indication, gave: Gold, $6.80; silver, 1 oz.

Roosevelt Mineral Claim.

The *Roosevelt* mineral claim is one of the oldest recorded claims in the camp, and is being developed by a company of which Mr. J. Clew, of Vancouver, is said to be president, and Mr. Baldwin manager. In October the property was not being worked, but was found in charge of a watchman. The property is situated on the North fork of Bitter creek, about a mile up from the main creek and at an altitude of about 1,200 feet. The country-rock is an argillite, cut by east and west dykes, parallel with which is a crushed zone from 5 to 10 feet wide, more or less cemented with quartz and containing lenses of iron-sulphides carrying gold values, also a little galena and copper-pyrites. The fissure is regular and apparently continuous where developed, and is filled with crushed country-rock, with variable quantities of quartz and mineral. The development consists of a main tunnel driven into the hillside, at a height of 20 feet above the creek-bed, for a distance of about 75 feet; this tunnel was almost blocked up by the waste from higher prospecting workings and slide and does not as yet exhibit any commercial ore-body.

About 40 feet higher up the steep bank an open-cut has been made, from which a tunnel has been started into the hillside on the fissured zone, in all about 20 feet.

Some very good values in gold are reported from the face, but these are uneven and depend on the amount of sulphide in the sample. A rough general sample from the lower tunnel gave: Gold, $8; silver, 10.4 oz.; copper, 6.6 per cent. About 200 yards down the creek from the tunnel and on the same side of the creek is what is called the "new strike." This is a similar crushed zone in the argillite country-rock cemented with quartz, striking east and west, about 10 feet wide and flanked on either side by porphyrite dykes, approximately 20 feet wide, which follow the fissure in as far as could be seen. In the crushed zone the broken country-rock predominates, but there occurs near the foot-wall side two streaks, one 12 inches and the other 6 inches wide, of rather strong mineralisation, which were sampled and assayed, giving: Gold, 80 cents; silver, 13.4 oz. per ton. There has been practically no work done on this showing and it has only recently been "faced up" by the couple of men left in charge when the working force was withdrawn, and although the showing at the surface is somewhat indefinite, it is possible a little work might show a considerable improvement.

Olga Mineral Claim.

The *Olga* mineral claim, being developed by James McNeill and two men, is situated about three miles and a half up Bitter creek, on the north bank of the creek. The country-rock is argillite and is here very much altered and disturbed, striking north and south and dipping nearly vertical. At an elevation of 400 to 500 feet above the creek, and back from the creek about 1,500 feet a tunnel has been driven into a crushed and mineralised zone for some 81 feet in a N. 45° W. direction, with, at 45 feet in, a crosscut to the right of 25 feet and at the face a drift of 10 feet in a northerly direction. The main fissuring appears to be in a general north and south direction with the strike of the strata, which the tunnel about half crosscuts in its course. In the tunnel, on the left side, a number of stringers of mineral seem to be coming out of the wall, which the work done does not fully develop. The mineralisation consists of bands of quartz carrying stringers and bunches of iron and copper pyrites, but to what extent these occur in the zone of crushing is not fully shown by the method of development adopted. A rough general sample taken from the couple of tons of sorted ore at the tunnel mouth gave, upon assay: Gold, $8.80; silver, 1.8 oz. per ton; copper, 10.1 per cent.

AMERICAN CREEK.

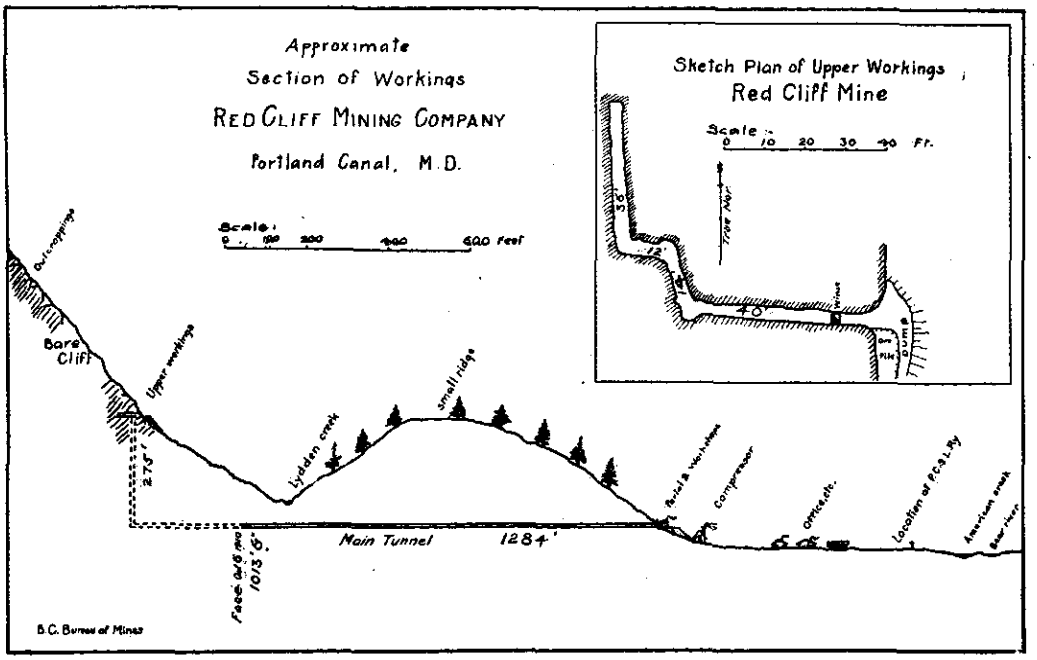
Red Cliff Group.

The *Red Cliff* group consists of seven mineral claims—the *Last Chance*, *Red Cliff*, *Mt. Lyell*, *Little Pat*, *Montrose*, and *Waterloo*, *Mac Fct.* and *Dot Fraction*—situated on the west slope of Bear River valley, a short distance below American creek. A small creek (Lydden creek) follows the base of the main mountain and is separated from the river by a small hill some 300 or 400 feet in height. The claims and mineral exposures are on the mountain side sloping up from Lydden creek, and have been properly so described, but this mountain is really the western boundary of the Bear river valley at the mouth of American creek. The property is owned by the Red Cliff Mining Company, Ltd., a Vancouver company, with a capital of $1,500,000, of which, however, according to the company's annual report, $350,000 of capital stock still remains in the treasury. The president and general manager of the company is A. Erskine Smith, of Vancouver, while E. B. Webster is the superintendent of the mine.

There are several exposures of mineral on the various claims, but the principal development has been upon the *Red Cliff*, and here the company has centred all its energies for the time being, and it is this work which commands present attention. The surface showing, the cause of the present development, was found some 200 feet vertically up the very steep hillside to the west of Lydden creek, where, exposed in a bluff, there is an outcropping vein carrying iron and copper pyrites in a gangue of quartz. Into this exposure a tunnel has been driven, directly into the hillside, in a general south-west direction for from 60 to 70 feet, when a sharp turn was made to the right—a crosscut—for 35 feet. In the tunnel near the portal a winze has been sunk about 10 feet below the tunnel level. This winze and crosscut would appear to be work done since Mr. Carmichael examined the property in 1909. The tunnel and winze are both in ore, but the crosscut is not—the ore-body being apparently to the left and in the line of the main tunnel. The total width of the mineralisation is not disclosed, as it has not been cut through on the left side of the tunnel, but is at least from 12 to 15 feet wide where developed. This same mineralisation can be seen for a long distance up the hillside in a general S. 30° W. direction, where it has been exposed by open-cuts and shots put into the bluff. The mineralisation consists of iron and copper pyrites, occurring in layers in a quartz gangue, carrying gold and silver values.

From the tunnel workings, including a chamber 8 by 10 feet in size at the inner end of the tunnel, a quantity of ore has been placed on the dump, estimated at about 200 tons and running in copper about 5 per cent. A ton and a half of ore from the workings, that had been

previously taken down to the company's Vancouver office, was shipped this fall to the Tyee smelter and there sampled, yielding, according to the company's annual report: Copper, 8.25 per cent. (dry); silver, 2.44 oz.; and gold, $5 to ton. It is believed that, as the iron-pyrites carry more than a proportionate amount of the gold present, the ore on the dump will carry higher values in gold than the copper tenure of this sample shipment would argue.



As previously stated, there are other similar outcroppings of ore on the company's property. These occur on about the same break of the hill and appear to be all cutting into the hill, but these have been very slightly developed, the company naturally selecting the exposure on the *Red Cliff* as the most promising superficially for present development.

The hill slope at Lydden creek is evidently the location of a heavy snowslide in winter, and the company, apparently realising the futility of attempting any permanent construction work there, started in on the slope of the small hill facing on Bear river, and is now engaged in running a tunnel to pass through a point vertically under the upper development workings. This tunnel is at an elevation of about 275 feet lower than the upper workings, and, according to survey, will require to be driven 1,284 feet to bring it vertically below these workings. The tunnel is being driven straight, 8 by 8 feet in cross-section, and passes under the bed of Lydden creek, leaving some 60 feet of covering, through which very little water was seeping. Below the tunnel mouth is ample height for dump, and at the bottom of the dump, on a small flat, well above Bear river, is the company's camp and plant.

The plant consists of a 10-drill, steam-driven, Canadian Rand air-compressor and a receiver, two 60-horse-power boilers, and an electric-light dynamo, in a suitable house covered with corrugated iron. The other buildings comprise an office, two storehouses, stable, two bunk-houses, and a mess-house, all built of logs, with rubberoid roofs. All these buildings are equipped with electric light, and the blacksmith-shop, compressor building, store, office, and dining-room are connected by local telephone. The tunnel is equipped with a double line of track, using 20-lb. rails, and is a creditable piece of work. The compressor is set on a concrete foundation and is in excellent shape.

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Lake
Lakes and Glaciers draining into Nass river.
DIVIDE 3400'
MOUNTAIN BOY M. Co.
HERCULES M. Co.
GOLDEN CROWN Co
SILVER TIP GR
LUCKY FRENCHMAN GROUP.
Mt Johnston 6365'
Bear River Glacier
Strohn Cr.
To Meziadin L. and Nass R. 30 miles
Bear R. Canyon
PORTLAND-BEAR RIVER M. Co
BEAR RIVER CANYON M. Co.
BEAR RIVER M. Co.
RED CLIFF M. Co.
DREADNOUGHT GR.
Mt. Gladstone 4300
To Porter creek
to Nass R. 25 miles
DALY SULLIVAN M. Co.
CAMERON GR.
INTERNATIONAL GR.
PORTLAND STAR GR
BITTER CREEK TOWNSITE
Hotel
BITTER CREEK M. Co.
OLGA GR.
ROOSEVELT GR.
Bitter Cr.
Texas Cr.
Cascade Cr.
INTERNATIONAL
Cable Elev. 250'
Salmon River
Fish Cr.
BOUNDARY
Bear R.
Portland Canal Short
MAIN REEF GR.
PORTLAND NELSON GR.
SILVER BOW M. Co.
FRANKLIN GR.
LORD GORDY GR.
RUSH PORTLAND M. Co.
PORTLAND CANAL M. Co
L. L. H. GR.
OLD CHUM GR.
1 mile very steep down to Bitter creek
STEWART
Gov't wharf
Railway wharf
PORTLAND CITY
ALASKA
Glacier covered mountains (about 6000')

PLAN OF PART OF

PORTLAND CANAL

MINING DIVISION

B. C.

—: Scale :—

Feet. 3000 2000 1000 0 1 2 Miles

Main Trail.

Government Waggon road.

Compiled and drawn by M.T.Nation, Bureau of Mines, Victoria, B.C.

Valley of Chilcotin River—near Anahim Reserve.

Valley of Chilcotin River—near Alexis Creek.

The lower tunnel was in, on October 6th, 1,013 feet, and at the rate of progress being made, between 40 and 50 feet a week, should be vertically below the upper workings about the middle of November; one power drill was being used on three shifts.* The country-rock passed through by the tunnel seems to be similar to the rock exposed around the upper showings and was a dark-coloured igneous rock, probably a diabase, plentifully seamed by small cross-fissurings filled with quartz, but not carrying mineral values.

The company has available in Lydden creek a very fine water-power which could be cheaply utilised, and so dispense with the cutting of cordwood for boiler fires; it is understood that plans to this end have already been prepared.

On the *Montrose* claim, in the canyon of Lydden creek—a spot very difficult to get at for intitial development—there is an outcropping very similar in mode of occurrence to that on the *Red Cliff*, but differing, in that it has a smaller percentage of copper and a greater of iron pyrites, with correspondingly higher gold values. This showing is extensively exposed by Nature, but very little work has been done on it beyond a few shots in the face of the almost perpendicular side of the canyon. This showing and others exposed at other points on the claims awaits the issue of the development on the *Red Cliff*.

Mountain Boy Mining Company.

The Mountain Boy Mining Company owns a group of claims which includes the *Mountain Boy*, *Hard Nut*, *Northern Belle*, and others, situated on the south side of American creek, some four miles from the mouth of the creek, at an altitude of about 2,200 feet. The property is at present under bond to the Pacific Coast Exploration Company and is being developed by a force of sixteen men, under the management of Mr. Stanley as foreman. Some development has been done on each of these claims, but at present the work is confined to the *Mountain Boy* claim. The showing being developed is on the face of a bare hill, swept clear by snowslides, between 800 and 900 feet vertical above the small subsidiary valley which runs parallel with American creek and is separated therefrom by a small rolling hill, similarly as at the *Red Cliff*. The cabins are situated on the American creek slope of the small hill, in a bunch of timber, in order to be free from the snowslides, which, in winter, fill the subsidiary valley with snow many feet deep.

From the cabins a trail leads over the small hill into the small valley, from which a switch-back trail runs up the face of the slide for 800 feet vertical to the tunnel on the *Mountain Boy* claim. Prospecting cannot be carried on here safely after snow comes, and any permanent workings would have to be put in from the vicinity of the cabin, similarly as has been done at the *Red Cliff*, but would, however, require a much larger tunnel.

The upper tunnel is in about 150 feet with a crosscut of 25 feet and a 10-foot winze. The tunnel was started into the hill in a westerly direction and soon ran through the mineralised zone; it was then swung around nearly 90° to a S. 15° E. direction and continued for about 60 feet, with a crosscut of 25 feet to the east in the mineralised zone. The country-rock is a dark, igneous rock, and the ore is found in a crushed zone, partly filled with quartz, in which galena is found in kidneys, in lenses, and in streaks, but at that time had not proved very abundant.

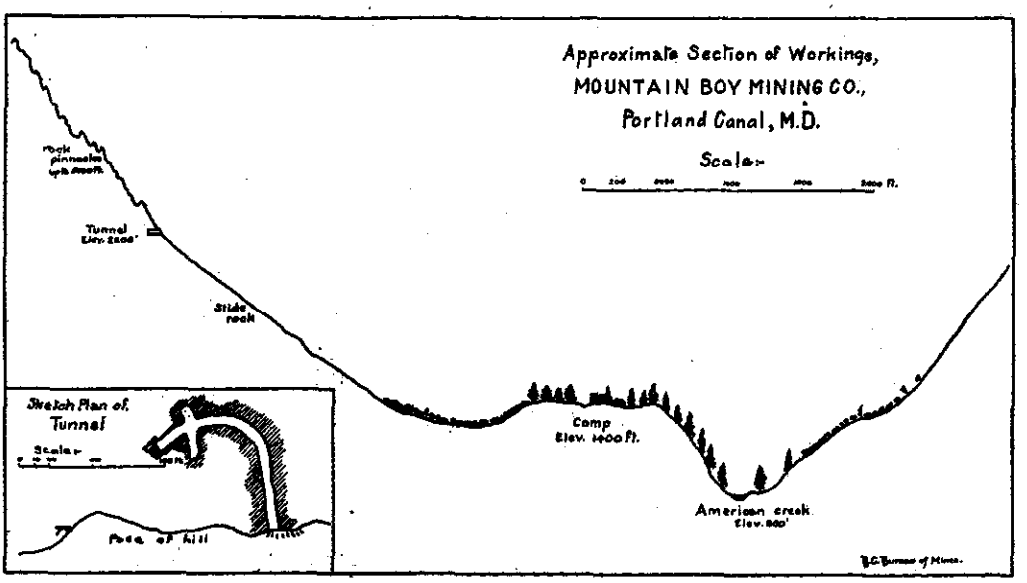
A sample of the galena from the vein gave, upon assay: Gold, trace; silver, 1.2 oz. per ton; lead, 72 per cent.

*It is unofficially reported that before the end of the year this lower tunnel had been driven to, and past, the point vertically under the upper workings, and that at about this point copper-ore, somewhat similar to that in the upper workings, was found in the tunnel. It is understood that this lower showing of ore is being developed and an upraise made.

On the *Hard Nut* a tunnel had been driven in about 70 feet on a zone of mineralisation about 11 feet 6 inches wide and somewhat similar in character to the *Mountain Boy*.

On the *Northern Belle* in No. 1 tunnel the mineralised body of quartz with galena is about 18 feet wide, and the tunnel and drifts measure about 32 feet. A sample of the galena ore from this tunnel assayed: Gold, trace; silver, 2.8 oz. to ton; lead, 52.5 per cent.

The No. 2 showing on the property has only been "faced up," and seemingly is on a zone of mineralisation and silicification about 35 feet wide, but is reported by the management as low-grade, giving on an average sample about $3 a ton.



Bear River Canyon Mining Co.

The Bear River Canyon Mining Co. is developing a group of claims situated in the valley about two miles above the mouth of American creek; the group consists of eight claims, including the *Independence*, *Pascoe*, *Kennewich*, and others. The development work seen had been done on the *Independence* claim, where a tunnel had been driven, from slightly above creek-level, into the eastern bank of the river, for a distance of 140 feet in a S. 40° E. direction, starting in on an outcropping of zinc-blende and galena which occurred on the contact of a porphyrite dyke with the argillite country rock. This particular showing of mineral had been mined out in the tunnel, and by a small shaft sunk at the mouth of the tunnel, and is described by the manager, Mr. Falls, as having been a lens of ore tapering in all directions and having a maximum height of 15 feet, a length of 20 feet, and a thickness of 10 inches. In the roof of the tunnel, at 42 feet in, another lens of ore had been cut and proved to be about 15 feet long by about 4 to 8 inches wide in the middle, tapering away at each end. At 105 feet in on the tunnel, a crosscut had been made to the left for 5 feet. The crushed zone of fissuring continued to the face of the tunnel, but did not exhibit further mineral. From these workings a few tons of mineral had been extracted and was on the dump, consisting of about two-thirds of zinc-blende and one-third galena. A general sample taken of the ore on the dump gave, upon assay: Gold, trace; silver, 17 oz. per ton; lead, 44 per cent.; zinc, 22.6 per cent. On the same strike as the fissure in the tunnel, but on the opposite side of the creek, there are three outcroppings of mineral of similar character, but these have not been developed nor prospected. All work on the claim had been stopped some time in September.

BELLA COOLA MINING DIVISION.

NOTES BY PROVINCIAL ASSAYER.

Burke channel is an inlet of the sea, running eighty miles north-easterly into the mainland coast; at the head of this inlet is Bella Coola, in the centre of the district of that name. The mouth of Burke channel is on the main waterway between southern British Columbia and Alaska, and is 300 miles north of Vancouver. Many of the steamships call at the mouth of the inlet on their way north and south, the stopping points being either Bella Bella or Namu, where accommodation can be had, and Bella Coola reached by either launch or sailing-boat. A direct service is, however, maintained by the Boscowitz Steamship Co., the company running a steamer every two weeks from Victoria and Vancouver direct to Bella Coola. A good trail runs from Bella Coola into the interior plateau.

The original country-rock of the district seems to be a quartz porphyry, which has been largely changed to a gneiss, flow structure being plainly seen.

Sure Copper Mountain Group.

These claims were formerly owned by the North Coast Copper Company, of Spokane; the title of this company has, however, been allowed to lapse, and all claims have expired. The principal work has been done on the *Olga* claim, half a mile north of the Nectlessonnay river. Some 850 feet above the river, on the west bank, there was a slight fissuring movement in the hornblende-diorite country-rock; this fissure showed a little iron and copper strain, and on this a tunnel was run 74 feet into the mountain, but no mineral of value was found, work being entirely in country-rock. About 300 feet below the upper tunnel another tunnel was run in 120 feet to tap the showing above, but this tunnel also is run in country-rock all the way, with no ore showing.

Time did not permit a visit to what is believed to be one of the best claims at present known in the district, and the following information was obtained from one of the owners:—

Bella Coola Chief Group.

This group of claims is situated ten miles up on the left bank of the Sallumt river, a tributary of the Bella Coola, joining the latter river twelve miles from salt-water. Here two tunnels—one 75 feet and the other 25 feet long—have been run into the hillside on a granite and limestone contact which shows a brecciated copper-ore said to give the following values: Gold, 0.25 oz.; silver, 5 oz.; copper, 9 per cent. The tunnels have been started on the same level, but run in a north-easterly and south-easterly direction. The manager is O. T. Kellog, of Bella Coola.

Several new locations have been made this summer at elevations of about 3,000 feet; no work has yet been done on these claims.

QUEEN CHARLOTTE MINING DIVISION.

REPORT OF E. M. SANDILANDS, GOLD COMMISSIONER.

I have the honour to submit the annual report on mining operations in the Queen Charlotte Mining Division for the year 1910.

Mining generally on the islands the past year, I regret to say, has been rather at a standstill, and not as much prospecting has been done as in previous years. The cause, possibly, of this was that the mining community, with its capital, was drawn towards the Portland Canal section. The deep snow of the previous winter and the lack of demand for properties discouraged much new prospecting. It is, however, encouraging to be able to say

that the assessments which have been done this year have shown up well. The number of claims and assessment work recorded is, however, very little short of last year, while the general revenue of this office exceeded that of last year.

COLLISON BAY.

On the *Meal Ticket* group, while doing the annual assessment work, a fine showing of chalcopyrite ore, 8 feet in width, was uncovered, which assays very well. The Moresby Island Mines, Ltd., now owning the group, proposes to do considerable work this coming year.

On the *Wireless* and *Telephone*, owned by Daykin and Metcalfe, a fine showing of ore was uncovered, carrying considerable bornite and yellow copper; these claims are very close to the water and easy for shipping. Some claims higher up than these, called the *Toben* and *Copper Coin Fraction*, owned by same parties, have a large surface showing of copper-ore, carrying good gold values. Considerable work has been done.

Oscar Laran on his property has done considerable work and exposed some very rich ore

IKEDA BAY.

The Vancouver people who had the *Ikeda* mines under option commenced operations about the 1st of April, and continued work to about the 1st August, when the mine was closed down pending incorporation, etc. During that period twenty diamond-drill holes were put down, aggregating in all 2,520 feet; 217 feet of drifting; 77 feet of crosscutting; and 20 feet of raise. The diamond-drilling accomplished has satisfactorily proven the depth and continuity of the main vein, also the value of the ore at depth. Apart from the above, a large amount of assessment was done, also some outside improvements. At the time of writing, a small force of men is at work at the mine getting things in shape to start up work on a larger scale.

HARRIET HARBOUR.

On the *Copper Queen* group of claims, owned by J. S. McMillan, no work of any importance has been done. Most of the claims are now Crown-granted.

On the Copper islands, in Skincuttle inlet, W. Campbell and others have a fine showing of good-grade ore on George island, one of the group. A fair amount of work has been done.

HUSTON INLET.

On the *Hercules* group and *Morning*, owned by McEachern and McMillan, only the ordinary assessment work has been done, but with very encouraging results, nice showings have been uncovered.

On the *Ivan* group the annual assessment work has been done by Thompson and McKinnon.

The Government commenced this year a cut-off trail from Jedway to head of the Collison bay and Huston inlet divides, which will be a great convenience.

GOLD OR MITCHELL HARBOUR (WEST COAST).

On the *Early Bird* group, owned by J. McLellan and others, was erected this summer a three-stamp, experimental mill (Fraser & Chalmers) with stamps of 250 lb. each, driven by a Pelton wheel. The mill was only run for a short period on account of the dry season, but in ordinary years there should be enough water for seven months' run. The results of ore milled this summer averaged over $50 to the ton. In consequence of this, the owners have decided to install a small power-hoist and continue development at depth, and also, should occasion warrant it, secure more water-power.

LOCKEPORT.

On the *Morgan* group very little work has been done this summer. The property was examined by S. S. Fowler last fall and plans for extensive work are now in hand.

The *Hawks Nest* group, on Tal-un-kwan island, has been Crown-granted.

On the *Last Chance* group, owned by McEachern, Jones, and Wintermute, considerable work has been done, and the last work, 700 feet higher up the mountain, exposed a new vein carrying very fair values in copper.

At the *Apex* group some work has been done and a cabin built.

The *Bird* and *Bismarck* groups, consisting of some thirteen claims and owned by the Pioneer Queen Charlotte Mining Co., have had some considerable work done on them, working from five to six men all summer. A tunnel 65 feet long has been driven in copper-ore all the way. The property is handy to water transportation. New cabin and trails were built this year.

TASSOO HARBOUR.

On the *Warwick* group, owned by Elliott, Corlett, and others, no work has been done since last July, when it was under bond to some Winnipeg people. Apart from the *Ikeda* mines, more work has been done on this property than any other on the islands. A crosscut tunnel some 300 feet long has been driven, showing ore all the distance, with the exception of a few "horses" of lime. A winze has also been sunk on the vein about 80 feet, showing that the ore goes down.

On the *Contact* group, owned by Messrs. Cannon and others, some work has been done, but, owing to the heavy fall of snow the previous winter, work in the upper workings could not be started until late in the fall

CUMSHEWA INLET.

The *Homestake* group, purchased from Topping and Johnson by an English syndicate, now called the Queen Charlotte Mining and Prospecting Co., has been worked continously by six to eight men. There are two tunnels on the property; No. 1 is in 100 feet on a 5-foot vein, and No. 2 is now in 300 feet, and will have to be driven 40 feet more to tap shaft sunk on the vein. The ore is galena and zinc-blende, carrying gold values. The company has erected buildings, and proposes to build a tramway and ship ore shortly.

GRAHAM ISLAND (SKIDEGATE).

The *South Easter* group, situated about two miles from Skidegate, near the Indian village, is owned by McLellan, Gordon, and others. There is a vein on this property varying from 2 feet to 21 feet, which has been uncovered on the surface for a distance of 1,800 feet. There is also a shaft sunk 20 feet on the vein showing 18 inches of very high-grade ore. The ore is composed of galena, zinc, and copper. The principal values are gold associated with the galena. This is a very promising prospect and is very easy of access, being close to water transportation.

GRAHAM ISLAND.

Hydraulic Placer Leases.—The Sandhurst Gold Mines, formed by Arthur Pearson, who owns some thirteen placer leases on the east side of Graham island, has recently purchased, in California, some machinery for the saving of the gold in the black sand. At the time of writing, this company is trying to land and install the machinery, but the recent stormy weather has retarded the work. South of this, Mr. Garde and associates have some eight placer leases.

OFFICE STATISTICS—QUEEN CHARLOTTE MINING DIVISION.

Claims recorded (quartz)	204
" (placer)	9
Certificates of improvements	5
" work	299
Bills of sale, etc	119
Free miner's certificates	222
Hydraulic placer leases	8

Revenue.

Mining recipts	$5,909 90
Free miner's certificates	979 75
Other sources	791 25
	$7,680 90

OMINECA MINING DIVISION.

REPORT BY W. ALLISON, GOLD COMMISSIONER. (OFFICE AT HAZELTON.)

I have the honour, as Gold Commissioner, to submit the annual report for the Omineca Mining Division, for the year ending December 31st, 1910.

The year 1910 has been marked by considerable progress, and the development work done has brought a number of prospects nearer to a stage when they may safely be designated as claims with every indication of developing into paying mines.

Some few small sample shipments have been made during the year for test purposes, the largest being 20 tons of lead-ore from the *Silver Cup* mine on Nine-mile mountain, near Hazelton, and 5 tons from the *Lead King*, an adjoining property.

Considerable ore was sacked on the *Sunrise* claim, another property on Nine-mile mountain, but an early fall of snow on the summit blocked the trail for pack-trains, and this ore could not be got out.

For the winter of 1910-11, there are six properties under development, five of which are situate on Nine-mile mountain and one on Four-mile mountain. Veins are from a few inches in width up to several feet, and in one case there is reported to be a shoot of ore uncovered by surface stripping, 10 feet in width at a maximum, and total length of nearly 300 feet.

Numerous transactions are reported during the year and several properties have changed hands, either by bond or purchase. Assays show about 2½ oz. of silver to each unit of lead in the ores, and in some cases there is a small quantity of grey copper present, which carries very high silver values; there are also some of the high-grade silver minerals. Gold values are, on the average, slightly less than a $1 a ton for galena-ores.

Some six to ten miles to the south of Hazelton about twenty claims were staked during the year, but only a small amount of development has been done. Some fair specimens of copper-ore, and also galena, have been brought from Rocher de Boule (Awillgate) mountain, on which the claims are situate, and, as two of the groups are under bond at present, spring will see the worth of the proposition put to the test.

In the Babine mountains, lying between Bulkley valley and Babine lake, considerable interest has been aroused among the prospectors during the last three or four years, the principal property, so far, being the *Bonanza* claim, owned by a corporation formed by James

Cronin and associates. Nearly 400 feet of tunnelling and sinking has been done thereon; the ore is galena, carrying fair silver values. No detailed statement of the ore-bodies opened up has ever been given out by the management, although Mr. Cronin states that with the completion of the Grand Trunk Pacific Railway in the Bulkley valley he will resume work to put the property on a basis to work at a profit. Numerous locations have been made all along the range for a distance of sixty or seventy miles, and there are still large areas that have not as yet been penetrated by the prospector. The values are chiefly in silver, but towards the northern end of Babine mountains several claims with arsenical iron-ore have shown gold values of from $6 to $25 to the ton. At the south end of the Babine lake a discovery of free-gold ore and telluride was reported during the summer, but is not well enough substantiated to be considered authentic. Some small specimens of quartz carrying native silver from small veins were, however, brought from that part at different times.

West of the Bulkley river, closely bordering the valley, is the Hudson Bay mountain district and the immense district drained by the Telkwa river and its tributaries, in which many different kinds of ores are found, in varying degrees of richness; several properties have dumps with an amount of shipping ore piled up awaiting transportation facilities. So far as the area being opened up by the Grand Trunk Pacific Railway is concerned, all that seems to be lacking is available transportation, and the country will soon take on all the activities of earnest development.

NINE-MILE MOUNTAIN.

Much interest has been centred on Nine-mile mountain during the past year, and about ninety new locations have been recorded; active development, to a greater or less extent, has been proceeded with on many of the claims, with promising results. The principal properties operating in this section are the *Sunrise* group, *Silver Cup* group, *Barber Bill* group, *Brown* group, *Stewart* group, *Silver Pick* group, *Silver Queen* group, *American Boy* group, and *McBean* group. The ore is chiefly silver-bearing galena.

CARIBOO MOUNTAIN.

Considerable prospecting has been done during the past year on Cariboo mountain, which is situate immediately to the north of Nine-mile mountain, and a number of locations have been made thereon. The mineral encountered is silver-lead ore, similar in character to that of Nine-mile mountain.

GLEN MOUNTAIN.

This is a new district opened up this season, which is situate on the Skeena, about five miles to the north of Hazelton. Some forty-four locations were made during the year; the ore encountered being silver-lead, and also similar in character to that found on Nine-mile mountain.

FOUR-MILE MOUNTAIN.

Considerable activity has taken place on Four-mile mountain during the past season, and new locations to the number of fifty-six were recorded. On some of the claims more or less development work has been carried on, the most important in this respect being the *Erie* group, owned by E. L. Kinman, of Vancouver; a shaft has been sunk to the depth of 75 feet, and open-cuts run on the outcrop of the vein, exposing it for a length of 300 feet. The vein has been proved to have an average width of 14 feet, and to carry an ore-shoot for that distance with a width of from 18 inches to 4½ feet, while in depth it has been proved up to the bottom of the shaft. A few men have been employed continuously on development work, and it is understood that, with the opening of navigation, the force will be largely increased with a view of thoroughly exploiting the property.

ROCHER DE BOULE (AWILLGATE) MOUNTAIN.

A number of claims were staked during the past season on Rocher de Boule mountain, and some sixty claims were recorded, since when no important work has taken place.

HUDSON BAY MOUNTAIN.

Assessment work on the old locations has been well kept up, and a number of new locations have been made; bonds have been acquired on many of the properties.

TELKWA DISTRICT.

A number of new locations have been made during the year, and several claims have been bonded.

KITSALAS CANYON AND ZYMOETZ RIVER.

About 200 new locations have been made in the vicinity of Kitsalas canyon and Zymoetz river, and considerable work has been done on several of the old locations, but I am not in possession of authentic information as to how the properties are proving up with development.

Mining in this Northern Interior is still in the prospecting stage, and progress in this direction has hitherto been naturally slow, from lack of transportation facilities; but with the advent of the Grand Trunk Pacific Railway, this phase of the situation will undergo a rapid change, and it is anticipated that next season will witness considerable activity in mining operations throughout the whole of this district.

COAL.

During the year several coal-mining syndicates have been conducting operations on a fairly large scale, and good reports are being received from time to time; work, however, has in no case progressed to a stage where a definite statement can be made, but claims on the Zymoetz river and the Bulkley river and its tributaries give promise of producing mines with the necessary development.

The anthracite district around the headwaters of the Skeena continues to attract attention, and more claims are yearly being added to the number in private ownership.

PLACER-MINING.

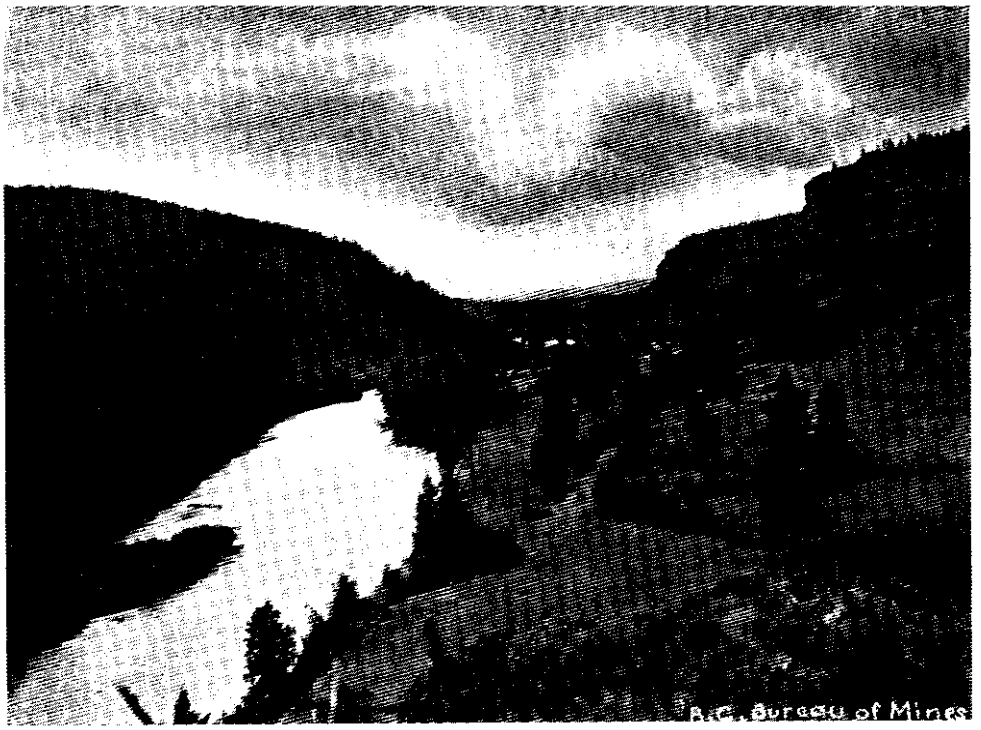
Placer-mining in the eastern part of the Division, which has been undergoing a steady decline in the value of annual output, seems to be about to take on a new lease of life, numerous leases of ground have been taken up, and tests are being made to determine their value. So far the holders express satisfaction with the results.

OFFICE STATISTICS—OMINECA MINING DIVISION.

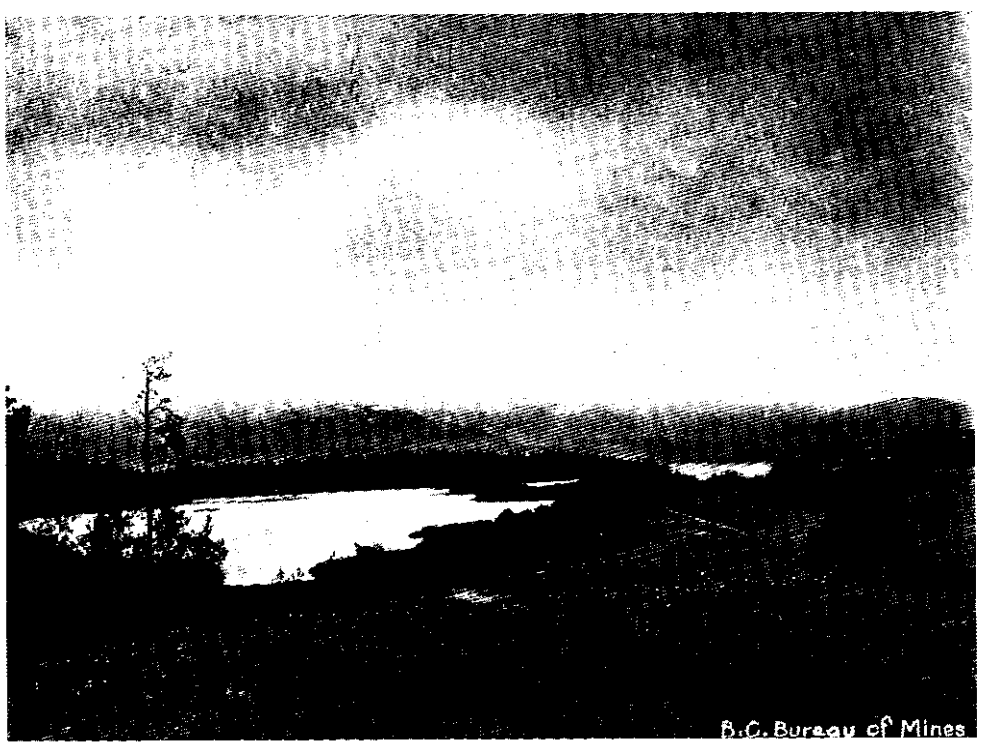
Mineral claims recorded	690
Placer "	29
Certificates of work	382
Agreements and transfers	194
Free miner's certificates (individual)	861
" " (special)	3
" " (company)	1
Mining receipts issued	990
Placer-mining leases	20

Revenue.

Free miner's certificates	$ 3,664 00
Mining receipts	7,553 15
Total	$11,217 15



Chilcotin Valley—at Bull Pasture.



Choelquoit Lake—looking west.

PEACE RIVER MINING DIVISION.

REPORT BY THOS. JAMIESON, GOLD COMMISSIONER.

I have the honour to submit herewith a brief report on mining conditions in the Peace River Mining Division for the year ending December 31st, 1910.

I regret to state that I am unable to report any change in the conditions which existed during the year 1909. With the exception of the issuing of a very few free miner's certificates, I have not been called upon to transact any business in the way of mining.

A few prospectors were engaged during the summer months prospecting on the many bars of the Peace river, and although they found considerable gold, it was not in sufficient quantity to offer any great inducement to the individual miner. However, they are of the opinion that it is well worth considering as a dredging proposition.

There has also been a few prospectors working on the south Pine river, above the middle forks, but with what success I am at present unable to say.

SOUTH-EAST KOOTENAY DISTRICT.

:o:

FORT STEELE MINING DIVISION.

REPORT BY J. F. ARMSTRONG, GOLD COMMISSIONER.

I have the honour to submit a report on the progress of mining in the Fort Steele Mining Division for the year 1910.

The following table shows approximately the number of mineral claims held during each year since 1899:—

Year.	Held under Crown Grant or Certificate of Improvement.	Certificate of Work.	New Locations.
1899	37	718	729
1900	71	704	470
1901	104	642	455
1902	117	451	253
1903	142	335	200
1904	167	260	169
1905	189	193	181
1906	241	235	160
1907	254	160	115
1908	264	150	100
1909	280	154	116
1910	294	161	179

MINERAL CLAIMS.

North Star Group (south-west side of Mark creek).—This property was shut down during 1910, but will probably resume development this spring.

Sullivan Group (north-east side of Mark creek).—This property was taken over by the Consolidated Mining & Smelting Company of Canada in 1910. The company has purchased several adjoining claims and has done much development work, and has shipped 23,000 tons of ore.

St. Eugene Group (east side of Moyie lake).—The Consolidated Mining & Smelting Company of Canada has reduced its working force during the year, and the output diminished to 78,000 tons.

Aurora Group (west side of Moyie lake).—This group made a trial shipment with encouraging results, and it is hoped that shipments will be continued in 1911.

Society Girl Group (east side of Moyie lake).—This group also made a trial shipment with good results.

On Tracy creek the *Estella* group has been bonded for $175,000, and the *Swan* and *St. Lawrence* have been purchased by a Spokane syndicate. The portion of the Kootenay Central Railway now being built will come within six miles of these properties, and means of transport thus furnished is sure to increase the work in this camp.

In the St. Mary's country increased interest is being manifested and two groups are now under bond.

The year 1909 saw the turn of the tide in prospecting, and the year just past shows a continued increase and mining matters are now much brighter.

OFFICE STATISTICS—FORT STEELE MINING DIVISION.

Mineral claims recorded	179
Placer claims recorded or re-recorded	9
Certificates of work	161
Certificates of improvements issued	16
Conveyances and other documents of title	26
Partnership agreements	4
Gold Commissioner's permits	4
Documents filed	15
Affidavits filed	279
Records of water grants and permits	4
Mining leases issued	5
Mining leases in force	45
Free miner's certificates (ordinary)	331
" " (company)	4
" " (special)	1
Crown grants issued	10

Revenue.

Free miner's certificates	$1,721 50
Mining receipts	4,382 01

NORTH-EAST KOOTENAY DISTRICT.

:o:

GOLDEN MINING DIVISION.

REPORT OF E. J. SCOVIL, GOLD COMMISSIONER.

I beg to submit the annual report for the Golden Mining Division of North-East Kootenay for the year 1910.

During the past season, mining has been at a standstill and, with the exception of a certain amount of prospecting, restaking, and the usual statutory assessment work, little has been accomplished; the properties are awaiting improved transportation facilities.

The different silver-lead and copper properties have been referred to so often in the Mineral Report that it is unnecessary for me to repeat.

OFFICE STATISTICS—GOLDEN MINING DIVISION.

Free miner's certificates (110 and 3 special)	$877 25
Mineral claims recorded (24)	60 00
Placer claim re-recorded	2 50
Lease rents collected	150 00
Assessments recorded (35)	497 50
Powers of attorney (placer), (6)	15 00
Bills of sale (8)	20 00
Water rental	13 00
Abstracts, etc.	6 25
Acreage tax collected	541 25
	$2,182 75

NOTES BY THE PROVINCIAL MINERALOGIST.

The following information, not given by the Gold Commissioner, is submitted:—

Monarch.

The *Monarch* mine, near Field, in this Mining Division, owned by the Mt. Stephen Mining Syndicate, of Vancouver, and described by the Provincial Mineralogist in the Report of last year, page 98, this year shipped some 53 tons of ore running about 50 oz. silver and 62 per cent. lead.

It is learned that the tunnel, then mentioned as having been started 580 feet above the railway-tracks, has been driven into the hill horizontally for some 335 feet, from the end of which a double-compartment raise was put up, at an angle of 65 degrees, for a distance of 475 feet. This raise was apparently miscalculated, for it came out at the top on the steep cliff or slide, which will necessitate a further tunnel and raise.

Several hundred feet of crosscuts were driven in the old workings, which is said to have developed a large body of ore, which will, however, require to be concentrated, to which end the company has sent away several parcels of ore on which separate tests have been made, both in Europe and in United States, and the results seem to show that a proper concentration and separation of the lead and zinc can be made.

Giant.

The *Giant* mine, situated about seven miles from Spillimacheen, has not been operated this year, but it understood that further experiments will be made with the process of "dry concentration" which was described in last year's report. The property is held by the Golden Giant Mines, Ltd., of Golden, B. C.

The Labourers' Co-operative Company, which owns the *Shining Beauty* claim, on which a large amount of development work was done, some 1,000 feet of tunnelling, has not been in operation for several seasons, but the renewed activity in the sale of stock in the East would argue that further development work was contemplated.

WINDERMERE MINING DIVISION.

REPORT OF GEO. F. STALKER, MINING RECORDER.

I have the honour to submit the annual report on mining operations in the Windermere Mining Division for the year ending December 31st, 1910.

The mining operations in this district show a very slight improvement over last year; there were more locations recorded this year than in 1909, but the development work done during the year was limited to a few properties, and, with two or three exceptions, amounted only to the usual assessment work.

OFFICE STATISTICS—WINDERMERE MINING DIVISION.

Free miner's certificates issued	52
Locations recorded	32
Certificates of work recorded	42
Certificates of improvement recorded	7
Money paid in lieu of work	1
Bills of sale recorded	7
Revenue	$3,213.10

NORTH-WEST KOOTENAY DISTRICT.

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REPORT OF ROBERT GORDON, GOLD COMMISSIONER.

I have the honour to submit herewith the annual report on the progress of mining within the Revelstoke and Lardeau Mining Divisions for the year ending December 31st, 1910.

Mining throughout the entire district has been practically at a standstill during the past year, and the hopes entertained a year ago of a revival in this industry have not been realised.

Development work on the mica claims in the Big Bend district has been prosecuted during the past summer, work having been done on the *Thistle*, *Maple Leaf*, and *Shamrock* claims. The Big Bend Mica Mines, Limited, is the only company doing any real development work in the Big Bend, having employed about twenty men throughout the summer stripping and prospecting, and bringing out about a ton of very high-grade mica at the close of the season as samples. This company intends to prosecute its development work during the coming season, and, if possible to arrange transportation, will make regular shipments.

In the Lardeau Division nothing was done in mining until late in the fall, but the Beatrice Mines, Limited, has had from twelve to twenty men at work at the *Beatrice* during the last three months of the year, and they are still working, intending to increase the staff at an early date.

In placer-mining, practically nothing is being done in this district. A few hydraulic properties in the vicinity of Goldstream have been worked in a half-hearted manner, but no real work has been done, and the outlook for the coming year is not very bright. I trust that our report for 1911 will show an improvement, and that work will be undertaken with a determination to make a success of the various enterprises in which time and money have been invested.

REVELSTOKE DIVISION.

REPORT OF W. C. MCLAUCHLIN, MINING RECORDER.

I have the honour to submit herewith a brief report of mining operations in the Revelstoke Mining Division for the year 1910.

Little change has taken place since 1909, development work has been carried on more or less upon most of the leading properties, and the necessary annual assessment work on others. This Division has an immense stretch of really good prospecting ground in the Big Bend district which, with the advent of railway communication, which is practically assured in the near future, will receive due attention from the prospector.

OFFICE STATISTICS—REVELSTOKE MINING DIVISION.

Free miner's certificates issued	145
Mineral claims recorded	15
Certificates of work recorded	17
Bills of sale recorded (mineral)	4
Money paid in lieu of assessment work	8

LARDEAU MINING DIVISION.

REPORT BY B. E. DREW, MINING RECORDER.

I have the honour to submit herewith a brief report of mining operations in the Lardeau Mining Division during the year 1910.

While there has not been any marked improvement, so far as office statistics are concerned, during the past year, the development work done on several properties has been very satisfactory and is worthy of note.

The Beatrice Mines, Ltd., after a period of inactivity, has resumed operations, and it is the intention of the owners to mine and ship 500 tons of ore, which is in sight, during the present rawhiding season.

The Eva Gold Mines, Ltd., has given an option on its property.

The *Del Rey* and *Colorado* groups of claims have been surveyed and are about to be Crown-granted. Samples taken from the present workings appear to have been so satisfactory to the owners that they have expressed their determination of proceeding to develop their properties next season, and to install the necessary machinery to treat the ore on the ground.

The *Burniere* and *Nelson* groups have shown up well with the year's assessment work; the free-gold ore appears to improve with depth, although the values obtained on the surface were far from being low grade.

The *Mallet* and *Spider* claims, with the past year's work, have exceeded expectations; 18 inches of clean galena ore has been exposed. A tunnel, being driven 100 feet to catch the ore-body at an equal depth, is already in 50 feet.

The *Excise* and *Duty* claims, nearly adjoining the last-mentioned property, have shown up, on being prospected on surface, ore running from $50 per ton. A tunnel at present is being driven to catch the lead at approximately 80 feet in depth.

The *Lucky Jack* group, with free-milling gold ore, is at present under option, and it is expected the property's mill will be again in operation early in the coming year.

OFFICE STATISTICS—LARDEAU MINING DIVISION.

Free miner's certificates issued	36
" " " (special)	2
Certificates of work issued	80
Payments in lieu of work	2
Claims recorded	22
Bills of sale recorded	9

SLOCAN DISTRICT.

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AINSWORTH, SLOCAN, AND SLOCAN CITY MINING DIVISIONS.

REPORT BY E. E. CHIPMAN, GOLD COMMISSIONER.

I beg to submit the annual report for the Ainsworth, Slocan, Slocan City, and Trout Lake Mining Divisions for the year 1910.

The several mines operating in the different mining divisions during the past year can be said to have fully borne out the expectations at the end of 1909, as, wherever any continuous or extended work on any of them has been carried on, there has been almost invariably a marked improvement in conditions. The destructive forest fires of July, 1910, which destroyed tramways, concentrators, compressors, and other mining buildings, practically put the largest producing mines, on the line of the Kaslo & Slocan Railway, out of business. The railway-line being, in a great measure, destroyed at the same time, the mines were only able to procure supplies at a greatly increased expense, and the enhanced cost of transportation made the shipment of ore almost prohibitive. Notwithstanding these drawbacks, there was a larger increase in the tonnage of ore shipped from the Slocan District, 44,335 tons having been returned, upon which 2 per cent. tax has been paid.

AINSWORTH MINING DIVISION.

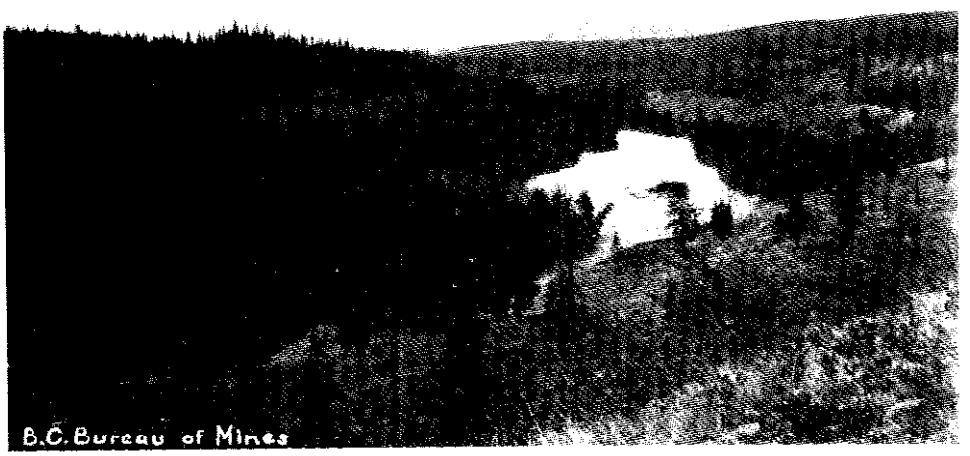
Bluebell Mine.—Operations at this mine were suspended at the end of March last, pending the completion of the reconstruction of the owning company. The object of such reconstruction is the provision of the funds and plant necessary to continue mining at a depth and the treatment of 300 tons of ore per day, instead of about 160 as formerly. It would appear that, notwithstanding the fact that former owners had extracted the greater part of the comparatively high-grade lead-ore from above the adit level, the result of the extraction and treatment of some 90,000 tons from the same areas has been such as to fully justify the anticipated expenditure. The importance to the community of the continuance of active work at such a property as the *Bluebell* is well shown by the fact that during 1909 some sixty-three men were constantly employed, whilst in 1910 the average number was but fifteen.

Highland Mines (Kootenay, B. C.).—Under a New York company the mine closed down in financial difficulties in January, 1910, but was reopened again in July under a new company, the Kootenay Silver Lead Mines, Ltd., of Vancouver. An average of about fifteen men was employed in the mill and mine until November, since which time six men have been employed at the mine in development work only. From August to December the mill averaged about 140 tons of mill-feed per day, and shipped 110 tons of concentrates to the Trail smelter, running 28 oz. silver and 65¼ per cent. lead.

No. 1.—Three men working on this mine since October have made 150 feet of drifts and upraises, and expect to work continuously during the coming year. Fifteen tons of high-grade ore are now ready for shipment.

Maestro.—Three men have been working continuously; 300 feet of drifts and upraises have been accomplished, and 32 tons of ore have been shipped.

Valley of Chilko River—looking north.



Valley of Chilko River—looking south.

Tiger.—This mine, on Cedar creek, employing four men, has driven several hundred feet of crosscut tunnel. No ore was shipped, but a fine body of silver-lead ore was encountered in the December work.

Star and Sunlight Mines.—Three hundred feet of crosscut has been driven during the year. The tunnel is now in 750 feet. Several small veins have been encountered, but no drifting has been done. The owners expect to cut the main ledge about 50 feet in. All work has been done by contract.

WOODBURY CREEK.

The *Jessie-Blue Bird* worked three men in the early part of the year, and shipped 35 tons of ore, but has been shut down during the summer and fall.

The King Solomon Mining Co. has done considerable development upon some of the high-up claims, and reports having considerable ore ready for shipment, but so far no ore has been marketed.

SOUTH FORK OF KASLO CREEK.

Cork Mine.—No work has been done at the *Cork* mine during 1910. Some development will be made in the spring of 1911, and the long crosscut tunnel driven to the main vein; there are about 350 feet still to be driven to reach the vein.

West Kootenay Mining Corporation, Ltd.—This company, not registered in British Columbia, was created in the beginning of 1910 by a syndicate of French financiers, who redeemed the claims formerly the property of the Kaslo-Slocan Company. This property is situated at the head of the South fork of Kaslo creek, in the neighbourhood of the *Joker* group. The works undertaken during the month of July consisted of surface and installation works. The work done on the various veins crossing the property indicate that they are gold-bearing. Several assays made on ore taken from the main vein have revealed values varying from $\frac{1}{2}$ to $1\frac{1}{2}$ oz. of gold per ton and a considerable amount of silver. A Pelton wheel of 500 horse-power with a compressor plant, delivered by the firm of Allis Chalmers, will be installed next spring and the work pushed on actively.

KASLO CREEK.

The *Whitewater* and *Whitewater Deep* mines worked about sixty men up to the time of the fire in July, when they lost their concentrator, compressor, and mine buildings. The latter have largely been replaced, and about eighteen men have been employed on development work in the mines.

The *Utica* group, on Paddy's Peak mountain, changed hands during the year. The property is developed by five tunnels, all showing ore; the lower tunnel has a vertical depth of 1,300 feet under the apex, where a large body of high-grade ore is exposed. One hundred and forty-six tons of ore were shipped during the year, principally from the lower tunnel. The company proposes building a mill and tramway the coming season, for the more convenient handling of ore.

Panama.—This mine worked three men continuously during the year and accomplished 400 feet of work, consisting of crosscut tunnels, drifting, and upraising, and 60 tons of very high-grade silver-ore were shipped. The owners intend working the property steadily the coming year.

Only assessment work was done on the mines on the Duncan river and its tributaries, and no new discoveries of note have been reported.

OFFICE STATISTICS—AINSWORTH MINING DIVISION.

Free miner's certificates (personal)	204
" " (company)	2
" " (special)	7
New claims recorded	70
Transfers	30
Certificates of work	248
Pre-emptions	5
Certificates of purchase	45
Certificates of improvements (land 4, mines 91)	95

SLOCAN MINING DIVISION.

REPORT BY ANGUS MCINNES, MINING RECORDER.

I have the honour to submit herewith the annual report on the mining operations in the Slocan Mining Division for the year ending December 31st, 1910.

The great forest fire that swept the north-eastern section of this division during the dry season greatly retarded some of the big mines in that section, and destroyed much valuable property, the *Rambler-Cariboo* mine being one of those to suffer most, having its compressor and other buildings destroyed, and the means of transportation cut off, which for a time forced the management to reduce the force of the mine, and, consequently, the ore shipments have been greatly reduced. But the Government came to the rescue by building a good waggon-road to connect the mines of McGuigan basin with the C. P. R. at Three Forks, and now the mines in that section are shipping the ores *vid* Three Forks.

Rambler-Cariboo.—This mine is situated in McGuigan basin, just above McGuigan, a town on the Kaslo and Slocan Railway. The property is under the management of W. E. Zwicky. The compressor plant and other buildings needful to enable the mine to again resume operations have been finished. Work at the mine has been pushed forward with greater vigour than ever; a chute has been built at Three Forks whereby the ore can be dropped into the cars from the sledge, which carries from 7 to 10 tons at a load. The ore is now being shipped in bulk, which makes it very much cheaper to handle. Mr. Zwicky informs me that the mine never looked better nor the prospects for increased output brighter.

Washington Mines.—This property is situated in the Washington basin, having the same outlet as the *Rambler* at McGuigan. It is operated by John L. Retallack, who has, since the fire, resumed operations with much vigour, having run tunnels to the length of 1,200 feet and 150 feet of raising. Preparations are being now made for shipping large quantities of ore.

Richmond-Eureka.—Operations on this property have been carried on all the year. A large quantity of ore has been discovered in No. 6 workings, and development work has been kept well ahead. This property was one of the biggest shippers in the Sandon camp during the year, shipping over 4,100 tons of ore, employing an average force of twenty men.

Slocan Star.—The management has confined operations during the year to development work, only about 170 tons having been extracted in the course of development, no stoping having been done. Some of the ore-shoots opened in the adjoining ground, the *Richmond-Eureka* property, have been found to continue into the *Star* ground. The work done during the year was mostly drifting and crosscutting, about 1,700 feet in all. It is expected that the year on which we have entered will see great activity at this property. The owner is the Byron N. White Co. (foreign).

Ruth and Hope Mines, Ltd.—These properties are situated near Sandon, and have been continuously operated during the year with a force of fifteen men. Between tunnelling and drifting 1,900 feet of development work has been done. A large tonnage of ore has been shipped, and the conditions are very favourable for still larger shipments being made during the year 1911.

Noble Five Group.—This property, owned and operated by the Hon. James Dunsmuir, with T. L. McAllister as manager, is situated near Cody, and has a fine large concentrator in connection with it. The work done during the year consists of tunnelling, crosscutting, and drifting, as follows: Drifting, 887 feet; raising, 225 feet; crosscutting, 125 feet; sinking, 110 feet. There are large reserves of ore blocked out ready to stope; the ore is very high grade, running 140 oz. in silver and 67 per cent. lead. The management has had several new and comfortable buildings erected this year.

Surprise Mine.—The work done during the year consists of a tunnel and a raise; the raise was put up from the continuation of the *Last Chance* No. 3 tunnel for 440 feet, with about 300 feet yet to reach the old workings above. The vertical depth from the *Surprise* outcrop is 1,100 feet, but the old workings are down to the 300-foot level, which leaves 800 feet down to the tunnel below. It is expected connections will be made through to the old workings by about the middle of next April; so far, 170 feet of the raise has been in ore of good grade—silver and lead. The property is owned by Wm. Kemp, of Chicago, and Alexander Smith, of New Denver.

Molly Hughes.—This property is situated on the shore of Slocan lake, near New Denver. An average of twelve men has been employed; 220 feet of drifting and 125 feet of uprise was done during the year. The ore shipped was 375 tons, which contained 66 oz. gold, 26,000 oz. in silver, and 3,000 lb. lead. The vein runs from 12 to 18 inches in width, and it is considered a "dry ore." Development work has been kept well ahead of the stoping.

NORTH FORK OF CARPENTER CREEK.

There has been a considerable amount of work done in this section. The properties worked to any extent are the *Jo Jo*, *McAllister*, *Milton* group, and *Evening Star*.

Van-Roi Mine.—The work for the last five months has been confined to development work, blocking out large bodies of ore, mostly concentrating. On the 1st of September it became necessary to reduce the force at the mine, as all the ore-houses and other available space had been filled with ore, waiting to be run through the new mill, which is now nearly finished, and which will be one of the finest mills in the Slocan, fitted up with all the latest machinery, and capable of handling a large quantity of ore.

Hewitt Mines.—This property is situated on Four-mile creek, and is operated by Monty M. Davies, with a crew of ten men, and is shipping regularly.

Standard Mine.—This mine is now considered by mining men to be a very rich silver-lead mine; it has now as fine showing as any mine that has yet been opened up in this Province. This showing is in the No. 5 tunnel, which is in solid ore for a distance of 160 feet, with a 22-foot solid face of ore, and the end is not yet. They are now running a No. 6 tunnel to tap the ore-body at a further depth of 400 feet; and if the body of ore they are now boring through reaches down to that level, and there is every indication that it will, then the *Standard* will be a big high-grade silver-lead mine. A tram-line from the mine and a large mill will be built on the shore of Slocan lake, about one mile north of Silverton, for which water rights have been applied for and a mill-site purchased.

OFFICE STATISTICS—SLOCAN MINING DIVISION.

Free miner's certificates (ordinary)	120
" " (company)	4
New locations recorded	29
Certificates of work recorded	129
Conveyances recorded	14
Certificates of improvements recorded	10
Permits filed	20
Traders' licences issued	32
Revenue from all sources	$3,308.15

SLOCAN CITY MINING DIVISION.

REPORT OF HOWARD PARKER, MINING RECORDER.

I have the honour to submit my report for the Slocan City Mining Division for the year ending December 31st, 1910.

The *Eastmont* group, situated on Ten-mile creek, six miles from Slocan lake, has done a considerable quantity of development work during the year, a force of about twenty men being engaged continuously. The development work consists of a further 500 feet of crosscut on No. 4 and about 150 feet on No. 3 tunnel, as well as an upraise of about 200 feet to connect No. 3 with No. 2 tunnel. No. 3 tunnel exposes ore continously for 200 feet or more, of an average width of 18 inches. Upwards of 677 tons of ore was shipped during the year, averaging 190 oz. of silver per ton. This is far in excess of the previous year, when only 200 tons were shipped. The property is owned by the Ellis Silver Mining Company, Limited, and E. A. Griffith is superintendent.

The *Combination* group is situated on Springer creek, within one mile and a half of Slocan City. The owners have driven 200 feet of tunnel, and there is every indication of the property proving a big shipper in the near future. The vein is one of the largest in this district; the surface showings indicate high-class bodies of silver-lead ore, besides small values in gold.

The *Ottawa* shipped 20 tons of high-grade silver-ore during the year.

The *Enterprise* shipped about 65 tons of similar ore.

The *Meteor* has been leased to Barber, Law, and Wafer, and the lessees have now a car of ore ready for shipment.

The *Bessie* group of seven claims, situated near the *Kilo*, was sold in November last to an English mining company, who purpose opening up the property next spring.

OFFICE STATISTICS—SLOCAN CITY MINING DIVISION.

Free miner's certificates (ordinary)	92
" " (company)	2
" " (special)	1
Certificates of work recorded	123
Locations recorded	99
Conveyances recorded	20
Certificates of improvement recorded	12
Cash paid in lieu of work	$500

TROUT LAKE MINING DIVISION.

REPORT OF F. MUMMERY, MINING RECORDER.

I have the honour to submit herewith my report of the progress of the mining industry in the Trout Lake Division for the year 1910.

In the number of claims located, certificates of work issued, etc., the office statistics will show but little change from that of the previous year, but the number of men employed and tonnage produced was only about one-half the total for 1909. No new companies have started, nor have any of the old ones resumed operations during the year, and, with the exception of light shipments made by the Ethel Co., production was limited to one mine, the *Silver Cup*.

Silver Cup.—This mine, owned by the Ferguson Mines, Ltd., was worked steadily, making this the sixteenth year that the mine has been continuously operated. An average of thirty-five men was employed, and development to the extent of 1,551 feet done, consisting of the shaft sunk an additional 230 feet; drifts and crosscuts, 1,231 feet; raises, 90 feet. Shipments, consisting of high-grade silver-lead ore, amounted to 271 tons.

The Ethel Silver Mining Co., of Spokane, Wash., the owners of the *Frances* and *Noel* mineral claims, situated on Ethel Mt., employed, during the earlier months of the year, four or five men, under the direction of J. S. Lampiere, and about two cars of ore were shipped, up to the time operations were suspended in April. I have written Mr. Lamphere for statement of development, etc., but, having received no reply, I am unable to give any additional details in reference to this property.

Swede Group.—On this group of claims, situated at Poplar, some work has been done during the past summer under W. F. Anderson, representing a syndicate of Scotch capitalists, who have an option on the property. The work done, I understand, consisted chiefly of surface-prospecting the various claims of the group, but I have been unable to learn with what result, or whether likely to lead to a more comprehensive plan of development during the present year.

Canadian Boy.—On this claim, situated at Seven-mile, on the South fork of Lardeau creek, and located in 1896, owned by Kirkpatrick, Thompson, and Daney, a very promising body of ore has been exposed. The vein, between 7 and 8 feet of quartz, cutting the formation at right angles, besides carrying small streaks of clean carbonates, is heavily mineralised throughout its entire width. A shaft has been sunk 10 feet, a substantial and commodious shaft-house erected, and it is the intention of the owners during the present year to thoroughly determine the possibilities of this property by active development.

OFFICE STATISTICS—TROUT LAKE MINING DIVISION.

Free miner's certificates issued to individuals	109
" " companies	5
Mineral claims recorded	63
Certificates of work issued	225
Bills of sale, agreements, etc., recorded	46
Certificates of improvements recorded	15
Grouping notices filed	41

NELSON DISTRICT.

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NELSON MINING DIVISION.

REPORT OF W. F. TEETZEL, GOLD COMMISSIONER.

I have the honour to submit the annual report on the Nelson Mining Division for the year ending December 31st, 1910.

GENERAL REMARKS.

In all respects the year 1910 was a banner year in the Nelson Mining Division, both in number of major properties operating, in tonnage produced, and in general mining activity, including unusually comprehensive prospecting, directed impartially to all the principal mineral showings of the Division. All the camps shared in the increased activity, but particularly those of Nelson and Sheep Creek, while the Bayonne, as a new and rising gold camp, is entitled to especial notice; the Erie and Ymir camps maintained their tonnage. Only one or two mines of importance closed during the year, and these gaps in the list of shipping properties were far more than compensated for by properties coming under operation.

Three stamp-mills were in continuous operation during the year, that of the *Granite-Poorman* of the Nelson camp, and those of the *Queen* and the *Nugget* of the Sheep Creek camp. The *Athabasca* and *Fern* mills of the Nelson camp, the *Wilcox* of the Ymir camp, and the *Second Relief* of the Erie camp were operated periodically, when needed. With these exceptions, practically all the ore produced was shipped, in its crude state, to Trail, for treatment at the smelter of the Consolidated Mining & Smelting Company of Canada. A certain tonnage, no substantial amount, went to the Granby smelter at Grand Forks. Some of the largest operating properties did not ship at all, but concentrated their energies on development work, the results of which will be seen in increased tonnage for the Division in the early future.

No serious losses occurred in 1910, outside of the snowslides in the Ymir and Sheep Creek camps, the *Ymir* and *Wilcox* of the former camp, and the *Kootenay Belle* of the latter, losing some buildings.

The prospects for 1911 are of the brightest. Sheep Creek camp starts the winter with more operating properties than ever previously, all of which should continue in operation throughout the year, while several bonds were taken in the fall which should result, in the spring, in new mines being brought under development; and in addition to this, the *Mother Lode* will erect a stamp-mill. The Nelson camp will see the Toad mountain consolidation bear fruit in large mining operations, and the Division will be the gainer from the *Molly Gibson* taking the prominence of earlier years as a shipper. There is ground for the persistent belief that the *Ymir* mine, that formerly made the Ymir camp, may resume active work. At least one promising property of the Erie camp, the *Big Bump*, expects to introduce new capital the coming year. Moneyed interests have also become identified with ledges that do not fall into any recognised camp, and it is possible before 1911 is out that some new locality—Nine-mile creek, for instance—may be claiming recognition. Mining operations have been carried on on La France creek, and extensive prospecting on Midge and Cultus creeks and on the lower portion of Summit creek, all flowing into the southern link of Kootenay lake, while near Kitchener and Creston local attention is being directed to the mining possibilities.

Experimentation with Zinc-ores.

A development of the past year was the special attention directed toward the problem of providing a commercially satisfactory process for the reduction of the refractory zinc-ores of the Kootenay, which, in the event of a successful solution being found, will mean to the Kootenay the opening-up of an almost entirely new field of mining. On the representations of the various boards of trade and the silver-lead mine operators, the Dominion Government appropriated $50,000 for experimental work in this department, and the Provincial Government co-operated by granting the use of the Snyder zinc-smelter at Nelson. The appropriation is being used at present for research work at McGill University, conducted with characteristic Kootenay ores, the department being supplied with 500 lb. each of the zincky ores of the *Ruth*, *Whitewater*, *Blue Bell*, *Sullivan*, and *St. Eugene* silver-lead mines, and 1,000 lb. of the ore of the *Lucky Jim* zinc-mine. Dr. Eugene Haanel, Director, Mines Branch of the Dominion Department of Mines, in November announced that, if the preliminary research-work indicated an electric process, the smelter built at Nelson by the Canada Zinc Company for the Snyder electro-thermic process would almost certainly be used to complete the work; while, if some other process were indicated, the smelter would probably be located at Nelson in any event, for convenience to power and the ores.

In September, A. Gordon French, metallurgical chemist, announced that he, too, would attack this problem. The City of Nelson co-operated by lending gratis its original power plant on Cottonwood creek, partly standing, and Mr. French organized at the coast the French Complex Ore Reduction Company. A considerable plant has been put together, and the experiments are now in progress at Nelson.

A third investigation on this immensely important line has been conducted in the neighbouring Division of Ainsworth by the private enterprise of the operators of the *Blue Bell* mine, at Riondel. The experimentation was under the direction of S. S. Fowler, manager and consulting engineer of that property. No results have been given out.

NELSON CAMP.

The Nelson camp has experienced a most substantial extension of mining operations, notwithstanding the closing, after June, of one of its leading mines, the *Silver King*, and this will be gathered from the development recorded below for individual properties. A feature was the reopening of the *Queen Victoria* copper-mine at Beasley, under the new control of the Consolidated M. and S. Company, for a period sufficiently long to demonstrate the shipping worth of this property when the price of copper recovers. The *Granite-Poorman* and the *Athabasca* were operated full force, the former providing the chief tonnage for the camp. The *Eureka* and the *Fern* were extensively developed, and their ore given adequate smelter tests. New capital became available for the *Silver King* and the *Granite-Poorman*, the former becoming the king-pin of the Toad mountain consolidation, while the latter is expected to increase both plant and output. Numerous smaller mines have operated, which, under favouring circumstances, are in line for tonnage. Indications are for still broader mining activity the coming year. The ore of the camp is prevailingly free-milling gold and gold-copper; on some properties, as the *Eureka* and the *Queen Victoria*, the copper being the chief value. Nelson, Hall, Granite, and Beasley are the shipping points.

Toad Mountain—Morning Mountain—Cottonwood Creek.

Silver King.

The *Silver King* mine, on Toad mountain, was operated by the Kootenay Development Syndicate, under a lease from the Hall Mining & Smelting Company, Limited, for the first six months of the year, continuing to ship to Trail, its output being 1,589 tons of copper-ore. Lack of capital caused the shutting-down of the mine. In the autumn a merger of nearly all the properties on Toad

mountain was effected through the instrumentality of R. S. Lennie, an exceptionally strong group of Pacific Coast capitalists acquiring the assets of the Hall Mining & Smelting Company, Limited; the Dandy and Ollie Consolidated Mines, Limited; the Starlight Mines, Limited; the Kootenay Development Syndicate; and the properties owned by A. H. Kelly, A. E. Rand, A. H. Buchanan, and R. S. Lennie. The merger covers forty mineral claims, the Hall Mines smelter, and other equipment. The intention of the new syndicate is to bring under development the large bodies of low-grade ore known, and believed, to exist at depth, both on the developed properties and in virgin ground. The first step will be the driving of a long crosscut tunnel to drain the *Silver King* workings and gain depth on that particular vein. Operations, it is understood, will commence in the spring, the fall work having been confined to a thorough examination of the property. A new process of reduction, the Elmore-Murex, is in view, if proven successful.

California. Another Toad mountain shipping mine is the *California*, owned by Mackenzie & Mann. In January, under the lease of Marks Brothers, it shipped 36 tons of gold-copper ore to Trail. The option lapsed, and in the latter part of the year J. P. Bell and William Hudson obtained a lease and bond on the group. In December the mine force was increased to thirteen men, and at the close of the year the lessees made shipments to Trail. It is their expectation to ship regularly the ensuing year to the Granby smelter, where the process is said to especially suit the ores of this property.

Athabasca. The *Athabasca* property, on Morning mountain, employed an average of thirty men throughout 1910, being operated continuously by the reorganized Athabasca Syndicate. Considerable work was done on the ledge, which at the opening of the year had been recovered beyond the fault that caused the suspension of work in 1909, and some work was also done on a ledge that was picked up lower down. About 300 feet of crosscut was also driven, to intercept a parallel vein which shows on the surface, this work being still in progress. Altogether there was 1,100 feet of development work, consisting of raise, drift, and crosscut, in a general extension of the old workings. The 10-stamp mill was operated, when required, to crush 3,000 tons of gold-ore, 84 tons of concentrates being shipped to the Trail smelter.

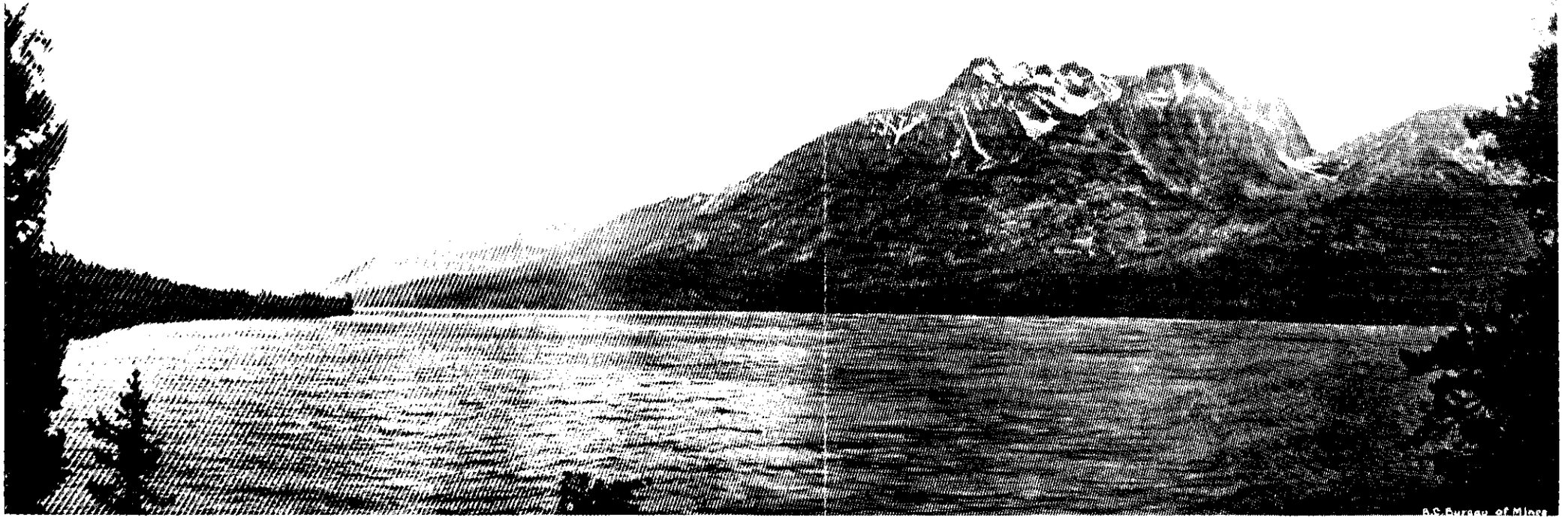
Perrier Group. On Cottonwood creek, the *Perrier* group, owned by R. W. Hinton, A. Crossley, C. Crossley, Ralph Young, W. Heron, and T. Turner, shipped 9 tons of ore to Trail in March, the season's work consisting of 40 feet of shaft on the lead and a quantity of open-cut work. At the end of the year a single-drill vertical compressor and a Huntingdon mill of 12 tons capacity were installed. The ore on this property and the adjoining one, the *St. Elmo* group, carries free-milling gold. The latter, owned by W. Maher and T. J. Scanlan, which previously had 300 feet of tunnel-work, and had also shipped, was further developed by a large open-cut on the ore-shoot.

On Hall creek, the *Fern* property, owned by the Fern Gold Mines, Limited, and worked under lease by J. C. Moen and Henry Skoning, sent 14 tons of ore to the Trail smelter, and put 70 tons of ore through the 10-stamp mill of the property. The entire year's work was on the new lead, and consisted of 200 feet of drift and 80 feet of upraise, the new lead being reached from No. 2 level of the old workings. The property is two miles and a half from Hall Siding.

Sandy Creek—Eagle Creek.

Alma N. Group. On Sandy creek, on the divide from Eagle creek, the *Alma N.* group, owned by J. J. Malone, John Ostin, W. Gosnell, George Matthews, and Nels Lowenring, was developed by 248 feet of crosscut tunnel, which is expected to catch the lead in 310 feet more, and give a depth of 98 feet. Previous development

Valley at south end of Tatlayoko Lake—showing outlet of Homathko River.



Tatlayoko Lake—source of Homathko River—looking south.

consisted of a 46-foot shaft on the lead, to the bottom of which was driven a crosscut tunnel 60 feet long. The ore is free-milling gold and some native copper.

Granite-Poorman.

The *Granite-Poorman* property, on Eagle creek, was the banner producer of the camp, a total of 7,701 tons of gold-ore being put through the 20-stamp mill, while 368 tons of concentrates was shipped to Trail. A shortage of water considerably restricted the tonnage milled—and mined—but this is provided against for the future, a 100 horse-power motor being installed at the mill, and connected by 2,000 feet of pole-line with the City of Nelson's power-transmission line from Bonnington falls. Another improvement was the addition of a surface tram at the *Granite* mine, connecting the mine and aerial tram, and a new ore-bin and a sorting-pocket. The feature of the year's work was the opening-up of the *Greenhorn* vein at depth and the tapping of high-grade ore-shoots in it, in addition to which the development of both the *Granite* and the *Poorman* was continued. In all there was 834 feet of crosscutting on the *Greenhorn* and *Granite*, 1,270 feet of raising on the *Greenhorn* and *Poorman*, and 632 feet of drifting on the *Greenhorn* and upper *Granite*, the latter containing the *Beelzebub* vein. In the latter part of the year the Kootenay Gold Mines, Limited, with $250,000 capital stock, chiefly underwritten at the Coast, was organized to acquire the property from Thomas Gough, E. E. Guille, and J. P. Swedberg, the partners, however, retaining a strong interest. Mill capacity for a much larger tonnage and a cyanide plant to increase the recoveries are among the objects in view. In the four years preceding 1910 the net returns of the property were $167,000.

Eureka.

The *Eureka* property, on Eagle creek, owned by the Eureka Copper Mines, Limited, shipped to Trail in October and November 342 tons of ore, which ran about $18 a ton, being in the nature of test shipments from five or six ore-shoots the company has been developing for some time past. The present development was started in 1907, and has steadily proceeded, with the result that several good ore-shoots have been opened up at various depths, and a large amount of copper-gold ore blocked out. The past year's work consisted of 700 feet of crosscut and 1,000 feet of drift.

The *Central* property, owned by Joseph Legault, Harry Niven, and Joseph Dumont, made shipments to Trail in February aggregating 80 tons. The workings consist of a 100-foot shaft on the lead, with drifts at the 50-foot and 100-foot levels, each 60 feet long. The season's work was principally stoping from both levels. The ore is gold-copper, chiefly copper.

The *Pingree* property, at the head of the creek, owned by the Pingree Gold Mines, Limited, a Victoria company, was developed in two portions. The *Mayflower* tunnel was continued 60 feet and reached ore. The *Pingree* tunnel was continued about 140 feet, encountering an ore-shoot, on which a little winze was sunk. The ore is gold-copper, largely sulphides.

The *Royal Irish* group, owned by Michael Egan, was developed only by assessment work, though shipping two years ago.

Bird Creek—Forty-nine Creek.

On Bird creek, on the *King George V.* group, owned by John Smallwood, 26 feet of a crosscut tunnel was driven and a long open-cut made. The tunnel reached the ore-shoot about the end of the year, showing shipping gold-ore similar to that in the open-cut. This property is adjoined by the *Ophir*, owned by John Baxter. Present work on the latter is driving a crosscut, which is in 67 feet, and which should reach the lead in 24 feet more, giving a depth of 90 feet. The ore lead crosses both properties.

On Forty-nine creek, the *Gold Hill* group, owned by Alex. McDonald, carried its 650-foot drift another 50 feet, giving a depth on the lead in the face of the drift of 300 feet. Considerable money has been laid out on this property in the past. The ore carries gold.

The *Reliance* property, two miles below, of which the claims are Crown-granted, is owned in Pittsburg. The property, which is equipped with a Chilian mill, was extensively sampled last season, but no work was done. The ore is gold-copper.

Bear Creek.

The *Queen Victoria* copper-mine at Beasley, which was taken over by the Consolidated Mining and Smelting Company about the beginning of the year under a long-term option, was brought under active operation early, and in May began to ship to the company's smelter, shipping continuously to the end of August, when the property was closed down, the company having demonstrated what it had in view—the availability of the property's large low-grade ore-bodies in the event of a raise in copper values, copper being the mine's principal valuable constituent. The shipments aggregated 3,073 tons. The ore is a very desirable one from a smelting standpoint. The property is equipped with a complete plant.

YMIR CAMP.

The Ymir camp includes the mineralised territory of Wild Horse creek and its tributaries, Porcupine, Hidden, Boulder, and other creeks, adjacent to the town of Ymir. Three properties of the camp underwent major development during the year, of which two produced ore for market, and two other properties were successful in enlisting capital necessary for their adequate development. The *Ymir* mine, formerly a large producer, is understood to have extensive diamond drilling in view for the coming spring, with a view to disclosing new ore-bodies at depth which would justify the resumption of operations. Various other properties have been developed to a less extent, some of which are likely to have command of capital the coming season. An increase in tonnage this year is certain, with probably, also, a greater breadth of mining operations. The ore of the camp is free-milling gold, with occasional galena.

Yankee Girl.

The *Yankee Girl* property, owned by the Yankee Girl Gold Mines, Limited, of New York capital principally, was the steady producer of the camp the past year, between January and November shipping to Trail 4,738 tons of gold-ore. At the end of November the company was reorganized, making available new capital. The last month of the year the mine was closed, during the installation of a seven-drill compressor. The Great Northern Railway has promised a new rate, which will materially encourage shipment. It is understood the property may ship largely to the Granby smelter, while also sending ore to the Consolidated. Four ore-shoots have been developed on the first level, two of shipping and two of concentrating ore. Development will proceed at an accelerated rate the coming year.

Dundee.

The *Dundee* property, on Dundee mountain, has done a year's steady development, which, since June, has taken the form of driving a long crosscut tunnel expected to catch the ledge aimed at at 1,800 to 2,200 feet, and give 1,000 feet depth. At 450 feet distance on this tunnel a blind vein was encountered, and at 500 feet the main ledge was caught, showing a width of over 15 feet, both these events occurring in December. It is probable that a drift will follow in the lead to a point vertically under the shaft of the upper workings, this to be followed by a raise. The Dundee Syndicate represents chiefly Vancouver capital. With a small compressor installed as the year closed, the property will prosecute development work actively, and will very probably join the list of shipping mines. A bunk-house was added to the buildings, and power development for 150 horse-power.

Wilcox.

The *Wilcox* property, operated by A. H. Tuttle, was also steadily developed throughout the year, with very satisfactory results. The work has been directed toward opening up the big ore-shoot at depth, and some 240 feet has been drifted. At a point 158 feet in from the beginning of ore, a raise was

started toward the old stope, 205 feet above. Both in the drift and the raise the shoot has shown a uniform width of 5 feet of ore, and also maintained its gold values. One of the points that has been demonstrated is that the black dyke that intersects the formation does not cut off the ore, as the shoot has been picked up beyond the barrier, carrying the same values. The stamp-mill was started up in September, and by the end of the year crushed about 800 tons of ore, while 22 tons of concentrates was shipped to Trail. A new bunk-house was built to replace the one partly carried away last winter, being located at the upper workings, and served by tram from the lower workings. Development will be actively pushed.

The *Ymir* mine, as already intimated, has a new development portended, the English capital being ready if the existence of more ore at depth is shown. The local faith in this property is unshakable. It has an 80-stamp mill, the largest in the Division.

The *Sterling* group, on Wild Horse creek, was bonded late in the fall to Philip White, of Vancouver. The group has good surface showings. Mr. White let a contract for 100 feet of tunnel, and has erected cabins. The property, it is understood, will be actively developed.

In December the *C. P. R.* group was bonded to a Vancouver syndicate by the Ymir and Nelson owners, the life of the bond being two years, and requiring, among other things, substantial development work during the present winter. The group comprises ten claims, and is crossed by five parallel veins; the showings are chiefly of milling ore, though some high assays have been obtained.

On the *Commodore* group of six claims, owned by D. E. Grobe and Ymir associates, considerable tunnelling and open-cut work has been done, and ore is exposed, some of which contains ruby silver.

The *Bimetallic* has steadily pressed forward the long crosscut tunnel to tap its lead, which is believed to be a continuation of the *Ymir* lead, a distance of 95 feet being reached at the end of the year.

The *Lucky Boy* made a shipment of 3 tons of ore to Trail in January.

The *Mint* group, also owned in Ymir, has been under development. Four veins have been opened up, and some high-grade galena has been exposed.

The *Ymir Belle*, owned by M. Tait, J. G. Dewar, A. McDougall, and H. L. Jackson, has been developed by surface work, tunnelling, and two shafts. The 100-foot shaft is nearly all in ore.

The *Black Cock* group has been idle, but it is understood negotiations are in progress to include it in the Sterling bond, which group it adjoins. If this eventuates, this group, which shipped considerable ore ten years ago, may again produce. It is owned by McMillan Brothers.

Among other properties that have done minor development are the *Evening Star*, the *Little George*, and the *Lucky Girl*.

ERIE CAMP.

The Erie camp is another of the old gold camps of the Kootenay that seems destined to again come to the front. It takes in the territory of the North fork of the Salmon river, as well as small adjacent creeks. In addition to its operating properties, development work was done on an extensive scale, as well as extensive prospecting. The camp has had its share of new discoveries, and will very probably enjoy new capital the coming year.

Arlington.

The *Arlington* mine, three miles from Erie, owned by the Hastings (B. C.) Exploration Syndicate, Limited, was in continuous operation, employing an average of twenty-eight men. This property has been operated by the same operators for over nine years, without a day's shut-down. Crude ore to

the extent of 1,133 tons was shipped to the smelter of the Granby Consolidated Mining, Smelting & Power Company, the gross returns amounting to $60,905.63. The total work amounted to 1,400 feet, consisting of 901 feet of drift, 374 feet of raise, and 125 feet of winze.

Second Relief.

The *Second Relief* mine was taken over in the spring by a syndicate of Eastern capitalists represented by A. D. Westby, having previously been operated by the Second Relief Mining Company. Various shipments from March to December aggregated 189 tons, to the Trail smelter, the 10-stamp mill being operated for the last five months of the year. The power is obtained from the North fork by a flume two miles long. When the year closed fourteen men were employed, and it was the intention to actively develop throughout the winter the three veins of the property. Two of these were discovered under the present management, while the third is the famous *Second Relief* vein, from which such a tonnage has been taken in the past.

Big Bump.

The *Big Bump* mine, an adjoining property, though not shipping, did a large quantity of work, continuing the development of the property and the blocking-out of ore. In the fall the Big Bump Mining Company, representing Edmonton and Calgary capital, placed an issue of stock on the market, with good results. In December an arrangement was concluded with A. D. Westby, under which ore from this property should be crushed at the *Second Relief* mill, with the expectation that a large tonnage would be put through the present winter.

Another property on which considerable development is recorded is the *Keystone*, operated by W. J. Wilson. A shipment of 17 tons was made to the Trail smelter in July.

Numerous minor properties have been developed by more than assessment work, the number including the *Henry Clay*, owned by Andrew Sostad, for which an extension of the *Arlington* lead is claimed.

SHEEP CREEK CAMP.

The Sheep Creek camp continues to hold its important position, and another year of paying production has further justified the confidence felt in this young gold camp. While the year 1909 was a record year, both in tonnage and in the breadth of operations, 1910 has far exceeded it, and, so far as can be seen, the advance has been sound. It is the particular claim of Sheep creek that its mines pay their way, and nothing has occurred the past year to damage that claim. The twelve months witnessed the final payments on the four leading properties of the camp; a considerably larger number of properties are under development than the year before, and strikes innumerable have been made. Depth continues to be found on the various veins, with values maintained, and there is at present not a property, with the exception of the old *Yellowstone* and the *Columbia*, whose lowest working on a lead is not in ore. As in some cases this depth is 500 feet, the substantial basis for the general confidence in the camp can be seen. Though producing without intermission for twelve years or more, it took the camp three-quarters of that time to be discovered, but since that stage progress has been steady. Various properties have been bonded, which will come under development the coming year, so already a broader distribution of activity for the coming season is assured. In addition, it is inevitable that some of the properties heretofore developing will become shippers. The number will include the *Mother Lode*, which is preparing to erect a stamp-mill with the opening of spring. Salmo, on the Nelson & Fort Sheppard branch of the Great Northern Railway, ten miles distant, is the camp's shipping point. Fissure veins in a quartzite formation, varied with numerous associated formations, including limestone, characterize the camp, the ore occurring in lenses, except in the few cases of contact veins. The ore is prevailingly free-milling, the percentage of free gold decreasing with depth and the sulphides

increasing. On the outskirts of the camp are traces of galena, and down the creek a few miles there is a pronounced silver-lead area, exemplified by the *Emerald* mine and numerous prospects.

Dominion Mountain.

Nugget.

Overlapping the summit of Nugget or Dominion mountain is the *Nugget* property, owned by the Nugget Gold Mines, Limited, which completed its title in the spring. Of the seven veins cutting the summit, two of which were discovered during the year, the main vein, and veins 1, 2, and 3 north, are all developed by a network of tunnels, the third drift on the main vein going in from both sides of the mountain. In the main vein is a large ore-shoot, found in all four drifts, the lowest being in ore for 500 feet. The third and fourth drifts are connected by a winze and raise, and midway a chamber of 18 feet cube has been stoped out. There are some remarkable values in the veins of this property. About thirty-five men were employed throughout the year, a 4-stamp mill, operated by steam, continuously crushing ore. Besides the bullion produced, the property shipped 127 tons of concentrates to Trail.

Mother Lode.

The *Mother Lode*, on the Sheep creek slope, after another year's development, closed in December with, it is claimed, sufficient ore blocked out to run a mill of average capacity for three years, this event being coincident with the completion of the title by John McMartin, of New York. Tests of the ore were made on a large scale in San Francisco, the mill-site has been cleared, lumber hauled, and a mill of the latest type will be erected in the spring. Mr. McMartin has since formed a company of $1,250,000 capital stock to operate the property. About forty men were employed, and development, in the latter part of the year, took the form of a long crosscut to give further depth on the main vein, and also a crosscut from farther up the creek, coming in on the vein at an angle under the oldest workings, both crosscuts exposing the ore-bodies sought.

Under a bond secured last winter, the *Clyde-Belt* group came under active development in the spring by the Britannia Mining and Smelting Company, and a large force of men has been employed in development work. The main vein has been tapped on two levels, and since the summer a long crosscut has been steadily pressed, which is expected to give 500 feet depth on the land. Mine buildings were also erected.

The *Golden Belle* property, owned by the Amalgamated Sheep Creek Gold Mines, Limited, and comprising the largest group of claims in the camp, has been actively developed since July, when a large force was placed at work. In the summer a new ledge was struck, which has shown up well with development, and on this ledge work is now proceeding.

The *Golden Fawn* was operated the first part of the year by the Salmo owners, a Vancouver syndicate bonding it in June, since which time development has actively proceeded. The property has rich surface showings, and the syndicate is drifting to catch the values at a little depth.

The *Devlin Lode*, the *Columbia*, and the *Searchlight* are other groups on Dominion mountain. The first named was bonded in the summer, and some development work has been done and a quantity of ore sacked. The second, as one of the earlier producers, is certainly in line for development, though at present quiescent. The third has the *Nugget* veins, but has not yet been touched by development, and would, offhand, be considered one of the good propositions of the camp. Adjoining that property, and under pretty nearly the same control, it may either be absorbed or embark on a destiny of its own.

The *Sno Sio* group, owned by Gus Schwinke, has some surface development, and a new lead was discovered in the summer.

Wolf Creek—Yellowstone Mountain—Cariboo Creek.

On Wolf creek, at the forks with Sheep creek, lies the *Queen* property, the mother of the camp, its tunnels 150 feet below the bed of Wolf creek, and also attacking the slopes on either side. The Queen Mine, Incorporated, a group of Wisconsin capitalists, completed the bond and took title in December. The year's work was nearly all under the creek, the ore-shoot encountered in the fifth level in February being followed for some hundreds of feet, at times to a width of 20 feet. This is now being stoped, while a tunnel into the slope of Yellowstone mountain has picked it up at a little height above the creek. The other veins of the property have not been touched the past year, with the exception of the *Alexandra*, which, since the installation of a larger air-line, is to come in for a thorough test. The 20-stamp mill, supplied with water from both creeks, has operated continuously, though at times having difficulty for water, and 773 tons of concentrates was shipped to Trail. About forty-five men are employed and five drills have been used, but the improvements in the air-line will permit of immediate increase in the number of drills.

The *Bonanza* property, farther up the creek, shipped 19 tons of ore in February. A very good amount of development work was done by the Sheep Creek Bonanza Mining Company, Limited, principally in the shape of drifting on the lead, until, in the early fall, the property reverted, for financial reasons, to the Salmo owners, who have since operated it.

Higher up on Wolf creek are two promising prospects, the *Rainy Day* group and the *Gordon* group, both owned in Nelson. The former has a wide ledge with rich surface showings, and an endeavour is being made to enlist capital on the lines of a local company. The latter also has a promising ledge. Both are new locations.

On Yellowstone mountain, the *Kootenay Belle* mine was formerly a producer, but, reaching the stage when new depth was required, was developed by a crosscut tunnel driven to give that depth, part being driven by the operators, the Rogers Syndicate, and part by contract. In December the new tunnel, which represented a year's work, reached the smaller and richer of the two ledges of the upper workings. Since that event development has proceeded actively on a good scale, consisting both of drifting on the present lead, with a view of raising to the shaft above, and of pushing on the crosscut to catch the larger lead, which should be cut in about 90 feet farther. A shipment of development ore has been made to the Trail smelter. The upper workings are connected by tram with the 14-stamp mill owned by A. H. Tuttle, which in the past has crushed ore for three different surrounding properties. The Rogers Syndicate made its final payment on the property about the end of the year. An active policy of development will be followed the ensuing year.

Higher up the mountain is the *Vancouver* property, which shipped in the spring 57 tons of high-grade ore, being operated by J. J. Malone under lease from Frank Unfried and G. H. Fisher. The lease was not renewed, but about the end of the year a lease was given to Max Lomprey, who is proceeding with the drift from which the ore referred to was taken. Messrs. Unfried and Fisher also have a group of claims higher up, with independent showings, and this will in future be grouped with the property just described.

The *Eureka* property, on Cariboo creek, which has seven veins in all, was bonded in the spring by William Kennedy and the late William Claffy to the Van Houten-Heymann Syndicate, of Vancouver. The summer's work was chiefly road and cabin building, after which the main vein came under further development, a drift being driven in ore. A full winter's work is being put in on this drift. There was considerable earlier development of this property by the bonders. A full year's development is anticipated, with good possibilities of shipping. Across the creek, the ledge of the *Bluestone*, owned by Gus Schwinke, has a tunnel in ore.

On the upper fringe of the camp are two promising groups that were the subject of deals which will bring them under development. A consolidation of two large properties in the summer resulted in the *Davenport* group, which was bonded to a Vancouver syndicate. Various leads are partially developed, and extensive development in the early future is looked for. The *Treadwell* group, in the same locality, has lately been bonded, also in Vancouver.

Mount Vernon.

The *Summit* property, on Mt. Vernon, has had a year of important development, including the smaller veins from which some extraordinary values have been obtained, and also the "big ledge." On this property occurs a contact between limestone and quartzite formations, and this contact vein has been crosscut for depth. In the winter and spring 195 tons of high-grade ore went to Trail, and considerable sacked ore has also gone the present rawhide season. The Vancouver Financial Corporation has throughout the year operated this property, which is one of great promise.

Adjoining is the *Ore Hill* property, which operated years ago, and which contains the same big ledge referred to. The early operators spent a good deal of money in a series of crosscuts for a rich ledge that outcrops, and which crosses Coon creek, all of which stopped too short. It is now controlled by St. Paul financial interests represented by A. D. Westby, the title being clear, and sooner or later this property should be slated for real development. On this point, however, the owners are keeping their own counsel.

On the farther side of the mountain is the *Pipe Dream* group, owned by Al. Garvin and James Van Hook, who for two years have worked at their big ledge. Late in the year the crosscut for depth caught the ledge, which was found to maintain both size and values. A drift from the point of intersection has disclosed good milling ore. Work is suspended for the winter. An adjoining claim, the *Nelson*, owned by A. McDougall and James Westby, supposed to contain the same ledge, has been developed by assessment work.

Fawn Creek.

The *Skookum* group, in the lime belt of Fawn creek, owned by H. T. Aitkin, has two ledges under development, principally by surface work.

The *Black Cat* group, farther up, has had assessment work done on its showings. The same description applies to the *Oma* group, on the crest of the mountain. All these have traces of silver.

Across the creek, on the slope of Dominion mountain, Napoleon Gagnon has continued development on the *Joint* group, recent work being in the shaft. Assessment work has been done on other claims in this locality.

SW-259

Iron Mountain.

On Sheep creek, but not of the Sheep Creek camp, strictly speaking, is the galena and iron territory, its chief exponent being the *Emerald* silver-lead mine, owned by the Iron Mountain, Limited, of which John Waldbeser is the active head. The mine is about six miles from Salmo, well south of the creek, and has been worked steadily for years. The past year it employed a considerable force, and shipped to Trail 1,679 tons of ore. There are quite a number of properties on Iron mountain, in a more or less developed state, staked for galena.

On the creek itself, not far from the Emerald trail, is situated the *Lucky Boy* group, owned by Frank McCaslin and Gus Schwinke, which has several leads, from one of which there is some shipping ore on the dump. The best lead was discovered in the autumn.

BAYONNE CAMP.

During 1910 the Bayonne gold camp, on the North fork of Summit creek, came into some prominence, probably 100 prospectors visiting the locality in the course of the summer, while the first general development in the history of the camp was recorded. The Bayonne camp is almost due east from the Sheep Creek camp, and may be reached from it by a trail over the divide. The other entry is by the Government trail above Kootenay Landing, the Bayonne trail leaving the road at the forks of Summit creek. The Bayonne camp is located on the same mineralised belt that is in evidence in the Erie and Sheep Creek camps, but its formation has its own peculiarities, the gold occurring in quartz fissure veins in a granite formation. There is prevailingly a very deep wash, which makes the tracing of leads difficult, and sluicing—while the creek contains water—is one of the methods employed in surface development. The ores generally resemble the characteristic ores of Sheep Creek, there being the same free-milling gold, sulphides, and oxides, and a similar range in values. The prospects for the coming year are excellent. At the present time only two properties can be said to command an adequate capital. With the acquisition of capital and the construction of a waggon-road to give access, the Bayonne camp, towards which some outside attention is now being directed, must ultimately be heard from.

82F/SE-30

The *Bayonne* property, the premier property of the camp, staked some ten years ago, and owned by the Bayonne Mining & Milling Company, comprising Butte capital, was not itself operated during the year. The claims of this group are all Crown-granted, and existing development consists of two drifts, respectively 550 and 800 feet long, both tapping the ore-shoot, and a crosscut tunnel 275 feet long which has not yet reached the lead. A considerable quantity of ore is on the dump. Messrs. Hickey and Wagener, heads of the company, had measurements taken in the summer for a drift below the crosscut, figuring on taking all the ore out by that channel. Including the price originally paid for the property, $200,000 has been invested in this group, and the company undoubtedly intends to stay with its investment.

SE-31

The *Echo-Sunrise* group, consisting of twenty-two claims, full and fractional, was the result of a consolidation in the winter, which, under various bonds, transferred the property to the Echo-Sunrise Syndicate, formed with Vancouver capital. Work was carried on on two portions of the lead, 170 feet of drift being driven from the intersection of the previously existing crosscut, which gave 54 feet depth on the showing; while at another point 236 feet of tunnel, the face at 80 feet depth, was driven to catch a smaller intersecting vein, which has not yet been caught. A short drift, lower down, previously existing, was carried a little farther. A combined bunk-house and kitchen was built.

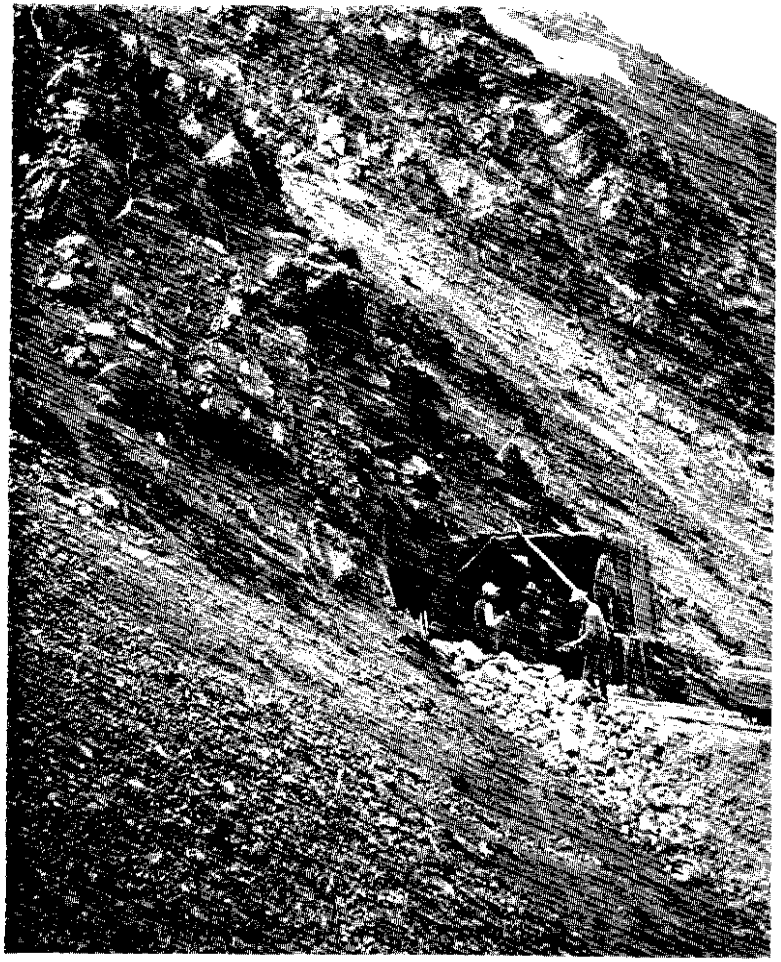
SE-33
SE-34

The *Montana* group, owned by Frank Aitken and Philip Casey, reached ore on the *Maggie Aitken* lead, in the last 10 feet of a 70-foot drift, of which 25 feet was driven the past season. The *Montana* lead was stripped by a number of open-cuts.

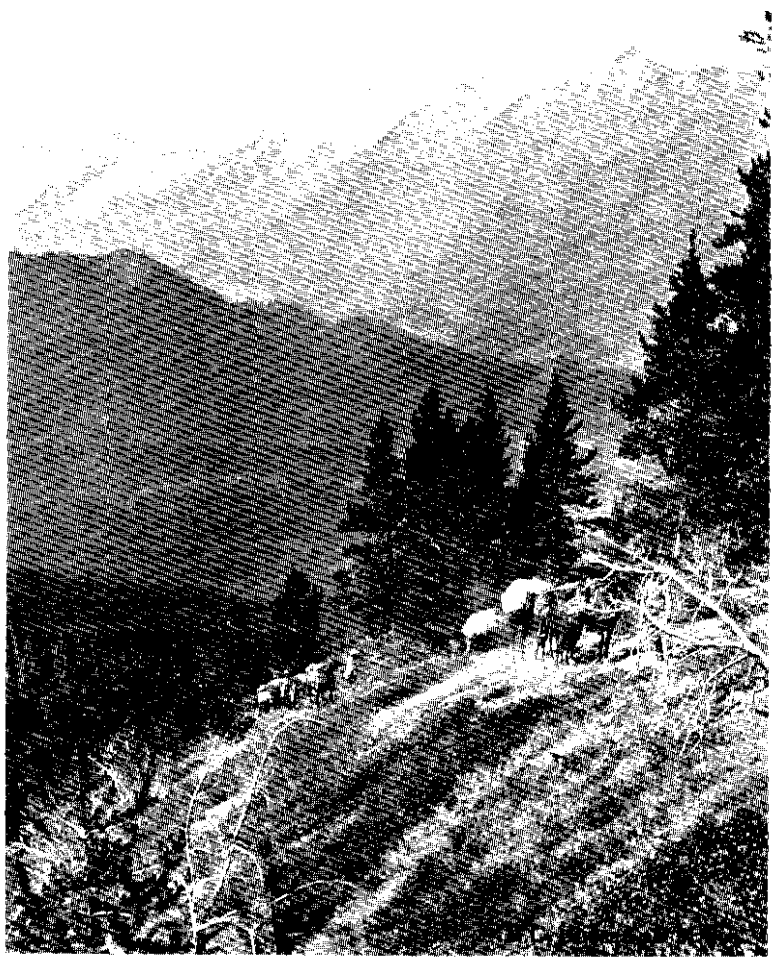
The *Bluebird* group, owned by W. Gosnell and Thomas Moran, drove 25 feet of a crosscut tunnel, which is expected to reach the vein in another 40 feet.

The *Old Mike* group, owned by H. Ginsberg, was developed by ground-sluicing, some open-cuts on the lead, and a certain amount of tunnel-work.

Twelve other properties were developed by surface work exclusively, as follows: On the *Big Jackpot* group, owned by James Grant and L. E. Borden, three open-cuts were made on the lead, which is now stripped for 200 feet. On the *Gold Nugget* group, owned by Alex. Stewart, the lead was stripped for 30 feet. On the *Josephine* group, owned by M. C. Monaghan and James McKiernen, 400 feet of ground-sluicing was done, in one place uncovering the lead, which is supposed to be a continuation of the north *Bayonne* lead. On the *Monitor* group,



Tatlayoko Lake Gold Mng. Co.'s No. 1 Tunnel.



Valley of Homathko River—from Tatlayoko Mine Trail.

owned by Michael Burns and James Hickey, the lead was stripped by three open-cuts. On the *Ray* group, owned by James Grant, L. E. Borden, Alex. Fyfe, Charles Burke, and William Walmsley, ground-sluicing was done, a ditch 200 feet long being constructed. On the *Red Rock* group, under the same ownership as the last, 225 feet of ground-sluicing was done and a little stripping. On the *Diamond Dick* group, owned by Angus Curry and Joseph Campbell, the lead was crosscut on the surface at various points, the ore-shoot being traced for 400 feet. On the *Smuggler* group, owned by Alex. Stewart and J. J. Malone, seven open-cuts were made, and the lead was stripped for 250 feet. On the *Iola* group, owned in Vancouver, assessment work was devoted to stripping the lead and open-cut work. On the *Ochico* group, owned by Joseph Campbell, stripping was done, with eight or nine open-cuts. On the *Alaska* group, owned by Alex. Stewart, M. R. McQuarrie, James Grant, Charles Burke, and William Holland, stripping was done on the lead, and six cuts were made, all on ore. On the *Deleware* claim, owned by Fred Conway and Alex. Stewart, two open-cuts were made on the lead, in ore.

MISCELLANEOUS.

The *Molly Gibson* silver-lead mine, on Kokanee creek, which empties into the West arm ten miles above Nelson, was acquired by the Consolidated Mining and Smelting Company for its large reserves of ore, which are desired for the Trail smelter, this deal being one of the most significant of the year for the Nelson Mining Division. A large force of men was placed at work, putting the property in shape for operation. The mine is ten miles from the water, and in the past the concentrates were hauled eight miles and a half from the mill, which was connected with the workings by one mile and a half of tram. The Consolidated Company completed, with the close of the year, a second aerial tram four miles long—which contains one single span but 300 feet short of a mile—and a terminal, thus reducing the haul to four miles. Prior to 1910 there was underground development to the extent of 5,277 feet of narrow work, the two lowest of the five drifts being each about 2,000 feet long. A vast amount of stoping remains to be done in the present workings before further development at depth is actually necessary. The first-grade ore will be shipped direct to the smelter, shipment, in fact, being now in progress. The company's intentions with respect to the mill have not been stated. This property will be one of the heavy producers of the Kootenay the current year.

The quartzite belt of Granite or Nine-mile creek, on the opposite site of the arm, was the scene of active locating, a syndicate of principally Eastern capital being organized by P. J. Gleazer to exploit and develop certain of the promising gold leads, some of which were first staked ten years ago. On the *White Deer* group, which has galena-ore carrying gold, 40 feet of tunnel was driven. The *Big Ledge* group, consisting of a row of eight claims on a gold-bearing ledge, was developed by open-cuts. Thirteen miles of trail up the creek was opened.

On La France creek, on the east side of Kootenay lake, the La France Creek Mining Company prosecuted a summer's work on its property, the *La France* group, the ore being silver-lead and grey copper. Also on the upper portion is the *Snowstorm* group, owned by Thomas Wall, on which some work was done. There was also some desultory work by various persons holding claims lower down the creek.

In the territory tributary to Creston there has been a certain amount of attention bestowed on mining. On Corn creek, John McPeak and F. Burns located four claims on a ledge, naming the group the *Big Chief*, and stripping the ledge 40 feet. Relying on assays, they propose development. Another silver-lead property was staked in 1909 by James Crawford on Duck lake, under the name of the *Blue Bird*, preliminary development work being done on it the past season. The *Alice* property at Alice Siding was idle, but a deal was made by the *Aurora* silver-lead property at Moyie to send ore to the *Alice* mill for concentration, but failure of the water made this unsuccessful.

Goat creek and Granite creek, on the east side of Kootenay lake, Midge creek, Cultus creek, and Summit creek, on the west side, and Goat river, on the south, were all extensively prospected the past summer, and much minor development work was done that can have no mention here. On Midge, Summit, and Cultus creeks various claims were staked for gold, while the last-named creek also revealed some good silver showings.

OFFICE STATISTICS—NELSON MINING DIVISION.

Free miner's certificates (ordinary)	655
" " (company)	9
New locations	605
Certificates of work	635
Bills of sale and documents of title	146
Certificates of improvement	14

Revenue.

Free miner's certificates	$4,336 75
Mining receipts	4,968 05
	$9,304 80

ARROW LAKE MINING DIVISION.

REPORT OF WALTER SCOTT, MINING RECORDER.

I have the honour to submit the annual report on the Arrow Lake Mining Division for the year ending December 31st, 1910.

82L/SE-12

On the *Big Ledge*, situated on Bald mountain, Pingston creek, a tunnel 200 feet was driven on the *Sunshine* mineral claim, showing up a large deposit of zinc-ore. Upon this vein there is a large showing of zinc-ore; values, 12 to 45 per cent. zinc per ton.

On the *Millie Mack* group, situated in the vicinity of Burton, development work has been carried on all summer, showing a large quantity of high-grade ore; assay values, gold 2.17 oz., silver 31.3 oz., and lead 9.5 oz. per ton.

OFFICE STATISTICS—ARROW LAKE MINING DIVISION.

Free miner's certificates	44
Certificates of work recorded	26
Mineral claims recorded	15
Bills of sale, etc., recorded	7
Cash paid in lieu of work	$700.00

ROSSLAND DISTRICT.

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TRAIL CREEK MINING DIVISION.

REPORT OF J. KIRKUP, GOLD COMMISSIONER.

I have the honour to submit the report of mining operations in the Trail Creek Mining Division during the year 1910.

During the past year the mining operations in this district were confined almost exclusively to the companies operating on Red mountain, viz.: The Consolidated Mining and Smelting Company of Canada, Limited; the Le Roi Mining Company, Limited; and the Le Roi No. 2, Limited. In addition to the foregoing, a number of other small properties were worked to some extent under lease during some portion of the year.

The shipments of ore were somewhat greater than those of the previous year, although such were curtailed to quite a large extent through the partial closing of the *Le Roi* mine, the output being 253,471 tons, of an approximate value of $2,966,096, as compared with an output of 237,656 tons, valued at $2,875,084, for the previous year.

The average number of men employed during the year was 655, as compared with 736 during the previous year.

Centre Star Group.

This group of mines, the property of the Consolidated Mining and Smelting Company of Canada, Limited, consisting of the *Centre Star*, *War Eagle*, *Iron Mask*, *Idaho*, *Mugwump*, and other mineral claims, has been worked continuously during the past year, the work being generally distributed over the group, the shipments of ore being as follows: *Centre Star*, 83,809 tons; *War Eagle*, 52,979 tons; *Iron Mask*, 39,061 tons; *Idaho et al.*, 15,769 tons; making a total of 191,618 tons, which is slightly in excess of that of the previous year; and, although the whole of these properties are fairly productive, the work of the past year has disclosed some fine bodies of high-grade ore in some of the deeper workings of the *War Eagle*, in close proximity to the *Pilgrim* and *Mugwump*, adjoining properties of this company.

Development work during the year consisted of the following: Driving, 7,195 feet; raising, 1,852.8 feet; crosscutting, 2,238.5 feet; winzing, 81 feet; together with 26,499.2 feet of diamond drilling. The average number of men employed during the year was 430.

Le Roi, Black Bear.

These, the properties of the Le Roi Mining Company, Limited, are situate on the south slope of Red mountain, the *Le Roi* lying west of and adjoining the *Centre Star*, and south of and adjoining the *Josie*, one of the properties of the Le Roi No. 2, Limited. Mining was carried on by this company until the 10th September, at which date the mine was closed (the company having gone into voluntary liquidation), and remained closed until the 1st November, when work was resumed with a much decreased force of men. The shipments during the year were 13,997 tons, being 2,415 tons in excess of the previous year.

Development work during the year consisted of crosscutting, 617.5 feet; raising, 95 feet; together with 4,118.5 feet of diamond drilling. The average number of men employed during the year was sixty-one.

Le Roi No. 2 Group.

The *Josie*, *Annie*, *Annie Fraction*, *Poorman*, and *No. 1* are adjoining properties, situate on the west slope of Red mountain (adjoining the properties of the Consolidated Mining and Smelting Company of Canada, Limited, and those of the Le Roi Mining Company, Limited), owned and operated by the Le Roi No. 2, Limited. During the year they produced 46,922 tons of ore, 16,861 tons of which was milled on the premises of the company, producing 1,431 tons of concentrates.

Development work during the year consisted of driving, 2,640.2 feet; raising, 106.6 feet; crosscutting, 2,185 feet; winzing, 111.5 feet; diamond drilling, 12,823 feet; together with 765 feet of driving and 11 feet of crosscutting done under contract by the Consolidated Mining and Smelting Company of Canada, Limited, from the deeper workings of the *War Eagle* in ground of the *Josie* mine. These properties are looking remarkably well, some fine bodies of ore having been opened up during the past year. The average number of men employed during the year was 125.

Velvet.

This property is situated on Sophie mountain, close to the International boundary-line, at a distance of probably nine miles from Velvet Siding, on the line of the Red Mountain Railway, and connected therewith by a good waggon-road. The property is equipped with a complete plant, consisting of engine, boilers, hoist, stamp-mill, concentrator, and all necessary buildings, all of which are in good condition, the initial cost of which was upwards of $70,000.

During a portion of the past year this property was worked under lease, some five or six men being employed. The shipments amounted to 664 tons of ore of a good grade, but the cost of transportation, including the long haul to the railway, was so great that the property could not be profitably worked.

Blue Bird.

This property, situate immediately south of and distant about half a mile from the City of Rossland, is a very promising one, and was worked during the early portion of the year under lease, but finally taken over by the owners and by them worked in a limited manner during the past three months, three men only being employed. During the year some 30 or 40 feet of a tunnel was run and a shaft was sunk 46 feet on the ledge, the vein at that depth being 2.5 feet wide, of high-grade galena with some signs of copper. The shipments of ore during the year consisted of 40 tons.

Inland Empire.

This property, situate on Grenville mountain, in the extreme western portion of the district, is equipped with all the necessary appliances required for the working of the property, and was worked during a portion of the year by the owners thereof, the Inland Empire Mining & Milling Company, Limited (foreign), but was closed down ostensibly for the purpose of reorganization, and has remained closed.

Cliff and Con. St. Elmo.

These properties, situate on Red mountain, to the north of and adjoining those of the Consolidated Mining and Smelting Company of Canada, Limited, have recently been acquired by the Granby M. S. & P. Co., Ltd., under bond, and development work has been carried on during the past three or four months with a force of between fifteen and twenty men, but no shipments of ore were made up to the end of the year.

The following properties were worked under lease during portions of the year, with shipments of ore as follows: *Nickle Plate*, 855 tons; *I. X. L.*, 108 tons; *Olla Podrida*, 63 tons; *Lily May*, 16 tons; *Mountain Trail*, 64 tons; and *Great Western*, 10 tons. Four of these properties are being worked at the present time with fair success.

In addition to the foregoing, little or no work was done, other than the annual assessment work on a small number of claims, as shown by the accompanying office statistics.

OFFICE STATISTICS—TRAIL CREEK MINING DIVISION.

Mineral claims recorded	29
Certificates of work	45
Certificates of improvement	0
Bills of sale, etc., recorded	5
Free miner's certificates (company)	8
" " (individual)	148
" " (special)	1

BOUNDARY DISTRICT.

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GREENWOOD MINING DIVISION.

REPORT OF W. G. McMYNN, GOLD COMMISSIONER.

I have the honour to submit the annual report on mining operations in the Greenwood Mining Division during the year 1910.

The year has been a good one for copper-mining and smelting in the Boundary country. The additional increase in the capacity of the smelters now makes it possible to treat about 2,500,000 tons of ore annually, with a further material reduction in cost. The quantity of ore mined during 1910 was 1,661,261 tons, compared with 1,594,000 tons in 1909. The price of copper averaged 12.86 cents per pound, against 13.05 cents per pound in 1909; but, despite the low grade of the ore, the processes are now so improved that the companies did fairly well.

The tonnage returns for 1910 were:—

	Tons.
Granby Company's mines	1,074,864
Mother Lode Company's mines	364,650
Snowshoe mine	146,845
Rawhide "	47,350
Jack Pot "	16,783
Oro Denoro "	9,339
Number Seven "	1,778
Golden Eagle "	120
Sally "	32
Total	1,661,261

The British Columbia Copper Company, Limited, has increased its holdings of New Dominion Copper Company's shares to 155,000, which is 64 per cent. of the whole. Mr. J. E. McAllister is the general manager of both these companies, and the information now given regarding them has been authenticated by him.

British Columbia Copper Co., Ltd.

The net earnings of the above company for its fiscal year ending November 30th, 1910, were approximately $275,000, as compared with $204,973, which latter was the balance of profit and loss for the fiscal year to November 30th, 1909. Cost of production, refining, and marketing per pound of fine copper, after crediting expenditure with the value of the silver and gold recovered from the ore, was estimated at 9.624 cents per pound of fine copper, as compared with 9.829 cents for the year 1909 and 9.996 cents for 1908 fiscal year. The total output of copper was 6,908,780 lb., as compared with 6,325,000 lb. in 1909. Gold and silver production is estimated at about 25,000 oz. of gold and 86,000 oz. of silver.

During 1910 the company increased the total blast-furnace capacity of its smelter by one-third, thereby bringing its maximum treatment capacity up to about 2,600 tons per day. This was done by increasing the hearth-area of two of the three furnaces by 50 per cent. Previously all three furnaces were 48 by 240 inches at the tuyeres, and their approximate average ordinary total capacity had been about 1,800 tons daily, with a maximum of nearly 2,000 tons. Now they will average between 2,400 and 2,500 tons per day.

The increase in smelting capacity has necessitated a corresponding increase in the plant for feeding the furnaces and taking away the molten slag; also an extension of the crane run at one end of the converter building. For slag-hauling, a large locomotive, capable of hauling two 25-ton slag-cars at a time, has been put in. Heretofore there have been in use two 15-ton Baldwin-Westinghouse electric locomotives for slag-hauling and three 7½-ton locomotives for furnace-charging. An additional charging-locomotive has lately been put in to meet the increased capacity. The 25-ton slag-cars are side-dumping, and are equipped with an electric motor having worm gear for tilting the car to dump its contents. This company was the pioneer in using this style of car for slag-dumping. The design has since been adopted by many other companies.

In the copper-converting department of the works there are two converter-stands with 84 by 126-inch horizontal shells. These take matte of 45 to 55 per cent. copper tenure and produce blister copper of 99.3 per cent., also containing 20 to 50 oz. silver and 5 to 15 oz. of gold per ton. This product is sent to New Jersey for refining. The stands are tilted by hydraulic accumulators, and the shells handled by a 40-ton, 4-motor travelling crane. Two more converter-shells have recently been added, making a total equipment of seven.

Electric power, transmitted from Bonnington falls, eighty miles away, is used in the works, in which there are installed motors having a total capacity of about 2,000 horse-power. Among the motors are three of 300 horse-power, each belted to one of the three large Connersville blowers, which supply the blast to the furnaces.

The company obtains the greater part of its ore-supply from its own mines and those of the New Dominion Copper Company (which it controls). Provision is being made for increasing the ore-supply from the company's mines, and thus render the smelter independent of the custom ores, if these be not obtainable to advantage.

The *Rawhide* output is to be increased to 30,000 tons a month, while 3,000 tons will be obtained monthly from the *Lone Star*, situated just south of the International boundary-line, and eight miles from the smelter. The *Lone Star* mine is being connected with the Canadian Pacific Railway at Boundary Falls by an aerial tramway five miles and a half in length. It has available reserve of 300,000 tons of gold-copper ore and is a good matte-maker.

Coke is obtained from south-west Alberta, the railway distance between the colliery and smelter being 370 miles. With three blast-furnaces running, the consumption of coke is 8,000 to 9,000 tons a month. A reserve of 10,000 to 12,000 tons is kept as an emergency supply in case of interruption in the regular receipts of coke from the colliery.

The approximate figures of production during 1910 are as follows: Material smelted, 456,000 tons. Contents: Gold, 25,640 oz.; silver, 85,000 oz.; copper, 7,351,000 lb. The gross amount of the pay-rolls of the two companies, including that of the British Columbia Copper Company's *Napoleon* and *Lone Star* mines, is from $62,000 to $65,000 per month. The number of men employed is from 500 to 540, of which total, 118 is the normal force at the smelter.

In New York last week the directors of the company declared an annual dividend at the rate of 10 per cent. on the outstanding stock of the company, to be paid quarterly, commencing with 2½ per cent. ($62,875) on the 1st February, 1911. The par value of the stock is $5 per share, and 503,000 shares of the capital stock of the company have been issued.

Granby Consolidated M. S. & P. Company.

In August, 1910, fire destroyed the surface equipment at the No. 3 tunnel outlet, thereby checking production to some extent. Until new buildings could be erected and plant put in, it was necessary to equip the 200-foot level for shipment of ore. By means of a raise, connection was made between No. 3 and the 200-foot level, along which ore was conveyed to the Victoria shaft.

In place of the buildings destroyed by fire, the following were erected: Machine-shop—Brick walls, cement floor, corrugated-iron roof, size 40 x 120 feet. Generator-house—Brick walls, cement floor, corrugated-iron roof, size 24 x 36 feet. Car-repair shop—Corrugated-iron roof and walls, size 25 x 60 feet. Mine foreman's office—Corrugated-iron roof, frame walls, cement floor, size 20 x 60 feet. New machinery installed—One 28-inch engine-lathe, 20-foot bed; one 30-inch planer, 8-inch bed; one 24-inch shaper; one 5-inch radial drill; one 2-inch Acme pipe and bolt machine; one 18-inch engine-lathe, 4-foot bed; two 85 K. W. generators; two 100 horse-power electric motors; six 50 K. W. transformers; one 6-ton single-end mine locomotive.

Development—Drifting, raising, and sinking, 11,271 feet; diamond drilling, 7,094 feet. Output—The output of copper for 1910 is stated at 20,018,048 lb.

Consolidated M. & S. Co. of Canada.

The *No. 7* mine, which is owned by the Consolidated Mining and Smelting Company of Canada, Limited, commenced shipping in October, 1910, and has shipped 1,178 tons of ore to the company's smelter at Trail for treatment. This 1,178 tons aggregated a gross value of: Gold, 306 oz.; silver, 15,090 oz.; lead, 30,256 lb.; representing a gross coin value of $13,712.

During 1910 about 720 feet of underground development work was done, together with construction work, to the amount of about $75,000. This construction work includes the new compressor plant and building, surface tram at the mine, new assay office, new blacksmith-shop, and other mine buildings; also the aerial tram from the mine to Boundary Falls and the railway spur at Boundary Falls. The number of men employed averages about sixty.

Jewel Syndicate, Limited.

At the *Jewel* mine, in Long Lake camp, the 7-drill compressor, with 125-horse-power motor, also an electric hoist of 50 horse-power and skip, have been installed and a suitable building erected over same. An assay office with laboratory attached has been built. A new head-gear, with ore-bin and track to the bin at the head of the horse-tram, has been completed.

In the mine the main shaft has been raised on for 100 feet, straightened out, and retimbered. New tracks have been laid in the levels and raises put up for ore-shoots. Stations with ore-pockets at each level have been cut and general preparation made for shipping ore.

At the mill the erection of the machinery has been completed, including electric motors, with sub-station and transformers, transforming the power, supplied by the South Kootenay Water Power Company, from Bonnington falls. The mill was started in August, but it was found that the slimes plant was of insufficient capacity to treat the tonnage required. Thus the mill has only been run intermittently, treating a few tons of ore, in all about 500 tons.

No shipment of concentrates or bullion from the zinc precipitation has yet been made. Additional machinery to meet the requirements of the slimes plant has been ordered, and will be installed during the next few months. About seventeen men were employed during the year, the average monthly pay-roll during the year being $1,462.60.

The Greenwood-Phoenix Tramway Company.—The tunnel of this company has been continued during the year, and is now in a distance of 1,250 feet.

Tatlayoko Lake Gold Mng. Co.—Dyke Structure at.

Tatlayoko Lake Gold Mng. Co.'s Cabin.

82E/SE-9 *The Argo Tunnel & Mining Company.*—The Argo tunnel, also referred to in my last annual report, has been driven to a distance of 450 feet.

OFFICE STATISTICS—GREENWOOD MINING DIVISION.

Free miner's certificates issued	348
Claims recorded	97
Assessments recorded	294
Transfers, etc., recorded	84
Placer claims recorded	4

GRAND FORKS MINING DIVISION.

REPORT OF S. R. ALMOND, GOLD COMMISSIONER.

I have the honour to submit the annual report on mining in the Grand Forks Mining Division for the year 1910.

The returns of the different companies working mines in the Grand Forks Division—viz., the Granby, the B. C. Copper Co., the Consolidated M. & S. Co. of Canada, and the New Dominion Copper Co.—show that, even with the drawbacks occasioned last summer by fires, an increase in production was obtained over the previous year of 1909. The Boundary country is the heaviest ore-producing district in British Columbia, the output for the past year being 1,680,000 tons, of which over 1,000,000 tons was mined at Phoenix and smelted at Grand Forks by the Granby Company. The B. C. Copper Company mined over 380,000 tons of the above output, principally around Phoenix, and smelted the same at its smelter at Greenwood; the Consolidated M. & S. Company, also working principally around Phoenix, mined over 140,000 tons, which was shipped to Trail and smelted at its works there. The New Dominion Copper Company, working the *Rawhide* mine near Phoenix, shipped over 50,000 tons of ore to the B. C. Copper Company's smelter at Greenwood; these two companies apparently work as one.

I give an extract from the review of the mining industry by Mr. E. Jacobs:—

"*Some Noteworthy Occurrences.*—Reviewing the year just closed, the noteworthy occurrences included the following: The Granby Co. completed the enlargement of the smelting and converting capacity of its big copper-smelting works at Grand Forks; the British Columbia Copper Co. increased the blast capacity of its works at Greenwood by one-third—from 2,000 tons of ore a day to a maximum of 2,600 tons; the *Rawhide* and *No. 7* mines were reopened, the latter after having been inoperative six or seven years; the 15-stamp mill at Long lake for the *Jewel* mine was completed; aerial tramways were constructed, one from the *No. 7* mine to the railway at Boundary falls, and the other from the *Lone Star* and *Washington* mine to the C. P. R., also near Boundary falls; the *Wellington* group mine became a regular shipper, following its having been developed in 1909; the driving of two exploratory tunnels was proceeded with in the Boundary creek valley, near Greenwood; arrangements were made to go on with railway construction from Midway up the West fork of the Kettle river, and thence to the Okanagan country."

Diamond drilling as prospecting work seems to be utilised to a great extent by the above companies.

The B. C. Copper Company works two mines, the *Lone Star* and *Napoleon*, in the State of Washington; and one mine, the *No. 7*, close to the boundary-line in Central camp, is worked by the Consolidated M. & S. Co. Mines worked by the foregoing companies and situate in this division are:—

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The *Gold Drop*, *Curlew*, and *Monarch* claims by the Granby Co. The *Gold Drop* handles the ore from the *Curlew* and *Monarch*, it having a full equipment as a working mine, and the latter two claims being adjoining ground. There was 2,484 feet of development work done on these claims during the year just past, and the output has been on an average of about 600 tons per day for each day in the year. The work has been steady, and the production was over 212,000 tons.

82E/SE-

The *Oro Denoro*, *Jack Pot*, and *Rawhide* mines, worked by the B. C. Copper Co. The *Oro Denoro* was only worked for a small portion of the past year, but during that time it shipped over 11,000 tons of ore. The *Jack Pot* sent out between 19,000 and 20,000 tons of ore to the Greenwood smelter, and latterly has been shipping at the rate of 100 tons a day. It is expected that the *Athalstan*, adjoining the *Jack Pot*, will be again on the shipping list in this year 1911. The *Rawhide* mine has been, since it commenced work again, a steady shipper, the average of its output being about 600 tons per day, and the total tonnage, for the time the mine was worked, amounted to over 54,000 tons. It is expected that the tonnage for the present year will average 1,000 tons per diem. The earnings of the B. C. Copper Co. are said to be in the neighbourhood of $275,000 for their last year's work.

82E/SE-25

The *Snowshoe* mine, worked by the Consolidated M. & S. Co. of Canada, operated continuously during the year under a lease from the owners, the Snowshoe Gold and Copper Mines, Limited, and produced 143,000 tons of ore, aggregating a gross value of: Gold, 9,245 oz.; silver, 34,305 oz.; copper, 3,143,000 lb.; a gross coin value of: Gold, $184,900; silver, $18,675; copper, $410,955; total, $614,530. The ore produced was treated by the company's smelter at Trail. About 150 feet of underground development was done, together with about 800 feet of diamond drilling; all the diamond drilling was done from the surface downwards. The mine employed on an average about eighty men during the year. No new construction work was carried on.

"*Phoenix Amalgamated Mines.*—No underground work has been done on these properties. The construction work on ore-bunkers, surface tramway, as well as mine buildings, was finished towards the end of the year, and the mine is now in a position to commence daily shipments to the Trail smelter. The additional construction amounted to about $10,000. For the last two months in the year about twenty men were employed on the surface, finishing up the construction work. No shipments were made from these properties."

Very little prospecting was done during 1910 in this district, but a considerable amount of prospect work was carried on on claims already located, especially in the camps up the North fork of Kettle river.

On the *Fife* group of mines, situated near Fife, on Christina lake, development work was carried on through the year. The group is owned by the Fife Mines Co., Ltd., and Mr. Chas. Dempster, of Rossland, appears to be at the helm. The main tunnel, driven on the vein, is now in 630 feet; side drifts and crosscuts, 300 feet; shafting and winze, 285 feet; stations, 50 feet; shaft from surface to first crosscut, 75 feet; drift at this point, 35 feet; tunnel No. 1, 70 feet. Only one small stope has been made, from which has been extracted some 200 tons of ore, which is now in the bins. This extraction is but a small part of the ore in sight in these workings, but it has been the policy of the company not to extract more ore than necessary in the actual development work, as it desires to have that development a year or two ahead of actual mining. Several ore-shoots have been encountered showing ore of good grade, the average of their shipping product, so far, being 4 per cent. copper and from $3 to $6 in gold and silver. The best values in gold have been obtained from the deepest workings, where at times it has run as high as $12 per ton. The company purchased the surface rights to a large portion of the property, and this has been all cleared and planted in vegetables

garden, etc. A seven-drill Rand compressor plant is in operation, being housed in substantial, building with iron corrugated roofing, etc. The requisite machinery for an electric plant has also been installed. Two powder-houses capable of holding a large amount of explosives have been built. An up-to-date boarding-house, with kitchen, etc., and bunk-houses to accommodate the men, have been built. There is also the office-building and assay office. The company has been employing on an average some twenty men, but these are laid off at present, as the company is now engaged in diamond drilling with the usual force. This work is expected to fully demonstrate the value of the property. The property consists of five claims, which are surveyed and ready to be Crown-granted. Arrangements are in progress for a trial shipment of 100 tons or so, but shipment in earnest will not be commenced until the future plan of operations and point of shipment is fully determined.

Granby Consolidated Mining, Smelting & Power Co., Ltd.—The smelting and converting plant is at Grand Forks, the present equipment of smelter being eight copper blast-furnaces, 42 x 266½ inches, with a maximum capacity of 4,500 tons of ore for twenty-four hours, and three converter-stands, 84 x 126 inches, with a maximum capacity of 40,000,000 lb. of copper per year. The plant was operated continuously during the year, but operations were somewhat restricted owing to the very low price of metals, the average New York price of electrolytic copper for the year being a little under 12¾ cents per pound. A fire which occurred at the mines in August destroyed a part of the shipping equipment, which put the mines and smelter at half capacity during the months of August and September. There was treated at the smelter during the year 1,100,000 tons of Granby ore from the company's mines at Phoenix, and 22,000 tons of ore from other mines not owned by the company, making an average for each day of the year of 3,100 tons, or a daily average per furnace of 517 tons. There was shipped to the New York refineries 11,250 tons of blister copper. The average number of men employed was 300. There was no new construction or new machinery added during the year, other than was necessary to keep the plant in its present state of efficiency. Costs of operating were materially reduced during the year, and new methods are now contemplated which will further reduce costs of operation.

OFFICE STATISTICS—GRAND FORKS MINING DIVISION.

Locations	90
Certificates of work	279
Transfers	46
Agreements	2
Abandonments	1
Permission to relocate	1
Filings	35
Certificates of improvement	45
Crown grants	32
Free miner's certificates	183
" " (company)	1

OSOYOOS MINING DIVISION.

REPORT OF JAS. R. BROWN, GOLD COMMISSIONER, FAIRVIEW, B. C.

I have the honour to submit herewith the annual report of the mining operations in the Osoyoos Mining Division for the year 1910.

KEREMEOS CREEK VALLEY.

In the various camps in upper Keremeos valley there was nothing done beyond the annual assessment work, and no new strikes of any value were made. The *Apex* group was surveyed

and is being Crown-granted. In the lower valley some sinking was done on the *Black Hawk* ledge, and last year's discovery on the *Mount Zion* was further investigated.

At Olalla, the *Bullion* shipped 10 tons of ore that was expected to assay at least $50 per ton; the ore was sent from Keremeos, four miles from the mine, to the Granby smelter at Grand Forks, but the returns have not yet been received.

82E/SW-12 The *Dolphin* group has been surveyed, and is being Crown-granted. Considerable work
82E/SW-16 was done on the *Golconda* to intersect the *Copper King* ledge at a depth of nearly 200 feet, with the expectation that the ledge is something less than 50 feet ahead. On the *Copper King* itself only the assessment work was done.

CAMP HEDLEY.

The report of progress in mining in Camp Hedley during 1910 is almost wholly that of operations on the *Nickel Plate* and other properties of the group, for an unfortunate combination of circumstances prevented the *Kingston* and other properties of the camp, which formerly contributed their share, from figuring in the work of development to any marked extent; but to make up for this, the year has been a banner one in the case of the *Nickel Plate*, and goes to show that the expectations of those who looked for a better order of things with the new company are being realised.

The development work done during the year, apart altogether from what work was done in the way of ore-extraction, totalled, for all the properties of the group, 905 feet of drifting, 520 feet of sinking, and 280 feet of upraises. Other exploratory work, while not exactly regarded as development, was the diamond drilling, of which 3,137 feet was done.

The tonnage milled during the year was 46,828 tons of ore, and in addition there were several thousand tons more broken, that are now lying in the stopes ready to be sent down the tramways to the mill. For the greater part of the year the monthly ore tonnage milled was over 4,000 tons, but during three or four months it fell far below that, because of a partial dismantling of the old plant to permit of installation of new equipment. The highest tonnage ever milled in any previous year was 44,568 tons.

So far as the improvement of the mine is concerned, as the result of exploration and actual development, there are many new ore-bodies now opened up that were not known to exist a year ago. In No. 4 tunnel, for instance, driven early in 1906 by M. K. Rodgers, there is now being taken out two train-loads of ore per day, and from that tunnel new ore-bodies are opened up, both above and for 120 feet below it. The most significant item of the development operations was that of 520 feet of sinking. This is a feature which was hitherto practically unknown in the mine, the previous workings being confined to tunnels and adits. It now shows that the mine will respond to development in depth, and, so far, the results have borne out the belief that the ore-bodies encountered in sinking would keep up the values and show no tendency to become leaner as depth is attained. In addition to the development done on the *Nickel Plate*, *Sunnysides*, and *Woodland*, the past year has seen the resumption of work on the *Bulldog*, which had been practically untouched for a period of four years under the former management, and the results obtained from drifting and from boreholes indicate that this claim will also furnish its quota of ore for the mill.

Outside Work.—Neither was improvement confined to the mine and the reduction plant, but the year witnessed general improvement to outside work as well. Perhaps first in importance was the new electric tramway to No. 4 tunnel, some 3,000 feet in length, which had to be graded and the track laid and wired. Then there were extensive improvements and repairs to the gravity-tram by way of strengthening and in some cases renewing the trestles.

The flume also, which is 15,000 feet in length, received considerable attention in overhauling, repairing, and renewing in part. Other outside work was the laying of about 7,000 feet of water-pipe to supply water for the boilers, condensers, and mill. In the power-house the most radical changes of all took place. Here the old water-driven plant, of altogether inadequate capacity, has been superseded by one of the most complete and economical plants obtainable, and one especially adapted to the circumstances, in that it is interchangeable for either steam or water, or may be run by both. To install such a plant necessitated the addition of three 150-horse-power return-tubular boilers, together with pumps, pipes, feed-water, etc., making available, with what was before in place, something over 750 horse-power by steam.

The company's annual statement shows the bullion recovery for the year to have been $519,356.46, from which the net profits were $271,767.67; and this does not include the sands and slimes impounded for retreatment, which have an estimated gold-content of $84,000.

NOTE BY PROVINCIAL MINERALOGIST.—The following notes are taken from the *Engineering and Mining Journal* of April 1st, 1911: "During the year ended December 31st, 1910, the Hedley Gold Mining Company, operating the *Nickel Plate* and *Sunnyside* mines in the Boundary District of British Columbia, paid dividends amounting to $168,000, or 14 per cent. on the outstanding stock. There were milled 46,828 tons of ore that yielded $519,356, or $11.09 per ton; the expenses were $255,370. In the mine 16,000 tons of ore, averaging $13, was broken in excess of the ore milled, and sand was impounded for future further treatment, having an estimated gold-content of $84,000. The undivided profits after paying dividends were, on January 1st, 1911, $182,809, a sum considerably in excess of the expenditures from capital for additions to and changes of plant, which amounted to $127,294 during the year."

The *Kingston* was not worked during the year, but for no fault of the property, and the same may be said of the *Golden Zone*. On the *Pollock* group and the *Oregon* a limited amount of development work was done, with satisfactory results.

KRUGER MOUNTAIN.

82E/5W-1 The *Dividend* group have done some little work in development, and have erected more buildings, but beyond that no work has been done on the mountain.

CAMP FAIRVIEW.

No work has been done in this camp. As a whole, mining in the district has not gone ahead.

OFFICE STATISTICS—OSOYOOS MINING DIVISION.

Certificates of work issued	112
Location records	108
Free miner's certificates	166
Certificates of improvements	15
Conveyances, etc.	29

VERNON MINING DIVISION

REPORT OF L. NORRIS, GOLD COMMISSIONER.

I beg to say that my report for the year 1910 on the mining industry in the Vernon Mining Division may be disposed of in a very few words. Nothing of importance transpired and very little development work was done, the claim-owners having contented themselves with doing the annual assessment work only. In fact, the mining business never was so quiet, a fact that is borne out by the appended office statistics.

OFFICE STATISTICS—VERNON MINING DIVISION.

Free miner's certificates	140
Assessments recorded	18
Mineral claims recorded	24
Transfers	4
Certificates of improvements	4
Crown grants issued	4

YALE DISTRICT.

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KAMLOOPS MINING DIVISION.

REPORT OF E. T. W. PEARSE, GOLD COMMISSIONER.

Beyond the keeping-up of the yearly assessment work on all promising claims, very little has been done in this Division during the year 1910. The work which has been done, however, has given encouraging results. The establishment of a smelter is the great need in the Kamloops camp, as the ore, although apparently in immense bodies, is of too low a grade to stand shipment.

The *Iron Mask* mine, which has for the past two years been practically at a standstill, is, under the new management, showing signs of again being brought into activity, as I am able to report by the courtesy of Mr. E. G. Wallinder, whose statement will be found below.

The report from the *Wheal Tamar*, also given herein, is very satisfactory, and I hope, before another season is over, that this property will have come to the front. Other properties in the Kamloops camp from which reports are included help to indicate that some day a large copper camp may be established in the vicinity of Kamloops.

The owners of locations at the head of Seymour arm feel well rewarded for such work as they have done, but the present inaccessibility of these properties renders extended work almost impossible.

The copper locations on the north shore of Kamloops lake are giving promise of good results, especially those of C. B. Fredericks, the *Maxine* group, on which is apparently a very large ore-body, having the advantage of being close to the water-front, and very handy for shipment.

Nicola and Ashcroft Divisions have been practically inactive, but the report of Mr. Dodd, Mining Recorder for Yale Division, tells a different tale.

A fact worthy of mention is the energy displayed by the Canadian Northern Coal and Coke Company in prospecting for coal on the North Thompson river, a short report on which has been given by the courtesy of the secretary-treasurer, Mr. H. G. Ashby.

KAMLOOPS CAMP.

Python.—(From W. F. Wood.) Considerable work has been done on this property through the year, in renewing timbers, new open-cuts, and extending the tunnel across the ore-body another 30 feet, which shows increased values, and also increased width with depth. There are now 1,075 feet in length of underground work, and fifteen open-cuts on the surface.

Lake View, etc.—(From W. H. Fowler.) During the year 1910 development of the different ore zones has produced very favourable results. While most of the work has been on the surface, the size of the ore-bodies has been proved. In most cases this work has been done by the help of horses, ploughs, and scrapers.

Commencing at the east end of the camp, on the *Lake View*, a cut 140 x 10 x 3 feet uncovered a lode over 100 feet in width, with much commercial ore at the grass-roots. This is a new property.

On the *Irene* group a shaft was sunk some 50 feet by the owners, T. Bulman and James Beckwith. The ore is heavy iron-pyrites, magnetite, and copper-pyrites.

On the *Laura* group one cut, 100 x 5 x 5 feet, showed ore all the way, of the same character as above. A shaft is now started on the foot and the work is being rushed.

Ajax.—A tunnel has been started to cut an ore-body of some 200 feet in width, and work will continue through the winter.

Giant Copper.—One surface cut, 250 x 12 x 5 feet, exposed an enormous iron cap for the full length of the cut.

Maxim.—One surface cut, 500 x 10 x 3 feet, all in mineralised zone.

Hecla.—Assessment work.

Commoner.—Assessment work with fine showing.

Bar Sinister.—One cut, 198 x 5 x 5 feet, all in ore; one cut, 25 x 7 x 5 feet, in cap and good ore.

Big Four.—One cut, 30 x 8 x 6 feet, low-grade ore; shaft and cut, 10 x 6 x 5 feet, feldspar and copper.

Wheal Tamar.—(From O. S. Batchelor.) The *Wheal Tamar* tunnel was advanced some distance early in the year, when, on account of the low price of copper, it was deemed advisable to do some prospecting for gold on other properties under same ownership; in this the results were most encouraging.

The first work was done lower down the hill on the *Gordon* group, eleven miles east of Kamloops, where a deposit of honey-combed quartz was found. A large block of this sent to Vancouver proved to contain gold to the value of 5.7 oz., valued at $113.60 per ton; and the whole 7 feet, carefully sampled by a qualified engineer, assayed $15 in gold per ton. On the strength of this, a half-interest in the claim was bonded to a party to drive a tunnel a distance of 100 feet under the outcrop. This tunnel is now in 70 feet.

Some work has been done on the *Hill Top*, the vein continuing down very strong.

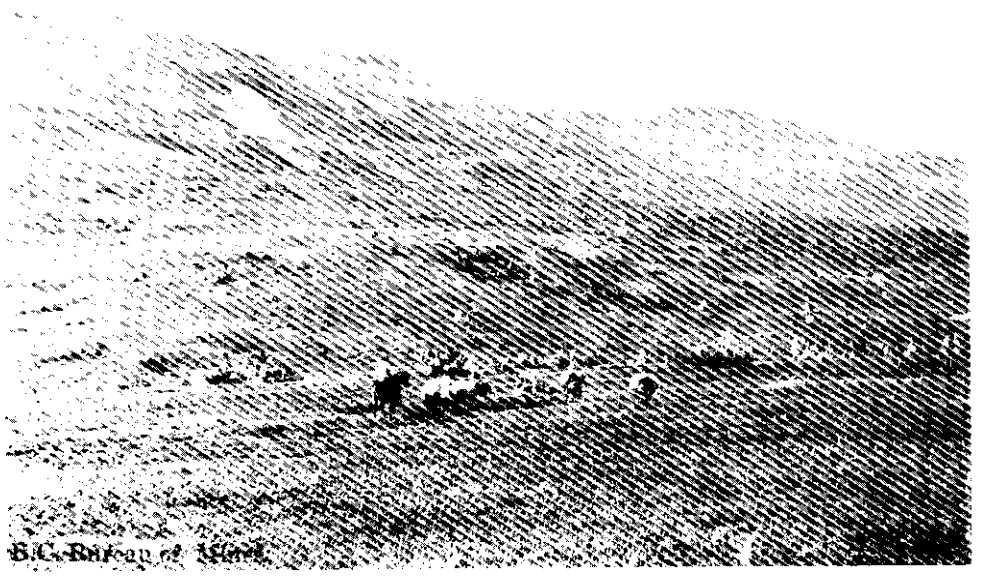
Iron Mask.—(From E. G. Wallinder.) In 1908 E. G. Wallinder purchased from Kamloops Mines, Limited, its entire property located in the Kamloops Division, and ever since then has been arranging and equipping for production through the *Iron Mask* shaft. During the 1910 season the shaft was straightened and retimbered; a new cable and automatic skips to work in counterbalance were installed. A five-cell Foust jig was erected and a 100-gallon Aldrich vertical triplex pump purchased. Charles J. Stone, of Butte, Montana, is consulting engineer; John F. Stewart is in charge at the mine. About thirty men are employed. Shipments to smelters are expected early in 1911, at which time it is intended to organize a corporation.

Seymour Arm Camp.

(From F. A. McLeod.) A report of work done on *Camp McLeod* and *Steeple Jack* group of claims, Seymour arm.

We drove 16 feet on tunnel, with ore improving as work advanced, and the face of the tunnel is in ore—galena, copper-pyrites, and zinc—very hard to break, and is improving with every round of shots. We stripped vein 50 feet and crosscut the vein 12 feet, and went through 8 feet of ore, lead carbonates and copper-pyrites, which looks very good for near the surface. We have showed up the ledge for 3,000 feet, ranging from 3 to 14 feet of ore, the capping running with a lime-dyke. The dykes are very strong and can be traced for miles. There are three parallel veins in the district and traceable for a long distance. We cut out

Tatlayoko Lake—looking south.



Summit of Potato Mt.—east of Tatlayoko Lake.

one mile and a quarter of trail to make connections with the trail cut out by the Government last fall. The trail is a big benefit to the district, as it will give claim-owners a chance to get in and out in spring much earlier, and permit horses being taken to the claims.

Cotton Belt Group.—(From A. J. McMullen.) Our group of seven claims was surveyed this summer, at a cost of $1,225, for Crown grant, which we will apply for shortly. Some of these interests are being bought up and work will be pushed on this property next season.

COPPER CREEK CAMP.

(From S. Macartney.) There is very little to report in the way of development on the mines on the north side of Kamloops lake for the past year, all the companies operating there being closed down. The Kamloops Lake Cinnabar Mining Co. contemplates opening up again in the spring, some changes having been made in the management. The Hardie Cinnabar Mining Co. has now got its large holdings Crown-granted, and it is to be hoped that this company will see its way to install a furnace in the near future, as this property is now beyond the prospect stage.

The *Tenderfoot* has been closed down for two years, and it is not likely that anything will be done before cheaper transportation can be obtained. The average ore is too low a grade to ship any distance.

G. F. Monckton is opening up the *El Progresso*, the property adjoining the *Tenderfoot*. The tunnel is now in good ore; average assay, 5 per cent. copper, $8 gold, and $1.50 silver to the ton.

Maxine No. 2 Group.—(From C. B. Frederick.) This group consists of six claims which are situated on the north shore of Kamloops lake, and are very easy of access, the main workings being about 2,500 feet from the lake, and also close to the proposed main line of the C. N. R., which runs through three of the claims. The development work has been mainly performed on *Maxine No. 2*. The surface along the outcrop has been uncovered for a distance of about 200 feet, showing a well-defined vein of from 8 to 12 inches of ore carrying high values in copper; a crosscut has also been driven, cutting the vein at a depth of 30 feet. At the intersection of the crosscut the ore has increased to 2 feet, with a width of 5 feet between walls; another crosscut is now being driven which will tap the vein at a depth of 100 feet from the surface outcrop. This property is owned by Chas. B. Frederick, Cherry creek.

Berenice No. 2 of this group, also owned by Mr. Frederick, has a shaft sunk to 14 feet, the ore vein, though not so wide as *Maxine No. 2*, carries higher values.

Two claims of this group are owned by Wm. Philip, Kamloops, and one by Herbert Darroch, Kamloops.

COAL PROSPECTING ON THE NORTH THOMPSON RIVER.

(From H. G. Ashby, Secretary, Canadian Northern Coal & Coke Co., Ltd.)

I cannot give you very much information regarding our operations at Mosquito flat, except to say that we have a Cyclone core drill working there which will drill down to 1,000 feet. Cost of same landed at Mosquito flats about $5,500. The first hole was taken down 178 feet, but had to be abandoned pending the arrival of larger casing. The present hole we are now drilling is down about 278 feet in sandstone, and will be continued until we strike coal. This is about all the information I am at liberty to give you at the present time.

OFFICE STATISTICS—KAMLOOPS MINING DIVISION.

Free miner's certificates	300
Certificates of work	142
Records	150
Bills of sale	21
Certificates of improvement	5
Total receipts	$2,886.45

ASHCROFT MINING DIVISION.

REPORT OF H. P. CHRISTIE, MINING RECORDER.

I have the honour to submit the annual mining report for the Ashcroft Division during the year 1910, and the office statistics.

There has been very little change since the previous year; no ore has been shipped, and the situation practically remains unchanged. The assessment work is, on the whole, well kept up, and the owners of claims appear satisfied, although very little actual development work has been done.

OFFICE STATISTICS—ASHCROFT MINING DIVISION.

Claims recorded	67
Free miner's certificates issued	74
Certificates of work	40
Bills of sale recorded	21

NICOLA MINING DIVISION.

REPORT OF W. N. ROLFE, MINING RECORDER.

I have the honour to state that, with the exception of assessment work, I am not aware of any extended operations having taken place on any of the metalliferous mines in this district.

YALE MINING DIVISION.

REPORT OF WM. DODD, MINING RECORDER.

I have the honour to submit herewith the annual report and statistics for the year ending December 31st, 1910.

PLACER-MINING.

With the exception of a placer lease on Siwash creek, which was operated by Thomas and Muller during the past season, there has been no activity. Placer-mining as formerly conducted hereabouts may be said to be non-existent. So far as I am aware, the output of placer gold may be said to be nil.

MINERAL CLAIMS.

As was to be expected, the surveying of three different lines of railway in the Yale Division and impending construction has led to marked activity in prospecting for lodes. The increased interest in mining taken throughout the Province of late has fostered the operations of prospectors, and this Mining Division, covering as it does a great area of

practically virgin ground unprospected in so far as quartz goes, and presenting throughout its extent no inconsiderable difficulties due to the mountainous topography and the dense vegetation of the lower slopes, is at last beginning to receive a fair measure of long-retarded attention.

Bearing in mind its proximity to Vancouver, its accessibility by the Canadian Pacific, its intersection by the Fraser River, navigable as far as Yale, the existence of the old trail from Hope to Nicola and the Dewdney trail to the Similkameen, with construction in progress of the Canadian Northern Railway skirting the south side of the Fraser, and the approaching construction of the V. V. & E. Railway, the district will be ultimately well served with channels of transportation; and eventually the completion of the contemplated trunk motor-road, joining the Hope End of the Yale road with the Similkameen system, will greatly facilitate access and haulage of supplies to the Skagit valley.

Although a rush of several hundred prospectors took place in the winter of 1879-80 through Hope to placer diggings on Ruby creek, a feeder of the Skagit river, which it joins in northern Washington, no systematic quartz prospecting has hitherto been followed on the watershed of the Skagit on our side of the line. However, during the past summer, Greenwall and Stevens, two American miners from Nevada, in consequence of information received of the presence of colours in certain creeks, proceeded to prospect, and, tracing these colours to their source, were rewarded by finding the claims now known as the "*Steamboat* group" (July, 1910).

As a consequence, an influx of prospectors has taken place, and some 500 locations have been made throughout the Skagit district. This number includes other localities such as Lightning creek, to the south-east of Steamboat mountain; at the Red mountain, two miles removed; at the Twenty-three-mile post on the main trail; at the Lake House and in the vicinity of Gibson Bros.' galena locations on the west side of the Skagit, close to the International boundary.

The original *Steamboat* claims have been incorporated by Greenwall and Stevens as the Steamboat Mining Co., Ltd., of Vancouver, and as soon as cabins had been erected and transportation of supplies arranged for, work on the first and upper level was pushed. Shortly after, a longer lower drift was opened, and at present some ten men are at work under the personal direction of Mr. Stevens. As everything is in order for continuous work during the remaining months of winter, the owners hope to have sufficiently developed their ground by summer to warrant the erection of a stamp-mill.

In the absence of authoritative technical information as to the nature of the deposits up to this time, I am only able to say that the owners report that the gold is found in a free state in a porphyritic dyke, which is from 4 to 8 feet in width, and traceable for a long distance owing to the erosion of its surface.

From the reports of prospectors, it appears that the country, as a whole, is intersected by dykes, and it is mainly on these that locations have been staked. The geological nature, dimensions, and values of these ore-shoots, if present, remain for the coming working season to determine.

Stanley Thompson and associates have let a contract for underground work on their group in the immediate vicinity of the *Steamboat* group, but the lateness of the season, when most of the locations were made, and the scarcity of pack-horses available, which were all engaged by the Steamboat Mining Co. for the remainder of the open months, has prevented the forwarding of supplies for owners who would otherwise have erected winter camps.

I might add that Hope Station is eighty-nine miles from Vancouver by C. P. R., and Hope is fifteen minutes' journey beyond by power-ferry and stage. From Hope to Steamboat mountain is twenty-three miles by the Dewdney trail (Similkameen), and then thirteen miles down the Skagit river to the base of the mountain, or in all thirty-six miles from Hope; so that in summer, given suitable train and saddle connections, it would be possible to leave Vancouver in the morning and camp at Steamboat the same night. Roadhouses are in course of erection along the route, and ample hotel accommodation offers at Hope, where there are also two general stores.

During the last months of 1910 there have been some eighty mineral locations made on the upper portion of Siwash creek, which flows into the Fraser some two miles above Yale; the locations themselves are five miles from the village. Specimens showing free gold have been brought in. The ore is quartz, from both dykes and smaller veins intersecting the slates. As the lower portions of this creek have produced coarse gold in the past, and always been favourite hydraulic grounds, the country higher up is well worth prospecting.

On the whole, the mining outlook for the Yale Mining Division is good; there will in all probability be hundreds of prospectors at work during the season of 1911, and important discoveries may be looked for.

OFFICE STATISTICS—YALE MINING DIVISION.

Free miner's certificates	115
Mineral and placer claims	629
Leases issued	5
Certificates of work	23
Powers of attorney	2
Free miner's certificates (company)	1
Assignments and agreements, etc	59

SIMILKAMEEN MINING DIVISION.

REPORT OF HUGH HUNTER, MINING RECORDER.

I have the honour to forward the annual mining report on the Similkameen Mining Division for the year 1910.

There has been little change in lode and placer mining in this section since my last report. Assessment work has been generally performed on claims not Crown-granted. The prospects for the year 1911 are exceedingly bright for this section. A deal is pending on Copper mountain of copper properties situated in Voigt's camp, which, when consummated, will add to the prosperity of the whole country.

A cement plant having a capacity of 500 barrels daily is to be erected on One-mile creek, a short distance from Princeton. Their expert reports an abundance of suitable material close at hand.

The United Empire Mining Company is working on its coal property in the same vicinity, and expects to ship coal early in the year.

The Princeton Coal and Land Company is developing its coal-mine, and shipping a few cars of coal weekly. It is the company's intention to enlarge its plant, so as to be able to fill increasing orders.

The B. C. Coal and Coke Company has a large area of coal lands in the vicinity of Granite creek and Tulameen, and has installed a compressor plant and started a tunnel to tap the coal.

OFFICE STATISTICS—SIMILKAMEEN MINING DIVISION.

Free miner's certificates issued	161
Location records	140
Certificates of work	270
Conveyances	32
Certificate of improvements	1

LILLOOET DISTRICT.

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LILLOOET MINING DIVISION.

REPORT BY WM. FLEET ROBERTSON, PROVINCIAL MINERALOGIST.

Lillooet is one of the oldest towns in the interior of British Columbia, and was, in the earliest days of the Cariboo gold-rush, the starting-point of the great waggon-road into the goldfields, and, although to-day, on account of the railway connection, the traffic starts from Ashcroft, all the nomenclature of the main road, such as the 83-mile, the 100-mile, and the 150-mile house, refers to the distance from Lillooet when that town was the starting-point.

The old route from the coast to Lillooet, used by the Hudson's Bay Company and later followed by the gold-seekers, was *vid* the Fraser and Harrison rivers and Harrison lake to its head; here the waterway was abandoned, and a waggon-road twenty-nine miles long, known as the "Long Portage," was followed to the lower end of Lillooet lake, as the river between the two lakes was too rapid for navigation.

From the head of Lillooet lake a waggon-road ran eastward over a low divide to the west end of Anderson lake, a distance of about twenty-four miles; Anderson lake was traversed in batteaux or canoes, although there was a trail along the north shore of the lake and also of the adjoining lake, Seton lake; between Anderson and Seton lakes was a portage of about four miles, on which in the early days a short tramway was operated.

The eastern end of Seton lake—its outlet—is within about three miles of the Fraser river, and the town of Lillooet is situated on the bench, overlooking the Fraser river where the creek from Seton lake enters the river.

Since the advent of the Canadian Pacific Railway this old route has been abandoned, and is of interest chiefly as a monument of the early pioneer days of the interior, for, in British Columbia, the fifty or sixty years since, has passed it into the early history of the Province. Within the past year, however, interest has been renewed in the route as the most probable route for a railway from the upper Fraser valley to the Coast.

The town of Lillooet is still the only place of any importance in this district, and is to-day reached by stage either from Lytton, a distance of forty miles, or from Ashcroft, both stations on the main line of the Canadian Pacific Railway.

The town is not now what it was in "Cariboo days," but still supports a couple of good stores, two good hotels, two churches, a printing-office, and also a post-office and telegraph-office, and is each fall the starting-point for a large number of hunting parties. Formerly, the benches of the Fraser river near the town were extensively worked for placer gold, but this work has been abandoned now for several years. The river bars and bottom were also worked in past years by steam dredging plants, but, although there is seemingly sufficient gold in the river bottom, dredging has not, as yet, here been made a commercial success.

Near Lillooet a number of quartz ledges have been proven to carry gold, and in parts these were found to be very rich, but, so far, the pay-shoots have not been found large enough for successful company operations.

On Cayoosh creek several promising properties were opened up by companies, notably the *Golden Cache*, which, after doing a large amount of mining-work and installing a great amount of machinery, finally suspended operations, presumably for lack of ore.

While the company flotations and operations in the vicinity do not appear to have been successful, there have been a number of smaller properties in the Bridge river section which have managed to do development and pay expenses, even when run practically without initial capital and with the most primitive appliances; these were opened up by working partnerships, and the plants consisted of home-made arrastras.

These properties have for some years past been producing gold, and with a view of forming some estimate of the probable future of the camp, the writer visited the camp in September.

Bridge river flows into the Fraser river about five miles above the town of Lillooet, and a good trail, which might be made into a waggon-road, runs from Lillooet up the valley of Bridge river for about twenty-five miles, or to the mouth of the North fork; the trail follows up this fork to its headwaters, continuing northward.

Above the junction of the North fork, the main Bridge river is in canyon for some ten or twelve miles, and the valley is impassable for foot-passengers, much less for pack-horses, so that no practical connection exists between the upper and the lower Bridge river valleys, except over the summit of Tyaughton mountain, a rise of nearly 8,000 feet. This lower valley has been the scene of a number of hydraulic-placer enterprises, but none were found in operation in 1910.

The gravel-deposits in this valley are very thick and the stream has cut into them deeply, leaving steep-sided gravel-benches which, in places, carry considerable gold.

Various attempts have been made to work these, but the results have never been satisfactory, partly because of the small amount of water used, few serious attempts having yet been made to bring in an adequate water-supply.

Brown Hydraulic Mine.

The one notable exception to this is the *Brown* hydraulic mine, situated at the junction of North fork and main Bridge river, from which the water, obtained from a small tributary creek, was brought for five miles down the west bank of the North fork, on the upper bench. This property was extensively opened up and operated in 1900, but has since been closed down, as not sufficient gold was obtained to make it profitable.

The trail, which follows the lower Bridge river up to the canyon, continues up the North fork to its source, and so into the district to the north; this trail is much used by hunting parties in the fall.

The writer followed the North fork trail for three or four miles, when, at Birch's ranch, a trail leading up the mountains to the west was taken, and, after crossing over a couple of subordinate summits over 7,000 feet in height, Holbrook gulch, a branch of Big creek, a creek flowing to the north and entering the North fork ten miles above its mouth, was reached on the evening of the 31st of August.

Spokane Group.

The *Spokane* group, owned by Dr. Christie, of Lillooet, and others, is situated on the headwaters of Holbrook gulch; the mine cabin is at an altitude of 6,520 feet and the upper tunnel at 7,050 feet. This upper tunnel has been driven in 20 feet, disclosing a quartz vein about 30 inches wide, cutting through a diabase country-rock with a strike of N. 70° W. and a nearly vertical dip.

The quartz is, in parts, quite heavily mineralised with white and yellow iron-pyrites and some copper-pyrites carrying values in gold and silver. A sample taken of one of the well-mineralised portions of the vein gave, upon assay: Gold, $7.20; silver, 0.7 oz. to the ton; and copper, 2.3 per cent.

A lower crosscut tunnel has been started to cut the vein at depth, and had been driven in about 160 feet, but required to be driven farther before the vein might be expected.

A system of later basic dykes was noted as following up the course of the gulch, forming a small subordinate ridge, on which, near the mine cabin, a small shaft had been sunk to a depth of about 15 feet on a crushed zone in the diabase, about 3 feet wide, which showed some copper-stain, and from which a sample was taken for assay, which did not, however, disclose any values.

The mine cabin is at the entrance of the upper limit of timber-growth and the mine is above timber-line, so that all mine timber has to be hauled nearly a mile.

The proper entry into this section is by following up Big creek, and this would be the route used should more extensive mining operations be undertaken.

The headwaters of Holbrook gulch are only separated from the valley of Bridge river by a range of precipitous mountains, the distance being not more than four or five miles, but this route is so steep it can only be followed by experienced prospectors unencumbered by horses or baggage.

From Holbrook gulch a route was taken across a ridge to the westward and down over a snowslide to the great basin on the summit of the Tyaughton range of mountains. On the west side of this basin the main Tyaughton trail was found; this is a trail much used by the Chilcotin Indians when travelling to Bridge river during the hunting season, and follows Alexander creek down to its junction with Bridge river, some eight or ten miles above the canyon on that river.

The whole summit of Tyaughton mountain and its slopes—in fact, all the upper Bridge river district—was found to be covered on the surface with a deposit of powdered pumice-stone, sometimes in pieces an inch or two in diameter, evidently thrown out in recent times by some volcano.

The Tyaughton trail was found to be almost obliterated by fallen trees, so much so that, although the start from Holbrook gulch was made at 8 a.m., it was 5.15 p.m. before the first open flat on Alexander creek was reached, a small opening and meadow at an altitude of 3,500 feet, taken up some years ago by Oliver Brett, but later abandoned owing to the continued summer frosts due to the elevation.

On September 2nd the trail was followed down Alexander creek, and at about half a mile from its mouth the Babb hydraulic plant was found.

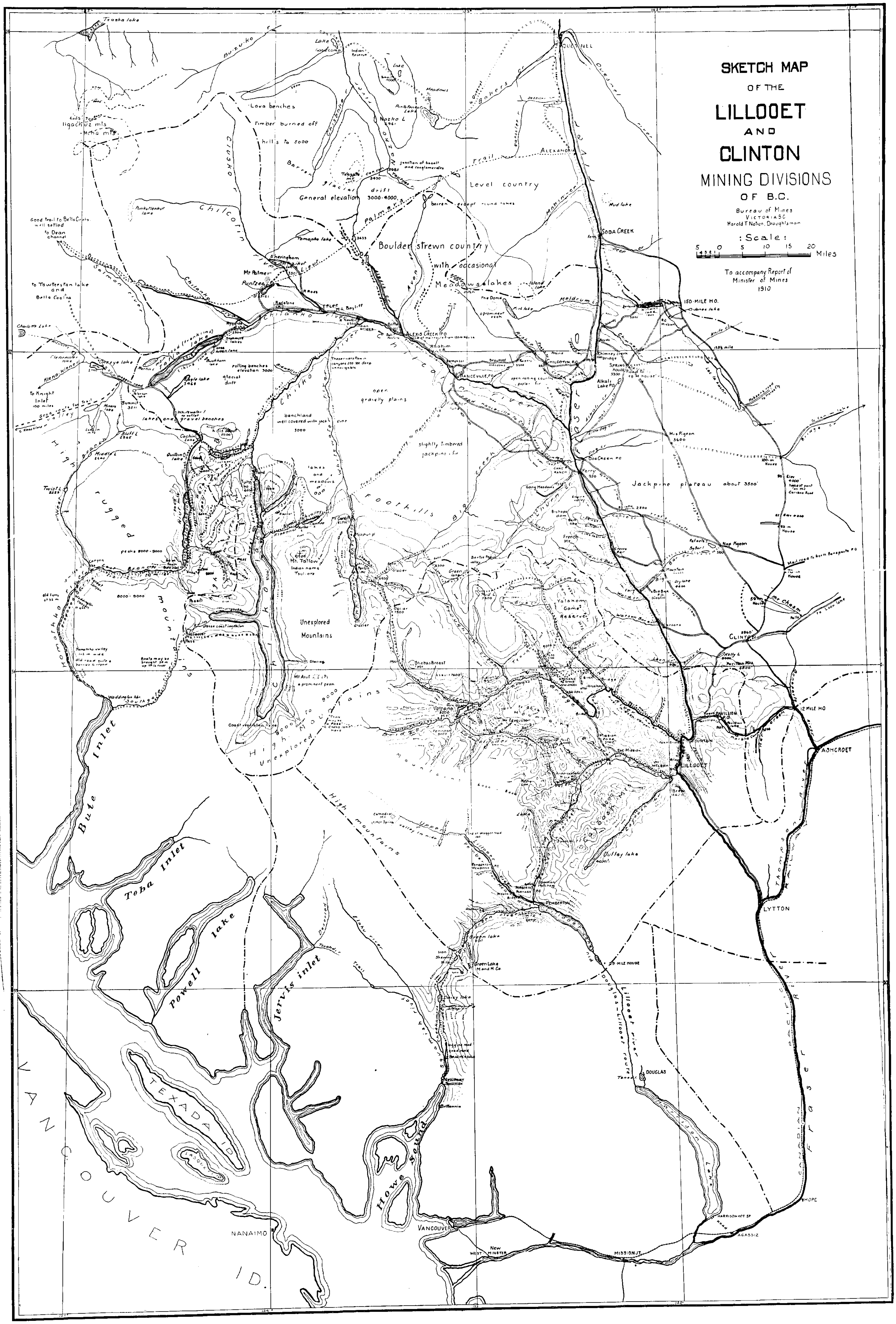
Babb Hydraulic Mine.

The Babb hydraulic plant is situated on Alexander creek about half a mile from its mouth, and is held by a syndicate or unincorporated company. The property was operated in a small way in 1909, but not during the year 1910, being in charge of a watchman only. The gravel-bank that had been worked is on the left side of the creek and is quite extensive; the bed-rock is slate, somewhat irregular as to dip, rising slightly into the hill.

The fall of the creek for 2,000 feet below the mine is so flat that the tailings have to be carried in a block-lined sluiceway, but at the end of the flume a good dump is found at a fall in the creek. The irregularity of the bed-rock has caused the excavations to assume very irregular form, not conducive to economical working.

The plant consists of a good water-supply under a head of 340 feet, taken from Alexander creek about two miles farther up, brought down the right-hand side of the creek by flume. The penstock is 16 inches in diameter, of iron. The water was used through two 7-inch giants assisted by a by-wash from another small creek.

North Fork Bridge River.



SKETCH MAP
OF THE
LILLOOET
AND
CLINTON
MINING DIVISIONS
OF B.C.
Bureau of Mines
VICTORIA B.C.
Harold T. Nation, Draughtsman
:Scale:
5 0 5 10 15 20 Miles
To accompany Report of
Minister of Mines
1910
Tzasha lake
Buzuko r
Lava benches
Timber burned off
hills to 5000
Ilgachuz mts
Itcha mts
Chilcotin r
Clusko r
Chisbako r
Nazko r
Nazko L
Barren glacier drift
General elevation 3000-4000
Junction of basalt and conglomerates
Level country
Palmer's trail
Boulder strewn country
with occasional
Meadows lakes
Quesnel
Quesnel river
Bakers cr
Alexandria
Mud lake
Soda Creek
Deep cr
Meldrum cr
150-Mile Ho.
Jones lake
Williams lake
Knife cr
158½ mile
Lac la hache
Hobsons road to Horsefly
Good trail to Bella Coola, well settled
to Dean channel
to Towteestan lake and Bella Coola
Charlotte Lake
Salmon river
Chilanko river
Mr Palmer
Puntzee L
Redstone
Alexis Creek P.O.
Anahim
Hanceville P.O.
Chilcotin P.O.
Chimney Creek bridge
Spring House 3300
Alkali Lake P.O.
Tatla lake
Oneeye lake
Klena-klene r
to Knight Inlet 100 miles
Good route for trail valley
Eagle lake 3468
rolling benches elevation 3000
glacial drift
Chilko r
Whitewater r
These rivers flow in canyons 200-300 deep unnavigable
open gravelly plains
benchland well covered with jack pine 3000
slightly timbered jackpine, fir
lakes and meadows
Foothills
Big creek
Churn cr
Dog Creek P.O.
Ferry 950
Gang Ranch
Mrs Pigeon 3600
100-m House
Jackpine plateau about 3500'
Bridge cr
to Canim lake
Nap Pigeon
Mail road to North Bonaparte P.O.
70-m House
59-m House
The Chasm
to Loon lake
Clinton 2960'
Kelly L
Pavilion Mts.
Pavilion P.O.
12 Mile Ho
Ashcroft
Bonaparte r
Thompson River
Lytton
Lillooet
Fountain
Cayoosh cr
Duffey lake
Yalakom Game Reserve
Bridge r
Cochin Lake
Quitsin lake
Middle L
Bluff L
Twist L
rugged
peaks 8000-9000
Homathko river
Mountains
Chilko lake
Mt Tatlow
Unexplored Mountains
Shebas Breast Mt
Mt Ferguson
High mountains
Unexplored
High mountains
Coast vegetation here
Waddington Hbr
Bute Inlet
Toba Inlet
Powell lake
Jervis inlet
Elaho river
Squamish river
Cheakamus
Texada Id.
Lasqueti Id.
Vancouver Id.
Nanaimo
Howe Sound
Vancouver
New Westminster
Mission Jt.
Agassiz
Harrison Hot Sp
Harrison Lake
Douglas
Douglas-Lillooet route
Lillooet river
Lillooet Lake
Pemberton
Pemberton Meadows
Green lake
Green Lake M and M Co.
Daisy lake
Brackendale
Newport
Squamish
Brittannia
29-Mile House
Canadian Pacific Railway
Fraser river
Hope

The company has erected suitable mine buildings and a small sawmill, sufficient for its needs, driven by water. Although not at present working, it is understood that, although the plant is, as yet, only a prospecting one and has not been commercially successful, it has given sufficient encouragement to induce the company to continue operations in 1911.

92 J-135

Jones Coal Claim.

An interesting deposit of carbonaceous shale with coal was visited on September 2nd; this is located directly above Jones' Ranch, on the steep hillside to the north of Bridge river valley, and about two miles downstream from the mouth of Alexander creek. The river valley here has an elevation above sea-level of about 2,300 feet, and the so-called coal-cropping is at an altitude of 4,175 feet; a horse-trail extends up the mountain to an elevation of 4,000 feet.

The upper portion of this mountain is capped with more or less horizontal beds of volcanic deposition, consisting of scoriæ, breccias, overlying a whitish volcanic crystalline flow, and overlain by beds of volcanic mud and gravel in which are beds of sandstone of irregular thickness.

Interbedded with the intermediate series mentioned are one or two beds of a black carbonaceous shale from 1 to 2 feet in thickness, in which occur lenses of coal, these sometimes occupying the entire bed, but always retaining the lens shape.

This coal, while not developed in quantity, gave the following remarkably good analysis on a small sample of clean coal: Moisture, 8.1 per cent.; ash, 5.6 per cent.; volatile matter, 33.6 per cent.; fixed carbon, 52.7 per cent.; total 100 per cent.

92 J-35

Summit Group.

The *Summit* group, owned by W. W. Jones, Babb, and others, consisting of three claims—the *Summit*, *South Side*, and *North Pole*—is situated at an altitude of 5,000 feet on the north slope of Bridge river, a couple of miles above the mouth of Alexander creek and directly across the valley from the mouth of Thomas Green creek. On the mountain-top and forming the edge of the bluff facing the river, there outcrops a very large basic dyke running in a north and south direction; cutting through this in a general N. 40° E. direction are a number of quartz veins carrying iron, zinc, and lead sulphides, with appreciable gold and silver values.

There are a number of exposures of the veins on the bluff hillside, slightly developed by open-cuts and pits. About 50 feet below one of these outcrops a tunnel has been driven in for some 40 feet, disclosing a somewhat irregular quartz vein carrying a small quantity of the minerals described. Some 400 feet to the east of this first tunnel, at an altitude of 5,175 feet, a small upper tunnel has been run in for a short distance.

The main tunnel was started in at the outcrop of a vein striking N. 40° E., but the tunnel was driven in a due east direction for 50 feet, leaving the vein on the left-hand side; at this point the tunnel was swung around to the left and continued for 27 feet in a N. 40° E. direction, when the tunnel was again turned to the left in a N. 50° W. direction and continued for 10 feet. The tunnel has thus run away from the vein, and by calculations would have to be driven 28 feet farther in the last direction before it would cut the line of the vein.

A sample taken of the ore as it could be hand-sorted assayed: Gold, $8; silver, 2.2 oz.; lead, 10 per cent.

92 J-148

North Star and University.

On the main Bridge river valley, just above the mouth of Gun-creek and opposite the ranch formerly occupied by Arch. Trevarge, the hills are generally low and rolling, although rocky and precipitous in places, rising above the valley to a height of 400 to 500 feet—the mountains being about a mile farther back.

The rock-exposures on these hills are chiefly volcanic, agglomerates, etc., which have been cut by numerous basic and porphyrite dykes, very much weathered and decomposed on the exposures. Accompanying these dykes are lenses of quartz, scarcely sufficiently continuous to be styled veins, but sometimes of considerable length and reaching a thickness of 2 or 3 feet. These quartz lenses carry in places considerable quantities of galena and stibnite, lead and antimony sulphides, which contain small values in gold and silver.

A general sample of such mineralisation gave, upon assay: Gold, 40 cents; silver, 0.6 oz.; the sample was not assayed for lead or antimony.

On this series of quartz-croppings the *North Star* and *University* mineral claims have been staked by W. W. Jones, Christie and Smith, and a small amount of work done in the way of open-cuts, etc. On the former, in an open-cut 10 feet long, quartz of about 4 feet wide is exposed carrying lenses of stibnite from 3 to 4 inches wide; on the latter several open-cuts have exposed a vein showing extensive mineralisation for a width up to 8 inches, but not averaging more than 3 inches. These quartz lenses, while not continuous, seem to be more or less in line, as though following some definite fissuring which has a strike of N. 40° E. and dips at an angle of 45 degrees to the south-east.

Wayside Mine.

The *Wayside* mine is located on the north side of Bridge river valley, about three miles above the mouth of Gun creek and opposite the mouth of the South fork. The property was staked by John Patterson, and is now held by H. M. Babb *et al.*, of Lillooet.

Here the country-rock changes from the prevailing character of the lower valley to a diorite, a large body of which is found on the east side of Cadwallader creek, extending down into the valley of Bridge river at this point. Through this diorite country-rock is a regular fissure, with a strike of N. 30° W. (mag.) and a dip of 38 degrees to the south-west, cutting into the hillside nearly at right angles and so outcropping down the face of the hill, which has a slope of about 20 degrees.

Running in from the outcrop on the vein are three adit tunnels, Nos. 1, 2, and 3. No. 3 tunnel is the highest, at an elevation of 2,950 feet, and has been driven in about 25 feet, disclosing in the general fissure a quartz vein about 20 inches in width and of considerable regularity. This tunnel was the first prospecting workings driven by the discoverer, and the vein here is seemingly at its best, having clearly defined walls, and being well mineralised with iron-sulphides carrying appreciable values in gold, samples of hand-sorted ore running as high as $30 to the ton in gold. No. 2 tunnel has been driven in from a vein outcrop for 135 feet, starting at a point some 270 feet lower down the hill than No. 3, and at an elevation of 2,680 feet, on what was supposed to be the same vein; but, as the intermediate outcrop between the two tunnels has not been uncovered, and the dip in the upper tunnel would appear to strike to one side of No. 2 tunnel, this is by no means certain, and it may prove to be a parallel vein. The quartz vein at the portal of this No. 2 tunnel is about 12 inches wide, and continues in for some distance of this width, pinching out, however, at 90 feet in, to almost nothing, but again widening out farther in. Still farther in, the vein splits into three stringers, and so appears in the face at the inner end of the tunnel.

On the dump just outside of the tunnel there is a pile of about 15 tons of ore—quartz heavily mineralised with iron-sulphides, expected to carry good values in gold. A sample shipment of ore from this dump was taken out by pack-train in September, 1910, but no information has been obtained as to its assay value. Occasionally a little free gold, visible to the eye, is seen in the ore, but it does not occur in quantity, and the values are chiefly in the sulphides.

No. 1 tunnel, at an elevation of 2,590 feet, or 90 feet lower than No. 2, has been driven in for about 150 feet; the fissure or crushed zone is here distinct and the walls perfect; the quartz vein, however, is of variable width, frequently pinching out, and not nearly as strong here as in the upper levels.

The property is equipped with suitable buildings, etc., but was not worked during the past season.

CADWALLADER CREEK.

Cadwallader creek heads in the mountains to the north of Anderson lake, and from this summit flows north-westerly into Bridge river. For many years placer-mining on a small scale has been going on along the bars and benches of the creek, and individual operators still take out small quantities of gold.

The hillside on the east of the creek slopes gradually for about three-quarters of a mile to the mountains, which rise abruptly; this hillside was, a number of years ago, completely covered by mineral locations, of which a number are still alive to-day, and a few actually producing gold.

Geologically, this hillside differs essentially from the valley of Bridge river, and, apparently, from the rest of the district, these being composed of sedimentary rocks, while the rock formation of this part of Cadwallader creek is a light igneous rock, seemingly a diorite. This mass of diorite is found from the *Wayside* mine, on Bridge river, along the east side of the Cadwallader creek valley to above the *Pioneer* mine, a distance of fifteen miles, and in width extends from the creek nearly, but not quite, to the base of the mountains about half a mile.

It is reported that either a branch of this body of diorite or a similar body extends along the east side of the South fork, but this section was not visited and, as far as can be learned, has been little prospected.

So far, all the claims which have shown values are in the belt of diorite, and while the veins continue into the sedimentaries, they are not there mineral-bearing. This fact would lead to the supposition that the profitable field for prospecting, or mining, in the vicinity was within the boundaries of this diorite outcropping, in which case the probable extent of the camp, as a camp, is limited to the area as described.

The creek flows in a north-west direction, and along its eastern hillside two distinct series of veins have been shown up by the prospecting and mining work done; the main series of veins runs nearly east and west, while the second series strikes nearly north-east and south-west; these veins cut each other sharply, and apparently the fissuring through which they were formed occurred at the same time. The veins are from 10 inches to 5 feet in width, and are remarkably regular as to strike, dip, and continuity.

For the most part, they carry free gold and iron-sulphides containing gold, but the amount of sulphide is small. Free gold, visible to the eye, can be found in most of the veins, while in some of the veins it is very plentiful, and in places produces bonanza and beautiful specimens.

The development and mining work done on the various properties has been so intermittent and disjointed, owing to separate ownerships and other causes, that no clear idea could be obtained as to the regularity, or otherwise, of the gold-tenure of the veins, or whether it occurs in shoots, although this latter seems probable.

The Lorne Amalgamated Mining Company, of which Mr. William Sloan, of Nanaimo, is president, has obtained control of the *Lorne* and *Woodchuck* mineral claims and four others which are now being worked under one company management. The first of these claims was for a number of years worked by individual owners, who did considerable mining, treating the ore mined in a home-made arrastra driven by an overshot water-wheel, and managing to better than pay expenses with the rather primitive appliances available.

Following the formation of the Amalgamated Company, a 5-stamp mill was erected, a tramway built connecting the tunnels with the mill, and a serious attempt is being made to so connect the various separate working tunnels as to chute the ore underground to the lowest level, from which it will be taken to the mill by the tram. While this attempt at more economically handling the ore is well under way, all arrangements have not been completed.

No. 1 Tunnel, Woodchuck.—This tunnel follows in from the outcrop for 90 feet, a vein having a strike N. 45° E. and a dip of 30 degrees to the north-west. At this distance, one of the main veins of the east and west series was cut, which has a dip of 65 degrees to the north, and this main vein was followed for 120 feet in an easterly direction. The crushed zone of this fissure is from 6 to 7 feet wide, in which there is a quartz vein varying in width from 10 to 55 inches, while the remainder of the fissured material is connected together with quartz.

No. 2 Tunnel, Woodchuck.—This is a crosscut tunnel for 120 feet, where one of the north-east and south-west veins was struck and followed for about 80 feet in a N. 45° E. direction. This is a different vein from that in the No. 1 tunnel, and is dipping at an angle of about 60 degrees to the north-west. The quartz vein here exposed is narrow, being only from 8 to 24 inches in width, although the gold values contained are reported higher than the average.

No. 1 Tunnel, Lorne or King Claims.—This is an adit tunnel driven in from the outcrop for 250 feet in a N. 45° E. direction on one of the north-east and south-west veins, having a dip of 70 degrees to the north-west. The fissure for the length of the tunnel appears to be remarkably regular and well defined, the quartz vein therein being from 12 to 24 inches in width, and the gold values are said by the management to be satisfactory. From near the face of this No. 1 tunnel a raise has been put up to No. 2 tunnel, *Lorne*.

There are several other smaller openings disclosing continuations of these veins or other parallel ones; the openings mentioned are, however, the principal workings.

It is not possible, even if it were desirable, to hand-sample veins of this character, so no statement can be made as to the average value of the quartz; that gold is present in considerable quantities in parts of the vein is apparent to the eye, while the fact that the properties were worked for years at at least a small profit by a home-made arrastra would argue that the gold-tenure is sufficient for profitable working by a stamp-mill.

Arrastra.—The old arrastra formerly used on the property is still standing beside a pile of tailings of from 500 to 800 tons. Samples from this old dump were taken for assay, and the assayer reports only a trace of gold remaining in them, which speaks well for the efficiency of the home-made plant. This old plant consists of an overshot water-wheel 28 feet in diameter, with a 2-foot breast, hung on a large timber axle supported by four bearings. On either side of the water-wheel is a driving-pulley, each of which was connected by a crossed belt with vertical shaft of an arrastra, 12 feet in diameter. The crushing-capacity of these two arrastras is said to have been from 3,000 to 4,000 lb. of ore a day. A photographic reproduction of the old plant accompanies this report.

Stamp-mill.—The stamp-mill erected by the new company is a 5-stamp battery, built by the Union Iron Works of San Francisco, and has stamps weighing 750 lb. dropping from 7 to 7½ inches, at the rate of 85 drops to the minute, and having a crushing-capacity of from 2 to 2¼ tons to the stamp a day. The ore from the tramway is deposited into a bin, from which it is fed to a Blake crusher, and thence into the crushed-ore bin, from which the stamp-mill is fed by an automatic feed. There is a single battery-plate, without any subsequent mercury-trap or any appliance to save concentrates. The amount of water being used in the battery and over the plate was excessive, and it is more than probable unnecessary losses were being made.

The power plant consists of an 18-inch Pelton wheel driving the crusher, and a 48-inch Pelton wheel driving the stamp-mill, both under a head of 270 feet.

Blackbird.

The *Blackbird* mineral claim is situated about half a mile to the south-east from the *Lorne* workings, and was being developed under a working bond by Messrs. Ferguson, Holten, *et al.*, who were having a tunnel driven on contract by Leach and Williams. In September, 1910, this tunnel had been driven in 37 feet in an easterly direction along a quartz vein. At the portal of the tunnel the quartz was 4 feet wide, diminishing as the tunnel proceeded, until at the face it was 8 inches. The quartz carried small values in gold. Later in the year the bonders reported having stopped work, as the vein had continued to get smaller.

Ben d'Or.

The *Ben d'Or* group of five claims, owned by the Ben d'Or Mining Company, an incorporated company, has been taken over by the bond-holders, and was being worked under lease and bond by A. F. Noel, assisted by three men; the work being done, however, is, by the lease, limited to development workings. The property is on the east bank of the Cadwallader creek, about a mile and a half up the creek from the *Lorne* workings.

The east and west series of quartz veins, already described as being developed farther down the creek, is here again seen, and appears to be very regular in both strike and dip. There are probably a number of veins on the property, but the present workings are all on the same vein, which, as exposed on the surface, has a width of about 6 feet. These workings consist of four adit tunnels, connected by raises, as follows:—

No. 1 Tunnel.—The highest, or No. 1, tunnel was found to be caved and could not be entered, but was said to be stoped out pretty well to the surface.

No. 2 Tunnel.—This tunnel is 100 feet lower than No. 1, and follows in the quartz vein in a nearly easterly direction for from 500 to 600 feet. The vein in the tunnel appears to be very regular and permanent, with good walls, and having an average width of between 3 and 4 feet.

No. 3 Tunnel.—This tunnel is 100 feet lower than No. 2. At this level the vein did not outcrop conveniently, and, consequently, was reached by a crosscut tunnel, driven through a diorite country-rock for a distance of 270 feet, at which distance the vein was cut and drifts made along it, both to the east and west. In the east drift the vein was continuous to the face, maintaining its width, but dipping nearly vertically. In the west drift the vein maintains its width for 225 feet, but becomes thinner for the further length of the tunnel, some 150 feet.

No. 4 Tunnel.—This tunnel, 210 feet lower than No. 3, is a crosscut driven for about 480 feet, but had not been continued far enough to cut the ledge, the lessee claiming that a survey showed it had still 30 feet to go before the ledge might be expected. The vein varies from 3 to 4 feet in width, and the ore from each of the tunnels shows visible free gold in considerable quantities.

The workings on No. 2 and No. 3 tunnels were practically all development workings, and all were found in exceptionally good condition as regards timbering, etc.

The average gold-tenure of the vein could not be learned—it was not to the interest of the lessee to make it known—but ore in the mill-bins, some 75 tons, said to be taken in about equal quantities from each level, was certainly quite rich in free gold, and also carried some iron-sulphides containing gold.

Mill.—The *Ben d'Or* mill is erected in the flat at the edge of Cadwallader creek, about 1,000 feet from the portal of No. 3 tunnel, with which it is connected by a back-balance tramway, an incline built on a high trestle, of somewhat temporary construction, as it is expected, as soon as the connection is made underground, that a more permanent tram would be laid from No. 4 tunnel, a much shorter distance and on a more moderate incline.

The ore from the tramway dumps into receiving-bins capable of holding from 50 to 75 tons of ore; from there it is fed over a grizzly with a 2-inch opening to a 10 x 12-inch jaw-crusher, the crushed ore and screenings passing into a crushed-ore bin. The crushed ore is fed automatically to two 5-stamp batteries made by the Hamilton Manufacturing Company, Peterborough, Ont. The stamps weigh 850 lb. and drop 7½ inches at 102 drops to the minute, *crushing the ore to pass a 35-mesh screen.*

The amalgamating-plates are 4 feet wide by 8½ feet long, set on a 7½-degree slope, and are provided at the end with mercury-traps. The tailings are passed over crude tables covered with blanket, where some attempt was being made to save sulphides. A quantity of these concentrates has thus been saved and was lying sacked in the mill, from which a general sample was taken which assayed $180 in gold to the ton.

Power is generated by a large turbine water-wheel working under a head of 30 feet, the water-supply for which is taken from Cadwallader creek about 200 yards above the mill, and brought in by a wooden flume. There is a large surplus of water at most seasons.*

Countless.

The Countless mineral claim adjoins the property of the Ben d'Or Company, higher up the hillside away from the creek, and has suffered from lack of water-power, although unlimited water might have been brought in by a ditch-line from the main creek. The property was reported as being owned by William Manson *et al.*, of Lillooet, and has not been worked for some years.

The only workings that could be found on the property was an open pit some 60 feet long by 20 feet deep, on a quartz vein about 4 feet wide, as exposed. The strike of this vein, S. 65° E., was different from any other vein worked in the camp, and the dip was nearly vertical. The quartz from this opening was treated in a crude arrastra, and is said to have carried a fair amount of gold.

The old arrastra was a tub 9 feet in diameter, in the centre of which was a vertical shaft driven by a horizontal water-wheel attached to it by radial arms; to the outer rim or edge of the water-wheel were affixed buckets into which impinged a stream of water from a nozzle, under a small head.

The reason given for the non-working of the property was an insufficiency of water.

Pioneer.

The *Pioneer* mine, consisting of one Crown-granted mineral claim, is situated about half a mile up the creek from the *Ben d'Or*, and almost at the creek-level. At this point the creek valley has become narrower, and being farther up-stream, the creek level is much higher, so that, although the quartz veins

*NOTE.—About the last of the year, and since the above was written, the *Ben d'Or* group and the *Countless* and the *Exchange Fraction* mineral claims have been acquired by the Coronation Mining Company, Limited, a Victoria company—with a capital stock of $500,000—of which H. B. Thomson is president, and the properties are to be fully worked next season.

are about the same elevation as those previously mentioned, they here outcrop only slightly above water-level in the creek. The country-rock here is the same as noted in the other claims, and the quartz veins are found to be very regular, and with a constant strike of nearly east and west. Two distinct veins have been opened up, and surface development would seem to indicate others.

The development of the property is not great, but the conditions under which it is being operated are peculiar and worthy of special note. It is a "one-man mine," being owned and operated entirely by one man, F. H. Kinder, who is not a miner by trade, but who, single-handed, has successfully mined and milled enough ore each year to make a comfortable living.

The main No. 1 tunnel was started some 4 feet above high water in the creek, and has been driven in for 100 feet as a crosscut tunnel, cutting at 70 feet in from the portal No. 1 ledge, a quartz vein averaging about 18 inches in width, on which drifting has been done to the west for 30 feet and to the east for 10 feet. At 100 feet in the tunnel cuts the No. 2 ledge, a quartz vein from 24 to 30 inches wide, and on this a drift has been made to the left (west) for 20 feet, from which a raise is up 16 feet; a similar drift has been made to the east for 55 feet.

There are other small tunnels and openings on the property, which, while not extensive, prove the quartz veins to be more than ordinarily regular and persistent, and to carry good gold values.

For reasons which will be understood when the methods and conditions of working the property are considered, ore carrying less than from $20 to $25 could not be worked, and, consequently, the workings have had to follow the richer ore-shoots.

The owner has apparently done all the development and mining single-handed and alone; the ore has been mined, filled into sacks, and, where necessary, hoisted by hand and carried, either in a wheelbarrow or by the owner on his back, to a home-made arrastra—described later—capable of treating from 400 to 500 lb. of ore a day. If wages can be made, and apparently they are, by such primitive methods and the total absence of capital, its speaks well for the gold-tenure of the quartz mined.

The arrastra is 8 feet in diameter inside; the vertical shaft supporting the arms is driven by a belt connected to the horizontal shaft of an undershot current water-wheel placed in the creek. The property has considerable merit, as a small mine, but does not promise to develop into a large one; the present output as it is being run would not exceed $600 during the season.

From the Cadwallader Creek camp the creek valley was followed up for about ten miles over a rough, and little used, trail, following the creek and on an easy gradient, where camp was made for the night, near creek-level, at an altitude of 4,100 feet. The next morning, September 11th, the summit was crossed, the ground being covered with snow.

The trail out of the Cadwallader creek valley zigzags up a steep, burned-over ridge, rising in about three miles in a direct line to an elevation of 6,800 feet. The summit is devoid of trees or scrub, and in summer is grass-clad, providing excellent grazing. Several quartz ledges have been staked on the summit, but the recent snow had covered up all traces of work and the showings could not be found.

Proceeding southward from the summit, a descent was gradually made into the valley at the headwaters of McGillvray creek. The upper portion of the valley is on the edge of the timber-line, and consists of a series of grass-covered basins dotted over with clumps of balsam and spruce trees, a most beautiful place in summer, but indicating heavy snowfall in winter

with an open season of only three or four months in the year. The trail down this valley is an old Indian hunting-trail, not inviting for travel, and frequently takes to the side-hills and timber to avoid the canyons which characterize the valley throughout.

One day's hard travel brought the party to the forks of McGillvray creek, about five miles from its mouth and from Anderson lake. Here camp was made on the evening of September 11th, at an elevation of 3,900 feet, good feed for horses being found where forest fires had many years ago removed the timber; this was the only grazing-place seen on the lower ten miles of the creek.

McGillvray Creek Mines.

On September 12th the main trail down the valley was followed for about four miles, when a branch trail leading off to the east and up the side-hill was taken, that in about half a mile led to the mine and mill of the Anderson Lake Mining and Milling Co., Ltd., of which J. Dunlop, of Lillooet, is president. The property was at that time under lease and bond to H. M. Babb, *et al.*, of Lillooet, who had during the summer done some work on the property, having mined and milled about 300 tons of quartz-ore. At this date, however, the work had been stopped and no one was found on the property.

Mine.—The lower, or No. 1, tunnel is at an altitude of 3,300 feet, and has been driven in for about 150 feet. The country-rock is a schistose slate much fissured in all directions, the fissures being frequently filled with quartz. This tunnel has been run in on, and develops, a quartz vein from 6 to 8 feet wide, striking N. 25° W. into the hill, and dipping 60 degrees to the north-east. The vein is clearly defined, with marked gouge on the walls, and seems inclined to send off strong spurs to the west. This lower tunnel has been partly stoped to a height of four sets of timber, and was making a large amount of water.

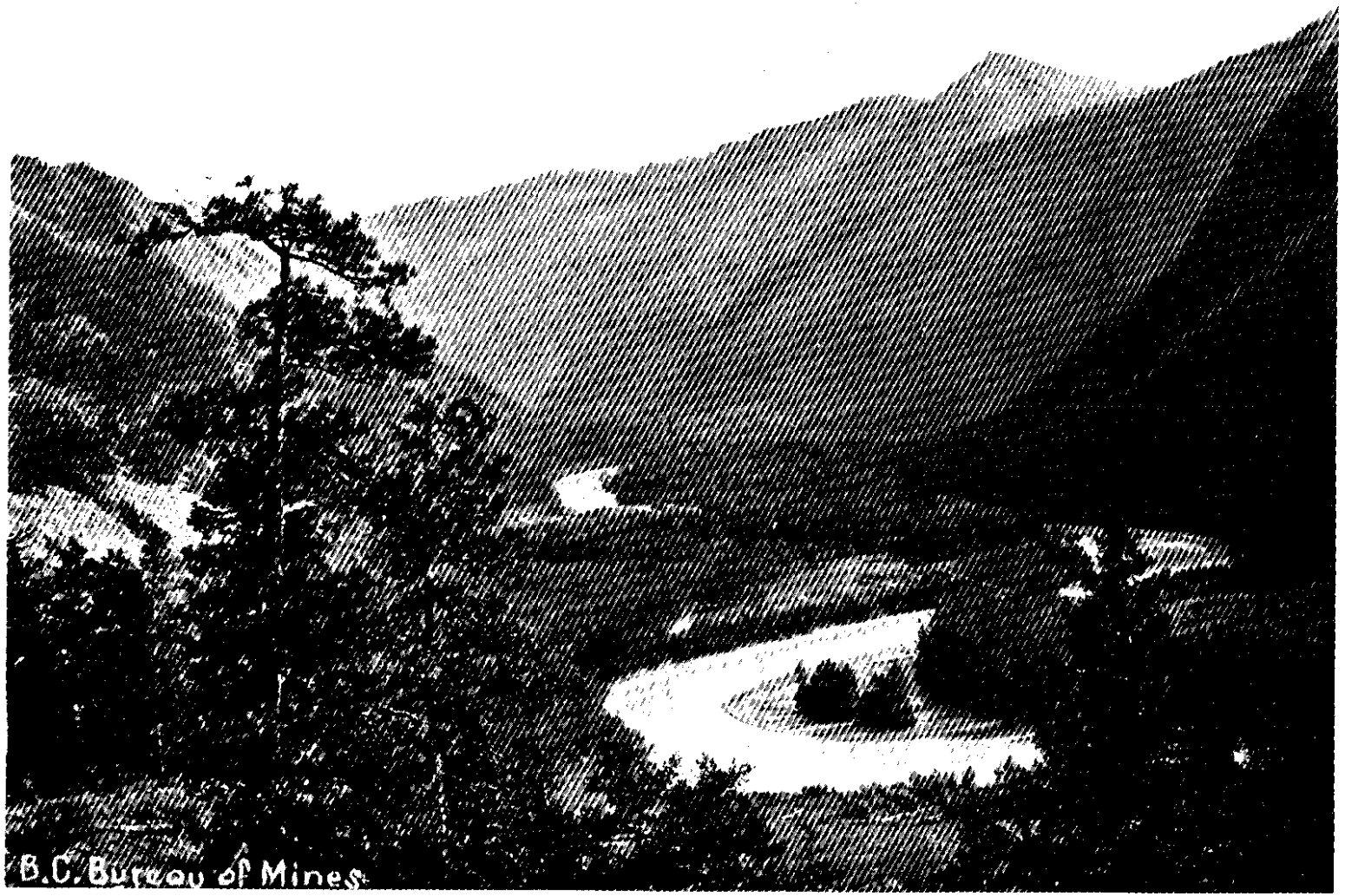
The upper, or No. 2, tunnel is 150 feet higher, at an altitude of 3,450 feet, and has been driven in about 500 feet in a general N. 25° W. direction, following in the quartz vein, which has a width of from 6 to 8 feet of quartz. About 150 feet in, the tunnel swings to the left, thus leaving the vein, but, after running a short distance on a "spur," the tunnel was swung back again to the right and again picked up the main vein, which is here very wide, and at this point considerable stoping had been done.

The main vein appears to continue in a N. 25° W. direction, but for some reason it was not followed, and the tunnel had been again deflected to the left, following a "spur" in a N. 45° W. direction. The tunnel follows in this direction for about 250 feet, but towards the face the vein disappears gradually, until, at the face, it is represented by merely a few stringers of quartz.

While the ore "peters out" in the tunnel, it is the writer's opinion that it is only on a spur from the main fissure, and it seems probable that the main vein continues, and might be picked up again from the point where the tunnel was deflected. At points along the level, stoping has been carried up for from three to five sets of timber.

The vein quartz is very white and clean, especially on the hanging-wall side, but in the portion next the foot-wall there is visible considerable decomposed iron-sulphides, with which it is suspected the gold values are chiefly associated. The amount of quartz developed is very considerable, but the gold value found in the quartz by the mill tests is admittedly low—below $5 to the ton.

Messrs. Babb *et al.*, after mining some 300 tons of quartz through the mill, dropped the lease, without, it would appear, doing any development or prospecting work other than in extracting the quartz from the stopes.



Bridge River—looking from Jones Rauche down to Canyon.

Tramway.—A back-balanced surface tramway some 750 feet long, laid at an angle of 30 degrees, connects the upper tunnel with the mill, and is equipped with two 1-ton iron skips running on 30-lb. rails. The bins at the upper terminal have a capacity of about 50 tons, and at the level of the lower tunnel, about half-way up the tramway, there is a way-station and small bunker.

Mill.—The mill building is of logs and is only partly roofed over, with sufficient room for four 5-stamp batteries, of which only two have been erected. The plant, built by the Wm. Hamilton Mfg. Co., Peterborough, Ont., consists of an 8 by 10-inch cast-iron frame Blake crusher; a stamp-mill of two 5-stamp batteries with 750-lb. stamps, dropping 8 inches; each battery is provided with double 8-foot amalgamating-plates, and suitable mercury-traps and riffles; in all, a very complete little plant. Power is provided by a 4-foot Pelton wheel under a head of 300 feet, the water being brought in from a small creek by ditch and flume to the head of the tramway, from which it is conveyed to the mill in an iron penstock.

The lower part of the McGillvray creek is in canyon, the rocky banks rising precipitously from the creek, while, about half a mile from the mouth, there is a perpendicular fall of about 50 feet, providing a water-power of great size that could be cheaply utilised.

The trail from the Anderson Lake Mining and Milling Co.'s property keeps high above the creek-bed on the east bank, and coming down gradually by a series of easy grades to the lake-level at the mouth of the creek.

At the lake there is a very good scow-landing and warehouse, to which point all the machinery and supplies are brought by water. From the landing a trail runs eastward along the north shore of Anderson and Seton lakes to Lillooet, and another westward to Pemberton Meadows; these trails formed part of the old route from Harrison lake into the Cariboo goldfields, in use in the earlier days of that excitement.

On September 12th the day's journey by pack-train included the last five miles of McGillvray creek—with a stop of about four hours at the Anderson Lake mines—and was continued westward for another four miles, when camp was made on the high bench along which the trail runs, near a meadow, invisible from the trail, where feed for the horses was found. This is said to be about the only place north of Anderson lake and west of McGillvray creek where horse-feed can be obtained, the rest of the country being heavily timbered. The country to the north-west of Anderson lake is composed of highly altered sedimentary rocks, cut by many igneous intrusions, a district which might be suspected of being mineral-bearing, but which, as yet, has not developed any mineral locations of promise.

September 13th. The trail to the north-west of Anderson lake was followed westward to the head of that lake a distance of six miles, which was reached by about 10.30 A.M. The shore of the lake, in most places, rises steep and precipitous, so that it was impossible for the trail to follow near the shore; therefore it has been run along a high bench some 800 feet higher than the lake-level and at the base of the higher hills, only descending to the lake at its western end.

From the south-west end of Anderson lake the old Cariboo waggon-road extends south-westward to the north end of Lillooet lake and to Pemberton Meadows. This interesting old road was originally very well built, and is still kept in a fair state of repair, as supplies for the Lillooet lake and Pemberton Meadows are, at present, brought in *vid* Lillooet.

The depression in which Anderson lake lies continues in a general south-westerly direction of about nine miles, gradually rising; the valley, which was nearly a mile wide at Anderson lake, narrowing almost to a gorge.

At the head of this watershed is Summit lake, at an elevation of about 1,375 feet, being 475 feet higher than Anderson lake. Summit lake is surrounded by mountains which rise to heights of 3,000 to 4,000 feet.

About two miles to the south-west of Summit lake the road crosses over the divide and on to the headwaters of Poole creek, a small creek flowing south-west into the Birkenhead river and so into Lillooet lake. On the meadows at the head of this creek is Ronald Currie's ranch, and here camp was made on the evening of September 13th after a journey of about eighteen miles.

At the head of Anderson lake there is a quantity of good land occupied by a dilapidated Indian settlement; in the valley between Anderson and Summit lakes there are several stretches of valley bottom suitable for agriculture.

About four miles and a half from Anderson lake an old-timer, named Place, has erected a cabin and store and cleared some land on which he was growing hay, and some fine vegetables, such as potatoes, beets, carrots, cabbages, etc., as well as small fruits, all of which showed that the climate and soil were admirably suited for such produce.

Currie's ranch is situated on the height of land between the watersheds of Anderson and Lillooet lakes, at an altitude of about 1,500 feet, and is quite an old settlement, dating from the time when the old waggon-road was a thoroughfare. The valley here is over half a mile wide, the bottom land containing some fine pasture land.

The snowfall here in winter is reported as being heavy, but it was evident from the luxuriant growth that both climate and soil are admirably suited for mixed farming or fruit-growing.

September 14th. The road was followed to the south-west down the valley of Poole creek—a valley containing much fine arable land—to the Birkenhead river, which was crossed on a good bridge. The Dominion Government Salmon Hatchery was passed at about noon, and here additional supplies were obtained at a small store kept at Pemberton Portage P. O. by Mr. Spetch.

The Pemberton Portage road continues down to the end of Lillooet lake, where it joins a newly built Government road leading up the Lillooet river.

About six miles up from the lake this road crosses from the east bank of the river to the west bank over a substantially built bridge; after crossing this bridge, camp was made on the flats of Pemberton Meadows; about fourteen miles having been travelled since morning.

The valley of the Lillooet river is about a mile and a half wide; the bottom land is flat meadow land composed of river-silt deposited by the slow-flowing river. The valley is flanked on either side by rocky forest-clad hills, and continues to the northward for from twenty-five to thirty miles, containing some of the finest bottom-land meadows to be found in the Province, known, generally, as the "Pemberton Meadows," and which lie at an elevation of about 875 feet above sea-level. Most of the land has been taken up by settlers or speculators, and a good waggon-road runs for twenty-six miles up the valley.

There has been little done as yet to make use of these wonderfully fine agricultural opportunities, since transportation facilities with the outside world do not exist; it is expected that this difficulty will soon be removed, as a railway-line has been surveyed through from Squamish, on Howe sound, and some preliminary construction already begun.

A certain amount of prospecting is being carried on in the mountains to the west of Pemberton Meadows and a number of claims located; these properties were not sufficiently developed to justify an inspection, but samples were obtained from the prospectors, the best of which showed a fair percentage of copper, but none gave values in gold or silver.

September 15th. The trail from Pemberton Meadows to Squamish was started upon in the morning; this leads westward from the waggon-road at the bridge, across the meadows, and after winding around some swampy ground, follows up the valley of Green river. Green river is a large stream flowing from the west into Lillooet river, practically at the lake; it rises in Green lake, on the summit between the watershed of the Squamish and Lillooet rivers. This river is about eighteen miles long, and falls about 1,500 feet in this distance; much of this drop is in a series of falls and rapids, a couple of miles up from Pemberton Meadows, producing a great water-power which could be utilised at a very small initial expenditure. The valley of the river is for the first few miles in a deep ravine, with steep sides, along which the trail has been cut out often on ledges overhanging the boiling stream, producing one of the most beautiful trails that it has been the writer's good fortune to see.

This trail, while wonderfully picturesque, is anything but desirable for the purpose for which it was intended—driving cattle over to salt-water—and is, also, singularly devoid of feed for horses or cattle, a difficulty frequently met with in the mountain trails on the Coast, but fortunately uncommon in the mountains of the Interior.

Horse-feed can only be had on the trail at three points—the first, some meadows about eight miles west of Pemberton Meadows; the next, at the west end of Green lake at the 20-mile post; and the third, at Crystal lake, or Stony creek, which are nearly adjoining. The feed is not good or plentiful in any place, and this seriously interferes with the use of the trail.

Camp was made on the evening of September 15th at the east end, or outlet, of Green lake, at the 18-mile post, at an altitude of 2,300 feet, where a little grass on the margin of the lake afforded scant feed for the small pack-train.

Green lake is a beautiful sheet of water surrounded by well-wooded hills, and abounds in trout, which will make it a popular summer resort as soon as the railway is constructed.

September 16th. Camp was moved at 9 A.M., the trail passing to the north of Green lake.

Iron-ore.—About twenty-two miles from Pemberton Meadows, on the side of the trail between the Meadows and Squamish, immediately north of Green lake, and in the Lillooet Mining Division, several mineral claims have been staked on a deposit of bog iron-ore; one of these is the *Iron Mask*, but the other claim-names could not be distinguished on the posts. This deposit extends over a considerable area, and has been slightly prospected on the surface by a number of open-cuts, the largest of which is about 20 feet long, and has developed ore to a depth of from 2 to 3 feet. A sample taken of the ore exposed in the cut gave, upon assay: Iron, 48 per cent.; silica, 2.2 per cent.; sulphur, 0.2 per cent.; phosphorus, 0.1 per cent.

The area over which iron is found is considerable, but the work done is insufficient to demonstrate the depth of the deposit and, consequently, its size. The deposit is at present commercially inaccessible, but it is directly on the surveyed line of a proposed railway between Squamish and Pemberton Meadows.

Green Lake Mines.

A short distance to the west of Green lake and above the 23-mile post from Pemberton Meadows, a trail was found leading off to the south from the main trail; this leads up to the Green Lake Mining & Milling Company's property.

The pack-train was sent on to a camp about a mile ahead, on the shore of a small lake, while the writer and Mr. Nation followed up the mine-trail on horseback; after proceeding

several miles it was considered advisable to send the saddle-horses back with a returning packer who was met on the trail, and the rest of the journey and the return, after dark, was performed on foot.

The side-trail from the main trail to the mine proved to be about seven miles long, the first part wandering over and among huge boulders and rocks slid down from the mountain. The trail gradually worked around to the south side of Green lake, and finally followed up Fitzsimmons creek, which flows into the lake, until, at an elevation of 3,450 feet, the temporary camp of the mine, consisting of a collection of tents, was found, and here the horse-trail ended. The mine workings are some 700 feet higher than the camp, at an elevation of 4,150 feet.

The property, consisting of several claims, is owned by the Green Lake Mining & Milling Company—V. Lloyd-Owen, secretary-treasurer, Vancouver,—and the mining operations were in charge of Mr. Collyer, as foreman.

The development work done was not sufficient to be conclusive; there appeared to be a great crushed zone extending in an east and west direction for a long distance, cutting diagonally down the mountain-face, and dipping into the hill at an angle of about 40 degrees in a schistose country-rock.

This crushed zone appears to be about 500 feet wide, and at places on the outcrop and in several small tunnels small lenses of chalcopyrite are found; to prospect this zone at a depth, a crosscut tunnel has been driven into the hillside—here as steep as 45 degrees—for a distance of over 400 feet, and was at that distance still in the crushed zone. At various points in the tunnel small lenses of yellow copper were visible, but in no place in sufficient quantity to suggest profitable ore.

According to the statement of the management, its prospecting indicated that the greatest prevalency of these lenses was on the hanging-wall side of the zone, and, as the tunnel had not then been driven far enough to cut the hanging-wall, it was still being driven ahead.

Subsequent reports received indicate that since September the hanging-wall has been reached without passing through any sufficient concentration of mineral to constitute ore. There is undoubtedly a large amount of copper-ore disseminated throughout this crushed zone, but so sparsely as to be quite unworkable in any part of it as yet discovered.

LILLOOET MINING DIVISION.

REPORT OF C. PHAIR, GOLD COMMISSIONER.

I have the honour to submit the annual report on the progress of mining in Lillooet Mining Division during the year 1910.

In this Division there is very little change from the previous year.

PLACER-MINING.

No work was done on any of the placer leases except on the *Jesperson* leases on Cayoosh creek, and on these only to the amount of the required assessment work. These leases are now held under bond by J. T. Mellott, of Seattle, who informed me that it is his intention to

work the ground on an extensive scale, and to drive a tunnel, in solid rock, on the north side of the falls, so that the stream may be turned into it for the purpose of carrying off the surface material, which was mined several years ago by Chinese.

Colonel T. L. Eggleston, who owns eighteen leases on Cadwallader creek and Bridge river, had the ground examined by a mining engineer, but I have not heard whether his report was favourable or otherwise.

There were six placer claims worked by individual miners, some of whom informed me that they did not make more than fair wages.

MINERAL CLAIMS.

The *Anderson Lake* mines, on McGillivray creek, were worked by H. M. Babb, who held the claims under an option; he milled 300 tons of ore.

Pioneer.—Mr. F. H. Kinder, unaided, crushed with an arrastra 8 tons of ore from the *Pioneer* claim, which yielded $400.

Lorne and Woodchuck Group.—The Lorne Amalgamated Mines Company has acquired the *Lorne* and *Woodchuck* groups, consisting of six claims. The 5-stamp mill on the *Woodchuck* claim, partly erected some years ago, was completed and operated during part of the season, crushing 315 tons, which yielded $4,476. Mr. Daniel Hurley is the manager.

Ben d'Or Mines.—The *Ben d'Or* mines were again operated by Mr. A. F. Noel, under lease, who milled 135 tons. He has not made a return of the yield as yet, but he told me he struck very rich ore. He extended the tunnel 60 feet and did some stoping.

Green Lake Group.

The *Royal Edward, Iron Hat, Tonapah, Iron Wedge, London, Albany, Eldorado, Hard Cash, Ophir,* and *Midget* claims, at Green lake, are bonded to Mr. A. McEvoy, of Vancouver, for $30,000. These mines are being operated by the Green Lake Mining and Milling Company, Limited, and I am indebted to Mr. V. Lloyd-Owen, the secretary-treasurer of the company, for the following information:—

An exploratory tunnel, 6 x 4 feet, driven to crosscut the formation, was started on the *London* claim, and last November, when work was discontinued for the winter, it was driven 527 feet. For practically the whole distance the tunnel went through low-grade ore, showing values in gold, silver, and copper.

From surveys made during the summer, it appears that the best of the ore is to be expected at about 570 feet from the mouth of the tunnel.

In addition to driving the tunnel, considerable exploratory and development work was carried on—such as open-cuts, aggregating several hundred feet in length, cutting and stripping the ore-body.

At present there is no machinery on the ground, but water rights have been acquired on London and Fitzsimmons creeks, insuring ample power for mining and other purposes.

The Howe Sound and Northern Railway is being pushed forward from Newport, some twelve miles of steel having been laid, and efforts will be made to have these mines in a position to ship ore by the time the railway reaches the property.

The new Government waggon-road from the Mission on Seton lake to Bridge river, which was begun this year, will greatly help in the development of that camp. The high prices paid in the past for packing supplies over a trail retarded development.

OFFICE STATISTICS—LILLOOET MINING DIVISION.

Mineral claims recorded	123
Placer claims recorded	11
Certificates of work recorded	79
Conveyances recorded	93
Mining and dredging leases in force	38
Free miner's certificates issued	125

Revenue.

Free miner's certificates	$ 640 00
Mining receipts, general	3,546 45
Tax—Crown-granted mineral claims	488 25
Mineral-tax	64 32
	$4,739 02

CLINTON MINING DIVISION.

REPORT OF F. SOUES, GOLD COMMISSIONER.

I have the honour to submit the annual report for the Clinton Mining Division of Lillooet District for the year ending December 31st, 1910.

I regret that there has been no improvement in mining in this Division in the past year; as a matter of fact, the industry, once flourishing, may now be said to be dead. A few mineral claims have been recorded, but that does not constitute mining. I am not aware that any attempt at development has been done on any of them.

The various dredging leases on the Fraser river have been amalgamated in one company—The Canada Dredging Co., Ltd.—but there has not been any work done by the company up to the end of the past year.

OFFICE STATISTICS—CLINTON MINING DIVISION.

Mineral claims recorded	16
Certificates of work	15
Mining leases in force	11
Dredging "	13
Conveyances recorded	16

Revenue.

Free miner's certificates	$ 204 50
Mining receipts, general	139 60
	$ 344 10

VANCOUVER ISLAND AND COAST.

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ALBERNI DISTRICT.

ALBERNI MINING DIVISION.

H. C. RAYSON, GOLD COMMISSIONER.

I have the honour to submit the annual report on mining in the Alberni Mining Division during the year ending December 31st, 1910.

With the exception of smelter tests, there have been no actual shipments of ore from this district, yet work of a development nature has been going on on many properties, with a creditable amount of briskness, such work further convincing the respective owners that continued development will expose leads that will warrant a larger outlay of capital.

In instance of a few of the most active properties, there is the *Raven* group of Ward & Rochester, within sight of Alberni, where a 6-inch lead of copper-ore is being followed up. On the *Thunderbolt* group, T. H. Knight-Bayne has carried his tunnelling along one of the many rich stringers to within striking distance of the main body, besides showing up large exposures of iron-capping with frequent indications of copper. J. Wilkinson has done steady work this summer on the large iron-exposure on the *Black Prince*, this being one of the many good surface showings met with in Uchucklesat harbour and Snug basin. The Mercury Mines Co., Ltd., having acquired the cinnabar properties situate at Sechart, pushed the workings energetically this summer, with very encouraging results; work will be again resumed with increased activity during 1911.

The placer leases on Wreck bay, having lapsed through want of the required development work, were eagerly re-leased by parties said to be actively engaged in dredging operations at Nome.

There was a considerable excitement and stampede for leases and placer claims on China creek during the spring, but nothing was attempted in the way of washing or hydraulicking—indeed, the boom was the work of the company-promotor, who thought he saw easy money in the gentlemen from Nome.

There has been a good deal of locating done in the neighbourhood of the *Big Interior* group and work to cover improvements for the year. R. W. Lindsay's claims on Sproat lake and Taylor river were bonded to Vancouver parties, and have been further developed in consequence.

Applications for coal-prospecting licences continue, the ground covered being along the coast at Nitinat, Hesquot, Quatsino sound, and the West arm, also in the townsite of Alberni, where some very promising-looking strata were exposed recently.

OFFICE STATISTICS—ALBERNI MINING DIVISION.

Free miner's certificates issued	116
Mineral claims recorded	39
Certificates of work recorded	42
Transfers	14
Certificates of improvements issued	8
Powers of attorney	2
Crown-granted mineral claims on roll	209

Revenue.

Free miner's certificates	$ 465 70
Mining receipts, general	425 90
Acreage tax on unworked Crown-granted mineral claims	1,411 00
Total	$2,302 60

CLAYOQUOT MINING DIVISION.

REPORT OF W. T. DAWLEY, MINING RECORDER.

I have the honour to submit the annual report on mining operations in the Clayoquot Mining Division for the year ending December 31st, 1910.

During the past year more prospecting was done than in previous years, and the number of claims staked shows a marked increase. There has been an important discovery of limestone in the district, which, with the clay which is located near it, should prove valuable for the manufacture of cement.

The following work was done during the year:—

No. 36, situated at Catface mountain, owned by H. H. Rhodes—stripping and removing slide and retimbering tunnel, to cover annual assessment work.

Copper King No. 1, *No. 2*, and *No. 3*, situate at Ahousat, owned by S. Watson and P. Sullivan—large cut, 12 by 5 by 6 feet; also extended main tunnel 2 feet; 80 feet stripping, 6 feet wide.

Brown Jug No. 3 and *Golden Cache*, situate at Hesquot lake, owned by A. Norris and A. E. Waterhouse—tunnel extended 10 feet long, 4 feet wide, and 6 feet high.

Mamie, *Maggie*, *Sadie*, and *Rose*, situate at Elk river, a group owned by C. Dawley and A. Watson—tunnelling 22 feet 9 inches long, 4 feet wide by 7 feet high; open-cut at mouth of tunnel, 30 feet long, 10 feet high, 4 feet wide.

Roosevelt, situate at Elk river, owned by Paul Wollan—open-cut, 15 feet long, 4 feet 4 inches wide, 6 feet 8 inches deep.

Prince Alfred, situated at Clayoquot river, owned by P. and A. Wollan—tunnel, 9 feet long, 4 feet 8 inches wide by 6 feet 10 inches.

Pete and *Iron King*, situate at Ahousat, owned by W. Wilson and J. Irving—$200 cash paid to cover annual assessment work.

Island Belle No. 1 and *Island Belle No. 2*, situate at Elk river, owned by Wilson, Irving, and Lindsay—$200 cash was paid.

Double Standard and *Ivanhoe*, situate at Nootka sound, owned by W. Wilson—$200 cash was paid.

Lilly May, *Jay Gould*, *Rothschilds*, *Hetty Green*, and *Great Western*, situate at Deer creek, owned by James Thompson and partners—50 feet tunnelling, 6 feet and 4 feet.

O K. No. 3, situated at Kennedy lake, owned by T. G. Norgar—extended tunnel 4 by 6 by 7 feet, and stripped on the lead 24 feet long by 15 feet wide, and 4 feet deep.

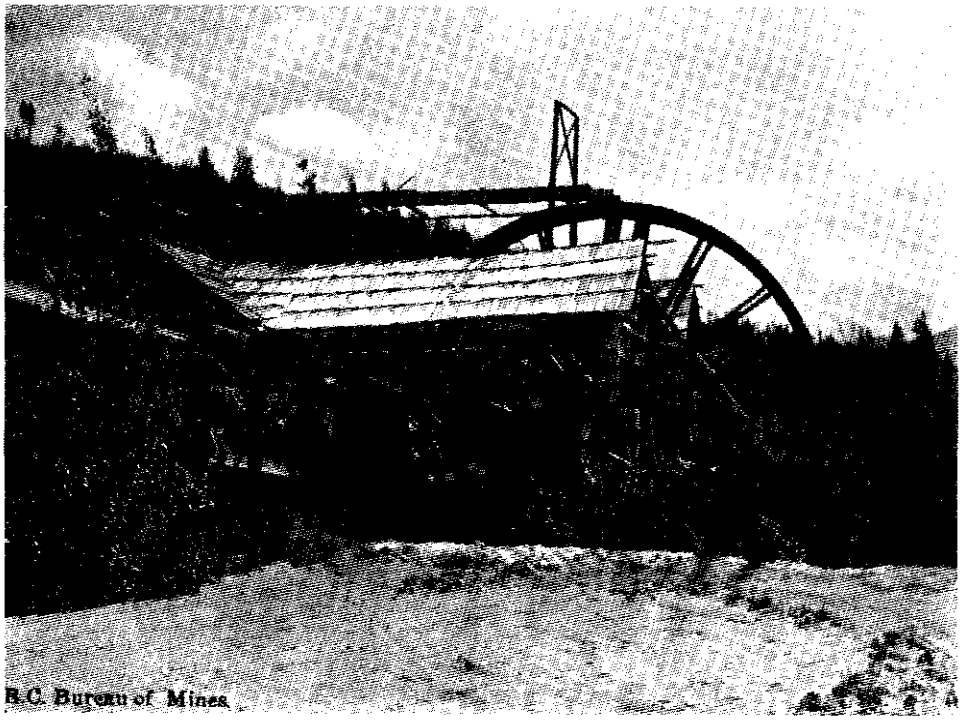
Leora, situate at Elk river, owned by D. W. Hanbury and C. Bowes—sunk shaft 30 feet by 8 feet square; built 1,500 feet tramway from mouth of tunnel to east bank of Elk river, for the shipment of ore, at a cost of $1,000, to cover assessment work for four years.

OFFICE STATISTICS—CLAYOQUOT MINING DIVISION.

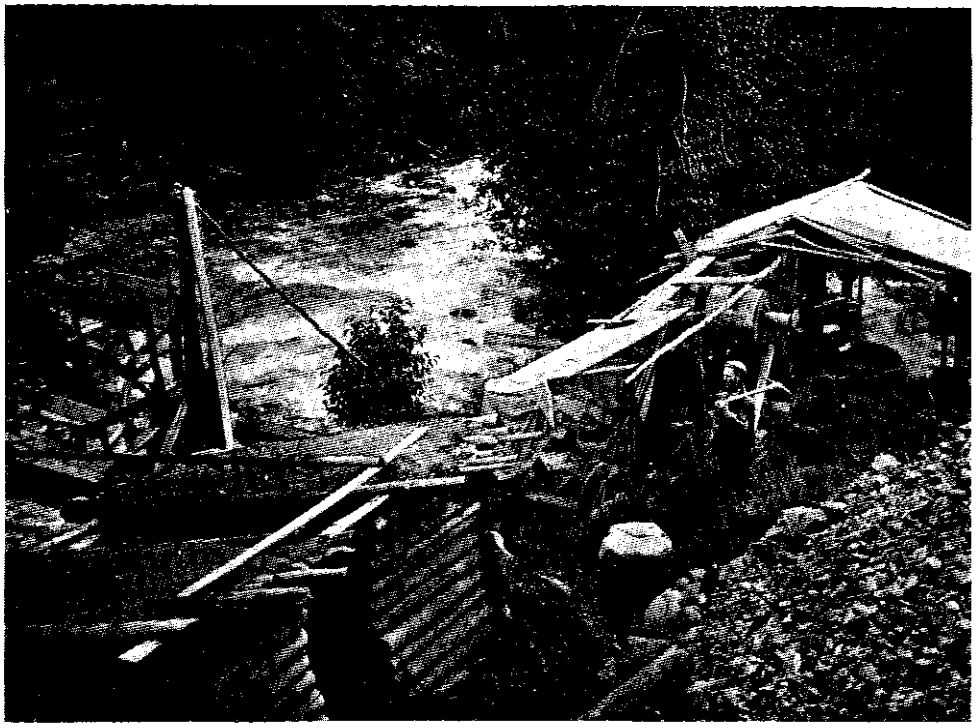
Free miner's certificates issued	17
Mineral claims recorded	37
Certificates of work recorded	25
Transfers, sales, etc., recorded	7

Revenue.

Free miner's certificates	$ 76 75
Mining receipts, general	801 75
	$ 878 50



Old Arrastra—Lorne Mine—Cadwallader Creek.



Arrastra—Pioneer Mine—Cadwallader Creek.

QUATSINO MINING DIVISION.

REPORT OF O. A. SHERBERG, MINING RECORDER.

I have the honour to submit the annual report on the mining operations in the Quatsino Mining Division for the year ending December 31st, 1910.

There has been more interest taken in development work, especially towards the end of this year, than during the preceding year, both in mineral claims and coal leases.

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On the *Rupert* mineral claim, situate at Rupert arm of Quatsino sound, work has been carried on since May, when that property was bonded by the Canadian American Exploration Company. The work done consists of about 400 feet underground work in shaft, tunnel, and crosscut; also open-cuts. At the depth of 80 feet they struck four stringers of copper-glance ore lying close together, on which they are now sinking a shaft. Although the ore appears in very small quantity, the indications are quite favourable to keep on with the work.

A group of three mineral claims situate at Teeta river, south-east arm of Quatsino sound, has recently been bonded from Chris. Nordstrom and G. Sorenson. A few men have been at work building a camp and a float for landing supplies; rock-work will be commenced in a few days.

Considerable work had already been done by the former owners of this property in stripping, open-cuts, and a tunnel started on a 4-foot quartz vein, and I understand that it is the intention of the new party to go ahead with the tunnel. Sample assays have been taken from this quartz that carried considerable gold.

Development work has been carried on continuously during the past year by Thomas Pearson, of Vancouver, on the coal property, situate on the west arm of Quatsino sound, owned by the Quatsino Coal Syndicate. The underground work has been extended about 600 feet.

In the latter part of September a diamond drill was brought here and work started on a coal property consisting of twenty claims situate on the north side of the main channel of Quatsino sound, opposite Limestone island.

The Manhattan Coal Co., which owns a few coal claims on the south side, will be ready in about a week to start work with a diamond drill on its property near Monkey creek.

OFFICE STATISTICS—QUATSINO MINING DIVISION.

Free miner's certificates	40
Mineral claims recorded	58
Certificates of work recorded	25
Certificates of improvements recorded	26
Bills of sale, etc., recorded	10

Revenue.

Free miner's certificates	$184 75
Mining receipts, general	452 20
Total	$636 95

NANAIMO DISTRICT.

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NANAIMO MINING DIVISION.

REPORT BY WM. FLEET ROBERTSON, PROVINCIAL MINERALOGIST.

TATLAYOKO LAKE DISTRICT.

In July, 1910, the Provincial Mineralogist made a trip into the country at the headwaters of the Homathko river, in the vicinity of Tatlayoko lake, where some prospecting had been going on. This district is of interest, as it is about on the contact of the Coast Range granites with the sedimentary rocks of the Interior. That this contact is the most likely section near the Coast for prospecting, and will probably be found mineral-bearing at various points, has been pointed out in these reports, and is particularly noticed on page 67 of this Report, on Portland Canal Mining Division. In this particular section of the contact mentioned, few prospectors have been in the field; it is, so far, virgin ground, and is well worth examination.

At the present time there are no transportation facilities for the shipping of ores, unless of exceptionally high value, nor does it seem probable that such transportation will be provided in the near future; there is, however, no great difficulty in getting supplies or machinery into the district. For this reason it may be advisable for the prospector to give more particular attention to gold-ores, which may be treated on the ground, until such time as sufficiently large and numerous deposits of the base metals have been proven to justify the construction of a railway.

The following report on the district was made by the Provincial Mineralogist to the Honourable the Minister of Mines in August, 1910:—

DEPARTMENT OF MINES,
VICTORIA, August 18th, 1910.

SIR,—With regard to the country in the vicinity of Tatlayoko lake, the headwaters of the Homathko river, on which, at the request of the Honourable the Minister of Works, you instructed me to report, and to advise you whether the mineral probabilities justified the building of a waggon-road into the district.

I have just returned from an inspection of the properties held by Mr. A. H. Sheppard and associates on Tatlayoko lake, and find that they have some eleven or twelve mineral claims, divided into two groups which they call the *Copper Camp* and the *Gold Camp*.

These groups adjoin and are situated on the eastern side of the valley in which Tatlayoko lake lies, some two miles south of the southern end of the lake and directly opposite the pass by which the Homathko river—the outlet of the lake—breaks to the westward through the Coast range of mountains and flows to the south-west into the head of Bute inlet, a distance of from fifty to seventy-five miles.

Tatlayoko lake is at an elevation of about 2,700 feet above sea-level, and the mineral claims referred to are at an altitude of 5,900 feet, or 3,200 feet higher than the lake.

The property is in the Nanaimo Mining Division, being in the Coast watershed, but at present is only to be reached through the Clinton Mining Division—from Ashcroft by waggon-road, *viâ* the 150-Mile House, thence, *viâ* Williams lake, crossing the Fraser river by the

Chimney Creek bridge to Chilcotin, Hanceville, and Alexis Creek. The distance by waggon or stage road from Ashcroft to Alexis Creek is about 225 miles, to which point there is a regular bi-weekly stage and mail service, over good roads.

An alternative route leaves the Cariboo stage-road either at Clinton or at 59-Mile House, crossing the Fraser river by the Government ferry at Churn creek, thence *viâ* the "Gang Ranch" to Hanceville; this latter route is shorter and is preferred by freighters, but, as these roads are in poor condition and there are no stopping-houses, the former route is taken for passenger service.

From Alexis Creek a fairly good waggon-road continues westward for some fifty miles to Tatla lake, and is much used by the settlers of the district.

From the end of the established waggon-road, Mr. Sheppard has had no special difficulty in continuing to the northern end of Tatlayoko lake, an estimated further distance of some fifty miles (I went a short cut by pack-train, so did not see this part of route), using an ordinary Studebaker waggon with two horses—taking in a fair load of freight, with, to my knowledge, in one instance, a woman seated on top of the freight. This would indicate to me that the unbuilt waggon-road is through easy country, and that comparatively little and inexpensive work would render the road quite serviceable to the north end of Tatlayoko lake. These Chilcotin waggon-roads have been in use for twenty or thirty years and are quite good enough for the service required; an automobile has passed over all of them.

In passing from the watershed of the Chilcotin river over to the watershed of the Homathko, the divide is so low (about 3,000 feet) and gradual as to be imperceptible, and, to quote Dr. G. M. Dawson, in Geological Survey Report, 1875, on the point, "but without attention it would hardly be known that so important a feature in the hydrography of the country existed here."

From inquiry I learn that the usual freight rate from Ashcroft to Alexis Creek by team has been from 2½ to 3 cents a pound, but this last season, due to the rush on the Cariboo road, the rate went up to 4 cents a pound. I should estimate that 2 cents a pound would take freight from Alexis creek to the north end of Tatlayoko lake. The time occupied by a freight team between Ashcroft and the lake would be from two to three weeks.

Tatlayoko lake is from fifteen to twenty miles long, running north and south in a narrow valley flanked on the west by high mountains rising abruptly from the water's edge; on the east side the mountains do not rise so abruptly, the slope being more or less terraced, but these terraces are broken in continuity by granite or other plutonic masses of rock, which would render it difficult and expensive to construct a waggon-road along this shore.

On this point, however, I might say that on the eastern shore of the lake the location stakes of the original route laid out for the Canadian Pacific Railway are still visible, the plans and sections for which, from Bute inlet *viâ* Tatlayoko lake to Tatla lake, etc., are still available.

Further, if I am correctly informed, it was by this route that Waddington attempted to find a route for the first waggon-road into the Cariboo country, and his reports thereon should also be available.

There is a trail along the eastern side of Taklayoko lake which might easily be made a very good one, but is now sadly in need of attention and relocation in places.

Mr. Sheppard takes his waggon only to the head of the lake, and transports his freight down the lake in a boat; from the foot of the lake the trail starts up to the claims, a climb of 3,200 feet, and this calls for pack-horses, a condition which would not be altered, however much the transportation facilities into the district might be improved.

I met Mr. Sheppard at Ashcroft—his partner, Mr. Thomas Morris, was at the mines, in charge of the work.

The Copper Camp Group.

The *Copper* group (*Copper Dyke, Copper Dyke Ext.* mineral claims, etc.) is the most northerly of the Sheppard claims, and on this from 480 to 500 feet of tunnelling has been done. At an altitude of about 6,200 feet, on a bare, rocky peak, a certain amount of copper-carbonate and copper-stain led to the belief that there was a copper vein below, and at an altitude of 5,900 feet a tunnel was driven in (S. 45° E.) for 300 feet. This tunnel is driven in on a basic dyke, about 4 feet wide, with a seam of calcite, about half an inch wide, on either side of it.

I could not see even an *indication of mineral* in the tunnel, except a little copper-stain in the $\frac{1}{2}$-inch calcite seam, so there was nothing to sample.

I told Mr. Morris my opinion, and asked him to break me a sample of what he considered "*the very best rock in the tunnel.*" This he did in my presence, and I have brought the sample down and have had it assayed; it does not contain more than a trace of copper, gold, or silver.

Some 400 feet lower than the upper tunnel a crosscut tunnel has been started and driven for 180 feet, but, as Mr. Morris explained, "it had still to be driven 250 feet farther before they expected to cut the lead."

Mr. Morris quotes Mr. Sheppard as authority for the statement that the rock from the upper tunnel "averaged 2.12 per cent. copper, and some assays gave as high as 16 per cent. copper."

The fact is, there never was any *ore* in the tunnel that assayed in copper, and the 500 feet of drifting done never had any justification. Why money was thus expended I am unable to say; no work has been done on this group this past year.

Tatlayoko Lake Gold Mining Co.

The *Gold* group, of which the principal claim is the *Tyee* mineral claim, lies to the south of the *Copper Camp*, at an altitude of 5,900 feet and above timber-line. The country-rock here is a network of dykes, mostly basic, frequently cut by more recent acid dykes; these dykes are so numerous as to completely obliterate most signs of the original sedimentary formation.

Cutting through this network of dykes there was seen, outcropping on the surface, a quartz vein, having a strike of about S. 20° E., and dipping to the east, into the hill, at an angle of 37 degrees—very persistent in its course, but of variable width, varying from a few inches to several feet. I took a rough sample of this outcrop, at one of the wide parts where it seemed to be most heavily mineralised, and find it to assay: Gold, 3.50 oz.; silver, $26 to ton, being ore worth about $85 to the ton.

Associated with this quartz vein, apparently in lenses lying alongside the vein, were considerable quantities of stibnite—sulphide of antimony—mixed with quartz. These lenses assayed about the same in gold as did the main vein, and such experiments as I have been able to make did not indicate any increased gold values with an increasing percentage of antimony, from which I argue that the gold value is not associated with the stibnite, although it seems probable that the silver values are so carried.

To strike this outcrop at a depth, a crosscut tunnel had been run, S. 55° E., for 60 feet without cutting the vein; a raise was then put up from the tunnel for 18 feet, and the vein was found, being here about 12 inches wide. I sampled it at this point, and found it to carry: Gold, 0.28 oz.; silver, 2.60 oz.; about $7 ore. The raise indicated that the tunnel was too far to the right, so a deflection was made to the left for 30 feet, when the vein was struck at the tunnel level, and subsequently this vein has been drifted on for 20 feet, but the last 12 feet only of the tunnel might be considered as in commercial ore.

At the face of the tunnel the whole drift was in ore, and apparently had not disclosed the full width of the ore-body. What was considered the "hanging-wall" was quartz, which I had sampled, and it assayed: Gold, $8; silver, 16 oz. to the ton; below this the vein was exposed for a width of 90 inches, which I sampled, in three parts of 30 inches each, and assayed, as follows:—

	Gold, oz.	Silver, oz.
30 inches, next hanging-wall	Trace.	0.4
30 inches, middle of vein	0.14	1.0
30 inches, bottom of vein	0.20	30.4

The lower 30 inches of the exposure in the face of the tunnel contains a considerable percentage of sulphide of antimony; this part of the vein continued into the floor of the tunnel, for a depth not determined, so that the 30 inches sampled does not represent the full thickness of this grade of ore.

These samples were certainly encouraging, but not as yet commercial ore in this locality, and not nearly up to the indications of the surface outcrops.

At an elevation some 100 feet lower than the upper tunnel, a lower tunnel has been driven in on another quartz vein, which vein is from 6 to 12 inches in width, having a strike of about S. 55° E. (mag.), and a dip to the north-east of 35 degrees. This vein was followed in by the tunnel for 105 feet, when another vein, having a strike S. 32° E., and a flatter dip, was encountered, and the tunnel was deflected to the left along this for 54 feet, when a further deflection was made to the left—to S. 32° W.—and the tunnel continued for 90 feet; in which latter portion it could not be seen that any vein was followed or cut. The quartz in this lower vein was sampled and assayed, and contained: Gold, 2.90 oz., and silver, $1.50 a ton, equivalent to about $59 to the ton.

The property stands as a prospect upon which they have driven 12 feet on a body of ore, as indicating by assays, of increasing and as yet undetermined size.

As to the geology of the district, the granite and other plutonic rocks forming the Coast Range mountains extend eastward as far as Tatlayoko lake; on the east side of this lake are the sedimentary rocks of the Interior, and along this contact there is a strong probability that productive mineral deposits occur, particularly where the dykes from the main Coast upheaval have struck off into the sedimentaries. It is on this contact that the mineral locations of Portland canal, the Telkwa, and of Lillooet are found.

While the Sheppard locations are merely prospects, and in no way justify the expenditure of any serious amount of money by the Government for better transportation, still the district in general is so promising that, in my opinion, it is highly desirable that a trail be put through from the Coast (Bute inlet) into the district, but I do not think there is any present need for a waggon-road.

I am, Sir,

Yours truly,

W. F. ROBERTSON,

Provincial Mineralogist.

NANAIMO MINING DIVISION.

NOTES BY PROVINCIAL ASSAYER.

VALDES ISLAND.

The name Valdes has for many years been applied to what was supposed to be one island, lying between Vancouver Island and the Mainland, opposite the mouth of Bute inlet, and separated from Vancouver Island by Seymour narrows. This island was first charted by Captain George Vancouver in 1792, but subsequent, in fact recent, explorations and surveys have shown that, instead of being only one island, it was really a group of three or four islands, separated, in a most remarkable manner, by narrow salt-water passages, through which the spring tides rush with great violence. The name "Valdes Island," however, still is applied to the group, which is distant some 140 miles from Vancouver City, with which point, and also with Vancouver Island ports, frequent steamboat communication is maintained. This group of islands has for many years yielded an immense quantity of beautiful fir and cedar timber, and is traversed in many directions by old logging-roads.

From Open bay, on the east coast of the most southerly island of the Valdes group, a belt of limestone extends in a north-westerly direction towards Granite bay, on the north-west coast; associated with which, and at certain points penetrating it, is a dark igneous rock having in places a porphyritic structure, while, on either side of the limestone, the country-rock is granite. Along the belt referred to a series of ore outcroppings have been found and claims located.

Great Granite Mines.

These properties have been consolidated as two groups, the *Lucky Jim* and *Great Granite*, owned by the Great Granite Development Syndicate, Limited, of Vancouver; Crown grants are being applied for. These properties were examined for the writer in 1908, and since then most of the development work has been done on the *Lucky Jim*; this claim is situated close to the Hastings Sawmill Company's railroad-track, about two miles and three-quarters from deep water at Granite bay.

On the *Lucky Jim* the shaft has been continued to a depth of 110 feet, and follows the vein at an angle of 80 degrees. At the time the property was visited a change was being made from hand-drilling to machine work, and an eight-drill Rand compressor and hoist were being installed. While this was being done the shaft had been allowed to become half filled with water and it could not be examined.

The management stated that there was good ore for the entire depth of the shaft, and that 184 tons, taken from about 75 feet down, gave $22 in gold, 8 per cent. copper, and 3½ oz. of silver per ton, and at the bottom of the shaft the ore was even of a higher grade; an examination of the ore on the dump would seem to confirm the above statement.

The ore-zone runs in a south-easterly direction; about 300 feet south-east of the shaft, a prospect tunnel has been run in 150 feet and has cut across the ore-body diagonally; while this has not developed up any large ore-body, yet the ore is amply proved to extend in this direction and to be of the same nature and quality as that obtained from the shaft. The tunnel is 55 feet lower than the collar of the shaft.

To the north the country-rock is a great granite batholith, while to the south a crystalline limestone extends for miles. The ore in these claims seems to have been formed alongside diabase dykes of considerable size, but the ore-bearing solutions appear to have come up at a later date, during a second period of movement along old fracture planes. The gangue matter

is a crystalline limestone in which the ore occurs as bands and masses. There is very little evidence of calcite or quartz, the main ore-body being in solid crystalline limestone, the latter enclosing large fragments of the original diabase dyke.

In an open-cut in the *Lucky Jim* a cross-dyke of still later date is seen, cutting the ore-body and also the larger diabase dyke. This smaller dyke is more porphyritic in character and the appearance of tellurides in quartz may be associated with the latter dyke.

Two parallel zones of mineralisation occur 300 feet to the north and 300 feet to the south of the *Lucky Jim* shaft. It is intended to crosscut these zones when the shaft has been sunk to a depth of 200 feet.

The main ore-zone has been prospected for a distance of 1,500 feet by open-cuts and gives indications of ore at all points; the general outlook for the property is encouraging.

The equipment consists of a small boiler and hoist, a large boiler and eight-drill Rand compressor and pumps, the whole being installed in a very substantial manner.

Since the above was written information has been received that the shaft has been pumped out and the new compressor plant started up; east and west drifts have been started in the shaft from the 100-foot level, the east drift being in 25 feet and the west 15 feet, showing up good ore, with copper and gold-telluride mineralisation.

Great Gold Group.

The group consists of seven claims, viz.: *Granite*, *Little Copper*, *Great Gold*, *Boulder*, and *Little Silver*, owned by the Great Gold Development Syndicate, with head office in the Winch Building, Vancouver. The principal work has been done on the *Great Gold* claim, on which a large prospect-hole 8 x 10 feet has been sunk to a depth of 8 feet. There is a good showing of ore in this hole, on a granite and limestone contact; the mineralisation on the surface is mostly pyrrhotite, but gives place to copper-pyrites in the bottom, the gangue matter being a dark, fine-grained rock having a considerable amount of lime in its composition. Very little quartz was seen here, limestone being noted to the north and granite to the south.

A general shipment of ore from this prospect-hole is said to have run 6 per cent. copper, $1 to $2 in gold, and 3 to 5 oz. of silver to the ton. This appears to be a fair average of the ore.

White Swan Group.

This property is situated near the Hastings Sawmill Company's railroad-track, some four miles from Granite bay, at a slightly higher elevation than the *Lucky Jim* claim. The group consists of the *White Swan*, *Sunrise*, and *Mystic Cave*, and is owned by the Canadian-American Exploration Company, Limited, of Vancouver.

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A number of prospect-holes and open-cuts have been made, principally in a diabase rock near a limestone contact. This surface work shows a slight mineralisation, consisting largely of pyrrhotite with pyrite, a little chalcopyrite and arsenical iron, the latter, however, not yielding the high gold values elsewhere associated with this mineral. A large shaft, 11 x 8½ feet, has been sunk vertically 50 feet in diabase rock; from the bottom of the shaft a drift has been run N. 50° W., and another drift also starts from the shaft running S. 50° E. for 30 feet, then turning sharply to S. 45° W. and continuing for 50 feet farther. Work at the end of this drift has been discontinued, but is being pushed from the turn in a direction S. 50° E.

The drifting has been done with the object of cutting the lime-diabase contact, where it is hoped ore may be found. All the underground work is in a rather tight diabase rock, very sparsely mineralised with pyrrhotite and a little copper-pyrite, but at no point has commercial

ore yet been struck. The mineralisation is of a different character to that found in the Great Granite Mines, the gangue matter being quartz instead of limestone; the contact and strike of the mineral zone is also more obscure.

The equipment consists of a small steam-hoist and boiler.

LASQUETI ISLAND.

This is a small, rocky island some fifteen miles long, situated towards the southern end of Texada island, in Nanaimo Mining Division, and easily reached from either Nanaimo or Vancouver.

St. Joseph Group.

This group of claims is situate on Section 21, on the north shore of Lasqueti island, a short distance west of West point, and is owned by the Lasqueti Mining Company, of Vancouver; Percy Williams, engineer. The general country-rock around Tucker bay and West point, on the north shore, is diabase, fissured in places and cut by occasional dykes of the same rock. A fissured zone occurs on the *St. Joseph* claim, running directly into the island, with a north and south strike and dipping 70 degrees to the north; the fissure, which is about 6 feet wide, is filled with crushed diabasic rock, showing much slickensiding and movement, but is very tight; this rock appears quite similar to the country-rock, and may have been derived from it or from a later dyke which had been subsequently crushed up.

A tunnel was started about 30 feet above high water, the bank at this point rising abruptly, and has been run in 93 feet approximately on the strike of the fissured zone. At 16 feet from the mouth, a crosscut has been run to the left for 20 feet; this has cut through the zone referred to and is in the solid country-rock.

Higher up the bank, and 38 feet vertically above the tunnel, an inclined shaft has been sunk to a depth of 100 feet, at an angle of 70 degrees; this follows the fissure for 80 feet, when the latter dips at a slightly greater angle. It is proposed to make a station at the 100-foot level and run a crosscut west through the fissured zone.

The ore occurs in small seams and stringers in the fissure, and consists of marcasite and chalcopyrite. The mineralisation throughout is very sparse, the fissure apparently having been too tightly filled with rock, at the time the mineralised solutions attempted to penetrate it, to allow of the formation of any considerable body of ore.

NANAIMO MINING DIVISION.

REPORT OF GEORGE THOMSON, GOLD COMMISSIONER.

I have the honour to submit herewith the annual report on the mining operations in the Nanaimo Mining Division for the year ending the 31st December, 1910.

The mining situation in this Division remains practically unchanged since my report of last year.

OFFICE STATISTICS—NANAIMO MINING DIVISION.

Free miner's certificates (individual)	402
" " (company)	3
" " (special)	1
Mineral claims recorded	260
Certificates of work recorded	287
Paid in lieu of work	12
Certificates of improvements	3
Transfers and agreements recorded	33

Ben d'Or Mine—Cadwallader Creek—Lillooet Mining Division.

VICTORIA DISTRICT.

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VICTORIA MINING DIVISION.

REPORT OF GRANVILLE CUPPAGE, MINING RECORDER.

I have the honour to submit the mining report for the Victoria Mining Division for the year 1910.

The office statistics show an increase of revenue of $2,640.36 over those of the preceding year. The mining situation has remained practically unchanged, and the increase of revenue, especially in free miner's certificates, may be accounted for by prospectors, etc., obtaining their licences here on their way through to the Portland Canal district.

The mining receipts show an increase in revenue of $853.40, largely due to claim-owners absent from the district, who preferred to pay their money in lieu of doing the annual assessment work.

OFFICE STATISTICS—VICTORIA MINING DIVISION.

Free miner's certificates	693
" " (special)	7
Mineral claims recorded	53
Certificates of work recorded	58
Certificates of improvements recorded	4
Conveyances recorded	17
Placer leases issued	6

Revenue.

Free miner's certificates	$6,201 54
Mining receipts, general	1,717 95
Total	$7,919 49

NOTES BY PROVINCIAL MINERALOGIST.

Probably the most extensive hydraulic placer-mining enterprise that has yet been undertaken on Vancouver Island was started over a year ago on the southern shore of Vancouver Island, about forty-five miles from Victoria, at a point where the Sombrio and Lost rivers empty into the Straits of Juan de Fuca. The enterprise has been undertaken by the Sombrio Mining Partnership, composed of D. H. Hanbury and associates, of Victoria; the work is being done under the superintendence of R. S. Gallop. The property consists of some 286 acres of Crown-granted land—five hydraulic and four creek mining leases.

The ground covered by the leases consists of a large deposit of gravel formed at the mouth of the Sombrio river, at which point it is probable the old channel of Lost river also came out, although now it finds its way into the sea through a new channel, two miles to the eastward, cut through the rim-rock of the older channel.

From the report of George Jamme, mining engineer, of Seattle, who examined the property, the amount of gold-bearing gravel here available is very large. Immediately back of this gravel delta the hills rise rapidly; the hills being composed of schists, greenstones,

conglomerate, sandstones, and shales, with heavy deposits of gravel, that filled, at one time, the river valleys, which were evidently gouged out by glacial action. Into these gravel-beds the present streams have cut deeply, depositing their detritus—and probably the gold—in the delta covered by the leases.

The water-supply is furnished by the Sombrio and Lost rivers, the former estimated as having a flow of 400 cubic feet a second, and the latter 700 cubic feet a second, which has been brought on to the ground, at present in a small flume, under a head of 200 feet. A good tailings-dump, into the sea, is available for all time.

Mr. Jamme's estimate of the gold-tenure of the gravels is "about 15 cents per cubic yard."

The company has already installed a plant consisting of 1,400 feet of 24-inch steel riveted pipe, 1,000 feet of 22-inch, 1,000 feet of 20-inch, 1,000 feet of 16-inch, and 500 feet of 9-inch pipe, with two 4-inch giants, together with 300 feet of flume and suitable head-gates.

The water is taken out of Sombrio river, a tunnel having been cut through a rocky spur, into which the water is deflected by a wing-dam.

In addition to this, a large cabin, cook-house, blacksmith-shop, stable, and office have been erected—accommodation for twenty men; the plant, etc., represents an outlay of about $35,000.

The partnership has made an attempt at hydraulicking, but, as the deposits were covered by a heavy growth of timber and underbrush, these caused unexpected obstacles to the work, which was eventually suspended until additional capital could be obtained to provide means for the removal of the forest-growth.

NEW WESTMINSTER MINING DIVISION.

REPORT OF J. MAHONY, MINING RECORDER.

I have the honour to submit the following report of mining operations in the New Westminster Mining Division for the year 1910:—

The mineral claims recorded during the year were distributed as follows:—

Britannia, Howe sound, and vicinity	29
Bowen island	6
Gambier island	6
Burrard inlet, Indian river, and vicinity	16
Capilano river	7
Lynn creek	6
Seymour creek	19
Porpoise bay	7
Welcome pass	1
Jervis inlet and vicinity	29
Pitt lake and vicinity	23
Stave lake and vicinity	22
Harrison lake and vicinity	45
Harrison river and vicinity	9
Chilliwhack and vicinity	20
Abbotsford	1
Squamish and vicinity	38
Pemberton trail and vicinity	30
	314

There has been a considerable increase in the number of free miner's certificates issued and also the number of mineral claims and certificates of work recorded during the year. A number of new claims have been recorded in the vicinity of Seymour creek, and a lot of assessment work recorded, but no ore has been shipped from the claims during the year. More attention is being paid to quartz-mining throughout the different parts of the district than during the last two years, and, while the operations have been confined to doing assessment work only on the claims, it is expected that during the year 1911 several claims will be in a position to ship ore.

OFFICE STATISTICS—NEW WESTMINSTER MINING DIVISION.

Free miner's certificates issued	2,469
Quartz claims recorded	314
Certificates of work recorded	262
Certificates of improvements recorded	9
Conveyances recorded	51
Placer claims recorded	12

Revenue.

Free miner's certificates	$15,505 20
Mining receipts	3,905 55
	$19,410 75

INSPECTION OF METALLIFEROUS MINES.

Since the beginning of the year 1909 a change has been made in the system of mine inspection, by the appointment of a Chief Inspector of Mines, Mr. Francis H. Shepherd, with headquarters at Nanaimo, who has direct charge and control over the District Inspectors, who report to him direct.

WEST KOOTENAY AND BOUNDARY DISTRICTS.

REPORT OF JAMES MCGREGOR, INSPECTOR.

I have the honour to submit the annual report for the year 1910, with respect to the condition of the metalliferous mines in my Inspection District.

ROSSLAND DISTRICT.

The number of shipping mines in this camp has increased during the past year, the South belt receiving a great deal of attention, with very encouraging results. Upon inspection, I have always noticed an inclination by the management to observe the rules prescribed in the Act. In the larger mines of this district development is carried on extensively. I have always found the machinery and safety devices in good condition.

NELSON DISTRICT.

The number of shipping mines in this district has increased during the year, with every indication of a further increase. The Sheep Creek section of this district has received much attention during the year, with most encouraging and satisfactory results. Prospecting, and developing especially, have been very active. Upon inspection of the mines, I found them complying with the requirements of the Act.

LARDEAU DISTRICT.

There is no increase in the number of shipping mines in this district, though a considerable amount of prospecting and development has been in progress throughout the year. Upon inspection, I found the mines in a safe condition.

KAMLOOPS DISTRICT.

The principal work in this district consisted of developing and prospecting.

SIMILKAMEEN DISTRICT.

In this district the number of shipping mines remain the same as last year. Active developing has been vigorously followed, with encouraging results. A great amount of prospecting still continues in the district.

SLOCAN DISTRICT.

There has been much greater activity in this district during the year than had previously been, both in mining and developing. Upon careful inspection, I have found the mines in a safe condition.

BOUNDARY DISTRICT.

In this district the number of shipping mines has greatly increased during the year, and also the output, with every indication of a still greater increase during the present year. The developing of the several mines is being pushed forward with great persistency and effect. I have found upon inspection a desire to conform with the provisions of the Act.

EAST KOOTENAY DISTRICT.

REPORT OF EVAN EVANS, INSPECTOR.

I have the honour, as Inspector of Metalliferous Mines for the East Kootenay District, to submit my annual report for the year 1910.

The following mines worked continuously during the year: *St. Eugene*, *Aurora*, and *Society Girl* at Moyie, and the *Sullivan* mine at Kimberly.

Upon inspection of the mines which come under the Act, I have always found them to be well timbered and well ventilated by natural or artificial ventilation, and the requirements of the "Inspection of Metalliferous Mines Act" carried out as nearly as reasonably possible.

I have one accident to report for the year.

COAST INSPECTION DISTRICT.

REPORT OF JOHN NEWTON, INSPECTOR.

I have the honour to submit as Inspector, the report of the metalliferous mines for the Coast District for the year ending 1910.

During the present year I have visited all the mines in my district.

PORTLAND CANAL MINING DIVISION.

Stewart Mining & Development Co.—This company's property is situated about four miles from the town of Stewart, at an altitude of 1,100 feet. The mine has two tunnels driven in the mountain, one to the north and one to the south of the lead; the one to the north is in a distance of 350 feet, and the one to the south is in a distance of 100 feet. No machinery had been installed when I visited the mine.

Portland Canal Mining Co.—This mine is situated about three miles south of the *Stewart* property, at an altitude of 2,500 feet. This mine has four tunnels driven in the mountain, all connected with one another by overhead stoping. The ventilation is good in this mine.

No. 1 level, driven 400 feet; No. 2 level, driven 450 feet; No. 3 level, driven 200 feet; No. 4 level, driven 50 feet.

This mine has an aerial tramline from the foot of the mountain, a distance of four miles, but it was not in operation when I visited the mine; also a concentrator, which was ready to start work. Number of men employed, 16.

The Red Cliff.—This mine has two tunnels driven into the mountain. The No. 1 tunnel is in a distance of 80 feet; the No. 2 tunnel is 300 feet down the mountain, and is going to connect with the other tunnel by a 300-foot raise, to tap the ore in the tunnel above; this tunnel was at that time driven a distance of 500 feet. Thirty-two men were employed at the mine.

Machinery installed—Two 60-horse-power vertical boilers; 250-light Westinghouse generator, and all buildings wired for lights, by a 25-horse-power engine; one 11.00 cubic feet Canadian Rand compressor, which can be driven by steam or water-power.

QUEEN CHARLOTTE MINING DIVISION.

Ikeda Mines.—This mine has three tunnels, one in a distance of 700 feet. The ventilation was only fair when I visited it; a fully equipped set of machinery is installed. This mine had shut down the day before I got there.

VALDES ISLAND.

Lucky Jim Mine.—This mine has a shaft down 120 feet, with two tunnels, running north and south; the south level is in a distance of 126 feet, and the one to the north is in a distance of 80 feet. Only prospecting work is going on.

Machinery installed—One 7-drill Canadian Rand compressor; one 36-horse-power tubular boiler; one small hoist.

White Swan.—This mine was full of water when I visited it; all the buildings around the mine had been burned down by the fire that raged through the island in the summer.

NEW WESTMINSTER MINING DIVISION.

Britannia Mine.—This mine is situated up Howe sound. I examined all parts of this mine, and found the conditions good; the ventilation is good; a good supply of fresh air is passing through this mine; a good intake and return airway is maintained, on account of all the stopes being connected one with another. The manways are well protected and in good shape.

This mine has six levels running: No. 1, 1,300 feet; No. 2, 1,700 feet; No. 3, 100 feet; No. 4, 250 feet; No. 5, 200 feet; No. 6, 500 feet.

Machinery installed—One Canadian Rand two-stage compressor, 2,400 cubic feet capacity, driven by Pelton wheel; two 200 Kw. A. C. generators, 6,600 volts, driven by Pelton water-wheel; two No. 6 Champion crushers, conveyor-belt, etc., driven by electric motor; one 6 by 8 double-cylinder hoists, operated by compressed air; five 5 by 5 double-cylinder hoists, operated by compressed air; one continuous-cable haulage system, driven by electric motor; one timber elevator, 6 inches by 8 inches, double cylinder; also an 8 by 8 air-line conveying the compressed air a distance of four miles up the mountain from the beach.

TEXADA ISLAND.

Marble Bay Mine.—This mine has a shaft down 1,100 feet, with a level running to the north of the vein. The ventilation of this mine is good, by reason of all the stopes being connected. Overhead stoping is in operation, and seems well adapted for this deposit. Only one shift of men was working when last I visited the mine, but another shift was going to start on the Monday after I left. The mine is fully equipped on the surface.

Machinery installed—Two tubular boilers, one 100 horse-power, one 85 horse-power; one Canadian Rand compressor, 10-drill; two Lidgerwood hoists on surface; three Lidgerwood hoists below; one electric dynamo, 7 Kw.

Cornell Mine.—This mine has a shaft down 600 feet, but only the 450-foot level is working; ventilation good. This mine has lately changed hands, and only prospecting work is being pushed.

Machinery installed—One return-tubular boiler, 31 horse-power; one locomotive boiler, 32 horse-power; one 5-drill Canadian Rand compressor; one small hoist.

Little Billy Mine.—This mine was shut down the last time I visited the island.

Copper Queen Mine.—This mine is also shut down; only two men are employed to pump the water out.

Raven Mine.—This mine is situated about four miles from the *Cornell* mine, to the south; only three men were working on the property. There are two tunnels driven a distance of 300 feet and 80 feet. No machinery is installed.

Malaspina Mine.—This mine is situated about one mile to the south of the *Raven*, and about five miles from the *Cornell*. Only three men are employed on this property, as only prospecting work is being done; they have a tunnel in a distance of 525 feet, and expect to tap the ore in about 500 feet more.

Machinery installed—One 5-drill Canadian Rand compressor; one tubular boiler, 32 h.-p.

Rose and Bell Mine.—This mine is situated about one mile to the west of the *Cornell*; only four men were employed. There is a shaft down 80 feet, with a gasoline hoisting-engine.

LIST OF ACCIDENTS IN METALLIFEROUS MINES, 1910.

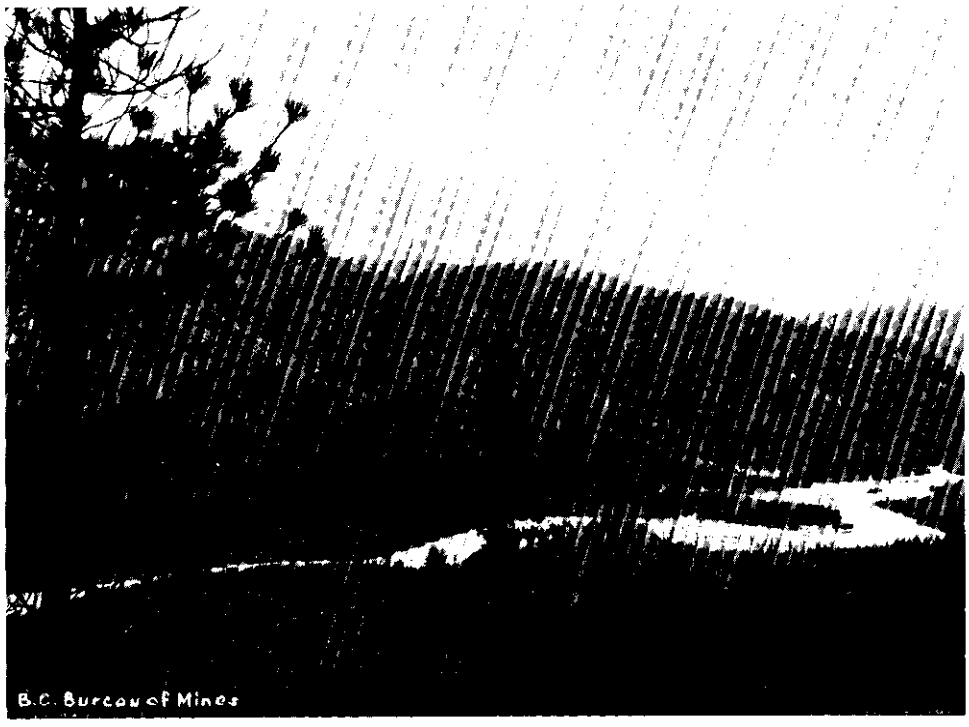
REPORTED BY JAMES McGREGOR AND EVAN EVANS, INSPECTORS, EAST AND WEST KOOTENAY AND BOUNDARY DISTRICTS.

No.	Mine.	Date.	Name.	Occupation.	Details.
1	Granby, Phœnix.....	Jan. 2	Axel Carlson..	Miner	Fell into ore-shute and was killed.
2	Centre-Star, Rossland..	" 12	Hamilton [Anderson	Car-loader ..	Leg broken on C. P. Ry. track; died in hospital during amputation.
3	" " ..	" 21	Mike Cule.....	Miner	He was barring down some rock and it fell upon him, killing him.
4	Washington, Slocan....	Mar. 5	Louis Maston..	Trammer....	Killed by a snowslide at mouth of tunnel.
5	Granby, Phœnix.....	" 8	J. O. Mullin...	Miner	Drilled into powder in missed hole and was killed.
6	" "	" 8	Archie Boyd ..	"	Drilled into powder in missed hole and was killed.
7	Sunnyside, Hedley.....	Apr. 14	Peter Stone ...	"	Fell off car and injured his knee-cap.
8	Mother Lode, Deadwood	May 15	Wm. Dobrusa..	"	Fell down ore-chute and broke left arm and bruised head.
9	" "	" 28	G. C. McKit- [trick	"	Killed by a rock he was barring down.
10	Surprise No. 2, Sandon.	June 19	Vit. Ganattore	"	Eyes injured by picking into unexploded powder in muck.
11	Mother Lode, Deadwood	" 23	Mike Miller...	"	A rock falling from chute crushed his right foot.
12	" "	July 27	Nils Hang....	Crusherman..	Killed by falling down shaft.
13	Snowshoe.....	Aug. 17	B. Hanniman..	Miner	Killed by rockslide in quarry.
14	"	" 17	Mike Bauer ..	"	" "
15	Arlington.....	Oct. 5	Joseph Pearson	"	A spark from his pick destroyed one eye.
16	Rawhide.....	" 28	Kosta Wiznink	Shoveller ...	Killed by electricity.
17	"	Nov. 27	George Gill...	Miner	Severely injured by premature explosion of charged hole.
18	"	" 27	Joe Christian..	"	Same accident; same result.
19	Greenwood, Phœnix ...	Dec. 19	Wm. Lakeland	"	Arm injured between car and tunnel.
20	St. Eugene, E. Kootenay	Feb. 28	Fred. Ege.....	Timberman..	While building a chute, a piece of rock fell, breaking his arm.

REPORTED BY JOHN NEWTON, INSPECTOR, COAST DISTRICT.

No.	Mine.	Date.	Name.	Occupation.	Details.
21	Little Billy, Texada I.	May 1	J. Raper.....	Miner	Fingers caught between two cars and bruised.
22	" "	" 17	G. Faulds.....	"	A machine-clamp fell upon him, breaking some ribs.
23	Britannia, Howe sound.	Oct. 11	P. Collins.....	"	Injured in face and hands, and lost one finger by premature explosion.
24	" "	Nov. 17	W. Doblet....	"	Piece of steel fell on his head, bruising him.
25	" "	" 17	Dr. H. B. Mar-[chant	Physician...	Killed by being caught between tramway bucket and tower.
26	" "	" 19	O. Yanada....	Labourer....	Caught between a car and the crusher building.
27	" "	Dec. 10	F. Anstot.....	Mucker.....	Struck in the eye by a piece of rock.
28	" "	" 11	Phil Ryan.....	Miner	A machine slipped and bruised him about the head.
29	" "	" 11	Fred. Shopland	Carpenter...	Fell with a piece of timber, spraining his back.
30	" "	" 13	Wm. Mason...	Labourer....	Fell on a piece of iron and cut his hand.
31	" "	" 13	Geo. Strath ...	Mucker.....	Toe was bruised by a piece of falling rock.
32	" "	" 13	H. Hauser	Hoistman...	Bruised on the head by a piece of rock which fell from a timber.
33	" "	" 21	Winko Drivich	Mucker.....	Struck in the eye by a piece of rock.
34	" "	" 22	A. Gustapon ..	"	Slipped and strained his back.
35	" "	" 23	Stanley Roper.	Teamster ...	Slipped and struck his head.
36	" "	" 17	Robert Samis..	Miner	Fell off a pile of rock in stope, and was injured about ribs.
37	" "	" 28	John Wilkund.	Mucker.....	Struck in the eye by a piece of rock.
38	Bonanza, Babine.....	Feb. 11	Emil Johnson..	Miner	Drilled into missed hole, which exploded, killing him.

Cadwallader Creek—looking down.



Bridge River—looking up from Jones Ranche.

TABULATED LIST OF ACCIDENTS IN METALLIFEROUS MINES, 1910.

	Cause of Accident.	Extent of Injury.			Total.
		Fatal.	Serious.	Slight.	
A	Blasting	0	2	1	3
B	Defective powder	0	0	0	0
C	Drilling into old holes containing powder	3	0	0	3
D	Powder in muck	0	0	1	1
E	Shafts and cages, accidents connected with	0	0	0	0
F	Falling down shafts or winzes	1	0	0	1
G	Falling down chutes	1	1	1	3
H	Mine-cars	0	0	3	3
I	Rock falling in stopes, levels, etc	2	0	2	4
J	Rock falling down chutes or openings	0	0	1	1
K	Timbering	0	0	0	0
L	Miscellaneous, underground	1	0	9	10
M	Miscellaneous, surface	5	0	4	9
	Totals	13	3	22	38
Accidents for each 100,000 tons ore mined		0.58	0.13	1.00	1.71
Accidents for each 1,000 men employed		4.19	0.96	7.08	12.23

COAL-MINING IN BRITISH COLUMBIA.

———:o:———

By W. F. ROBERTSON, PROVINCIAL MINERALOGIST.

The coal-mines of the Province, already developed and working, have for many years produced not only enough coal for domestic consumption, but also to supply a large demand from the Pacific Coast States and North-western States of the American Union.

This demand for export coal, particularly on the seaboard, has been so constant and the price obtainable so satisfactory to the shippers that it has permitted of the domestic price being kept at a figure so high as to admit of the importation from California of fuel-oil as a competitive fuel, where conditions permitted of its use, and, as a result, a large number of the coastwise steamers are now equipped with oil-burning boilers, while it is currently reported that at least one large railway will soon equip locomotives for the use of this liquid fuel.

The maintenance of the present high price of coal on the seaboard, in the face of the direct competition of fuel-oil both in British Columbia and Pacific Coast of the United States, and the fact that the British Columbia collieries have greatly increased their output, would seem to indicate that the market is growing faster than the collieries are being developed, and that the present price of coal is likely to be maintained, a consoling thought to the mine-owners, if not to the consumer.

The East Kootenay collieries, owing to their distance from the seaboard, are protected by the cost of transportation from competition of the coastwise fuels, both solid and liquid; but the same factor also limits the field of the market for East Kootenay fuel to the Interior of British Columbia and to the States immediately to the south.

The coal reserves of the East Kootenay or Rocky Mountain coalfield were fully described in the Report of last year, and it is sufficient here to state that they are practically inexhaustible.

The following table shows, for the past four years, the output and the *per capita* production of the various districts:—

Year.	District.	Gross Tons of Coal mined.	Total No. of Employees at Colliery.	Tons of Coal mined per Employee.	Number of Men employed Underground.	Tons of Coal mined per Underground Employee.
1907	East Kootenay District	876,731	2,290	383	1,527	574
	Coast District.....	1,342,877	3,769	356	2,862	469
	Whole Province	2,219,608	6,059	366	4,389	506
1908	East Kootenay District	883,205	2,524	350	1,746	506
	Coast District.....	1,226,182	3,549	345	2,686	456
	Whole Province	2,109,387	6,073	347	4,432	476
1909	East Kootenay District	923,865	2,427	380	1,737	532
	Coast District.....	1,476,735	3,991	370	2,976	496
	Whole Province	2,400,600	6,418	374	4,713	509
1910	East Kootenay District	1,365,119	3,111	439	2,374	575
	Coast District.....	1,774,116	4,647	382	3,529	502
	Whole Province	3,139,235	7,758	404	5,903	532

In the East Kootenay field the competition of the various collieries in British Columbia and immediately across the line in Alberta has kept the price obtainable for coal between $2.25 and $2.50 a ton, with little probability of a material increase, owing to the facility with which new collieries can be opened up in that district.

While no figures can be given as to the cost of production in the various fields, the *per capita* production of these fields is of interest, as having a bearing upon the working costs and indicating the mining facilities existing, and the improvement made in these conditions from year to year, resulting in the greater effectiveness of the employee.

It will be seen from the above that the production "per employee" has materially increased, particularly in this last year. This increased effectiveness of the labour employed is largely due to better methods, better equipment, and greater volume of output.

During the year 1910 there were 404 (2,240 lb.) tons of coal mined per employee, or 532 tons for each underground employee. According to the Report of the Inspector of Coal-mines for the State of Washington, it appears that in the mines in that State there was mined in 1909 some 3,205,900 long tons (2,240 lb.) of coal (3,590,639 tons of 2,000 lb.), with a *per capita* production of employee equal to 560 long tons per annum; while in 1910 each employee represented 590 long tons production, or an output of 3,553,200 tons (2,240 lb.).

From this it appears that the effectiveness of the employee is greater in Washington than in British Columbia—whether due to the nature and occurrence of the coal-seams, equipment, or other causes is not known.

It is, however, to be noted that this increased *per capita* production has been obtained at a greater list of accidents than in British Columbia mines, as in Washington there was 92,548 tons (2,000 lb.), or 82,632 tons of 2,240 lb., while in British Columbia there was mined some 112,116 tons (2,240 lb.) for each life lost.

The output made by the collieries of the Province during the year is the greatest yearly product that they have ever made. The gross output for the year was 3,139,235 tons (2,240 lb.), which represents an increase over that of the year 1908 of about 48.8 per cent., and over 1909—formerly the "banner year"—of about 30.7 per cent.

Of this gross tonnage of coal mined, some 2,800,046 tons was used as coal, valued at $9,800,161, while 339,189 tons were utilised in making coke, of which there was produced some 218,029 tons (2,240 lb.), of a value of $1,308,174. The total value of the product of the collieries of the Province for the year 1910 was $11,108,335, an increase over the highest previous record—that of 1909—of $2,533,451, or nearly 30 per cent.

As in former years, the greater proportion of this product was made by three larger companies—the Crow's Nest Pass Coal Co., with two collieries in East Kootenay, and by the Western Fuel Co., of Nanaimo, and the Canadian Collieries, Ltd. (formerly the Wellington Colliery Co.), these last two operating on Vancouver Island.

In addition to these larger shippers, very appreciable shipments have been made by the Hosmer Mines, Ltd., and the Corbin Coal & Coke Co., in East Kootenay; by the Nicola Valley Coal & Coke Co., the Diamond Vale Collieries, and the Coal Hill Syndicate, all of the Nicola valley; by the Princeton Coal & Land Co., of Princeton; and by the Pacific Coast Coal Mines, Ltd., and Vancouver & Nanaimo Coal Mining Co., both operating on Vancouver Island, near Nanaimo.

The details of the shipments made by each of these companies will be found in reports of the Inspectors of the various districts.

During the year 1910 about 51.3 per cent. of the coal, sold as such, by the collieries of the Province was consumed in British Columbia; about 46.2 per cent. was exported to the United States, including Alaska; and 2.5 per cent. was exported to other countries, chiefly to Mexico. Of the coke sold, about 96 per cent. was consumed in British Columbia, and the remainder was exported to the United States.

The distribution of this output of coal and coke is shown in the following table:—

COAL AND COKE PRODUCED, EXPORTED, ETC., BY PROVINCE DURING YEAR 1910.

SALES AND OUTPUT FOR YEAR.	COAL.		COKE.	
(Tons of 2,240 lb.)	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	1,238,439		213,274	
" export to United States	1,114,809		8,730	
" " other countries	60,290			
Total sales		2,413,538		222,004
Used in making coke	339,189			
" under colliery boilers, etc.	206,871		79	
Lost in washing	146,277			
Total for colliery use		692,337		79
		3,105,875		222,083
Stock on hand first of year	36,290		17,109	
" last of year	69,650		13,055	
Difference { * added to / † taken from } stock during year		*33,360		†4,054
Output of collieries for year		3,139,235		218,029

By-products—Clay, 4,535 tons.

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	133		97		230	
Whites—Miners	3,003				3,003	
Miners' helpers	619				619	
Labourers	1,085		481		1,566	
Mechanics and skilled labour	798		626		1,424	
Boys	143		63		206	
Japanese	24		25		49	
Chinese	95		548		643	
Indians	3		15		18	
Totals	5,903		1,855		7,758	

COLLIERIES OF THE COAST DISTRICT.

The gross output of the Coast collieries, including the Nicola valley, for the year 1910 was 1,774,116 tons (of 2,240 lb.) of coal actually mined, while some 29,821 tons were added to "stock," making the actual consumption of coal 1,744,295 tons.

Of this gross consumption, 1,479,373 tons were sold as coal, 124,548 tons were consumed by the producing companies as fuel, 135,204 tons were lost in washing, while 4,670 tons were used in making coke, of which there was produced some 2,333 tons (2,240 lb.), and 5,994 tons were taken from stock, making the total sales 8,327 tons.

Formerly, in 1902, the Coast collieries exported to the United States 75 per cent. of their coal; in 1910 they exported there only 24.5 per cent. of their product, 71.3 per cent. of the output being consumed in Canada.

The following table gives an aggregate summary of the output of the Coast collieries for the year 1910, and shows the dispositions made of such product:—

SALES AND OUTPUT FOR YEAR.	COAL.		COKE.	
(Tons of 2,240 lb.)	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	1,055,861		8,327	
" export to United States	363,722			
" " other countries	60,290			
Total sales		1,479,873		8,327
Used in making coke	4,670			
Used under colliery boilers	124,548			
Lost in washing	135,204			
Total for colliery use		264,422		
		1,744,295		
Stocks on hand first of year	34,752		16,480	
" last of year	64,573		10,846	
Difference {*added to / †taken from} stock during year		*29,821		†5,994
Output of collieries for year		1,774,116		2,333

By-products—Fire-clay, 4,535 tons.

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	61		56		117	
Whites—Miners	1,861				1,861	
Miners' helpers	366				366	
Labourers	831		138		969	
Mechanics and skilled labour	169		284		453	
Boys	119		52		171	
Japanese	24		25		49	
Chinese	95		548		643	
Indians	3		15		18	
Totals	3,529		1,118		4,647	

COLLIERIES OF THE EAST KOOTENAY DISTRICT.

The gross output of the collieries of the East Kootenay District for the year 1910 was 1,365,119 tons (2,240 lb.) of coal actually mined, of which 3,539 tons were put into stock, making the actual consumption of coal 1,361,580 tons. Of this gross consumption of coal, 933,665 tons were sold as coal, 82,323 tons were consumed as fuel by the producing companies, 11,073 tons were lost in washing, while 334,519 tons were converted into coke, of which there was produced 215,696 tons, while 1,940 tons of coke were added to stock, and 79 tons were used under company's boilers, making the coke sales for the year 213,677 tons.

The East Kootenay collieries exported to the United States about 80 per cent. of the coal they sold and about 4 per cent. of the coke.

The following table gives an aggregate summary of the output of the East Kootenay collieries for the year 1910, and shows the dispositions made of such product:—

Sales and Output for Year.	Coal.		Coke.	
(Tons of 2,240 lb.)	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	182,578		204,947	
" export to United States	751,087		8,730	
" " to other countries				
Total sales		933,665		213,677
Used in making coke	334,519			
" under colliery boilers, etc.	82,323			79
Lost in washing	11,073			
Total for colliery use		427,915		
		1,361,580		
Stocks on hand first of year	1,538		269	
" last of year	5,077		2,209	
Difference added to stock during year		3,539		1,940
Output of collieries for year		1,365,119		215,696

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	72		41		113	
Whites—Miners	1,142				1,142	
Miners' helpers	253				253	
Labourers	254		343		597	
Mechanics and skilled labour	629		342		971	
Boys	24		11		35	
Japanese						
Chinese						
Indians						
Totals	2,374		737		3,111	

COAL POTENTIALITIES OF BRITISH COLUMBIA.

In addition to the coal-mines actually producing and whose outputs are included in the foregoing tables, there are a number of important fields which have not as yet reached the producing stage—some of these partly developed and equipped, and others only prospected.

That these fields contain a large reserve of coal there is absolutely no doubt, and many of them will be developed and producing as soon as the market demands it and the transportation facilities can be provided.

The great undeveloped coal-seams of the Rocky Mountain coalfield were fully described by the writer in last year's Report, and further need not now be said.

In the Similkameen valley, near Granite creek, very large beds of good coal are now being opened up, and will be productive in a few years. Mr. Camsell, of the Geological Survey, estimates this basin to have an area of about five square miles, with a minimum thickness of coal of 20 feet, giving a "minable content of 64,000,000 tons."

Near Princeton, one colliery has been already opened and has made small shipments; but the area of this field is great—probably nearly fifty square miles—so that there appears a certainty that several other mines will eventually be opened up.

In the Nicola valley the area of the coal-bearing basin is smaller—about ten square miles—but it has been estimated by the Geological Survey as probably containing 30,000,000 tons of coal.

The Telkwa area, to the east of Hazelton, is expected to be about as extensive as the Nicola field.

On Vancouver Island, in addition to the areas actually being worked, there is in the Quatsino Mining Division on Quatsino sound a cretaceous coalfield now being developed by Mr. Thos. Pearson and associates, which gives promise of containing extensive beds of workable coal; prospecting workings have been in progress here for four or five years, with considerable success.

The Suquash area is now being opened up by actual mining by the Pacific Coast Coal Mines, Ltd., and has already made small shipments, and it is expected that the output will be increased rapidly.

On Graham island coal has been known for forty years. Exploratory workings on coal outcrops have been carried on at Camps Robertson and Wilson; at present arrangements are completed for a systematic boring of the measures to the dip to accurately define the beds; when this is done a railway will be built to convey the coal to tide-water—probably on Skidegate inlet.

To the north of these camps areas have been located and considerable boring done, with results which show the field to continue nearly to Masset. The eastern extension of the field has not, as yet, been satisfactorily established.

Near the headwaters of the Skeena river an area of sixteen square miles has been located and partly developed, and shown to contain extensive beds of coal approaching anthracite in character. This area is more than 100 miles north of Hazelton, the nearest point on a railway now under construction, so that it may be some time before serious development is undertaken.

In the Peace river valley extensive coalfields are located and partly prospected, but these also are, as yet, far from transportation.

In a paper read by D. W. Dowling, of Geological Survey, before the Canadian Mining Institute at the Quebec meeting in March, 1911, he gave the following estimate of the probable coal-content of the various known coal-areas in British Columbia:—

SUMMARY FOR BRITISH COLUMBIA.

					Anthracite.	Bituminous.	Lignite.
					Million Tons.	Million Tons.	Million Tons.
Koskeemo	5	square miles, at	3	feet		9	
Suquash	10	"	3	"		19	
Comox	300	"	6	"		1,152	
Nanaimo	350	"	6	"		1,344	
Cowichan	9	"	4	"		23	
Graham island	60	"	8	"		307	
"	100	"	4	"			256
Elk river	230	"	100	"		22,600	
Elk river, north	140	"	100	"		14,000	
Nicola	12	"	4	"		30	
Princeton	52	"	5	"			166
Tulameen	5	"	20	"		64	
Telkwa	10	"	5	"		30	
Hat creek	2	"	50	"			68
Skeena river	16	"	6	"	61		
Peace and Pine river	50	"	3	"		96	
Total	1,351	square miles			61	39,674	490

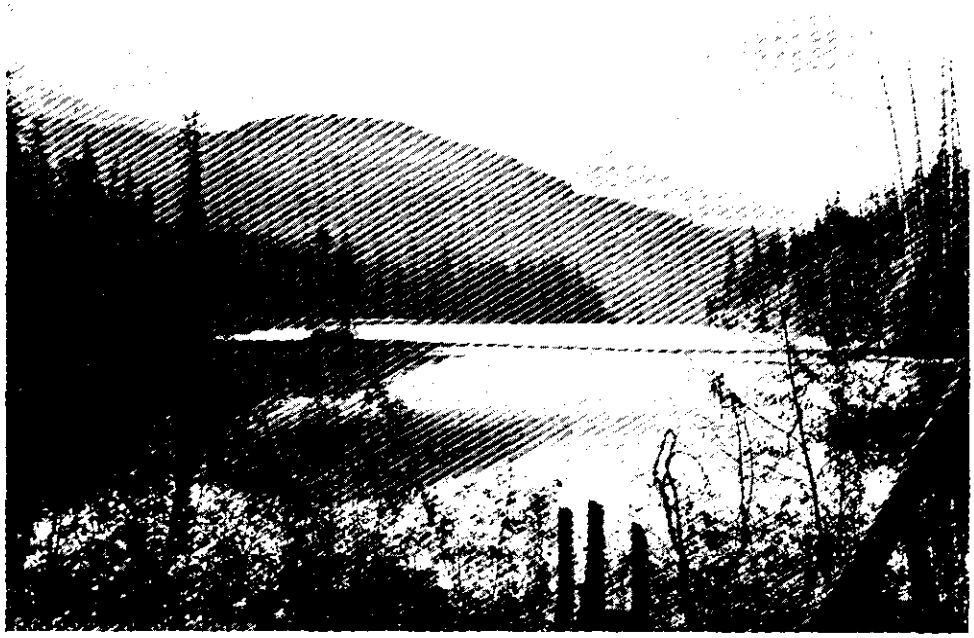
COAL-PROSPECTING ON DENMAN ISLAND.

Coal-prospecting has been in progress during the past year on Denman island, an island lying off the east coast of Vancouver Island, near Comox, and a borehole was sunk there to a depth of 1,342 feet without, however, striking coal.

Through the courtesy of Mr. H. W. R. Moore, of Victoria, the record of the borehole has been obtained and is here recorded, since the information obtained, although negative, may be of future value in other prospecting ventures:—

Depth, Feet.	Character of Strata.	Thickness.
		Ft. in.
0	Surface clay and gravel	10 0
10	Blue shale	210 0
220	9-inch blue sandstone	0 9
221	Blue shale	28 0
249	4-inch red sandstone	0 4
249	Blue shale	82 0
331	4-inch sandstone	0 4
331	Blue shale	43 0
374	2-inch light-coloured shale	0 2
374	Blue shale	51 0
425	Shale streaked with sandstone	11 0
436	Blue shale	102 0
538	14-inch light-coloured shale	1 2
540	Blue shale	111 0
651	Light-coloured shale	1 0
652	Blue shale	382 0
1,034	*Small coal partings*	1 0
1,035	Blue shale	79 0
1,114 to 1,342	Sandy shale	228 0

John Currie Mountains from Pemberton Meadows.



Green Lake—on Pemberton Meadows—Squamish Trail.

INSPECTION OF COAL AND METALLIFEROUS MINES.

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REPORT OF FRANCIS H. SHEPHERD, CHIEF INSPECTOR OF MINES.

I have the honour to submit my Second Annual Report as Chief Inspector of Coal and Metalliferous Mines.

The reports of the District Inspectors, covering the production of coal and coke, the number of employees, and list of accidents, and a brief sketch of the mines under their several inspectorates, are hereto attached.

The following subjects, being of special importance, are submitted as pertaining more to general principles than to detailed information :—

ACCIDENTS IN COAL-MINES.

This subject is the most important pertaining to the Inspector's duties, and therefore should receive commensurate attention. The primary reason for the existence of the office of Inspector of Mines is to endeavour to prevent accidents by enforcing statutory legislation governing mining operations, but the fact remains that accidents do happen, and probably always will; but when they do occur, the necessary investigation as to cause should at least offer some suggestion as to the prevention of similar accidents in the future, and with this end in view the following comments and analyses are submitted :—

Falls of Roof and Coal (Thirteen Fatal Accidents).—Falls of roof and coal are generally conceded in all coal-mining countries to be the most prolific source of accidents in coal-mines, both fatal and otherwise. In the ordinary course of mining, the superincumbent strata must inevitably fall, but it is not the main or major breaks which cause the most fatal accidents, but small falls in comparatively protected working-places, and generally due to unforeseen slips which give no warning, and very often in places which would be considered apparently well timbered.

The only remedy to this class of accidents is increased vigilance, ample timbering, and frequent visits of the mine officials, whose senses are turned more keenly to danger, while the miner may grow accustomed to environment and be prone to over-confidence in the security of his surroundings. But even with all the human care and foresight which may be bestowed in this connection, accidents from this source cannot be avoided.

Mine Cars and Horses (Eleven Fatal Accidents).—This source of accident has unfortunately occupied a prominent place in the history of coal-mining in British Columbia, and this is much to be regretted, because the systems employed and the materials used are entirely under human control, and should therefore be accompanied by a reasonable degree of safety.

In ascribing a reason for these accidents, it would appear that the number of fatal accidents from this cause bears a direct ratio to rapidly increased outputs. This is noticeably the case in the East Kootenay, where seven of the eleven deaths from this cause occurred at the mines of one company, which has, as suggested, been rapidly increasing its output.

These accidents are avoidable, and while many of them are due to the carelessness of the unfortunate victims themselves, much can be done by the mine officials in keeping the tackle and material in good order, maintaining ample clearances, and installing the several safety devices provided for in the new "Coal-mines Regulation Act."

The four remaining accidents are miscellaneous, and it would appear, therefore, that our chief sources of fatal accidents are from the two causes set forth, and a material reduction in the number of such accidents will occur in direct proportion to the amount of vigilance and care bestowed by all concerned, especially in the latter class—viz., mine cars and horses.

The Proportion of Deaths per each 1,000 Persons employed.—Owing to several serious catastrophes in the early years of the previous ten, our ratio of lives lost makes an unenviable record. This for the years 1901 to 1910, inclusive, is 7.56 nearly. The ratio for 1910 is 3.6. For the six years ending 1910 the ratio is 4.52, which includes thirty-two persons lost in the Extension explosion in 1909. The lowest years are : 1905, 2.72 ; 1906, 3.11 ; 1908, 2.95.

While it is generally conceded that the coal-mines of British Columbia may, in the main, be classed as dangerous, still the hope is expressed that, with the installation of the increased inspection system, the enforcement of the new "Coal-mines Regulation Act," and the co-operation of the mine officials, the loss of life may in the future be materially reduced, and that we may attain a place among the safe coal-mining communities, notwithstanding the fact that they may possess safer mining conditions.

Mine-rescue Work.—It is very gratifying to be able to report that the several companies throughout the Province have responded very thoroughly to the statutory requirements of the Act as to mine-rescue appliances. The training of employees is progressing satisfactorily, though some difficulty is experienced in procuring a ready and economical supply of oxygen. The Hon. the Minister of Mines has caused inquiries to be made with a view of establishing an oxygen manufacturing and compressing plant within the Province, with a view of supplying the oxygen readily and cheaply. This would seem to be absolutely necessary to efficiency and success.

In addition to the colliery installations, the Hon. the Minister of Mines has established general installations of the rescue apparatus at Nanaimo, Cumberland, Middlesboro, and Hosmer. The District Inspectors have each graduated at a course taken at the United States Mine-rescue Station at Seattle, and are able to use or direct the use of the apparatus in an emergency.

The unfortunate catastrophe at Bellevue, Alberta, on December 9th, strongly emphasized the need of mine-rescue apparatus, and it fell to the lot of our inspectors, managers, and volunteers to render our first aid of this kind to a neighbouring Province, and it is to be regretted that in this noble attempt to save the lives of their fellow-men, one noble life was sacrificed from among the rescuers.

Fred. D. Alderson, of Hosmer, B. C., holder of a British Columbia First-class Certificate of Competency, was one among the first to rush to the rescue of the entombed miners at Bellevue, and after saving life succumbed to the deadly gases himself.

The following disinterested account in a letter to *Mines and Minerals*, from the pen of James Ashworth, Esq., M.E., general manager of the operating department of the Crow's Nest Pass Coal Co., who directed one of the rescue parties, and which, without the aid of oxygen helmets, made a noble attempt to rescue the men in the inner reaches of the level :—

"The first rescue party under Mr. John Powell, the superintendent of the mine, who had taken charge only eight days previously, found a few men on the road alive, and also twenty-one dead, all in one bunch arranged around a high-pressure air locomotive charging station, near No. 84 chute. About this time the rescue party, with oxygen apparatus, arrived on the scene and commenced work. Inspector Strachan and Mr. Alderson first went in with a full two-hour helmet outfit, and after going inbye about 500 feet had to return, as Alderson said

something was wrong with the helmet. On the second try they found a group of men arranged around the inside high-pressure air charging station at No. 124 chute. The problem now was how to bring these men out from No. 124 chute to No. 84 chute, a distance of about 2,000 feet. It was agreed that Strachan should go out and take one man with him by the aid of Alderson's Draeger outfit, and thus Alderson was left inside with the men without any rescue apparatus. Mr. Strachan then started in again with his two-hour apparatus and carried another complete apparatus for Alderson. Alderson then put on the apparatus, and Mr. Strachan stripped off his own and put it on another man, whom Mr. Alderson then took out to No. 84. Alderson again started in in his outfit, and carrying another full suit for Mr. Strachan's use; the load was, however, too much for him, and he dropped it on the way. On reaching Mr. Strachan he had his chin-valve open, and said he thought his potash cartridge was played out, and consequently he was himself very exhausted. He then took off his apparatus and remained inside with the men to be rescued, and who were still in good form, having the high-pressure air to keep them alive. Mr. Strachan then put on the apparatus and came out without experiencing any difficulty. This appears to show that Alderson must have hurried in, and made a greater demand on the apparatus for air than it was capable of supplying. The Draeger men had in the meantime sent out of the mine to bring in two sets of half-hour apparatus, and Messrs. Evans and Huby also went out for a further supply of two-hour oxygen cylinders and potash cartridges. About this time Birmingham had returned with two half-hour apparatuses, and another Draeger man, Matusky, put on a two-hour apparatus, and went in carrying a half-hour apparatus in his hand. When he arrived at the place where the men were grouped together, he was alarmed to find that all of them had collapsed, from some reason that was not apparent to him. One man, the fireboss, was standing, and was just able to speak, but was incapable of assisting Matusky in putting the half-hour apparatus on him. Matusky then left the half-hour apparatus with the man, and hastened out to report the serious state of affairs. A messenger was then despatched to the outside to bring in additional help, and a conference was held to determine what should be done to save the men at No. 124 chute. It was decided to make a dash and pull out the men without waiting for the extra oxygen or for a rope, which had also been sent for. This 'forlorn hope' party then formed themselves into a string of about 10 feet apart. Mr. Spruston led the way, and carefully tested the air as he advanced, and the only gas he detected on his lamp was about a $\frac{3}{8}$ to $\frac{1}{2}$-inch cap of fire-damp before he reached the unconscious men. None of this party appear to have perceived the effect of any gas until they commenced to exert themselves, and hence the whole of them were affected at about the same moment. It then became a *sauve qui peut*, some reaching No. 84 chute dizzy and almost unconscious, and others falling by the way. Another messenger then rushed out of the mine and announced that every one of the rescue party was lost, and the Draeger men in particular. Doctor McKenzie, who formed one of the 'forlorn hope,' in his eagerness to be of service, carried in the pulmotor apparatus, and probably fell at the same time at No. 114 chute. Messrs. Evans and Huby and others who arrived on the scene about this time were the means of bringing out and reviving by artificial respiration the whole of the men found at No. 124, excepting only Alderson and another man, who were found much later side by side, and too late to revive them. The last man to be rescued alive was the doctor, who along with two others was pulled out by men attached to a rope which had been brought in by the fresh band of rescuers. At least ten men of the 'forlorn hope' party were rendered helpless by a mixture of fire-damp and carbon-monoxide gas. That it was this latter insidious gas which rendered the work of this party so dangerous is clearly proved by the certificate of the doctor, who certified that the two men taken out dead had died from poisoning by this gas."

The lesson learned, both at Bellevue and at an underground fire which occurred at the Western Fuel Company's mine at Nanaimo, is that the helmet must not be put on in vitiated atmosphere. The inhalation taken before the helmet is closed must be of pure air, and in order to extend its sphere of action the writer suggests that an auxiliary cylinder of compressed air could be attached to the apparatus, so that in the event of the admission of impure air or deleterious gases the helmet could be purified by the admission of a supply of pure air. This would seem to be necessary in rescue-work, for it seldom occurs that the rescued are found in an entirely pure atmosphere, or, if so, they may have to traverse, as at Bellevue, a dangerous zone.

It is gratifying to know that the widow of the late Mr. Alderson has received substantial assistance from the miners, the general public, and the Governments of Alberta and British Columbia.

CONSOLIDATION AND AMENDMENT OF THE "COAL-MINES REGULATION ACT."

A Bill for this purpose was introduced in the Legislative Assembly at its session of 1910 by the Hon. the Minister of Mines, but the subject being of such paramount importance, and in order to obtain the opinion and suggestions of both operators and employees, so that the very best legislation should ensue, the Bill was withdrawn, with the assurance of the Hon. the Minister of Mines that a trial Bill should be drafted and submitted to those concerned and a complete Bill introduced to the Legislative Assembly at its session of 1911.

In accordance, therefore, with the instructions of the Hon. the Minister of Mines, a Bill was drafted by the Deputy Attorney-General, the Deputy Minister of Mines, and the Chief Inspector of Mines. The various mining centres were visited by the Deputy Minister and the Chief Inspector of Mines, who held conferences with both the operators and the employees or their representatives, and received many valuable suggestions, many of which were embodied in the completed Bill. The main intent and purpose of the Bill was to improve the old Act and to introduce new measures for safety.

Many valuable suggestions from the Report of the Royal Commission on Mines (Great Britain), 1906-1909, were embodied in the Bill, and upon all questions where any doubt existed the opinion of the Royal Commissioners was accepted as conclusive.

The following is a brief *résumé* of the changes introduced:—

Employment of Women, Girls, and Boys (Sec. 3).—Women and girls of any age are prohibited from working in any mine or about any mine except in the performance of clerical work, etc., and no boy under the age of fifteen years shall be employed underground, or, under fourteen years, above ground.

As to Employment of Persons about Engines (Sec. 4).—The age of persons having charge of hoisting machinery, lowering or raising persons, has been raised from eighteen to twenty-two years, and a medical examination every six months is imposed; and no person having charge of hoisting machinery, not used for the lowering or raising of persons, shall be under the age of sixteen.

Time Persons may be employed Underground (Sec. 18).—The eight-hour clause has been amended to make it more workable and easier of enforcement. Certain special extensions have been introduced to enable engineers, onsetters, pumpmen, stablemen, etc., where more than two shifts are worked, to change shifts at the place of duty, but in no case to exceed eight hours and thirty minutes. A penalty is also provided for any person who pays or receives payment in excess of eight hours, other than such specially exempted work.

Ventilation where Two or More Shafts are required (Sec. 20).—Where two shafts are necessary, no mine shall be ventilated by a midwall or any other subdivision in any shaft, but shall be ventilated by separate shafts separated by not less than 75 feet of natural strata.

F. D. Alderson—a B. C. Certificated Coal Mine Manager
(Sacrificed his life in rescue party after explosion at Bellvue, Alta.)

Miners—with Draeger Oxygen Apparatus.

Mining Submarine Areas (Sec. 25).—This section is new and is based upon the recommendations of T. E. Foster, M.E., of Newcastle-on-Tyne, to the Government of Nova Scotia, who is considered an able authority upon this question. The minimum cover of solid strata under which general mining operations may be carried on is placed at 180 feet, but the plan of the method to be employed must have the approval of the Chief Inspector of Mines.

Certificated Managers and other Officials (Sec. 28, Subsec. 3).—Provides that where more than fifty persons are employed at one time, the manager and overman must be separate persons.

Qualification of Candidates for Certificates of Competency (Sec. 23).—Qualifying experience for manager's certificate must not be less than five years, except in the case of a graduate of a recognised mining college, when it must not be less than four years. For overman the experience must not be less than five years, and that he must not be less than twenty-three years of age. For shiftboss, fireboss, or shotlighter, that he shall have had not less than three years' experience and shall be at least twenty-three years of age. St. John's or other recognised ambulance certificate is required.

Certificated Coal-miners (Sec. 49).—The District Inspector is made (ex officio) a member of any Board within his inspectorate.

Returns and Notices (Sec. 59).—Notice of accident, where loss of life has occurred, must be reported to the Inspector by telephone, telegraph, or messenger. In section 62 certain notices of abandonment or opening are required to be reported without unnecessary delay, instead of two months as heretofore. The place of any fatal accident must remain undisturbed for a period of three days or until examined by the Inspector, or where such stoppage would seriously interfere with the general operation of the mine, then only until the place of accident has been examined by a coal-miner or a member of the miners' or gas committee.

Plans of Abandoned Mines (Sec. 65).—For the protection of life and property, the information contained on any deposited plan is made available to the Inspector in the discharge of his duties.

Inspectors (Sections 68, 69, and 75).—The Chief Inspector is read into the Act. The Minister of Mines is empowered to appoint any mining engineer or person of scientific or practical experience to make a special investigation and report upon matters relating to the safety of life and property. In cases of danger the Inspector is empowered to order the closing of any mine unconditionally.

Plans of Mines (Secs. 80 and 82).—This section has been brought up to date as to scale, etc. In addition to plans being posted up at or near the entrance to the mine, all roads used as a means of egress shall be conspicuously marked in the mine.

Inquests (Sec. 86, Subsec. 7).—Prohibits an official of a miners' union from serving on a jury. Subsection (8) required the Inspector to post a notice at the mine stating the time and place of inquest.

GENERAL RULES.

Ventilation (Rule 2).—Requires 300 cubic feet of air for each animal, instead of 100 cubic feet as heretofore. Rule 1 requires that the ventilation apparatus when on the surface shall be placed in such a position as will render it safe from the effect of an explosion. This does not prevent the installation of auxiliary ventilating apparatus underground.

Rule 2 also requires that where naked lights or electricity is used, or where blasting is done, that the brattice-cloth shall be fireproof.

Rule 4 requires the fireman to post a notice of his examination on a blackboard at the fireman's station, in addition to the regular report in a book kept for the purpose. Firemen must also be provided with some approved pattern of gas-tester to determine low percentages

of marsh-gas. All air-courses, stoppings, overcasts, sealings, and abandoned workings, where accessible, must be examined once a week by a competent person or persons. This person is the equivalent to the "master wasteman" under British custom.

Lamps and Lights (Rules 9 and 10).—No person to carry a key or other contrivance whereby he may be enabled to open a safety-lamp except at a duly appointed lamp-station.

The right to search a person or persons for matches, etc., is read into the Act, and provides penalties for refusing to be searched.

No single-gauze safety-lamp shall be used. Safety-lamps shall be tested in an explosive mixture of gas and air at least once a week, or as often as any part of the lamp may have been renewed. Every safety-lamp shall be submitted to a mechanical air-test whenever assembled after being taken apart.

Explosives and Blasting (Rule 11).—Permission may be granted by the Inspector to allow a sufficient number of cases or canisters of explosive containing not more than 4 lb. each to be taken into a mine to serve one round of shots in rock-work or rock tunnels. Clay shall be provided for tamping. Minister of Mines to issue a permitted list of explosives which may be used in any mine.

Rule 12. Shot-igniter to be approved by the Minister of Mines. Precautions laid down covering shots which have missed fire. Detonators to be kept under the control of some person appointed in writing by the manager, except in a case where an electric igniter is used, in which case miners may carry their own detonators, but the shotlighter only shall have charge of the igniter. It is made unlawful for a person to open a case of detonators within stated distances of a naked light. All haulage or other roads that are dry and dusty shall be watered for a distance of 40 yards from the place of firing.

Water and Boreholes (Rule 14).—In approaching dangerous accumulations of water, the Chief Inspector of Mines may grant a greater width of the drivage approaching such dangerous accumulation than 8 feet. This is to allow ample space for track and brattice.

Manholes (Rule 15).—Manholes are defined as to size. Safety appliances are required on underground plane, inclines, and slopes.

Maximum Number of Persons allowed to enter Cage (Rule 23).—The Inspector to decide the number to enter the cage.

Signalling (Rule 25).—Signalling and guides to apply to all shafts irrespective of depth. Sinking shafts may be exempted by the Chief Inspector of Mines, in so far as guides are concerned.

Inspection of Mines on behalf of Workmen (Rule 37).—Provides that when the miners do not avail themselves of this rule, the Chief Inspector shall select, in alphabetical order, two of the miners to make the inspection, and the owner, agent, or manager may withhold from the wages of the underground employees a sufficient sum pro rata to remunerate the persons making such examination.

Sanitary Arrangements (Rule 41).—Sanitary arrangements are to be provided and maintained in a sanitary condition.

In the metalliferous mines there is a reduction of lives lost from fifteen in 1909 to thirteen in 1910, and a corresponding decrease in the ratio of lives lost per 1,000 men employed from 4.90 to 4.19. Drilling into old holes containing unexploded powder claims three lives, notwithstanding the fact that records of shots responding are kept. Fatal accidents on the surface show an increase, and five lives were lost through various causes. Falls of rock are to a great extent unavoidable, but it would seem that many of the other accidents reported could be avoided, and greater vigilance is required in the metalliferous mines, in an endeavour to reduce the loss of life.

INSPECTION OF COAL-MINES, 1910.

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VANCOUVER ISLAND AND COAST INSPECTION DISTRICT.

The collieries operating during the year in this Inspection District, including the new mines that have been started, were:—

NANAIMO: The Western Fuel Company—No. 1 shaft, Protection shaft, and No. 4 shaft, Northfield mine.

Pacific Coast Coal Mines, Limited—Fiddick Colliery, South Wellington, Cranberry District, Nos. 1 and 2 slopes.

Vancouver-Nanaimo Coal Mining Company, Limited—New East Wellington Colliery, Mountain District, Nanaimo, No. 1 slope.

EXTENSION: The Canadian Collieries (Dunsmuir), Limited (formerly the Wellington Colliery Company)—Nos. 1, 2, and 3 mines, all worked from what is known as the No. 1 tunnel, and No. 4 mine, worked by a shaft.

CUMBERLAND: The Canadian Collieries (Dunsmuir), Limited—Nos. 4 and 7 slopes, and Nos. 5 and 6 shafts.

NICOLA VALLEY: The Middlesboro Colliery of the Nicola Valley Coal and Coke Company—Nos. 1, 2, 3, 4, and 5 mines.

Diamond Vale Colliery Company—No. 3 mine.

Pacific Coast Colliery Company—No. 1 slope and No. 1 shaft, adjoining the Middlesboro Colliery.

Coal Hill Syndicate—One shaft and slopes.

PRINCETON: Princeton Coal and Land Company's Princeton Colliery.

REPORT OF THOMAS MORGAN, INSPECTOR.

SIR,—I have the honour to herewith submit my annual report for the collieries in my Inspection District for the year ending 31st December, 1910, together with a list of all accidents and the colliery returns.

The Western Fuel Company.

Head Office—San Francisco, Cal.

Officers.	*Address.*
John L. Howard, President or Chairman,	San Francisco, Cal.
Jas. B. Smith, Vice-President or Vice-Chairman,	San Francisco, Cal.
D. C. Norcross, Secretary,	San Francisco, Cal.
Joseph L. Schmidt, Treasurer,	San Francisco, Cal.
Thomas R. Stockett, General Manager,	Nanaimo, B. C.
Thomas Graham, Superintendent,	Nanaimo, B. C.

Capital of the Company, $1,500,000.

The above company has operated the following collieries at Nanaimo during the past year, viz.: No. 1 or Esplanade shaft, Nanaimo; Protection Island mine; No. 4 Northfield mine.

The following returns show the combined output of the company's mines for the past year:—

RETURNS FROM WESTERN FUEL CO.'S MINES FOR YEAR 1910.

SALES AND OUTPUT FOR YEAR.	COAL.		COKE.	
(Tons of 2,240 lb.)	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	223,958			
" export to United States	211,136			
" " other countries	17,118			
Total sales		452,212		
Used in making coke				
" under colliery boilers, etc	59,934			
Total for colliery use		59,934		
		512,146		
Stocks on hand first of year	10,932			
" last of year	11,656			
		724		
Difference added to stock during year				
Output of colliery for year		512,870		

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	23		20		43	
Whites—Miners	383				383	
Miners' helpers	35				35	
Labourers	412		18		430	
Mechanics and skilled labour	87		71		158	
Boys	51		28		79	
Japanese						
Chinese			126		126	
Indians (natives of B. C.)	3				3	
Totals	994		263		1,257	

Rescue and Training Station—Western Fuel Co.—Nanaimo.

No. 1 SHAFT, ESPLANADE, NANAIMO.

Thomas McGuckie, Manager; John Hunt, Overman.

During the past year I have examined all the accessible parts of this mine every month since the 1st of February.

No. 1 shaft and Protection Island shaft are one mine; they are opened from one to the other in different places, ventilated by the same fans and by the same ventilation system. All the men working in No. 1 North level, and a few working in Protection getting coal for the boilers, are taken over to Protection island and are lowered down the shaft. From there they go to the different places into No. 1 North level of No. 1 shaft. The workings of this mine are very extensive; from the face of the workings, down the Diagonal slope off the Main slope to the face of the workings in the back of No. 1 North level, is from five to six miles. There are two seams of coal being worked in this mine, known as the Upper and Lower seams; the Upper seam is separated from the Lower by from 30 to 60 feet of hard sandstone rock and conglomerate. The coal in the Lower seam varies in thickness from 20 to 45 inches, and is good hard coal of excellent quality, and will stand handling well; the seam is worked on the "long-wall method," to which it is well adapted. The coal is nearly all worked or mined by compressed-air, the coal-mining machine being extensively used with good success with regard to cost, and quantity of production and a large percentage of lump coal produced. The method of mining this coal is undercutting with a compressed-air cutting-machine. There is a large volume of compressed air for these air cutting-machines, and a lot of this air is used at times to assist the ventilation. As this is all long-wall work, sometimes the coal will not stand to be mined with the mining-machine, and is dug out with picks; there is greater percentage of lump coal when it is mined with the mining-machine.

There are three slopes down from No. 1 North level in the Upper seam, through the strata, to the Lower seam. No. 2 and No. 3 slopes are connected on the north side of No. 2 slope, and the south side of No. 3 and No. 2 slopes is also connected with the long-wall of Protection shaft workings in the Lower seam. The coal from these slopes is hoisted up to No. 1 North level, on the Upper seam, and then hauled by electric motors to the foot of No. 1 shaft. The ventilation in this slope was good; for the use of ten men and one mule there was 21,000 cubic feet of air a minute circulating through the district.

Ventilation in No. 2 slope in No. 1 North level, on the north side of the slope, for the use of fifty men and ten mules, was 13,000 cubic feet a minute; for the use of fifty men and ten mules on the south side, there was 14,700 cubic feet a minute; air taken in No. 3 slope in No. 1 North level, for the use of thirty-five men and five mules, was 13,200 cubic feet a minute.

Lamb's Incline, in the Upper Seam in No. 1 North Level.—This is "pillar and stall" work and the extraction of pillars. For the use of thirty men and five horses, there was 12,000 cubic feet of air a minute going through the district. Total air coming down Protection shaft was 92,000 cubic feet a minute, made by the fan at the top of Protection The fan is 20 feet diameter by 8 feet, and it makes seventy-five revolutions a minute, with a water-gauge 1.5 inches. There is 13,000 cubic feet of air a minute going out by the way of No. 3 level, to keep the old workings clear, and also up No. 1 air-shaft, on the north side of the shaft. There was 33,000 cubic feet going out by way of Newcastle shaft after ventilating Lamb's incline workings and part of Nos. 3 and 2 slopes on the north side. The balance of the air after ventilating the south side of No. 2 and No. 1 slope workings, and also the old workings, was 56 cubic feet of air a minute, going out by way of No. 1 level to No. 1 shaft fan.

No. 1 Slope.—This slope branches off No. 1 North level towards the east, about 70 or 80 yards north of the shaft, and is down 6,513 feet. At 5,055 feet down, No. 7 East level branches off the slope, and this forms the deepest workings in this mine, not including the bottom of the slope. No. 7 level is 1,200 feet vertically below the mud-flats of Nanaimo river, and has been working the biggest part of the year. It is now finished, and is the return airway for the air coming down the Diagonal slope workings. For the use of twenty-four men and five horses, there was 15,000 cubic feet of air a minute going through No. 7 level.

At a point about 1,000 yards down No. 1 slope, the Diagonal slope branches off to the east. The coal from these workings is raised from No. 1 slope, and then taken to No. 1 shaft, where it is raised to the surface. The coal is hauled to the Diagonal along the rock tunnel by a tail-rope haulage, and is then hauled up to the Diagonal slope by a first-motion engine, stationed at the bottom of No. 1 shaft, to the top of the Diagonal slope, and then is hauled up the Main slope by endless-rope haulage. The workings in Diagonal slope are nearly all "pillar and stall" works. I visited this mine every month since the 1st of February, and found the workings in good order, well timbered, and the ventilation fairly good. For the use of 115 men and nineteen horses, there was 36,000 cubic feet of air a minute going through two districts very evenly divided. Total air going down No. 7 level and the Diagonal slope was 51,000 cubic feet a minute. Total air at the fan-shaft on the south side was 84,600, minus 51,000, equals 33,600 cubic feet a minute for leakage for doors and stoppings, and old workings and the stables.

The following are the official returns from the No. 1 shaft and Protection Island mines for the year 1910:—

Sales and Output for Year.	Coal.		Coke.	
(Tons of 2,240 lb.)	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	187,923			
" export to United States	133,360			
" " to other countries	10,583			
Total sales		331,866		
Used in making coke				
" under colliery boilers, etc.	31,439			
Total for colliery use		31,439		
		363,305		
Stock on hand first of year	8,327			
" last of year	9,711			
Difference added to stock during year		1,384		
Output of colliery for year		364,689		

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	15		13		28	
Whites—Miners	229	3.30 - 7.00			229	
Miners' helpers	22	2.86			22	
Labourers	274	2.86 - 3.30	13	2.75	287	
Mechanics and skilled labour	67	2.86 - 3.57	52	3.00 - 4.50	119	
Boys	36	1.10 - 2.45	18	.50 - 1.65	54	
Japanese						
Chinese			88	1.50 - 1.75	88	
Indians (natives of B. C.)	3	2.86			3	
Totals	646		184		830	

Mine worked 291 days during the year.

NORTHFIELD MINE, NANAIMO COLLIERY.

J. W. Montgomery, Manager.

This mine is working all the time, and is an important mine to produce coal, as is shown by the returns. The workings are all on the Lower seam, and the coal is of the best quality, hard, and stands handling well. The shaft for this mine is down 60 feet to the coal, and from the bottom of this shaft a slope is driven to the dip in the coal, a distance of about one mile. Levels are turned off right and left of this slope, as required to bring the coal out on to the slope. The coal is hauled up the slope, by an endless-rope haulage, to the bottom of the shaft. It is then raised up the shaft to the pit-head, and is conveyed to the wharf, to the ships or steamers. The shaft and slope are lit up all the way to the bottom with electric lights, and one can walk from the top to the bottom without a light. There is a telephone at every station down the slope. There is also a travelling-road parallel to the slope from the surface, for the men to travel down the mine to their work; this road is also lit up by electricity. This is the same seam of coal that is worked in the Lower seam in No. 1 shaft. The ventilation in this mine is very good.

Split 1, No. 2½ and 3 Left, for thirty-five men and seven mules, was 7,500 cubic feet; No. 4 Left, for thirty men and one mule, was 6,000 cubic feet; air taken for No. 5 Left, for twenty-five men and three mules, was 5,300 cubic feet; air taken for No. 6 Left and No. 4 Right, for fifty-five men and six mules, was 12,000 cubic feet; air taken for No. 2 Right, for four men and one mule, was 6,000 cubic feet. Total air at fan-drift was 64,000 cubic feet, leaving 26,600 cubic feet of air for leakage through doors and stoppings and old workings.

You will observe that the Western Fuel Co. is well supplied with fans, in case of break-down.

The following are the official returns of the Northfield Colliery for the year ending the 31st December, 1910:—

Sales and Output for Year.	Coal.		Coke.	
(Tons of 2,240 lb.)	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	36,035			
" export to United States	77,776			
" " to other countries	6,535			
Total sales		120,346		
Used in making coke				
" under colliery boilers, etc.	28,495			
Total for colliery use		28,495		
		148,841		
Stocks on hand first of year	2,605			
" last of year	1,945			
Difference taken from stock during year		660		
Output of colliery for year		148,181		

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		7		15	
Whites—Miners	154	3.30 - 5.50			154	
Miners' helpers	13	2.86			13	
Labourers	138	2.86 - 3.30	5	2.75	143	
Mechanics and skilled labour	20	2.86 - 3.57	19	3.00 - 4.00	39	
Boys	15	1.10 - 2.20	10	1.00 - 2.25	25	
Japanese:						
Chinese			38	1.50 - 1.75	38	
Indians						
Totals	348		79		427	

Mine worked 297 days during the year.

Canadian Collieries (Dunsmuir), Ltd.

Head Office—Victoria, B. C.

Capital, $15,000,000.

Officers.	*Address.*
Sir William Mackenzie, President,	Toronto, Ont.
A. D. McRae, Vice-President,	Toronto, Ont.
R. P. Ormsby, Secretary,	Toronto, Ont.
A. J. Mitchell, Treasurer,	Toronto, Ont.
C. F. Compton, Asst. Secretary,	Victoria, B. C.
W. L. Coulson, General Manager,	Victoria, B. C.

The Canadian Collieries (Dunsmuir), Ltd., during the year 1910 acquired all the holdings of the Wellington Collieries Company, Ltd., and has been operating the following mines during the last half of the year under the general management of Mr. W. L. Coulson :—

The Extension Colliery, in the Cranberry District (Extension); Thomas Russell, manager.

The Union Colliery, in Comox District; John Matthews and James Gray, managers at the several mines.

NOTE.—This latter colliery is in the inspection district of Inspector Newton, in whose report will be found a description of the property and the details of production.

The following table shows the combined output of all this company's collieries during the past year :—

RETURNS FROM CANADIAN COLLIERIES MINES FOR YEAR 1910.

SALES AND OUTPUT FOR YEAR.	COAL.		COKE.	
(Tons of 2,240 lb.)	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	559,474		8,327	
" export to United States	121,543			
" " other countries	25,873			
Total sales		706,890		8,327
Used in making coke	4,670			
" under colliery boilers, etc.	49,822			
Lost in washing	123,602			
Total for colliery use		178,094		
		884,984		
Stocks on hand first of year	8,892		16,480	
" last of year	22,816		10,846	
Difference { * added to / † taken from } stock during year		*13,924		†5,994
Output of colliery for year		898,908		2,333

By-products—Fire-clay, 4,535 tons.

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		23		36	
Whites—Miners	1,049				1,049	
Miners' helpers	291				291	
Labourers	308		43		351	
Mechanics & skilled labour.	69		154		223	
Boys	60		17		77	
Japanese	24		25		49	
Chinese	95		348		443	
Indians						
Totals	1,909		610		2,519	

EXTENSION COLLIERY.

Thomas Russell, Manager.

The general supervision of all the mines of this colliery is intrusted to Mr. Thomas Russell, who has an overman in charge of each separate mine.

No. 1 or Tunnel Mine.

William Jones, Overman.

Nearly all the mining done at this colliery is "pillar and stall," and some extraction of pillars. The coal is taken up a slope, and taken out of the tunnel by an electric motor. I have examined this mine every month since the 1st of February last, and found all the workings in good order and the ventilation going all through the mine, and have never found any gas in the mine. For the use of fifty-six men and six horses, there was 22,800 cubic feet of air a minute circulating through the mine; the total air at the fan-shaft was 33,800 cubic feet a minute, leaving 11,000 cubic feet a minute to ventilate the old workings, leaking through the doors and stoppings. A Murphy fan, size 8 by 2 feet, double, speed 102 revolutions a minute, with a $\frac{3}{4}$-inch water-gauge, creates the ventilating-current.

No. 2 Mine.

Thomas Jackson, Overman.

This mine is entered by the rock tunnel about a mile long. There are two slopes in this mine, sunk from a motor-road by which the coal is gathered together to make up a trip for the motor to take out of the tunnel to the tipple. The old No. 2 slope came out on the hill above the tunnel, and the men and horses can go out that way if necessary; the ventilating-fan is on the hill near the slope over this airway. No. 2 slope goes down past the inside end of the tunnel to the basin, from which the coal is being taken out. The mining is done on the "pillar and stall" system. A great amount of the coal has to be left in this mine to act as the roof, as there is so much bad roof above the coal; most of the work in this district now is the extraction of pillars. The ventilation was fairly good. For the use of thirty men and three mules, there were 36,000 cubic feet of air a minute for No. 1 district in the old slope. For the use of sixty-five men and ten mules, there were 14,000 cubic feet of air a minute in No. 2 district in the old slope.

Nos. 3 and 4 Districts in the Slant Slope, and the No. 4 Level.—This slope starts down to the dip about 250 yards east of the inner end of the main tunnel. The workings off this slope are all to the dip of No. 4 level. The workings are "pillar and stall" and the extraction of pillars. In places in this slope the roof is good; the roof is good hard sandstone in some places, and in others it has to be timbered with stringers to keep it up. The coal is hauled up the slope with an electric motor or hoist, and is then taken away with the electric motor to the tipple. I found all of this mine very clear; I got just a cap of gas over the timbers on two or three occasions. For the use of forty men and five mules in No. 3 district, there was 8,000 cubic feet of air a minute going through the district; for the use of sixty-five men and ten mules in No. 4 district, there was 14,000 cubic feet of air a minute going through that district. The total air at the fan-shaft was 73,000 cubic feet of air a minute, leaving a leakage of 31,000 cubic feet a minute for old workings, doors, and stoppings.

Thomas Jackson, overman; Hugh Fulton, Davidson, William Bradley, William Cosier, A. Smith, Harry Mitchell, William James, James Nimmo, Donald McLean, Sam Mottishaw, Issac Nash, William Kerr, firemen and shotlighters.

No. 3 MINE, EXTENSION.

William Simpson, Overman.

This mine is the continuation of No. 4 West level from the rock tunnel. The method of mining in this mine is "pillar and stall" and the extraction of pillars; all to the raise of No. 4 level is the extraction of pillars. There is quite a lot of pillar coal in this district, and the coal varies in thickness from 5 to 12 feet. There are two connections upward from this mine to the surface. From No. 4 North level, the old slope goes right through to the surface, and the airway to the fan. The ventilation was good all through this district; for the use of forty men and four mules, there was 18,000 cubic feet of air a minute going through the district. All the coal from No. 3 mine, on the west side of the tunnel, goes out along No. 4 level, and out of the tunnel, as does the coal from No. 2 mine.

No. 3 MINE, SLOPE DISTRICT.

This district is nearly all "pillar and stall" work at the present, where they found the coal after going through a big fault uphill. The ventilation was good, and the mine was well timbered. I only found gas in this district on two occasions, on top of a cave in No. 12 stall, off Gregson's level, and this was cleared out by driving a crosscut through from the upper side of the stall. For the use of forty-six men and five mules, there was 12,000 cubic feet of air a minute going through the district. The total air at the fan-shaft was 64,000 cubic feet of air a minute, leaving for leakage 34,000 cubic feet a minute to keep the old workings ventilated, and for the leakage through doors and stoppings.

Firemen are: George Smith, Evan John, James Nelson, Dan Fagan, Dan Campbell, Pat Malone, John Ross, and John Barclay.

No. 4 MINE, EXTENSION.

This shaft is 290 feet deep; the size is 8 by 16 feet; one part is used for an upcast, with a mud wall all the way down the centre of the shaft. The other is used as a downcast. This mine is about one mile and a half from the Extension tunnel to the south. There is not much done in this mine as yet; the levels are only in a short distance, and there is a slope down about 200 yards from the North level. The ventilation was good and the mine all well timbered. I never found any gas in this mine. For the use of twenty men, there was 30,000 cubic feet of air a minute going through the workings.

Thomas Mills, overman; John McMurtrie and James Perry, firemen.

The following are the official returns of the Extension Colliery for the year ending the 31st December, 1910:—

SALES AND OUTPUT FOR YEAR.	COAL.		COKE.	
(Tons of 2,240 lb.)	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	251,208			
" export to United States	72,920			
" " other countries				
Total sales		324,128		
Used in making coke				
" under colliery boilers, etc.	12,467			
Lost in washing	43,812			
Total for colliery use		56,279		
		380,407		
Stocks on hand first of year	1,906			
" last of year	1,981			
Difference added to stock during year		75		
Output of colliery for year		380,482		

By-products—Clay, 65 tons.

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		14		18	
Whites—Miners	395	3.50 - 5.00			395	3.50 - 5.00
Miners' helpers	273	2.75 - 3.30			273	2.75 - 3.30
Labourers			7	2.75 - 3.02	7	2.75 - 3.02
Mechanics and skilled labour	15	2.75 - 3.02	56	2.75 - 4.40	71	2.75 - 4.40
Boys	42	1.10 - 2.20	5	1.10 - 2.20	47	1.10 - 2.20
Japanese			6	1.50	6	1.50
Chinese	8	1.50 - 1.65	106	1.35 - 1.75	114	1.35 - 1.75
Indians						
Totals	737		194		931	

Pacific Coast Coal Mines, Limited.

Head Office—Victoria, B. C.

Capital, $3,000,000.

Officers.	*Address.*
John Arbuthnot, President,	Victoria, B. C.
Luther D. Wishart, Vice-President,	New York.
S. H. Reynolds, Managing Director,	Victoria.
Jas. Savage, Secretary-Treasurer,	Victoria.
George Wilkinson, Superintendent,	Nanaimo, B. C.

Value of plant, $424,226.

This is a recently organized company and includes in its holdings the Fiddick Colliery of the former South Wellington Mines, Ltd., and certain property at Suquash,* on the east coast of Vancouver Island, near Malcolm island, where the company has, within the past year, opened up a new colliery, which is now producing coal. The output of coal made by the company from these two collieries combined is shown in the following table :—

SALES AND OUTPUT FOR YEAR.	COAL.		COKE.	
(Tons of 2,240 lb.)	Tons.	Tons.	Tons.	Tons.
Sold for *consumption* in Canada	93,467			
" export to United States	27,473			
" " other countries	17,299			
Total sales		138,239		
Lost in washing	11,602			
" under colliery boilers, etc.	11,305			
Total for colliery use		22,907		
		161,146		
Stocks on hand first of year	14,288			
" last of year	27,952			
Difference added to stock during year		• 13,664		
Output of colliery for year		174,810		

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		5		16	
Whites—Miners	192				192	
Miners' helpers						
Labourers	13		24		37	
Mechanics and skilled labour	11		17		28	
Boys	8		4		12	
Japanese						
Chinese			64		64	
Indians			15		15	
Totals	235		129		364	

*NOTE.—The details as to the Suquash Colliery will be found in Inspector Newton's report.

FIDDICK COLLIERY, SOUTH WELLINGTON.

George Wilkinson, Manager. Harry Devlin, Overman.

This mine is called the Fiddick Colliery, of the former South Wellington Mines, Ltd. It is worked from two slopes, No. 1 or Fiddick and No. 2 Richardson slope. The slopes have not been extended during the year, or since I started on the 1st February, 1910. This mine has been very successful in the output. They are putting out about 900 tons of coal a day, and if they were not curtailed by the boundary on both sides of them, they would have put out much more coal.

No. 1. Slope.—I have made an inspection of this slope every month since the 1st of February, 1910, and never saw any gas in the mine. This mine is well timbered, and has good ventilation, and is a wet mine. For the use of forty men and three horses, there was 14,000 cubic feet of air a minute going through the west side of the slope; for the use of forty-five men and five horses, on the east side of the slope, there was 15,000 cubic feet of air a minute going through the mine.

No. 2 Slope Workings.—On my last visit to this mine I found there was 22,800 cubic feet of air a minute circulating through the mine, for the use of forty-eight men and six horses. The total air at the fan-drift was 63,650 cubic feet a minute, leaving 11,600 cubic feet a minute for leakage through doors and stoppings and the old workings. In all my inspections of the two slopes I never found gas in the mine.

George Wilkinson, manager; Harry Devlin, overman; John Ovington, Alexander Bryden, Albert Manifold, Richard Rallison, George Roughead, and Thomas Jones, firemen and shot-lighters.

The following are the official returns for the Fiddick Colliery for the year 1910:—

Sales and Output for Year.	Coal.		Coke.	
(Tons of 2,240 lb.)	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	92,701			
" export to United States	27,473			
" " other countries	17,299			
Total sales		137,473		
Lost in washing	11,602			
Used under colliery boilers, etc.	10,305			
Total for colliery use		21,907		
		159,380		
Stocks on hand first of year	13,238			
" last of year	25,829			
Difference added to stock during the year		12,591		
Output of colliery for year		171,971		

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		5	5.00	15	
Whites—Miners	185	3.30 - 5.00			185	
Miners' helpers						
Labourers	11	2.85	23	2.75 - 3.00	34	2.83
Mechanics and skilled labour	11	3.30	15	3.25	26	3.30
Boys	8	1.35	4	1.25	12	1.30
Japanese						
Chinese			60	1.50	60	1.50
Hindoos			15	1.65	15	1.65
Totals	225		122		347	

Name of seams or pits—Upper Douglas seam; No. 1 slope (Fiddick); No. 2 slope (Richardson).

Description of seams, tunnels, levels, shafts, etc., and number of same—Two slopes and one adit level; one air-shaft, 10 x 12 feet. In No. 1 slope there are working at the present time Nos. 2, 3, and 4 East levels, and Nos. 2 and 3 West levels; seam averaging from 3 to 26 feet in thickness. In No. 2 slope there are working Nos. 4, 5, and 6 Right levels; seam averages from 3 to 28 feet in thickness.

Description and length of tramway, plant, etc.—Seven miles of standard-gauge railway and sidings. Two locomotives and thirty Hart-Otis dump-cars with a capacity of 40 tons each. Bunkers with a capacity of 4,000 tons, with loading conveyor and wharf. Washing consists of one Jeffrey-Robinson washer, capacity of 400 tons per day of nine hours; and attachments for load-washed product either on loading conveyor or by elevators on to railroad-cars. Power plant consists of two boilers, return-tubular type, 120 horse-power

each; one dynamo and engine for lighting purposes. At mine the power-house contains two return-tubular boilers, 100 horse-power each; one Ingersoll air-compressor; one Canadian Rand air-compressor; one dynamo and engine for lighting purposes; one thoroughly equipped machine-shop, also blacksmith-shop and carpenter-shop; one thoroughly equipped tipple, capacity 1,500 tons per nine hours, containing Phillips crossover dump and car hauls and all other modern arrangements; one double-drum, geared, friction hoisting-engine, 200 horse-power; one Sheldon fan-engine (9 x 12), running 160 revolutions per minute, size of fan-wheel 9 feet, producing 82,000 cubic feet of air per minute, with a water-gauge of $\frac{3}{4}$ inch; one Sullivan diamond drill, Class C; winches for underground haulage, two $6\frac{1}{2}$ x 8, one 5 x 8, two 5 x 7, one 9 x 11; pumps, two Camerons No. 5, capacity 50 gallons each, one duplex $4\frac{1}{2}$ x $2\frac{3}{4}$ x 4, one $5\frac{1}{4}$ x $3\frac{1}{2}$ x 5, two 7 x 5 x 7, one 3 x 2 x 3, two 4 x 6. One hundred and sixty mine-cars and approximately eight miles of narrow-gauge track in mine.

The Vancouver-Nanaimo Coal Mining Co., Ltd.

Head Office—Vancouver, B. C.

Capital, $250,000.

Alvo. V. Alvensleben, President,	405 Hastings Street, Vancouver, B. C.
H. W. Maynard, Vice-President,	98 Powell Street, Vancouver, B. C.
Willebald Tinhoff, Secretary-Treasurer,	405 Hastings Street, Vancouver, B. C.
J. J. Grant, Managing Director,	Nanaimo, B. C.

Value of plant, $30,000.

NEW EAST WELLINGTON COLLIERY.

Harry Freeman, Manager.

This mine is opened from one or two slopes from the surface at the dip. At a distance of about 1,200 feet down the slope, pitching about 27 degrees, coal was struck. There is also a counter-slope from the surface to the bottom of the mine, and this is the return airway; one being the haulage slope, and the other the airway, connected with the fan-shaft. The main haulage level branches off at the bottom of the slope at an angle of 65 degrees, with two counter-levels running parallel with the main level. The main levels are 1,500 feet from the bottom of the slope. From the bottom of the slope, running off the counter-level to the south-east, are the long-wall workings. This mine is ventilated by a triple-entry system, one to the rise and one to the dip, with two currents of air. The ventilating-fan is a 9-foot Sheldon, direct-driven by a 10 x 12-inch engine, with a capacity of 80,000 cubic feet a minute. The haulage-road is narrow-gauge and direct, about one-quarter mile in length; the average grade of the slope is 27 degrees. The seam varies in thickness from 5 to 6 feet, and is a very hard coal. There is a stable underground to accommodate fourteen horses, size 30 x 50 x 6.5 feet. The trips are hauled up to the slope by a 10 x 12 Washington hoisting-engine, hauling eight to ten coal-cars per trip. On landing at the surface they are run over a tippler of the Head-Wrightson patent; capacity is 400 tons in eight hours. Tippler and screen are belt-driven from a 9-horse-power engine. The plant is operated by 68-horse-power return. There are two Snow pumps underground, 7 x 4 feet, and two air-compressors on top, one 9 x 12 inches,

and one 8 x 12 inches. There is a railway connection with the E. and N. Railway at Newcastle Siding. I have been out to this mine and examined the workings every month since the 1st of February, 1910, and I never found any gas in the slope working during that time. On my last visit there was 28,000 cubic feet of air a minute going through the mine, for the use of five men and nine horses. Total air at the fan-shaft was 50,000 cubic feet a minute, leaving 22,000 cubic feet a minute for leakage for doors, curtains, and old workings, to keep them clear. It was well timbered and had good ventilation. Firemen are: Joseph Dykes, Joseph Thompson, and William Moore.

The following are the official returns from the New East Wellington Colliery for the year 1910:—

Sales and Output for Year.	Coal.		Coke.	
(Tons of 2,240 lb.)	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	29,542			
" export to United States				
" " to other countries				
Total sales		29,542		
Used in making coke				
Used under colliery boilers, etc.				
Total for colliery use				
Stocks on hand first of year	200			
" last of year	100			
Difference taken from stock during year		100		
Output of colliery for year		29,442		

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		2		3	
Whites—Miners	40	3.30 - 7.00			40	
Miners' helpers		1.75 - 3.30				
Labourers	35		2	2.50	37	
Mechanics and skilled labour	2	2.86 - 3.30	8	3.00 - 3.50	10	
Boys						
Japanese						
Chinese			10	1.75	10	
Indians						
Total	78		22		100	

Name of seams or pits—New East Wellington mine; Mountain district; Wellington seam.

Description of seams, tunnels, levels, shafts, etc., and number of same—The mine is connected with the surface by two slopes, one being the haulage slope, length 1,150 feet, the other a counter-slope connected with the fan-shaft and adit level. The main haulage level

branches off at the bottom of slope at an angle of 65 degrees, with two counter-levels running parallel with main level; the main levels are in 1,500 feet from bottom of slope. From bottom of slope running off the counter-level to the south-east are the long-wall workings. The mine is ventilated by the triple-entry system, one to the rise and one to the dip, with two splits. The ventilating-fan is a 9-foot Sheldon, direct-driven by a 10 x 12-inch engine, with a capacity of 80,000 cubic feet per minute. The haulage is narrow-gauge and direct, about one-quarter mile in length; average grade of slope, 27 degrees. The seam varies from 5 to 6 feet in height, of a very hard coal. There is a stable underground to accommodate fourteen horses; size, 30 x 50 x 6 feet 5 inches.

Description and length of tramway, plant, etc.—The trips are hauled up the slope by a 10 x 12 Washington hoisting-engine, hauling eight to ten coal-cars per trip. On landing at the surface are run over a tippler of the Head-Wrightson patent, capacity 400 tons in eight hours. Tippler and screen are belt-driven from a 9-horse-power engine. The plant is operated by 68-horse-power return-tubular boiler. There are two 7 x 4 Snow pumps underground; two air-compressors on top, one 9 x 12, one 8 x 12. There is railway connection with the E. and N. Ry. at Newcastle Siding.

Nicola Valley Coal & Coke Co., Ltd.

Head Office—Vancouver, B. C.

Capital, $1,107,700.

Officers.	*Address.*
John Hendry, President,	Vancouver, B. C.
Alexander McLaren, Vice-President,	Vancouver, B. C.
W. H. Armstrong, Managing Director and General Manager,	Vancouver, B. C.
J. J. Plommer, Secretary-Treasurer,	Vancouver, B. C.
Charles Graham, Mine Manager,	Middlesboro, B. C.

Value of plant, $170,000.

MIDDLESBORO COLLIERY.

Charles Graham, Manager.

No. 1 MINE.

Robert Fairfould, Overman.

This mine has worked more or less since my inspection from the month of February, 1910. This mine is operated by a tunnel driven with the measures, and nearly all the coal is worked to the rise of this tunnel. There is a Main slope down, and two slant slopes are started off each side of the Main slope. There is nothing else going on at the present time. There is also No. 1 slope; this slope and counter are down about 300 feet. The coal in this mine is of good quality. The seam is about 18 feet in thickness, and pitches about 20 degrees, only working about 8 feet of the coal. I have examined this mine nearly every month since I have been here, and found a little gas on one or two occasions in potholes in the roof, where

the roof was rotten and broken down. The mine had taken a swing by having too much coal taken out of the pillars. It caused the mine to cave in, and blocked the roads and airways. Most of the mine had to be retimbered; some places two or three times; and the roads and airways had to be opened out. For the use of fifty men and one horse, there was 12,000 cubic feet of air a minute going through the working-places. The total air at the fan-shaft at the mouth of the old slope, at Coal gulley, was 24,750 cubic feet per minute, leaving 12,750 cubic feet a minute for leakage for stoppings, doors, and old workings. The fan is 2 x 5 feet, making 350 revolutions a minute. Firemen are: Andrew McKendrick and George Hudson.

No. 4 Mine, Middlesboro.

This mine is up the hill about 300 feet above the opening of No. 1 mine. The seam of coal is about 9 feet thick, and of good hard quality, pitching about 20 degrees. I have examined this mine every month since I started down here, and found it in good order all the time; well timbered and good ventilation. For the use of eighteen men, there was 9,500 cubic feet of air a minute going through the mine, with a fan 38 x 18 inches. Nathaniel Bevis, overman; David Crawford and Alexander Ewart, firemen.

No. 5 Mine, Middlesboro Colliery.

This mine, opening level with No. 1 mine, overlies No. 1 seam. About 150 yards to the south of No. 1 mine the thickness of the seam is about 5 feet. The dip varies from 20 to 30 degrees. In my visit to this mine I found it always clear and in good order; well timbered and good ventilation. For the use of seventeen men and one horse, there was 8,400 cubic feet of air a minute going through the mine. This mine has a tunnel level into the coal for a haulage-road, and there is also a counter-tunnel for an airway. The fan is 38 x 18 inches. Nathaniel Bevis, overman; David Crawford and Alexander Ewart, firemen.

No. 2 Mine, Middlesboro.

Hugh Gillespie, Overman.

This mine is half a mile to the south of No. 1 mine, and is worked by a slope and levels turned to right and left off the slope; this slope is down about 1,150 feet. The seam pitches about 20 degrees, and is about 5 feet thick; the coal is good quality. This mine is worked by "pillar and stall" system. Up the pitch, the chutes in the middle of the stalls and the sides are filled up with rock and dirt to keep the roof up, as the stalls are 40 feet wide; the roof is good hard sandstone. The ventilation was good. For the use of thirty-five men and one mule, there was 20,000 cubic feet of air a minute going through the mine. Firemen are: Stephen Davis and William Halliman.

No. 3. Mine.

There was a tunnel driven through the strata from No. 1 level in No. 2 mine to the coal in No. 3 mine, and the air came down this shaft, ventilated the workings, and returned through the tunnel into No. 1 level in No. 2 mine, and to the same fan that ventilates No. 2. For the use of twenty men and one horse, there was 10,000 cubic feet of air a minute going through the mine. The roof is of hard sandstone, but the coal is only about 2.5 feet thick. Total air at the fan-shaft was 30,000 cubic feet a minute. Hugh Gillespie, overman; Stephen Davis and William Halliman, firemen.

The following are the official returns from Middlesboro Colliery for the year 1910 :—

SALES AND OUTPUT FOR YEAR.	COAL.		COKE.	
(Tons of 2,240 lbs.)	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	138,681			
" export to United States				
" " other countries				
Total sales		138,681		
Used in making coke				
Used under colliery boilers, etc	2,987			
Total for colliery use		2,987		
		141,668		
Stocks on hand first of year	440			
" last of year	259			
Difference taken from stock during year		181		
Output of colliery for year		141,487		

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		4		14	
Whites—Miners	170	3.30 - 5.00			170	
Miners' helpers	40	3.00			40	
Labourers	58	2.75 - 3.30	38	2.75 - 3.00	96	
Mechanics and skilled labour			29	3.25	29	
Boys			3	1.00 - 2.00	3	
Japanese						
Chinese						
Indians						
Totals	278		74		352	

No. 1 mine, Jewel seam, 18½ feet thick—Main tunnel is in a distance of 1,740 feet from portal, forming main haulage and intake airway. Main dip is down 575 feet in excellent coal; outside dip is down 475 feet. Ordinary rooms, including crosscuts and counter-levels, are about 14,000 feet into the workings. The mine worked 280 days during the year.

No. 2 mine, Ells seam, 5 feet thick—Main tunnel is in a distance of 1,650 feet from portal, forming haulage-way and main return airway. The main slope to low side of tunnel is down 1,191 feet. This forms the main intake airway, and is connected to the main tunnel. Ordinary chute-ways, including crosscuts and counter-levels, are about 14,100 feet into the working-places. The mine worked 279 days during the year.

No. 3 mine, Gem seam, 2 feet 6 inches thick—This seam was started during the year. It is under No. 2 seam, and was tapped by a rock tunnel 328 feet long, starting at No. 4 chute in main level, No. 2 mine. The seam is small, but the coal is of very good quality.

Upon striking the seam, levels were driven right and left, which are in 350 feet and 650 feet respectively. Ordinary rooms and crosscuts are about 880 feet into the working-places. The mine worked ninety days during the year.

No. 4 mine, Major seam, 14 feet thick—Main tunnel is in 450 feet, forming return airway. Main slope to left of main tunnel is down 640 feet, forming main haulage and intake airway. Ordinary rooms and crosscuts are about 7,240 feet into the working-places. The mine worked 261 days during the year.

No. 5 mine, Ells seam, 5 feet thick—Main tunnel is in 1,600 feet from portal, forming intake airway and main-haulage road. No. 1 dip is down 164 feet; No. 2 dip 60 feet. Ordinary rooms, including crosscuts and counter-levels, are about 5,190 feet into the working-places. Mine worked 274 days during year.

Description of plant—Haulage: Horses are used on all main levels; hoisting from the dips is done by hoists run by compressed air furnished by a Canadian Rand compressor, capacity 2,215 cubic feet per minute. The compressor also furnishes power to run the fans at Nos. 1, 4, and 5 mines, and the mining machinery in No. 5 mine. No important addition has been made to tipple or machinery during the year.

Diamond Vale Collieries, Limited.

Head Office—Vancouver, B. C.

Capital, $3,000,000.

Officers.	*Address.*
T. J. Smith, President,	414 Seymour street, Vancouver, B. C.
J. H. Sanderson, Vice-President,	Vancouver, B. C.
J. F. Faulkner, Secretary,	Vancouver, B. C.
F. J. Lumsden, Treasurer,	Vancouver, B. C.
Benj. Browitt, Mine Manager,	Merritt, B. C.

Value of Plant, $50,000.

DIAMOND VALE COLLIERY.

Benjamin Browitt, Manager.

This company's property lies immediately to the south of the Middlesboro Colliery, the Coldwater river being the boundary between them. The two shafts mentioned in the previous reports are not being continued, and the machinery has been removed.

No. 3 Mine.

This mine is about one mile and a half east of Merritt, and about two miles from the two shafts that the company sunk on their property to the east. This is a slope driven to the dip of the coal about 500 feet. There is one level to the left and one to the right of the slope. Nearly all the coal comes from the level on the left of the slope. This mine has a good hard sandstone roof all through, and the coal is of good quality, averaging about 4 feet in thickness, and pitching about 37 degrees. For the use of ten men, there was 6,300 cubic feet of air a minute going through the mine. The fan was 22 x 46 inches. J. H. Grimes is fireman.

The following are the official returns from the Diamond Vale Colliery for year 1910:—

SALES AND OUTPUT FOR YEAR.	COAL.		COKE.	
(Tons of 2,240 lb.)	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	2,261			
" export to United States				
" " other countries				
Total sales		2,261		
Used in making coke				
Used under colliery boilers, etc	100			
Total for colliery use		100		
		2,361		
Stocks on hand first of year				
" last of year	70			
Difference added to stock during year		70		
Output of colliery for year	2,431	2,431		

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	3.50			1	3.50
Whites—Miners	10	3.75			10	3.75
Miners' helpers						
Labourers	1	3.00	2	2.87	3	2.92
Mechanics and skilled labour			1	3.50	1	3.50
Boys						
Japanese						
Chinese						
Indians						
Totals	12		3		15	3.55

Name of seams or pits—No. 3 slope.

Description of seams, tunnels, levels, shafts, etc., and number of same—Seam averages 4 feet 6 inches in thickness, separated by two continuous bands of rock, each averaging 4 inches in thickness. Three slopes driven: Main slope, 10 x 6 feet, down 450 feet; average dip, 35 degrees; direction, 5° 30′ S.E.; dip, 10° 30′ S.W. (magnetic); counter-slopes, 12 x 5, or thickness of seam. Levels turned off east and west. East level in a distance of 500 feet; west level, 250 feet. Rooms, 72-foot centres, driven up the pitch on the East level and parallel to slope in the West. Rooms, 36 feet wide, with chutes on each side; pillars, 36 feet wide. Roof, hard shale for three feet, then sandstone; floor, hard shale. Centre of rooms packed tight with rock from partings, thus keeping fresh current of air always along the faces.

Description and length of tramway, plant, etc.—Tramway, none. Boiler, 24 horse-power, locomotive type. Small hoist, double-acting; cylinders, 8 x 12 inches; drum, 2 feet 6 inches diameter, geared 4 to 1.

Coal Hill Syndicate.

Head Office—Merritt, B. C.

Officers.	*Address.*
W. L. Nicol, President,	1200 Comox Street, Vancouver, B. C.
Joseph Graham, Vice-Pres. and Gen. Man.,	Merritt, B. C.
Andrew Bryden, Mine Manager,	Merritt, B. C.

Value of plant, $3,000.

This is a new company that has just started in to develop a new colliery, and has not been at work a year as yet.

This property is up on the hill above the Middlesboro property. There are three slopes. No. 1 slope is down 300 feet, No. 2 is down 600 feet, and No. 3 is down 200 feet. The seam of coal is 10 feet thick, and the roof is good hard sandstone. The coal is hauled down the hill to the Middlesboro mines and is loaded into the railroad-cars. Only Nos. 2 and 3 slopes were working at the time. For the use of four men, there was 7,200 cubic feet of air a minute going through the workings. There is natural ventilation. The air goes down one slope and around the workings up the other slope.

The following are the official returns of Coal Hill Colliery for the year 1910:—

Sales and Output for Year.	Coal.		Coke.	
(Tons of 2,240 lb.)	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	2,200			
" export to United States				
" " other countries				
Total sales		2,200		
Used in making coke				
" under colliery boilers, etc.	100			
Total for colliery use		100		
Stock on hand first of year				
" last of year				
Difference added to stock during year				
Output of colliery for year		2,300		

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	5.00	1	5.00	2	5.00
Whites—Miners	3	3.50			3	3.50
Miners' helpers						
Labourers			2	3.00	2	3.00
Mechanics and skilled labour			1	3.50	1	3.50
Boys						
Japanese						
Chinese						
Indians						
Totals	4		4		8	

Name of seams or pits—No. 1 seam, 3 feet thick; No. 2 seam, 8 feet thick; No. 3 or Wilson seam, 12 feet thick; No. 4 or Nicol seam, 14 feet thick.

Description of seams, tunnels, levels, shafts, etc., and number of same—Shaft, 7 x 5, cuts the No. 1 seam at 30 feet deep, and continues to the 100-foot and cuts the No. 2 seam. A slope was driven from the surface on the No. 1 for 300 feet. A slope was driven from the surface on No. 2, 500 feet. No. 1: A slope was driven from the surface on the No. 3, 100 feet, and a level run east 80 feet and west 200 feet, and then the slope was sunk another 100 feet. No. 2: Hoisting slope was sunk 300 feet, intersecting the West level from No. 1 slope, and the level continued 300 feet west. Two levels were started east and two west.

Description and length of tramway, plant, etc.—Consists of 24-horse-power boiler and engine, one steam-pump, duplex, 4 x 6.

Pacific Coast Colliery Co. of B. C.

Head Office—Minneapolis, Minn.

Officers.	*Address.*
Jas. C. Andrews, President,	Minneapolis.
J. S. Sherril, Secretary-Treasurer,	Minneapolis.
W. E. Duncan, Consulting Engineer,	Merritt.

This company's property is situated in the Nicola valley, and adjoins the Middlesboro Collieries to the north. Development work was started in the early part of the year, the work being confined to the lower measures, which indicates a large amount of coal on the property.

No. 1 SLOPE.

Howell John, Overman.

This slope is being driven east of north 50 degrees to the dip of the coal at 30 degrees, the entry being 8 by 10 feet, and the distance from the portal to the working-face is 300 feet. The coal-measures passed through have been somewhat disturbed, but this appears to be running out, the coal at the face being about 5 feet.

No. 2 SHAFT.

Howell John, Overman.

This shaft is being sunk close to the south line of the property. The coal has been struck at a depth of 115 feet. A main entry has been driven 35 degrees east of north, to a distance of 85 feet, showing about 10 feet of coal at the face. A level has been turned off 30° west of north, intended for driving, so as to connect with No. 1 slope. Steam-hoists are installed at both mines, and ventilation is conducted at No. 2 shaft by a small steam-driven fan, giving good air throughout the workings. A tipple is built at No. 2 shaft alongside of the spur of the C. P. R. running in from the Middlesboro mines.

No. 1 slope working one shift, working two mines. No. 2 shaft working two shifts, three mines in the shifts.

Princeton Coal and Land Company, Ltd.

Head Office—15 Great St. Helens, London, E. C.

Officers.	*Address.*
Sheffield Neave, Chairman,	London, Eng.
Alex. Crerar, Director,	London, Eng.
Arthur Hicklin, Director,	London, Eng.
Oswald J. Bambridge, Director,	London, Eng.
E. S. Neave, Secretary,	London, Eng.
Ernest Waterman, Local Director,	Princeton, B. C.
Jas. Holden, Mine Manager,	Princeton, B. C.

This company only began operations in December, 1909, and was formerly the Vermilion Forks Mining and Development Company.

The following are the official returns from the Princeton Colliery for the year 1910:—

SALES AND OUTPUT FOR YEAR.	COAL.		COKE.	
(Tons of 2,240 lb.)	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	6,278			
" export to United States	3,570			
" " to other countries				
Total sales		9,848		
Used in making coke				
" under colliery boilers, etc.	300			
Total for colliery use		300		
		10,148		
Development coal not marketed		1,720		
Difference {taken from / added to} stock during year				
Output of colliery for year		11,868		

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	3.75	1		2	
Whites—Miners	14	Contract.			14	
Miners' helpers						
Labourers	4	3.00	9	2.75	13	
Mechanics and skilled labour			3	4.00	3	
Boys						
Japanese						
Chinese						
Indians						
Totals	19		13		32	

Name of seams or pits—No. 1.

Description of seams, tunnels, levels, shafts, etc., and number of same—Thickness of seam, 24 feet, top 8 feet being mined. Main slope on dip of seam, 11 per cent. 650 feet, 12 x 7 feet; counter-slope down 600 feet, 12 x 7 feet; counter-level driven east 305 feet; main level driven east 285 feet. Air-shaft 8 x 8 feet, timbered, 64 feet deep down.

Description and length of tramway, plant, etc.—Length of tramway from end of tipple to mouth of slope, 200 feet; 50-horse-power hoist; 50-horse-power boiler; fan.

NORTHERN DISTRICT OF VANCOUVER ISLAND.

REPORT OF JOHN NEWTON, INSPECTOR.

I beg to submit my report as Inspector of Mines for the Northern District of Vancouver Island for the year 1910.

Canadian Collieries (Dunsmuir), Ltd.*

These mines were operated by the Wellington Colliery Company, but were taken over by the Canadian Collieries (Dunsmuir), Ltd., in the middle of 1910.

UNION COLLIERY.

No. 4 MINE.

John Matthews, Manager; David Nellist, Overman, with a staff of nine Firemen.

This mine consists of No. 1 and No. 2 slope. No. 1 slope has not been advanced during the year. Nos. 14 and 15 West levels, down the No. 1 Diagonal slope, are still advancing. Nos. 16 and 17 East and West levels, down the No. 2 Diagonal slope, are still advancing. In No 13 East the pillars are being extracted. Nos. 14 and 15 West levels, off No. 1 Diagonal

* See also page 188.

slope, are in a distance of 4,800 feet from the foot of the slope, and are still advancing. All of these levels are in good coal, and worked on the "pillar and stall" plan. The No. 2 Diagonal is turned off the No. 16 West level at a distance of 500 feet from the foot of the No. 1 Diagonal, running in a southerly direction; Nos. 16 and 17 East and West levels are turned off this slope. The levels are in a distance of 700 feet, and in good coal, ranging in thickness from 4 to 5 feet, with a band of rock running through it, varying from 1 foot to 18 inches. All of these levels are in good coal, and worked on the "pillar and stall" system.

In No. 13 on the East level and No. 11 West level the pillars are being extracted. I found 44,000 cubic feet of air a minute passing into this section of the mine, divided into two splits.

No. 1 Split (East Side).—I found 25,000 cubic feet of air a minute passing into this section, for the use of sixty men and nine mules, or an average of 363 cubic feet to the unit. No explosive gas was found; the timbering and roadways were in good condition.

Hygrometer Readings.

Place.	Dry Bulb.	Wet Bulb.	Moisture.
No. 16 East level	60	58	87 %
" 5 stall	61	57	76 "
" 28 "	60	56	76 "
" 14 "	60	58	88 "

No. 2 Split (West Side).—I found 13,000 cubic feet of air a minute passing into this section of the mine, for the use of twenty-one men and three mules, or an average of 533 cubic feet to the unit. No explosive gas was found. I examined all the return airways in this slope, and did not find any trace of explosive gas; timbering and roadways were in good condition.

Hygrometer Reading.

Place.	Dry Bulb.	Wet Bulb.	Moisture.
No. 9 stall	58	56	87 %
" 16 level	58	56	87 "
" 15 stall	58	56	87 "

No. 2 Slope.

This slope branches off the No. 1 slope to the right, a short distance from the entrance of the mine, and forms the deepest workings of this No. 4 mine. The face of this slope has not advanced much during the present year, on account of water.

The levels are turned off on the east and west of this slope. Nos. 12, 13, 15, 16, 17, and 18 levels are working on the west of this slope, and Nos. 12, 13, 14, 15, 16, 17, and 18 levels are working on the east side. The pillars are being extracted in No. 12 on the west side; all the other levels are in good coal, ranging from 5 to 6 feet in thickness, with a band of rock running through the centre of it, varying from 4 to 6 inches. All the levels are worked on the "pillar and stall" system. Nos. 12, 13, 14, 15, 16, 17, and 18 levels are worked on the east side of this slope. Nos. 12, 13, and 14 levels are all extracting pillars. The other levels are in good coal, especially Nos. 17 and 18 levels, the coal ranging from 5 to 7 feet of clean coal. All of this slope is worked on the "pillar and stall" system.

The overlying strata is fire-clay, and is a dangerous element to the miners, as 60 per cent. of the accidents occurring are caused by this overlying strata.

I examined all parts of this section of the mine, both intake and return airways, and found the following conditions: I found 41,000 cubic feet of air a minute passing into this mine, divided into two splits.

West Side Split.—I found explosive gas given off in No. 12 pillars, showing a cap on the flame of a safety-lamp; no shooting is being done there and only the Wolf safety-lamps are being used; all the other places clear of gas. I found 10,000 cubic feet of air a minute passing into this section, for the use of fifty-four men and six mules, or an average of 166 cubic feet to the unit; the timbering and roadways were in good condition. I examined all the return airways in this slope, and did not find any trace of explosive gas. All the examinations were made with a Wolf safety-lamp.

Hygrometer Readings.

Place.	Dry Bulb.	Wet Bulb.	Moisture.
No. 13 face of level	62	62	100 %
" 15 " "	56	56	100 "
" 16 " "	58	56	87 "
" 28 stall	58	56	87 "
" 18 "	58	58	100 "

East Side Split.—I examined all parts of this section, both intake and return airways, and found the following conditions: I found explosive gas given off in Nos. 12, 13, and 14 pillars, showing a cap on the flame of a safety-lamp; no shooting is being done, and only locked Wolf safety-lamps are being used. I also found a little explosive gas in No. 12 stall, No. 15 level, and in No. 4 stall, No. 17 level; all the other places clear of gas. I found 11,000 cubic feet of air a minute passing into this section of the mine, for the use of fifty-five men and eight mules, or an average of 174 cubic feet to the unit. I examined all the return airways of this section, and did not find any trace of explosive gas. I found 85,000 cubic feet of air a minute passing into this mine, divided between the two slopes. I found going into No. 1 slope, 44,000 cubic feet a minute; I found going into No. 2 slope, 41,000 cubic feet; total, 85,000 cubic feet. Main return: East side return, 39,000 cubic feet a minute; West side return, 80,000 cubic feet a minute; total, 119,000 cubic feet a minute; leaving a loss to be accounted for of 34,000 cubic feet.

Hygrometer Readings.

Place.	Dry Bulb.	Wet Bulb.	Moisture.
East side pillars	62	60	88 %
No. 15 level (face)	56	54	87 "
" 16 " "	58	56	87 "
" 17 " "	58	56	87 "
" 4 stall	56	54	87 "
East side return	58	58	100 "
West " "	58	58	100 "

No. 5. MINE.

John Kesley, Manager; John Gillespie, Overman; and staff of five Firemen.

Mining has been done in the Upper seam only. The coal is of a very tough nature, making it very hard to shoot; nothing but giant powder is used in this mine on account of the hardness of the coal. This mine is connected with No. 6 mine by a good travelling-road, having double doors, allowing separate intake and return airways. This mine has Nos. 1 and 2 inclines working. The No. 1 incline has a slope and two levels going; all of these are in good coal, although it is full of impurities, making it very hard to keep clean coal. No. 2 incline has no solid work going; all the places are splitting the pillars. The main levels have been standing for some time, but have started up again and only prospecting work is being carried on.

I examined all parts of this mine, both intake and return airways, and found the following conditions: I found 30,000 cubic feet of air a minute passing into this mine, divided into two splits. No explosive gas was found in this district.

No. 1 Split.—I found 12,000 cubic feet of air a minute passing into this split, for the use of twenty men and six mules, or an average of 461 cubic feet of air to the unit; the timbering and roadways were in good condition.

Hygrometer Readings.

Place.	Dry Bulb.	Wet Bulb.	Moisture.
Face of main level	54	54	100 %
No. 2 stall	52	51	93 "
" 5 "	52	50	86 "

No. 2 Split.—I examined all parts of this section of the mine, and found the following conditions: I found explosive gas in No. 10 stall, up the No. 1 incline; all the other places were clear of gas. I found 13,000 cubic feet of air a minute passing into this section of the mine, for the use of forty-six men and five mules, or an average of 254 cubic feet to the unit; the timbering and roadways were in good condition. I examined all the return airways in this mine, and did not find any trace of explosive gas.

Hygrometer Readings.

Place.	Dry Bulb.	Wet Bulb.	Moisture.
No. 1 incline (face)	54	52	86 %
Face of level	52	50	86 "
No. 5 stall	54	52	86 "
Upcast shaft	53	52	93 "

I found entering this mine, 30,600 cubic feet of air a minute; going up the upcast shaft, 42,200 cubic feet of air a minute; making a total loss of 11,600 cubic feet to be accounted for. I made all my examinations with a Wolf safety-lamp.

No. 6 MINE.

John Kesley, Manager, and six Firemen.

This mine is practically the same seam as No. 5 shaft; both mines are working the same seam, only being divided by double doors, but both have a separate intake and return shafts. This coal is of a very tough nature, and is hard to shoot; nothing but giant powder is used in

this mine. Owing to the hardness of the coal and the fact that this seam is full of impurities, it is very hard to keep clean coal. The east side of the shaft has very little solid work going; all the places are splitting the pillars; only the two main levels are in solid work, and only just been started up again after standing for a considerable time. Owing to the faulty nature of the ground, only prospecting work is carried on in this side of the mine. The west side is the same as No. 5 mine.

I examined all parts of this mine, both intake and return airways, and found the following conditions: I found 18,000 cubic feet of air a minute passing into this mine, divided into two splits. I found no explosive gas in this mine.

No. 1 Split.—I examined all parts of this section, both intake and return airways, and found the following conditions: I found 7,500 cubic feet of air a minute passing into this section of the mine, for the use of twenty men and four mules, or an average of 312 cubic feet of air to the unit; the timbering and roadways were in good condition.

Hygrometer Readings.

Place.	Dry Bulb.	Wet Bulb.	Moisture.
Face of level	51	50	93 %
No. 9 stall	52	48	74 "
" 3 "	52	50	93 "

No. 2 Split.—I examined all parts of this section, both intake and return airways, and found the following conditions: I found 9,000 cubic feet of air a minute passing into this section of the mine, for the use of forty men and four mules, or an average of 304 cubic feet to the unit; the timbering and roadways were in good condition.

Hygrometer Readings.

Place.	Dry Bulb.	Wet Bulb.	Moisture.
Main level	52	50	86 %
" incline	56	55	93 "
No. 3 stall	52	51	93 "
" 5 "	54	52	86 "
Upcast shaft	54	54	100 "

I found entering the mine, 18,000 cubic feet of air a minute; passing up the upcast shaft, 24,000 cubic feet of air a minute; making a loss of 6,000 cubic feet of air a minute. I examined all the return airways in this mine, and could not find any trace of explosive gas. I made all my examinations with a Wolf safety-lamp.

No. 7 MINE.

James Gray, Manager (*vice* William H. Wall, resigned); Fred. Jarritt, Overman; and a staff of nine Firemen.

This mine is situated two miles in a direct line from No. 4 mine, and about five miles from town, lying in a northerly direction. This slope is down a distance of 5,000 feet, and in good coal, of a very hard nature; the prospects of this mine are very bright. This mine is well adapted for a long-wall system; the coal averages 3½ feet in thickness, with rock in the

centre, making ideal conditions for machine mining—in fact, it is the only way to work this seam. This mine will turn out to be one of the best mines in this district. A tunnel is being driven about 800 feet, to make a uniform grade; when completed will make one of the best slopes in this district. Nos. 3, 5, 6, 7, and 8 levels on the West side, and Nos. 5, 6, 7, and 8 on the East side, are all in good coal, of a very hard nature.

I examined all parts of this mine, both intake and return airways, and found the following conditions: I found 48,000 cubic feet of air a minute passing into this mine, divided into two splits. I found explosive gas in No. 7 East level; all the other places were clear of gas.

No. 1 Split.—I found 18,000 cubic feet of air a minute passing into this section of the mine, for the use of forty men and four mules, or an average of 409 cubic feet to the unit; the timbering and roadways were in good condition.

Hygrometer Readings.

Place.	Dry Bulb.	Wet Bulb.	Moisture.
Face of East level	52	52	100 %
No. 16 stall	52	50	86 "
" 5 "	54	50	73 "

No. 2 Split.—I examined all parts of this section, both intake and return airways, and found the following conditions: I found 20,000 cubic feet of air a minute passing into this section of the mine, for the use of forty-seven men and four mules, or an average of 425 cubic feet to the unit; the timbering and roadways were in good condition.

Hygrometer Readings.

Place.	Dry Bulb.	Wet Bulb.	Moisture.
No. 3 level, 10 stall	50	48	86 %
" 3 " 14 "	50	48	86 "
Jap level	52	50	86 "
No. 9 stall	52	50	86 "
Main return	48	48	100 "

I examined all the return airways, and could not find any trace of explosive gas. All the examinations were made with a Wolf safety-lamp.

I found entering the mine, Main intake, 48,000 cubic feet of air a minute; at the Main upcast shaft, 55,000 cubic feet of air a minute; a total loss of 7,000 cubic feet of air a minute.

The following are the official returns from the Union Colliery for the year 1910 :—

SALES AND OUTPUT FOR YEAR.	COAL.		COKE.	
(Tons of 2,240 lb.)	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	308,266		8,327	
" export to United States	48,623			
" " other countries	25,873			
Total sales	382,762	382,762		8,327
Used in making coke	4,670			
Used under colliery boilers, etc.	37,355			
Lost in washing.	79,790			
Total for colliery use		121,815		
Stocks on hand first of year	6,986		16,480	
" last of year	20,835		10,846	
Difference { added to* / taken from† } stock during year		*13,849		†5,994
Output of collieries for year		518,426		2,333

By-products—Clay, 4,470 tons.

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	9	12.00 - 6.00	9	6.00 - 3.00	18	
Whites—Miners	481	4.50-3.30			654	
Chinese, 138; Japs, 35	173	3.00-2-60				
Miners' helpers	18	2.75			18	
Labourers	308	3.00 - 2.50	36	2.75 - 2.50	344	
Mechanics and skilled labour	54	3.25 - 3.00	98	3.25 - 2.75	152	
Boys	18	1.25 - 2.25	12	2.00 - 1.00	30	
Japanese	24	1.60	19	1.50 - 1.40	43	
Chinese	87	1.60 - 1.45	242	1.75 - 1.40	329	
Hindus						
Totals	1,172		416		1,588	

Pacific Coast Coal Mines, Limited.*

SUQUASH COLLIERY.

John White, Overman.

This colliery is owned by the Pacific Coast Coal Mines, Ltd., and is situated on the north-eastern part of Vancouver Island.

*See also page 192.

A shaft 6 by 10 feet in the clear is down 170 feet. Levels are turned off each side of the shaft, running N. 45° W. and S. 45° E. respectively; the North-west level is in a distance of 500 feet, but is not working at present. The South-east level is in a distance of 11,000 feet, and is still advancing. At a distance of 600 feet from the shaft on the South-east level, a pair of slopes are turned away, running in N. 45° E., and are down a distance of 1,200 feet, and are still advancing. These levels and slopes are in good coal, ranging from 4 to 5 feet in thickness, with small bands of rock running through it; this seam is well adapted for long-wall mining, worked by machines.

Only development work is being carried on; all the coal is dumped on the ground; a few shipments have been made to passing steamers.

I found 7,000 cubic feet of air a minute passing into this mine, for the use of ten men and two horses, or an average of 583 cubic feet to the unit. No explosive gas found; the timbering and roadways were in good condition.

The following are the official returns from the Suquash Colliery for the year 1910:—

Sales and Output for Year.	Coal.		Coke.	
(Tons of 2,240 lb.)	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	766			
" export to United States				
" " other countries				
Total sales		766		
Used in making coke				
" under colliery boilers, etc.	1,000			
Total for colliery use		1,000		
Stocks on hand first of year	1,050			
" last of year	2,123			
Difference added to stock during year		1,073		
Output of colliery for year		2,839		

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	5.00			1	5.00
Whites—Miners	7	4.00 - 5.00			7	4.00 - 5.00
Miners' helpers						
Labourers	2	3.00	1		3	3.00
Mechanics and skilled labour			2	3.50	2	3.50
Boys						
Japanese						
Chinese			4	1.50	4	1.50
Indians						
Totals	10	3.00 - 5.00	7	1.50 - 3.50	17	1.50 - 5.00

Name of seams or pits—Suquash, No. 1 shaft.

Description of seams, tunnels, levels, shafts, etc., and number of same—One shaft, 6 x 10 feet, with midwall one side for hoisting and the other for ventilation. Seam about 6 feet in thickness and of good quality.

Description and length of tramway, plant, etc.—One donkey-engine for hoisting, and one pump and one fan for ventilation, producing about 10,000 cubic feet per minute. One vertical boiler supplies the steam-power.

EAST KOOTENAY DISTRICT.

Until within the year 1909 there was only one company actually producing coal in the East Kootenay District—that is, the Crow's Nest Pass Coal Co., although this company operated three separate collieries; but during that year two new companies began to produce—namely, the Hosmer Mines, Limited, at Hosmer, and the Corbin Coal and Coke Co., at Corbin. These new companies only began to ship coal towards the latter part of 1908, and, consequently, their outputs have not been large, but they have extensive and fully equipped collieries, and in the future will be important factors in the production of the district.

The district is divided into two separate inspection districts. The Southern East Kootenay District, under Inspector Evan Evans, with headquarters at Cranbrook, includes the Coal Creek Collieries and the Carbonado Collieries of the Crow's Nest Pass Coal Co., although this latter colliery has not been worked this past year. The Northern East Kootenay District, under Inspector Robert Strachan, with headquarters at Hosmer, includes the Hosmer Colliery of the Hosmer Mines, Limited, the Michel Collieries of the Crow's Nest Pass Coal Co., and the Corbin Colliery of the Corbin Coal and Coke Co.

SOUTHERN EAST KOOTENAY INSPECTION DISTRICT.

REPORT OF EVAN EVANS, INSPECTOR.

I have the honour, as Inspector of Coal-mines for the Southern East Kootenay District, to submit my annual report for the year 1910.

Crow's Nest Pass Coal Co., Ltd.

Officers.	*Address.*
Elias Rogers, President,	Toronto, Ont.
E. C. Whitney, Vice-President,	Ottawa, Ont.
R. M. Young, Secretary,	Fernie, B. C.
Elias Rogers, Treasurer,	Toronto, Ont.
Jas. Ashworth, General Manager, Operating Department,	Fernie, B. C.

Capital of the Company, $3,500,000.

The above company is now operating the following extensive collieries on the western slope of the Rocky mountains in the East Kootenay District, viz.:—

COAL CREEK COLLIERIES, situated on Coal creek, about five miles from the town of Fernie, on a branch railway to the mines, connecting at Fernie with the tracks of the Canadian Pacific Railway and also those of the Great Northern Railway.

CARBONADO COLLIERIES, situated on Morrissey creek and connected by a branch railway with the Canadian Pacific Railway and the Great Northern Railway at Morrissey. The colliery is about fourteen miles from Fernie by rail, in a south-easterly direction. This colliery has been shut down for more than a year.

MICHEL COLLIERIES, situated on both sides of Michel creek, on the line of the Canadian Pacific Railway, being twenty-three miles in a north-easterly direction from Fernie. This last colliery is in the Northern Inspection District.

The total gross output of the company's collieries for the past year was 1,080,145 tons. Of this 265,566 tons were used in the manufacture of coke, yielding 173,659 tons, of which 1,382 tons of coke were added to stock, making the amount of the coke sales 172,198 tons, of which 163,468 tons were sold for consumption in Canada, and 8,730 tons were exported to the United States. The coal exported to the United States amounted to 636,297 tons, while 118,400 tons were sold for consumption in Canada.

The amount and disposition of this combined output of the company's collieries is more fully shown in the following table:—

SALES AND OUTPUT FOR YEAR.	COAL.		COKE.	
(Tons of 2,240 lb.)	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	118,400		163,468	
" export to United States	636,297		8,730	
" " other countries				
Total sales		754,697		172,198
Used in making coke	265,566		79	
" under colliery boilers, etc.	58,256			
Total for colliery use		323,822		79
		1,088,519		
Stock on hand first of year	63		180	
" last of year	1,689		1,562	
		1,626		1,382
Difference added to stock during year				
Output of collieries for year		1,080,145		173,659

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	57		12		80	
Whites—Miners	929				929	
Miners' helpers						
Labourers	200		223		423	
Mechanics and skilled labour	593		303		896	
Boys	24		2		26	
Japanese						
Chinese						
Indians						
Totals	1,803		515		2,354	

CARBONADO COLLIERY.

The Carbonado Colliery was not operated during the year 1910.

COAL CREEK COLLIERY.

John Shanks, Manager.

The colliery is five miles east of Fernie. Transportation is afforded by a branch railway making connection with both the Canadian Pacific Railway and the Great Northern Railway at Fernie.

I regret to state that the number of accidents in and about the mines is large; most of the accidents are attributed to haulage.

The colliery operated continuously during the year; the production of the mines for the year exceeded any previous year's output by nearly 100,000 tons. With the view of keeping up the output and be in position to meet any further increased demand, the management is increasing the development work, and a considerable amount of work is also being accomplished on the surface.

The Draeger rescue apparatus, including the reviving apparatus, has been installed at the colliery; at present the installation is new and being perfected. I expect that early in the year the station will be completed and brought to efficiency.

In connection with the colliery, a number of persons have taken the advantage of ambulance classes in connection with the Canadian Ambulance Association; after examination fifteen of the candidates were successful in obtaining certificates of proficiency. In addition, there are employed at the colliery a large number of persons qualified to render first aid.

The following mines have been in operation during the year: No. 1 North, No. 5, No. 9, and Old No. 1 mine, on the north side of the valley; No. 1 South, Nos. 2 and 3 mines, on the south side of the valley. The general strike of the seams is approximately north and south, the seams dipping towards the east at an average angle of from 14 to 18 degrees. The coal from the various mines is conveyed to the same tipple, a steel structure 840 feet in length, extending across the valley of Coal creek.

No. 5 MINE.

D. Martin, Overman; J. Stewart, H. Miard, W. McFegan, John McAlpin, Joseph Lane, and Thos. Wakelam, Firemen.

This mine is opened by means of three adit tunnels north-west of the tipple. The main tunnel is practically on the same elevation as and 3,800 feet from the tipple; this tunnel is about 4,200 feet in length, driven on the strike of the seam. The 1st and 2nd slopes are driven to the dip, from points 1,550 feet and 2,450 feet respectively from the entrance of the tunnel. A second tunnel continued to the upper workings serves both for ventilation and a separate travelling-way.

No. 4 South tunnel is at about 350 feet higher elevation and is about 2,300 feet in length; No. 19 incline and No. 21 incline are driven to the rise from this tunnel, about 1,040 feet and 1,700 feet respectively from its entrance.

The coal from the inclines and from No. 47 district is conveyed through this tunnel to the surface and lowered over a gravity-plane about one mile from the tipple. The gravity-plane is 1,100 feet in length.

The seam is from 8 to 16 feet thick; the mode of working is principally pillar and room. The levels off the inclines and slopes are 250 feet apart; rooms 14 feet wide are driven up the pitch from the levels; where the seam is 8 feet thick the pillars are 50 feet wide, and where the seam is 16 feet thick they are 70 feet wide. The cars are lowered from the rooms with small jigs, and are hoisted and lowered over the slopes and inclines by the tail-rope and direct system of haulage, being there conveyed through the tunnels by compressed-air motors; the output of the mine is about 1,000 tons of coal a day. The cars are hauled to the tipple by steam locos. on a side-hill tram-line of 3½-foot gauge.

During my inspection on the 8th and 9th of December I found in No. 19 incline district 28,400 cubic feet of air a minute, for fifty men and five horses. In No. 47 district and No. 2 slope the quantity of air is 29,000 cubic feet a minute, for fifty men and six horses. In No. 1 slope district the air-current is 30,000 cubic feet a minute, for fifty-one men and four horses. The total ventilation at the fan-drift is 129,000 cubic feet a minute; the ventilation is produced by a Chandler fan, 16 feet diameter by 4 feet 8 inches wide, running 140 revolutions a minute, belted 4 to 7, driven by 16 x 18-inch engine.

I found the mine clear of gas and the workings well timbered. Safety-lamps are exclusively used throughout the mine. Shot-firing is not allowed, except in a few places driving to the surface off No. 1 slope. Shots are fired with battery, and only permitted explosive is used. Barometer, 25.6 inches.

NEW NO. 1 MINE, NORTH.

W. Wilson, Overman; Jas. Baggley, John Mawson, Walter Joyce, and C. McNay, Firemen; Wm. Wesnadge and Wm. Shenfield, Shotlighters.

This mine is located on the north side of the Coal creek valley; the entrance is by means of an adit tunnel about 300 feet vertically above the tipple. A second tunnel is driven part of the distance for ventilation. The coal from the tunnel is lowered over a gravity-plane about 3,000 feet from the tipple. The seam is from 7 to 12 feet thick; the main tunnel is 1,800 feet in length; two pair of inclines 1,000 feet apart have been driven up the pitch. In the 1st and 2nd inclines the mode of working is pillar and stall. In Nos. 5 and 6 inclines or Main level district the method of working is long-wall; the practice consists in setting cogs 8 feet apart, parallel with the face; the mine-track is laid parallel with the face and moved forward as the face advances towards the rise; the seam is 7 feet thick and of good quality. The cars from the face to the inclines are conveyed by horse-haulage, and are lowered down the inclines by the tail-rope system actuated by compressed-air hoists.

On December 20th, when I made my last inspection, I obtained in the Main level district 18,000 cubic feet of air a minute, for fifty-five men and five horses. In the 1st and 2nd incline districts I obtained 23,000 cubic feet of air a minute, for fifty-five men and five horses. The size of the fan is 5 feet diameter by 2 feet wide, running 250 revolutions a minute, belted and driven with a 25-horse-power electric motor.

During my inspection I found gas above the timbers in the face of the counter-level and in No. 8 room in Main level district. The ventilation is good throughout the mine and the workings well timbered. Wolf safety-lamps are used throughout the mine; shot-firing is not allowed, except in No. 1 incline workings. The output of the mine is about 750 tons a day.

NO. 9 MINE.

B. Caufield, Overman; J. Caufield, Ben Barnes, and Adam Watson, Firemen.

Entrance to this mine is by two adit tunnels; the main tunnel, 14½ by 7 feet, is used for haulage, and the second tunnel, 12 feet by 7 feet, serves for ventilation. The main tunnel is

3,350 feet in length and driven on the strike of the seam. At present only the extraction of pillars is being done in the 2nd incline district. From the foot of this incline the coal is conveyed to the tipple by compressed-air motor; the entrance of the tunnel is about 400 feet from the tipple.

During my inspection on December 19th, I found the working-places clear of gas and the ventilation good. I obtained 27,000 cubic feet of air a minute, for thirty men and one horse. The total quantity of air at the fan is 103,500 cubic feet a minute for both No. 9 mine and Old No. 1 mine. The size of the fan, 16 feet diameter by 8 feet wide, running 114 revolutions a minute, water-gauge 2 inches; the fan is driven by 16 x 18-inch engine, belted, at the ratio 4 to 7. The fan is arranged so that, if necessary, the current can be reversed in a few minutes. Wolf safety-lamps are exclusively used; shot-firing is not allowed, except in rock-work, and these are fired during the night.

OLD NO. 1, NORTH.

Bernard Caufield, Overman; Jas. McPherson, Robt. Adamson, and Wm. Commons, Firemen.

This mine is operated on the pillar-and-stall system, and the operations are in the lower portion of the Old No. 1 seam. The entrance is by an adit tunnel through which the coal is conveyed to the tipple by a compressed-air motor. The ventilation entering the mine is 29,250 cubic feet of air a minute, for fifty men and three horses; the mine is ventilated by No. 9 mine-fan, a roadway having been constructed to No. 9 return airway.

On December 16th I inspected this mine. I found gas in the face of No. 2 incline; the place was standing until a crosscut was through from the adjacent place. The working-places are well timbered, although there is a good deal of crushing of timbers in the roadways. Wolf safety-lamps are exclusively used throughout the mine; shot-firing is prohibited.

NO. 2 MINE.

W. Lancaster, Overman; Frank Landers, J. Bushnell, and H. Landfear, Firemen.

This mine is located on the south side of the valley; entrance is by an adit tunnel, in line with the tipple; operation is inside of the rock tunnel, 1,400 feet from the entrance. An incline has been driven up the pitch of the seam. On the south side of the incline the seam is 8 to 25 feet thick and worked on the pillar system. On the north side of the incline the seam is 7 to 8 feet thick, worked on the long-wall method; the system consists in setting cogs parallel with the face; the mine-track is laid parallel with the face and moved forward as the face advances; the roadways are from 250 to 300 feet apart; with this arrangement few roads are required for a given length of face. The coal is lowered over the incline by direct haulage, and from the foot of the incline to the tipple the coal is conveyed by compressed-air motor.

For the district I obtained 23,520 cubic feet of air a minute, for sixty-three men and six horses. Safety-lamps are used exclusively, and shot-firing is not allowed.

On December 14th, when I made my inspection, I found gas in the crosscut off the 1st left level, also an undue percentage of gas in the air in the return airway from the south side; the coal makes gas freely; the workings are well timbered.

Recently connection has been made, by 14 x 7 feet tunnel, from the surface to the North level in No. 2 mine; near the entrance the management is erecting a new and separate fan for improving the ventilation in No. 2 and 3 mines. The fan is 16 feet diameter by 8 feet wide, capable of making 125,000 cubic feet a minute; I expect this will be completed and running early in the coming year.

No. 3 MINE.

George Obrien, Overman; John Biggs and Thos. Radcliff, Firemen; D. Shanks, Shotlighter.

This mine is located about 100 feet east of No. 2 mine tunnel; the entrance is by means of a slope 2,250 feet in length, driven on the pitch of the seam. At a point about 1,450 feet from the entrance, a level about 1,950 feet in length has been driven towards the south. Two slopes have been driven from the level. The coal is 4 feet thick and of good quality. The mode of working is long-wall. Stall-roads are turned off the slopes 50 feet apart; cogs are set 6 feet apart on each side of the roads, and packed with "brushings" from the floor of the roadways. The coal is hoisted to the level with air-hoists, and conveyed to the slope by horse-haulage, whence it is raised to the surface by an electric hoist erected on the surface.

On my inspection on December 14th, I obtained 20,800 cubic feet of air a minute, for fifty men and one horse. The ventilation is good in the Main slope workings; I detected a small percentage of gas in the return air from the 2nd and 3rd slopes; I also found gas from the roof in the return road from 2nd slope. Both the workings and roadways are well timbered. Wolf safety-lamps are exclusively used. Shot-firing in coal is only allowed in the Main slope workings; a little shot-firing is allowed in rock in the lower workings in 2nd slope when the men are out of the mine. Parallel with the Main slope a separate roadway has been constructed for the men to travel.

Total ventilation at the fan-drift, which ventilates both No. 2 and No. 3 mines, is 90,000 cubic feet of air a minute, the fan running 128 revolutions a minute. Water-gauge, 2 inches. Size of fan, 16 feet diameter by 8 feet wide (Wilson's), driven by 16 x 18-inch engine, ratio 4 to 7.

No. 1 EAST MINE. (Same Officials as No. 3 Mine.)

This is a new mine; the seam is 20 to 40 feet thick. At a point 550 feet from the entrance in No. 2 mine a rock tunnel, rising 1 in 4, was driven to intersect the seam; at present a roadway is being driven to make a second opening to the surface. When this opening is through the management will continue developments.

No. 1 MINE, SOUTH.

W. J. Mazey, Overman; John Worthington, Wm. Stockwell, Chas. O'Brien, Firemen.

This mine is located 2,500 feet south-west of the tipple and 250 feet vertically above the main tram-line. The entrance is by means of two adit tunnels, about 1,800 feet in length, driven on the strike of the seam. The seam is 25 feet thick; the upper portion of the seam is of a harder nature than the lower portion. The mode of working has been pillar and stall in the lower portion of the seam, but in future the management has decided to work the upper portion on the long-wall system. The coal is conveyed to the entrance by horse-haulage and lowered over a gravity-plane to the main tram-line, whence it is hauled to the tipple by an electric motor.

In December, when I made my last inspection, I found gas in the face of No. 18 room and back incline; the remaining working-places were well ventilated and the timbering in good condition. Total quantity of air in the fan-drift is 21,280 cubic feet a minute, for twelve men and one horse. The mode of ventilation is "plenum," a mode of forcing air into the mine. Size of fan, 5 feet diameter by 2 feet wide, running 200 revolutions a minute, belted to and driven by a 25-horse-power motor. Wolf safety-lamps are exclusively used; shot-firing is prohibited.

A plan of the mine and the general and special rules are posted up at each mine. The permanent power plant consists of sixteen boilers of different types, aggregating 2,400 horse-power. A four-stage compressor (Canadian Rand), compressing to 1,000 lb.; capacity, 1,350

cubic feet of free air a minute; high-pressure cylinder, 17 x 36; low-pressure cylinder, 34 x 36. A Walker compressor, 100 lb. to the square inch; capacity, 3,500 cubic feet free air a minute. A duplex compressor to 100 lb.; capacity, 1,700 cubic feet of free air a minute. Four Eddy's generators, 100 K. W. each, driven with Robb-Armstrong engines; simple side-crank, 20 x 20 inches.

The following are the official returns for the Coal Creek collieries for the year 1910:—

SALES AND OUTPUT FOR YEAR.	COAL.		COKE.	
(Tons of 2,240 lb.)	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	41,110		69,150	
" export to United States	431,772		8,692	
" " to other countries				
Total sales		472,882		77,842
Used in making coke	118,432			
" under colliery boilers, etc.	29,756			
Total for colliery use		148,188		
		621,070		
Stocks on hand first of year	36		180	
" last of year	1,530		758	
Difference added to stock during year		1,494		578
Output of collieries for year		622,564		78,420

NUMBER OF HANDS EMPLOYED, DAILY WAGES PAID, ETC., INCLUDING 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	34		11		45	
Whites—Miners	525				525	
Miners' helpers						
Labourers	115		122		237	
*Mechanics and skilled labour	329		172		501	
Boys	24		2		26	
Japanese						
Chinese						
Indians						
Totals	1,027		307		1,334	

*NOTE.—Mechanics and skilled labour include: Underground—Drivers, motormen, rope-riders, hoistmen, trackmen, bratticemen, timbermen, pumpmen, fanmen, and carpenters. Above ground—Lampmen, weighmaster, tipplemen, firemen, machinists, carpenters, blacksmiths, engineers, and electric-plant firemen.

Name of seams or pits—The following mines are working: Old No. 1, No. 1 North, No. 1 South, No. 1 East, No. 2, No. 5 North, No. 9. No. 0 South and No. 5 South are not working.

Description of seams, tunnels, levels, shafts, etc., and number of same—The same as last year, with the addition of No. 1 East. This mine has been opened by a rock tunnel driven from a point about 550 feet from the mouth of No. 2 mine. The main roads are being driven in an easterly direction. The coal is from 20 to 40 feet thick.

Description and length of tramway, plant, etc.—The same as last year. The new permanent slack-bins which were erected at the Fernie Coke-ovens, and placed in operation about June 1st, 1910, were burned on October 6th, 1910. It is expected that these bins will be reconstructed and ready for operation early in the spring.

NORTHERN EAST KOOTENAY INSPECTION DISTRICT.

REPORT OF ROBERT STRACHAN, INSPECTOR.

I have the honour to submit my first annual report as Inspector of Coal-mines for the Northern East Kootenay Inspection District.

This district, which was created a separate division with headquarters at Hosmer, includes all the mines from Hosmer to the eastern boundary of British Columbia.

The mines at present being operated are as follows: Hosmer Colliery, by the Hosmer Mines, Ltd.; Michel Colliery, by the Crow's Nest Pass Coal Co., Ltd.; and Corbin Colliery, by the Corbin Coal & Coke Co., Ltd.

Hosmer Mines, Ltd.

Head Office—Montreal.

Officers.	*Address.*
W. D. Matthews, President,	Toronto, Ont.
A. R. G. Howard, Secretary,	Montreal.
B. T. Coon, Treasurer,	Bankhead, Alta.
Lewis Stockett, General Manager,	Hosmer, B. C.
David G. Wilson, Mine Manager,	Hosmer, B. C.

Capital of Company, $1,500,000.

Value of plant, $1,000,000.

HOSMER COLLIERY.

David G. Wilson, Manager; John Musgrave, Overman.

All the coal-seams at Hosmer are reached by two crosscut adit tunnels, which, entering in the Fernie shales, underneath the coal-measures, crosscut the ten principal coal-seams of the coalfield. The seams at present being operated are Nos. 2, 6, 9, and 10.

No. 2 SEAM.

This seam, which is struck at about 1,600 feet from the mouth of main tunnel, is 12 feet thick, and is at an inclination of 62 degrees. Method of work is pillar and stall; raises in the outer portion being driven at an angle, inside they are driven up full pitch; breasts are broken off at right angles.

This seam is ventilated by two splits, being respectively: Inside split, 8,640 cubic feet of air a minute; Outside split, 17,800 cubic feet a minute; a total of 26,440 cubic feet a minute for the use of eighty-five men.

At my last inspection I found gas in three places in this mine; with this exception, all the places, roads, and airways were in good condition.

No. 6 SEAM.

This seam, which is struck at 3,338 feet from entrance to tunnel, is 8 feet thick, and is worked by the same method as No. 2 seam.

Unfortunately, during the year, owing to heating of the coal, it was found necessary to abandon the South side and build air-tight stoppings to prevent any further spread of the fire. On the North side all the work at present is development. This seam is ventilated by two separate splits: North side split, 14,600 cubic feet a minute; South side split, 9,900 cubic feet a minute.

There are only sixteen men employed in this seam, and, at the time of my inspection, I found all the places clear of gas, well ventilated, and the timbering in good condition.

No. 9 SEAM.

This seam is struck at 4,232 feet from the main tunnel entrance, and averages 5 feet thick; it is worked by pillar and stall method; the pitch at this point of the tunnel is about 10 degrees.

At the time of my last inspection I found no trace of explosive gas; the roads, places and airways were all in good condition, well timbered, and the ventilation good.

This mine is also ventilated by two separate splits: South side split, 26,400 cubic feet of air, for the use of twenty-eight men, allowing an average of 942 cubic feet for each unit employed; North side split, 2,860 cubic feet of air a minute. This side, owing to some troubled ground, has at present been abandoned.

No. 10 SEAM.

This seam, which is at the inside of the main tunnel, or about 4,820 feet from the entrance, averages about 40 feet thick, of which only the top 10 feet is being worked. The inclination of this seam is similar to No. 9 seam, and it has been found necessary in both these seams to use compressed-air hoists to haul the empty car up and lower the loads down.

This seam is also ventilated by two splits: South side, 47,140 cubic feet a minute, for the use of forty-two men and one horse, allowing an average of 1,047 cubic feet a minute for each unit employed; North side has an average of about 15,000 cubic feet a minute, there being no men employed owing to this side having been abandoned.

The haulage from the various seams to the tipple is done in three separate stages: First, from foot of chutes or inclines to top of outside incline by compressed-air locomotives; a pair of 28 x 44-inch first-motion engines, with 8-foot drum, lower the loaded trips down to foot of incline, where they are hauled to tipple by compressed-air locomotives.

The ventilation is produced by a Walker type fan, 20 x 7½ feet, running as an exhaust-fan, but can be reversed, if necessary, producing 175,000 cubic feet of air a minute, with a water-gauge of 2 inches. Speed of fan, 102 revolutions a minute, driven by a pair of 38 x 46-inch engines, with a continuous-rope drive. Ratio of speed of engine to fan, 1 to 1.5.

The lamps in use at Hosmer are the Wolf safety-lamps, which are cleaned, tested as required by General Rule 8A, and examined by the fireboss at the lamp-room, situated near the entrance of the mine.

There is no blasting done in the coal at this mine; blasting in rock is done with "Monobel," and fuse fired by means of Bickford's patent fuse-igniters.

In addition to the above seams, another level is being made along the outcrop of the coal-seams about 500 feet higher than the main tunnel. This level is reached by an incline on the mountain-side, and at present Nos. 2, 6, and 9 seams have been reached. The tipple, which consists of Philipps' crossover dump, jigging-screens, and picking-tables, has been improved during the year by the addition of a Jeffery-Robinson washer, capable of washing 500 tons of slack per day. The remainder of this plant is described in the Hon. the Minister of Mines' Report for 1909.

In accordance with the "Coal-mines Regulation Act Amending Act, 1910," a rescue-station has been installed at the Hosmer mines, and at present consists of two two-hour Draeger apparatus, helmet type, with a suitable supply of spare oxygen cylinders and potash cartridges for same, pulmotor, recharging-pump, Draeger electric hand-lamps, and four large tanks of oxygen, and I understand that this outfit is being improved by the addition of some more inhalation apparatus. Practice with the use of the apparatus is engaged in almost weekly in the mine, while the pulmotor is being used in connection with the ambulance class which is being taught by Dr. Higgins.

The following are the official returns of the Hosmer Colliery for the year ending 31st December, 1910:—

Sales and Output for Year.	Coal.		Coke.	
(Tons of 2,240 lb.)	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	54,098		41,479	
" export to United States				
" " other countries				
Total sales		54,098	41,479	41,479
Used in making coke	68,953			
Used under colliery boilers, etc.	22,086			
Lost in washing	11,073			
Total for colliery use		102,112		
		156,210		
Stocks on hand first of year	1,475		89	
" last of year	3,388		647	
Difference added to stock during year		1,913	558	558
Output of collieries for year		158,123		42,037

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	9	6.00 - 3.50	10	10.00 - 3.00	19	
Whites—Miners	115	3.50 - 3.00			115	
Miners' helpers	187	2.50			187	
Labourers	52	2.50	95	2.25 - 2.75	147	
Mechanics and skilled labour	31	2.75 - 3.50	31	3.00 - 3.67½	62	
Boys			9		9	
Japanese						
Chinese						
Indians						
Totals	394		145		539	

Name of seams or pits—A level, Nos. 2, 6, 9, and 10; B level, Nos. 2, 6, 8, and 9.

Description of seams, tunnels, levels, shafts, etc., and number of same—A level, main tunnel; B level, tramway, 500 feet above main tunnel.

Description and length of tramway, plant, etc.—Washer for nut coal, 500 tons daily capacity, has been added to former description.

Crow's Nest Pass Coal Company.*

MICHEL COLLIERY.

Norman Fraser, Manager.

This colliery, operated by the Crow's Nest Pass Coal Co., Ltd., is situated on both sides of the Michel creek, and comprises Nos. 3, 4, 5, and 3 East on the south side of the creek, and Nos. 7 and 8 on the north side.

No. 8 MINE.

W. Robinson, Overman; John Moore, A. Kirkleberg, W. Thomas, A. McTuskey, H. Massey, A. Almond, B. Cheetham, and T. Phillips, Firebosses.

No. 8 mine is won by adit level; the seam averages about 12 feet thick, and is worked by the pillar-and-stall method. Stalls are driven up about 15 feet wide, leaving pillars about 50 feet thick; about 350 men are employed. The haulage from the face is by means of cars hauled by horse or small balance arrangement to top of inclines, where they are lowered down by compressed-air hoists, which haul up the empty cars from the foot of incline; cars are taken to the tipple by compressed-air locomotives.

The ventilation is by three separates splits, with the following quantities: Slope district, 28,800 cubic feet of air a minute, for the use of fifty-four men and four horses; No. 17 chute district, 14,400 cubic feet a minute, for the use of sixty men and six horses; No. 3 incline district, 15,000 cubic feet a minute, for the use of fifty-eight men and four horses.

Ventilation is produced by a Walker type fan, 20 x 7½ feet, driven by a 13 x 23 x 30-inch tandem compound condensing-engine; both engine and fan being built by Messrs. Walker Bros., Wigan, England. The engine is connected to the fan by a rope-drive, the ratio of speed of engine to fan being 1 to 1.5. Quantity of air produced, 180,000 cubic feet a minute; water-gauge, 4 inches; speed of fan, 138 revolutions a minute. This fan ventilates both Nos. 7 and 8 mines, providing for 450 men and eighteen horses, allowing an average of 345 cubic feet a minute for each unit employed.

The use of explosives in coal is confined to the west side of No. 3 incline; this district, which is near the outcrop of the coal, is very damp and gas is very seldom seen. Explosive used is "Monobel," with electric detonators, shots being fired at night only.

In my last inspection of No. 8 mine, I found small quantities of explosive gas in No. 4 East slope, No. 4 West level, and No. 7 room in No. 7 East level. I also found about 3 per cent. of gas in East slope and in No. 27 Dip level; all the other places were clear, well timbered, and in good condition.

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* *See* also page 213.

No. 7 Mine.

Wm. Robinson, Overman; Jas. Berry, V. Frodsham, and Jos. Summers, Firemen.

This seam, which is reached by a crosscut tunnel off No. 8 mine at a point about 2,000 feet inside the mouth of No. 8, averages 7 feet thick, and is mined by the single-stall method. Levels are driven east and west on the strike of the seam; inclines are then driven up full pitch, the stalls or rooms being driven at right angles to the inclines or parallel with the levels. Pillars are left about 30 feet thick; when the stall has reached its distance (500 feet), the pillar is then withdrawn, allowing the roof to settle down. In this operation about 50 per cent. of the timber used is withdrawn and can be used again. Method of withdrawing timber is by Sylvester chain and lever.

The haulage in this seam is exactly similar to that of No. 8 mine. The ventilation is produced by same fan as is used for No. 8 mine, and is divided into two splits: East side split, 10,400 cubic feet a minute, for the use of thirty-five men and two horses; West side split, 7,000 cubic feet a minute, for the use of thirty-two men and two horses.

Blasting in the coal is confined to the West side and the New slope on the East side; *in this seam also "Monobel" is the explosive used, with electric detonator.*

At the time of my last inspection of this mine I found a small quantity of explosive gas in the face of East level and parallel to same. I also found a slight trace, about 1½ per cent., of gas in the air in the New East slope; all the other places were clear, roads and airways all well timbered, and ventilation good.

No. 3 Mine.

Thos. Spruston, Overman; Thos. Cunliffe, A. Frew, and Wm. Davies, Firemen.

In this mine, which is the last seam at present reached by the crosscut tunnel driven across the measures on the south side of Michel creek, the coal is about 6 feet thick. Previously this seam was worked on the pillar-and-stall system, but has recently been changed to long-wall, and looks as if it will be a great improvement on the old system, both as to the easier production of coal and as to the quantity of round coal produced.

As the coal-seams in Michel all dip at an angle of about 15 degrees to the south, all the coal on this side of the creek has to be hauled up by hoist. The coal is taken from the face to foot of the slopes by horse, and in the same way from the top of the slope to the foot of incline leading to tipple. Arrangements are at present under way to install an endless-rope system to take the place of the horse at the top of slopes. There is no blasting done in the coal in No. 3 mine.

At the time of my last inspection I found a small quantity of explosive gas in No. 6 East, No. 2 slope, also in No. 2 room (long-wall), No. 3 slope. I found about 3 per cent. of *gas in the air in Dip level, West side No. 3 slope.* All the other places were clear and in good condition.

No. 4 Mine.

Thos. Spruston, Overman; Jas. McLeod, R. Spruston, and Wm. Davie, Firebosses.

In this seam, which is the second struck by the crosscut tunnel, the coal averages about 12 feet thick, and is worked by the pillar-and-stall method. The haulage is similar to No. 3 mine, and there is no shooting in coal in this seam.

The ventilation of both Nos. 3 and 4 is effected by a fan situated at an outlet of No. 4 mine. This fan is of the Guibal type, 16 by 8 feet, driven by an Erie City engine, 16 by 24 inches, at a speed of 132 revolutions a minute. Total quantity of air, 117,000 cubic feet a

minute, with a water-gauge 2.5 inches; this total is divided into three splits, two of which ventilate No. 3 mine and one No. 4 mine. The quantities are as follows: East side split, No. 3 mine, 41,600 cubic feet a minute, for the use of thirty-four men and five horses; West side split, No. 3 mine, 37,200 cubic feet a minute, for the use of twenty-eight men and four horses; No. 4 mine split, 35,000 cubic feet a minute, for the use of eighteen men and one horse.

At my last inspection I found a large cap of gas off No. 1 level, from No. 6 room to face; all the other places were clear of gas, well timbered, and in good condition.

No. 5 MINE.

Thos. Spruston, Overman; Joe. Mason, Jas. Simister, and Ed. Hayes, Firebosses.

In this seam, which is the first reached by the tunnel, the coal averages 8 feet thick, and is worked by the pillar-and-stall method, similar to No. 4. The system of haulage is practically the same as in both Nos. 3 and 4. There is some blasting done on the 1st West level in this seam, with "Monobel," using electric detonators.

During my inspections I have never found any gas in this level, and it is very wet. At the time of my last inspection I found some explosive gas in the top crosscut off No. 8 room, No. 4 West level, and in the slant off No. 3 East. I also found about 3 per cent. of gas in the air from No. 19 room, No. 3 East, extending right through into return airway.

The ventilation is by two splits: West side split, 23,000 cubic feet of air a minute, for the use of fifteen men and two horses; East side split, 42,600 cubic feet a minute, for the use of thirty men and four horses. This ventilation is produced by a small 10 x 4-foot fan, with a water-gauge of $\frac{7}{10}$ inch; speed, 160 revolutions a minute. This fan is being replaced by a larger fan.

No. 3 EAST MINE.

Thos. Spruston, Overman; Jas. McLeod, R. Spruston, and Wm. Davies, Firebosses.

This mine, which is situated on the south bank of Michel creek, has been reopened this summer after having been shut down for seven or eight years. The tunnel, about 10 x 12 feet, is driven in on the coal-seam; the coal at present is 12 feet thick, and is worked on the pillar-and-stall system. Haulage is at present by horse, although, as the seam is inclined to dip, a hoist is being installed. Ventilation is by means of a small 2 x 4-foot fan, driven by a small steam-engine at a speed of 120 revolutions a minute.

At the time of my inspection I found 10,800 cubic feet of air a minute, for the use of eighteen men and one horse, allowing an average of 514 cubic feet for each unit employed. I found no trace of gas, the places were all well timbered, and the ventilation good. Some blasting is done in this seam in the coal; the explosive used being "Monobel," with electric detonators.

In all the Michel mines the Wolf safety-lamp is in use; these lamps are all cleaned and tested, as required by General Rule 8A, in the lamp-room, then examined by the firebosses previous to being taken into the mines.

The coal from the various mines is brought to a common tipple; this tipple, which is of structural steel, is 664 feet long and 14 feet wide. The cars are taken by one of Green's self-dumping car-hauls on each side on to the tipple and dumped, the empties returning to their own side, on the South side, by an overhead track, and on the North side by a track underneath the loads. The tipple is fully equipped with shaking screens, picking-tables, and

belt-conveyors to take the slack to the coke-oven bins. The coal is loaded into open cars, or into box cars if required, for which purpose two Smith's gravity box-car loaders are provided. All the machinery about the tipple is driven by electricity.

Air is provided for the compressed-air locomotives by a Canadian Rand compressor having a capacity of 1,450 cubic feet free air, compressed to 1,200 lb. to the square inch. Power for hoists, pumps, etc., is provided by a Walker compressor and a low-pressure Rand, the Walker capacity being 3,500 cubic feet of free air to 100 lb. to the square inch, Rand capacity being 4,500 cubic feet free air to 100 lb. to the square inch. The electric power is provided by a Ridgeway generator of 250 kilowatts; another unit of similar capacity is being installed at present. Steam is provided by eleven high-pressure boilers, each of 105-horse-power capacity; three low-pressure, each 130-horse-power capacity, B. C. rating. In addition to above, there are the required workshops, offices, machine-shops, etc., and a large wash and change room for the workmen.

As required by the "Coal-mines Regulation Act Amendment Act, 1910," rescue apparatus has been installed at Michel, and at present equipment consists of three half-hour capacity Draeger rescue apparatus, with a suitable supply of spare potash cartridges for same. I am informed that three more of this type are also on the way, also an extra supply of spare cylinders to allow of the cylinders being recharged at Coal Creek pumping-station; a pulmotor is also on the way. I am glad to say that Michel possesses one of the finest ambulance classes, having about seventy-five students, under the instruction of Drs. Weldon and Shaw.

The following are the official returns from the Michel Colliery for the year 1910:—

SALES AND OUTPUT FOR YEAR.	COAL.		COKE.	
(Tons of 2,240 lb.)	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	77,290		94,318	
" export to United States	204,525		38	
" " to other countries				
Total sales		281,815		94,356
Used in making coke	147,134		79	
" under colliery boilers, etc.	28,500			
Total for colliery use		175,634		79
		457,449		
Stocks on hand first of year	27			
" last of year	159		804	
Difference added to stock during year		132		804
Output of colliery for year		457,581		95,239

NUMBER OF HANDS EMPLOYED, DAILY WAGES PAID, ETC., INCLUDING 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	23		12		35	
Whites—Miners	401				404	
Miners' helpers						
Labourers	85		101		186	
*Mechanics and skilled labourers	264		131		395	
Boys						
Japanese						
Chinese						
Indians						
Total	776		244		1,020	

*NOTE.—Mechanics and skilled labour include: Underground—Drivers, motormen, rope-riders, hoistmen, trackmen, bratticemen, timbermen, pumpmen, fanmen, and carpenters. Above ground—Lampmen, weighmaster tipplemen, firemen, machinists, carpenters, blacksmiths, engineers, and electric-plant firemen.

Name of seams or pits—No. 3 East, No. 3, No. 4, No. 5, No. 7, and No. 8 mines working.

Description of seams, tunnels, levels, shafts, etc., and number of same—Same as last year. No. 3 East is being opened by a tunnel on the level. The coal is being mined both to the dip and rise, mostly to the dip. The coal is 12 feet in thickness.

Description and length of tramway, plant, etc.—Same as last year.

Corbin Coal & Coke Company, Limited.

Head Office—Spokane, Wash.

Officers.	*Address.*
D. C. Corbin, President,	Spokane, Wash.
Austin Corbin, 2nd Vice-President,	New York, N. Y.
A. T. Herrick, Secretary-Treasurer,	Spokane, Wash.
E. J. Roberts, Superintendent,	Spokane, Wash.
T. H. Williams, Mine Manager,	Corbin, B. C.

Capital of Company, $2,000,000.

Value of Plant, $293,803.

CORBIN COLLIERY.

T. H. Williams, Manager; J. B. Thomas, Overman; Jas. McCulloch, N. Howells, and S. Richards, Firemen.

This colliery, which is situated on the East fork of the south branch of Michel creek, is reached by a spur, called the British Columbia Eastern Railway, connecting at McGillvray with the Canadian Pacific Railway's Crow's Nest Pass branch line. At present only one mine

is in operation, the coal varying in thickness from 10 feet to about 250 feet. The main tunnel is 14 x 8½ feet, driven in on the coal for a distance of almost 2,000 feet. The method of work is pillar and stall, and some of the pillars on the outcrop are already in the process of extraction.

Haulage is by compressed-air locomotives of compound type. Power for the locomotives is generated by a four-stage Rand compressor driven by steam; boiler plant consists of two return-tubular boilers, 105 horse-power each, with two 45-horse-power locomotive boilers in reserve.

This mine is ventilated by four splits, with the following quantities: A split, 18,000 cubic feet a minute; A Prim. split, 15,000 cubic feet a minute; D split, 11,000 cubic feet a minute; E split, 7,000 cubic feet a minute. At the time of my inspection I found all the places, roads, and airways clear of gas, well ventilated, and in good condition; there were only about eighteen men working.

Some blasting is done in this mine with "Monobel," fuse and Bickford's patent fuse-igniter being used. The ventilation is produced by a small fan, 4 x 12 feet, connected direct to 8 x 12-inch steam-engine, the fan producing 54,000 cubic feet of air a minute, against a water-gauge of $\frac{3}{10}$ inch; speed, 86 revolutions a minute. The lamp in use in this mine is the Wolf safety-lamp, which is cleaned and tested, as required by General Rule 8A, in the lamp-room, then examined by the fireboss previous to being taken into the mine.

In compliance with the "Coal-mines Regulation Act Amending Act, 1910," rescue apparatus has been installed at Corbin, and at present the equipment consists of two two-hour capacity Draeger apparatus, one half-hour Draeger apparatus, a recharging-pump, and a suitable supply of spare potash cartridges and oxygen. An ambulance class has been started under the instruction of Dr. J. S. Gladwin.

The following are the official returns from the Corbin Colliery for the year 1910:—

SALE AND OUTPUT FOR YEAR.	COAL.		COKE.	
(Tons of 2,240 lb.)	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	10,080			
" export to United States	114,790			
" " other countries				
Total sales		124,870		
Used in making coke				
" under colliery boilers, etc.	1,981			
Total for colliery use		1,981		
Stocks on hand first of year				
" last of year				
Difference { added to / taken from } stock during year				
Output of colliery for year		126,851		

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	4.80	8	4.07	14	4.27
Whites—Miners	98	3.75	.....	.....	98	3.75
Miners' helpers	66	2.75	.....	.....	66	2.75
Labourers	2	2.75	25	2.60	27	2.61
Mechanics and skilled labour	5	3.15	8	3.90	13	3.59
Boys	.....	.....	.....	.....	.....	.....
Japanese	.....	.....	.....	.....	.....	.....
Chinese	.....	.....	.....	.....	.....	.....
Indians	.....	.....	.....	.....	.....	.....
Totals	177	$3.38	41	$3.14	218	$3.33

Name of seams or pits—"A" and A1."

Description of seams, tunnels, levels, shafts, etc., and number of same—Strike of seam is S. 18° W., and dip 70 degrees east to vertical. Outcrop along crest of ridge running south; width 4 to 150 feet. There are four main tunnels, A, B, D, and E. A is the lower and main haulage tunnel, 9 x 14 feet in the clear, and 2,200 feet long; B, D, and E are 9 x 10½ feet in the clear. There are five levels, about 40 feet apart, between B and D tunnels; and three levels, 40 feet apart, above E tunnel. There are no shafts, the tunnels and levels being connected by 6 x 10-foot raises.

Description and length of tramway, plant, etc.—Tramway is 950 feet long; 360 feet of this on trestle leading to coal-bins, having 1,000 tons capacity. Power plant—Two 50-horse-power boilers, locomotive type; two 120-horse-power boilers, tubular type; one 80-horse-power engine and dynamo; one Rand high-pressure air-compressor; two Porter air-locomotives; one fan-engine and 4 x 12-foot ventilating-fan.

The Draeger rescue station established by the Department of Mines at Hosmer is, at present, in temporary quarters; the outfit, which consists of four two-hour Draeger apparatus, two half-hour Draeger apparatus, a pulmotor, Draeger electric lamps, with a good liberal supply of spare oxygen cylinders and spare potash cartridges, is in good condition. I am glad that we have not had any calls on it, so far as this Province is concerned, the explosion at Bellevue being the only occasion that it has been in use, a report of which I have sent to you. The Bellevue accident brought very forcibly to our notice the disadvantage we laboured under through not having sufficient trained men, not only as to using the apparatus, but to help with supplies and in the use of the pulmotor. The amount of the time lost in changing from one train to another showed the necessity of having, if possible, a railroad-coach to keep the station in, so as to be ready for a call at a distance.

SUMMARY—TABLE SHOWING ACCIDENTS OCCURRING IN B. C. COLLIERIES IN TEN YEARS—1901 TO 1910.

For the year	1901.				1902.				1903.				1904.				1905.				1906.				1907.				1908.				1909.				1910.				Total for 10 years.			
Output of coal—tons.	1,691,557				1,641,626				1,481,913				1,685,698				1,825,832				1,899,076				2,219,608				2,109,387				2,400,600				3,139,235				20,094,532			
No. persons employ'd	3,974				4,011				4,264				4,453				4,407				4,805				6,059				6,095				6,418				7,758				52,244			
Nature of Injury. / Cause of Accident.	Fatal.	Serious.	Slight.	Total.	Fatal.	Serious.	Slight.	Total.	Fatal.	Serious.	Slight.	Total.	Fatal.	Serious.	Slight.	Total.	Fatal.	Serious.	Slight.	Total.	Fatal.	Serious.	Slight.	Total.	Fatal.	Serious.	Slight.	Total.	Fatal.	Serious.	Slight.	Total.	Fatal.	Serious.	Slight.	Total.	Fatal.	Serious.	Slight.	Total.	Fatal.	Serious.	Slight.	Total.
Explosion (cause unknown).	64	..	..	64	125	..	..	125	..	..	..	..	14	..	..	14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	203	..	..	203
Gas explosions	2	2	12	16	1	..	8	9	21	..	16	37	7	..	8	15	..	..	9	9	..	..	1	1	1	1	18	20	1	..	8	9	32	..	7	39	..	..	6	6	65	3	93	161
Falls of coal.....	6	9	2	17	1	4	1	6	4	5	2	11	5	12	1	18	2	8	3	13	5	6	3	14	8	15	7	30	3	6	10	19	7	7	4	18	5	16	5	26	46	88	38	172
" rock	6	8	4	18	7	6	2	15	8	8	4	20	4	7	1	12	4	6	1	11	7	8	7	22	2	7	8	17	5	10	7	22	6	13	9	28	8	15	12	35	57	88	55	200
Mine cars and horses	3	5	5	13	3	6	5	14	5	7	2	14	3	15	5	23	3	9	8	20	2	13	13	28	8	22	15	45	1	19	15	35	6	17	24	47	11	49	23	83	45	162	115	322
" timber	..	2	..	2	2	..	..	2	1	2	..	3	..	2	..	2	1	2	..	3	..	1	1	2	..	4	1	5	1	3	..	4	..	2	3	5	1	4	2	7	6	22	7	35
Hoisting, ropes, &c .	..	2	..	2	..	2	..	2	..	4	1	5	..	2	..	2	..	..	1	1	..	2	1	3	..	..	3	3	1	4	..	5	..	.	3	3	..	2	4	6	1	18	13	32
Powder, &c., explo'n	..	4	6	10	..	..	1	1	1	7	..	8	1	..	1	2	1	1	3	5	..	1	1	2	1	2	4	7	..	2	4	6	1	1	3	5	1	1	3	5	6	19	26	51
Underground — Miscellaneous.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	3	..	2	3	5	1	1	4	6	4	2	5	11	2	2	2	6	1	4	4	9	8	13	19	40
On surface — miscellaneous.	2	2	2	6	..	3	1	4	2	..	1	3	3	3	..	6	1	2	..	3	1	3	2	6	10	9	2	21	2	4	3	9	3	5	4	12	1	4	7	12	25	35	22	82
Fire in Mine	19	..	..	19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	19	..	..	19
	102	34	31	167	139	21	18	178	42	33	26	101	37	41	16	94	12	30	26	68	15	36	32	83	31	61	62	154	18	50	52	120	57	47	59	163	28	95	66	189	481	448	388	1317

ACCIDENTS IN BRITISH COLUMBIA COLLIERIES DURING 1910.

CAUSES OF ACCIDENT AND NATURE OF INJURY.	NAME OF COLLIERY.																														TOTAL FOR 1910.			
	Nanaimo.			Extension.			Union.			S. Wellington.			E. Wellington.			Middlesboro.			Princeton.			Other Collieries.			Crow's Nest.			Hosmer			Corbin.					
	Fatal.	Serious.	Slight.	Fatal.	Serious.	Slight.	Fatal.	Serious.	Slight.	Fatal.	Serious.	Slight.	Fatal.	Serious.	Slight.	Fatal.	Serious.	Slight.	Fatal.	Serious.	Slight.	Fatal.	Serious.	Slight.	Fatal.	Serious.	Slight.	Fatal.	Serious.	Slight.	Fatal.	Serious.	Slight.	Fatal.	Serious.	Slight.	Total.
Gas—Explosion of																																		6
Fatal																																		
Serious																																		
Slight			1			1						1						3															6	
Falls of Coal																																		26
Fatal							2									1												2					5		
Serious		3			1			2									1									8					1		16		
Slight			2						1						1												1						5		
Falls of Rock																																		35
Fatal	1			1			2																		4								8		
Serious		3						5						1			2									4							15		
Slight			3						3			2			1												1			2				12		
Mine Cars and Horses																																		83
Fatal				2												1									7			1					11		
Serious		5			1			10			4						2									22			5					49		
Slight			2			2			4			5			3			2								1			4					23		
Shots or Powder																																		5
Fatal							1																										1		
Serious											1																							1		
Slight			1						1			1																						3		
Ropes, Hoisting or Haulage																																		6
Fatal																																		
Serious																										2							2		
Slight									2																	1			1				4		
Post or Timber																																		7
Fatal																													1				1		
Serious																										1			3				4		
Slight						1			1																								2		
Miscellaneous—Underground																																		9
Fatal																														1			1		
Serious		1			1															1													4		
Slight									1																	1			2				4		
Miscellaneous—Surface																																		12
Fatal																													1				1		
Serious					1												1									2							4		
Slight									1			1			1														4				7		
Total	1	12	9	3	4	4	5	17	14		5	10		1	6	2	6	5		1					11	39	5	5	9	13	1	1		28	95	66	189
Number of men employed	1,257			931			1,583			364			100			352			32			23			2,354			539			218			7,758		

ANALYSES OF ACCIDENTS DURING YEAR 1910.

	No. of Accidents per 1,000 Men employed.				Tons of Coal mined per Accident.			
	Fatal.	Serious.	Slight.	Total.	Fatal.	Serious.	Slight.	Total.
East Kootenay District	5.46	15.75	5.78	27.00	80,301	27,860	75,840	16,251
Coast District	2.36	9.89	10.32	22.59	161,283	38,568	36,961	16,896
Total Province	3.61	12.24	8.51	24.36	112,116	33,044	47,564	16,619

PER CAPITA PRODUCTION OF COLLIERIES.

	Gross tons of coal mined in 1910.	Total number of men employed by colliery.	Tons of coal mined per man employed at colliery.	Number of men employed underground in collieries.	Tons of coal mined per man employed underground.
East Kootenay District	1,365,119	3,111	439	2,374	575
Coast District	1,774,116	4,647	382	3,529	502
Total for Province	3,139,235	7,758	404	5,903	532

DETAILED STATEMENT OF ACCIDENTS IN B. C. COLLIERIES DURING 1910.

COAST COLLIERIES.

REPORTED BY THOMAS MORGAN, INSPECTOR.

No.	Colliery.	Date.	Name.	Occupation.	Details.
		1909.			
1	Midlesboro.....	Dec. 31	Robert Baxter	Miner	Lying on right side mining in No. 1 level, new slope No. 2 mine; piece of coal fell and broke left collar-bone.
		1910.			
2	No. 1 Nanaimo..	Jan. 4	Jas. McKam	Driver.....	Kicked on head by mule; slightly bruised.
3	" " ..	" 6	Mark Flemming...	"	When cleaning out drill-hole with air he blew some gas into his open light; slightly burnt.
4	Northfield	" 11	A. Partray.....	Machine-runner	Was about to move his machine; in setting up a prop, he loosened some stone, which in falling knocked down another prop, which hit him on the head, injuring it severely.
5	No. 1 Nanaimo..	" 10	Jos. Stroma.....	Pusher	Fall of rock bruised his back.
6	" " ..	" 15	Geo. Salmon	Driver.....	Was coupling cars when the mule started; he was caught between the cars and sustained a dislocated shoulder.
7	Extension.....	" 17	Jno. Campbell.....	Miner	Was timbering; hitch gave way; stringer fell on him, bruising his body.
8	No. 3 Extension..	" 19	Jas. Perry.....	Driver.....	Was riding a car which jumped the track, thereby jamming his leg against the rib, breaking a small bone.
9	East Wellington.	" 21	Jno. Calverley	Rope-rider....	Fell while pushing a car and was bruised.
10	Union	" 24	Martin McLaughlin	Pusher & driver	Jammed between his trip of cars and a standing car; sustained fractured pelvis.
11	"	" 24	Hamaoki	Miner	Fall of coal caused broken leg and strained back.
12	S. Wellington...	" 27	August Guelette...	Pusher	Went to stop a horse another man was driving; got between a car and post and was slightly squeezed.
13	No. 1 Nanaimo..	Feb. 1	Marshall Taylor...	Driver.....	Mule started up, when his thumb was caught in tail-chain of the car and was injured.
14	Extension	" 5	Eugene Lowe	Miner	Was prying down piece of coal; bar slipped and he fell under the coal; was crushed about the hips.
15	Union	" 7	Fuji.....	"	Crushed by fall of top coal; died two days later.
16	No. 4 Union	" 8	David Roberts	"	Fall of coal caused broken bones in nose and face, bruised arm and chest.

ACCIDENTS IN COAST COLLIERIES.—*Continued.*

No.	Colliery.	Date.	Name.	Occupation.	Details.
17	S. Wellington...	Feb. 9	Dexter Taylor.....	Machinist	Blow-off pipe of surface boiler broke, and Taylor was burned about face and neck by the fire being blown from the furnace. The pipe had been renewed only three days previous.
18	No. 2 Extension.	" 10	Otto Metsa.....	Runner.....	A disarranged curtain allowed a slight accumulation of gas, which Metsa lighted with open light, and sustained slight burning of face.
19	Union.....	" 12	Chung.....	Miner.....	Fall of rock broke finger.
20	Princeton.....	" 14	Geo. Bennie.....	"	Tripped and fell while walking down main slope and broke two ribs.
21	No. 4 Union	" 16	Jas. Baird	Mule-driver...	A mule moved a car that Baird was lifting on to the track, and Baird was strained in the back.
22	S. Wellington...	" 17	Isaac Scott.....	Miner.....	Was putting post under some rock, when the rock broke, bruising his head slightly and laming his back.
23	Extension	" 17	Joe. Young	Labourer	A pile of lumber on the surface fell on him and caused a broken leg.
24	Nanaimo	" 22	Mike Henderson...	Miner.....	Falling coal caused broken ankle.
25	Middlesboro	" 22	Wm. Cumberland..	"	Ignited some gas and was slightly burned about face and arms.
26	No. 1 Nanaimo..	March 8	Geo. Chapman	"	Was pulling down some coal, which fell on him, breaking his ankle.
27	S. Wellington...	" 11	Geo. Martin	Pusher	A car he was pushing jumped the track and a wheel bruised his foot.
28	" " ..	" 16	Jno. Ovington.....	Shotlighter....	He lighted two shots, thinking both had gone off. Ovington approached the place when the second went off, causing a face and scalp wound.
29	Nanaimo.....	" 18	Geo. Edwards.....	Winch-driver..	Passing between two moving cars and had his arm broken.
30	Union	" 22	Jno. Harvey	Rope-rider	Riding on car up slope and was crushed against roof, sustaining crushed back and chest.
31	No. 4.....	" 22	Peter Dorn	Miner.....	Struck by moving trip of cars on main slope, which he attempted to board and had his leg broken.
32	No. 1 Nanaimo..	" 24	D. H. Beaton.....	"	Fall of coal in his place caused bruised back and legs.
33	Middlesboro	April 9	Jas. Williamson...	Pusher.....	He jumped on passing trip of cars, but fell off and was crushed between stoop-side and the car, sustaining internal injuries, from which he died April 16th.
34	No. 4 Union	" 25	Geo. Nettleton....	Mule-driver...	Car jumped the track and he was caught between cars, getting ribs broken and arm crushed.

ACCIDENTS IN COAST COLLIERIES.—*Continued.*

No.	Colliery.	Date.	Name.	Occupation.	Details.
35	No. 2 Extension.	April 28	John Clarke.....	Labourer	Caught between cars, he got his right thigh fractured.
36	No. 1 Nanaimo..	May 5	Jas. Doherty.....	Miner	Killed by fall of rock.
37	Union	" 7	Wong Dick	"	Killed by fall of rock.
38	Middlesboro	" 12	Alex. Pollock	Rope-rider....	Trip ran off track ; he jumped to ring signal and was run over by a car, sustaining compound fracture right leg.
39	No. 1 Nanaimo..	" 25	Henry Allsopp	Shotlighter....	Small bone of right hand broken by a shot. Holes were placed in No. 6 stall, No. 5 S. heading, Diagonal slope. The bottom hole was fixed and he was on his way back to fix the second hole, when he noticed a blaze behind the coal. He called on Green and Newberry to help him put out the fire, and was busy at it when the top shot went off.
40	Nanaimo	" 25	Pat Corcoran.....	Driver.....	Horse scared by prop, and he was run over by car, bone in knee broken.
41	S. Wellington...	June 3	Jos. Wilkinson....	Miner	Knee-cap broken by piece of rock thrown by a shot he had fired.
42	Middlesboro	" 14	Jno. Loftus	"	Fall of rock in his place caused injury to back and spine.
43	S. Wellington...	" 15	M. Davis	Rope-rider....	Crushed between rib and moving car ; collar-bone broken and chest crushed.
44	" " ...	July 6	Jas. O. Drojier....	Pusher	Contusions and scalp-wounds as the result of being struck by runaway cars on incline.
45	Middlesboro	" 25	Wm. Halliman....	Fireboss	Knocked down and bruised by a moving car.
46	Extension	Aug. 7	Cornelius Bowater.	Rope-rider	Killed ; was riding on loaded car ; his head struck stringers and he fell off ; back broken by being crushed between car and rib.
47	Middlesboro	" 18	Edward Thomas...	Box-car loader.	Fell off coal-bunker on surface, and dislocated left elbow.
48	S. Wellington...	" 18	Tony Tork.....	Miner	Caught between a car and rib ; leg broken.
49	Northfield	" 24	Alex. Watson.....	Machine-helper	While working on a machine, a bit of steel penetrated his right eye, destroying it.
50	No. 2 Extension.	" 27	Jno. Lapsansky ...	Runner	Fell and fractured knee-cap.
51	E. Wellington...	Sept. 6	Davld. Richards ...	Miner	Fall of rock caused broken ankle.
52	No. 1 Nanaimo..	" 6	Mike Dydo	Brusher.	Fall of rock broke arm.
53	Extension	" 7	D. Terry	Runner.	Killed by car on incline.
54	Nanaimo	" 13	Herman Hill.....	Mucker	Fall of rock caused scalp-wounds.

ACCIDENTS IN COAST COLLIERIES.—*Continued.*

No.	Colliery.	Date.	Name.	Occupation.	Details.
55	No. 1 Nanaimo..	Sept. 16	Fred. Killeen	Driver.....	Car left track at a switch; arm broken between car and prop.
56	" " ..	" 16	Francis Green.....	Shotlighter ...	Fall of coal crushed right foot.
57	Middlesboro	" 17	Geo. Cassidy.....	Miner	Killed; a timber in his room broke, letting down a heavy fall of coal, which buried him.
58	E. Wellington ..	" 23	Herbert Heimer...	Machinist.....	Fell off surface bunker and bruised face.
59	Nanaimo	" 30	Dan Lewis.....	Miner	Slightly bruised in Diamond slant by piece of rock falling.
60	S. Wellington...	Oct. 15	Harry McKenzie...	"	Fall of rock caused bruised heel.
61	" " ...	" 17	James Odwier.....	Pusher	Horse started and crushed his fingers in couplings of cars.
62	Middlesboro	" 22	Thomas Archibald.	Miner	Burned on arms and neck by gas which accumulated during fifteen minutes' absence from the level.
63	"	" 22	Wm. Archibald ...	"	Slightly burned in same accident.
64	"	" 25	Wm. Kinnear.....	"	Fall of rock caused broken leg and flesh-wounds.
65	S. Wellington...	" 26	Tong Chong.....	Chuteman	Caught between car and post; pelvis fractured.
66	" " ...	Nov. 18	Leslie Duckie	Miner	Slightly burned by gas in main entrance, No. 2 shaft.
67	No. 1 Nanaimo..	" 19	David Todd.....	Machine-helper	Fall of coal fractured thigh-bone.
68	E. Wellington...	" 19	Jno. C. Leaman ...	Miner	Fall of rock bruised right side.
69	" " ...	" 22	Angelo Sevanti....	"	Jammed between car and timber; rib broken.
70	Middlesboro	" 23	John Dunn.....	Bratticeman ..	Stringers knocked out by car fell on him, breaking left leg and small bone in right leg.
71	No. 2 Extension.	" 26	D. J. Gordon.....	Miner	Hand injured between locomotive and a post.
72	No. 1 Nanaimo..	" 29	J. Hatelio	Driver.....	Run over by his car; thigh-bone fractured.
73	S. Wellington...	Dec. 5	Pat Dwyer.....	"	Hand crushed between car and post.
74	" " ...	" 5	J. W. Gregory	Miner	Jammed between car and post; contusion of pelvis.
75	Middlesboro	" 14	Joe Farmer	Driver.....	Jammed between car and rib; right collar-bone dislocated and bruised about body.
76	No. 1 Nanaimo .	" 20	Walter Spencer ...	Labourer	Fall of rock broke leg and caused bruises.
77	E. Wellington...	" 21	W. Griffith	Driver.....	Kicked on knee by horse.
78	" " ...	" 21	Wm. Moore.	Shotlighter ...	Fall of coal bruised and cut him.
79	No 3 Extension.	" 28	Thos. Brown..	Miner	Fall of rock killed him.

ACCIDENTS IN COAST COLLIERIES.—*Concluded.* REPORTED BY JOHN NEWTON, INSPECTOR.

No.	Colliery.	Date.	Name.	Occupation.	Details.
80	No. 7 Cumberland	June 7	Edward Potter....	Driver.....	Caught by a runaway car and sustained a broken arm.
81	No. 4 "	" 24	A. Meacham	Miner	Bruised on knee by fall of rock.
82	No. 5 "	" 28	W. Thompson.....	"	Ribs broken by fall of coal.
83	No. 4 "	July 7	A. Rowan	Rope-rider....	Run over by a loaded trip and lost a foot.
84	No. 5 "	" 7	R. Dunsie	Cager	Cage descended upon and bruised him about the ribs.
85	No. 4 "	Aug. 5	D. Nillist.....	Hoisting-engine helper.	Two fingers cut off in the reversing gear of engine.
86	No. 7 "	" 6	Jos. Bardoni	Miner	Went back to a shot and was fatally injured.
87	No. 5 "	" 9	Thos. Meeson	Driver.....	Fell in front of a loaded trip and was bruised about spine and abdomen.
88	No. 5 "	" 10	Jos. Williams	Runner.....	Crushed between cars; sustained broken leg.
89	No. 7 "	" 25	Wm. Malpass.....	Miner	Crushed between cars; sustained a broken pelvis.
90	No. 6 "	" 26	Togota	"	Leg broken by fall of rock.
91	No. 4 "	Sept. 13	Ralph Simpson....	Driver...	Crushed between cars; sustained broken pelvis.
92	No. 4 "	" 15	Wong Chung	Miner	Killed by fall of rock.
93	No. 4 "	" 19	A. Beattie	"	Back strained by a falling stringer.
94	No. 6 "	" 20	Thos. Blakley....	"	Injured about head and back by fall of rock.
95	No. 4 "	" 26	Wm. McLean	Driver-boss ...	Foot run over by a loaded car.
96	No. 6 "	" 28	Yuskime.....	Miner	Fall of rock injured his spine.
97	No. 6 "	" 29	Y. Obora	"	Fall of rock broke ribs and injured [spine.
98	No. 4 "	Oct. 4	John Prince.	"	Killed by fall of coal.
99	No. 7 "	Nov. 11	Jas. Battistana....	Runner.....	Caught by rope and bruised about neck and ribs.
100	No. 4 "	" 16	Mike Manecova ...	Miner	A stringer fell on him, causing dislocation of hip.
101	No. 7 "	" 21	A. McQueen	"	Went back on shot and was bruised about legs.
102	No. 4 "	Dec. 19	Jos. Saladanr	"	Ribs broken and crushed about chest and head by fall of fire-clay.
103	No. 7 "	" 23	Aisoka	"	Back, spine, and head injured by fall of rock.
104	No. 4 "	" 27	Wong Man	Runner.....	Leg broken when knocked down by a mule.
105	No. 6 "	" 29	Edward Burns	Driver.....	Jammed between car and landing and got a sprained leg.

EAST KOOTENAY COLLIERIES.

REPORTED BY EVAN EVANS AND ROBERT STRACHAN, INSPECTORS.

No.	Colliery.	Date.	Name.	Occupation.	Details.
1	No. 2 Hosmer...	Jan. 6	Y. Urana.....	Driver.....	Jammed between a car and door; broken arm and injured head.
2	No. 2 Coal creek	" 7	Oliver Winstanley.	Rope-rider....	While riding on car he jumped off and slipped on ice and broke arm.
3	No. 1 "	" 12	Joseph Ceitica.....	Miner.....	Jammed between car and boom; sustained broken clavicle.
4	No. 1 "	" 24	John Kepsek.....	"	Fall of rock killed him.
5	No. 1 "	Feb. 1	Chas. Carravetta...	Coupler.....	Dragged under cars by cable and got three ribs broken and a cut head.
6	No. 8 Michel....	" 14	Joe Compon.	Driver.....	Kicked by horse and run over by car; broken leg.
7	No. 4 Michel....	" 18	P. Buskovich.....	Pusher	Killed; run over by car which he drove down a slant, contrary to orders.
8	No. 5 "	" 22	John Ferfon.....	Miner	Killed by a cave, caused by knocking out a timber.
9	No. 6 Hosmer...	" 28	B. Petro.....	Labourer.....	Fall of rock broke two fingers.
10	Hosmer.....	Mar. 1	H. Kobak.....	"	Ankle caught under car and sprained.
11	No. 8 Michel....	" 3	Chas. Dedys.....	Driver.....	Struck by jig-rope; urethra fractured.
12	No. 5 Coal creek	" 5	James Steele	Driver-boss ...	Kicked by a horse; broken nose.
13	No. 5 "	" 15	Simon Ivy	Miner	Run over by a horse and two cars; dislocated hip and crushed pelvis.
14	Hosmer tunnel ..	" 15	S. Holowachuck...	Switchman....	Leg crushed between motor and post.
15	Hosmer.....	" 17	W. Simmonds.....	Motorman	Foot crushed by motor on surface.
16	No. 5 Coal creek	" 18	Fr. Westwood.....	Hoistman.....	Broke tibia by hitting it against a car.
17	No. 3 Michel....	" 19	J. Suchadolnik	Miner	Fall of coal broke leg.
18	No. 8 "	" 22	W. Werenka	"	Fall of coal broke left leg.
19	No. 2 Coal creek	" 30	Thomas Kynaston.	Driver.....	Fall of rock killed him.
20	No. 2 "	Apr. 6	Thomas Savage....	"	Crushed between horse and post; fore-arm broken.
21	No. 5 Michel....	" 7	G. Pozzi	Trackman	Cave on slope buried and killed him.
22	No. 8 "	" 6	C. Pokoring.....	Switchman....	Riding on car; leg fractured.
23	No. 5 "	" 12	Wm. Pugh.....	Labourer.....	Crushed between car and post; leg broken.
24	No. 8 "	" 13	G. Masura	Timberman....	Fall of rock broke leg.
25	No. 5 Hosmer...	" 14	H. Masenko.....	Labourer	Foot bruised by moving car.
26	No. 9 "	" 16	F. Ranssank	Miner	Fall of rock cut his neck.
27	No. 5 "	" 18	P. Daneluk.....	Labourer	Crushed between car and post; chest and hips crushed.

ACCIDENTS IN EAST KOOTENAY COLLIERIES.—*Continued.*

No.	Colliery.	Date.	Name.	Occupation.	Details.
28	Hosmer tunnel..	Apr. 18	F. Patterson	Motorman	Injured face by knocking against motor.
29	No. 6 Hosmer...	" 20	G. Kupchack.	Trackman	Cut foot with axe.
30	Hosmer.....	" 22	R. Patterson....	Lamp-boy.....	Fingers injured by detonator while playing round motor-house.
31	No. 8 Michel....	" 25	G. Nakirmak.....	Miner	Fall of coal injured back.
32	No. 1 Coal creek.	May 7	Dominic Viani	Pusher.....	Two cars broke away from McGinty, caught Viani and broke arm, leg, and three ribs.
33	No. 8 Michel....	" 11	G. Rossai.....	Driver	Run over by car and killed.
34	No. 2 Coal creek.	" 13	Wm. Price.....	Pusher.....	A runaway trip of cars on incline crushed him between cars and rib; injured chest and scalp-wound.
35	No. 2 "	" 13	J. H. James	Tracklayer....	Same as last case; same result.
36	No. 8 Michel....	" 19	A. Farano	Driver	Crushed between car and rib; killed.
37	No. 2 Hosmer...	" 19	L. Cusandro	Miner	Finger lacerated between car and chute.
38	Hosmer.....	" 23	B. Swanton.....	Engineer	Foot jammed between two cars.
39	Hosmer.....	" 27	T. Climovik	Labourer	Fell while carrying timber, and injured back.
40	No. 5 Coal creek.	" 29	Alfred Clare	Rope-rider	Riding on car, struck head on a timber; fracture of vertebra.
41	No. 8 Michel....	June 3	G. Pittaro	Brakeman	Timber rolled off trip and broke his leg.
42	No. 6 Hosmer...	" 9	D. Maskevich.....	Labourer.....	Struck by a timber falling down chute, and internally injured.
43	No. 6 "	" 11	B. Kozllowski.....	Miner	Run of coal suffocated him.
44	No. 6 "	" 11	M. Danus.....	"	Run of coal suffocated him.
45	Corbin	July 4	John Ciddio	Back-hand	Fell down unfenced chute and was killed.
46	No. 2 Coal creek.	" 4	Chris. Dingsdale ..	Motorman....	The motor dislodged a rock, which knocked him under motor, which passed over him, killing him.
47	Corbin	" 10	Wm. Pavier.....	Miner	Falling coal broke arm.
48	Hosmer	" 11	M. Ragan	"	Prop fell on him and broke hip.
49	Coal creek	" 22	Louis F. Metul....	Motorman	Motor ran over him and killed him.
50	"	" 23	Geo. Millar	Miner	Fall of coal broke collar-bone and crushed hips.
51	Hosmer.....	" 25	M. Bitango	Labourer	Part of arm taken off by conveyor on tipple.
52	No. 9 Hosmer...	" 27	I. Hawaczszku	Rope-rider	Foot cut between car and post.
53	No. 6 "	" 28	John Joy	Miner	Hand cut by timber.

ACCIDENTS IN EAST KOOTENAY COLLIERIES.—*Continued.*

No	Colliery.	Date.	Name.	Occupation.	Details.
54	No. 1 Coal creek	July 30	W. D. Williams...	Timberman's [helper	Crushed between cars and leg broken.
55	No. 2 Hosmer...	Aug. 3	Joe Sturck.....	Labourer	Eye destroyed, accidentally struck by a pick.
56	No. 1 Coal creek	" 5	Mike Stinek	Driver	Crushed between car and shafts, due to harness breaking; left arm broken, ribs broken, cut head.
57	Hosmer.....	" 8	G. Bratti	Coke-puller ...	Fell off coke-wharf and broke rib.
58	No. 2 Coal creek	" 9	James Roby	Rope-rider....	Struck in the back by runaway trip; died of broken back three weeks later.
59	No. 2 "	" 24	Edw. Hamer.....	Miner	While timbering, a timber fell and broke his ankle.
60	No. 5 "	" 31	John Klus	"	Runaway trip struck him and caused broken ribs and bruised head.
61	No. 5 "	" 31	Harry McGimsey..	Driver-boss....	Crushed between cars on McGinty and killed.
62	No. 10 Hosmer..	Sept. 6	E. Domina.....	Labourer.....	Thumb broken by haulage-rope.
63	No. 5 Michel...	" 7	John Bozal.....	Miner	Fall of coal fractured knee.
64	No. 1 Coal creek	" 20	Roco. Catenaro....	Driver.....	Jumped off trip and right leg was jammed and broken.
65	Coal creek	" 22	Jos. W. Buchanan.	Loco. engineer.	Locomotive jumped a switch on surface railway and went over a bank 200 feet; Buchanan sustained broken left leg and arm.
66	No. 1 Coal creek	Oct. 7	Thos. Stewart.....	Driver-boss....	Was driving air-motor, did not notice a door, ran into it, crushing his leg so it had to be amputated.
67	Hosmer.....	" 8	D. McLellan	Driver.....	Broke right arm while mounting a trip in motion.
68	No. 2 Coal creek	" 12	F. G. Westwood ..	"	His horse knocked out a post and a timber fell and broke Westwood's clavicle.
69	No. 8 Michel...	" 13	J. Feraniek	"	Struck by car; broken leg.
70	No. 9 " ...	" 22	John Toth	Miner	Finger cut by coal-cutting machine.
71	No. 9 " ...	" 25	P. Sartoris.....	Labourer.....	Fall of rock broke a toe.
72	No. 9 " ...	Nov. 3	M. Prosyk	"	Finger injured between rope and pulley.
73	No. 9 " ...	" 8	E. Kostinuk	"	Falling coal broke collar-bone.
74	No. 3 " ...	" 9	J. Suchodolnik	Miner	Falling coal broke small bone of right leg.
75	No. 2 Coal creek	" 18	Frank Zeman.....	"	Falling rock broke ribs, bruised back and shoulder.
76	No. 5 Coal creek	Nov. 18	Francis Scarpino...	Rope-driver...	Crushed between moving car and post; internal injuries.
77	No. 9 Hosmer...	" 19	J. Uynnycyk.....	Labourer.....	Struck by car; injuries fatal.

ACCIDENTS IN EAST KOOTENAY MINES.—*Concluded.*

No.	Colliery.	Date.	Name.	Occupation.	Details.
78	No. 9 Hosmer...	Dec. 7	M. Romanuk.....	Rope-rider....	Crushed between car and post; arm broken and side bruised.
79	No. 3 Michel....	" 7	Fra. Payk.....	Miner	Falling coal broke both legs.
80	No. 5 Coal creek	" 8	Dom Sarchesi.....	"	Falling rock broke tibia.
81	No. 9 Coal creek	" 9	Sam Heaney	"	Falling rock broke ankle.
82	Michel.....	" 20	Robt. Clare	Oiler	Arm crushed in machinery.
83	No. 8 Michel....	" 27	John Lord	Driver	Thrown off a car which jumped the track, and collar-bone broken.
84	No. 4 "	" 31	John Balver.....	Miner	Falling coal broke small bone in leg.

PROSECUTIONS UNDER "COAL MINES REGULATION ACT."

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As is incumbent upon the Inspector, he has been obliged to lay information before the local Magistrates in a large number of cases for infractions, by the workmen in the mines, of the general and special rules, which are provided solely for their own protection. These regulations are for the general safety of all the underground employees, and the carelessness of one man endangers all his fellow workmen, whose lives are practically in the hands of such foolishly careless or criminal person.

It will be noticed that the number of prosecutions this year is greater than formerly, due to the increase of the industry and to the greater number of Inspectors, permitting of a closer supervision of the work.

The following prosecutions and convictions have been obtained during the year for the offences noted :—

Offence committed.	In Violation of Provisions of "C. M. R. Act, 1888."	No. of Prosecutions.	No. of Convictions.	Penalties inflicted.
Intimidating firemen from performance of duty	Section 42	1	1	Cancellation of certificate as overman
Having tobacco or matches in possession in a mine where safety-lamps are required	General Rule 8	17	17	Fined $10 and costs; in one instance convicted to 7 days' imprisonment
Going through "danger" fence in mine	Special Rule 54	1	1	Seven days' imprisonment
Storing powder in mine	Gen. Rule 9, ss. (c)	2	2	Fined $10 and costs.
Damaging safety-lamp	Spec. Rules 50 & 51	3	3	" "
Tampering with safety-lamp	General Rule 8	1	1	Thirty days' imprisonment.
Riding on cars in mine	Special Rule 63	3	2	Fined $10 and costs.
Failing to place sprag in place	Special Rule 43	1	1	" "
Failing to make true report as official	General Rule 3	1	1	(Fireboss); fined $10 & costs.
Violation of "eight-hour law"	Section 23B	4	4	Fined—manager, $10; workmen, $2.
Taking more than 4 lb. of powder into mine	Gen. Rule 9, ss. (b)	1	.....	Fled the country.

METALLIFEROUS MINES SHIPPING IN 1910.

CASSIAR.

PORTLAND CANAL MINING DIVISION.

Mine or Group.	Locality.	Owner or Agent.	Address.	Character of Ore.
Lordigordy	Stewart	Leckie & Williams	Vancouver	Gold, silver, lead.

EAST KOOTENAY.

FORT STEELE MINING DIVISION.

Aurora	Moyie	H. H. Dimock	Moyie	Silver, lead.
North Star	Kimberley	North Star Mines	Kimberley	"
St. Eugene	Moyie	Con. M. & S. Co. of Canada	Moyie	"
Society Girl	"	J. P. Farrell	"	"
Sullivan	Kimberley	Con. M. & S. Co. of Canada	"	"

GOLDEN AND WINDERMERE MINING DIVISIONS.

Monarch	Field	J. A. Thomson	Vancouver	Silver, lead.

WEST KOOTENAY.

NELSON MINING DIVISION.

Arlington	Erie	Leslie Hill	Nelson	Gold, silver.
Athabasca	Nelson	A. W. Constans	"	Gold, silver, lead.
Emerald	Salmo	J. Waldbeser	Salmo	Silver, lead.
Eureka	Eagle Creek	L. B. Reynolds	Nelson	Gold, silver, copper.
Granite-Poorman	Granite	Thos. Gough	Williams Siding	Gold, silver.
Hope	Salmo	W. A. Talbot	Salmo	Gold, silver, lead.
Keystone	Erie	W. J. Wilson	Erie	Gold, silver.
Mother Lode	Sheep Creek	W. Watson	New York	Gold, silver, lead.
Nugget	"	W. C. Bayley	Nelson	Gold, silver.
Queen	Nelson	E. V. Buckley	Sheep Creek	Gold and silver.
Queen Victoria	Beasley Siding	Con. M. & S. Co.	Trail	Gold, silver, copper.
Silver King	Nelson	Kootenay Development Syndicate	Nelson	Silver, copper.
Summit	Sheep Creek	Sheep Creek Summit Gold Mines,	Vancouver	Gold, silver.
Wilcox	Ymir	A. H. Tuttle [Ltd.	Ymir	"

AINSWORTH MINING DIVISION.

Bismark	S. F. Kaslo Creek	Neil McKay	Victoria	Silver, lead.
Bluebell	Riondel	S. S. Fowler	Riondel	Silver, lead, zinc.
Flint	Kaslo Creek	V. Anderson	Kaslo	Silver, lead.
Highland	Ainsworth	A. E. Duchesnay	Vancouver	"
Jessie Bluebird	"	E. Johnson	Kaslo	"
Maestro	"	H. Giegerich	"	"
Panama	Bear Lake	"	"	"
Utica	Paddy Peak	C. F. Caldwell	"	"
Wellington	Whitewater	W. G. Robb	"	"
Whitewater	"	S. S. Fowler	Nelson	"
Whitewater Deep	"	J. L. Retallack	Kaslo	"

SLOCAN AND SLOCAN CITY MINING DIVISIONS.

Alamo-Idaho	Three Forks,	Thomas Avison	New Denver	Silver, lead.
Eastmont	Slocan	E. A. Crease	Nelson	Silver, lead, gold.
Enterprise	Ten-mile Creek	S. S. Fowler	"	Silver, lead.
Fisher Maiden	Silverton	Geo. Long	Silverton	"
Hewitt	"	G. Stilwell	"	"
Lone Bachelor	Three Forks	A. Cameron	Three Forks	Gold, silver, lead.

SLOCAN AND SLOCAN CITY MINING DIVISIONS.—*Concluded.*

Mine or Group.	Locality.	Owner or Agent	Address.	Character of Ore.
Lucky Jim	Bear Lake	A. W. Allen	Kaslo	Lead, zinc.
Majestic	Sandon	G. H. Wright	Sandon	Silver, lead.
Mollie Hughes	Slocan	Julius Wolff	New Denver	Gold, silver.
McAllister	Three Forks	W. G. Clark	Sandon	Silver, lead.
Noonday	Silverton	T. J. Lloyd	Silverton	Silver, lead, zinc.
Ottawa	Slocan	McPhee & McVicar	Slocan	Silver.
Payne	Sandon	O. V. White	Sandon	Silver, lead.
Rambler-Cariboo	McGuigan	W. E. Zwicky	Kaslo	"
Reco	Sandon	J. M. Harris	Sandon	"
Richmond-Eureka	"	Con. M. & S. Co	Trail	"
Ruth and Hope	"	J. Anderson	Kaslo	"
Slocan Star	"	O. V. White	Sandon	"
Standard	Silverton	G. H. Aylard	New Denver	"
Van Roi	"	Le Roi No. 2	Rossland	"

TROUT LAKE MINING DIVISION.

Silver Cup	Ferguson	F. C. Merry	Ferguson	Gold, silver, lead.

TRAIL CREEK MINING DIVISION.

Blue Bird	Rossland	Lyman Carter, Pres.	Rossland	Silver, lead, gold.
Centre Star	"	M. E. Purcell	"	Gold, silver, copper.
I. X. L.	"	R. T. Evans	"	Gold, silver.
Le Roi	"	A. J. McMillan	"	Gold, silver, copper.
Le Roi No. 2	"	Ernest Levy	"	" "
Lilly May	"	Johnston & Finney	"	Gold, silver, lead.
Mayflower	"	Nels Hanson	"	" "
Mountain Trail	"	C. C. Knutson	Northport, Wash	Gold, silver, copper.
Velvet	"			" "

BOUNDARY.

GRAND FORKS MINING DIVISION.

Golden Eagle	Kettle River	John A. Thomson	Vancouver	Gold, silver, copper.
Granby	Phœnix	G. W. Wooster	Grand Forks	" "
Little Bertha	Brown's Camp	C. M. Kingston	"	Gold, silver.
No. 7	Phœnix	Chas. Biesel	Phœnix	Gold, silver, lead.
Snowshoe	"	"	"	Gold, silver, copper.

GREENWOOD MINING DIVISION.

Bounty Fr	Beaverdell	T. T. Henderson	Greenwood	Silver, lead.
Mother Lode	Deadwood Camp	B. C. Copper Co.	"	Gold, silver, copper.
Mountain Rose	Summit Camp	New Dom. Copper Co.	"	Silver, copper.
Oro Denoro	"	B. C. Copper Co.	"	Gold, silver, copper.
Rawhide	Phœnix	New Dom. Copper Co.	"	" "
Sally	Kettle River	R. Wood	"	Silver, lead.
Wellington	Wellington Camp	B. C. Copper Co.	"	Gold, silver, copper.

OSOYOOS MINING DIVISION.

Nickel Plate	Hedley	Gomer Jones	Hedley	Gold, silver.

ASHCROFT MINING DIVISION.

Monocacy	Cocum Valley	R. Waitshoair	Coutlee P. O.	Copper.

BOUNDARY.—*Concluded.*

LILLOOET MINING DIVISION.

Mine or Group.	Locality.	Owner or Agent.	Address.	Character of Ore.
Anderson Lake M. &	Anderson Lake	H. M. Babb	Seattle	Gold.
Bend'Or. .. [M. Co.	Cadwallader Creek	A. F. Noel	Lillooet	"
Pioneer	"	F. H. Kinder	"	"

COAST.

NEW WESTMINSTER MINING DIVISION.

Britannia	Howe Sound	R. H. Leach	Britannia Beach	Gold, silver, copper.

NANAIMO MINING DIVISION.

Cornell	Van Anda	G. L. Tanzer	Van Anda, B. C.	Copper, gold, silver.
Marble Bay	Texada Island	Alex. Grant	Van Anda	Gold, silver, copper.

CLAYOQUOT MINING DIVISION.

Leora	Elk River	D. W. Hanbury	Victoria	Gold, silver.

LIST OF CROWN-GRANTED MINERAL CLAIMS.

:o:

CROWN GRANTS ISSUED IN 1910.

CASSIAR.

Claim.	Division.	Grantee.	Lot No.	Acres.	Date.
Atlin	Atlin	Richard Kennedy	904 G. 1	51.65	Mar. 9
Chilcat	"	" "	728 G. 1	49.91	Mar. 9
Elise	"	John Wm. Burnham	902 G. 1	43.83	Mar. 9
Fairfield	"	Michael Cassin	921 G. 1	43.51	Oct. 6
Gilroy Fractional	"	Martin Conway	730 G. 1	33.11	Mar. 9
Hartford	"	John Wm. Burnham	801 G. 1	44.4	Mar. 9
Lawrence	"	Michael Cassin	955 G. 1	51.65	Oct. 6
Horrible	"	" "	810 G. 1	46.62	Oct. 6
Maid of Erin	"	Richard Kennedy	722 G. 1	50.17	Mar. 9
Northern Partnership No. 1	"	John Dunham, James Alexander, Konrad Warwecka and Benjamin Green-Nicoll	918 G. 1	45.46	Aug. 31
Nova Scotia	"	David Fraser	900 G. 1	51.61	Mar. 9
Queen Bess	"	Henry Nicholson	911 G. 1	48.23	Nov. 10
Sonora	"	John William Burnham	727 G. 1	30.18	Mar. 9
Spokane	"	Martin Conway, Sam. Martin Fraser	807 G. 1	36.79	Mar. 9
Sugar Quart Fract	"	John Mitchell Turnbull	908 G. 1	30.3	June 12
Togo	"	Henry Nicholson	910 G. 1	48.91	Nov. 10
Utica	"	Michael Cassin	957 G. 1	51.65	Oct. 6
Victoria	"	John William Burnham	903 G. 1	50.19	Mar. 9
War Eagle	"	Richard Kennedy	901 G. 1	51.65	Mar. 9
Windsor	"	John Wm. Burnham	804 G. 1	44.76	Mar. 9
Wonderfull	"	Richard Kennedy	726 G. 1	29.52	Mar. 9
Moresby Island	Queen Charlotte	John S. McMillan	78	45.79	July 20
Pine Log	" "	" "	88	32·43	July 19
Aloha	Skeena	Gribble Island Copper Co	608 Rg 4	51.6	June 29
Bellingham	"	" "	601 Rg 4	51.6	June 29
Blue Bell	"	" "	603 Rg 4	49.25	June 29
Ben Hur	"	Stewart Mining & Development Co., Ltd	870 G. 1	51.65	Aug. 16
Ben Hur Fractional	"	" " "	871 G. 1	10.64	Aug. 16
Copper Queen	"	Gribble Island Copper Co	604 Rg 4	50	June 29
Copper Cliff	"	" "	605 Rg 4	50.7	June 29
Dot Fractional	"	Red Cliff Mining Co., Ltd. (N. P. L.)	87 G. 1	3.72	Oct. 4
George E	"	Stewart Mining & Development Co., Ltd. (N. P. L.)	872 G. 1	49.23	Aug. 16
Little Pat Fractional	"	Red Cliff Mining Co., Ltd. (N. P. L.)	78 G. 1	46.82	Oct. 4
Miller	"	Graham Chambers, David James Rainey	893 G. 1	51.65	Feb. 28
Montrose	"	Red Cliff Mining Co., Ltd. (N. P. L.)	76 G. 1	50.90	Oct. 4
Mount Lyell	"	" " "	77 G. 1	46.69	Oct. 4
Mac Fract	"	" " "	86 G. 1	5.8	Oct. 4
Northern Bell	"	Graham Chambers, David James Rainey	897 G. 1	51.65	Feb. 28
Pontiac	"	" " "	894 G. 1	51.65	Feb. 28
Roosevelt No. 2	"	" " "	895 G. 1	43.26	Feb. 28
Roosevelt No. 1	"	" " "	896 G. 1	45.01	Feb. 28
Ruby	"	William Noble	887 G. 1	51.65	Aug. 20
Red Cliff	"	Red Cliff Mining Co , Ltd. (N. P. L.)	75	51.65	Sept. 30
Sunbeam	"	Stewart Mining & Development Co., Ltd	869 G. 1	44.45	Aug. 16
Silver Bow No. 1	"	Myron Knox Rodgers	456 G. 1	51.65	Aug. 22
Silver Bow No. 2	"	" "	457 G. 1	51.65	Aug. 22
Silver Bow No. 3	"	" "	458 G. 1	39.22	Aug. 22
Silver Bow No. 4	"	" "	459 G. 1	51.65	Aug. 22
Tyee	"	Gribble Island Copper Co	602 Rg 4	46	June 29
Viking	"	" "	607 Rg 4	51.6	June 29
White Bear	"	" "	606 Rg 4	47.9	June 29
Watterloo	"	Red Cliff Mining Co., Ltd (N. P. L.)	79 G. 1	51.65	Oct. 4
Washington No. 1	"	Myron Knox Rodgers	867 G. 1	50.32	Oct. 11
Contention	Omineca	John Joseph Campbell, Charles H. Schepster, Henry Edward Macdonell, Robert Scott Lennie	1829Rg5	37.36	Mar. 10
Keystone Fractional	"	John Joseph Campbell, Charles H. Schepster, Henry Edward Macdonell, Robert Scott Lennie	1830Rg5	14.72	Mar. 10
Standard	"	James Joseph Campbell, Charles H. Schepster, Henry Edward Macdonell, R. S. Lennie	1828Rg5	39.59	Mar. 10
Dawson	Cariboo	William Charles Fry, John Stevenson, Charles E. Rollins, Jr., Angus McPherson, Wm. Bromfield Brough, Roxelina Cadwell-Johnston, administratrix of the estate of Wm. Albert Johnston, deceased, intestate	365 G 1.	51.65	Oct. 24
Mabel	"	William Charles Fry, John Stevenson, Charles E. Rollins, Jr., Angus McPherson, Wm. Bromfield Brough, Roxelina Cadwell-Johnston, administratrix of the estate of Wm. Albert Johnston, deceased, intestate	366 G. 1	51.31	Oct. 24

EAST KOOTENAY.

Claim.	Division.	Grantee.	Lot. No.	Acres.	Date.
Dorothy	Fort Steele	James A. Harvey, John Z. Carns	2167 G. 1	43.05	Sept. 29
Kruger	"	James A. Harvey, John Z. Carns, Frank Guindon	2331 G. 1	29.6	Sept. 29
Maple	"	" " "	2169 G. 1	46.47	Sept. 27
Roberts	"	" " "	2330 G. 1	37.07	Sept. 29
Tarrant	"	William Tarrant, James Angus	8955	43.35	Jan. 3
Toronto	"	James A. Harvey, John Z. Carns, Frank Guindon	2168 G. 1	32	Sept. 27

WEST KOOTENAY.

Alexander	Nelson	Charles Lewiston	9078 G. 1	51.37	Aug. 26
Atlin	"	William Coffey	4800 G. 1	27.37	Oct. 13
Atlin Fraction No. 2	"	" "	9336 G. 1	20.79	Oct. 13
Bullion	"	William Waldie	8325 G. 1	50.74	Aug. 26
Clarendon	"	Clarence Chipman Ladd	5142 G. 1	33.30	Feb. 15
Clarendon Fractional	"	" "	5143 G. 1	34.30	Feb. 15
Edward VII	"	Charles Lewiston	9077 G. 1	18.22	Aug. 26
Hide Away	"	Wm. Waldie	5625 G. 1	28.07	Aug. 26
Placer Fract	"	Charles Lewiston	9079 G. 1	7.73	Aug. 26
Pasadena	"	Agnes Billings	9185 G. 1	49.85	Dec. 8
Sultana	"	Frederick P. Drummond	9186 G. 1	25.39	Dec. 8
Blutcher	Ainsworth	Wm. Anderson Allan	3633	48.10	Sept. 27
Castick	"	Wm. M. Bennett	9840 G. 1	47.93	June 22
Copper Head	"	Alfred Joseph Watson	3635 G. 1	49	Aug. 12
Evening Star	"	William Anderson Allan	6497 G. 1	51.65	Sept. 27
Hecla	"	Elon Ezra Chipman, Angus Campbell, Wm. Houston, Neil Franklin Mackay	7379 G. 1	51.65	Aug. 12
Ivanhoe	"	Wm. Anderson Allan	1195 G. 1	42.57	Sept. 27
Jack Rabbit	"	*Alfred Joseph Watson*	3639 G. 1	47.80	Aug. 12
Mountain Con	"	Wm. M. Bennett	9841 G. 1	49.07	June 22
Ottawa	"	William Anderson Allan	1196 G. 1	51.65	Sept. 27
Pilot	"	Alfred Joseph Watson	3640 G. 1	48.30	Aug. 12
Surprise Fractional	"	Francis Algernon Devereux	6336 G. 1	8.5	Aug. 12
Summit	"	Elon Ezra Chipman, Angus Campbell, William Houston, Neil Franklin McKay	7380 G. 1	51.55	Aug. 12
Airdrie Frac	Slocan	Thomas Larance McAllister and Carson A. Bigney	9831 G. 1	15.77	April 21
Carbajal	"	Consolidated Mining & Smelting Co. of Canada	6532 G. 1	0.8	Jan. 11
Emporium	"	William Hoover Yawkey, John D. Farrell, Augusta Lydia Yawkey, Cyrus Carpenter Yawkey, as the executors of the estate of William Clyman Yawkey, deceased	2109 G. 1	45.16	Oct. 21
Hester	"	Thomas Larance McAllister	9831 G. 1	25.55	April 12
Jane No. 2	"	" "	9830 G. 1	42.09	April 12
Kilo	"	Noah F. McNaught, James McNaught	9328 G. 1	50.06	Aug. 19
Kilo No. 2	"	" "	9330 G. 1	37.14	Aug. 19
Moonraker	Slocan City	Thomas McNeish, Conway Edward Cartwright, John F. Helliwell, John Elliott, Alexander MacDonald, William John Wilson, Francis M. Black	8939 G. 1	32.51	July 18
Number three	Slocan	John Morgan Harris	5916 G. 1	30.84	Aug. 5
Number four	"	Fred. Texas Kelly	5917 G. 1	36.84	Aug. 5
Number five Fractional	"	John Alexander Whittier	5918 G. 1	20.46	Aug. 5
Ranger	"	Noah McNaught, James McNaught, Robert Wetmore Hannington	9332 G. 1	41.39	Aug. 20
Skylark	"	Noah F. McNaught, James McNaught, Robert Wetmore *Hannington*	9333 G. 1	47.36	Aug. 20
Violet No. 3	"	Noah F. McNaught, James McNaught	9329 G. 1	23.12	Aug. 19
Wedge Fractional	"	" "	9331 G. 1	47.05	Aug. 20
Annie E	Trout Lake	Clara Grace Westfall, administratrix of the estate of John Wesley Westfall, deceased, intestate	7269 G. 1	51.65	Nov. 24
A. E. Fractional	"	Clara Grace Westfall, administratrix of the estate of John Westley Westfall, deceased, intestate	7276 G. 1	2	Nov. 14
Bosun	"	Clara Grace Westfall, administratrix of the estate of John Wesley Westfall, deceased, intestate	7271 G. 1	51.56	Nov. 24
B. S. Fractional	"	Clara Grace Westfall, administratrix of the estate of John Wesley Westfall, deceased, intestate	7275 G. 1	2.65	Nov. 14
Early Bird	"	Charles Manson Oliver	8708 G. 1	51.62	Feb. 15
Fidelity	"	Clara Grace Westfall, administratrix of the estate of John Wesley Westfall, deceased, intestate	7269 G. 1	51.39	Nov. 24
F. D. Fractional	"	Clara Grace Westfall, administratrix of the estate of John Wesley Westfall, deceased, intestate	7274 G. 1	2.20	Nov. 14
Galilleo	"	Edward Baillie	8659 G. 1	28.43	Oct. 6
J. W. Fractional	"	Clara Grace Westfall, administratrix of the estate of John Wesley Westfall, deceased, intestate	7482 G. 1	4.90	Nov. 14
Lost Chord	"	Henry W. Schloss	8664 G. 1	51.65	June 24
Last Chance	"	" "	8665 G. 1	51.34	June 24
Mohecan	"	Charles Manson Oliver	8706 G. 1	51.65	Feb. 18
Nipissing	"	Clara Grace Westfall, administratrix of the estate of John Wesley Westfall, deceased, intestate	7270 G. 1	51.65	Nov. 24
Pathfinder	"	Charles Manson Oliver	8707 G. 1	51.23	Feb. 15
Pluto	"	Edward Baillie	8658 G. 1	32.43	Sept. 30
Spokane	"	Clara Grace Westfall, administratrix of the estate of John Wesley Westfall, deceased, intestate	7272 G. 1	47.20	Nov. 24
We Two	"	Clara Grace Westfall, administratrix of the estate of John Wesley Westfall, deceased, intestate	7273 G. 1	51.65	Nov. 24

"V FIDELITY GROUP"

WEST KOOTENAY.—*Concluded.*

Claim.	Division.	Grantee.	Lot No.	Acres.	Date.
Eureka	Revelstoke	Charles Walsh, Edward Adair, Samuel McMurty, Walter Walsh, Frank G. Walsh, Gilbert Wilson, Robert F. Green	9124 G. 1	49.5	June 21
Evening Star	"	Charles Walsh, Edward Adair, Samuel McMurty, Walter Walsh, Frank G. Walsh, Gilbert Wilson, Robert F. Green	9125 G. 1	51.2	June 21
Flora Bell	"	Charles Walsh, Edward Adair, Samuel McMurty, Walter Walsh, Frank G. Walsh, Gilbert Wilson, and Robert F. Green	9121 G. 1	41.75	June 21
Grand View	"	Charles Walsh, Edward Adair, Samuel McMurty, Walter Walsh, Frank G. Walsh, Gilbert Wilson, Robert F. Green	9122 G. 1	39.8	June 21
Morning Star	"	Charles Walsh, Edward Adair, Samuel McMurty, Walter Walsh, Frank G. Walsh, Gilbert Wilson, and Robert F. Green	9123 G. 1	26.86	June 21

BOUNDARY.

Ajax	Grand Forks	Sylvia Rice Covert, Bernard Lequime, David Whiteside, Forbes M. Kerby	1029 S.	32.3	Aug. 17
Banner Fractional	"	Fred. W. Reid, Albert L. Whiteside	1012 S.	1.88	Jan. 12
Bystander	"	Jacob M. Paulson	1028 S.	26	April 28
Buffalo	"	James McDonald	920 S.	42.25	June 24
Bay Horse	"	John Mulligan and Eric E. Jackson	755 S.	51.24	Nov. 14
Burlington Fractional	"	" "	757 S.	35.9	Nov. 14
Columbia	"	Archie Chisholm	958 S.	44.26	Nov. 16
Connection	"	Lake D. Wolford, Forbes M. Kerby	954 S.	38.55	Nov. 16
Cressant	"	" "	3383	41.44	Nov. 30
Early Dawn Fractional	"	John Mulligan, Eric E. Jackson	758 S.	47.5	Nov. 14
Florence	"	B. C. Copper Co., Ltd	1187 S.	32.98	Feb. 9
"	"	Archie Chisholm, Patrick McGinnis, Donald Wm. Matheson	956 S.	26.25	Nov. 15
Golden Age	"	Herbert Charles Kerman	967 S.	26.9	Feb. 14
G. H. Fractional	"	Thomas Newby, Leander Merson, Frank Loehr, Howard E. Garnett	922 S.	14.5	July 18
Hennakinn	"	Basil Wm. Garrison	439 S.	42.2	Nov. 15
Homestake Fractional	"	Lake D Wolford, Forbes M. Kerby	3167	38.33	Nov. 30
I. X. L.	"	James McArdle, Frank McFarlane, John McLaren, Peter Wolf, Albert L. Whiteside	1030 S.	48.45	June 27
Kate Frac. No. 2	"	Lake D. Wolford	961 S.	8.74	Sept. 21
Lucky Jack	"	Herbert Charles Kerman, Maggie M. Kerman, Henry Watkin, David Shannon	1026 S.	44.28	Feb. 14
Lucky Shot Fractional	"	Julius Carson	566 S.	45.65	Sept. 30
Nakusp	"	James West and Archie Chisholm	960 S.	31.65	Nov. 16
Ottawa	"	" "	957 S.	33.67	Nov. 16
Rossland	"	James Sutherland, Chisholm Fraser	965 S.	51.65	June 27
Shirley Fractional	"	Elsie L. Clement	1013 S.	2.86	Feb. 17
Standard	"	Jacob N. Paulson	1027 S.	41.4	April 28
Shelby	"	Archie Chisholm	959 S.	41.39	Nov. 16
Triplicate Fractional	"	John Mulligan, James F. Cunningham	598 S.	14.4	June 17
Tiger Fractional	"	John Mulligan, Eric E. Jackson	756 S.	31.16	Nov. 14
Verde	"	Wm. Henry Otter, Charles N. Mardon	1011 S.	40.97	April 4
Violet Fractional	"	Basil William Garrison	588 S.	27.5	Nov. 15
White Bear	"	Herbert Charles Kerman, Maggie M. Kerman, Henry Watkin, David Shannon	1025 S.	51.65	Feb. 14
Woodburn	"	Julius Carson	887 S.	46.75	Sept. 30
Woodburn Fractional	"	" "	888 S.	10.78	Sept. 30
Aetna Fractional	Greenwood	Granby Mining, Smelting, & Power Co., Ltd	1024 S.	0.11	Aug. 26
Boston Bay Fractional	"	John Thomas Beattie, John Wm. Nelson, Donald A. Cameron, Wm. Wellington Craig	794 S.	11.6	July 26
Bounty	"	Sydney Mimmings Johnson and Philip D. S. Stanhope	2348	51.65	Aug. 16
Bullion Fractional	"	John Mulligan	3238	2.06	Aug. 26
B. C.	"	Marion Atwood and Thomas M. Graves	725 S.	48.42	Sept. 27
California Fractional	"	John Mulligan	761 S.	20.5	Sept. 21
Connection Fractional	"	Artemus L. White	3131	21.26	Nov. 2
Crescent No. 2	"	Harry H. Shallenberger	1257 S.	41.02	Nov. 21
Eholt	"	Fred Moser, John Zurfluh	823 S.	42.49	Nov. 15
Florence	"	Neil H. Lamont, Edwin Foyle Smith	880 S.	34.47	Feb. 28
Monte Grande	"	John Mulligan	152 S.	21.9	Sept. 21
Morning Star	"	Edward G. Smith	1201 S.	51.65	Nov. 15
McKinley	"	Alexander A. McIntosh	168 S.	44.40	Sept. 27
Paymaster Fractional	"	George Radcliffe Naden	892 S.	28.63	July 14
S. I. B. A.	"	Wm. Edward McArthur	2881	51.65	May 2
Tamarack Fractional	"	Robert Duncan Kerr and Emile Etchepore	798 S.	35.14	Feb. 15
Tanglefoot	"	John Zurfluh and Fred. Moser	1215 S.	50.82	Nov. 15
Wellington	"	Thomas Hemmerke, James H. McNeil, Ralph W. Smailes, James Napier Paton	2621	51.65	June 27
Apex	Osoyoos	Eclipse Mining & Milling Co	1038 S.	37.5	Mar. 15
Johnny Bull	"	Richard H. Parkinson	544	22.46	Oct. 12
Kendall	"	" "	548 S.	51.65	Oct. 12
V. V. E.	"	" "	546S.	40.84	Oct. 12
Blackbird	Lillooet	Eusebius Shultz Peters and John Fisher May	1176 G. 1	37.7	Jan. 31
Duke	"	Mark Robert Eagleson	1222 G. 1	19	Mar. 8
Leroy	"	" "	1225 G. 1	39.3	Mar. 8

BOUNDARY.—*Concluded.*

Claim.	Division.	Grantee.	Lot.	Acres.	Date.
Maud S. Fractional	Lillooet	Thomas Pearson Reid, Samuel Gibbs, Harvey Anson Christie	1226 G. 1	30.5	Feb. 3
Nellie	"	Mark Robert Eagleson	1179 G. 1	39.5	Feb. 15
Royal	"	" "	1224 G. 1	23.7	Mar. 8
Whip-poor-Will	"	" "	1221 G. 1	44	Feb. 15
Black Bear	Vernon	Robert J. Murtrie	3693 G. 1	51.65	July 26
White Bear	"	" "	3694 G. 1	51.65	July 26
Knob Hill	Similkameen	Ellen Josephine Barrow and George Edgar Winkler	808 S.	51.65	July 28

VANCOUVER ISLAND AND COAST.

First Chance	Alberni	James A. Moore	285	51.65	Oct. 12
Keiser	"	James Dunsmuir	417	40	Jan. 31
Cougar	N. Westminster	Britannia Mining & Smelting Co., Ltd.	2347 G. 1	29.58	June 23
Georgina Fractional	"	" "	2411 G. 1	47	July 2
Necessity Frac	"	John H. Tilsley	2611 G. 1	26.02	Oct. 22
Ormond No. 2	Clayoquot	James Beck, Thomas Thoroton Gardhouse	354	28.1	Apr. 21
Ormond No. 2 Fractional	"	" "	355	16.34	Apr. 21
Ormond	"	" "	352	45.91	Apr. 21
Ormond No. 3	"	" "	353	34.35	Apr. 21
Eureka No. 1	Quatsino	James A. Moore	233	41.8	June 30
Eureka No. 2	"	"	234	41.8	June 30
Eagle No. 1	"	"	274	47.65	June 30
Eagle No. 2	"	"	275	46.3	July 6
Eagle No. 3	"	"	277	36.07	July 6
Eagle No. 4	"	"	278	37.16	July 6
Eagle No. 5	"	"	279	50.4	July 7
Eagle No. 6	"	"	280	51.65	July 7
Eagle No. 7	"	"	297	30.3	Oct. 12
Eagle No. 8	"	"	298	29.08	Oct. 12
F. H. C. No. 1	"	"	272	49.31	June 30
F. H. C. No. 2	"	"	273	40.75	June 30
Last Chance	"	"	286	51.65	Oct. 12
Red Cross No. 1	"	"	235	46.02	June 30
Red Cross No. 2	"	"	236	45.62	June 30
Red Cross No. 3	"	"	237	51.65	June 30
Red Cross No. 4	"	"	268	51.65	June 30
Red Diamond No. 1	"	"	269	51.65	June 30
Red Diamond No. 2	"	"	270	51.65	June 30
Red Bug No. 1	"	"	301	41.00	July 7
Red Bug No. 2	"	"	302	47.4	July 7
Sunrise	"	"	271	51.65	July 6
Seattle No. 1	"	"	287	51.65	Oct. 12
Seattle	"	"	300	51.65	Oct. 12
Victoria	"	"	276	51.65	July 6
Alpha	Victoria	Clifford Terrian	1 G.	27.05	Aug. 6
Beta	"	"	2 G.	21.0	Aug. 6
Taboga	"	Henry Marsh	3 G.	38.05	Aug. 6

DEPARTMENT OF MINES.

VICTORIA, B. C.

HON. RICHARD MCBRIDE,	*Minister of Mines.*
R. F. TOLMIE,	*Deputy Minister of Mines.*
WM. FLEET ROBERTSON,	*Provincial Mineralogist.*
HERBERT CARMICHAEL,	*Provincial Assayer.*
D. E. WHITTAKER,	*Assistant Assayer.*
F. H. SHEPHERD,	*Chief Inspector of Mines, Nanaimo.*
THOMAS MORGAN,	*District* ,, "
JOHN NEWTON,	,, ,, *Cumberland.*
EVAN EVANS,	,, ,, *Cranbrook.*
ROBERT STRACHAN,	,, ,, *Hosmer.*
JAMES MCGREGOR,	,, ,, *Nelson.*

GOLD COMMISSIONERS AND MINING RECORDERS.

Mining Divisions.	Location of Office.	Gold Commissioner.	Mining Recorder.	Sub-Recorder.
Atlin Mining Division	Atlin	J. A. Fraser	John Cartmel	
Sub-office	Discovery City			R. Webster.
"	Telegraph Creek			Jas. Porter.
"	Summit Station			Geoffrey Butler.
"	Wynnton			W. H. Simpson.
"	Pleasant Camp			
"	Haines (U. S.)		(Com. for taking	Risdon M. Odell.
"	Nahlin		Affidavits)	J. F. Pilling.
Stikine Mining Division	Telegraph Creek	Jas. Porter	Jas. Porter	
Sub-office	Boundary			C. A. Tervo.
Liard Minidg Division	Telegraph Creek	Jas. Porter	Jasr Porter	
Skeena Mining Division	Prince Rupert	J. H. McMullin	J. H. McMullin	
Sub-office	Kitimat			Geo. L. Anderson.
"	Port Simpson			J. R. C. Deane.
"	Essington			A. Forsythe.
"	Stewart (Portland Canal)			John Conway.
"	Unuk River			Burt E. Daily.
"	Hartley Bay			Ed. McCoskrie.
Portland Canal M. D.	Stewart	J. H. McMullin	John Conway	
Bella Coola Mining Div.	Prince Rupert	J. H. McMullin	J. H. McMullin	
Sub-office	Bella Coola			Chris. Carlson.
Queen Charlotte Min'g D.	Jedway	E. M. Sandilands	E. M. Sandilands	W. Prescott.
Sub-office	Skidegate			A. J. Gordon.
"	Masset			C. Harrison.
"	Lockeport			H. L. Beresford.
Omineca Mining Division	Hazelton	William Allison	Jas. E. Kirby	
Sub-office				
"	Fort Grahame			Wm. Fox.
"	Fort St. James			Alex. C. Murray.
"	Manson Creek			Ezra Evans.
"	Copper City			P. R. Skinner.
"	Aldermere			R. Gale.
"	Lorne Creek			F. E. Holt.
"	Kitsalas			J. H. Patterson.
"	Fort St. John			F. W. Beatton.

GOLD COMMISSIONERS AND MINING RECORDERS.—*Continued.*

Mining Divisions.	Location of Office.	Gold Commissioner.	Mining Recorder.	Sub-Recorder.
Peace River Mining Div..	Fort St. John	Thos. Jamieson....	Thos. Jamieson....	F. W. Beatton.
Cariboo Mining Division..	Barkerville	C. W. Grain	R. S. C. Randall ..	
Sub-office	Quesnel.....	....	.....	David H. Anderson.
Sub-office	Fort St. George...	.....	....	Geo. J. Walker.
Quesnel Mining Division..	150-Mile House...	C. W. Grain	E. C. Lunn.....	
Sub-office	Quesnel.....	(at Barkerville)	....	David H. Anderson.
Clinton Mining Division..	Clinton	F. Soues	F. Soues	
Lillooet "	Lillooet.....	Caspar Phair... ..	Caspar Phair.....	
Kamloops Mining Division	Kamloops.....	E. T. W. Pearse	E. Fisher	
Ashcroft "	Ashcroft.....	" (at Kamloops)	H. P. Christie.....	
Nicola "	Nicola.....	E. Fisher...	W. N. Rolfe	
Yale "	Yale	"	L. A. Dodd	
Sub-Office.....	Hope.....	....	.....	A. H. Gravener.
Similkameen "	Princeton	Hugh Hunter	Hugh Hunter	
Sub-office	Hedley	.....	.....	F. M. Gillespie.
Vernon Mining Division..	Vernon	L. Norris	H. F. Wilmot	
Greenwood Mining Div...	Greenwood.....	W. G McMynn ...	Geo. Cunningham..	
Sub-office	Vernon	.....	.....	H. F. Wilmot.
"	Rock Creek.....	....	.....	H. Nicholson
"	Beaverdell	.....	.....	E. F. Ketchum.
Grand Forks Min. Div....	Grand Forks	S. R. Almond	S. R. Almond	
Osoyoos Mining Division..	Fairview.....	J. R. Brown	Ronald Hewat	
Sub-office	Olalla.....	.....	.....	R. W. Northey.
"	Hedley	.....	.....	F. M. Gillespie.
Golden Mining Division..	Golden	E. J. Scovil.....	F. H. Bacon	
Windermere " ..	Wilmer.....	.....	G. F. Stalker	
Fort Steele Mining Div...	Cranbrook	J. F. Armstrong...	N. A. Wallenger...	
Sub-office	Steele.....	.. ..	.....	Joseph Walsh.
"	Fernie.....	.....	....	J. S. T. Alexander.
"	Moyie	.....	.....	Fred. J. Smyth.
"	Marysville	....	.....	
Ainsworth Mining Div ...	Kaslo	E. E. Chipman	R. J. Stenson	Wm. J. Green.
Sub-office	Howser.....	.....	....	W. Simpson.
"	Trout Lake	....	.....	F. Mummery.
Slocan Mining Division...	New Denver	E. E. Chipman (at	Angus McInnes ...	
Sub-office	Sandon	" Kaslo)	.....	W. J. Parham.
Slocan City Mining Div...	Slocan City	... .	Howard Parker....	
Trout Lake Mining Div..	Trout Lake	E. E. Chipman....	F. Mummery.....	
Nelson Mining Division ..	Nelson	W. F. Teetzel.....	S. H. Hoskins.....	
Sub-office	Creston.....	....	.....	Guy Loewenberg.
"	Ymir.....	..... Nelson)	.....	J. A. Fraser.
Arrow Lake Min. Division	Nakusp.....	W. F. Teetzel (at	Walter Scott	
Sub-office	Vernon.....	....	H. F. Wilmot.....	
Revelstoke Mining Div...	Revelstoke.....	Robt. Gordon	W. E. McLauchlin.	Edward Edwards.
Lardeau Mining Division.	Camborne.....	" (at Revelstoke)	B. E. Drew	
Trail Creek Mining Div...	Rossland	John Kirkup	J. E. Hooson.....	

GOLD COMMISSIONERS AND MINING RECORDERS.—*Concluded.*

Mining Division.	Location of Office.	Gold Commissioner.	Mining Recorder.	Sub-Recorder.
Nanaimo Mining Division	Nanaimo	George Thomson	George Thomson	
Sub-office	Ladysmith			John Stewart.
"	Alert Bay			Edward Conway.
"	Van Anda			
"	Rock Bay			W. H. Lines.
Alberni Mining Division	Alberni	H. C. Rayson	H. C. Rayson	
Clayoquot "	Clayoquot	" (at Alberni)	W. T. Dawley	
Quatsino "	Quatsino	" "	O. A. Sherberg	
Victoria Mining Division	Victoria	R. A. Renwick	G. V. Cuppage	
New Westminster Min. D.	New Westminster.	S. A. Fletcher	John Mahony	
Sub-office	Vancouver			Geo. D. McKay.
"	Harrison Lake			L. A. Agassiz.
"	Chilliwhack			J. Pelly.

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LIST OF ILLUSTRATIONS.

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Victoria, Government Printing Office, 1911.

Author.

Robertson, William Fleet. *(Provincial Minerologist.)*

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