ANNUAL REPORT

OF THE

MINISTER OF MINES

FOR THE

YEAR ENDING 31st DECEMBER,

1894,

BEING AN ACCOUNT OF

MINING OPERATIONS FOR GOLD, COAL, ETC.,

IN THE

Province of British Columbia.

VICTORIA, B. C.:
Printed by RICHARD WOLFENDEN, Printer to the Queen's Most Excellent Majesty.
1895.

REPORT

OF THE

MINISTER OF MINES,

1894.

To His Honour EDGAR DEWDNEY,

Lieutenant-Governor of the Province of British Columbia.

MAY IT PLEASE YOUR HONOUR:

The Annual Report of the Mining Industries of the Province for the year 1894 is herewith respectfully submitted.

JAMES BAKER,

Minister of Mines.

Minister of Mines' Office,

11th April, 1895.

PROVINCE OF BRITISH COLUMBIA.

MINING STATISTICS FOR 1894.

Name of Bar, Gulch, Creek, or River.	No. of Companies working.	No. of Interests.	No. of Companies taking out gold.	No. of Companies prospecting.	Average number of men employed during season.		Rate of Wages.		Nature of Claims.					How Worked.					Description of machinery.		Value of Gold per ounce.	Estimated value of yield for the year.	Value of Silver per ounce.	Estimated value of yield for the year.	Total Divisions.		Total Districts.		Remarks.
					Whites.	Chinese or Japanese.	Whites.	Chinese or Japanese.	Bar.	Creek.	Bench.	Hill.	Quartz.	Rocker.	Sluices.	Hydraulic.	Shaft.	Tunnel.	Water wheels.	Steam engines.					Gold.	Silver.	Gold.	Silver.	
CARIBOO.																												
Barkerville Division:																					$15 50 to							
Williams Creek and tributaries	23		18	5	27	37	$3 50	$2 50		8		15			11	9	2	1			16 50	$17,900						
Mosquito, Red Gulch, and Valley Creeks	6		5	1	29	8	"	"		4		2			2	2	1	1		1	17 25	11,900						
Hardscrabble, Sugar Creek, and vicinity	6		5	1	5	24	"	"		4		2			3	2	1		1		17 00	7,500						
Lowhee Creek and vicinity	5		4	1	3	13	"	"		2		3			3	2					17 25	6,500						
Grouse, Canadian Creek and vicinity	7		5	2	9	14	"	"		3		4			3	3	1				16 00	5,500						
Antler and Cunningham Creeks	11		9	2	5	26	"	"		5	2	4			5	2	2	2	1	1	16 00	6,500						
Stevens Creek, Beggs Gulch and vicinity	4		4			12	"	"		3		1			3	1					16 00	4,000						
Shepherd's Valley and Pine Creeks	4		3	1	9		"	"		3		1			3			1			17 25	2,500						
Desultory mining						15	"	"														4,000			$66,300			
Lightning Creek Division:																					16 50 to							
Lightning and Cottonwood Creeks	12		8	4	16	19	"	"		7		4			6	1	2	2	1		17 50	8,000						
Van Winkle and Perkins Gulch	2		1	1	2	2	"	"		2					2						"	1,500						
Slough Creek and Devil's Canyon	5		3	2	20		"	"		3		2			3		1	1		1	"	6,500						
Nelson and Burns Creeks	6		6			23	"	"		4		2			4	2					"	10,500						
Last Chance and Davis Creeks	3		3			10	"	"		2		1			3						"	3,000						
Ruchon and Canyon Creeks	2		2			6	"	"		2					2						"	1,500						
Chisholm, Timon, and Poor Man's Creeks	2		2	1	5	5	"	"		3					2			1			"	1,700						
Desultory mining						15	"	"														2,000			34,700			
Quesnellemouth Division:																												
Fraser River	7		7		6	40			4		3			4	2	1					16 00	16,000						
Cottonwood River	3		3		6	10			1	1	1			1	2						"	2,000						
Hixon and Ferry Creeks	3		3			13			1	2				1	2						15 00	2,200						
Quesnelle River	3		3		25	15			1	1		1		1	1	1					16 00	3,000						
Desultory mining																						3,000			26,200			
Keithley Creek Division:																												
Keithley Creek	5	18	5		5	20	4 00	2 50		2		3			2	2	1		1		17 40	9,750						
Do. desultory						10															"	1,500						
Snowshoe Creek	6	20	5	1	10	12	"	"		4		2			3	2	1		1		17 00	8,000						
Do. desultory						4															"	300						
Martin Creek	2	7	2			7				2					2						"	800						
Harvey Creek	4	14	4		3	11				4					3		1		1		17 40	4,000						
Pine Creek	2	4	1	1	2	2						2			1		1				"	500						
Spanish Creek	2	4	2		4							2						2			16 50	1,200						
North Fork, Quesnelle River	3	7	2	1	3	5	3 25	2 00	1		2				2			1			"	2,000						
Do. do. desultory						12															"	1,500						
South Fork, do.	3	5	2	1	100	50	3 00	1 75				3				3					"	7,250						
Do. do. desultory						12															"	1,750						
Quesnelle River, from Forks 40 miles down stream, desultory						20															"	4,000						
Horsefly River					40																"	15,000						
Fraser River (Quesnelle to Riskie Creek)	2	18	2			18					2					2					16 00	6,000						
Do. desultory						16															"	1,000			65,150		$192,350		
CASSIAR.																												
Laketon Division:																												
Dease Creek	10		9		4	23	5 00	3 50		4		6			10			3	1		15 50	8,000						
Thibert Creek	9		9		7	11	"	"		3	1	5			9			3	1		16 00	3,700						
Desultory mining																						600			12,300			
McDame Creek Division:																												
McDame Creek and tributaries	10		9	1	5	20	6 00	4 00	1	5		4			9			2	2		17 50	8,550						
Rosella Creek	1		1		1		"			1					1						"	200						
Desultory mining																						1,000			9,750			
Liard River Division:																												
Desultory mining																						350			350			
Stikine Division:																												
Desultory mining																						300			300			
KOOTENAY.																												
Eastern Division:																												
Wild Horse Creek	8	35	7	1	22	43	3 to 3.50	2 50		4	4				3	4	1			1	18 00	22,500						Includes $10,000 taken out by joint stock company.
Bull River	2			2	4					2					2													
Perry Creek	1		1		3							1			1							300						
Moyea River	2	7	1	1	8		3 50			1		1			2							1,800						
Weaver Creek	1	4		1	4					1							1		1									
Desultory mining																						300			24,900			
Western Division:																												
Northern Subdivision	15	58			58	1	3 50	2 00		9	6				5		6	2			18 00				14,410			*Value of ore shipments.*
Lardeau "	15	38			50		"			15					15						17 00				3,870			
Southern "	31	170	6	1	97	2	2.50 to 3		2	165	4				19	3	5	1	3		17 to 18				2,500			Argentiferous copper (Nelson) ..... $ 73,164
"O.K." Mineral Claim																									2,000			Silver and lead (Slocan) 605,534
"Poorman" "																									15,000			Gold, silver, and copper (Trail Creek) 106,267
																											62,680	
LILLOOET.																												
Cayoosh Creek, Bridge River, Bars and benches of Fraser River	14		13	2	30	50	3 00	1 50													15 to 16.50						39,267	Value ascertained from buyers
YALE.																												
Osoyoos Division:																												
Rock Creek	18	39	15	3	15	24	3 00	1 50	2	14		2			16			2			17 00	7,000						
Cedar Creek	3	15	3			15	"	"		3					3							1,500						
Cherry Creek	3	13	3		13		"			3					3							3,200						
Siwash Creek	2	9	2		9		"					2						2				1,400						
Mission Creek	2	9	2	1	9		"					2			2							1,200						
Desultory mining																						300						
Fairview (quartz)	1	90	1	10	16								1					1	1	1		13,000						Bullion from ore crushed by Strathyre Co.'s Mill.
Camp McKinney "	1	34	1	24	30	1	"	"					1					1	1			34,750						Bullion from ore crushed by Cariboo Mining Co.'s Mill.
Boundary Creek and vicinity (quartz)	2	160	2	154	46		"						2				2					2,800	.63	8,500	65,150	8,500		8,500	
Similkameen Division:																												
Similkameen	16	38	9	7	29	34	2 50	1 25	1	5	4		6		6	4	3	3	5		17 50	5,900						
Tulameen	2	8	2			8		1 50		2					2				2		"	230						
Granite Creek	6	12	2	4	17	2	"	"		1	3	2			2	1		3	1		17 75	2,700						
Whipsaw Creek	1	8	1		9		2 00			1					1						17 50	275						
Slate Creek	1	1		1	1					1					1							2,700						
Desultory mining					19	26																			11,805		76,955	
					824	786																					$393,942	$8,500

The approximate yield of Platinum for the season is estimated at $950

PROVINCE OF BRITISH COLUMBIA.

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TABLE

Showing the actually known and estimated yield of gold and silver; the number of miners employed; and their average earnings per man, per year, from 1858 to 1894.

Year.	Amount of gold actually known to have been exported by Banks.	Add one-third more estimate of gold carried away in private hands.	Gold. Total.	Estimated yield Silver.	Gold and Silver. Total.	Number of Miners employed.	Average yearly earnings per man.
1858 (6 months)	$ 390,265	$ 130,088	$ 520,353	.....	$ 520,353	3,000	$ 173
1859	1,211,304	403,768	1,615,072	.....	1,615,072	4,000	403
1860	1,671,410	557,137	2,228,547	.....	2,228,547	4,400	506
1861	1,999,589	666,530	2,666,119	.....	2,666,119	4,200	634
1862	3,184,700	1,061,566	4,246,266	.....	4,246,266	4,100	517
1863						4,400	482
1864	2,801,888	933,963	3,735,851	.....	3,735,851	4,400	849
1865	2,618,404	872,801	3,491,205	.....	3,491,205	4,294	813
1866	1,996,580	665,527	2,662,107	.....	2,662,107	2,982	893
1867	1,860,651	620,217	2,480,868	.....	2,480,868	3,044	814
1868	1,779,729	593,243	2,372,972	.....	2,372,972	2,390	992
1869	1,331,234	443,745	1,774,979	.....	1,774,979	2,369	749
1870	1,002,717	334,239	1,336,956	.....	1,336,956	2,348	569
1871	1,349,580	449,860	1,799,440	.....	1,799,440	2,450	734
1872	1,208,229	402,743	1,610,972	.....	1,610,972	2,400	671
1873	979,312	326,437	1,305,749	.....	1,305,749	2,300	567
1874	1,383,464	461,155	1,844,619	.....	1,844,619	2,868	643
1875	1,856,178	618,726	2,474,904	.....	2,474,904	2,024	1,222
1876	1,339,986	446,662	1,786,648	.....	1,786,648	2,282	783
1877	1,206,136	402,045	1,608,181	.....	1,608,181	1,960	820
1878	1,062,670	1-5th 212,534	1,275,204	.....	1,275,204	1,883	677
1879	1,075,049	,, 215,010	1,290,059	.....	1,290,059	2,124	607
1880	844,856	,, 168,971	1,013,827	.....	1,013,827	1,955	518
1881	872,281	,, 174,456	1,046,737	.....	1,046,737	1,898	551
1882	795,071	,, 159,014	954,085	.....	954,085	1,738	548
1883	661,877	,, 132,375	794,252	.....	794,252	1,965	404
1884	613,304	,, 122,661	735,965	.....	735,965	1,858	396
1885	594,782	,, 118,956	713,738	.....	713,738	2,902	246
1886	753,043	,, 150,609	903,652	.....	903,652	3,147	287
1887	578,924	,, 115,785	694,709	.....	694,709	2,342*	296
1888	513,943	,, 102,788	616,731	.....	616,731	2,007	307
1889	490,769	,, 98,154	588,923	$ 47,873	636,796	1,929	330
1890	412,029	,, 82,406	494,435	73,984	568,419	1,342†	423
1891	358,176	,, 71,635	429,811	.....	429,811	1,199	358
1892	332,938	,, 66,588	399,526	.....	399,526	1,340	298
1893	316,279	,, 63,256	379,535	.....	379,535	1,247	304
‡ 1894	380,055	,, 76,011	456,066	8,500	464,566	1,610	283
					$54,479,420		

* This is exclusive of over 650 white men who, during the season of 1887, were working on or prospecting for mineral claims.
† This is exclusive of over 300 whites employed working on or prospecting for mineral claims.
‡ Value of gold, silver, copper and lead ore shipped from Nelson during year, $784,965, not included.

REPORTS.

CARIBOO.

MR. BOWRON'S REPORT.

RICHFIELD, 17th November, 1894.

SIR,—In submitting my twentieth annual report upon the mining industry, I have the honour to state that it is a source of extreme satisfaction to me to be able to announce the commencement of actual work upon many of the proposed undertakings referred to in previous reports.

With all her hidden wealth in minerals, the fact remains that the mining portion of the district, at least, has for the past twenty years been gradually diminishing in population. This would now appear to be changed, and it is to be hoped that the tide has turned. The opening of spring of the present year brought many new faces into our midst, and although there was no rush, and a few of the new-comers could well be dispensed with, yet the principal portion were men of the right stamp, who have come to develop our resources, and will doubtless leave their impress for good upon the district. Very many of those who have visited the mines this year represent capital in England, the United States, or Eastern Canada, and there are few, if indeed any, who have gone away dissatisfied with their investigations, and it is in the fact of such men becoming interested in our mines, either by purchase or location, that we feel warranted in assuming that a revival of the early days of the district is at hand.

The unusually late spring and subsequent unparalleled freshet, consequent upon the heavy snow-fall of last winter, much retarded mining operations in the early part of the season, and hydraulic piping did not commence until long after the usual time. So rapidly did the snow disappear when warm weather set in, that many of the hydraulic claims, which depend upon this source of water supply, had an unusually short season. This fact, taken in conjunction with the knowledge that a very large portion of the miners have been engaged by outside capital in exploiting new ground, will account for the limited gold output of the season.

The facilities offered for hydraulic mining have been the chief attraction to outside capital, although other branches of the mining industry, viz., deep diggings, dredging, and quartz mining, have all received more than ordinary attention. I shall therefore endeavour to touch briefly on each branch separately.

Hydraulic Mining.

Upwards of sixty applications, aside from those held by the ordinary record, have been made during the season for ground for hydraulic mining in various parts of the district, upon some of which very large expenditures are being made.

The success attending the short runs made by the Horsefly Mining Company, of Horsefly, and the Cariboo Hydraulic Mining Company, of Quesnelle Forks, has excited much interest in those parts of the district. These two companies, although not yet fairly equipped for working, will no doubt produce more gold next season than the whole output of the district for the present year.

On the North and South Forks of the Quesnelle River, and below the Forks for twenty miles, a large number of claims have been located, and in most instances work of development is being prosecuted with vigour.

On the lower part of the Quesnelle River, Messrs. (Dr.) Reynolds, McLaren, Fry & Co. (The Quesnelle River Hydraulic Mining Co., Limited), who obtained a lease of ground last season, brought in pipes and monitor during the winter, constructed ditches, dams, and got their pipes laid, but not in time to take advantage of the water supply. However, they managed to secure a few hours' run, which gave satisfactory returns.

Mr. H. Carey, of Toronto, representing eastern capital, has been making a thorough examination of the district from its lower boundary as far north as Fort George, on the Fraser, and has recently applied, on behalf of his principals, for four leases for hydraulic workings, about six miles south of the latter point.

A party of miners have been prospecting the most of the season on what is known as Big Valley Creek, and as applications are being made for eight or ten leases on this creek for hydraulic purposes, they are presumed to have found something good.

Mr. W. MacIntosh, of Montreal, who recently visited Cariboo in the interest of eastern capitalists, has become interested in some promising hydraulic claims on the Cottonwood and Quesnelle Rivers, as well as some other valuable mining properties. Mr. MacIntosh intends returning in the spring to proceed with their development.

There are two conditions to be noted which greatly militate against the successful working of our hydraulic mines in a great portion of the district. I refer, first, to those places where the gold is found near the source of the creek, upon which, owing to the great elevation of such ground, it is often difficult, if not impossible, to obtain a water supply with the requisite pressure; and, secondly, on the higher altitudes, the working season is rendered extremely short by the length and severity of the winters.

With a view of overcoming the first difficulty, parties are now in the field testing a new method of working, by which, it is claimed, large quantities of gravel and débris may be disposed of, and the gold secured with a very limited supply of water, by using such supply as is obtainable an infinite number of times.

Deep or Drifting Diggings.

In previous reports I have referred to the advantages possessed by Willow River as a field for the investment of capital, and in my last year's report I mentioned the fact of Mr. C. F. Law having acquired a lease of one mile of the valley of that stream. Mr. F. C. Laird, of Chicago, having been induced to associate himself with Mr. Law in the undertaking, the work of development was proceeded with. An elliptical drill or boring machine was placed on the ground, and four holes, varying from three to six inches in diameter, were sunk across the valley of the creek, finally locating what is believed to be the deep channel, at a depth of 102 feet from the surface. In the last hole sunk, fine particles of gold were forced up through the 3-inch drill with the water and borings from below, and washed up from the small sluice-box into which the waste-pipe discharged. The gold, which amounted to about fifty cents, was obtained from the last four feet sunk before bed-rock was reached. This is certainly a magnificent showing. The foreman assures me there can be no mistake in this statement, as the sluice was washed up every ten feet as they went down. Mr. Laird, who had arrived with his family about the time the last hole was bottomed, decided to sink at once a working shaft 4 x 12 feet. The old Vulcan 30 horse-power boiler, and the necessary pumps, were placed on the ground, substantial buildings erected, and about fifteen or twenty men are engaged in the work of sinking.

Upon the favourable prospects obtained in this mine, all the ground above and for six or seven miles below was located and leases applied for. Should, therefore, the sinking of the working shaft on Mr. Laird's claim confirm the existence of gold in quantities equal to that obtained from the small 3-inch bore, the importance to the district of this discovery can well be imagined, as work in these deep drifting claims may be prosecuted the entire year.

The Slough Creek Mining Company, which, as before reported, had reached a depth of 246 feet with their boring machine, and had let a contract for the sinking of a working shaft, were driven out by water and had to order pumps of greater capacity, which will be put on during the coming winter. All the ground above and below this claim on Slough Creek has been taken up.

I regret to say that the Whittier Concessions Syndicate, of London, have not yet started actual operations on their ground on Williams Creek, having been somewhat hampered in their negotiations to secure certain properties adjoining their concession, which they deemed important to possess before starting operations on the scale of magnitude they purpose doing. I am, however, just in receipt of information that all arrangements are now completed, and that the manager will be on the ground to commence operations before the first of the year.

The Bonanza claim, on Lower Lightning Creek, having repaired their dam, which was washed away in the spring, are again pumping out their diggings.

Of the old Well-known Claims

Which have been worked for years with more or less success, there is little to be said.

The Forest Rose claim, on Williams Creek, continues to pay fairly well.

The claims on Mosquito Creek have paid about as usual, considering the time worked.

Shepherd's claim, on Shepherd Creek, paid well while the water supply lasted.

Mr. Shaw's drifting claim, on Hardscrabble Creek, gave good returns while working, but the freshet in the spring caused them much loss of time.

The Waverley Hydraulic Company, on Grouse Creek, failed to reach bed-rock in the face, and were consequently again disappointed in the yield of the precious metal.

In the claims owned by Chinese I find the same falling off in the gold yield, and as the slight decrease in the output is so general, the cause may be safely attributed to the short time claims were enabled to work, rather than to any want of or decrease in the value of the pay gravel worked.

It is gratifying to note that the revenue receipts for the first nine months of 1894 have exceeded those of 1893 by about $3,000. The most of this excess is due to mining receipts general and to the issue of free miners' certificates, the former exceeding the receipts for the same period of 1893 by about $1,500, and the latter by about $1,000.

I estimate the total gold product of the year as follows:—

Barkerville Polling Division, 1st January to 15th November.....	$ 66,300
Lightning Creek " " "	34,700
Quesnellemouth " " "	26,200
Keithley Creek and Quesnelle Forks, " "	65,150
Estimated product from 15th November to 31st December (say)	10,000
	$202,350

Dredging.

In my report for 1893 I referred to the adaptability of our large rivers for dredging purposes, by machines similar to those now in use in New Zealand, little thinking that within a year this method of recovering the gold in our river beds would be attracting so much attention in British Columbia. Shortly after writing that report, I was furnished by Mr. Cox, M. E., of London, with copious extracts from the New Zealand Gold Fields Report for 1892, on river dredging, the perusal of which more than confirms my expressed opinion on the matter.

In view of the attention that this method of gold mining is attracting, I reproduce in full an article on dredging in Otago contributed by Mr. T. A. Rickards to the "Mining and Engineering Journal." This article appeared in the New Zealand Gold Fields Report for 1893, and will be read with much interest and profit by those about to engage in this branch of industry:—

RIVER-DREDGING IN OTAGO.

(By T. A. Rickards.)

The first gold seekers who prospected the sands of the Shotover and Molyneux Rivers restricted their search to the easily accessible deposits which had accumulated under the shelter of rocky bars; and when the auriferous sands were found to extend under the waters of the river, they turned the stream by means of wing-dams. The rich alluvium was found, however, in places where this mode of operation was found impracticable or too costly; and in such places, standing shovel in hand, they snatched with difficulty the golden sand, which increased in richness the less accessible it became. The simple shovel was useless in a fast current; hence the next step was to contrive a ladle or spoon with which to scoop up the river bed. A piece of hide fastened to an iron rim was arranged behind the modified blade of a shovel, and this at the end of a long pole helped to increase still further the area available for work. Soon, however, the distance from the shore, and with it the increasing depth of water, prevented further advance. A barge or punt was then built; the whole was lengthened to 20 feet or more; the scoop was enlarged so as to hold a barrowful; and the increased weight requiring other than mere hand labour, a winch and tackle were rigged up. This now became the "spoon-dredge," the forerunner of the numerous types of bucket-dredges which have started a new branch of the mining industry of New Zealand.

The spoon-dredge served its purpose, but the numerous mines along the banks of the river had begun to send down tailings, which soon covered the bottom with a rapidly increasing thickness of valueless material. The spoon-dredge was not capable of coping with this fresh difficulty, but the rapidly flowing river suggested the greater power now needed to replace human muscle. A water-wheel took the place of the winch, and the "current-wheel dredge" was invented. This consisted of a simple bucket-dredge, worked by an undershot-wheel, placed

at the side of the punt. The power needed to propel the machine severely restricted its usefulness, for it could not be employed in the back-waters, or indeed, anywhere but in the full force of the river current, and the richest part of the channel had therefore to be left untouched. Steam was substituted for water-power, and the bucket and ladder type of dredge was advanced a stage further by the addition of revolving screens; winches for mooring, and pumps for raising the water were also required to separate the fine gold-bearing silt from the coarse gravel. This brings us down to to-day, when the river sands and the sea-beaches of the South Island are worked by a force of over fifty dredges, propelled by water, steam, and electricity.

When I was at Dunedin, in 1890, it was difficult to find a man who had not located some acres of land on river bank or sea-shore. Dredging properties were plentiful as "leaves in Vallambrosa," and the "potentialities of acquiring wealth beyond the dreams of avarice" were offered on every hand. Returning in March, 1891, I found that the number of dredges at work had largely increased, with a corresponding diminution in the dredging fever. The results had been disappointing.

The success of the Dunedin dredge was the main cause of the dredging fever. Directed by a man of great experience in this branch of engineering, and put to work in a part of the River Clutha which soon proved very rich, this dredge returned in ten months two-thirds of the paid-up capital of the company which owned it. One of the Shotover dredges had also been fairly successful, while on the sea-beach the Waipapa dredge, exploiting the tatiniferous gold-bearing sand, had made, under many difficulties, very encouraging returns. It was at once found that the extent of ground available for this mode of working was almost unlimited; the river channels and the sea-coast were soon covered with locations; claims were taken up and floated into companies, the vendor receiving, for ground which had cost him but a few shillings, a large sleeping interest in a concern to the working capital of which he contributed nothing. Large areas were assumed to be valuable, on account of reported rich yields obtained by the diggers from spots representing a very small proportion only of the total field to be worked. No tests—or only unsystematic tests—were made. It was overlooked that the rapid rise of the river would prevent work during many months in the year. Moreover, in this form of mining, experience so far accumulated had been but small, and the saving of the gold was often attempted under conditions which were hopeless. Gradually the enterprising investor awoke to the stern fact that, like all other branches of mining, dredging required judgment, care, and experience.

The pontoon in this case has a length of 80 feet, a width of 18¼ feet, and a depth of 4½ feet. The ladder is constructed to work to a depth of 20 feet below the surface of the water. The power to propel the machinery is derived from the river, and is transmitted as electricity.

The Dunedin dredge is working the bottom of the Clutha at a point about three miles above the town of Roxburgh. The deposit covering the rocky bed of the river consists here of 20 feet to 25 feet of barren drift, overlying a thickness of 2 feet to 2½ feet of gold-bearing wash. Sometimes the "pay" thins to 6 inches. The overburden of drift consists of small-sized gravel, but the pay-wash is composed of large boulders, among the interstices of which occurs the gold. Black-sand is found in both drift and pay-wash, that of the drift originating, together with the bulk of the material in which it occurs, from the mines along the river. The gold is similar to that obtained elsewhere along the Clutha, consisting of fine, flat flakes in a black iron-sand. Gold is not seen in the quartz of the pebbles.

This dredge has a double ladder of buckets giving 2 cubic feet each, twelve emptying per minute on each side, giving the machine a capacity of 106 cubic yards per hour. There are thirty-one buckets on each side, the material from which passes through the two perforated iron cylinders, the larger pebbles being ejected along an iron shoot, which returns them to the river, while the fine gravel passes over a table 8 feet long by 7½ feet wide. The grade is 2 inches per foot, and cocoanut matting is used to arrest the gold. This table, and the similar one on the other side, discharges upon a middle table, 8 feet long by 4 feet wide, which is provided with iron-bar riffles. From here the gravel falls into the river. The above comprises the whole apparatus employed in the saving of the gold. The cocoanut matting is washed at regular intervals in a tank, the gold being subsequently separated from the black-sand by panning.

The motive power for the machinery is derived from steam, the fuel used being the lignite which occurs at Coal Creek, three miles up the river. The price is 8s. per ton, delivered at the bank, whence it is ferried by boat. The daily consumption is three tons. Electric light enables work to be uninterrupted.

The dredge had just re-started at the time of my visit, after a stoppage due to the rise in the river, which was even then flowing nine knots per hour. During flood-time the rate of flow reached twelve knots, while the average is seven knots per hour. The working expenses are £250 per month. This includes the wages (£160) of nine men and a dredge-master. The coal bill is £30. The balance of the £250 is taken up by repairs and supplies. The average of steady work is only four days per week of six working days. This does not allow for the interruption, often for weeks, due to floods. From December, 1889, to October, 1890, dividends amounting to £4,080 were paid on a nominal capital of £7,200, and a paid-up capital of £6,240. After October work ceased on account of the spring floods until the first week in December. The directors' report for the six months ending the 2nd of July, 1890, states that the gold obtained amounted to 884oz. 5dwt. 8gr.—value, £3,316—out of which £1,680 was returned in dividends.

The Dunedin dredge is working the auriferous gravel lying upon the rock-bed of the swift-flowing Clutha; but the Waipori dredge, which we will next consider, is placed under much more favourable conditions. The Waipori River is a small stream, running through a flat valley surrounded by rolling foot-hills. A wide deposit lies in the hollow of the valley, and above it flows the present stream. The gold obtained does not lie upon the bed-rock of the original channel, which is much deeper, but at a horizon marked by a course sand—the "false bottom" of the miners.

The dredge is of the bucket-and-ladder type. The stream is of insufficient depth to float it, but the dredge makes its own waterway by the removal of the gravel. The capacity is 7,600 cubic yards per week of 125 to 130 working hours. The movement of the pontoon is directed by four winches operating wire ropes fastened to the shore. The engine is of forty-horse power, supplying the power necessary to work the buckets themselves, as well as the pump which gives the water necessary for the tables. The contents of each bucket as it comes up are emptied into a revolving sizing-cylinder, constructed of horizontal iron bars. The fine silt goes straight to the tables, while the coarse passes to another sizing-cylinder (this time of perforated boiler-plate), which separates the coarse gravel and boulders. These fall into the stream from an iron shoot, while the fine goes to the tables, which are arranged on either side, and are covered with coarse cocoanut matting, with linen underneath.

The following figures will indicate the cost of operations during the period of a year:—

Repairs and alterations, £222 9s. 1d. This was chiefly in pins and bushes. The wear and tear is mostly about the buckets. The lips last for two years, and the pins on which the buckets are hinged have an average life of three months.

Wages, £1,192 16s. 4d. This includes the pay of eight men and three boys per day; one engineer, one winchman, and one boy to attend to the tables on each shift, making six men and three boys per twenty-four hours. Then there are to be added the dredge-master and a blacksmith.

Material, £272 9s. 5d. This includes the shed on the shore, which serves as an office, forge, and tool-house.

Coal, £507 12s. Firewood, £377 6s. The wood (manuka) costs £1 15s. per cord. Coal (from Westport) costs 55s. per ton, delivered.

Rent, £293. This is the amount (at 10s. per acre) paid to the Government as rent for the claim. During the year the first two months were taken up by the erection of the plant, and in the remaining ten the gold obtained amounted in value to £3,095 8s. 6d. The cost of the dredge, including fees to the engineer, was £3,380 14s. 3d. The weekly cost upon the ground is £30 for labour, £20 for fuel, or (including repairs) about £65 in all.

Three typical weekly records are as follows:—

First week—Yield, 21oz. 16dwt.; time of actual work, 140 hours; ground lifted, 8,400 yards; depth of lift, 10 feet; firewood, 10 cords.

Second week—Yield, 33oz. 13dwt. 18gr.; time, 126 hours; ground lifted, 8,400 yards; depth, above 13 feet; firewood 10, cords.

Third week—Yield, 29oz. 12dwt.; time, 126 hours; ground lifted, 7,560 yards; depth, about 13 feet; firewood, 10½ cords.

Up to that time the dredge had handled very little virgin ground, the material consisting chiefly of the tailings carried down from old sluicing claims. Since then it has reached solid ground, and the results, with the same expense, have reached 50oz. per week.

This dredge is working under conditions admirably suited to its capabilities. The working cost is slight, the amount of capital tied up is very small, the area of the claim is

large, and the danger of floods *nil*. The depth at which it is working varies from 10 feet to 15 feet. The "false bottom" of compact coarse sand enables the buckets to get well under the pay-wash, and avoids a great deal of the wear and tear incident to working upon a rocky bed.

The material treated, while it is very similar to that of the mines on the Clutha, yet contains gold more shotty than that of the big river claims. The gold of the Waipori flats came in large measure from the erosion of the neighbouring quartz lodes—the O. P. Q. and other reefs. While on the dredge I was shown a round white quartz pebble, taken that morning from one of the buckets, which was the size of a hand, and showed several splashes of gold as large as a small finger-nail. Such a find, very unusual in the alluvial mines of Otago, marks the somewhat exceptional conditions under which this deposit was probably formed.

Gold-saving.

The methods used are of the crudest kind. There is no doubt that the river receives back more than half of the gold contained in the material raised by the dredge. The tables at Waipori are somewhat larger than those of the Dunedin dredge; but in both cases it appears the height of absurdity to think that they can save a large percentage of the fine, flakey gold carried along in such a large flow of water, and amid so great a volume of sand and gravel. The report of the directors of the Dunedin Dredge Company says that "the dredge-master reports that the gold-saving appliances are all that could be desired." This is the severest satire upon the childish efforts made to save the gold, fully 60 per cent. of which must be a mere passenger through the apparatus designed to arrest it. Over a hundred cubic yards of gravel, together with the water employed to transport it, are in this case handled by the dredge every hour, and of this a very large proportion passes over the surface of two tables covered with cocoanut matting, whose dimensions are 8 feet by 7½ feet. There is no opportunity whatever given for a separation of the gold from the mass of heavy black iron-sand and the sediment in which it is enveloped. The surface over which it passes is far too small, and the distance over which it travels is altogether too short to enable it to be arrested by the simple means adopted. What is collected is in spite, rather than by reason, of the efforts made to catch it, and represents a small proportion only of the gold in the material, the larger part being lifted from the river only to be returned.

The Use of Mercury.

The use of mercury is not familiar to the alluvial miner of Otago, as it is to his brethren elsewhere. There exists a curious idea that it will not act in cold weather, due no doubt to the fact that the cleaning-up in the mills and mines is invariably done with hot water. Of course there is a substratum of truth in this idea, since amalgamation is as a rule* retarded by cold and assisted by heat, but within narrow limits only, and not to such an extent as to make the fact of any great practical importance. It certainly will not explain why the Otago digger has "left in the cold" one of the best friends of mining all the world over. From an examination of the conditions under which the gold of the alluvium of Otago occurs, particularly in the deposits of the Clutha and its tributaries, I am strongly of the opinion that the use of mercury will have to be resorted to if any large percentage of the precious metal is to be extracted.

In the case of the elevator plant, the example of California can be followed, and mercury placed in the riffles of the sluice-boxes themselves. Then it requires but an extension of the idea of side-runs, preceded by undercurrents, to permit the further use of quicksilver in wells or traps. With the dredges, one of the first alterations of existing methods which is demanded is the enlargement of the area over which the material passes. Dredges are now constructed at Dunedin to handle over 150 tons per hour. This requires a very large surface to effect even the roughest separation of the fine gold-bearing silt from the large mass of non-auriferous wash. The Wellman dredge at Waipapa,† which is supplied with tables 24 feet by

*In the mountains of Colorado, at an altitude of 8,500 feet, the amalgamation at the stamp-mills meets with no obstacle in winter. On the contrary, it is curious to note that the mill-men of Gilpin County unite in asserting that the cold weather is beneficial to amalgamation, for the reason that the warmth thins the mercury and causes it (with the vibration due to the falling stamps) to run off the plates.

†This dredge was idle during the time of my stay in Otago, owing to a change which was being made in its construction. An interesting description appeared in the records of the Mining Conference held at Dunedin in 1890, written by Mr. James Allen, a member of this Institute. This dredge is working the sea-beach, those portions where the titaniferous gold-bearing sand has been concentrated by the action of the prevailing winds.

30 feet, having an incline of ¾-inch per foot, is designed on common-sense principles, and supplies an example to other dredges of Otago. But even the dispersion of the material over such an enlarged surface will not suffice to collect the finer particles of gold. Mechanical means must be assisted by chemical; gravitation must be followed by amalgamation.

The fineness of the gold in the New Zealand alluvium may be imagined when it is stated that by actual count it requires six to seven thousand particles of the gold as found on the West Coast (best known by the Hokitika discoveries) to form a grain in weight. It will be said that, as a matter of practice, it has been noted that very little gold finds its way beyond the first strips of matting, and that, on washing, the bottom strips are seen to collect scarcely any. The following experiments were made at Waipapa:—First experiment—The bottom cloths—those 16 feet to 18 feet from the head—were washed separately from the remainder, with the result:—Amalgam for eight days—top cloths, 89oz. 16dwt.; bottom cloths, 4dwt. 5gr. Second experiment—The second row of cloths from the bottom, that is from 14 feet to 16 feet, were separately washed. The amalgam from the top cloths was 89oz.; the cloths from 14 feet to 16 feet yielded 8dwt.

It is necessary to add here that the produce becomes amalgam only in cleaning up, mercury being used simply in collecting the residues from the washing of the plush—which last does the direct gold-saving.

This is after the fashion of the mill-man who carefully assays his tailings, but fails to note how much gold he is losing in the slimes which are carried down stream to cheer the hearts of a tribe of Mongolians. The evidence obtained by such tests is an *ignis fatuus* to the miner, deluding him into blissful ignorance of his losses. The fact is that in such cases the gold lost is in an entirely different condition from that saved, and methods which served to arrest the latter are entirely insufficient to hold the former.

The character of the gold is in no way prejudical to amalgamation. In both river-banks and sea-beaches, it is bright, of high caratage, and not "rusty," or mixed with minerals inimical to mercury. On the other hand, its fine flakey character makes it particularly hard to arrest by purely mechanical methods. The thin plates of gold, especially when the edges are turned, as must often happen during the treatment the gravel undergoes, are especially adapted to be transported by water.

The material used for the gold-saving is cocoanut matting, which within certain limits answers admirably. Owing to its porous character, it is usually supplemented by linen placed along the wood-work of the tables or sluice boxes. Some of the dredges employ plush. The choice is largely a matter of expense. At the Island Block it was found that the plush used in the side-runs caught too much of the black iron-sand and got quickly choked. At Waipapa, with a very large proportion of fine black sand, it answered well. The difference of experence is due probably to the quantity of water used, and the gradient over which the material passed.

The dredge has added largely to the area available for mining operations. In this branch of mining, Otago is opening up a new and important field. The practical result of the experience so far obtained proves that the bucket-dredge, though admirably simple and inexpensive, is best suited to the raising of auriferous alluvium lying upon a "false bottom." Upon a true bed-rock the wear is much increased, and the effectiveness much diminished. Everyone knows how difficult it is to scoop fine gold mixed with gravel *under water* by the aid of a shovel. It runs off. The bucket of the dredge is a modified shovel. For irregular bottoms the suction-pump dredge, of which the Wellman is a good example, will be found best adapted. In this case a powerful centrifugal pump draws up the water, gravel, and gold, delivering them to the level of the tables. At Waipapa, stones 35 lb. to 40 lb. in weight have been sent up by the pump; and it only required an improvement in construction, giving durability and strength, to render it a most effective machine for this class of work. A dredge thus provided is able to sweep the bottom clean. After that, the extraction of gold becomes the great question; and in this direction, as we have seen, there is a wide margin for improvement.

Time, however, will remedy these defects, and the Otago miner may meanwhile point with pride to the fact that he has shown the possibility of working the sands of the sea-shore at a profit, when they contain but two grains of gold per ton.

This concludes my notes upon a mining field but little known on this side of the equator. The chief lesson it conveys is, that we should seek to profit by the experience of others. Otago has much to learn from California in lode-mining and quartz-milling; but California would do well to study the steps of Otago in hydraulic elevating and dredging. The miner should be

the least conservative of men; his motto should be "pass it on;" the same difficulties should never require to be overcome twice; and thus should be avoided that worst of all wastes, the waste of experience.—*Mining and Engineering Journal.*

Quartz.

You will be pleased to learn that our quartz mining interests are also again attracting considerable attention, with apparently some tangible results.

Mr. S. J. Marsh, a practical assayer and experienced quartz miner of Colorado, Idaho, and Washington, having spent some time in looking over the district examining the old workings, applied to me for the use of the Reduction Works to make a milling test of ores from various parts of the district, which confirmed the results obtained from assays previously made by him, and Mr. Marsh is now negotiating for the use of the Island Mountain Mill to further prosecute the working of our ores.

Appended hereto is a report made by Mr. Marsh at my request, which deals fully with his experience, and embodies his opinion on the quartz of Cariboo District.

I have the honour to be,
Sir,
Your obedient servant,
JNO. BOWRON,
Gold Commissioner.

To the Honourable
The Minister of Mines.

MR. STEPHENSON'S REPORT.

GOVERNMENT OFFICE, QUESNELLE FORKS, B. C.,
November 3rd, 1894.

The Honourable
The Minister of Mines.

SIR,—In going over memorandum obtained for mining statistics, I find some improvement on last season as to the amount of gold taken out in this section of the Cariboo District for 1894.

The mining season could hardly be called a very favourable one, for although we had a good snowfall last winter, the unusually warm weather early in the season melted the snow in a very short period, causing serious freshets in this as well as in other sections of the country, and made water light later on, which, in a measure, was a drawback to mining operations.

On Keithley, Snowshoe, Harvey, and other creeks in that vicinity, there is so little change from last season (1893) that there is really nothing to report concerning them. On the North Fork of Quesnelle River considerable ground is covered by mining leases, upon which no work has been done the past season, owing to the claims having been laid over. From Quesnelle Forks down the main Quesnelle River considerable work has been done during the year in prospecting and getting ready to carry on operations on leased ground, and, so far as I have learned, very satisfactory prospects have been obtained upon nearly every location. There is no doubt but that a good deal of development work will be done during the coming season upon those claims along the Quesnelle River, and it is altogether likely more locations will be made in that section.

On the South Fork of Quesnelle River, the few small companies have done about an average season's work, while the Cariboo Hydraulic Mining Company have carried on work on a scale heretofore unknown in Cariboo. From early in the spring there was a strong force employed until a short time ago, and then, owing to frost and bad weather, the work was suspended for the season. Unfortunately, when the first piece of ditch was completed by which the Company could turn water into their pipes, the water supply was very light, and they had only a few days' piping, but the result of those few days fully satisfied their expectations. Now, the work on the ditch is so well advanced, and the other preliminary work being completed, they are all ready for piping just as soon as the season opens next spring.

Upon the Horsefly River, the Horsefly Hydraulic mining Company have done a large amount of work during the season, employing a large force of men, and now their mine is in perfect working order and promises satisfactory results, judging from what piping has been

done. The Horsefly Hydraulic Mining Company of Horsefly and the Cariboo Hydraulic Mining Company of South Fork of Quesnelle River are both under the management of Mr. J. B. Hobson, and are practically owned by the same company, and although the outlay in purchasing both these mines, bringing water to them, and the large plant used, has been very heavy, still there is no doubt but that they will prove splendid paying properties. Upon the Harper lease, on the Horsefly River, no attempt has been made this season to work the ground by the present lessee. Individual miners located and began to work on part of the ground, but were stopped by an injunction being served upon them. Some prospecting has been done up towards the head waters of the Horsefly, but without any definite results.

I have the honour to forward herewith the estimated yield of gold for the Keithley and Williams Lake Polling Divisions of Cariboo District for 1894, which, though a trifle better than that of 1893, will appear small from what may be justly expected in succeeding years.

I have the honour to be,
Sir,
Your very obedient servant,
W. STEPHENSON,
Government Agent.

MR. MARSH'S REPORT.

BARKERVILLE, 31st October, 1894.

John Bowron, Esq.,
Gold Commissioner, Cariboo.

DEAR SIR,—In answer to your request for a statement of the result of my investigation of the quartz resources of your district during the past summer, I beg respectfully to submit the following:—

Having come here somewhat prejudiced against the quartz of the district, from hearing of so many failures being made here, I at once started to satisfy myself, if possible, of the cause, not only of these failures, but (if the quartz was barren, as claimed) what was the probable source of the great deposits of placer gold that have been and are being worked out here.

Having obtained your kind permission to use the Government Assay Office, I visited the old quartz workings, finding large, and in some instances well defined, bodies of ore, consisting mostly of quartz generally well filled with pyrites or sulphuret of iron.

I carefully sampled some twenty of these veins, taking, in every instance, cross-sections from wall to wall, which I assayed with results varying from $4 to $77 per ton of 2,000 lbs., and an average of over $18 per ton.

Wishing to prove that the value did not lie in pockets or bunches, I took from each of two tunnels of one vein three tons of ore, which I worked at the Government Test Works with the following results:—

The ore was first milled with the stamp, and run over copper plates, which gave a return of $4.60 in free gold per ton. The tailings were concentrated and worked by the chlorination process, which gave $14.59 per ton of crude ore, or a total of $19.19 per ton. The sample from the concentrator showed the total value of the ore to be $26.14 per ton. A loss of $6.95 per ton was therefore incurred in working, due to the bad condition of the roasting furnaces, which had not been used for several years. A perfect roast, therefore, could not be obtained.

Another lot of 2¾ tons from another part of the district yielded $14 per ton in free gold, and $12.90 per ton in sulphurets by the chlorination process. The loss in this case was about $3.50 per ton, making a total value of $30.50 per ton of ore. The first lot was taken from veins 3½ and 4 feet wide, respectively, and the second from an 18-inch vein.

I have since taken some thirty or more samples from different places, which show the assay value of the surface ore to average about $16.50 per ton, about 20% of which is free gold. I have found some silver, but, so far, nothing of importance.

I would state here that the gold ores of this locality can be milled and chlorinated, on a basis of 25 tons per day, and five to one concentration, for $4.90 per ton, exclusive of mining.

A glimpse of the geological structure of the country shows the general country rock to be metamorphic slate, banded with occasional layers of limestone, striking north-easterly, and dipping towards the west at various angles from 80 to 28 degrees.

The veins, in some instances, are regular and well-defined; in others they consist of shutes of ore from a main axis, in some cases forming bodies of ore one hundred or more feet long, and from eight to twenty feet wide. Sometimes these shutes depart from the axis with the strike of the country rock. In all such cases they are very irregular, but often form pockets very rich in free gold. No accurate estimate of "ore in sight" can be made, on account of the manner in which development work has been done, but, to say the least, there is every probability of a continuance of as good ore as shows at the surface.

Now, in regard to the source of the wonderful deposits of placer gold that have in the past made Cariboo so well known the world over, I respectfully submit the following:—

In the early part of my researches here, I was forcibly struck with the total lack of "foreign" rock in the "wash" or drift gravel brought to the surface in the deep diggings and along the beds of the creeks, and later, through curiosity, I made a careful survey of the whole country, following the creek beds and examining hundreds of pieces of rock, which, in every instance except one (Grouse Creek), I could carry to the mountains through which the creek cut and place them beside "rock in place" so exactly the same that it left no chance for a doubt. At least, then, the wash or drift of the creek beds was formed from the surrounding mountains.

I next made a careful examination of the gold itself, and found that not only does each creek have its characteristic gold, but in some creeks there are two or more kinds of gold so distinct as to vary from $12 to $18 per ounce.

I went still further: I took a sample of gold from Lowhee Creek, and a sample of its quartz in place carrying free gold, the analysis of which exactly coincided.

I found a piece of quartz with gold in it in the bed of the creek. This gold was identical with the other gold of the creek.

I took a piece of quartz carrying gold from the head of the creek. The crystals and constituents of the two samples of quartz, as well as the constituents of the two samples of gold and the other gold of the creek, exactly coincided.

There are many instances of this kind; in fact, they occur on nearly every creek.

Now, sir, in view of these facts, I deem it safe to conclude that Cariboo has, through nature's process, derived all her millions from the quartz in the immediate vicinity.

I beg to remain,
Sir,
Yours very truly,
S. J. MARSH.

CASSIAR.

MR. PORTER'S REPORT.

LAKETON, CASSIAR, B. C., 8th October, 1894.

SIR,—I have the honour to forward herewith the annual mining statistics for this district, from which you will observe that the yield of gold remains about the same as last season. The mining operations carried on during the season have chiefly been confined to the old creeks, no new discoveries having been recorded.

I am sorry to say that the bright hopes entertained at this time last season, over the supposed richness of the quartz ledges that had been located on Quartz Creek during the summer, have so far vanished, for the assay returns of the ore sent out proved the ledges to be of no value, or at least not sufficiently rich to pay for working in such a remote locality; and, as a result, all the claims have been abandoned.

Some prospecting parties have been out during the past season in various directions. One of them crossed over early in the spring to the head-waters of the Iskoot River, and worked on a bar of a small stream flowing into the main river, and took out some $30 of fine gold. They informed me that the bar was not extensive, so they worked it out in a short time, and then prospected for more, but were not successful in finding anything that would pay them.

Another party crossed over from Dease Lake to one of the west branches of Turnagain or Black River, and they report finding some creeks in that section that they think would

pay, but owing to their scanty supply of provisions giving out, they were obliged to return before thoroughly satisfying themselves. They say that the place is about fifty miles from Laketon, in a south-easterly direction, and that it has all the appearance of being a gold-bearing section of country.

Messrs. H. Thibert and Capt. Thompson left this place early in the summer in a boat, and proceeded to the Liard River, and then ascended that stream almost to its source; but owing to the advanced state of the season when they reached there, they were obliged to turn back without doing any prospecting worth mentioning. They report that the country is low on either side of the Liard for a long distance above Sayyea Creek, but up near the head of the river it becomes mountainous, and they think that it would be a good section of country to prospect in.

Two men left Telegraph Creek about the middle of the summer, intending to go and prospect some of the upper branches of the main Stickeen, but as they had not returned on latest advices received from Telegraph Creek, I am not, of course, able to say anything at present concerning the result of their trip.

There is certainly a very extensive field here for prospecting in, and there is no doubt that good diggings exist, if only they could be found. A large area of this country has been run over by prospectors, but I am confident that there has not been sufficient attention paid to the many creeks met with in all directions. Of course, there are scores of creeks again in this remote portion of the Province that have not yet even been seen by the prospector.

The past season has been about an average one. A few sprinkles of snow have fallen during the last week or two, but they quickly melted away, and at the present time the ground is quite bare. We have had no severe frosts yet, the coldest being twenty-two degrees below the freezing point, and that on one occasion only. It has all the appearance at the present time of being a mild fall.

The following is an approximate estimate of the gold yield of the district for the year:—

Dease Creek	$ 8,300
Thibert Creek	4,000
McDame Creek	9,550
Rosella Creek	200
Liard River Division	350
Stickeen River Division	300
Total	$22,700

I have the honour to be,
Sir,
Your obedient servant,
JAMES PORTER,
G. C., Cassiar.

The Hon. the Minister of Mines,
Victoria, B. C.

WEST KOOTENAY.

MR. FITZSTUBBS' REPORT.

NELSON, B. C., 27th November, 1894.

SIR,—I have the honour to submit the annual mining report and statistics for West Kootenay District for the year 1894.

AINSWORTH SUBDIVISION.

The anticipated early completion of the Pilot Bay smelter, on the east side of Kootenay Lake, the property of the Kootenay Mining and Smelting Company, has given a stimulus to mining in this section.

This Company owns the famous Blue Belle group, and several others in the Ainsworth and Toad Mountain Camps, from most of which they will extract ore as early as possible. About the works at Pilot Bay nearly 100 men are now employed. The buildings are of brick, with corrugated iron roofs, and are of the following dimensions:—

Concentrator building	80 x 120
Sampler	33 x 50
Roaster	100 x 200
Smelter	60 x 100
Engine-room	50 x 50
Boiler-room	40 x 40
Machine and blacksmith shop	64 x 90
Carpenter shop	25 x 50
Laboratory and assay office	20 x 80
General office	30 x 45

The buildings are equipped with various machinery of the most modern type, and a battery of boilers of 200 h. p., smelters stacks capable of handling 100 tons of ore daily, sampling works with a capacity of 150 tons per day, and concentrator of like capacity.

A large and substantial wharf has been erected, and warehouses and ore-bins. It is predicted that the opening of these works will prove of great benefit to the people of the district, and particularly to those who are unable, from various causes, to send their ore to distant smelters.

The Blue Belle mine, on the ore of which the Company relies for much of its fluxes, has over 3,000 feet of tunnels, shafts, uprises, etc., completed, and is in a position to turn out 150 tons of ore per day.

No. 1 Mine, Ainsworth Camp.

This mine is working under a lease, and on it a 60-ton concentrator has been erected, through which 500 tons of ore has been passed, with a result of one ton to seven. Two thousand five hundred feet of flume has been built, introducing water for the concentrator.

Lady of the Lake.

This claim has a promising body of ore, to work which the owners have put in a syphon to drain Loon Lake, which is being lowered rapidly.

King Solomon.

A shipment of five tons of ore from this mine realized 160 oz. in silver and 40 per cent. lead.

Little Mamie.

Since the conveyance of this claim to Mr. W. McVicar, of Nova Scotia, it has been worked with a force of 15 men, and shows a 30-inch body of concentrating ore.

Little Phil and Black Diamond.

Two ore veins have been reached by a joint tunnel, run on the dividing line between the two claims, one showing high grade ore. On the other, ore is being extracted and prepared for shipment.

United.

The yield from this mine, it is intended, shall be treated at Pilot Bay, and if found to be satisfactory the mine will be worked permanently.

Highland.

One tunnel 230 feet; another, 100 feet above, 90 feet long. The face of this drift shows 3 feet of ore. Three hundred tons of ore are now on the dump.

On the Wakefield, Budweiser and Amazon are 250 feet of tunnel, and ore averaging 30 oz. silver and 45 per cent. lead has been found.

Morning Star.

This claim has ore averaging 60 oz. silver per ton.

Skyline.

This claim is not at present being worked, but it has completed large workings, and has several hundred tons of ore, averaging 80 oz. silver, on the dump.

No. of claims recorded	275
Transfers "	254
Assessment work recorded	324

KASLO CAMP, AINSWORTH SUBDIVISION.

Eureka.

Extensive development work has been done on this claim. A 190-foot tunnel has been run, cross-cutting the vein at a depth of 170 feet. The vein shows a 30-inch body of high grade ore. About $10,000 has been expended in improvements, etc. Ore shipments have been commenced, and it is expected that about 200 tons will be shipped.

Echo.

An 18-foot tunnel has been run on the ledge, exposing an 18-inch body of ore.

Iron Crown.

A tunnel, 110 feet, has been run to cross-cut the vein.

San Berdino.

A 70-foot tunnel has been run to intersect the ledge.

Solo.

A 50-foot tunnel has been run on the vein, and a large quantity of ore is on the dump.

Wellington.

About 350 feet of sinking and tunnelling work has been done, which has shown up a 2½-foot body of ore. A 50-ton shipment of this ore has been made, showing good returns, and shipments will continue during the coming winter.

Virginia.

About $6,000 worth of development work has been done on this claim.

Carbonate.

Two tunnels have been driven, in all about 250 feet, which show up a nice body of ore. A 3-mile trail has been built to the waggon road, and it is expected that two carloads will be shipped as soon as raw-hiding commences.

Charleston.

On this claim, about $2,000 has been expended in tunnels and drifts.

Lincoln.

A 60-foot tunnel has been run to catch the vein.

Utica.

About $2,500 has been expended in development work. This claim has been bonded for $20,000. Ten men have been continuously working, and a trail has been built to connect with the waggon road, and ore will be shipped during the coming winter.

London.

A 50-foot tunnel has been driven, which shows in the face a 6-inch body of exceptionally high grade ore.

Lucky Boy.

About $2,000 has been expended in tunnels, etc., and considerable ore is on the dump.

Beaver.

A 70-foot tunnel has been run on the ledge, and a large body of copper and dry ore has been exposed. A good trail has been also built from this claim to connect with the Kaslo waggon road.

Northern Belle.

About $9,000 has been expended on this claim, and shipments of ore amounting to about 100 tons were made early in the spring.

Surprise.

A shipment of 25 tons has been made from this claim, with good results, and a contract has been let to haul 200 tons of this ore to Kaslo, and shipments will be regularly made as long as the snow is on the summit.

Whitewater and Irene.

On this claim, 6 men have been employed for the past two months, and will continue to work during the winter.

Briggs Bros.' Claims, South Fork, Kaslo Creek.

A trail 5 miles long has been built to connect with the Kaslo waggon road, and 4 men will be kept continuously working on these claims during the winter.

TRAIL CREEK SUBDIVISION.

The mines of this subdivision, under the season's development, have shewn a decided improvement. Among the most prominent are the

Le Roi.

The shaft of this mine is 325 feet, and there are two tunnels 125 feet each way, and some uprises. Sufficient ore to ship 100 tons per day is exposed in these workings. No. 2 Shaft is 75 feet, shewing a strong ore body 7 feet wide, part of which is shipping ore; remainder requires concentration. Shaft No. 3, 50 feet, is on a distinct vein, and has a body, 2 feet wide, of probably the richest ore on the claim. This Company has added this season to its other machinery a 100 h.p. boiler and an air compressor of 10 machine drill capacity, and expect, during the winter, to ship 35 tons daily.

War Eagle.

In the Iron Mask Group, the War Eagle stands pre-eminent. Several shafts have been sunk on ore, one having a depth of 100 feet. No ore has been shipped from this mine, owing to terms of the bond.

Josie.

This claim has worked and shipped ore during the spring and summer, but is now closed down, for reasons known only to the management.

O. K. Mine.

One hundred and twenty-five feet of tunnel has been driven, and much good ore exposed. A 5-stamp mill has been erected. A gold brick valued at $2,000 was sent from this mine to Spokane. The ore is said to be refractory.

Cliff.

This mine will ship ore this winter.

Gold Hill.

This claim, discovered this season, has a good-sized vein of high grade ore. A 50-foot shaft has been sunk, and ten tons of ore shipped, averaging 100 oz. silver per ton.

Since my last report, 2,150 tons of ore have been shipped from this camp to U. S. Reduction Works, valued at $100,000.

No. of claims recorded	99
No. of transfers	62
Assessment work recorded	50

CARIBOO CREEK, SLOCAN MINING DIVISION.

On this creek, which runs into the Narrows from the east side of Arrow Lake, gold was discovered in June last. Many placer claims were recorded, and a few have been worked, with, it is said, encouraging prospects. The bed-rock is reported to be at some distance from the surface, and capital is necessary for efficient working. Recurring freshets have done much to retard the progress of these placers by damaging wing-dams, etc.

In July of this year, gold-bearing quartz ledges were discovered, rock from which assays from $40 to $216 were obtained. Of 1,000 lbs. tested, the assays ranged between $86 and $216. It is the intention of several parties to reside and work upon their claims during the coming winter, the construction of the Government trail affording them facilities for introduction of food, supplies, plant, etc.

Mica has been discovered on the west side of Arrow Lake, opposite Nakusp, and blocks of excellent quality, fifteen inches square, are reported to have been found.

Cariboo Creek is attracting some attention, and capitalists from Spokane, Toronto, Montreal, and New York are manifesting interest in its mineral resources.

No. of claims recorded, placer	57
" " " mineral	35
No. of transfers, placer	7
" " mineral	6

GOAT RIVER SUBDIVISION.

Among the properties in the southern portion of Goat River Division are the undermentioned, upon all of which assessment work has been done:—Irene, Silver King, Grub Stake, Little Bonanza, Hannah, Single Tax, M. & M., B. C., Henry George, Alice, Flying Dutchman, Climax, Can't Tell, International, and Grey Copper. The ore in these is principally grey copper, and is said to run high in silver.

On Goat River proper, about six miles above the forks, are: The New Leadville, a claim showing a large quantity of ore; it is bonded for $10,000, and has employed three men all the season. The Alice, reached by a trail from H. M. Custom House, also has a good quantity of ore in sight. The Tip-Top, whose ore is of higher grade than that of any lead-silver property in the neighbourhood; three men have worked here all the summer. The Montana, adjoining the Tip-Top, has the same characteristics.

On Duck Creek, served by the same trail, are: The President Group, which has been sold to a Minnesota syndicate, who are working six men thereon; the Sea King, Magog, Jim Slick, Kentucky, Bell, Huasco, Nancy N. Hanks, Black Belle, Morning Glory, Morning Star, and a few others, on all of which assessment work has been done, and some development, which is said to be satisfactory to the various owners, who are chiefly American companies. The character of the ore is grey copper and galena, and on an average two men have worked on each of them for the past summer.

No. of claims recorded	71
Assessment work recorded	39

SLOCAN SUBDIVISION.

Blue Bird,

Situated on Carpenter Creek. On this claim the development work consists of 1,800 feet of tunnelling and 200 feet of shafts. Shipments have been made from this property amounting to 240 tons, and there are 70 tons of shipable ore now on the dump. The average assay is 137 oz. silver and 75 per cent. lead. The number of men employed is 6.

Cumberland,

In the Idaho Basin, has 400 feet of tunnelling on it, and gives employment for six men. The ore is of a high grade, and there are about 55 tons on the dump awaiting shipment.

Mountain Chief.

This claim, situated on the Payne Mountain, has shipped 100 tons of ore, averaging 214 oz. silver and 71½ per cent. lead, and has 75 tons of the same quality on the dump. Eleven men are employed on this property. The development work consists of 300 feet of tunnelling.

Slocan Star.

This mine, which is one of the most promising in the subdivision, is situated on Sandon Creek. The shipments this year amount to 840 tons. On the dump awaiting shipment are 300 tons more, besides 8,000 tons of concentrating ore, which will be handled as soon as the Company erect their concentrator. The ore averages 100 oz. silver and 70 per cent. lead. Seventeen men are steadily employed, and the development work consists of 1,180 feet of tunnels, and 180 feet of a shaft.

Idaho.

This claim, situated in the Idaho Basin, bids fair to be a very valuable property, not only on account of the rich value of the ore, but on account of the immense bodies found. On this claim 1,300 feet of tunnels have been run, and 100 feet of shafting. Thirty-five men are employed. Two hundred and seventy-five tons of ore have been shipped, and there are on the dump awaiting shipment 270 tons of high grade ore and 4,000 tons of concentrating, which will be shipped to the concentrator at Howsen Creek as soon as it is finished. The average of the ore is 185 oz. silver and 68 per cent. lead.

Alamo.

This mine is situated in the Twin Lake Basin. On this claim the development work consists of 675 feet of tunnels and 160 feet of shafts. The average of the ore is 200 oz. silver and 60 per cent. lead. Forty tons have been shipped, and on the dump there are 40 tons of high grade ore and 800 tons of concentrates. Twenty-five men are employed on this property.

Deadman.

This claim adjoins the Noble Five Group, and gives employment to six men. The ore averages 150 oz. silver and 50 per cent. lead. No ore has been shipped from this claim. About 250 feet of tunnels have been run as development work.

Washington.

This claim is situated in McGuigan Basin, but has not been working for the last three or four months. Fifteen hundred tons of ore have been shipped from the claim, averaging 140 oz. silver and 60 per cent. lead. Over 1,000 feet of tunnelling and shaft work have been driven on this mine.

Ruecau.

This claim is situated near the Noble Five, and employs 12 men. The development work consists of 630 feet of tunnels and 125 feet of a shaft. Eighty tons of ore have been shipped, showing a return of 176 oz. silver and 76 per cent. lead.

Noonday,

On Cody Creek, has shipped 20 tons ore, but the grade is lower at present than those claims mentioned above, averaging 75 oz. silver and 70 per cent. lead.

Wonderful.

On this claim 680 feet of development work have been done, but no ore has been shipped. Twenty-two men are employed. About 1,400 tons are, however, on the dump, consisting of shipable and concentrating ore.

Omega.

This claim is situated on the Noble Five Hill, and employs 10 men. The development work consists of 300 feet of tunnels and shafts.

Noble Five Group.

On this group of claims 1,700 feet of development work have been run, and 600 tons have been shipped. Twenty-two men are employed. The value of the ore is 150 oz. silver and 70 per cent. lead.

Mountain Chief No. 2.

This mine is situated between New Denver and Three Forks, and employs 10 men. The value of the ore is 170 oz. silver and 75 per cent. lead. Six hundred and sixty tons have been shipped, and there are over 2,000 tons of concentrating ore on the dump.

Alpha.

This claim overlooks Silverton and Slocan Lake. The development work consists of 500 feet of tunnels. Eight hundred tons of ore have been shipped, averaging 120 oz. silver and 64 per cent. lead. The mine employs 24 men.

Fisher Maiden,

Situated near the head of Four-Mile Creek, has development work consisting of 400 feet of tunnels. Ten men are employed. Fifty tons of ore have been shipped, averaging 230 oz. silver and 10 per cent. lead.

Read and Robertson Group,

Situated six miles east of Slocan Lake, is not at present being worked. The development work consists of 600 feet of tunnels. The ore averages 120 oz. silver and 75 per cent. lead.

Thompson Group.

This set of claims is situated on the head-waters of Four-Mile Creek. Five men are developing the property, which has a strong ledge traceable for 1¼ miles. The character of the ore is the same as the Fisher Maiden, and as depth is gained the galena disappears, leaving a high grade dry ore.

On 8-Mile and 10-Mile Creeks numerous discoveries were made this summer. The Kalispell, on 10-Mile Creek, located in August, is the most promising. The locators are at work, and have 7 tons of ore, averaging between 400 and 500 oz. per ton. This is a very large ledge, and is situated close to Slocan Lake.

The Enterprise, on 8-Mile Creek, has a large showing, the ore averaging 250 oz. to the ton. The ledge has been stripped in twenty different places, and each shows no less than two feet of galena ore.

Vancouver Group,

Situated 4 miles up Four-Mile Creek, employs 4 men. Fifteen tons have been shipped, averaging 233 oz. silver and 60 per cent. lead. The development work consists of 600 feet of tunnels and shafts.

A concentrator, with a capacity of 100 tons per day, is being erected at the junction of Howsen and Carpenter Creeks, and the machinery for same is now on the way in *via* the Nakusp and Slocan Railway. This is the first machinery for the Slocan Country.

Mineral claims recorded	256
Assessment work recorded	390
Transfers recorded	300

NELSON SUBDIVISION.

Hall Mines.

This group of mines, owned by the Hall Mines, Limited, comprising the Silver King, Kootenai Bonanza, and American Flag, are situated on Toad Mountain, Nelson.

The principal workings are on the Silver King ground, and have been pushed forward with the sole idea of developing the Company's property. A small amount of stoping has been done since June, 1894, and since the commencement of operations in the summer of 1893 about 4,000 tons of ore have been extracted. Of this quantity (principally produced through development work) 640 tons have been shipped to various smelters, and the returns show an average value of 116 oz. in silver, 12½ per cent. copper, and $2 per ton in gold.

This Company has been the first in the district to employ diamond drills for prospecting, and has now in operation one hand drill and one power drill of 1,200 feet capacity. The Company has also a complete plant—boiler, engine, air compressor, etc.—to serve the power drill, at present 1,600 feet distant, with air and water.

Since the Hall Mines, Limited, purchased the property from the original holders, the development work has shown that the large body of ore which was known to exist at the time of the purchase has increased in area, carrying the same uniform grade of ore.

The expenditure by the Company on this group of mines will probably amount to $100,000.

The number of men employed regularly in this group is 50.

Dandy.

Situated on Toad Mountain. Very little development work has been done on this property, but it is the intention of the owners, with the prospect of the smelter on Kootenay Lake nearing completion, to commence operations and ship ore at no distant date.

Starlight.

This claim, situated on Toad Mountain, and practically newly developed, shows great promise of being a rich gold property.

The vein is about five feet wide, and the ore has an average of $20 per ton in free gold. A shaft twenty-feet has been sunk, and the uniform grade of the ore has been maintained. On the surface the vein has been stripped for a distance of 700 feet.

Fern Group.

This group of claims situated on Hall Creek have been bonded for $35,000. The claims are free milling, and have a reputed value of $20 per ton in gold.

Mineral claims recorded	94
Transfers "	47
Assessment work "	107

REVENUE.

1st January, 1894, to 31st October, 1894.

Free miners' certificates	$9,661 00
Mining receipts, general	7,947 46

MEMO.—The above refers only to the southern portion of West Kootenay.

PLACER MINING.

A small result, compared with work done, has been obtained from Hall Creek, Salmon River, Pend d'Oreille River, and 49 Creek. The products from the above creeks, etc., are estimated as follows:—

Hall Creek	$1,250 00
Salmon River	500 00
Pend d'Oreille River	250 00
49 Creek	500 00
Total	$2,500 00

49 Creek.

The Nelson Hydraulic Company, Limited, have a lease of one and one-half miles on this creek, and have done considerable development work.

During this year the Company have expended $13,000 in hydraulic plant, sluice boxes, ditches, &c. They are now engaged in putting in new sluice boxes, 750 feet long by 4 feet by 4 feet, and are extending the dimensions of the upper flume in order to carry the water they need for sluicing, and are also making arrangements for another 1,000 feet of piping, so that next spring two monitors may be used.

The trial clean up from sixty cubic yards of gravel gave the astonishing result of $500. The property is now shut down for want of water, but from the above results the prospects are more than satisfactory, and a good season's work is expected next year. There are in existence at present twenty-six mining leases covering ground on the above-mentioned creeks, as follows :—

Hall Creek	1
Salmon River	16
Pend d'Oreille River	7
49 Creek	2
Total	26

It is expected that considerable money in development work will be expended next year on the Salmon and Pen d'Oreille Rivers, which would have been the case this year had it not been for the depressed state of trade and general financial stringency.

Placer claims recorded	5
Transfers "	5

QUARTZ MINING, GOLD.

Only one mine of this kind has been in operation this year—the Poorman—situated on Eagle Creek, on which property a 10-stamp mill is erected, the total yield from which this season amounts to $15,000 in gold bars.

REVELSTOKE SUBDIVISION.

Little or no quartz mining has been done in this division during the past season.

PLACER—BIG BEND.

Columbia River Hydraulic Co.

Three men have been employed on this claim during the greater portion of the year.

Gold Stream.

About twenty men have been employed on this stream during a portion of the season.

McCulloch Creek.

About fifteen men have been working on this creek during the summer. A lease has been issued to one company, and another has been applied for.

French Creek.

Thirty men have been employed on this creek during the past season.

Smith Creek.

Ten men have been employed on this creek prospecting. The Smith Creek Hydraulic Co. have spent a large sum of money in opening up their property, and intend pushing on with the development work.

GOLD QUARTZ.

On Downie Creek there are a few locations which, from surface indications, may turn out to be good properties.

On Carnes Creek the ore so far found averages $47 in gold per ton.

The Gold Hill claim on McCulloch Creek, on which assessment work has been done, and from which assays have been made, show $96 per ton in gold.

Great damage has been done to trails and bridges by floods, &c., during the past season, making it very expensive to get in provisions to the different camps.

Several capitalists have visited the Big Bend country this year with a view of investing capital.

No. of mineral claims recorded	10
" placer	13
" transfers, mineral	9
" " placer	9
Assessment work recorded, mineral	6
Leases issued in Big Bend, placer	10

ILLECILLEWAET SUBDIVISION.

Little more than necessary assessment work has been done this season.
A car load of copper ore has been shipped to Chicago for a practical test.

No. of mineral claims recorded	19
" transfers "	3
Assessment work "	20

TROUT LAKE SUBDIVISION.

Sable Creek.

The principal claims located on this creek are the Alice, Agnes, Lucky Jack, Lulu, Great Britain, Dreadnought, and Last Chance. The ledges on some of them are said to be 20 feet wide and well mineralized. Average assays: Gold, $6; silver, 40 to 50 oz.; 14½ per cent. copper, and 2½ per cent. bismuth per ton.

Fish Creek.

The Lexington Group, on the east side of this creek, consists of the Lone Star, Bellingham, Brodie, and Lexington. The lead is 12 feet wide, and when opened well mineralized, with 5 feet of clear galena on the foot wall. Assays 60 oz. silver per ton.

In the Black Bear Group are the Black Bear, White Cloud, and the Revelstoke. Three feet of ore in sight. Assays 75 oz. silver and $4 in gold, and traces of copper, per ton.

The Gladstone Group of three claims shows from 2 to 3 feet of ore, which assays 80 oz. silver to the ton.

On the Silver Bow and Seattle the ore is of the character known as concentrating, and the ledge is 4 feet wide. Assays 112 oz. silver, $10 gold, and 10 per cent. copper per ton.

The Wagner group contains five claims; assays from 110 to 300 oz. silver per ton.

SOUTH FORK OF LARDEAU RIVER.

Abrahamson Group.

The ore of the North Star, of this group, carries $53 in gold and 23 oz. silver per ton.

The Queen of the Hills assays 152 oz. silver and $16 gold per ton.

On the Boss Group encouraging assays have been obtained.

The Black Prince Group is now in course of development by tunnel and shaft. The lead is from 9 to 18 inches of high grade copper ore, assaying from 250 to 1,200 oz. silver to the ton.

Silver Cup.

Lead from 18 to 24 inches of ore, assaying from 150 to 1,200 oz. per ton in silver.

No. 25 and Badshot.

These claims are supposed to be on the same ledge as the Black Prince.

On the Riche Group the ore is of a very high grade.

The Morning Star Group consists of three claims, showing a ledge 4 feet wide.

The ore of the Higginson Group, consisting of two claims, assays 250 oz. silver per ton.

The Black Horse Group assays 80 oz. silver and 80 per cent. lead.

The Blackburn Group, consisting of three claims, is concentrating ore. Assays 60 oz. silver and $18 gold.

The Glengarry, Pool and Abbott Groups have been more or less developed, and show large bodies of ore.

The Lardeau Group assays from 250 to 3,312 oz. silver per ton.

The Horne Ledge has a very large lead, and assays from 70 to 80 oz. silver and 80 per cent. lead per ton.

The Silver Reef assays from 25 to 30 oz. silver and 60 per cent. lead per ton.

On the Hot Boy Group there is 7 feet of concentrating ore, assaying 243 oz. silver per ton.

The Great Northern has 10 feet of ore visible, assaying 40 oz. silver and 60 per cent. lead per ton.

PLACER.

Lardeau Creek.

Several claims have been staked and two leases have been issued on this creek, from which promising prospects have been obtained. The quality of gold extracted will be found in Mining Statistics.

No. of mineral claims recorded	60
" placer " "	22
" transfers, mineral, "	26
Assessment work, " "	37

It appears from the foregoing that the mineral development, more particularly silver mining, is being pushed forward satisfactorily, notwithstanding the depressed prices of that metal and lead.

There has been steady advancement in the principal camps, and several new promising fields have rewarded the labours of the prospectors. This progress has been not only in the area of mineral discovery, but in the amount of output and shipment.

The increased attention given to placer and quartz (gold) mining, and the prospects obtained, justify hopes of success also in that direction.

It is pleasing to be able to point to the starting of industries incident to mining, such as the large local smelter, and also several concentrators and mills.

Much of the progress and of the confidence entertained by investors is due to the improvement in communications, and notably to the construction of an important and necessary work—the Nakusp and Slocan Railway.

The extent and great value of the minerals in this district are now established beyond all question, and I think that in few other fields would investments be so likely to yield a ready and remunerative return.

I have the honour to be,
Sir,
Your obedient servant,
N. FITZSTUBBS,
Gold Commissioner.

To the Hon. the Minister of Mines,
Victoria, B. C.

EAST KOOTENAY.

MR. CUMMINS' REPORT.

DONALD, B.C., February 1st, 1895.

The Honourable
The Minister of Mines, Victoria.

SIR,—I have the honour to submit my Mining Report for the year 1894 for the District of East Kootenay, together with the usual tabular statement of statistics relating to Placer Mining.

PLACER MINING.

The yield of placer gold from the various creeks has been as follows:—

Wild Horse Creek	$22,500
Perry Creek	300
Moyie River	1,800
Desultory mining—say	300
Total yield	$24,900

shewing an increase of $5,200 over the production of 1893.

WILD HORSE CREEK.

The hydraulic mining operations of the East Kootenay Exploration Syndicate have given very fair results, considering many unforeseen drawbacks which occurred to impede the work. Operations were commenced under the superintendence of Mr. Beatson, a Californian mining superintendent, early in May last. Great delay took place, owing to landslides, which carried away large portions of the Victoria ditch. During the extremely high water of the past season, the old dam at the head of the ditch was carried out, occasioning, altogether, delay of over six weeks at the most important part of the season. The pipe plant purchased some years back seems to have given much trouble, not proving sufficiently strong for the pressure of the head of water of 370 feet. The head had to be diminished to the extent of about 130 feet by introducing a pressure box at a lower level, thus decreasing the efficiency of the giants. These latter are also stated not to have given satisfaction. In August, a new giant was received from Messrs. Hendy, of San Francisco, and piping was commenced towards the end of the month. From this date to the end of October, piping went on continuously. The quantity of gravel put through the sluices for the season was 77,500 cubic yards, or 0.66 of a cubic yard of gravel for each 10 hours miner's inch of water used. It is estimated that this efficiency could be increased to 1 cubic yard per ten hours miner's inch of water by the introduction of proper pipe plant, using the full head of water; or, by using electric light and working 24 hours, the quantity could be increased to 2½ cubic yards of gravel for each miner's inch of water.

The operations of the syndicate during the past season indicate that their ground on Wild Horse Creek can be worked at a handsome profit. Last winter the Company bought out, through the agency, I understand, of Mr. David Griffith, a number of Chinese Companies who had been working on the creek, and, in March last, leased this ground back to Chinese Companies, with satisfactory results both to the syndicate and the lessees.

The gold shipped out realized, after all charges were paid, on an average of $17.60 an ounce, the fineness being 0.884. It contains, also a small value of silver.

The excessive floods during the summer, though causing, as mentioned before, some damage and much delay, produced an excellent effect by clearing the gravel out of the bed of the creek, and greatly improving the dumping ground for the hydraulic claims.

A further attempt was made by Mr. Laird, of Chicago, to reach bed-rock just below the mouth of Victoria Gulch. He was, however, compelled to discontinue work, owing to difficulties arising from quicksands.

The old shaft, sunk with Government aid over 20 years ago, but abandoned at a depth of 90 feet, is being again opened up by Mr. Jennings, who has applied for a lease including the site of the shaft. It is his intention to carry it down to bed-rock this winter. The old timbering is reported to have been found in good condition.

Four leases have been recently granted on Wild Horse Creek, two for deep-creek diggings in the vicinity of Victoria Gulch, and two hydraulic claims. It is expected that work will begin on the former at an early date, depending probably somewhat on the success of Mr. Jennings' undertaking.

MOYIE RIVER.

The Ridgway Company has, for a long time, been prospecting for placer on different portions of this creek. During last summer they discovered some good pay ground in an old channel, and have obtained a lease covering the ground desired. The work which they have done consists of a drift of about 80 feet long, run into the bank at an elevation of 5 feet above the river, at the end of which an incline was sunk to bed-rock, where some very good prospects were found, viz., $85 to the last two sets of timber. As water gave trouble, a drain was run, about 600 feet in length, from a point further down the river to reach the foot of the incline. The ground reached here proved not nearly as rich as indicated by the first prospects found. After drifting 300 feet further, however, another pay streak was found, stated to be about 40 feet wide and 5 feet high. A drift was run some distance in this, and breasted out on each side. This ground was paying well when a serious accident occurred. The timbering at the face of the drift gave way, and nine sets in succession from the face fell in, one of the miners, John Ridgway, being buried; another man, working near him, succeeded in extricating himself. A rescuing party commenced work at once, additional men being sent out by the Mining Recorder at Fort Steele. Two shifts were worked continuously. After eight days' work, night and day, the front of the drift was reached. Ridgway's body was found, dreadfully crushed; death must have been instantaneous. The cause of the accident is attributed to the neglect to brace the sets longitudinally to one another. When the first set tipped back, the weight on the sagging brought each set down in succession in a similar way.

TOBY CREEK.

Some good prospects having been found on this creek, a lease has been obtained of one and one-half miles of the creek. This ground is situated about three miles from the junction of the creek with the Columbia River.

CANYON CREEK.

I am glad to state that some sufficiently good prospects have been obtained to induce further enterprise on this creek. A lease has been granted to Mr. H. L. Estell of one and one-half miles of the creek, from the mouth of the canyon upwards. It is proposed, before the next high water, to expose and work out an area of the creek bed, about 250 feet in length by 60 feet wide, by constructing a dam and diverting the creek into a flume 6 feet by 4 feet. This work is now well advanced. There is supposed to be from 4 to 10 feet of gravel over the above area. The Canyon Creek gold is coarse, and of very good quality. If this enterprise proves a success, Mr. Estell and associates will continue to work other portions of their leased ground in a similar manner, and on a larger scale.

On Findlay Creek, some desultory placer mining has been done by Chinese this summer.

QUARTZ MINING.

In East Kootenay, as in most other localities, great discouragement has been felt by those interested in silver properties, owing to the depressed state and uncertain future value of that metal. A consequent inactivity in development has been the rule with respect to properties which do not hold forth prospects of producing gold. The attention of prospectors has been given to gold quartz, especially in the Fort Steele Division of the district.

The new discoveries of mineral in quartz made during 1894 are situated principally on the various forks of the St. Mary's River and on Wild Horse Creek.

The mineral localities on the several branches of the Spillemcheen River, in the Golden Mining Division, collectively known as the McMurdo District, have not made such advancement as was expected during 1894. The silver properties, for reasons stated above, have not been further developed to any considerable extent, whilst the gold-bearing ledges on the Middle Fork of the Spillemcheen, where most promising, have been retarded in development, owing to litigation and other unfortunate causes.

Comparatively little prospecting has been done in the Donald, Golden, and Windermere Divisions.

McMURDO DISTRICT.

Bobbie Burns Basin.

The promising gold ledges included in this group of claims have been held back owing to discontinuance of work on the principal claim during the whole season, whilst the law-suit as to the ownership of the property was pending. Judgment having, however, been given in favour of the defendant, Mr. Fotheringham, it is hoped that rapid progress will be made next season. The claim is now known as the Robert E. Burns, and includes the ground formerly recorded as the Bobbie Burns claim.

Work has been going on the Flying Dutchman claim during the winter, the results of which have not yet become known.

International Group.

The International claim, bonded to a Toronto syndicate, has been developed to some extent during the summer, but the work did not commence as early as was expected, the snow having lain later than usual. On the stipulated date the Syndicate was not prepared to make payment, as they desired an extension of time to be granted them for further development. This application for an extention of time not having been acceded to, it is considered probable that the property, one of the most promising gold properties of the district, will be again offered for sale. It is not likely to remain idle during the coming season. The work done last summer consists of a tunnel about 80 feet in length and several open cuts. Six samples taken from a cross-vein cutting the main croppings and about 18 inches in width gave an average assay of $200 of gold to the ton, the highest being $700 to the ton.

Several neighbouring claims were purchased by Mr. H. Forster, on which he had certain work done with a view to development. I have not been able to obtain any information of importance as to the results obtained.

The numerous other properties in the Golden Mining Division, mentioned in former reports, carrying mostly silver-bearing galena and copper ores, viz., on Spillemcheen Mountain, Jubilee Mountain, Carbonate Mountain, etc., have, as far as I am aware, had but little work done on them during the year.

IN THE WINDERMERE DIVISION,

In the vicinity of Findlay Creek, some new discoveries were made, which are represented to me as large bodies of galena, low grade in silver, probably suitable for concentration. Former discoveries in this division have had little but assessment work done on them.

FORT STEELE DIVISION.

Seventy-four new locations were made during the season, distributed approximately as follows:—Wild Horse Creek, 28; St. Mary's River, 21; Moyie River, 19; other localities, 2.

North Star and Sullivan Groups.

No progress of importance has been made in working the claims in this locality during the past year. Crown grants issued for the North Star, Dreadnaught, Buckhorn, and O. K. claims. It is understood that fresh financial arrangements have been made by the owners, and work is expected to progress. It is also reported that sales have been agreed upon respecting several of the claims in the Sullivan Group.

Moyie Lake Claims.

I hear from Fort Steele that the St. Eugene claim has been bonded for $12,000.

Work done by Messrs. A. L. Hogg and associates on their properties near the lake has very much improved the appearance of the claims.

An arastra has been set up on a gold-bearing ledge on Weaver Creek, a tributary of the Moyie River, which is expected to be in running order next season.

Wild Horse Creek.

James Dibble & Co. have been taking out ore with a view to shipping to Great Falls when navigation opens. They have had 7 men working on the claim and on the trail leading

to the Kootenay River. The ore is grey, or antimonial copper ore, carrying silver, and is expected to go about $200 to the ton. As stated in former reports, some high assays of silver have been obtained from these claims; the ore also carries gold.

On Kimbasket Lake,

In the Donald Division, two of the principal claims were bonded for $70,000. The bond expires on 1st June next.

There were 296 free miners' certificates issued in 1894, 96 records of claims, 89 certificates of work.

I have the honour to be,
Sir,
Your obedient servant,
A. P. CUMMINS,
Gold Commissioner.

LILLOOET.

MR. SOUES' REPORT.

GOVERNMENT OFFICE, CLINTON, B. C.,
December 31st, 1894.

SIR,—I have the honour to enclose herewith mining statistics, and submit my annual mining report for the year 1894

The total yield of gold from the district (ascertained from reliable sources only) is $39,257, showing a decrease as compared with last year of $12,119, and very much below the average of the past ten years.

So far as this district is concerned it has been a singularly unfortunate year in mining matters. In the early part of the season the Chinese itinerant miner in large numbers left the district for, presumably, greater attractions on Horsefly and the South Fork of Quesnelle, in the Cariboo District.

The extreme high water in all auriferous streams in this district in the early summer put a full stop to mining for nearly two months. To these causes may be attributed the great shrinkage in the annual yield.

Mr. Phair, Mining Recorder, reports with regard to the Lillooet Mining Division "that "the Mina Company, on Bridge River, worked the greater part of the season, but with unsat- "isfactory results.

"The Bridge River Gold Mining Co. worked only six weeks. They have had a new line "of ditch surveyed, and will commence work as soon as practicable in the spring.

"The Vancouver Enterprise Mining Co., on Cayoosh Creek, worked during the season, "with the exception of about one month. They took out about $800.

"The Lillooet Hydraulic Mining Co. were stopped work two months by high water in "the Fraser River. This Company took out $4,000 in gold for the season.

"The McDonald-Hurley lease was not worked to any extent this season, some three or "four Chinamen only being employed on it.

"Prospecting shafts have been sunk during the past year on the John Irving Hydraulic "Mining Leases; the ground is said to average twenty-five cents per cubic yard.

"An English company has bonded the latter leases—also the McDonald-Hurley lease— "and a survey has been made for a pipe line to bring water from Cayoosh Creek on to the "ground.

"The itinerant Chinese miners, to the number of about eighty, left early in the spring "for the Cariboo District. This, and the long continued and extreme high water, easily "accounts for the diminished annual yield."

Dredging Leases.

I have to report the whole of the bed of Fraser River in my district under lease, or application to lease, by this new method of gold mining. Portion of the lower part of Cayoosh Creek has been applied for, and applications were also sent in for the lower part of Bridge River. The latter, however, were not entertained, as they encroached on Indian reservations. No work has been done on any of these locations by this new method of dredging in my district, the season being too far advanced before the leases were granted and preliminaries arranged. I understand some of the lease-holders have had powerful machinery constructed, and are prepared to commence operations as soon as the river is free from ice in the spring.

Hydraulic Mining Leases.

With the exception of those referred to by Mr. Phair, none of the other leases in this district have been worked during the past year.

Quartz Mining.

I regret to report that in this class of mining nothing has been done during the past year.

Prospecting work is still being carried on by Mr. Allingham and others on their quartz claims on North Thompson and Mad Rivers with a perseverance and energy that might well be emulated by others who are much more favourably located than they are.

Coal Prospecting.

Renewal of coal prospecting licences have been issued to various parties to prospect for coal on the North Thompson, but I have been unable to this date to get any report from the licensees.

The following statement shows the number of free miner's certificates issued in the district for the past year, the number of records and re-records of placer mining claims, and the number of leases issued and applied for :—

Free miners' certificates issued	182
Placer claims recorded	12
" re-recorded	13
Mineral claims recorded	5
" re-recorded	2
Hydraulic mining leases issued	9
" " applied for but not issued	7
Dredging " issued	7
" " applied for but not issued	11

I have the honour to be,
Sir,
Your obedient servant,
F. SOUES,
Gold Commissioner.

The Hon. Col. James Baker,
Minister of Mines, Victoria.

YALE.

Kamloops Division.

MR. TUNSTALL'S REPORT.

KAMLOOPS, December 31st, 1894.

SIR,—I have the honour to enclose the annual mining report for the Kamloops Division of Yale District for the present year.

The Thompson River Hydraulic Mining Co., at Tranquille, had the misfortune to lose their dam, which was carried away by the great pressure of water to which it was subjected. The structure was forty feet high, and the work required to build another so delayed operations that but two or three days' piping with an inadequate supply of water could be obtained. The results, however, proved very satisfactory, the gravel in the pay streak returning at the rate of fifty cents to the cubic yard. This Company has expended a large amount of money and is fully deserving of success.

The Glen Iron Mining Company, at Cherry Creek, has shipped one thousand tons of ore to the Tacoma smelter, and have a contract for supplying one thousand tons more at a higher figure than that previously obtained. Ten men are at work, and the probability is that a much larger number will be employed next summer, as the excellent quality of the ore, which is comparatively free from impurities, is largely increasing its demand.

Mr. D. Gilman, of Seattle, who is the President of the Lake Shore and Eastern Railway, has bonded the mine in the sum of $60,000 for a period of six months. Should the deal be effected the production will be greatly increased to supply the wants of extensive iron works which are to be erected at Seattle for the manufacture of railway cars.

The Adams Lake group of mines promises to become very valuable. The principal work has been accomplished in the Homestake and Troublesome mineral claims, owned by Messrs. Olsen and Flynn, who will shortly reap the benefit arising from their energy and perseverance. An average lot of twenty tons of ore shipped to the smelter at Everett, Wash., U. S., yielded $1,200. There are two distinct lodes running parallel to each other through these locations. The first has been cross-cut and found to be twenty feet thick. The tunnel is being carried forward to intersect the second vein, which has about two feet of very rich ore on the hanging wall averaging from 500 to 3,000 ounces per ton in silver. This portion of the ledge is broken up and difficult to trace on the surface, but it is expected will be found intact when depth is attained.

The waggon road from Louis Creek to the mines is about twelve miles long, and was constructed jointly by the mine owners and the Government. It has a good grade for teaming purposes, and with a little improvement will meet all the wants for which it is intended, and reduce transportation between these two points to $5 per ton.

The Cinnabar mines at Copper Creek have had the following development work effected on them:—

Rosebush Mineral Claim.

Tunnel No. 1, four feet wide, six feet high, was started at a point about 375 feet above the level of Kamloops Lake, and run a distance of 137 feet in a northerly direction for the purpose of cutting the ledge which cropped up boldly some distance higher up. Its course was, however, misdirected, as further explorations demonstrated that the ore body lies to the east of the line of tunnel.

Shaft No. 1 was started from a point fifty-one feet above the level of the tunnel, with which it was connected by a cross-cut. In sinking a seam of high grade ore was encountered, varying in width from four to eighteen inches, and extending from the surface downward to a depth of twenty-six feet. The dump at this shaft shows eight tons of high grade ore, assaying over twenty per cent., and about twelve tons which will yield seven per cent. A drift has been run from the shaft about fifteen feet in a northerly direction, from which was taken over a ton of very rich ore. Seven open cuts have been run to the east and west of shaft No. 1, which exhibit stringers of valuable ore.

On the Yellow Jacket shaft No. 2, 4 feet by 4 feet, has been sunk on an incline to a depth of thirty-one feet. The formation here differs from that on the southern slope of the ridge, being softer and more friable. The bottom shows a rich seam clear across. No drifting was done at this point.

Prospecting on a small scale has been effected on the Blue Bird and Lakeview claims. The former has numerous large croppings of Cinnabar rock. The four locations were bonded last summer to an American company, who failed to carry out their agreement and desired to defer the last payment, which was refused. The proprietors are again making arrangements with another firm, and expect to see work resumed in a short time.

This property is advantageously situated on Kamloops Lake within a few miles of Savona, a station on the Canadian Pacific Railway, and consequently enjoys the benefits arising from cheap transportation and being economically worked.

On the copper locations east of Copper Creek little beyond assessment work has been performed.

I have the honour to be,
Sir,
Your obedient servant,
G. C. TUNSTALL,
Gold Commissioner.

The Honourable
The Minister of Mines, Victoria.

Yale Division.

MR. DODD'S REPORT.

GOVERNMENT OFFICE,
YALE, December 17th, 1894.

SIR,—In compliance with your circular, under date of the 16th of October, I have the honour to submit my mining report of the Yale Division of Yale District for the year ending 1894, and beg to state, for your information, that mining developments along the banks of the Fraser River received a severe check. The activity displayed, especially in new enterprises, was retarded by the unprecedented high freshet that occurred during the summer, which caused the waters to rise on the river to such an extent as greatly to interfere with mining operations.

Considerable attention has been given by outside capitalists to our auriferous bars and benches this year, and in several instances experts have examined and reported most favourably on several, expressing a high opinion on the prospects obtained. The proprietors of the Columbia Gold Mining Company, of Seattle and Wisconsin, having, a few months ago, purchased the auriferous mining lands across the Fraser at Yale, containing some 600 acres, from Mr. Wm. Teague, and better known as Hill's Bar Flats, are well pleased, I am glad to say, with recent encouraging prospects. They have incorporated for $1,000,000, and recently completed their surveys for the purpose of conveying the waters from Yale Creek across the Fraser in large iron pipes. Preliminary movements towards the construction of stone piers for supporting the pipes over the Fraser are expected to commence at an early date. The undertaking will require considerable time to complete, and a large amount of money will be expended on the work, and it is hoped, through favourable circumstances, by April, 1895, everything will be in order for operations on a large scale.

Groups of Chinaman may be seen along at different points on the low-water bars of the river, with rocker and sluice in large numbers, more than have been seen for many years, and from reliable reports, I have every reason to believe that larger yields of gold have been obtained this season than for many previous years.

The Scott Hydraulic Mining Company, situated at Texas Lake, about six miles west of Yale, purchased 160 acres of last spring from Kai Kee, for $4,000. The Company having gone to a large outlay in laying large iron pipes for upwards of half a mile, in conveying water for their operations on their claim, have had a run of about six weeks on the gravel, and have now got their claim in fairly working order for an early start next spring. The result of gold from six weeks' work made in opening up the claim, washed up last week, was highly satisfactory to the owners, who look forward hopefully to a prosperous season next year.

The recent prospects of gold obtained by Messrs. H. C. Bell and Shahan, of the Yale Gold Dredging Company, from the bed of their claim in the Fraser River, have been sufficient

to warrant Messrs. Bell and Shahan and their co-adventurers' confidence in their enterprise of constructing a large gold-dredge upon a new design, shortly to be operated on their leasehold on the river at Hill's Bar, near Yale.

Locators of quartz mines have simply performed the usual amount of development work to retain their locations; hence, there is nothing interesting to impart.

I have the honour to be,
Sir,
Your obedient servant,
WM. DODD,
Mining Recorder.

The Hon. the Minister of Mines,
Victoria, B. C.

Osoyoos Division.

MR. C. A. R. LAMBLY'S REPORT.

OSOYOOS, B. C., 26th November, 1894.

SIR,—I have the honour to enclose herewith mining statistics, and to submit my annual report on the mining operations and mineral development of the Osoyoos Division of Yale District for the current year. I also enclose sketch plans of the different mining camps in the district, showing the principal mineral claims referred to in this and my report of last year.

PLACER MINING.

On Cherry Creek thirteen men have been employed during the season, and about $3,200 worth of gold taken out, the gold being valued at $13.50 per oz.

On the North Fork four new locations were made, the owners of which speak cheerfully of the future.

On Mission Creek nine men have been working and prospecting during the summer, the yield of gold being about $1,200—a satisfactory increase over last year.

On Siwash Creek the workings have improved. Over $700 was taken out within a few days during October; the total yield from the creek being about $1,400.

There has been more work done on Rock Creek during the past season than for a number of years, and although in most cases only small wages were realized, the total output will be above the average.

Cedar Creek has been worked solely by Chinese this season, and from what I can learn, with indifferent success.

Boundary Creek seems, as far as placer mining is concerned, to be virtually abandoned. The last claim on the creek, the Louisa, held by Mr. John Thornton, lapsed on the 31st of May last.

QUARTZ MINING.

Fairview.

I regret to have to report that mining operations have not been carried on in this camp as extensively as during last year, owing, chiefly, to the Strathyre Mining Company having closed their quartz mill and suspended operations on their different properties early last spring. However, I am pleased to be able to say, the prospects are much brighter at the present than at any time during the past six or eight months. The owners of the famous Morning Star mineral claim, Messrs. Mangott and McEachern, have secured a lease of the Strathyre Mining Company's quartz mill, for a period of five months from the 20th inst., and have at present sixteen men engaged taking out and milling ore, and intend, during the term of their lease, to keep the mill, which has a capacity of twenty tons during the twenty-four hours, constantly running. One thousand tons of ore from this claim, worked in the Company's mill during the first part of the year, yielded $12,000 in gold and eight tons of concentrates, which realized at the Tacoma smelter $150 to the ton.

About 200 tons of ore from the Brown Bear have lately been worked in the Company's mill, and yielded about $5 per ton in gold.

On the Stemwinder, owned by Messrs. Gwatkin and Sheehan, a considerable amount of development work has been done during the past summer; the old shaft has been continued to a depth of 50 feet, and the tunnel started two years ago extended to a distance of 150 feet. The veins, three in number, are exceptionally large, and assay high in gold.

On the balance of the claims in camp nothing more than the necessary amount of work to comply with the Act has been attempted.

The locations on the mountain between Fairview and the Boundary Line have, with a few exceptions, been allowed to lapse, and little more than the annual assessment work has been performed on those still held.

Camp McKinney.

Foremost amongst the mineral claims in the district at the present time are the Cariboo and Amelia, owned by the Cariboo Mining and Milling Company, of Spokane, Washington. Early in the present year the Company brought in a ten-stamp mill to work their ore, and since the 1st day of May (when it started running) up to the 1st instant it had worked 163 days, milled 3,100 tons of ore, which produced gold to the value of $34,750, and about 60 tons of concentrates. The work, principally on the Cariboo, consists of 675 feet of tunneling, at a depth of from 60 to 80 feet, 370 feet of which was run this year. The area stoped out will amount to about 170 feet long, 50 feet deep, and 4 feet wide. About 30 men have been constantly employed in the mine and about the mill during the summer, and I believe it is the intention of the Company to keep the mill running all winter, if not prevented by frost.

On the Eureka, owned by Mr. John Douglas, there is a shaft 159 feet deep, and a drift at the 80-foot lead of 112 feet. No work has been done on this claim this season.

On the Fontenoy, belonging to Mr. Hugh Cameron, an 83-foot shaft has been sunk, and the rock, which carries silver, lead, and gold, has assayed as high as $400 per ton. The average is about $24 in silver and gold.

On the Alice and Emma there is a shaft 62 feet deep, the ore from which is a free-milling sulphuret.

The Maple Leaf, owned by James Lynch, adjoins the Alice and Emma. On this claim a shaft has been sunk 30 feet, and at that depth free gold is found.

Three miles from the camp is the Snowdon, situated near the falls of Rock Creek; owners, Messrs. Elliott and James, who claim $50 per ton for the rock.

The Victoria, owned by the Haynes Estate, Basche & Goericke, has an incline shaft 110 feet in depth. From this claim some very rich ore has been taken. An assay made for Mr. Nicholson gave $480 per ton in gold. One lot of ore, amounting to 1,200 lbs., sent to the Selby Smelting Works, of San Francisco, gave a return of $127, and another lot of 100 lbs. $183 to the ton.

On the Old England, situated about two and one-half miles south-easterly from the camp, $350 has been expended, sinking and timbering a shaft about 35 feet deep. The ore is similar to the Victoria.

Anarchist.—Owner, R. G. Sidley. On this claim, $500 has been expended this season. The work consists of two shafts, one 12 and the other 10 feet, and a surface cut of 16 feet. The other improvements are: cabin, 14 x 14; shed, 14 x 14; and ore crib, 7 x 7, with douhle floor. Character of ore is gold pyrites and galena; with of vein, 4 feet, which assays in gold $9.13, and silver $3.79. There is a 16-inch streak in the vein which averages $16.54 in gold and 4 oz. in silver. The concentrates of the whole ledge average, gold, $58.76; and silver, $22.91.

Boundary Creek Mineral Belt.

The different camps in this district are situated on Boundary and adjacent mountains, immediately north of the International Boundary Line, in the Kettle River Mining Division.

The principal minerals, which are found in immense bodies, are silver, gold, and copper. The mineral belt is, approximately, ten miles north and south, and twenty miles east and west.

In Graham Camp, on Inghram Mountain, a tunnel has been run on the Texas about 30 feet, and it is the intention of the owners to extend the tunnel during the winter to a distance of 50 feet.

Copper Camp

Is situated at the head of Copper Creek, a distance of about six miles from its confluence with boundary Creek, and about the same distance from the new waggon road, whence it is connected by an exceptionally good trail built entirely by the miners of the district.

The character of the ore generally is red oxide, carrying native copper, copper glance, and a small percentage of silver and gold.

On the Copper mine (owners, Messrs. Moran and Hammer), there is a very large body of copper ore averaging about 40 feet in width, and in one place widens out to 100 feet. This is, undoubtedly, the best developed property in the camp. The work consists of an 18-foot shaft, a 40-foot tunnel, and a number of open cross-cuts, which expose the ledge for a distance of 750 feet.

The estimated value of ore in sight is between one hundred and fifty and two hundred thousand dollars.

The King Solomon joins the Copper on the south, but is on a different ledge, which is 26 feet wide. The character of the ore is similar to the Copper, the average of which runs from 15 to 20 per cent. copper, carrying silver from a trace to 10 oz., and gold up to $10 per ton.

The Copper Queen is on the same vein, and joins the above claim on the south. Crown grants have been obtained for both of these claims.

On the Yutacan, the work done this season consists of four shafts, 15, 8, 12, and 7 feet, respectively. The ore is similar to that on the Copper mine.

On the Copperapais, which lies north-east of the Yutacan, a considerable amount of development work has been done during the past summer. A cut 30 feet long, 6 feet wide, and 3½ feet deep, has been made in the face of the mountain; also two cross-cuts on the ledge, each 12 feet long and 8 feet wide. The ledge averages 12 feet in width. On the remainder of the claims, the same character of ore has been exposed.

Deadwood Camp.

Is situated about two and one-half miles west of Boundary Creek, and is reached by the same trail that leads to the Copper Camp. Little more than the necessary amount of work to comply with the "Mineral Act" has been undertaken in this camp this season.

The principal claims in Smith's Camp, which is situated about one and one-half miles north of Boundary Creek Falls, and five and a half miles from Midway, are the Nonsuch, Last Chance, Republic, and Hidden Treasure, which have been consolidated into the Republic Mining Company, with Spokane people as principal owners.

The development work on the Nonsuch, which has extended over a number of years, consists of two tunnels, one 80 feet on the vein, and one of 300 feet on the contact, at a depth of about 150 feet from the surface. The ore runs about $20 in gold.

On the Republic, a western extension of the Nonsuch, the ledge is from 10 to 14 inches wide, and assays $60 in gold, 12 oz. in silver, and 1 per cent. lead to the ton.

Hidden Treasure.—The work on this claim consists of a 60-foot shaft.

On the Last Chance, which lies north of the Republic, a 12-foot shaft has been sunk on the vein, which the owners suppose to be the same as the Nonsuch lead.

Skylark Camp.

On the Skylark, the discovery claim, a tunnel has been run on the ledge a distance of 90 feet, at a depth of 50 feet, and the old shaft continued to a depth of 45 feet, and two additional shafts have been sunk, one 20 and one 30 feet. During the season, 68 tons of ore were sent to the smelter at Everett, Washington, U.S., which yielded 200 oz. in silver and ⅓ oz. in gold per ton, of a total of $8,500 in silver (at 63 cents per oz.), and $1,800 in gold (at $20 per oz.) There is at present 25 tons of high grade ore on the dump ready for shipment, averaging 198 oz. in silver and 12 oz. in gold per ton; also 75 tons of lower grade ore, running 75 oz. in silver and 1 oz. in gold to the ton. The vein, which is 6 to 24 inches in width, of well mineralized ore, has been traced on the surface for a distance of 400 feet. The ore is principally grey copper and galena, with a small percentage of ruby silver.

On the Providence, which is situated about one and a half miles north of the Skylark, a 75-foot shaft has been made, and a few tons of ore from the shaft, shipped to the Tacoma smelter, yielded 238 oz in silver and ½ oz. in gold per ton.

Two shipments of ore from the Defiance yielded 380 and 680 oz. in silver, and ⅓ oz. in gold per ton.

Extensive development work has been none on the D. A., which is situated across Boundary Creek from the above claims. The vein, which is rich in silver and gold, is about 6 inches wide, and the ore is similar to that on the Providence, and assays 230 oz. in silver and 5 oz. in gold to the ton.

The Silver King, a new discovery, shows a strong silver-bearing ledge, with a high grade pay streak which runs from 90 to 420 oz. silver and $\frac{3}{10}$ oz. gold per ton.

On the Last Chance, a 40-foot shaft has been sunk on a well-defined vein two feet wide, which assays high in silver.

The Lead King has a 9-foot vein of silver-bearing rock, carrying 40 per cent. lead. The ore is low grade, but no doubt, in time, will become valuable for smelting purposes. A number of surface cross-cuts have been made, exposing the vein for a distance of over 1,000 feet.

The Helen, one of the most promising properties in the district, has a vein from 10 to 16 inches in width, carrying high grade silver and gold-bearing rock. Assays of samples taken from all parts of the ledge run from 11 to 46 oz. in gold, and 50 to 100 oz in silver per ton. The work consists of two shafts, one 12 and the other 6 feet deep; also a number of deep surface cross-cuts.

On the remainder of the claims in camp, little more than assessment work has been performed this season.

Wellington Camp.

The work on the Keystone, which is the original location, consists of three shafts of a depth of 15 feet each, and a number of open cross-cuts. Assays of ore from different parts of the ledge, which averages 7 feet in width, give $10 gold, 8 oz. silver, and a small percentage of copper to the ton.

On the Wellington, which lies to the north of the Keystone, a tunnel has been run which cuts the vein at a distance of 30 feet and a depth of 20 feet.

The ore runs $10 in silver and 25 per cent. copper to the ton.

On the Bland which is situated about one mile west of the Wellington, there is a 2-foot vein of silver-bearing ore which runs from $200 to $500 in silver per ton. A 20-foot shaft has been sunk on the vein, which has been stripped for a distance of 150 feet.

On the remainder of the claims, viz., the Ophir, Wall Street, Columbia, Vancouver, and Keno, the owners have confined themselves to the amount of work necessary to hold their claims.

Greenwood Camp

Is composed of a number of large parallel veins of copper sulphuret ore, running from 20 to 200 feet in width, carrying from $10 to $60 in gold, and 8 to 10 per cent. copper per ton.

The principal claims are the Knob Hill, Old Ironsides, Stemwinder, Brooklyn, Snowshoe, Gold Drop, Monarch, War Eagle, Victoria, and Rawhide.

The work on the Knob Hill consists of an open cut of 156 feet and a 14-foot shaft.

On the Old Ironsides three shafts have been sunk, one 12 and two of 10 feet each, and an open cross-cut of 150 feet run.

On the Stemwinder, which is supposed to be on the same lead as the two last-mentioned claims, the ore body is 60 feet wide, and very high assays in gold have been obtained. The claim is steadily being developed, and the ore increases in richness with depth.

The work on the Brooklyn, which is located on a parallel vein to the Stemwinder, consists of two cross-cuts and a 20-foot shaft. The ore assays $10 per ton in gold and six per cent. copper.

Gold Drop.—On this claim there are two distinct veins, one 60 and the other 30 feet in width. The ore runs from $7 to $20 per ton in gold.

On the Snowshoe the vein, which in places is 200 feet in width, has been traced for a distance of 1,000 feet.

On the Red Cloud, which is located on a cross-vein between the Stemwinder and Brooklyn, two shafts, one 14 and one 10 feet deep, have been sunk on the vein. Assays as high as $59 in gold and $30 in silver to the ton have been obtained.

On the Rawhide, a south extension of the Snowshoe, the ledge, which varies from 50 to 100 feet in width, can be traced the entire length of the claim, 1,500 feet.

On the Monarch 75 to 100 feet of open cross-cuts have been run. The width of the ledge has not yet been determined.

Central Camp.

On the Lincoln over $3,000 has been expended in development work in the past three years, which consists of a 100-foot shaft and 100 feet of drifting at the bottom of the shaft. A shipment of ore to the Omaha smelter yielded $26 in gold and 280 oz. silver per ton.

On the City of Paris, which adjoins the above claim on the west, a 45-foot shaft has been sunk and a 25-foot cross-cut run. The ore body is 16 feet wide, and assays $100 in gold and $170 in silver per ton.

About $450 has been expended this season on the Mabel in sinking a shaft 22 feet deep and running a drift from the bottom of the shaft for 8 feet. Three parallel veins lying between granite walls run the entire length of the claim. Assays made by the owner, Mr. John Douglas, from the southerly vein give from 1½ to 15 oz. in gold to the ton. The average of the three veins is $100 per ton.

The Oro, the east extension of the above claim, has two veins of gold-bearing ore, which have been opened up by a 20 foot shaft and a number of cross-cuts.

On the St. Lawrence about $1,000 has recently been expended, principally in running a tunnel about 80 feet in length. Three thousand five hundred pounds of picked specimens from this claim shipped to Tacoma yielded $1,000 in gold.

Summit Camp.

The claims in this camp, except for assessment work, have lain idle during the summer. Active operations on the Emma, however, are looked forward to during the winter, as the result of the sale of that property to American capitalists.

Following is a statement of the free miner's certificates issued and records made in the different mining divisions of the district from 1st January to 20th November instant:—

KETTLE RIVER DIVISION.

Free miners' certificates issued	202
Mineral claims recorded, 93; placer, 18	111
Transfers—Mineral claims, 55; placer, 4	59
Certificates of work issued	85
" improvements issued	3
Water grants	3

OSOYOOS DIVISION.

Free miners' certificates issued	86
Mineral claims recorded	14
Transfers recorded	16
Certificates of work issued	34
" improvements issued	1
Permits	9

VERNON DIVISION.

Free miner's certificates issued	39
Claims recorded	15
Abandonments	2
Transfers	2
Certificates of work	2

The total yield of gold and silver for the district from 1st January to 1st November is:—

Gold (placer)	$14,600 00
" (quartz)	50,550 00
Silver "	8,500 00
Total	$73,650 00

I have the honour to be,
Sir,
Your obedient servant,
C. A. R. LAMBLY,
Gold Commissioner.

The Hon. the Minister of Mines,
Victoria.

Similkameen Division.

MR. HUNTER'S REPORT.

GRANITE CREEK, November 9th, 1894.

SIR,—I have the honour to forward my annual mining report for the Similkameen Division of Yale District for the year 1894.

You will observe that the yield of gold and platinum continues to decrease, although a large number of claims have been taken up for hydraulic mining. With one or two exceptions, nothing more than prospecting has been done on any of them.

Mining in the rivers and creeks has not been a success this year, as the extreme high water prevented the building of wing-dams until late in the season.

The Anglo-American Gold and Platinum Mining Company have 640 acres situated on the South Fork of the Similkameen River. They had a force of 15 men engaged in prospecting their property, sinking shafts, and running tunnels, with very satisfactory results. This Company's property was also surveyed, with a view to bringing on water from the Wolf Creek Lakes. The work was carried on under the superintendence of Capt. Scott, who has gone East to raise the capital necessary to develop the property.

The Similkameen Gold Point Hydraulic Mining Company have secured 320 acres, and are working the lower benches by means of a bucking hydraulic. Mr. W. J. Waterman, the principal owner in this Company, informed me that from three hours' actual washing he obtained 5 oz. of gold, besides platinum. He is looking forward to a big wash-up at the end of the season, and next season purposes mining on a larger scale.

The Similkameen Gold Gravels Exploration Mining Company have leased some very rich benches, but have done nothing towards developing their property this season except having their ground surveyed for a ditch to supply the water required.

A company of eight miners have leased three miles of creek claim on Whipsaw Creek, a tributary of the South Fork of the Similkameen. They have been carrying on the work in a vigorous manner, and obtained good prospects. They intend pushing on the work next season.

On the Tulameen, or North Fork of the Similkameen River, very little mining has been done this year. The Tulameen Improvement and Hydraulic Mining Company have not done any work on their ground.

Two leases have been granted on Slate Creek, a tributary of the Tulameen, which should prove to be a profitable investment, as Slate Creek produced nearly as much gold as Granite Creek.

The Granite Creek Gold Mining Company have leased four miles and a half of the South Fork, and, as the ground is very deep, they are running a tunnel to tap the bed-rock. From latest information they have tunnelled over three hundred feet up stream, and intend carrying on the work during the winter.

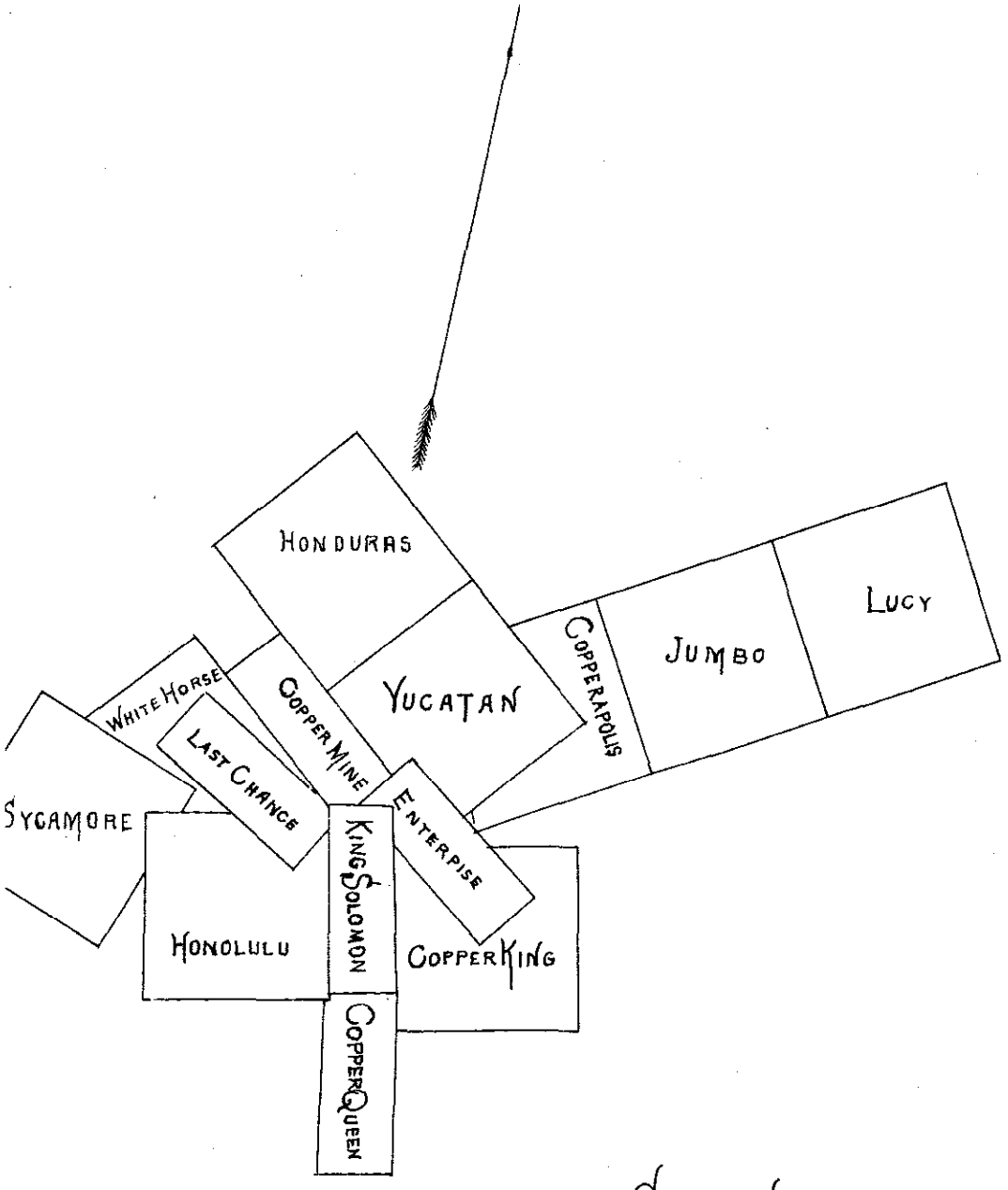
The Stevenson Gold and Platinum Hydraulic Mining Company have secured 640 acres on the lower end of Granite Creek, and are having logs cut for their saw-mill, which is expected soon. Surveys have been made, with a view to having everything ready for an early start in the spring. This property has been thoroughly prospected with good results.

Several applications for leases have been received from different parts of the district, and have been duly forwarded to the Gold Commissioner.

In quartz mining little has been done, owners of claims having merely performed their assessment work.

I have the honour to be,
Sir,
Your obedient servant,
HUGH HUNTER,
Mining Recorder.

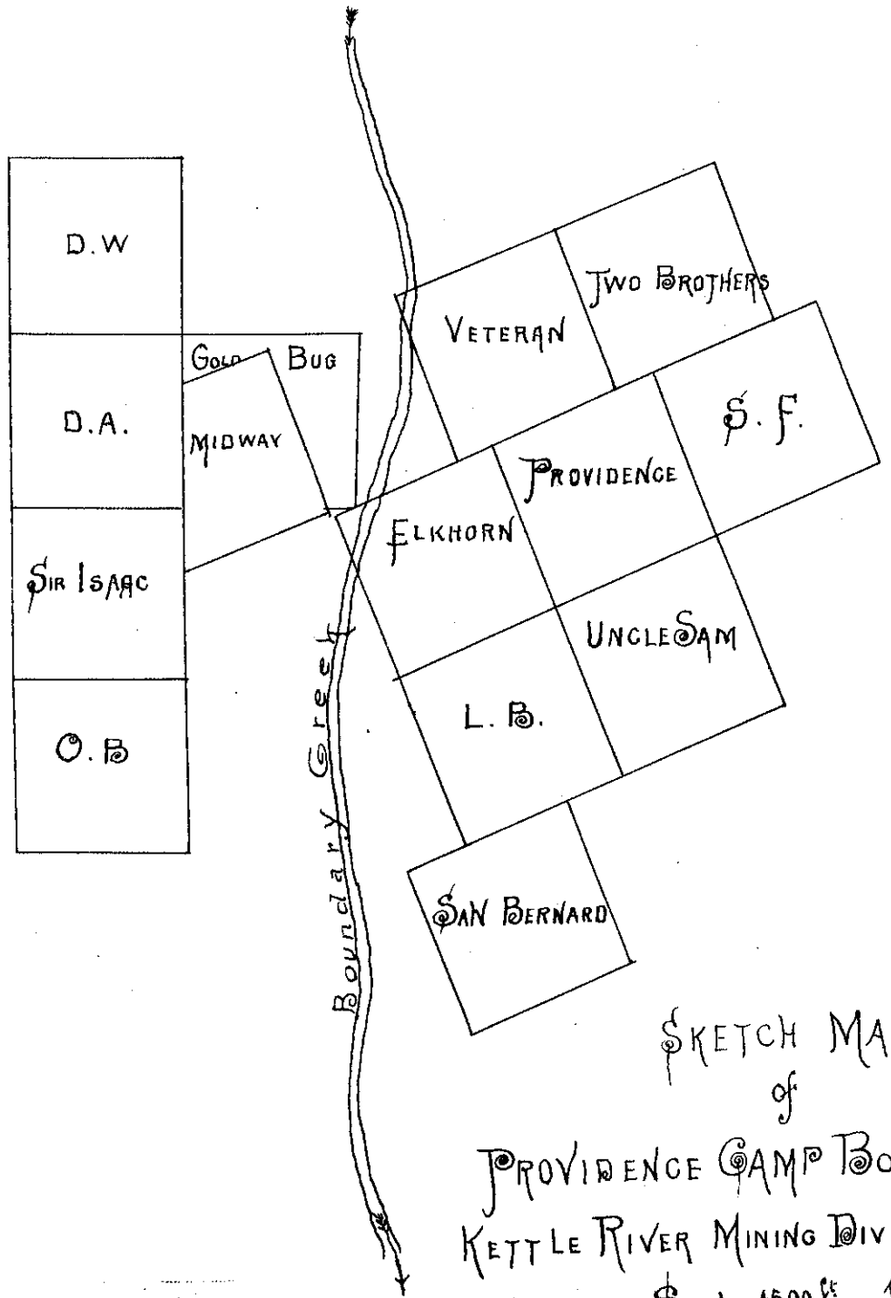
The Hon. the Minister of Mines,
Victoria.



Sketch Map of Copper Camp

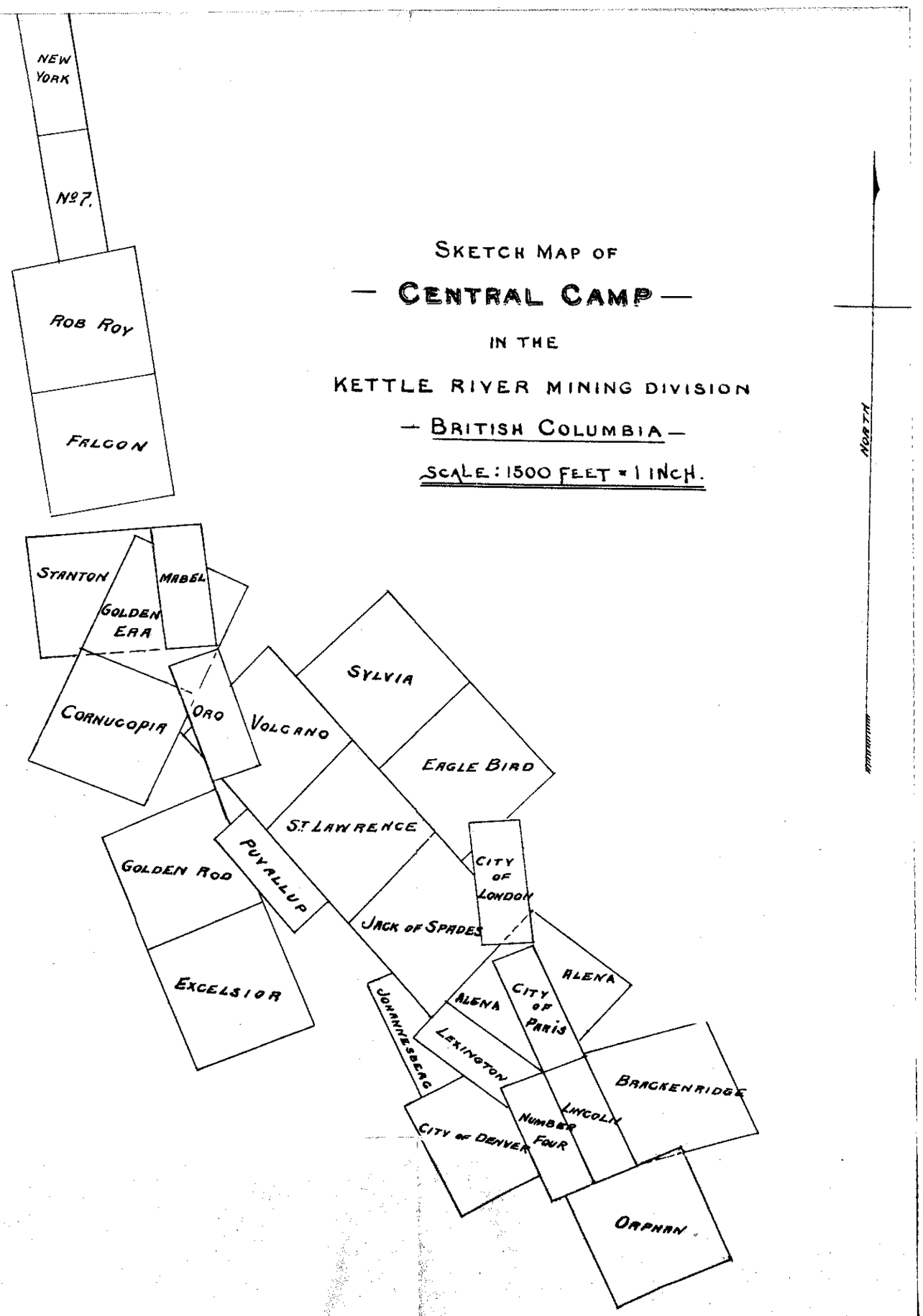
Kettle River Mining Division

Scale 1500 ft = 1 ins

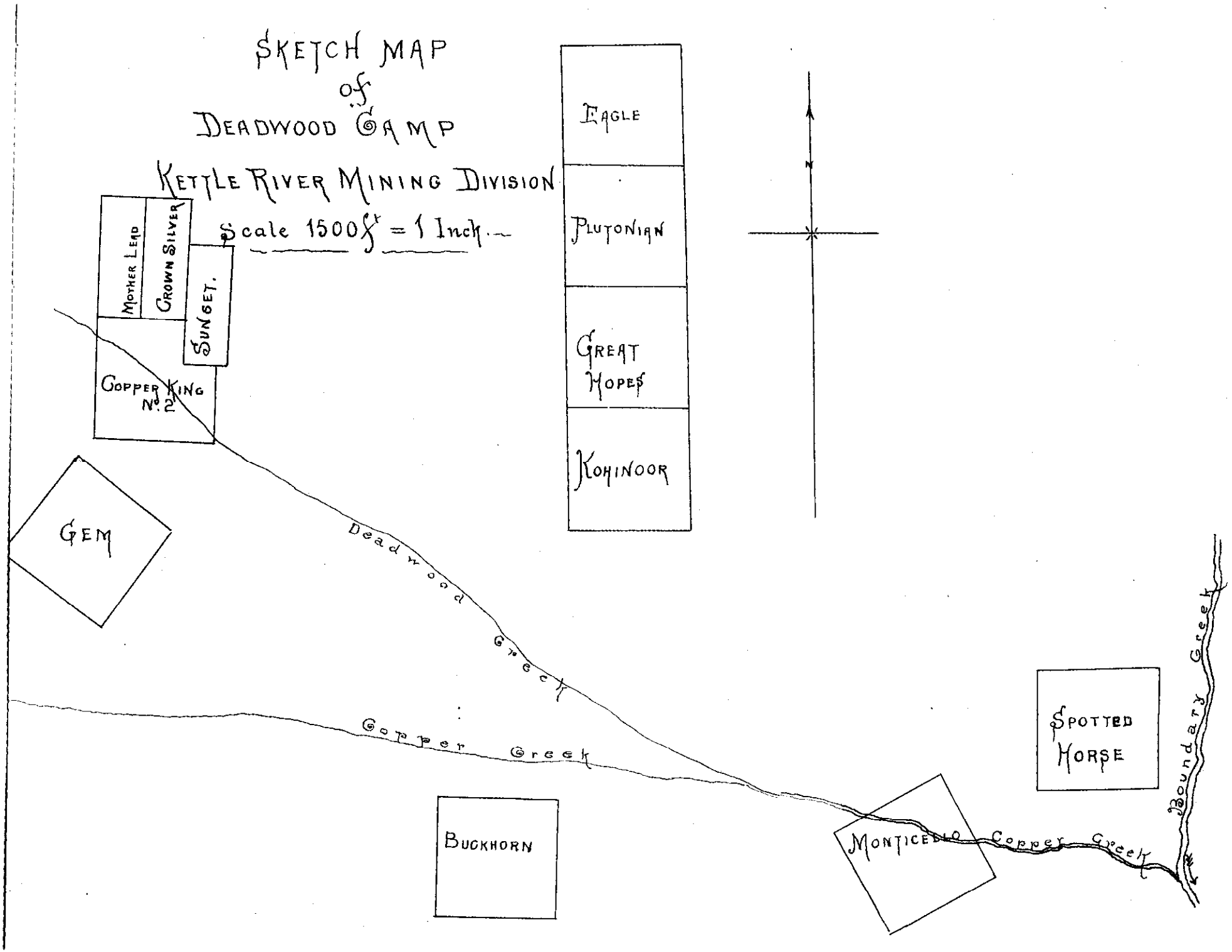


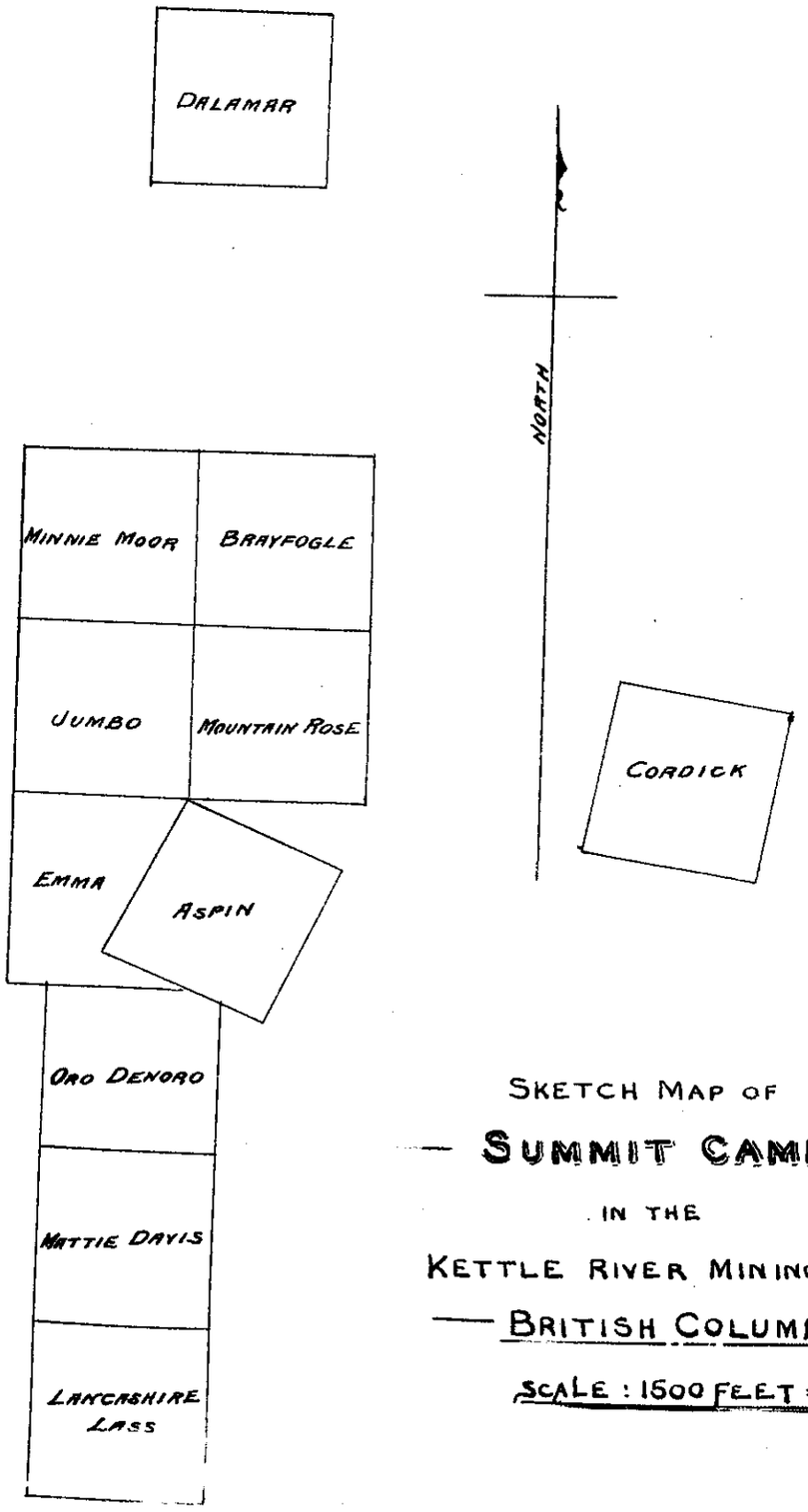
Sketch Map
of
Providence Camp Boundary Creek
Kettle River Mining Division B.C.
Scale 1500 ft = 1 inch

N



Sketch Map of
— Central Camp —
in the
Kettle River Mining Division
— British Columbia —
Scale: 1500 Feet = 1 Inch.


SKETCH MAP
of
DEADWOOD CAMP
KETTLE RIVER MINING DIVISION
Scale 1500 ft = 1 Inch.
MOTHER LEAD
CROWN SILVER
SUNSET.
COPPER KING No. 2
EAGLE
PLUTONIAN
GREAT HOPES
KOHINOOR
GEM
Deadwood Creek
Copper Creek
BUCKHORN
MONTICELLO
Copper Creek
SPOTTED HORSE
Boundary Creek



SKETCH MAP OF

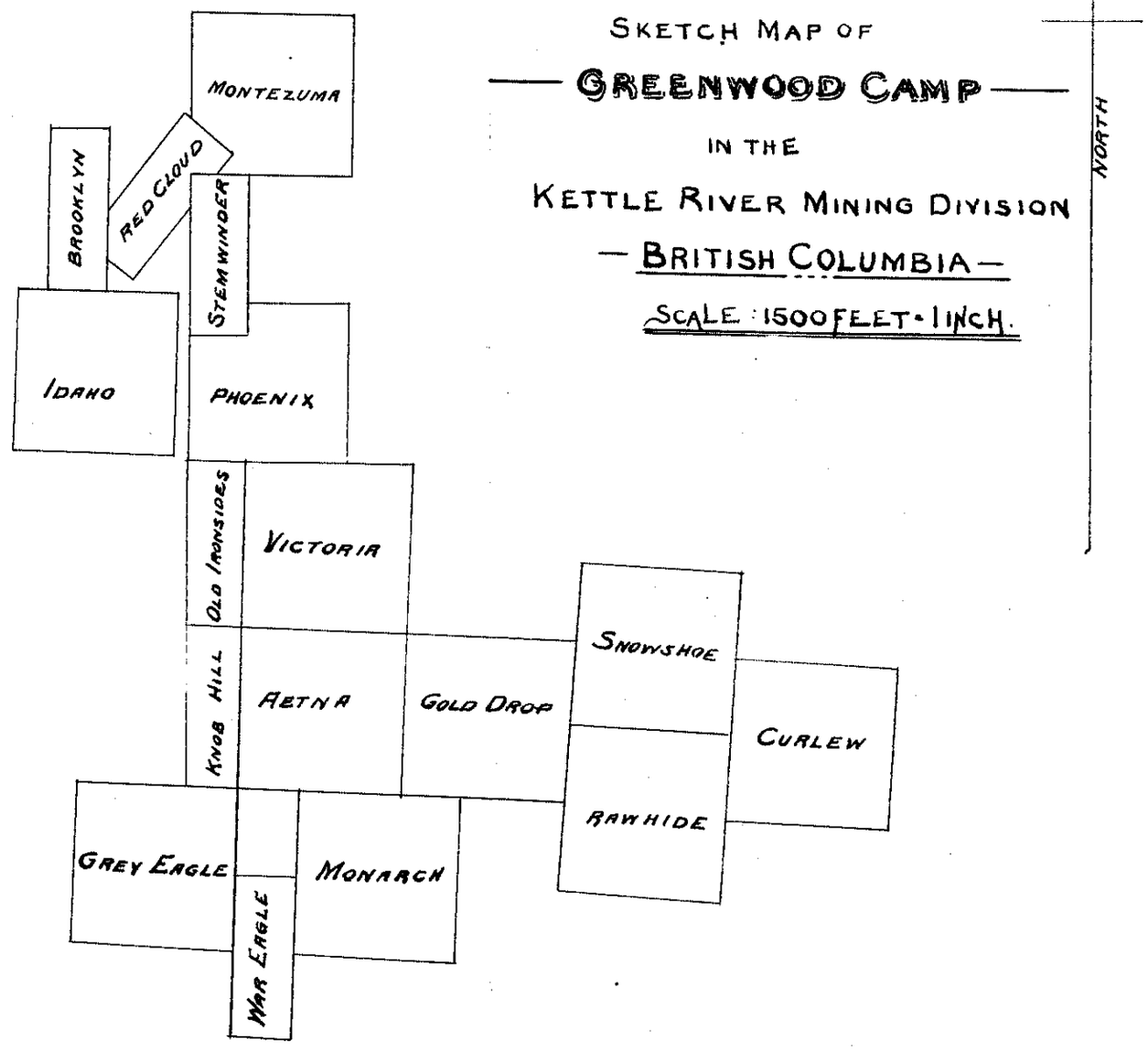
— SUMMIT CAMP —

IN THE

KETTLE RIVER MINING DIVISION

— BRITISH COLUMBIA —

SCALE : 1500 FEET = 1 INCH.



SKETCH MAP OF

— GREENWOOD CAMP —

IN THE

KETTLE RIVER MINING DIVISION

— BRITISH COLUMBIA —

SCALE : 1500 FEET = 1 INCH.

SKETCH MAP OF

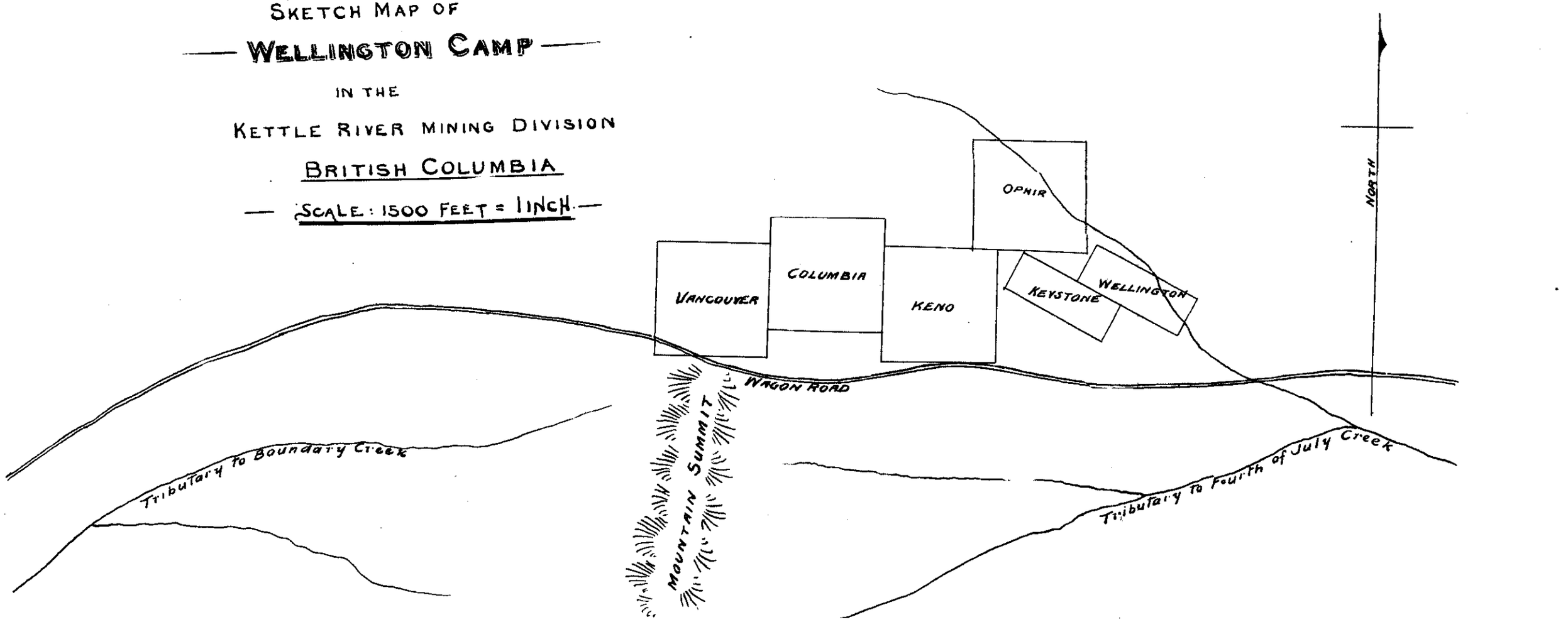
WELLINGTON CAMP

IN THE

KETTLE RIVER MINING DIVISION

BRITISH COLUMBIA

SCALE: 1500 FEET = 1 INCH



KEYSTONE

SWISS BOY

LAKE

RUBY SILVER

LAST CHANCE

IRON DUKE

SILVER KING

DENVER

SKYLARK

SWAMP ANGLE

MEADOW LARK

GREENWOOD CREEK

SKETCH MAP of SKYLARK CAMP KETTLE RIVER MINING DIVISION

Scale 1500 ft = 1 ins

CLIMAX

MAMMONT

HELEN

SUNRISE

M.G. BERNARD

NEW WAGGON ROAD

LYNN CREEK

CAPITAL PRIZE

BOUNDARY CREEK

GOLDEN GLOBE

MAPLE LEAF

LIVINGSTONE

LEAD KING

JIM CROW

HIGH KICKER

COMING MAN

VICTORIA

TELURIDE

TRUE NORTH

TUNNEL

MOUNTAIN CHIEF

AMERICAN BOY

BOUNDARY CREEK

Wagon Road

LAST CHANCE

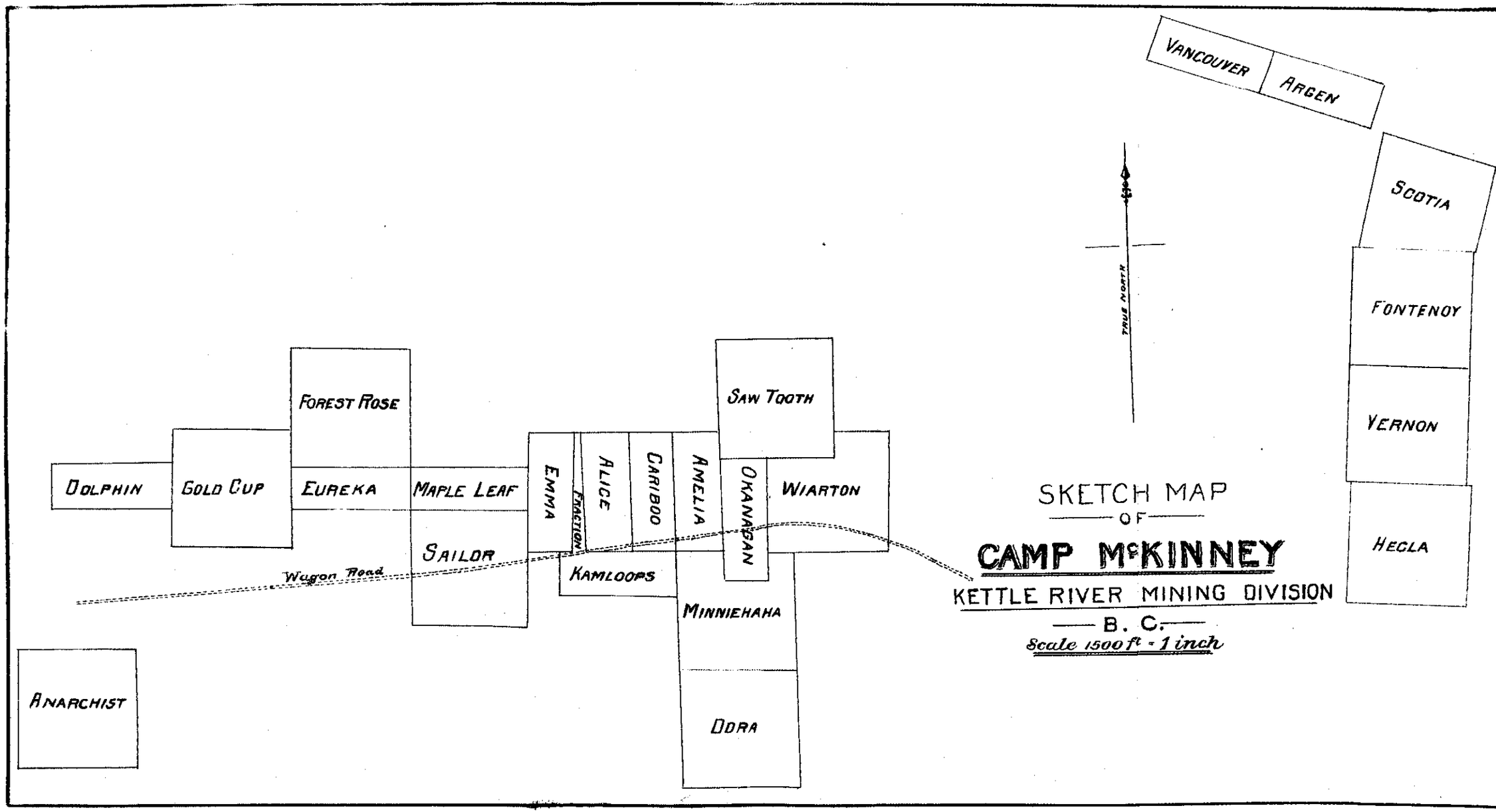
REPUBLIC

NON SUCH

HIDDEN TREASURE

Falls

SKETCH MAP
— OF —
SMITHS CAMP
KETTLE RIVER MINING DIVISION
— B. C. —
Scale 1500 ft - 1 inch.


VANCOUVER
ARGEN
SCOTIA
FONTENOY
VERNON
HECLA
TRUE NORTH
SAW TOOTH
FOREST ROSE
DOLPHIN
GOLD CUP
EUREKA
MAPLE LEAF
EMMA
FRACTION
ALICE
CARIBOO
AMELIA
OKANAGAN
WIARTON
SAILOR
KAMLOOPS
MINNIEHAHA
DORA
ANARCHIST
Wagon Road
SKETCH MAP
OF
CAMP McKINNEY
KETTLE RIVER MINING DIVISION
B. C.
Scale 1500 ft - 1 inch

WESTERN HILL

COMSTOCK

VICTORIA

HIDDEN TREASURE

GLADSTONE

WINCHESTER

WESTERN GIRL

WYNN M.

COMET

STEMWINDER

IVANHOE

DONNA

SILVER BOW

WIDE WEST FRACTION

WEST STAR

BISMARCK

MAYFLOWER

WIDE WEST

EXTENSION WIDE WEST

MANITOBA

To Keystone

Moffats

BROWN BEAR

SILVER BOW No 3

SILVER BOW No 2

HOMESTAKE

SILVER CROWN

LAST CHANCE

LAKE VIEW

ONTARIO

MORNING STAR

BLACK DIAMOND

AUGUST

EVENING STAR

BULLION

RATTLER

SPOKANE

ANNA JUNKON

RUBY

SMUGGLER

MORRIS

FRACTION

JOE DANDY

Reeds Creek

Strathyre Co's Mill Site

To Princeton

Elliots

To Osoyoos

TRUE NORTH

SKETCH MAP
— OF —
CAMP FAIRVIEW
— B. C —

Scale 1500 ft - 1 inch

COAL.

The following table shows the output of each year from 1874 to 1894, inclusive:—

Year.	No. of Tons.
1874	81,000
1875	110,000
1876	139,000
1877	154,000
1878	171,000
1879	241,000
1880	268,000
1881	228,000
1882	282,000
1883	213,000
1884	239,070
1885	365,000
1886	326,636
1887	413,360
1888	489,300
1889	579,830
1890	678,140
1891	1,029,097
1892	826,335
1893	978,294
1894	1,012,953

REPORT OF THE INSPECTOR OF MINES.

NANAIMO, B. C., February, 1895.

To the Honourable
The Minister of Mines,
Victoria, B. C.

SIR,—I have the honour, as Inspector of Mines, to respectfully present my report for the year ending 31st December, 1894, for your information, in accordance with the requirements of the "Coal Mines Regulation Act" of British Columbia.

The collieries in operation during the year 1894 were:—

Nanaimo Colliery, of the New Vancouver Coal Mining and Land Company, Limited.
Wellington Colliery, owned by Messrs. Dunsmuir & Sons.
Union Colliery, of the Union Colliery Company.

The output of coal during the year 1894 amounted to 1,012,953 $\frac{14}{20}$ tons, produced by the several collieries, as follows:—

Nanaimo Colliery	394,624 $\frac{17}{20}$ tons.
Wellington "	376,956 $\frac{17}{20}$ "
Union "	241,372 "
Total output in the year 1894	1,012,953 $\frac{14}{20}$ "
Add coal on hand 1st January, 1894	19,044 $\frac{15}{20}$ "
Total coal for disposal in 1894	1,031,998 $\frac{9}{20}$ "

The exports of coal by the Collieries in 1894 are 827,642 $\frac{10}{20}$ tons, as follows:—

Nanaimo Colliery, export	289,130	tons.
Wellington " "	304,852 $\frac{10}{20}$	"
Union " "	233,660	"
Total coal exported in 1894	827,642 $\frac{10}{20}$	"
Add home consumption in 1894	165,776 $\frac{18}{20}$	"
Coal on hand January 1st, 1895	38,579 $\frac{1}{20}$	"
Total	1,031,998 $\frac{9}{20}$	"

The coal was shipped at the Port of Nanaimo, Departure Bay, and Union, near Comox, on Vancouver Island, British Columbia. The exports were principally made to San Francisco, San Pedro, and San Diego, in California, U. S. Shipments were also made to Washington State, U. S., Alaska, Petropavloski, and to the Hawaiian Islands.

In order to show the standing of British Columbia coal in the California market, the following returns are set forth:—

British Columbia	649,110	tons.
Australia	211,733	"
English and Welsh	157,562	"
Scotch	18,636	"
Eastern, Cumberland, and Anthracite	16,640	"
Seattle, Franklin, and Green River	153,199	"
Carbon Hill and South Prairie	241,974	"
Mount Diablo and Coos Bay	65,263	"
Japan, &c	15,637	"
Total for the year 1894	1,527,754	"
" " 1893	1,479,785	"

To insure a correct statement of the entire amount consumed I have included all the arrivals by water at San Pedro, Port Los Angelos, and San Diego, in California, aggregating 208,936 tons.

Our large fuel consumers cannot complain of the prices they have had to pay this past year, as they have been the lowest ever known. Our consumption should have been largely increased on that account were it not for the stagnancy of trade among our principal manufactories. There is now every indication pointing to a possible twenty per cent. increase of fuel to be consumed in 1895 over and above the quantity burnt up the past year, and there is no article which so forcibly betokens prosperity as an increased coal demand.

I suppose we may feel gratified at the light concession allowed to us by the present Congress, although pronounced prosperity of our industry hangs upon the total abrogation of this most obnoxious tax on coal.

In connection with our coal mines, there are some thick beds of superior fire-clay, of which a considerable quantity has been sent to Victoria to be used in the potteries there.

Nor should we lose sight of the rising manufacture of a very superior and well tested coke now going on at the Union Colliery. The demand for this article at the iron works, where it is used both in this Province and California, is increasing. It is also growing in favour for heating stoves, where it is now much used.

As this coke is now made from the fine particles of coal that go away in the water from the coal washing machine, and would otherwise be lost, it is quite a profit to the Company, and we may expect to see at no distant day all the fine coal manufactured into coke.

THE NANAIMO COLLIERY.

No. 1 SHAFT, IN NANAIMO.

This No. 1 pit, as I have said in a previous report, is within the limits of the City of Nanaimo, and is the most extensive mine in this district, and is perhaps, from the surface, the most far-reaching mine in the Dominion of Canada, and belongs to the New Vancouver Coal Mining and Land Company, Limited. This has proved a most valuable mining property, and, to all appearance, no person can estimate its extent.

As I have mentioned in previous reports, this shaft is 650 feet deep, with a level from the bottom of the shaft known as No. 1 north level. About 50 yards in this level there is a slope driven in a north-easterly direction for 1,000 yards. At 600 yards down this slope the No. 3 north level branches off. All the workings of this extensive mine are under the waters of Nanaimo Harbour, except a small part in No. 1 level, which is under Protection (or Douglas) Island. The workings are generally dry, but not dusty. They are quite safe from any influx of water, as there is a thickness of from about 500 to 700 feet of hard rock and débris between the bottom of the water and the workings of the mine. All the workings in this mine are on the pillar and stall system, as well as on the panel principal. The pillars (coal) that are now being left are fully two-thirds of all the coal that was in the mine, this being left to protect the mine, but is in store for some future day.

The workings of No. 1 north level extend, as I have already mentioned, under the Nanaimo Harbour, Protection Island, and are now going under the Gulf of Georgia. This level, with all its windings, is now in from the shaft 4,500 yards, being the longest under ground hauling road in this district. For the long stretch of nearly two miles the coal has been very good, and has varied in thickness from 4 to 10 feet, except in some small spots. All the mining from this level is to the west side, excepting the slope mentioned in a previous report to connect with Protection Island shaft, which is to the east of the level, the coal dipping that way.

No. 3 level branches from the main slope and connects with the Protection Island shaft, east slope, about 200 yards from the top, and one and a half miles from where it leaves No. 1 shaft slope. The stalls from this level have been working up towards the No. 1 level. The coal in this section has been exceptionally good and regular, very little having been less than 6 feet thick. Some of it would go 10 feet, but all this will be stopped before they get to the No. 1 level, as they are going to leave a strip of coal about 40 yards wide as a barrier between the workings of the two levels. About half-way in the No. 3 level they have a slope down quite a distance to the eastward. This also promises to do well, the coal being good.

Ventilation is good, the intake being Protection Island shaft, the ventilation being on the separate split system, as follows:—To No. 1 level there was 45,000 cubic feet of air passing per minute. This was for two districts, viz.: To level and inside panel 15,000 feet per minute, for 21 men and 2 mules. Outside panel, 30,000 cubic feet per minute; this was for 59 men and 2 mules, both of those panels having a separate current. After passing the working places it gets in one body, and off to the upcast shaft. No. 3 level the ventilation is also good. When I was down in December I found that there were 18,000 cubic feet of cubic air passing per minute; this was for 45 men and one mule. In addition to the above, there were 25,000 feet per minute going down the main slope. This is for what men there are about the bottom of the shaft and in the slope.

No. 3 level has been the lowest place in which any mining has been done down this way since that memorable explosion on 3rd May, 1887. The slope has been extended 400 yards below No. 3 level, and is nearly all solid on the west side. Now that the slope has been cleaned up, everything put in order, and operations resumed, something good may be expected. This lower district is ventilated from No. 1 shaft.

In the levels above mentioned the New Vancouver Coal Company has been and is now hauling the coal out by electricity. Of this there is a full description in the report of 1893. Since that time they have got another large locomotive, which has brought out as many as 80 cars at one time, each car weighing fully one ton when loaded. This system of underground haulage is quite a success. Electricity is also used to haul the coal up the slope that is mentioned as being about half-way in No. 3 level. This is done by a winch, driven as above, and works well.

PROTECTION ISLAND SHAFT, NANAIMO COLLIERY.

This is also the property of the New Vancouver Coal Company, and is situated in the south point of Protection Island.

The mine is opened out to the north and south side of the shaft, but the principal mining is at present being done from the south level, which is a continuation of the coal worked in the No. 3 level of No. 1 shaft, and, except in ventilation, may be called part of the same mine. About 100 yards along this south level a slope starts. It goes to the east, and is the same that the No. 3 level of the No. 1 shaft connects with, 200 yards from the top. This level is now down 800 yards, with good coal almost to the bottom. Here they have a fault, but it will only take a short time to get over it. The prospects for coal down here are very good for a long time to come. This slope goes east, that is directly under the entrance of Nanaimo Harbour. From the north level there is another slope, which is is being driven in a north-easterly direction, under the Northumberland Channel, which separates Gabriola from Protection Island. Here the water is about two miles wide. Dipping from Protection, the rock gets thicker between the water and the mine as they advance. I think I will be quite safe in saying that by the time they get under Gabriola they will be 2,000 feet below the surface. In this slope they got a large down-throw of the coal. This they have now got over, and for the last 400 feet the coal has been very good, hard, regular, and about 6 feet thick. Here they have every indication of a very extensive field, and as I have said in my 1893 report, this is yet to be the great highway for bringing the coal out from under the above channel and the Gulf of Georgia, if not from the north end of Gabriola, where the New Vancouver Coal Company has large interests. This slope is now down 1,000 yards from the shaft, and it will be almost as many feet from the surface of the water.

This part of this mine, mentioned in my report last year as being shut down, for the wise purpose of reducing the output of coal, was started again in December, so that there will be a great increase in the production of coal for this Company.

Ventilation is good. I found that there were 10,000 cubic feet of air passing per minute for 30 men, and this will be greatly increased in a few days.

I may here say that nearly all the workings of both No. 1 and Protection shafts are under the sea.

The lower seam of this shaft has been idle, no mining having been done, but quite a few bore-holes have been put down to it from the upper seam, which give very encouraging prospects. Should this seam turn out well, it would be quite a boon to this place, and more particularly to the New Vancouver Coal Company.

I have not yet said anything about the machinery used at those two mines, as it is fully described in a previous report; yet there is one part that I would like to mention, as it is new about here, and that is the appliance for hauling the coal out of the two slopes in Protection shaft. At the surface there is a large steam engine, with grooved wheels for a rope to run in. This is a steel rope which acts as a belt, and goes from the engine down the shaft to the bottom; here there are large pulleys, which convey it into a winch at the top of the slope, and is used for lowering or hoisting, and is as well under control as if it were worked by steam.

This Company has erected two large bunkers for holding coal, one of them at their wharf at Nanaimo, which can hold 2,000 tons of coal. The other is built near their wharf on Protection Island, and can hold 1,200 tons. These bunkers are found to be a great saving in handling the coal that comes out of the mine when there is not a ship to put it in, and at any time when they expect a large steamship they can fill the bunkers and give it a quick dispatch.

NO. 5 SHAFT, SOUTHFIELD.

This mine also belongs to the New Vancouver Coal Company, and is the only mine that they have now in operation in this section of their estate. Here they have been much troubled with faults of one kind and another, and which they have not yet got clear of. But it is gratifying to know that this mine has much improved in the past year, the coal being much harder, and from experience I know it is very good. In some places the coal is over 20 feet thick, but in some other places it is quite thin.

There are two leading places in this mine, one of them known as the east drift (or heading). This starts from near the shaft on the east side, and is perfectly straight for 800 yards. This being the face for quite a long distance, the coal has been thick, good, and very hard. As

this place is going to the rise, the greater part is used as a self-acting incline for running the coal down. The other cutting place goes away from the shaft bottom on the west side, but is known as the east level, and is in about 1,000 yards from the shaft bottom. There has been some fine coal obtained from here, although there are some bad places.

Ventilation here is very good. When I was down in December there were 63,000 cubic feet of air passing per minute. This is used on the split system, the intake being to both sides of the shaft. On the east drift there were 31,200 cubic feet passing per minute. This was for the use of 35 men and 8 mules. On the west side or east level there were 32,000 cubic feet of air passing. This was for 45 men and 4 mules. This air is conducted well into the face by brattice or otherwise. There is not much gas found in this mine, and it is free from dust. Everything in and about this mine is kept in the best of order, nothing spared to keep it safe. This is connected with the old No. 4 slope.

NORTHFIELD MINE.

This mine also belongs to the New Vancouver Coal Company, and is entered by a shaft. There has been very little coal taken out of this mine during the past year, only a few men at work prospecting in what were known as the north and main slopes. In the north slope they got into good coal fully three feet thick. In this they drifted quite a long distance, the coal varying very little. This was also stopped. And now there is only one place working, and that is the slope. In this they are much troubled with faults, one after the other, yet they are persevering, and they expect to get into the same track of coal that the north slope is stoped on. The coal got from this mine was very good in quality, but thin and expensive to get.

No. 1 and No. 2, Southfield Mine, Nanaimo Colliery, is now worked out and full of water.

No. 3 pit (Chase River), Nanaimo Colliery, is worked out and filled with water.

HAREWOOD ESTATE.

This property belongs to the New Vancouver Coal Mining and Land Company, Limited, There has not been anything done here during the past year.

Nanaimo Colliery, with all the above mines closed, has good prospects for supplying a large demand from their No. 1 shaft, Protection, and No. 5 shafts, for many years to come.

WELLINGTON COLLIERY.

No. 1 PIT.

This shaft is mentioned in a previous report as being near Departure Bay, not far from the east boundary of the Wellington Estate. There has been much work done here, but they have sent away very little coal. Now they have the prospects of having a valuable mine at this place, both for coal and fire-clay, as when sinking the shaft they passed through 30 feet of good fire-clay, a considerable quantity of which has been sent away. This shaft is about 900 yards east of the face of the working of the famous No. 5 pit of this colliery, and, as they have put down a series of bore-holes between this shaft and the workings above mentioned, showing good results, they are now tunneling out from the shaft and have the expectation of reaching the coal in a short distance. All the works, both on the surface and at the bottom of the shaft, are fitted up in good style and convenient for the handling of a large output of coal, or anything that may have to be taken up or down this shaft..

No. 3 PIT, WELLINGTON COLLIERY.

There has not been any mining done during the past year, pumping having been done all the time. No. 4 pit drains to and is also partly ventilated by this No. 3 pit. There is yet a large quantity of coal to be got from this mine, but that is being left for some future time.

No. 4 PIT, WELLINGTON COLLIERY.

This is one of Messrs. Dunsmuir & Sons extensive mines, and is the same that had to be filled with water, owing to a fire in the old works. After the water was got out, they saw it was going to take a long time to get this again in working order, as most of the roads and air-ways were closed, stopping ventilation, and making it slow work to get ahead. But now everything is in working order again, the daily output of coal is again up to its usual quantity as if nothing had happened. The most of the mining done here is at the pillars (coal), which are fully two-thirds of all the coal of the mines, with the exception of one district, which is pillar and stall.

Ventilation is good, and on the separate split system, and is as follows:—On the west side there were 25,670 cubic feet of air passing per minute for 55 men; to the south side 21,500 feet per minute (this was for 62 men); to the east slant 15,000 cubic feet (this was for 37 men). The above 62,170 cubic feet of air is kept in motion by a Guibal fan, worked by a steam engine at the No. 4 fan shaft where the air goes out. There are yet 2,000 cubic feet of air per minute which go to the No. 3 shaft; this is for six men. The above air is well conducted around the stalls and pillars where the men are at work. In addition to all the men above mentioned, there are 25 mules distributed throughout the mine.

There is now very little gas seen in this mine, yet the greatest care is taken, the old works and all other places being carefully examined. Between firemen and shot-examiners, if there was any standing gas, they would be sure to find it, as they are continuously on the move from one place to another.

No. 5 PITT, WELLINGTON COLLIERY.

This is still the only mine of Messrs. Dunsmuir & Sons which is connected with the Esquimalt and Nanaimo Railway, and has direct communication with Victoria. The locomotives come here for the coal used by them, and the Railway Company's cars go under the shute and get coal for the Victoria market.

No. 5 pit is the greatest producing mine in the Wellington Colliery, the coal being brought to the shaft bottom from all directions. On the south and west side by a self-acting incline; from east level, New Diagonal and Horne's heading, by tail-rope system of haulage; and from the north side by a slope.

Much of the coal is mined here from the pillars; at other places by the pillar and stall system. But there is much of the mining done on the long-wall system; this latter works very well. There is a large extent of coal in sight, which will last a long time. The coal here, as is all the coal mined in this Colliery, is very good and hard, and from what they know by a series of bore-holes, it extends down close to the No. 1 shaft, near Departure Bay.

Ventilation good; motive power, Guibal fan worked by a steam engine. There was in December 109,000 cubic feet of air passing to the up-cast shaft per minute for 247 men and 33 mules.

The above is conducted on the separate split system and distributed as follows:—

To the New Diagonal slope there was 37,000 cubic feet of air passing per minute for 58 men; Horne's heading, 10,000 feet per minute for 16 men; and, as I have said, the haulage from those districts is on the tail-rope system, worked with compressed air. On the west and south incline there was 6,000 feet of air passing per minute for 7 men; the mining in this district is at the pillars.

No. 1 slope, there was 15,000 feet for 20 men. No. 2 slope, 15,000 feet of air passing per minute for 41 men. Long-wall District, 18,000 cubic feet of air for 45 men; and in the old Diagonal slope there was 8,000 cubic feet of air passing per minute; this was for 6 men. The mining in this last-mentioned district is also at the pillars. In addition to the men above-mentioned there are 33 mules distributed throughout the mine. This mine is free from dust.

In addition to the manager, there is the overman, fireman, and a staff of fourteen (14) shot examiners in this mine. These are constantly on the move from one place to another, never long in one place, except their presence is required; the smallest change taking place, or anything going wrong in the air-way, is sure to be found out quickly.

The bottom of this shaft is lighted up by electricity. This mode of lighting, and the use of the electric spark for pumping and for the locomotion in underground haulage, is now becoming quite an important power in mining machinery in this district, and is giving good satisfaction.

No. 6 PITT, WELLINGTON COLLIERY.

This pit also belongs to Messrs. Dunsmuir & Sons, and is about 900 yards east of No. 4 shaft. There are barriers of about 40 yards between the two mines in case of accident to either. The working of this No. 6 is connected with No. 5 shaft, but only in one place, and that is a travelling road. This connection is so fixed that it can be closed at any time, standing a great pressure, and does not interfere with the ventilation of either.

This is quite an extensive mine. Most of the mining is being done on the east side and in a northerly direction towards the workings of No. 5 pit, as well as in the south level. In this mine, as well as in all the other mines of this Colliery, the coal is very hard and of its usual good quality, for which there is quite a demand in the California market. Much of the coal has been mined here on the long-wall system. Now all the mining is done on the pillar and stall system, and a very small percentage being lost at the pillars.

In this mine Messrs. Dunsmuir & Sons have also started to mine in an upper seam of coal, the same that was worked in the East Wellington Colliery. At present the coal looks well, and is about two feet thick, hard, and has the appearance of being good. The opening in this coal is only small yet, but I hope that this may be a profitable coal to get, the whole district being full of it, except the small piece worked in the East Wellington Colliery. If it keeps good we may expect to see this vein of coal worked in the Northfield as well as the Wellington Estates.

Ventilation good; motive power, a fan on the Murphy principle worked by a steam engine. When I was down in December there were 41,400 cubic feet of air passing per minute. This was for 169 men. This mine is also ventilated on the separate split system, and in the following divisions:—To the east level there were 13,200 cubic feet of air passing per minute; this was for 60 men. East incline, 12,500 feet per minute for 55 men. Westside, 7,300 feet per minute for 32 men. And to the south level there were 8,400 cubic feet of air passing per minute; this was for 22 men. In addition to the men there were 16 mules distributed throughout the mine.

Much of the mining done here is at the pillars (coal), which represented fully two-thirds of the coal. Although this pit is connected with No. 5 pit, yet it is independent of it as far as ventilation is concerned. The mine is free from dust, and there is little or no gas found in it. Yet they have their full staff of firemen and shot examiners always looking as if they expected to find gas.

No. 2 SLOPE AND ALEXANDRA MINE.

The above mines are the property of Messrs. Dunsmuir & Sons. There has not been anything done during the past year in either the No. 2 slope or the Alexandra Mine.

EAST WELLINGTON COLLIERY.

There has not been anything done in this colliery during the past year. Both shafts are now full of water.

UNION COLLIERY, COMOX.

No. 1 SLOPE, UNION COLLIERY.

This colliery is the property of the Union Colliery Company. This is the same mine as mentioned in a previous report as No. 1 shaft, and where they were pumping the water from. Here they have been working for the greater part of the past year mining coal, which is very hard, and of the usual good quality of the coal from this colliery. The mining here has been on the pillar and stall system, and taking out pillars.

Ventilation is good; motive power, a fan on the Murphy principle. On December 20th there were 23,250 cubic feet of air passing per minute for 65 men. There is little or no gas now found in this mine; everything is kept in good order.

No. 2 Slope, Union Colliery.

This mine used to be worked from a shaft, but is now connected with a slope to the surface. This is where the machinery is re-erected, and the coal taken out; the shaft above mentioned being now the upcast shaft.

There has been much work done, but nothing regular in the way of coal was obtained until they got down quite a long distance, when good coal was struck. They are now in about 600 feet. Coal hard and very good—4 feet thick. This slope, from the surface to the bottom, is now 600 yards long. This is now a most valuable mine, having a greater field in front of them.

Ventilation good; motive power, a furnace. On December 20th there were 11,230 cubic feet of air passing down the slope per minute; this was for 29 men.

This slope is now being put in good order, seeing that they have now got a valuable coal mine, and one which will give a good account of itself for years to come.

No. 4 Slope, Union Colliery.

This is the slope mentioned in a previous report as No. 1 slope, and is the most extensive mine in this large colliery. It is now the longest slope in this district, from the entrance to the face is one mile, with the addition of 700 feet to where the engine stands. The first 500 yards of this slope is very flat, having to be worked by the tail-rope system. After the above distance it is of a very easy grade, so that the empty cars can take the rope down, the engine hauling up 12 loaded cars at one time, with fully one ton of coal in each car.

From this slope there have been eleven levels worked into the east side. The west side is nearly all solid, and at present they are not doing any work there. In the face of the slope which they are now extending the coal is seven feet thick, in three plies, with soft rock between the plies of coal. Of the levels working at present there are the Nos. 3, 4, 6 and 7 levels, which are intersected by a diagonal slope which branches off the main slope near the surface. The coal from the above levels goes out this way, being hauled by the slope engine, which saves much labour in running the coal. This slope is being continued so that the lower levels may also be cut off. Then again, there are the Nos. 8, 9, 10, and 11 levels, from which, together with the slope, the coal is being hauled out of the main slope. As I have said, all those levels are from the east side, with the coal varying in thickness from 3 to 9 feet. In some places it is somewhat soft, but the quality is good, as I will show you further on. This mine is worked on the pillar and stall system, leaving large pillars, which they will get after a time.

Ventilation is good; motive power, a large Guibal fan worked by a steam engine, both of which are erected on the top of the upcast shaft. The intake for the air being the main slope, and the travelling way, which goes parallel with the slope, from the outside. As I have said, ventilation is good. When I was down on the 20th December there were 42,600 cubic feet of air going down the intakes (slope and travelling-way); this was for 126 men. This mine is ventilated on the separate split system, as follows:—To the west side, when there are not any men at work, there were 8,400 cubic feet passing per minute; this was to keep some of the old works clear. To Nos. 3, 4, 6, and 7 levels, east, there were 11,250 cubic feet of air passing per minute; this was for 60 men. And to 8, 9, 10, 11 levels there were 18,720 cubic feet of air passing per minute; this was for 66 men, leaving 4,230 feet that escaped at the different doors on the levels near the slope; this was not lost, as it was caught up at the levels where it went in.

All the works and appliances about this mine are got up on systems for the saving of labour in handling the coal. This applies to both above and below ground. It will not be necessary for me here to give a description of the machinery and different appliances used, as they have been fully described in a previous report.

Nos. 1 and 2 Tunnels, Union Colliery.

There has not been anything done here during the past year.

No. 5 Shaft, Union Colliery.

This is a new shaft at present being put down by this Company. This shaft is about one and a half miles to the eastward of the bottom of No. 4 slope. As this has been bored near to where the shaft is going down, they expect to reach the coal at about 500 feet from

the surface. From the prospects got in the bore-hole, and from what they now see in No. 4 slope, everything goes to show that this will be a productive and valuable coal mine.

The railway is now graded to the shaft, and the permanent pit-head gear is erected. The engine is only a temporary one, as they are getting a large hoisting engine that will be able to take out 2,000 tons of coal per day, if required, and in all likelihood it will be wanted to do the above work, as this coal is gaining favour wherever taken. You will see by the returns that the output of coal here has almost doubled in the past year.

In addition to anything I may have said about the Union coal, the following communications were received, which are about as good authority as we can get:—

(Copy.)

"WAR DEPARTMENT,
"QUARTERMASTER-GENERAL'S OFFICE,
"WASHINGTON, D. C., MAY 17th, 1894.

"*To the Chief Quartermaster,*
"*Department of California.*

SIR,—Tests have been made of the sample of Comox coal purchased by you and shipped to the Depot Quartermaster, this City, with the following result:—Twenty-two hundred and twenty-two (2222) pounds equal one cord of standard oak wood.

"You will cause the proper parties to be informed of the result of this test.

"Very respectfully,
"R. N. BATCHELDER,
"*Quartermaster-General,*
"*U.S.A.*"

"HEADQUARTERS, DEPARTMENT OF CALIFORNIA,
"OFFICE OF THE CHIEF QUARTERMASTER,
"SAN FRANCISCO, CAL., MAY 24th, 1894.

"True extract copy respectfully furnished Messrs. R. Dunsmuir & Sons, San Francisco, Cal., for their information.

"J. G. CHANDLER,
"*Assistant Quartermaster-General,*
"*U.S.A.*"

[COPY.]

SAN FRANCISCO, CAL., March 5th, 1894.

Analysis of sample of coal mined by the Union Colliery Company, Limited, B. C.:—

Fixed carbon	59.02
Volatile carbonaceous matter	33.18
Water	1.24
Ash	6.56
	100.00 %
Sulphur	0.20 %.
Specific gravity	1.280

This sample forms a good, firm, and hard coke.

Tests made with a Thompson's Calorinater show the coal to have an indicated power of 7.865 calories.

One pound of the coal will evaporate 14.16 lbs. of water from 212 degrees Fahrenheit.

(Signed) THOMAS PRICE & SON.

ACCIDENTS

IN AND ABOUT THE COAL MINES, FOR THE YEAR ENDING 31ST DECEMBER, 1894.

January 4th—David Hopkins, runner in No. 1 shaft, Nanaimo Colliery, was killed by being struck with a prop which was pulled out, a rope being around it for lowering cars down an incline.

" 22nd—Hugh Grant, miner, working in No. 6 pit, Wellington Colliery, was injured about the back by a fall of rock while at work in his stall.

" 25th—R. Vass, miner, working in No. 4 slope, Union Colliery, got the small bone of one leg broken by a fall of rock while at work in his stall.

February 10th—A runner working in the No. 4 slope, Union Colliery, had his leg broken by a car while at work in the mine.

" 16th—J. P. Remarer, miner, working in No. 5 pit, Wellington Colliery, got his face slightly burned by a premature explosion of a shot.

March 21st—Charles Bosin, miner, working in No. 5 pit, Wellington, was killed by a fall of coal when at work in his stall.

April 17th—William Ballie, mule driver in No. 6 pit, Wellington Colliery, got a bone of foot broken by a piece of coal falling on it.

" 26th—George Notts, mule driver in No. 4 pit, Wellington Colliery, was slightly burned about the face by igniting some gas.

May 12th—Henry Rosewall, miner, working in Northfield Mine, Nanaimo Colliery, had one leg broken by a fall of rock while at work in his stall.

" 18th—George Hayworth, miner, working in No. 5 pit, Wellington Colliery, was slightly burned about the neck by an explosion of gas.

" 28th—George McGargle, mule driver in No. 5 pit, Nanaimo Colliery, was slightly burned by an explosion of gas while at work.

" 29th—William Jones, tracklayer in No. 4 pit, Wellington Colliery, was slightly burned about the face by an explosion of gas while at work.

June 5th—James Wallace, miner, working in No. 1 shaft, Nanaimo Colliery, was injured about the body by a fall of coal while at work in his stall.

" 21st—William Hughes, miner, working in No. 5 pit, Nanaimo Colliery, got his leg broken and otherwise injured about the body by a fall of coal while at work in his stall.

" 25th—Chung, brattice-man in No. 4 slope, Union Colliery, was slightly burned by an explosion of gas while at work.

" 26th—Thomas Vague, miner, working in No. 1 slope, Union Colliery, was hurt about the shoulders and ribs by a fall of coal while at work in his stall.

July 9th—Charles Mattson, runner in No. 5 pit, Wellington Colliery, was injured about the back by a car in the mine.

" 11th—John McKibbon, mule-driver in No. 4 pit, Wellington Colliery, got his arm broken by a car in the mine while at work.

" 12th—J. Stella, miner, working in No. 4 slope, Union Colliery, was injured by the premature explosion of a shot while at work in his stall.

" 12th—Yam (Chinaman) was slightly burned about the face by an explosion of gas while at work in No. 2 slope, Union Colliery.

" 28th—John Monochie, miner, working in No. 4 slope, Union Colliery, had the small bone of one leg broken by being caught in the rope on an incline.

August 10th—Steve Morris, timberman in No. 4 pit, Wellington Colliery, was injured about the back by a fall of rock while at work.

" 29th—Ah Sing, labourer working in No. 4 slope, Union Colliery, was slightly burned by an explosion of gas while at work.

Septemb'r 28th—Ah Tuck, runner in the No. 1 slope, Union Colliery, was killed by a fall of coal while at work.

" 28th—Robert Dunsmore, miner, working in No. 1 slope, Union Colliery, was slightly injured about the back by a fall of coal while at work.

October 15th—J. Kelly, runner in the No. 5 pit, Nanaimo Colliery, got his leg fractured by a fall of rock while at work.

October 15th—Herman Rosetta, miner, working in No. 5 pit, Wellington Colliery, had his leg broken by a fall of rock while at work in his stall.
" 20th—Louis Simoside, miner working in No. 4 slope, Union Colliery, was slightly burned about the face and arms by an explosion of gas while at work in his stall.
" 22nd—E. Barriatte, locomotive driver in No. 1 shaft, fell off the motor and got jammed by a car.
" 24th—J. S. Robinson, conductor on No. 4 slope, Union Colliery, was slightly hurt while jumping off the car while in motion.
Novemb'r 26th—George Graham, runner in No. 4 slope, Union Colliery, had his leg broken by being caught in the rope for lowering cars in the mine.
" 16th—William Quail, miner working in No. 1 shaft, Nanaimo Colliery, was killed by coal from a blowing through shot while at work in his stall.
Decemb'r 12th—J. Sayce, miner working in No. 5 pit, Wellington Colliery, was injured about the back by a fall of rock while at work in his stall.
" 15th—Patrick Malone, miner, working in the No. 6 pit, Wellington Colliery, got his back badly bruised by a fall of coal while at work in his stall.
" 19th—Batti Felicia, miner working in No. 6 pit, Wellington Colliery, dislocated his hip while in the act of taking down coal.
" 24th—Daniel Anthony, miner, had both legs broken while at work in his stall in the No. 4 slope, Union Colliery.
" 24th—Sing Gin, labourer, working in No. 4 slope, Union Colliery, was slightly burnt about the face and hand by an explosion of gas.

It is with sincere regret that I have again, at the close of another year, to make out the above long list of accidents, yet it is very satisfactory to know that there has been a great decrease, and fewer casualties, both serious and fatal, than there has been to report for many years.

Some of those mentioned in the list were very slight, the men being at work in a few days. Again, some of them were very serious; in some cases months elapsed before the unfortunate ones could again attend to their work.

In the above list, you will observe that there is a total of 37 accidents, 33 of those slight or serious, 4 being fatal. Of the 33 casualties, 6 were with coal, 8 with rock, 9 by explosions of gas, 2 by shots, 5 by cars in the mine, 2 by rope on inclines, and 1 while in the act of taking down coal.

Of the 4 fatal accidents, 2 were caused by falls of coal, 1 by a shot, and 1 by being struck by a prop which was pulled out, being used for the rope to run around at the top of a self-acting incline.

I have made enquiries into the circumstances of all these accidents, and on many occasions was at the place before I got notice. You will also have observed that all the accidents mentioned took place while the men were at work.

In the case of fatal accidents, there is generally a messenger sent to let me know, so that I may see the place before it is much disturbed, only removing what may be required to get the unfortunate one out.

I have no doubt but you will have observed, while looking over the list of accidents, that they have all occurred singly, and in the separate places where the men were at work.

With respect to the fatal accidents, and in all cases where an inquest was held, all evidence was taken which it was possible to get, and, as the evidence of those inquisitions is now filed in the Attorney-General's Department, I beg leave to refer you to the same.

In addition to the miner looking after his own safety, there is the manager, overman, fireman, shot examiner, and other persons having authority. All these are on the move throughout, not being long in one place, except when their presence is required, so that very little can escape their watchful eye.

All the old works, as well as the present working places are frequently examined for gas, this being the great enemy to guard against in coal mining, and I am glad to be able to say that there is now not much of it found in our mines, the ventilation being so good that it has got very little chance to accumulate.

In all the mines at work in the Nanaimo Colliery, a deputation of the men is sent once a month to examine the mine as to its condition for safety. The result of their finding is posted up in a conspicuous place, so that all may see it, as well as being entered in a book kept for that purpose, thus letting the workmen know the condition of the mine as to its safety.

At neither the Wellington or Union Collieries do the workmen take the benefit of this privilege, granted them by the "Coal Mines Regulation Act." I have no doubt but that the management would be pleased to see the workmen make a move in the above direction.

I am pleased to see the decrease in the accidents in and about our mines for the past year, but I yet hope to be able to say, when this year which we have just entered on comes to a close, that the accident roll will be wanting. If all precautions at our command are well exercised by officials and workmen, we will experience the good result, for it is only by using the greatest care and precautions that risks can be guarded against.

The above remarks apply alike to all about a colliery, from the manager to the boy that opens the door and shuts it again so that the air may travel where it was intended to go.

I may say here that there have been two convictions under the "Coal Mines Regulation Act." One of these was for opening a locked safety lamp in the mine; the other was for firing a shot without instructions from the shot examiner.

I have the honour to be,
Sir,
Your obedient servant,
ARCHIBALD DICK,
Inspector of Mines for British Columbia.

COLLIERY RETURNS.

NANAIMO COLLIERY RETURNS FOR 1894.

Output of coal for 12 months ending December 31st, 1894.		No. of tons sold for home consumption.		No. of tons sold for exportation.		No. of tons on hand 1st January, 1894.		No. of tons unsold, including coal in stock, Jan. 1st, 1895.	
Tons.	cwt.	Tons.	cwt.	Tons.	cwt.	Tons.	cwt.	Tons.	cwt.
394,624	17	108,389	14	289,130	—	6,501	15	3,606	18

Number of hands employed.				Wages per day.			
Whites.	Boys.	Indians.	Chinese.	Whites.	Boys.	Indians.	Chinese.
962	59	.....	157	$2.37 to $3.50	$1 to $2	.....	$1 to $1.25
Total hands employed..... 1,178				Miners' earnings, per day ..... $3 to $5.			

Name of Seams or Pits—Southfield No. 2, Southfield No. 3, Southfield No. 5, No. 1 Esplanade Shaft, No. 1 Northfield Shaft, Protection Island Shaft.

Value of Plant—$350,000.

Description of seams, tunnels, levels, shafts, &c., and number of same—Southfield No. 2, worked by slope, seam 6 to 10 feet; Southfield No. 2, worked by shaft, seam 5 to 10 feet; Southfield No. 5, worked by shaft, seam 5 to 10 feet; No. 1 Northfield Shaft, worked by shaft, seam 2 feet to 3 feet 6 inches; Protection Island Shaft, worked by shaft, lower seam 4 feet, upper seam 6 feet; No. 1 Esplanade Shaft, worked by shaft, seam 5 to 12 feet.

Description and length of tramway, plant, &c.—Railway to Southfield, 6 miles, with sidings; railway to No. 1 Shaft, 1 mile, with sidings; railway from Northfield Mine to wharf at Departure Bay, 4½ miles; rails are of steel, 56 lbs. per yard, of standard gauge, viz., 4 feet 8½ inches; 8 hauling and pumping engines, 15 steam pumps, 5 locomotives, 237 coal cars (6 tons), besides lumber and ballast cars; bunkers to hold 3,700 tons; fitting shops for machinery repairs, with turning lathes, boring, drilling, planing, screw-cutting machines, hydraulic press, steam hammer, &c., &c.; diamond boring machinery for exploratory work (bores to 4,000 feet); 150 horse-power electric plant engines, boilers, dynamo; 4 30 horse-power 8-ton locomotives, and 1 15 horse-power locomotive; hauling and lighting equipment; wharves, 2,000 feet frontage, at which ships of the largest tonnage can load at all stages of the tide.

SAMUEL M. ROBINS,
Superintendent.

WELLINGTON COLLIERY RETURNS FOR 1894.

Output of coal for 12 months ending December 31st, 1894.		No. of tons sold for home consumption.		No. of tons sold for exportation.		No. of tons on hand 1st January, 1894.		No. of tons unsold, including coal in stock, Jan. 1st, 1895.	
Tons.	*cwt.*	*Tons.*	*cwt.*	*Tons.*	*cwt.*	*Tons.*	*cwt.*	*Tons.*	*cwt.*
376,956	17	50,165	4	304,852	10	1,000	—	22,939	3

Number of hands employed.				Wages per day.			
Whites.	Boys.	Indians.	Chinese.	Whites.	Boys.	Indians.	Chinese.
830	64	.....	92	$2 to $3.50	$1 to $1.50	.....	$1 to $1.25
Total hands employed 986				Miners' earnings, per day ..... $2.75 to $4.50.			

Name of Seams or Pits—Nos. 1, 3, 4, 5, and 6 Pits.

Value of Plant—$150,000.

Description of seams, tunnels, levels, shafts, &c., and number of same—5 shafts, with slopes, airways, and levels; three air shafts.

Description and length of tramway, plant, &c.—5 miles of railway, with sidings and branches; 6 locomotives; 250 coal cars; 13 stationary engines; 9 steam pumps; 4 wharves for loading vessels, and bunkers.

Output of fire-clay—145$\frac{5}{20}$ tons.

R. DUNSMUIR & SONS.

UNION COLLIERY RETURNS FOR 1894.

Output of coal for 12 months ending December 31st, 1894.		No. of tons sold for home consumption.		No. of tons sold for exportation.		No. of tons on hand 1st January, 1894.		No. of tons unsold, including coal in stock, Jan. 1st, 1895.	
Tons.	cwt.	Tons.	cwt.	Tons.	cwt.	Tons.	cwt.	Tons.	cwt.
241,372	—	7,222	—	233,660	—	11,543	—	12,033	—

Number of hands employed.				Wages per day.			
Whites.	Boys.	Japanese.	Chinese.	Whites.	Boys.	Japanese.	Chinese.
416	14	45	290	$2.50 to $3	$1	$1 to $1.25	$1 to $1.50

Total hands employed 765

Miners' earnings, per day..... $3 to $4.50.

Name of Seams or Pits—Comox.

Value of Plant—$115,000.

Description of seams, tunnels, levels, shafts, &c., and number of same—No. 1 Slope, with airway and levels; No. 2 Slope; No. 4 Slope, with airway and levels; No. 5 Shaft, sinking.

Description and length of tramway, plant, &c.—12 miles railway, 4 feet 8½ inches gauge; 4 locomotives; 150 coal cars (25 tons each); 1 diamond drill; 3 stationary engines; 3 steam pumps; 3 electric pumps; 1 dynamo; 1 steam saw-mill; 2 wharves; 1 pile-driver.

Shipped $246\frac{15}{20}$ tons coke.

JAMES DUNSMUIR,
President, Union Colliery Company.

REPORT FROM THE ASSAY OFFICE AND LABORATORY.

—o—

BY MR. HERBERT CARMICHAEL, PUBLIC ANALYST AND ASSAYER.

—o—

The usual number of assays and examinations have been made during the past year; the most important are the following:—

From King Solomon claim, Alberni District; examined for Mr. W. H. Ellis.
Quartzose rock-matter, with fine pyrites; weight of sample, 5 oz.
Gold $135.90
Silver ..... 2¼ oz.

From China Creek District; examined for Mr. H. Saunders.
Weight of sample, 3 oz.; quartz and fine pyrites.
Gold $9.00
Silver ..... Trace.

From face of lowest tunnel, Golden Eagle claim, Alberni District; examined for Mr. Hy. Saunders.
White and blue quartz rock-matter, with very fine pyrites; weight of sample, 25 oz.
Gold $103.25
Silver ..... Trace.

From Comox District; examined for Mr. Wm. H. Grieve.
Quartz and pyrites; weight of sample, 8 oz.
Gold $5.00
Silver ..... ½ oz.

From Cariboo District; examined for Mr. J. McKinnon.
White quartz and pyrites, with a little galena; free gold showing; weight of sample, 6 oz.
Gold $665.00
Silver ..... 1⅛ oz.

From Wild Horse claim, East Kootenay; examined for Hon. Col. Baker.
Quartz rock-matter and pyrites; weight of sample, 12 oz.
Gold $30.00
Silver ..... ¼ oz.

From Copper King claim, Ainsworth District, Kootenay; examined for Hon. Theo. Davie.
Mixed copper ores in quartzose gangue; weight of sample, 6 oz.
Gold ..... None.
Silver ..... 75 oz. 16 dwt. 16 gr.
Copper ..... 30.92 %

From Robber King claim, Ainsworth District, Kootenay; examined for Hon. Theo. Davie.
Mixed copper ores in quartzose gangue; weight of sample, 6 oz.
Gold ..... None.
Silver ..... 42 oz. 11 dwt. 16 gr.
Copper ..... 14.42 %

From Walker Group of Islands, B. C.; examined for Hon. D. M. Eberts.
Magnitite; weight, 2½ lbs.
Iron ..... 64.812 %

Examined for Mr. H. G. Hall.
Galena; weight of sample, 2 oz.
Gold ..... None.
Silver ..... 1,666½ oz.

For Mr. Hall.
Pyrites and galena; weight of sample, 1½ oz.
Gold ..... None.
Silver ..... 31½ oz.

From Queen Charlotte Islands; examined for Mr. H. Saunders.
Magnitite; weight, of sample, 2½ lbs.

Iron	63.5 %

From Fairview, Osoyoos District; examined for Messrs. J. Piercy & Co.
Quartz with copper pyrites; weight of sample, 10 oz.

Gold	$120.00
Silver	2⅕ oz.
Copper	2.6 %

From Cassiar District; examined for Capt. John Irving, M.P.P.
Antimony sulphide, with a little galena; weight of sample, 3 oz.

Gold	None.
Silver	159¼ oz.

From Camp McKinney; examined for Mr. R. J. Sidley.
Quartzose rock-matter, with pyrites and galena; weight of sample, 2 oz.

Gold	$24.00
Silver	18.00

Several samples were assayed for the department from the Alaskan boundary. They yielded over $100 in gold and a small quantity of silver. The rock-matter was quartz, with some fine pyrites, but I am of the opinion that a good deal of the gold was free.

Several very good samples of copper have been brought in, but it has generally been found that no quantity of the ore could be got. This is to be deplored, as there is a demand in the Province for a copper ore carrying about 10 %. The ore must be situated so that the cost of transportation is small; otherwise, it would not be able to compete with foreign ores.

Some very fine-looking samples of coal came in from Queen Charlotte Islands. They were examined for Mr. Wm. Wilson, and four of them analyzed.

Sample No. 1 (surface).

Moisture	1.33
Loss on ignition	17.22
Total carbon	79.18
Sulphur	.917
Ash	19.49

Sample No. 2.

Moisture	1.91
Loss on ignition	35.81
Total carbon	93.665
Sulphur	.659
Ash	4.425

Sample No. 3.

Moisture	2.01
Loss on ignition	9.13
Total carbon	95.19
Sulphur	.909
Ash	2.8

Sample No. 4.

Moisture	2.32
Loss on ignition	17.19
Total carbon	93.43
Sulphur	1.17
Ash	4.25

I have the honour to be, Sir,
Your obedient servant,
HERBERT CARMICHAEL,
Public Analyst and Assayer

The Hon. the Minister of Mines.

VICTORIA, B. C.:
Printed by RICHARD WOLFENDEN, Printer to the Queen's Most Excellent Majesty.
1895.