ANNUAL REPORT

OF THE

MINISTER OF MINES

FOR THE

YEAR ENDING 31st DECEMBER,

1893,

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.

PROVINCE OF BRITISH COLUMBIA.

MINING STATISTICS FOR 1893.

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:							$3.50 &														$15 50 to							
Williams Creek and tributaries	21		18	3	29	35	$4 00	$2 50		7		14			10	10	1			1	16 50	$17,500						
Mosquito, Red Gulch, and vicinity	5		5		9	3	"	"		3		2			1	3		1			17 25	14,000						
Hardscrabble, Sugar Creek, and vicinity	5		5		10	16	"	"		4		1			1	2	1	1			17 00	8,500						
Lowhee Creek and vicinity	5		4	1	3	9	"	"		2		3			3	2					17 25	5,000						
Grouse, Canadian, and vicinity	8		6	2	12	16	"	"		2		6			3	3		2			15.50 to 16	7,000						
Antler Creek	5		4	1	8	10	"	"		2	1	2			4		1				16 00	2,500						
Cunningham Creek (upper)	5		4	1	1	16	"	"		3		2			4		1				16 00	6,500						
Shepherd and Valley Creeks	4		2	2	11		"	"		4					3			1			17 25	1,500						
Stevens Creek and Beggs Gulch	4		4			16	"	"		4					3	1						6,500						
Desultory mining						15	"	"														4,000						
																									$73,000			
Lightning Creek Division:																					16 50 to							
Lightning and Cottonwood Creeks	13		12	1	15	20	"	"		7		5	1		6	2	3	2	1		17 50	7,000						
Van Winkle and Perkins Gulch	5		3	2	2	15	"	"		3		2			4		1				"	1,500						
Slough Creek and Devil's Canyon	7		6	1	5	27	"	"		5		2			4	1	1	1			"	8,500						
Nelson, Burns, and Coulter Creeks	9		7	2		33	"	"		5	1	3			6	2		1			"	18,000						
Rushon and Canyon Creeks	3		3		2	9	"	"		3					2	1					"	3,000						
Anderson, Timon, and Poor Man's Creeks	4		3	1	3	9	"	"		2		2			3		1				"	4,000						
Last Chance and Davis Creeks	4		3	1	2	16	"	"		3		1			4						"	6,000						
Desultory						10	"	"														1,000						
																									49,000			
Quesnellemouth Division:																												
Fraser River (upper)	9		9			35			4		5			4	3	2					16 00	6,800						
Quesnelle River (lower)	3		2	1	3	16			2			1			2	1					"	4,000						
Cottonwood River (lower)	4		4			12			3		1			1	3						"	4,500						
Hixon and Ferry Creeks	6		5	1	4	29			1	3		2		1	5						15 00	10,150						
																									25,450			
Keithley Creek Division:																												
Keithley Creek	9	28	8	1	6	28	4 00	2 50		3		5			3	4	1	1	1		17 40	11,500						
Do. desultory						10															"	1,500						
Snowshoe Creek	4	18	4		8	12	"	"		2		2			1	2	1		1		17 00	7,000						
Do. desultory						3															"	350						
French Snowshoe Creek, desultory						3															"	450						
Harvey Creek	4	14	4		3	11	"	"		4					3		1		1		17 40	4,500						
Pine Creek, desultory						2															"	500						
Spanish Creek	1	5	1		3		"					1						1	1		16 50	1,250						
North Fork, Quesnelle River	3	9	2	1	8	8	3 50	2 00		1	2			1	2			1			"	2,500					This includes the Victoria Hydraulic Mining Co. (lease).	
Do. do. desultory						9															"	1,500						
South Fork, do.	3	13	3		10	17	"	"		1		2				3					"	7,000					This includes South Fork Hydraulic Co. (lease).	
Do. do. desultory						10															"	2,000						
Quesnelle River, from Forks 40 miles down stream, desultory						20								10							"	4,500						
Horsefly River, Horsefly Hydraulic Mining Company					30	30	3 00	1 75													"	2,500						
Fraser River (6 miles below Quesnelle to Riskie Creek	2	18	2			18					2				2						15 to 16.50	6,000						
Do. desultory						15								12							"	1,500						
																									54,550		$202,000	
CASSIAR.																												
Laketon Division:																												
Dease Creek	11		10	1	4	21	5 00	3 50		6		5			11			4			15 50	5,900						
Thibert Creek	7		7		10	9	"	"		3	1	3			7			3			16 00	3,809						
Desultory mining																						1,200						
																									10,909			
McDame Creek Division:																												
McDame and tributaries	8		8		4	25	6 00	4 00		4		4			8			1			17 50	8,776						
Desultory mining																						1,100						
																									9,876			
Liard River Division					20	3							11															
Desultory mining																						1,700			1,700			
Stikine Division	2		2		1	3	4 00	2 50	1		1				1		1											
Desultory mining																						350						
																						100						
KOOTENAY.																									450		22,935	
Eastern Division:																												
Wild Horse Creek	6	24	5	1	24	41	3 00	2 50		2		4			2	4	1		1		18 00	19,000						
Moyea River	2	5	2		3	2				2								2			"	700						
																									19,700			
Western Division:																												
Placer mining																					16 00	6,150						
Trail Creek Mining Subdivision:																												
O. K. Mineral Claim																						4,000						
Nelson Mining Subdivision:																												
Poor Man Mineral Claim																						6,000						
																									16,150		35,850	
LILLOOET.																												
Cayoosh Creek																												
Bridge River	14		12	2	35	55	3 00	1 50													15 to 16 50	51,376			51,376		51,376		Value from buyers ascertained.
Bars and benches of Fraser River																												
YALE.																												
Yale Division;																												
Fraser River											1					1						3,800						
Osoyoos Division:																												
Rock Creek	11	40	9	2	14	10	3 50	1 50	1	10	1				9			2			00	4,500					Two hydraulic companies prospecting.	
Boundary Creek	1	1	1		1		"														"	250						
Cedar Creek	7	28	2	5	2	12	"	"		7					7						"	300						
Cherry Creek	2	9	2		7	12	3 00	2 00		7	2				7		1	1			15 00	4,000						
Siwash Creek	2	2	2		3	3	"	"		2					2						16 50	400						
Mission Creek	2	2	2			2		"							2						"	200						
Harris Creek (quartz)	11	14		11										14					11									
Boundary Creek "	30	240		30	50		3 50							240					8									
Camp McKinney "	1	30		1	6		"							30					1									
Fairview "	40	170	2	38	35		"							170					6	4	15 75	13,404					Bullion from ore crushed by Strathyre Mining Company Co.'s Mill.	
																									23,054			
Similkameen Division:																												
Similkameen	7	19	5	2	*15	20	3 00	1 50		3	3		1		5	1		1	3		17 75	4,790					*Whites were employed prospecting on the Similkameen Gold Gravels Exploration and Hydraulic Co.'s ground.	
Tulameen	10	42	6	4	5	27	"	"	1	6	1		2		7	1		1	3		"	7,500						
Granite Creek	4	9	3	1	5	4	"	"		1		3						3	1		"	1,500						
Boulder Creek	2	3	2		1	2	"	"		1		1			1			1	1		"	250						
Newton Creek	2	3	2		3					2					2							300						
Whipsaw Creek	1	2		1																							Water gave out early in the season.	
																									14,340			
																											37,394		
																											$353,355		
					435	812																						

The approximate yield of Platinum for the season is estimated at $1,800.

PROVINCE OF BRITISH COLUMBIA.

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 1893.

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
					$54,014,854		

* 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.

REPORT.

GOLD.

The export of gold dust during the past year, as reported by the Banks in Victoria, amounts in value to $316,279.

In explanation of the decrease from the export of 1892, it is stated that a large proportion of the product of the mines in the Yukon District was shipped to San Francisco direct, and that the majority of the shipments from the Kootenay District left the Province via Spokane, Washington.

The value of the estimated yield of gold for 1893, is $353,355. While the amount produced by placer mining is somewhat less than that obtained in 1892, the total yield is greater, owing to the returns of some of the quartz claims in the Yale and West Kootenay Districts having been taken into account.

The anticipations formed in 1892, of an increased output from hydraulic workings, have not been realized, owing to the development work on the majority of the claims not having reached the stage when results could be expected, whilst in other cases operations have been hindered by an insufficient supply of water.

This branch of placer mining is yearly attracting greater attention throughout the Province, and the amount of capital already invested and to be laid out during the coming season, more particularly in working the bench lands in the vicinity of the Fraser River and its tributaries, is very considerable.

Interest is also being taken in the beds of the Fraser and Thompson Rivers, with a view to dredging, and, judging from the number of applications for leases for this purpose, a serious attempt will be made to prove the worth of the gold hidden in the strata of these rivers. As will be noticed further on, special machinery for dredging is in course of construction at different places on the Fraser.

PLATINUM.

The yield during the past season is estimated at $1,800, the lowest amount reached since the discovery of this metal, in the streams in the Similkameen division of Yale District.

IRON.

The exports of iron ore to the United States amounted to 500 tons forwarded to Tacoma, Washington, by the Glen Iron Mining Company, of Cherry Creek, Yale District, in the early part of the season, no further shipments being made in consequence of the dull times occasioned by the financial depression.

A description of the property of this Company is given in the Annual Report for 1891.

The mines on Redonda Island also furnished 900 tons of ore, which were shipped by steamer to Portland, Oregon.

This property, represented by Messrs. De Wolf & Co., of Vancouver, comprises one hundred acres, situated on the north shore of Redonda Island, which lies 100 miles north of the city of Vancouver. The island is of granite formation. Of the two veins running north-east and south-west, No. 1 vein has been worked at a point some six hundred feet above high-water mark, offering facilities for loading the ore direct into a vessel by a chute. This vein shows a solid face of ore over forty feet wide, the whole of which is estimated to run sixty per cent. met. iron. No. 2 vein is undeveloped, and shows thirty-six feet of solid ore.

As will be seen by the following analysis made by Professor Dawson, Dominion Government Geologist, Ottawa, the ore is of excellent quality.

Met. Iron	65.37
Sulphur	.015
Phosphorus	*Nil.*
Titanic acid	*Nil.*
Insoluble matter	8.06

CARIBOO.

MR. BOWRON'S REPORT.

RICHFIELD, 27th November, 1893.

SIR,—In submitting my nineteenth annual report upon the mining industry, I have the honour to say that I note with pleasure a restored confidence regarding the future of the district quite wanting for some years past. This confidence is inspired not from any material increase in the gold product, nor solely from the magnificent developments being made in our placer mines, although such alone are sufficient to warrant the belief that more prosperous days are about to dawn upon Cariboo; but the recent unsettled state of the silver market and the probable construction of a line of railway into Cariboo, in the near future, have had much to do with attracting the attention of the mining world to the gold fields of our district.

The explorations and surveys recently made by the Government on the Nechaco River and elsewhere, show the existence of the most extensive agricultural and grazing lands found *en bloc* anywhere in the Province. In these days of quick transportation, which we think cannot much longer be kept from our district, these lands will prove of great value to the miner as well as to the farmer, inasmuch as they may be utilized in the production of hay, oats, barley, and all kinds of vegetables necessary to the sustenance of a largely increased mining population.

Never, perhaps, has this district received more attention in legitimate mining operations from outside capital than during the past year. It is true that in our famous quartz bubble of 1877-8, a large amount of foreign capital was squandered, but this may not be regarded as legitimate mining. The alluvial mines at present attracting attention are altogether a different matter, as I believe in each individual case where absentees have invested, experienced miners were first sent to exploit the ground, make a thorough examination of the facilities for working, and report, before development works were undertaken.

In referring to some of the principal mines now in course of development, I shall begin at the southern part of the district. On the Horsefly River, the Horsefly Hydraulic Mining Co., Limited, of which H. Abbott, Esq., of Vancouver, is President and Mr. J. S. Hobson is Manager, has acquired, either by location or purchase, a large area of hydraulic mining ground, situated immediately above the Falls, having admirable dumpage, which is of the

utmost importance in hydraulic mining. This company, which kept a force of men employed during last winter in running tunnels, are well pleased with the prospects obtained, and as soon as the ditches are completed, will bring in an immense quantity of steel piping, preparatory to commencing work on a scale of magnitude hitherto unknown in the district.

This company, under the same management, having obtained by purchase the South Fork Co.'s concessions, and the well-known Hop E. Tong claim, and intermediate ground near Quesnelle Forks, are now making necessary arrangements to open up what is generally believed will prove one of the most productive mines ever worked. Mr. Stephenson, Government Agent for that Division, will probably, in his report, speak more definitely as to the works in that section.

I have muuh pleasure in reporting the success of Mr. A. D. Whittier in inducing a London syndicate to furnish the necessary capital to provide plant for working the lower part of Williams Creek by hydraulic lift. Mr. Whittier, after having spent nearly two years in London on this mission, returned to Barkerville about the 1st of September, accompanied by Mr. S. Herbert Cox, of the firm of Bainbridge, Seymour & Co., mining and consulting engineers, of 13, St. Helen's Place, London, E. C. Mr. Cox was late Inspector of Mines for the Government of New Zealand, and is thoroughly conversant with the most approved methods of raising gravel by hydraulic pressure. After spending a month in exploiting the ground, and making an examination of the facilities offered for its working in the manner proposed, Mr. Cox returned to London to report. In the meantime the surveys for the ditches were being made under the direction of Mr. Champion, C. E., and we now learn that Mr. Cox has reported most favourably upon the scheme, and that the extensive preparations required for works of this nature will be inaugurated early in the spring. The company represented by Mr. Whittier is incorporated under the Imperial statutes as the "Whittier Gold Concessions Syndicate," and is prepared to prospect, develop, and, if considered sufficiently good, purchase or otherwise acquire and work any mine or mines in British Columbia. The Williams Creek concession is the first property the syndicate proposes to develop.

Mr. Charles F. Law, late British Columbia Commissioner at the World's Fair, Chicago, having acquired by purchase the mining lease on Willow River, at Mosquito Creek, has succeeded in interesting Montreal capital in taking hold of its development. The Government boring machine, now stored at Kamloops, having been secured for the purpose, will be forwarded to the ground during the winter, and the boring of holes to locate the deep channel will be commenced in early spring. This is regarded as a most promising enterprise, especially by old miners.

Mr. William Adams, M. P. P., and a Mr. McDougall, of Ottawa, have applied for a lease of the old Kurtz & Lane ground on the Williams Creek meadows, and purpose, I understand, to locate and test the depth of the channel by means of the boring machine, preparatory to sinking a working shaft.

On the Quesnelle River, twenty miles from its mouth, Messrs. Fry, Cameron & Co., who have been prospecting all summer, recently applied for and have now the option of a lease of ground for hydralic mining. It is understood that having thoroughly tested the value of the gravel hills along the river sides, they will place iron piping and monitor on the ground this winter, preparatory to an early start in the spring. As this is a new section of country where comparatively little prospecting has been done, it is impossible to speak with any degree of certainty as to its future probabilities, except to say that the field is large.

Messrs. Norton & Co., a party of six men from San Juan Island, spent the summer on Chisholm Creek, a tributary of Cottonwood River, endeavouring to bottom the deep ground, but as the pumps sent from below were not of sufficient capacity to raise the water encountered in sinking, they were obliged to suspend operations for the winter without proving the value of their ground.

A party of three sturdy, enterprising young men, desiring to prospect out on Goat River, seventy miles to the north-east of Barkerville, applied for assistance to cut out the old trail made some five years ago. Upon obtaining the assistance required they at once cut out the trail and commenced prospecting on Goat River, where they intend remaining nine months before returning.

A party of four men will devote the winter to driving a tunnel to reach the deep ground on Stewart Creek, which lies about nine miles to the north of Barkerville. Although promising prospects were obtained on this creek in the early days, the bottom of the deep channel has never yet been reached.

The Slough Creek Co. has been most unfortunate in losing two of its leading men. Mr. Magee, one of the contractors, and manager for sinking a working shaft, after visiting the works, had occasion to return to Victoria, where he was stricken down with diphtheria, to which he succumbed in a few days; after which Mr. Gans, of Tacoma, was engaged as manager. While Mr. Gans was at Ashcroft making arrangements for the forwarding of two thirty horse-power engines, boilers and appliances (which had been purchased in the east), he met with an accident which proved fatal. The machinery, however, is now on its way to the mine, at which ten men are engaged preparing for winter work, and I am assured by Mr. Fife, of Tacoma, the president of the company, that notwithstanding these lamentable drawbacks they will persevere in their endeavours to prove the value of their mine.

Messrs. Rowe and Hoar, two of our old-time miners, obtained a prospect of three ounces to the set of timbers in a shaft sunk in the side-hill near the reduction works below Barkerville, and are now driving in a tunnel through which to work their claim.

On Shepherd Creek, the Discovery Co. have devoted nearly the whole season to bringing up a drain, digging ditches, and constructing a dam to store water. This claim promises to be remunerative in the future. Other companies have located ground on this creek and are running tunnels or otherwise prospecting the ground, with fair chances of success.

The foregoing represents in brief some of the principal new mining enterprises started within the last eighteen months, the mention of which will at least serve to show that "Old Cariboo" is anything but a "played out mining camp," as some may regard it. From evidences afforded me in my official position, I am led to the conclusion that the district is entering upon a new and prosperous career, scarcely inferior and certainly more lasting than the famous golden days of the early sixties.

There is another source of wealth possessed by the district, to which I referred in my last report, the development of which has not as yet been undertaken. Upon having my attention drawn to an article in Chambers' Journal for February, 1892, upon "Dredging for Gold in New Zealand," I was more than ever impressed with the adaptability of our larger streams for being worked by dredging, but as I hope soon to be in possession of all facts relating to the nature of the appliances used in the mining here referred to, I shall for the present only mention the fact of the presence in large quantities of fine gold in our river beds.

The yellow metal is most abundant on the Upper Fraser and its tributaries, and being in proximity to the recently explored Nechaco grazing country, should enhance the value of and promote the settlement of these lands.

To speak of the paying claims, or those contributing to the gold product of the district for the year, would be but a repetition of my last year's report, with the single exception of Joseph Shaw & Sons' claim on Hardscrabble Creek, which has paid handsomely this season, with every indication of continuing to do so for many years to come. The Nason Co., on Antler Creek, after overcoming one misfortune after another, have at last succeeded in pumping out their diggings, and are just starting to prospect the mine, which, if perseverance merits success, should prove a "Bonanza."

The total output of gold for the season is, as near as can be ascertained, somewhat greater than last season, which must be regarded as highly satisfactory, as so many white miners have been engaged in opening new mines and other non-productive works, that the Chinese have been much the larger producers.

Quartz.

Regarding our Quartz mines, there is absolutely nothing to report. Little more than representative work has been done; and it would seem as if by common consent that this most important branch of mining has been left in abeyance, awaiting the advent of railways into the district.

We observe that in California, gold mines of whatever nature, either alluvial or quartz, are at present attracting unusual attention, in consequence of the depressing effect on silver mining caused by the depreciation of the value of that metal. Many of the old gold-producing quartz mines, hitherto abandoned as unprofitable, owing to the low grade of ore they contained, are at the present time being re-located and worked, and rock yielding a return of three to four dollars a ton is now regarded as valuable, even if situated under adverse circumstances for working. If such be the situation in California, it is safe to predict that but a short time will elapse before our numerous ledges of gold-bearing ore will come prominently to the front.

The estimated gold product of the district for the year is as follows, viz. :—

Barkerville Polling Division,	1st January	to	15th November	$73,000
Lightning Creek	"	"	"	49,000
Quesnelle	"	"	"	25,450
Keithley Creek	"	"	"	54,550
Estimated product from	15th November	to	31st December (say)	8,000
				$210,000

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.

QUESNELLE FORKS, B.C.,
8th November, 1893.

The Honourable
The Minister of Mines.

SIR,—I have the honour to forward herewith the estimated yield of gold for the Keithley Creek, Alexandria, and Williams Lake Polling Divisions of the Cariboo District for 1893.

The mining season, although late in opening, has upon the whole been favourable for placer mining all through this section, as the supply of water during the summer was above the average. The actual number of claims producing gold has been about the same as the preceding year, while the estimated amount taken out is slightly in excess, which shows that the regularly organized companies have done quite as well as last year. This always has a good effect, even on the Chinese, as it proves they can do better by forming into companies and opening up claims which prove more remunerative than when worked individually in a desultory manner. On Keithley and Snowshoe Creeks there is very little change to report from last year ; there have been no new developments that I am aware of, and but very little prospecting has been done on these creeks during the past season. On Harvey Creek there are still a few miners working, but nearly all of them are going over the old worked ground, and any prospects of new finds are very slight. On the North Fork of Quesnelle River and Spanish Creek operations have been light for the season, the greatest amount of work on the North Fork being done by the Victoria Hydraulic Mining Company in prospecting some gravel benches. As far as I could learn, the results so far are not satisfactory, and work was suspended early in the latter part of the mining season. The company on Spanish Creek still keeps going ahead with their work during the whole year. They are running a drive into the hill looking for the old channel, and are taking out some gold, but nothing like pay for their work. Still they think the prospects are sufficiently good to continue on in hopes of finding something better.

From Quesnelle Forks down the main Quesnelle, about forty miles, all the work during the season has been confined to desultory mining. The Chinese working on the small gulches while the water lasted, and when the water falls in the river they go to places along the river where they can obtain dirt that will pay for rocking. During the last part of the season there have been whites down the river looking for hydraulic claims in the vicinity of what is known as 20-Mile Creek (twenty miles below Quesnelle Forks). The result of their work I see in notices of application for leases of several locations in that section, and, as I am given to understand, they really mean business and have the necessary means to carry on the work required, it is to be hoped they will get the ground applied for. The expenditure must be considerable to any company that will bring water upon those benches in sufficient quantity to properly work them, therefore I think that any company with capital that wishes to honestly prospect and endeavours to develop the mineral resources of the country should be liberally dealt with. The means of getting down the river to 20-Mile Creek, or, in fact, anywhere down the river, are very poor, there being no trail, and boating on the Quesnelle River is at

times rather dangerous work. On the South Fork of Quesnelle River the small hydraulic claims operated by Chinese have done about as well as usual, their limited supply of water necessarily makes their work light for the season. The South Fork Hydraulic Company worked on an average ten white men in opening up their claim (lease) until August last, when the property changed hands. The South Fork and the adjoining claim next below (Hop E. Tong Company), a Chinese company, were both purchased by a company with ample means to develop these properties, and are under the management of Mr. J. B. Hobson, mining engineer, who is pushing work ahead as fast as possible, and will continue to do so as long as the weather permits. A saw-mill, large hydraulic plant, and other material for the working of the claims will be laid upon the ground during the coming winter, and, as soon as men and money can accomplish it, it is the intention to have these claims in working order.

On Horsefly, the Horsefly Hydraulic Mining Company, also under the management of Mr. J. B. Hobson, have been steadily pushing their work ahead during the summer with an average force for the season of thirty whites and thirty Japanese, doing contract work on a ditch, and still there remains an immense amount of work yet to be done before the property is put in shape to give returns. The expenditure of this company on Horsefly, I think, will amount to about one hundred thousand dollars before their mine is in thorough working order, while they estimate the purchase and the cost of preparing the South Fork of Quesnelle property for working at about three hundred thousand dollars. A few such enterprises as these managed by thoroughly competent and practical men will go a long way to bring Cariboo once more to the front as a mining district.

The Harper lease on Horsefly has not been worked during the season; the unusually high water in the Horsefly River in the first part of the season did a great deal of damage to their dam, and as it (the river) kept high until late they did not resume work. A party of prospectors have been working on the Horsefly some sixty odd miles above the Harper claim. They opened a trail and took in pack animals. It was late in the season before they did much prospecting, but one company was getting a little fine gold when I last heard from them.

The sleigh road from the 150-Mile House into Horsefly will now enable the farmers to furnish that section with any farm produce which may be required, besides permitting of regular traffic during the winter.

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

CASSIAR.

MR. PORTER'S REPORT.

LAKETON, CASSIAR, B. C., 7th October, 1893.

SIR,—I have the honour to forward herewith the Mining Statistics for this portion of Cassiar District for 1893. Although I have been careful in collecting information, I must acknowledge a serious falling off from last year's yield of gold in some of the former important sections of the district. The decrease in this case is owing to the fact that the old creeks are fast becoming less remunerative each year, although McDame's Creek and its tributaries have produced more gold this season than last.

There have been eleven mineral claims located during the season on the Hyland River and in its close proximity, and some of the locators are highly elated over their prospects for the future. Several hundred pounds of apparently rich ore taken from these claims are now in transit to different points below for assay, and it is to be hoped that it will prove to be rich in the precious metal.

About ten persons were working during the summer on the bars of the Liard River, but were not as successful as they were last year, owing in a great measure to the fact that the water kept at a high stage during the greatest part of the summer.

Dease and Thibert Creeks have produced less this year than any season since they were discovered. The reason being, as already stated, they are about worked out, except some of the hill claims, which may continue te pay a fair return for a time longer.

The Arctic Placer Mining Company, who acquired two leases of mining ground on Thibert Creek last season, have failed so far to comply with the requirements of the lease granted that they have forfeited their rights, and the ground has naturally become vacant.

But little prospecting for new placer mines has been undertaken during the year. I have consequently nothing to say respecting explorations in this line.

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

Dease Creek	$6,500
Thibert Creek	4,409
McDame's Creek	9,876
Liard River Division	1,700
Stickine River Division	450
Total	$22,935

I have the honour to be,
Sir,
Your obedient servant,
JAMES PORTER,
Gold Commissioner, Cassiar.

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

WEST KOOTENAY.

MR. FITZSTUBBS' REPORT.

The Honourable
The Minister of Mines, Victoria.

VICTORIA, B. C., 1st January, 1894.

SIR,—I have the honour to submit the annual mining report and statistics for the West Kootenay District for the year 1893.

SOUTHERN DIVISION.

Nelson Mining Subdivision.

There have been 161 mineral claims recorded, 69 transfers, and assessment work has been done on 117 claims.

There have been 14 placer claims recorded, and 5 transfers of same recorded.

There are within the Southern Division 22 placer leases in existence, 15 of which are on the Salmon River, 6 on the Pen d'Oreille, and 1 on Forty-Nine Creek.

Foremost amongst the mineral claims in this district is the Silver King group, which has lately been sold to an English company for, it is said, nearly $1,000,000. The number of men now employed is 45, and I hear that the owners contemplate erecting extensive works during the ensuing season.

The survey for a tram-line for the transport of ore from the mine to the point of shipment has been made, and it is expected that the work in its entirety will be completed by next autumn.

One hundred tons of ore from this property has already been shipped to Swansea, which, it is learned, will yield over $100 per ton.

Dandy Mine

Is located on Toad Mountain, and is a westerly extension of the now famous Silver King. Development work consists of one shaft, 40 feet, three tunnels aggregating 600 feet in length, one of which is a cross-cut, striking the ledge at about 100 feet in depth and then running on the ledge about 150 feet, showing it to be from 4 to 6 feet wide, and well mineralized throughout. The ore runs from 15 ounces to 300 ounces in silver. Picked samples have assayed as high as 1,937 ounces to the ton, and the average yield of gold from the ore is $4 to the ton. The ledge is alleged to be a line fissure ; it is exposed from 10 to 50 feet in four places, and is traceable up to the workings of the Silver King mine. Mr. A. H. Kelly, who is owner of

13-16ths of this property, proposes in the future to work this mine on a much larger scale than hitherto.

Owing to depreciation in the value of silver and general financial stringency, many claims on Toad Mountain and elsewhere within the subdivision showing indications of richness and quantity of ore have up to the present been allowed to remain unworked.

In the gold belt south-west of Nelson, the Poorman mine yielded $6,000 worth of gold this year from about 200 tons of quartz. A 10-stamp mill, with a capacity of 20 tons per day, is on the ground, and the mine, it is reported, will be worked continuously during the present year.

On the Majestic claim, a few miles west of the Poorman, considerable development work has been done, and there is a probability that this property will be opened up this season.

On the Whitewater claim, on Rover Creek, no work has been done this year, but I understand negotiations are now pending for the purchase of this claim at a fair figure.

Several locations, showing ore resembling in character that of Toad Mountain, have been made on the Salmon River, about twenty miles south of Nelson, which, if as valuable as anticipated, and being in close proximity to the Nelson and Fort Sheppard Railway, will when worked add much to the wealth and prosperity of the Nelson subdivision generally.

Placer Diggings.

On Hall Creek but little work was done during the past season, the yield of gold from this field not exceeding, I think, $750.

There has been activity in placer locations on the Salmon and Pen d'Oreille Rivers. Twenty-one leases have been granted, and although only dead work was principally done last year, owners look forward to profitable results during the present one. A rush is expected next spring to this portion of the subdivision, experts maintaining that the two rivers above mentioned will be large gold producers.

Trail Subdivision.

In this subdivision there were, last year, thirty-three locations and eleven transfers of placer properties, and while no unusual activity is reported in connection with the quartz mines, such work as has been done therein has resulted generally to the satisfaction of the owners.

During 1893 the company owning the Le Roi mine increased the depth of their shaft by 100 feet, and levels run from bottom of shaft, 70 feet each way, show solid faces of ore of unknown width, averaging $60.00 of gold per ton. This company shipped 250 tons of their ore to the Tacoma (Washington) smelter, but the returns have not been made public. That they were satisfactory, may be inferred from the fact that the company have now shipped to their mine steam hoisting machinery, and are now working 30 men and 3 teams.

A large sum, possibly $10,000, was, it is said, unprofitably expended on the War Eagle, a claim adjacent to the Le Roi, in the earlier part of 1893, but a modified system of operations has revealed a continuous ore body 8 feet wide, of character and value almost identical with that of the Le Roi.

On the Nickel Plate, on which there is a shaft 50 feet, the ore vein is 18 inches wide, being pyritic in character and $115 per ton in value. Work on this mine is now being carried on and will be during the summer.

Four thousand dollars have been spent on the Josie, developing a 7 feet vein of pyritic ore carrying $30 to the ton. Last December ore from this claim was shipped to the Tacoma smelter.

The Mountain View shows a vein 30 feet wide and 200 feet in length, the ore of which averages about $25 in gold.

The Cliff is a location on the same vein as the Mountain View, and the surface work, much of which has been done, discovers a vein for its whole length of equal value to that of the Mountain Chief.

During the year the owners of the O. K. mine have extended their tunnel 100 feet and have made an upraise of 70 feet. The vein has an average width of 4 feet. Its richness may in some measure be estimated from the circumstance of the three owners having extracted $4,000 of gold in one week of last September, by the crude means of a hand-mortar only. The 250 tons of ore now upon the dump will probably, during the present winter, be shipped to a smelter.

Other claims show encouraging prospects, but are insufficiently developed to report upon with accuracy.

Last spring a waggon road, commenced by private parties and taken over and completed by the Government, has conduced much to the development of the Trail Mines, and 10 tons of ore from the Le Roi are daily transported over it and dumped upon a wharf, now in course of construction, which will be available at all stages of the river.

NORTHERN DIVISION.

Illecillewaet Subdivision.

In this subdivision, during the year ending 31st December, 1893, there were 31 locations made, 12 of which were new discoveries, the remainder being re-locations of abandoned ground. There were 37 certificates of work issued, and 15 bills of sale recorded.

Of actual development work in this district none has been done during the past year, though the work necessary to obtain certificates therefor has been performed.

Lardeau Subdivision.

In this subdivision the following records were made during the year past, viz.:—Locations, 21; certificates of work, 6; bills of sale, 4. The certificates of work were issued for work done on claims recorded previous to 1893, and as in the case of Illecillewaet, the development work for the season being only sufficient to obtain certificates of work.

Trout Lake Subdivision.

In this subdivision there were 31 locations, 42 certificates of work, 40 bills of sale. Here again, as in the other subdivisions of northern West Kootenay, there has been scarcely any development work done, with the exception of that required to obtain certificates of work on the number of claims given above.

In this subdivision 27 miles of new trails have been built, affording claim workers facilities for transportation of supplies to locations now under test, the result of which will determine the question of the necessity for a waggon road from Thompson's Landing to Trout Lake, which many are now loudly advocating.

Revelstoke Subdivision.

Here 27 locations were made, 26 of which are in the Big Bend country, and the majority of which are re-locations of abandoned ground. Two certificates of work were issued on claims recorded in 1892, and two bills of sale recorded.

Some rock obtained from a claim on the north-east side of French Creek is alleged to have assayed 58 oz. of gold to the ton; but as no work has been done on the claim, it is possible the owners have little faith in it.

On French Creek, four men have worked during the past season, and are still working, on the Consolation Placer Claim, and are reported to be taking out good pay, returns of which are not yet to hand.

Applications for four leases on this creek were made, but not completed, owing to the lateness of the season.

McCulloch Creek.

Four applications for leases on this creek were made, but not completed, for the reason given above, as regards three of them, the fourth being for the ground known as the Ophir Bed-Rock Flume Company, now in litigation.

Smith Creek and Goldstream.

Two men have been working on these streams during the past season, on a bench above the mouth of Smith Creek during high water, and on Goldstream during low water. Out of the latter they obtained about $400, but the cold weather prevented a clean-up on Smith Creek.

Goat River Subdivision.

For the year 1893 there were 52 locations and 28 certificates of work issued.

Development work was done on the Mineral Claims Alice, International, President, Jim Slick, Tip Top, Columbia, Tonawanda, Bounty, Gladiator, Lizzard, Badger, Montana Wisconsin, Towland, and others at Goat River and Duck Creek proper, and some work of the same character has been done in the Sutter or Priest Lake section, on the west side of Kootenay River, near the International Boundary Line.

This work, I am informed, proves conclusively the existence of rich and large bodies of ore, many tons of which have been mined, and now on the dump await the construction of railway or other road to be carried to market.

Slocan Subdivision.

Since the 1st day of January, 1893, to the present date, 368 mineral claims have been located in this subdivision and only 6 abandonments have been recorded. Assessment work has been recorded on 365, showing the confidence and *bona fides* in these locations, and 12 certificates of improvements have been issued.

Although these figures show a decided decrease in the number of claims dealt with, as compared with that of last year, yet the decline is compensated for by the large amount of assessment work done. Four hundred and seventy-three transfers of interests in mineral claims have been recorded during the same period, and 156 bonds have been placed on record.

In respect of development work, it would appear that more money has been expended on the Slocan Star than on any other mining property within the subdivision. At present 18 men are employed doing systematic development work. 150 tons of ore from this mine, are now stored at the Three Forks of Carpenter Creek to be shipped to Nakusp on the completion of the Nakusp and Slocan Railway, while 300 tons are stored within the ore house at the mine. There are three long tunnels, one above the other, on this property connected with one another by upraises. A snow road was recently built to the mine from the trunk road.

At the Washington mine 35 men, with an assayer, are employed, and 8 tons of ore are daily shipped therefrom. Considerable sloping has been done, and development work has been continued since the opening of the mine.

Eighteen men are working on the Bonanza King and World's Fair claims, two of the Noble Five group, which are unusually favoured by the absence of retarding quantities of water, and in the richness of their ore (carbonate) now being shipped. The locators are themselves working this group of mines at, it is said, a very handsome profit. A rawhide trail connects the mine with the sleigh road at the mouth of Sandon Creek, running to Three Forks. Shipments of ore are daily made.

On the Recall claim 8 men are developing, and 40 tons of ore have, up to the present, been shipped.

The Mountain Chief gives employment, steadily, to 16 men, and continual shipments of ore are being made. Four tunnels have been run on the ledge, in all of which ore is being stoped. This ore is being classed as the Peacock variety and contains native silver.

In the Four-Mile Creek section the Mountain Boomer has been subjected to the most development work. A car load shipment from this mine averaged 263 ounces of silver to the ton of ore.

A contract has just been let to run a tunnel on the Alpha, one of the Grady group, which stands high in the esteem of mining experts.

Prospectors have given much attention to the Wilson Creek portion of the subdivision, and many locations have been made.

In the spring of the year there was a rush of prospectors, capitalists, brokers and others to this part of the district, but the general depression so affected their operations that this camp has not quite realized the anticipations formed of its activity and prosperity last fall. Nevertheless, such work as has been done, and there is a great deal of it, has been satisfactory to those bearing its cost, and gives promise of and encourages increased vigour in mining operations for the future.

The dry ore belt up the North Fork of Carpenter Creek, which has been somewhat neglected during the past summer, is regarded as being rich, but the money stringency and low price of silver combined to deter the employment of capital on it.

Considering the circumstances of the year past, the mining works of this subdivision have been crowned with complete success, and it may be confidently predicted that, under improved financial conditions, more development work will be undertaken, machinery will be introduced, and the output of ore very largely increased. Forty tons per day are now being shipped, through Kaslo to the present terminus of the Nelson and Fort Sheppard Railway, near Nelson, and a careful estimate gives 225 as the number of miners now engaged in the various mines within the area of the Slocan Mining Subdivision.

AINSWORTH OR HOT SPRINGS SUBDIVISION.

During the summer months of last year the general financial depression affected this camp acutely, but towards the autumn confidence was revived, and there is fair promise of a busy and prosperous season in 1894.

Number One Mine.

The lessees of this mine have manifested their faith in the camp by the erection of a 50-ton concentrator, which will be the first one in the district, and they hope to have it in running order by the 1st of April. They calculate that after 60 days of operation the plant will have paid for itself. Twenty men are employed on the mine, and although only 85 tons were shipped, about 4,000 tons of ore are now on the dump awaiting concentration, which will reduce it to one-fifth its original weight, before shipping. The assays run from 60 ozs. to 275 ozs. Twelve hundred feet of shaft tunnels, etc., have been completed.

Mile Point Mine.

This mine, one mile south of Ainsworth, and within 300 or 400 yards of the Kootenay Lake, is regarded as being one of the best, and exceptional in showing high grade ore at a low level. Two tunnels, of 100 feet each, have been run, though the abundance of water has somewhat retarded the works, six men are employed, and its assays are said to average from 110 oz. to 3,000 oz. of ruby and wire silver per ton, and 30 per cent. lead.

Skyline.

Much development has been done on this property which is said to be a good one, but the Salt Lake owners do not care to work it, while the price of silver is so low.

Little Phil.

This claim lies about one and a half miles from Ainsworth, by the side of the Government waggon road, and adjoins the Little Donald. Last December a fine galena view, 8 feet wide, was struck by a joint tunnel 75 feet long, running on the line dividing the two claims. The ore assays 80 oz. in silver and 75 per cent. lead. This mine being so favourably situated will probably be worked vigorously during the present year.

Budweiser,

Three miles from Ainsworth, on Woodberry Creek, shows a vein 4 feet wide all through it.

Bobtail, Shafer, Jay Gould,

Are owned by the Shafer Gold and Silver Mining Company, of Seattle, and situated 1½ miles south of Ainsworth, on the lake. Extensive works have been erected and 400 feet of tunnel through hard rock have been run.

Highland.

A bond of $10,000 on this claim was lately taken up, and it will be worked this season. The ore assays from 50 to 75 oz. silver per ton.

Highlander.

This is considered to be very valuable property assaying as high as 180 oz. silver per ton, 30 per cent. lead. This, it is said, will be worked during the summer.

Charleston.

The Government waggon road runs through this claim, the ore it produces assays 95 oz. silver, 30 per cent. lead.

Blue Bell.

These properties, owned by the Hendryx Company, on the east side of Kootenay Lake, being of low grade, have been allowed to lie unworked this summer.

Turn of Luck, Bakers Fifth and Rand,

Are the property of the Kootenay Mining and Development Company, and are situated in the vicinity of Woodberry Creek. The prospects are encouraging, and development will be done.

Fry Creek.

This is a placer claim, located on Fry Creek, but too late in the season to commence operations.

Gold Bug.

This claim, also on Fry Creek, assays high in gold.

White Grouse and Red Mountain,

Situated on the headwater of one of the branches of St. Mary's River. Here many locations have been staked, but little or no development work has been done. Some rich ore (prospects) have been taken from the Copper King group. Further discovery and development may justify the building of a trail from near the mouths of the Kootenay and the Goat River to the White Grouse Mountain.

La France Creek.

Over one hundred claims have been located on this creek and vicinity, but the ore is reported to be of low grade.

Lardo and Duncan.

In the early spring much excitement was caused in the West Kootenay District by the report of rich strikes in the above sections. At one time it was reported that as many as 300 men were camped in one place on Duncan River awaiting the disappearance of the snow, before which time, however, many of them had exhausted their supplies, and were compelled to return. Of those who did prospect the Duncan region, none were able to give encouraging reports, but the fortunate locators of the Glacier claim, on Glacier Creek, running into Duncan River, a little below the outlet of the lake of that name. The Lardo, south of the line dividing north and south-west Kootenay, has also been a source of disappointment to a large number of prospectors.

KASLO SECTION.

Wellington.

This claim, on a stream debouching into Kaslo, shows very high grade galena of which 100 tons have been shipped.

Montezuma and Mexico.

These claims, though showing good prospects, remain unworked, being some distance from the Kaslo River and rather inaccessible.

Silver Glance.

This claim being 5 miles from any trail or road, remains unworked. Its ore is said to assay as high as 1,000 oz. per ton.

Beaver, Lone Star, Silver Tip.

These claims are being developed by tunnels, but so far no ore has been shipped.

Eureka, Yosemite.

These claims are 3 miles north from the Kaslo-Slocan waggon road and are being developed. The ore is of high grade.

Northern Belle.

Dr. Kilbourne, of Seattle, who paid a large sum for this property, is working it with 14 men, who have driven one tunnel 150 feet and another 200 feet. He has let a contract for hauling 600 tons of ore, 200 of which are already sacked. This claim is situated in the Whitewater basin.

Virginia

Is also in the Whitewater basin, and shows high grade ore and is being worked by 10 men. The owner, Mr. J. A. Finch, who purchased it recently, hopes to ship ore immediately.

Lucky Boy.

Situated in the Jackson basin, a high grade proposition, from which 20 tons have already been shipped.

Brennan Group

Being remote from any road remains unworked.

Carbonate

Is on Spring Creek and was bonded a few weeks ago to Mr. J. A. Finch for $10,000.

The following are the mineral claims being worked in the southern portion of West Kootenay, and the number of men employed:—

KASLO-SLOCAN DISTRICT.

Name of Claim.	No. of men employed.
Washington	40
Dardanelles	25
Noble Five	12
Reco	6
Mountain Chief	12
Slocan Star	15
Payne Group	8
Wellington	12
Blue Bird	12
Lucky Jim and Roadley	10
Northern Belle	10
Freddie Lee	8
Yosemite Group	6
Alamo	8
Idaho	6
Vergenia	6
Mammoth	6
Egypt	5
Eureka	6
Surprise	12
Noonday, Boulder, etc	15
Antelope	7
Franklin	5
Cumberland	6
Reid & Robinson	5
Chambers	4

AINSWORTH DISTRICT.

No. 1	10

NELSON DISTRICT.

Silver King Group	48

RECAPITULATION.

	Records.	Transfers.	Certificates of Work.	Certificates of Improvement.	Leases.	Abandonments.
Nelson	161	69	117		22	
Trail	33	11				
Illecillewaet	31	15	37			
Lardeau	21	4	6			
Trout Lake	31	40	42			
Revelstoke	27	2	2			
Goat River	52		28			
Slocan Subdivision	368	473	365	12		
Ainsworth	613	553	218			17
	1337	1167	815	12	22	17

The amount received for licenses and records in West Kootenay for the year 1893 is:—

Northern Division—F. M. C., $ 1,236; M. R. G., $ 947.
Southern " 15,464; " 11,419.

Up to the end of the year, nearly 3,000 tons of ore were shipped to foreign smelters over the Nelson and Fort Sheppard and Great Northern Railways.

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

NOTE.—The reported shipments of ore over the Nelson and Fort Sheppard Railway for the month ending on the 23rd of January last, amount to 1,214 tons, valued at $151,750.

REPORT FROM MR. KELLIE, M. P. P., FOR WEST KOOTENAY.

THE LARDEAU

Is a rich mineral region, and a continuation of the great mineral belt that runs through the western mining States northward from Mexico. It is situated in a northerly direction and distant about twenty-five miles from the now famous Kaslo-Slocan camp. About one hundred and eighty-five mineral claims have been located, and about forty bills of sale recorded. Many of the claims in this camp are of the most promising character; the ore deposits are both extremely valuable and extensive, and all that is now required is some better mode of transportation for ingoing supplies and output of ore than the hurricane deck of a cayuse, the only present mode of conveyance. However, a waggon road from Arrow Lake to Trout Lake will be constructed by the Provincial Government early this year right into the heart of the Lardeau mining region, which will give the mine owners a chance to get in their supplies cheaply, and afford cheap transportation for their ores at a reasonable cost.

The Great Northern Group,

Situated up the North Fork of the Lardeau River, about five miles distant from Trout Lake, is an immense deposit of galena ore, running forty ounces of silver and upward to one hundred ounces, with considerable gold. It has a surface showing of twenty-five feet of galena, on which a tunnel has been run for some distance. There are five locations in Great Northern Group.

The Wagner Group,

Near the headwaters of Healy Creek, comprises four locations. The ledge is reported twenty feet wide, thoroughly mineralized, and carries about one hundred and ten ounces of silver, several dollars in gold, and about seventy per cent. lead. Some development has been done, and the claim bonded for a large figure.

The Silver Cup

Is being developed this winter by Holden, Downs, and Walker. It is located about four miles east of Trout Lake. The ore is of a very high grade, running from six hundred to thirteen hundred ounces silver per ton. Recent reports state the ore body is rapidly increasing in width as development proceeds. The vein on surface was four feet in width.

The Abbott Group,

Situated on a fork of Healy Creek, is a magnificent surface-prospective property. There are six claims in the group. Considerable work was done late in the fall, which went to show, that as depth was reached, the value of the ore improves both in quality and quantity. A bond was given on this property to an English syndicate.

The Riverside Claim,

On Trout Lake, a gold property is being developed this winter. The vein shows up a three-foot ledge at end of a fifty-foot tunnel, the ore of which assays from $17 to $40 in gold.

The Black Prince,

Situated on headwaters of Lardeau River, is a high grade of ore, assays of which show 200 ozs., 427 ozs., and 405 ozs. silver per ton. One-fifth interest in this claim has changed hands for $5,000 cash. The owners are going to open up this claim, and expect to make regular ore shipments so soon as a waggon road reaches Trout Lake.

The Gainor Group,

Situated about twelve miles from Trout Lake, has a four-foot ledge, which assays $45.65 gold and 103 ozs. silver per ton.

Abrahamson Group,

Located near the forks of Lardeau, and has three claims in the group. The assays of ore on the Crystal claim, $19 gold, 100 ozs. silver; North Star, $53 gold, 23 ozs silver; Queen of the Hills, $16 gold, 153 ozs. silver. Considerable work has been done on these claims, and it is expected this year that the development of the property will be pushed vigourously.

Other promising groups are the Horne, Blackburn Pool, Rainy, Matheson, &c. The ore of the Lardeau country carries more or less gold in all its ledges, and must be classed as high grade. Taking everything into consideration (with reasonable cost of getting ores to market), the Lardeau mining region is amongst the most promising prospective mineral regions on the American continent, and we are confident its future is beyond question, a future pregnant with the brightest assurances of a great mineral output of gold, silver, and lead ores in the immediate future.

ILLECILLEWAET.

Mining operations in this camp during 1893, were not conducted on as large a scale as in former years. Want of capital to open out some of the best claims and erect a few ariel tramways and concentrators, has been the chief drawback.

The Lanark Mine

Is a splendid property, and at a depth of two hundred feet the ore body shows up a width of twenty-seven feet. This ore body continues from the surface. There are hundreds of thousands of dollars of ore in sight, of a high grade. The mountain slope on which it is situated is too precipitous for the construction of a waggon road. Forty tons of ore could be shipped daily, providing an ariel tramway were built from the mine to the Illecillewaet River. The construction of this tramway would swing the Lanark mine into the front rank of British Columbia producing mines.

The Maple Leaf,

An extension of the Lanark mine and on the same ledge, considered by many competent mining experts to be a more valuable property than the Lanark.

The Silver Bow,

A copper property situated on Gold Hill, carrying a heavy percentage of copper and $18 gold per ton. Considerable work has been done on this property during the last two years.

Jumbo Claim

Is an immense ledge of quartz on North Fork, carrying silver from twenty ounces to eleven hundred ounces per ton, with considerable gold. $20,000 has been spent on this claim in running drifts, and a car load of the ore was shipped to Scotland. There are hundreds of tons of ore on the dumps, and we expect, sooner or later, that the Jumbo mine will make a record for itself.

There are other claims worthy of notice, that require capital to open them out. Among others the Blue Bell, Bob O' Link, Whale, Oak Leaf, etc., of which time prevents a fuller description being given.

FISH CREEK.

Considerable development has been done on claims located on the upper tributaries of Fish Creek during the past few years. Probably $10,000 has been spent in actual development on the Elizabeth, Annie, Agnes and Dunvegan groups of claims. The Dunvegan is looking better than ever and is bonded to a Chicago mining syndicate. The Elizabeth group is owned by Walter Scott and S. S. Ryckman, M.P., of Hamilton, Ontario, who have organized a joint-stock company of $150,000 capital for purchasing and development purposes, The ore assays from eighty ounces silver to upwards of seven hundred ounces.

The Glengary and Sir John Macdonald claims, located in September, about twenty miles up Fish Creek, are said to form a strong ledge with an immense surface showing equal to the great Silver King on Toad Mountain. The character of the ore is somewhat similar. Assays

of the ore give four hundred ounces silver, twenty per cent. copper, it also carries gold in small quantities. Lower down the creek on the shoulder of a mountain spur is the Black Bear, Lexington and Gladstone groups, with magnificent showing in the two former groups of lead silver ores. First assays did not give as high return as was expected, but after some development was done ore of a higher grade was found in the ledges, and doubtless rich pay streaks will be found in these immense deposits. The percentage of lead in these claims runs up to 70. The Fish Creek region is an extension northward of the Lardeau mineral belt and looks quite as promising for the investment of capital as the Lardeau region.

BIG BEND.

This vast gold-bearing mineral region is now attracting the attention of mining men, and that a lively interest will be taken in this section of West Kootenay this year, is unquestioned. The alluvial and hydraulic diggings on Smith and French Creeks, will be vigorously worked. New hydraulic leases will be applied for, and Big Bend will again resume her status as a gold-producing field on a large scale. Want of cheap communication and the enormous expense entailed in getting in supplies has to all intents and purposes checked mining ventures in the Big Bend. Twenty-seven cents per pound for packing in hydraulic machinery, and ten cents per pound for packing in provisions, is too costly for ordinary mining purposes. No prospector can stand such a heavy drain on his limited finances, and no mining company would invest its capital under such extremely adverse circumstances. Time, however, works wonders. A waggon road will be constructed from Revelstoke this year, 1894, to the head of Steamboat Cañon, some seven miles from Revelstoke, where it will connect with a steamer, running from that point to the mouth of Donnie Creek, some forty odd miles. This will reduce the cost of transporting supplies to a largely reduced figure, and will enable miners to locate the numerous gold reefs and get in machinery to reduce the gold ores, which is now and has been heretofore, from want of reasonable communication, practically impossible. From personal observations last summer, I am deeply impressed with the thought that the Big Bend country is destined to become the great gold-producing district of West Kootenay. The formation of the Big Bend is perfect for gold-producing ores, granite, slate, shists, and porphyry. Many promising ledges have been discovered, which are being kept dark as the prospectors know, unless a cheaper mode of communication can be had than heretofore, it would be folly to record them. However, the question of cheaper transportation has now been definitely settled, and we may look forward with deep interest to an era of remarkable and unparalleled progress and prosperity for the Big Bend country.

JAMES M. KELLIE.

SLOCAN MINING DISTRICT.

The following comprehensive and accurate description of the Slocan country is mostly taken from a report written by that well-known and practical miner, Randall H. Kemp, for the Nelson *Tribune*, and is considered by all who are acquainted with the country, as an accurate and reliable report of what, in the near future, promises to be the greatest mineral-producing district in the world:—

THE FAMED SLOCAN DISTRICT.

Its History; its Location; How it is Reached; its Geology; its Mines; its Prospects—All go to Show it to be One of the Greatest of the World's Great Mineral Fields.

It appears almost incredible, even to those well informed on the subject, that it is scarcely two and a half years since the first mineral discoveries were made in that portion of the Selkirk range lying between Kootenay and Slocan Lakes, now locally known as the Slocan District. Previous to the summer of 1891, when rich ore was first found, a few prospectors had pushed their way up Kaslo River as far as Bear and Fish Lakes, and one or two small parties had reached Slocan Lake by way of Slocan River, but neither were rewarded by finding mineral.

In August, 1891, Andrew Jardine returned to Ainsworth from the Blue Ridge Mountains, thirteen miles westerly from the present city of Kaslo, with a quantity of high-grade silver-lead ore. On the value being ascertained, which was quite flattering, a stampede for the neighbourhood of the new find was a natural result. Prospectors swarmed the hills, and many fairly good discoveries were made. Early in September, the late John L. Seaton and Eli Carpenter, having penetrated farther westward than the others, found themselves within sight of Slocan Lake. Disputing on which course to take to return, they divided their outfit, Seaton starting to return to Kootenay Lake by way of Kaslo River, and Carpenter *via* Slocan Lake and River. In retracing his steps, Seaton discovered the croppings of the Payne mine. While engaged in staking the claim he was overtaken by Carpenter, who had changed his mind regarding the route out. The Payne was staked jointly by them on September 9th, and was the first location made in the justly-famed Slocan District. Returns from the ore they took back to Ainsworth caused the wildest quartz mining excitement ever known in British Columbia. The season was well advanced, and snow was falling on the higher ranges, yet 140 claims were located and recorded by January 1st, many of which have since become famous as producing mines. In October S. S. Bailey, representing capital, visited the district, and purchased the Payne, Maid of Erin, Mountain Chief, and Two Jacks claims, the transfer being the first made in the district.

The enterprise of the residents of the towns on Kootenay Lake kept pace with the intrepidity of the prospectors, in that they at once began making trails to the new El Dorado. The business men of Nelson, within a month after the first discoveries were made, commenced a trail from the Columbia and Kootenay Railway up Slocan River, and in thirty days had over twenty-five miles of it completed, to a point on the river where boats could be laden and rowed to the mouth of Carpenter Creek without difficulty. In the meantime supplies were boated up Slocan River; but owing to the number of portages and obstructions, trips were made with great difficulty and not a little danger. A trail had been built that summer up Kaslo River, for a distance of four or five miles, by the Government, and it was extended late in the fall to a total distance of twelve miles by the parties who then owned the townsite of Kaslo. Of those who took through supplies by way of the Slocan route, about thirty wintered on Slocan Lake, a majority of them erecting cabins at El Dorado, now called New Denver.

Prospectors, miners, and capitalists began heading for the Slocan in February, 1892, and by the 1st of April fully 500 men were camped in the neighbourhood of El Dorado. The spring was backward, however, and little prospecting was done before the middle of June. By that time many had left disgusted, giving the country a bad name on the way out. As soon as the snow disappeared from the lower levels, work was commenced on trails on three different routes. The Slocan River trail was completed to the lake; a trail was built from Nakusp, on Upper Arrow Lake, to the north end of Slocan Lake; and the trail up Kaslo River

was pushed through to Watson, on Bear Lake. A trail was also built from El Dorado to the forks of Carpenter Creek. During the summer trails were built to connect the various groups of claims with the main trails. The hull of a steamboat was built at El Dorado early in the spring, but owing to the failure of the company with which the order for machinery was placed, the boat was not launched until late in the fall.

During the summer there was little difficulty in getting supplies to the various claims, although the cost of packing was high. Development work soon exposed such quantities of ore that better means of communication than by trails was talked of, the more so as "Jim" Wardner had commenced shipping ore from the Freddy Lee mine. An effort was made to get the Government to build a waggon road from Nakusp to the head of Slocan Lake, a distance of twenty miles; but, for some reason, the Government refused to undertake the work. The residents of Kaslo saw their opportunity, and by inducing Mr. Wardner to transfer his pack animals from the Nakusp Trail to the Kaslo Trail, succeeded in getting enough subscriptions to begin work on a waggon road late in the fall, and by the middle of December had it passable for waggons for a distance of twenty miles, and later on it was made passable for sleighs for a farther distance of twelve miles—to the mouth of Cody Creek. Over this thoroughfare hundreds of tons of high-grade ore were transported during the winter of 1892-93, which proved conclusively that the reports sent out regarding the Slocan had not been exaggerated. Far-seeing men became aware that waggon roads would be inadequate to handle the product of the mines, and the Nakusp and Slocan Railway was commenced in July, 1893, and at this writing is practically graded to the Forks of Carpenter Creek, now known as Three Forks, and the steel laid ten miles out from Nakusp. By June of the present year, Slocan District will, practically, have rail connection with the outside world.

Such, in brief, is the history of a mining district that has steadily gone ahead during one of the most critical and depressing periods in the history of the financial world.

Location of District.

As previously stated, the Slocan District embraces both sides of the dividing ridge of the Selkirk Mountains, and has its recording office at New Denver. To give a general idea of the topography of the country, the following elevations above the sea of different points are shown: Kootenay Lake, 1,760; Bear Lake (on the summit between Kootenay and Slocan Lakes), 3,545; Three Forks, 2,620; Cody Creek (a tributary of the South Fork of Carpenter Creek), 3,945; Slocan Lake, 1,865. The highest peaks in the district are estimated not to be over 8,000 feet.

How to reach the District.

From the United States, Slocan is reached by the Spokane & Northern and Nelson & Fort Sheppard railways to Nelson. At Nelson the traveller has choice of three routes, namely: 1. By steamer to Kaslo, thence by stage to Watson, Three Forks, and New Denver. 2. By rail and steamer to Nakusp, thence by trail to head of Slocan Lake, thence by steamer to New Denver; it is expected that the Nakusp & Slocan railway will be in operation from Nakusp to New Denver and Three Forks by June 1st next. 3. By rail to Slocan Crossing, thence by trail to foot of Slocan Lake, thence by steamer to New Denver. This route is not now used to any great extent. The district is also reached by way of Bonner's Ferry, Idaho, thence by steamer to Kaslo, thence by stage to Watson, Three Forks, and New Denver. From Canada, Slocan District is reached from Revelstoke by rail and steamer to Nakusp, thence as above described in route 2 from Nelson. From Kaslo a railway has been surveyed to the mouth of Cody Creek, and part of the right of way cleared. It is stated the road will be built this year.

Geological Formation.

One of the most difficult features of the country to describe without the aid of a chart is the geological formation in which the many mineralized veins occur; but it is made up mainly of argillaceous slates and different forms of lime, cut at various angles by eruptive dykes. The mineralized portion of the district is about twenty miles in length and twelve miles in breadth, although isolated claims have been staked outside this area, as will appear further on. The general trend of the formation is northerly and southerly, dipping to the south-west at different angles. As a rule, the strongest veins cut the formation obliquely, cleaving any obtrusive dykes of porphyry, serpentine, or other material, thus demonstrating to

all practical minds that they are true fissures beyond doubt, and carry their valuable metalliferous contents to great depths. The formation of the country and the gangue matter or vein filling is quite soft, all mining being done by the single-hand method. To the south and west the district is bordered by granite formation, on the east by schistose, and on the north by trachyte.

THE MINES.

Properties from which ore has either been shipped or is ready for shipment.

Within the boundaries of the district as described in the foregoing, at least twenty-five locations have passed from the prospecting stage so that they can be termed mines. There are, in addition to this number, many prospects whose value is not yet determined. The majority of the companies or individuals operating own a group of claims adjoining the particular one which gives their property its local name. Often a company owns several locations, which, if 1,500 feet square, covers quite an area, yet their possessions are generally designated by the name of one claim, although all the others may have pay ore in sight. In gathering the information contained in this article, the writer has been very careful to glean all the facts relating to the working mines, giving each separate, thus hoping to make the entire description the more comprehensive.

The Payne Group.

The Payne was the first location made in Slocan District, and the first to pass into the hands of monied men. The group is made up of the Payne, Maid of Erin, Mountain Chief, and Two Jacks, all located on one ledge. The formation is slate shale, the vein trending about 35 degrees east of north. The width of the vein is from 8 inches to 4 feet, carrying galena from 6 inches to 2½ feet in thickness. One hundred tons are now being shipped, which samples 225 ounces silver and 70 per cent. lead per ton. On the Maid of Erin there is a 40-foot tunnel. Five openings on the Payne range from 6 to 22 feet in depth, and on the Mountain Chief a 110-foot tunnel taps the vein 100 feet in depth. Scott McDonald owns one-half of the Payne claim, and S. S. Bailey the other half and the remainder of the group. Present working force, eight men.

The Noble Five Group.

Many persons contend that the Noble Five group is equal to the Slocan Star in extent and value. The discovery was made on September 28th, 1891, by W. M. Hennessy, J. J. Hennessy, Frank Flint, J. L. Seaton, and J. G. McGuigan. The claims staked were named Noble Five, Knoxville, Bonanza King, World's Fair, and Maud E. The owners claim the formation is slate and porphyry, the vein having a northerly and southerly direction. Width of vein varies from 2½ to 6 feet, although in one place it is much wider, as in an upraise 9 feet of solid ore has been encountered. This winter 350 tons of ore have been shipped, which, it is claimed, yielded 150 ounces silver and 69 per cent. lead per ton. The claims are worked through adit tunnels, except in one instance where an 80-foot crosscut has been run, so as to insure safety from snowslides. The three tunnels on the property aggregate 600 feet. The working force is 20 men.

The Mountain Chief.

This great little mine is located within a mile and a half of New Denver, and is the property of George W. Hughes, he having purchased it in 1892 for a consideration of $15,500. The vein is from 2 to 6 feet wide, with a pay streak of clean galena from 1 to 3 feet. Upwards of 1,000 tons have been mined, the shipments giving returns of 130 ounces silver and 70 per cent. lead. The property is worked through tunnels driven on the vein. From 15 to 20 men are steadily employed.

The Dardanelles Group.

The property of this company consists of seven claims, located in the Dardanelles basin on the summit of the divide. The claims are named the Dardanelles, Antelope, Buffalo, Okanagan, Diamond Cross, Hidden Treasure, and Caribou. The Dardanelles and the Antelope, so far, are the only ore producers. The formation is slate and porphyry, the vein trending northerly and southerly, ranging from a narrow seam to 5 feet in width. The Antelope claim

has been leased to different parties. Fifty tons of ore have been marketed, which yielded 99 ounces of silver and 51 per cent. lead. The most development work has been done on the Dardanelles. An incline shaft has been sunk 200 feet, as the vein is very flat, the total vertical depth from the surface to the bottom of the shaft is not over 100 feet. Smelter returns from 150 tons shipped range in value from 248 to 322 ounces silver, and from 26 to 30 per cent lead per ton. On account of the great flow of water, heavier machinery is required before further sinking can be done to advantage. In the meantime, the company will run levels on the vein, exploring for additional ore chutes. There is a steam hoist and pump on the property, placed there at quite an expense, as the freight over the 4-mile trail was 10 cents a pound. Although the expenditures, so far, have been in excess of the receipts, yet the company are sanguine of future profits.

The Washington Mine.

The Washington mine is owned by the Washington Mining Company, in which J. L. Montgomery, T. E. Jefferson, and Ralph L Clarke are the shareholders. The vein is in slate formation, and has a north-east and south-west trend. Previous to the time of the company taking hold, 560 tons of ore were shipped. Since the company took over the property the shipments have increased, but the exact tonnage and value of the ore is not attainable, as the officers of the Company refuse to give information. The equipments of the property are the best of any in the district, and the company evidently feels as though it had a valuable mine, and the working is being done on a business-like basis. Thirty-eight men are on the pay-roll.

The Blue Bird.

The Blue Bird belongs to the Washington Mining Company and is not being worked. It is in black lime formation intersected by porphyry dykes. The shipments of ore have aggregated 300 tons, averaging 144 ounces silver and 71 per cent. lead. This is one of the early producers of the district, and is considered by many a valuable property.

The Slocan Star.

This is the bonanza mine of the district, and many are of opinion that it is the "big mine" of British Columbia. The group consists of the Slocan Star, Slocan King, Jennie and Silversmith. They were located on the 7th of October, 1891. Formation, slate, which the vein cuts obliquely on a north-east and south-west trend, dipping with the hill at an angle of about 45 degrees. On account of the strike of the vein along the mountain on the west side of Sandon Creek, is tapped by cross-cut tunnels. The present working tunnel is 140 feet in length, piercing the vein at a depth of over 100 feet. Here the vein is fully 50 feet between walls, every particle of which—aside from the first-class ore—can be profitably concentrated. A drift runs to the north-east on the foot-wall, where the ore is mixed. The tunnel, however, is continued across the vein to the hanging-wall, where a large body of clean galena was struck. On drifting north-easterly this body widened out to 12 feet, without a particle of waste, therefore the company was not long in extracting the 500 tons which have been stored at Three Forks, awaiting completion of the Nakusp and Slocan Railway. An upraise has been made to the surface through ore continuously. A lower tunnel, to cut the vein at a depth of 400 feet, has been started and work on it will be pushed. It is likely the company will stope 1,000 to 1,500 tons before the sleigh road from the mine to Three Forks breaks up. There is one ton of ore sacked in the ore-house which runs over 1,000 ounces of silver. The average value of the first-class ore now being shipped is 100 ounces silver, $8 gold, and 70 per cent. lead per ton. The Byron N. White Company, organized under the laws of Wisconsin, with a capitalization of $500,000, is the owner. Fifteen men are employed at present.

The Northern Belle Group.

This group is located on Jackson Creek, four miles from its junction with Kaslo River, and is twenty-one miles distant from Kaslo. The group comprises the Northern Belle, Dublin Queen, Kootenay Star, and Ophir claims, each 1,500 feet square. The property has been worked continuously since the date of location, in June, 1892. The hanging-wall of the vein is slate shale, on which there is about a foot of porphyry casing, the same as the other bonanza mines of the argillite belt. The foot-wall is lime and slate, through which the vein cuts. The lode is from six to twelve feet wide, all the filling being concentrating ore. There

are, however, chutes of clean ore from eighteen inches to three and one-half feet in width, which is simply broken down, sacked and shipped. Developments on the property consist of two adit tunnels, each 250 feet in length, and another started, which is in a distance of fifteen feet. Winzes are being sunk and uprises made to connect these tunnels. Six hundred tons have been marketed or are in transit from the mine to smelters since the company assumed possession on June 1st, 1893. From 200 to 450 tons per month is the proposed output for the future. This ore has an average value of 100 ounces in silver and runs 80 per cent. lead per ton. It costs less to transport it to Kaslo than ore from any other mine in Slocan district, the expense being only $10 per ton. It is claimed there is a profit of $50 for the company on each ton handled, which appears like huge dividends. The Northern Belle Mining Company, of Seattle, owns the property. Dr. E. C. Kilbourne, of that city, is president. The capital stock is $250,000. The present working force is twenty-four men.

The Surprise.

The Surprise is in slate and porphyry. It recently changed ownership, Chicago parties, whose names are withheld, being the purchasers. Rumour states the consideration at $60,000, half cash. Recently a shipment of 100 tons was made, which a vague report values at 229 ounces silver. Except that eight men are employed, no other information could be obtained.

The Whitewater Basin Mines.

The Whitewater Creek empties into Kaslo River about seventeen miles from Kaslo. Along the mountains bordering this stream and in the basin near its source quite a number of locations have been made, some, it is claimed, carrying a large percentage of gold on the surface. From the Whitewater claim, J. C. Eaton, in 1892, shipped seven tons of galena ore which netted him about $900. During the past year the Wellington mine shipped several carloads, the figures for which are not obtainable, as the manager is absent in Eastern Canada. A diamond drill was used on the Wellington, but owing to the seamy character of the formation its use had to be abandoned. The Virginia, bonded by J. A. Finch, is being worked by a small force.

The Noonday Group.

The Noonday group is made up of the Noonday, Fourth of July, and Grey Eagle claims, on Cody Creek, and is the property of G. J. Atkins & Co. Formation, slate and porphyry. Have an eight-foot vein of concentrating ore. Fully 100 tons on the dump of clean ore, which will run 115 ounces silver and 78 to 80 per cent lead. Total length of tunnelling 300 feet. Employs twelve men.

The Idaho and St. John.

This property consists of two parallel locations, about 200 feet distant from each other, the veins on which are from five to six feet wide. The ore is galena carrying grey copper. The pay streak is two and a half feet wide and solid in places, often averaging 200 ounces in silver. One tunnel is in 300 feet. from which three cross-cuts have been run varying from twenty to forty feet in length. Another tunnel is sixty feet long. Besides the above there is in addition at least 150 lineal feet of development. Total figures of shipments not obtainable, but one carload of ore from these claims netted $1,760. H. H. St. John, "Al" Behne, and E. C. Gove are the owners. The working force is twenty men.

The Lucky Jim.

The Lucky Jim group, which lies within a few hundred feet of Bear Lake, consists of the Lucky Jim, St. George, and Roadley claims. It was located in May, 1892, hence the claims are 1,500 square. James Shields, Charles Druin, and Robert Williams were the locators. The hanging-wall is dolomite, and the foot-wall slate shale. The trend of the vein is nearly east and west, dipping at an angle of about 45 degrees into the mountain, or south. On the surface the ore exposed was fully eight feet wide in places. Tunnels and cross-cuts on the property aggregate about 500 lineal feet, the deepest workings being about eighty feet from the surface. Between fifty and sixty tons have been shipped, which, it is said, returned 67 ounces silver and 60 per cent. lead. This is one of the lowest-grade mines in the district, but being located less than half a mile from the proposed Kaslo and Slocan Railway, the saving

in transportation will be quite an item. Dr. E. C. Kilbourne, of Seattle, owns one-half, Robert Williams one-third, and Thomas J. Roadley one-sixth. No work of consequence is now being done, only two men being employed.

The Ruecau Group.

For convenience, the owners of this group call their property the "Reco," their possessions consisting of the Ruecau, Texas, New Denver, Ephriam, and Clifton. The vein is exposed and cuts through four of the claims. The formation is slate, intersected by porphery dykes, through which the vein trends at nearly a right angle. Ten feet is the average width of the vein, which carries galena and carbonates, the pay streak ranging from 18 inches to 8 feet in width. Forty tons have been shipped, which ran from 167 to 261 ounces silver and 65 per cent. lead. John M. Harris, F. T. Kelly and S. M. Wharton are the owners. Their working force is fifteen men.

The Queen Bess.

Located on south side of the mountain from Idaho basin. Slate and lime formation; vein trending north-east and south-west; development, 300-foot tunnel, which cuts the vein at a depth of 65 feet, and a shaft 40 feet in depth. In places have 8½ feet solid galena. On dump, ready to ship, 50 tons of ore. A parallel vein 14 inches wide carries galena and carbonates. Owned by Seattle parties and J. H. Moran. A force of men were put to work the last week in January.

The Vancouver Group.

Located on south side of Four-mile creek, 1,500 and 2,500 feet above Slocan Lake and distant four miles from the townsite of Silverton. Formation, slate; veins, north-east and south-west trend; said to be huge fissures which can be traced three miles. The two carloads of ore shipped last winter averaged 250 ounces silver, one carrying 40 per cent. and the other 55 per cent. lead. Over $4,000 worth of development work has been done. The claims are named Vancouver and Mountain Boomer. Mahon Brothers are the owners.

The Grady Group.

But little information can be gleaned concerning this remarkable showing on Four-mile creek. Five hundred tons of ore, valued at $125 a ton, are on the dump ready to ship. The property is held under bond to the McNaught Land and Investment Company of Seattle, N. F. McNaught being in charge. It is claimed the price to be paid is $70,000, of which two payments of $5,000 each have been made.

The Cumberland.

The Cumberland is in the same basin as the Idaho, and is south-east of that mine. The formation is slate and lime; north-east and south-west trend, and dips at an angle of 80 degrees from the horizontal; vein filling, galena and quartz; average width of vein four feet, and pay ore 14 inches, although in places it is 20 inches solid. Development consists of a tunnel 132 feet on vein, a cross-cut tunnel 60 feet, one drift from cross-cut tunnel 40 feet, another drift 70 feet, and one shaft 15 feet. Sixty tons of ore are ready to ship. Four men are kept at work. The owners are Martin Clair, C. M. Gething, and F. F. Macnaughton.

The Alamo Group.

Situated in Twin Lake basin, and discovered in June and July, 1892. Claims consist of the Alamo, Twin Lakes, and Ivy Leaf. Is a contact vein, between slate and porphyry. One tunnel 250 feet in length and another 165 feet. Ore, galena and carbonates, which run very high. One car-load has been shipped and other shipments are ready. Vein runs from three to five feet in width. Four men employed.

The Bon Ton.

It would be impossible under present circumstances to mention and describe all the many claims in various stages of development in the Jackson basin, or on both sides of the creek. Outside the Northern Belle, the Bon Ton is the only one which made a shipment. It was but a few tons, and the returns were between $300 and $400 a ton. The Sunset, Lucky Boy, and others are said to be healthy prospects.

The Big Boulder.

So much has been written of the famous Big Boulder that a few brief notes regarding it in this article may not be amiss. Development in the upper works of the Slocan Star show where this great mass of galena rested in the vein before it took its slide down the hill to where it was found by "Jack" Cockle. Evidently erosion of the country formation below the ledge matter caused the boulder to drop from its natural place in the vein, and it was carried down the hill by its own gravity. There has been shipped from the boulder 40 tons, which yielded 130 ounces silver and 70 per cent. lead. The owners expect when the remainder is sorted to secure at least 25 tons more of the same grade.

The Read and Robertson.

This group is located in the Four-mile section of Slocan district. The group consists of the Tenderfoot, Read, Robertson, Cosmopolite, and North Star. The Jenny Lind corners on the vein, and it is on that claim and the Read and Robertson where the immense croppings are which attracted so much attention to the property. The surface showing is 20 feet wide and can be traced for 1,000 feet. Formation, argillite and black lime; vein filling, lime spar and galena. In places, from 2½ to 4 feet of solid galena can be seen, while the entire vein is a rare concentrating proposition. An average sample of the croppings yielded 142 ounces silver and 70 per cent. lead. This property was bonded for $14,000 to the London Mercantile Association, in October, 1892. They paid down ten per cent. of the bond and expended $4,000 in development. The same cause is given for forfeiting this bond as is given for forfeiting the bond on the Great Western. Many claim the Read and Robertson group is the coming great mine of the North American continent. J. A. Finch and associates now have the property bonded. No work is being done at present, on account of the depth of snow and lack of accommodation for a working force.

The Chambers Group.

This group consists of the Chambers, Wellington, Eureka, and Jay Gould. It is situate on the south fork of Carpenter Creek, above the mouth of Cody Creek, and was located October 26th, 1891. The hanging-wall is shale and the foot-wall quartzite. It is fully 80 feet between walls, the vein carrying stratas of clean galena and concentrating ore. Sample assays return an average of 120 ounces silver and from 60 to 80 per cent. lead. There has been 300 feet of development work done. The present owners are the Bank of Montreal, G. J. Atkins & Co., and "Ed" Becker, "Charlie" Kent, and "Tom" Litster. This is said to be the finest concentrating proposition in the district. Not being worked at present.

The Slocan Boy.

This claim lies above the Washington, the vein passing through a portion of the ground. It is owned by Spokane parties, who on account of private financial embarrassments are not working the property at present. A quantity of ore is on the dump, but no shipments have been made.

The Great Western.

The Great Western was located in October, 1891, by "Tom" McGovern and "Charley" Franklin, of Ainsworth, and is 600 x 1,500 feet. It is now a Crown grant claim. It is in the argillite slate belt. The vein is a very strong one, although but 2½ feet in width, dipping at angle of 60 degrees. From 3 to 14 inches is the width of the pay streak as far as developed, and there are about 30 tons of ore on the dump, which will average 120 ounces in silver and 70 per cent. lead. The development is made up of tunnels alongside the vein, cross-cuts, etc., which aggregate about 450 feet. The property was bonded in 1892 to the London Mercantile Association, who paid $5,000 on the bond, and expended $10,000 in development. The instability of the price of silver caused the company to throw up the bond and forfeit the money paid. The locators are still the owners.

The Eureka.

The Eureka and Mineral Hill claims lie north-east of the Slocan Star group on the same vein, and are the property of G. J. Atkins & Co. This ledge is at least 20 feet wide. They have run two tunnels, aggregating 500 feet, and have struck ore in the lower one. Assays

have yielded 169 ounces silver, and 70, 72, and 74 per cent. lead. Nine men are employed on this property, and work will also be commenced on the Elgin, on Slocan Star Hill, in the spring.

The Lorna Doone.

This claim is an extension of the Vancouver, and carries 18 inches of very rich ore. Rathbourne & Culver, the owners, have been offered $12,000 for it. Its location is three and a half miles east of Slocan Lake, near Four-Mile Creek. Several tons are on the dump, but no shipments have been made.

The Dayton.

This ledge was discovered last year by William Springer. It carries dry ore, and is located in the granite belt, three miles east of and near the foot of Slocan Lake, 20 miles from New Denver. The vein is 2½ feet wide, carrying 10 inches of pay ore, averaging 215 ounces silver and $21 gold per ton. The highest assay was 920 ounces silver and $40 gold. Mr. Springer has sold the claim to Mr. Hanauer, the Salt Lake smelter man.

The Greenhorn.

The Greenhorn claim is located on Cody Creek, opposite the Freddy Lee, and is in the same formation. There are three feet of solid galena in sight, which samples 100 ounces silver and 60 per cent. lead per ton. John McNeill, of Ainsworth, is the owner. The vein has been traced through the entire length of the location, 1,500 feet.

The Eureka Group.

To the north of Kaslo River, on the divide between Liddle and Bear Creeks, is a group of claims named the Eureka, Yosemite, Homestake, Scottish Chief, and Parrot. They are in the trachyte formation, and trend north-east and south-west. The veins are from 5 to 10 feet wide, carrying chutes of ore from 16 inches to 2½ feet in thickness, all galena, assaying 125 ounces silver and 77 per cent. lead per ton. On the Eureka and Yosemite there is 150 feet of tunneling and 44 feet of shafts, with open cuts 60 feet in length. On the Echo, another claim of the group, there is a 25-foot tunnel on a pay streak from 6 inches to a foot wide, carrying fine-grained galena assaying as high as 327 ounces silver per ton. McDonald Brothers, McPhee, and Moore are the owners.

The Jardine Camp.

The Jardine camp was discovered in September, 1891. The principal claims are known as the Trapper, Silver Tip, Beaver, Lone Star, Cornet, Snowflake, and Mountain Dew. They are located three miles from McDonald Brothers' Half-way House, and thirteen miles from Kaslo. The formation is trachyte with serpentine dykes, the veins trending north-east and south-west. A considerable amount of work has been done by the owners. The Beaver is 12 feet wide, carrying galena and copper. There are between 50 and 60 tons on the dump. There is four feet of ore in the upper tunnel of the Mountain Dew, which assays from 26 to 204 ounces silver. The Silver Tip carries dry ore, assaying as high as 400 ounces silver. Andrew Jardine, John (Lardo) McDonald, and "Jack" Allen are the owners.

The Montezuma.

The Montezuma is only eight miles from Kaslo, on a tributary of the South Fork of the Kaslo River. The formation is slate, granite, and lime, the vein cutting through the same. There were nine feet of clean galena on the surface, and development work has proved the vein to be from 3 to 4 feet in width. There is a cross-cut tunnel, 70 feet in length, tapping the vein 40 feet in depth. From the tunnel a drift has been run 40 feet, showing from 1 to 4 feet of ore. Its value is 80 ounces in silver and 60 per cent lead per ton. "Tom" McLeod, "Ed." Becker, and others are the owners.

The Fisher Maiden.

The Fisher Maiden, Stand-By, and Sixty-Three are owned by W. A. Crane and "Dan" McDonald. They are in the granite belt, near Eight-Mile Creek, down the Lake from New Denver. The veins are from 6 to 7 feet in width, carrying from 18 to 20 inches of ore, the

lowest assay of which was 220 ounces in silver. Ruby and silver glance predominate. In one place 6 inches averaged 600 ounces per ton. The Fisher Maiden and Stand-By are held under bond to Seattle parties for $30,000. This property is six miles back from Slocan Lake.

The Navigator.

The Navigator adjoins the Alpha claim of the Grady group, and is a parallel vein. It is a 3-foot ledge, with a pay streak 8 inches wide, carrying 120 ounces silver and 65 per cent. lead. The formation is slate, the vein trending north-east and south-west. Jasper King and "Ben" Anderson are the owners, and they propose to do considerable development work the coming summer.

The Grey Copper.

This claim lies between the Blue Bird and Reco, and cuts through slate, porphyry, and lime formation. The vein is three feet wide, and shows ore for 200 feet, averaging one foot in thickness. Assays run from 145 to 160 ounces silver and 72 per cent. lead. This claim is owned by "Jack" Thompson, "Ed." Becker, and "Charley" Kent.

The Tom Moore and St. Lawrence.

North-east of the Great Western are located the above-named claims. The ledge is about 5 feet wide, composed of iron carbonates, decomposed lime and galena. Some ore has been extracted, but not enough to ship. These prospects are surrounded by the big mines of the McGuigan basin. M. C. Monaghan, G. Hawley, and "Tom" Hennessy are the owners.

The Freddy Lee.

The Freddy Lee was the first mine in Slocan District to ship ore. Six carloads were shipped *via* New Denver and the Columbia River before the sleigh road was completed to Three Forks, in the winter of 1892. For the past few months the mine has been leased to Messrs. Goldstein, Flaherty, Fitzwilliams, and Crowley. They have shipped 108 tons. Under former management, when being operated by the Freddy Lee Mining Company, about 450 tons were shipped. The present lessees have over 100 tons ready for shipment. The vein is in slate formation, and is of irregular width. The ore streak sometimes widens out to three feet. Value of ore, 120 ounces silver, 70 per cent. lead. About 2,000 lineal feet of development work has been done.

Free Gold Ores.

That free gold ore has been found in the granite belt on the east side of Slocan Lake, from eight to twenty miles south of New Denver, is an open secret. Some of the prospects discovered there carry both gold and silver, and others appear to carry the yellow metal alone. One discovery, near Eighty-mile Creek, yielded from one assay $249, and from another $400 gold per ton. Several other locations have been made, but sufficient development work has not been done to determine their value.

Many other Prospects.

There are many prospects of merit in Slocan District which are not described in the foregoing, for the reason it was impossible at this time of the year to reach them or communicate with the owners. The Best, Ruby Silver, R. E. Lee, Young Dominion, and several more are not mentioned at length for this reason.

The microscope has demonstrated the reason why the ores of the Slocan are richer than those of any other district. By examination it has been found that in the cleavage of the galena cubes are minute particles of grey copper and antimonial silver. In some of the ores, notably that from the Mountain Chief, these forms are visible in great blotches to the naked eye.

For a plentiful and never-failing water supply for power or other purposes the Slocan mining district is second to none in the world. There is not a mine in the district at which electricity generated by water power could not be used.

The depressing financial wave which swept over the world in 1893, leaving ruin in its track everywhere, had but little effect on the Slocan. Even despite the great drop in silver and lead more mines are working, and the output is far greater, than before the panic.

A dry ore belt runs through the Slocan Country.

Few people realize the advantages that would accrue to the district by the discovery of a productive field of dry ore. With an abundant supply of dry ore there would be no necessity of shipping galena ores to distant points for reduction. Heretofore the Pacific North-west, with all its varied mineral resources, has not been productive of this one indispensable smelting material. One of the largest owners in the smelting plant partly constructed at Pilot Bay says the lack of a dry ore supply is the most serious drawback to be contended with. Neither is it generally known that the West Kootenay producer of dry silver ore saves $10 per ton in freight and treatment charges on ore shipped to smelters in the United States. Although dry ores have been found in several localities in the district, the field or belt that is the most promising is located on the tributaries of the North Fork of Carpenter Creek, to the north of Bear and Fish Lakes, in the Slocan Mining Division. The belt extends westward to near the mouth of Wilson Creek, four miles north of New Denver, but nothing more than prospecting has as yet been done in the vicinity of Wilson Creek.

The formation is white and black lime, shale, granite, and porphyry, in masses. Such it is from Slocan Lake eastward to the head of the North Fork of Carpenter Creek. The veins found run with the formation and some are contacts. Their width ranges from 6 inches to 4 feet. Assays have been made running all the way from 91 to 1,250 ounces silver per ton. What the section will develop once capital is invested, is to be determined. North of Bear and Fish Lakes are quite a number of locations. The formation is porphyry, slate and lime. Two and a half miles north-west of Watson, Messrs. Russell and Erickson have two claims, called the Silver Glance and Summit. They were located on July 19th, 1892, and that fall bonded to Franklin Farrel for $45,000. This bond, however, lapsed on account of stringent times. From these claims 1,500 pounds were shipped, which yielded at the rate of 232 ounces silver per ton. The veins are filled with quartz, the pay streak being from 10 to 20 inches in width. In the same neighbourhood is the Miner Boy, owned by Messrs. Cummings, Adams, and Niven. It is lime and slate shale, cutting the formation. They have a tunnel 175 feet on the ledge, but have shipped only 2½ tons as a test, which yielded 395 ounces silver per ton. Assays have been had ranging from 640 to 3,834 ounces. The ore consists of native silver, antimonial silver, grey copper, and black sulphides. Five men are at work on the claim, and the owners expect to ship quite a quantity of ore in the spring. E. C. Venmoerkerke, better known as "the major," shipped three tons from one of his claims, which gave returns of 195 ounces silver per ton. In the granite belt south of New Denver considerable quantities of high-grade ore has also been found. The locally noted Dolly Varden and Archie claims are in this belt.

The following table taken from Customs returns will give an idea of present output of ore, under very unfavourable circumstances as regards freights, but on the completion of the Nakusp and Slocan Railway a saving of $20.00 or $25.00 per ton will be possible when the output will largely increase:—

Mine.	Date.	Tonnage.	Total.
Washington	December 22nd	40	
Do.	do. 27th	82	
Do.	do. 29th	112	
			234
Noble Five	do. 29th	60	
Do.	do. 30th	39½	
			99½
Dardanelles	do. 26th	52	52
Reco	do. 27th	20	20
Mountain Chief	do. 26th	13½	13½
December's tonnage			419
Washington	January 1st	100	
Do.	do. 19th	40	
Do.	do. 23rd	60	
Do.	do. 26th	20	
Do.	do. 27th	20	
			240
Noble Five	do. 25th	74½	74½
Dardanelles	do. 21st	19	19
Mountain Chief	do. 4th	40	
Do.	do. 5th	65½	
Do.	do. 7th	59	
Do.	do. 30th	40	
			154½
Northern Bell	do. 9th	40	
Do.	do. 14th	40	
Do.	do. 26th	40	
			120
Freddie Lee	do. 18th	60	
Do.	do. 21st	47½	
			107½
Suprise	do. 28th	67	
Do.	do. 30th	20	
			87
Antelope	do. 9th	24½	24½
No. 1, Ainsworth	do. 11th	14½	14½
Kaslo Sampler	do. 16th	58	58
Mile Point Mine	do. 21st	11½	11½
Big Boulder	do. 27th	40	40
Hall Mines, Nelson	do. 19th	60	
Do. do.	do. 31st	60	
			120
January's tonnage			1,071
Washington	February 1st	60	
Do.	do. 7th	20	
Do.	do. 8th	20	
			100
Mountain Chief	do. 4th	60	
Do.	do. 8th	40	
Do.	do. 8th	40	
			140
Northern Bell	do. 6th	80	
Do.	do. 8th	60	
			140
Antelope	do. 4th	19	19
Tonnage for one week			399
Tonnage for six weeks			1,899
Average value of ore per ton			$130

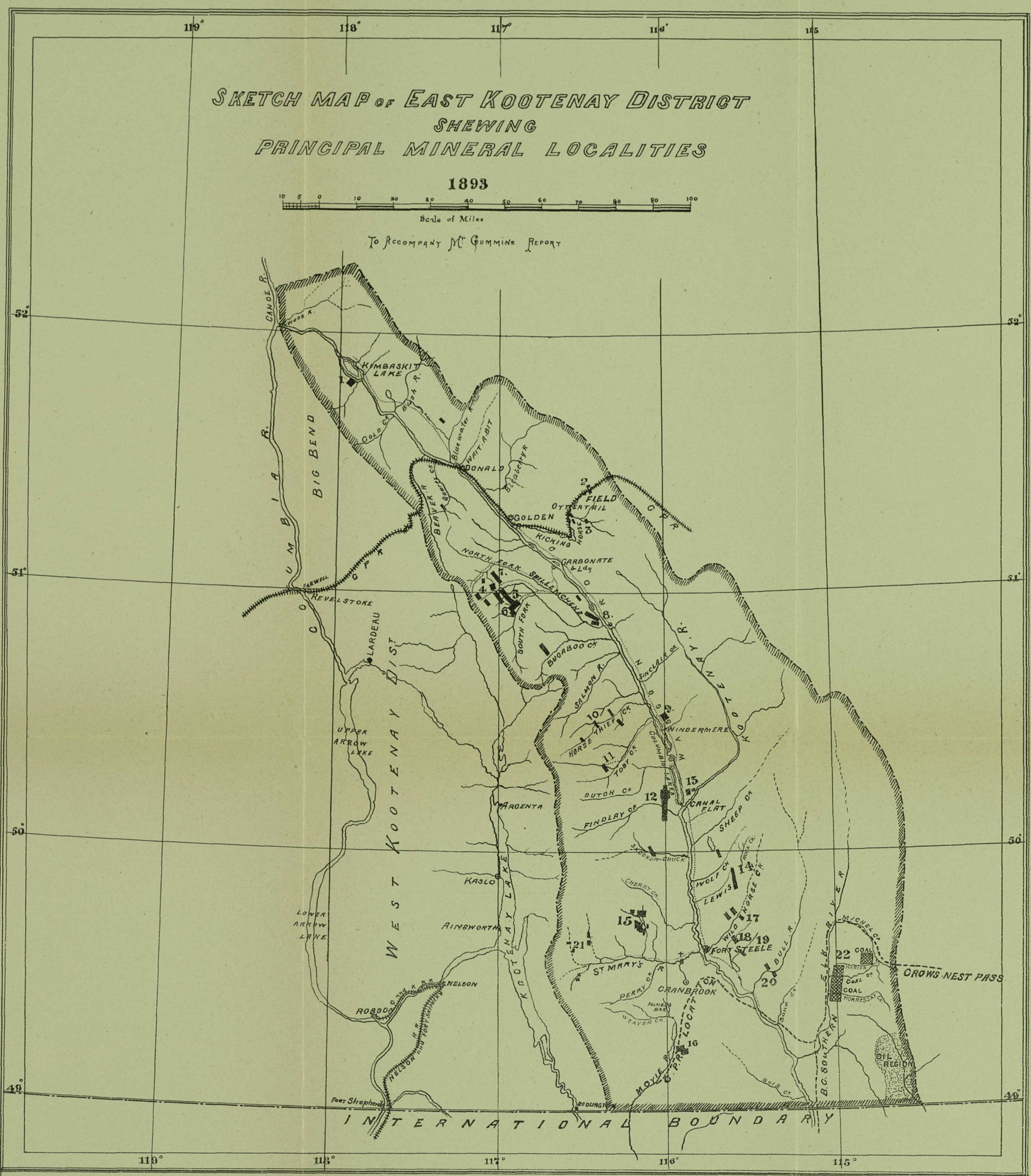
SKETCH MAP of EAST KOOTENAY DISTRICT
SHEWING
PRINCIPAL MINERAL LOCALITIES

1893

10 5 0 10 20 30 40 50 60 70 80 90 100

Scale of Miles

To Accompany Mr Cummins Report



1	Kimbasket Lake Claims	Arg. Galena	12	Thunder Hill Group	Silver, Gold. Copper. Lead
2	Field Claims "Monarch" mine	do. do.	13	Canal Claim	Copper
3	Otter Tail Claims	do. do & Copper	14	Rock Creek Claims	Arg. Grey Copper. Gold
4	"Bobby Burns" & "International" Group	Gold	15	"North Star" & "Sullivan" Groupe	do. Galena & Carbonates
5	Carbonate Mountain Group	Arg. Galena. Grey Copper & Gold	16	Moyie Lake Claims	do. Galena
6	Vermont Creek Group	do. Galena	17	Wild Horse Claims	Gold
7	Cariboo Basin Group	do. do. & Gold	18	Mouse Creek do.	Gold
8	Jubilee & Spillemechene Mountain Group	do. do. & Copper	19	Lost Creek do.	Copper. Silver & Gold
9	Windermere Mountain Claims	Copper	20	Bull River do.	do. do. do.
10	Horse Thief Creek Claims	Arg. Galena Copper & Iron	21	St Mary's Locations	Galena & Copper
11	Toby Creek Claims	do. do. & Copper	22	Crows Nest Pass" Coal Fields"	Coal

A. P. Cummins
P.L.S.

The figures, though satisfactory, cannot be taken into account in computing the probable output of the Slocan. All the properties are doing development work chiefly. When they are put in shape for mining on the proper scale the output can be then computed; at present it can only be surmised.

There are upwards of 400 men in the Slocan and between Kaslo and New Denver, who are employed, either directly or indirectly, in connection with the mines, and when the dangers of snow slides are passed there will be hundreds more. Without a single exception of note every mine in the Slocan has improved as it has been developed, the veins becoming stronger as they went deeper.

EAST KOOTENAY.

MR. CUMMINS' REPORT.

VICTORIA, B. C., February 1st, 1894.

SIR,—I have the honour to submit to you the following report on mining operations and mineral development carried on in the District of East Kootenay, during the year 1893, together with the usual statement in tabular form, respecting placer mining. I add a sketch map of the District, showing the principal mineral localities referred to in this and former reports. The map will give a more correct idea of the creeks tributary to the Columbia River, than can be obtained from the published maps.

PLACER MINING.

The yield of placer gold this season, has been confined to two creeks, both situated in the Fort Steele Division, and is estimated by Mr. Edwards, the Mining Recorder, as follows:—

Wild Horse Creek	$19,000
Moyie River	700
Total	$19,700

Mr. Griffith's hydraulic property on Wild Horse Creek, was sold to the East Kootenay Exploration Syndicate, of London. This company placed a considerable amount of new plant, supplied by the Albion Iron Works, of Victoria, on the ground this season, and piped for a time. The results are stated to have been such as to justify working next season on a much larger scale. The hydraulic ground, worked at a profit for many years by Chinese companies, has been bought by Mr. Griffith. It is probable that this ground will also become the property of the Syndicate, in which case hydraulic mining, to an important extent, may be looked forward to in the near future on Wild Horse Creek. There have been five applications for leases of ground on this creek during the year, one of which, on Victoria Gulch, a tributary of the main creek, has been granted, and work on this ground is expected to proceed in the early spring. An application has been received for a lease on Palmer's Bar Creek, in the more western portion of Fort Steele Division.

In the Donald Division there have been a number of applications for leases on the Blue Water Creek, which have been standing over for some time, a question of surface rights to the ground having been raised. The objections now removed, it is expected that the acquisition of the leases will be proceeded with. With regard to the placer prospects in the creeks north of the C. P. R., generally, it may be added that Mr. McConnell, of the Geological Survey of Canada, states in his report (Summary Report for 1892), that coarse gold has been found in the beds of several of the streams which flow into the Columbia from the East, and it is highly probable that paying placer deposits will eventually be discovered in this part of the range.

QUARTZ MINING.

The development of the mines and the energy displayed in prospecting for mineral, throughout the district as a whole, have not realized expectations. The cause of this must be mainly looked for in the extreme tightness of the money market and the depression of silver, together with its uncertain future. The resulting difficulty of selling prospects in silver localities, or of obtaining aid to develop, has been severely felt in this district.

Prospectors have been principally active in the southern portion of the district, in some instances with very encouraging results. A large number of new discoveries, of both gold and silver ore, have been made, namely, at the head of St. Mary's River, in the vicinity of the North Star Mine, on Moyie Lake, on Wild Horse Creek, and Bull River, and other localities.

In the extreme northern division, on Kimbasket Lake, a lead of great size, carrying silver-bearing galena, was found.

The principal work towards development has been done on the immense silver-lead deposits of the North Star Mine, at Thunder Hill, and on Vermont Creek in the McMurdo District.

More particular mention of the above discoveries and the result of the development work, will be made further on.

MCMURDO DISTRICT.

The Bobby Burns and International group of gold properties, situated on the Middle Fork of the Spillumchene River, noticed favourably in former reports, has lain almost idle, except for assessment work. Active work on the Bobby Burns claim, looked forward to as the result of the sale of the property to Victoria capitalists, has not been yet resumed owing to unfortunate delays in the transfer of the title. The International claim has been recently sold to a Toronto Syndicate, after protracted negotiations. It is hoped that these claims may be exploited successfully next season, and that the various other gold claims of this group will attract the attention of capital, which they deserve.

No considerable development has been done on the claims on Carbonate Mountain, Cariboo Basin, and Copper Creek, this season, further than annual assessments.

VERMONT CREEK.

On the south side of this creek the claims owned by Messrs. Wells and Pollock have been worked by them. One hundred tons of ore have been taken from tunnels and slopes on the various veins, described in former reports on these claims, and hauled out over a sleigh road to the Columbia River. The quality of the ore is about the same as that of the shipment packed out over the trail last year from this property, viz.: 100 ozs. silver and 50 to 60 per cent. lead.

On Spillumchene Mountain, Jubilee Mountain, and Horse Thief Creek, but little towards further development has been done.

AT THUNDER HILL MINE

Work proceeded rapidly during the early part of the summer and the previous winter. A force of 45 men were employed. The concentrating works described in last year's report, were completed and ran for a short time in the beginning of August, the machinery working very smoothly and well. The works and mine shut down about the middle of August, owing, it is understood, to a lack of funds. The company has gone into liquidation, it is stated, with a view to re-construction before resuming operations.

On the Canal claim, on the east side of Columbia Lake, I am informed that a promising body of copper carbonate ore has been exposed by recent work.

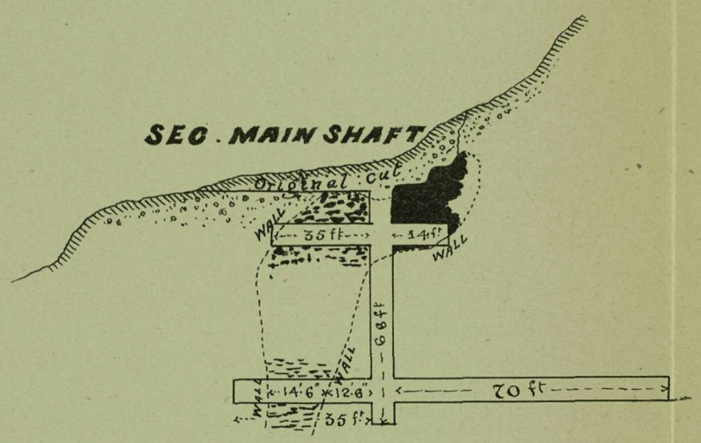
No further developments of importance are reported in the Hughs Range, between the Columbia Lake and the vicinity of Wild Horse Creek, though some locations were made of which of which I am without information.

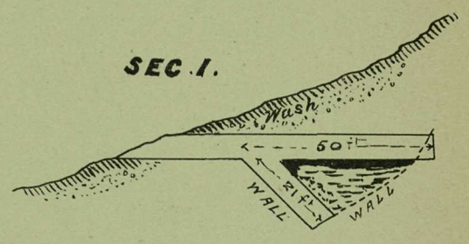
WILD HORSE CREEK.

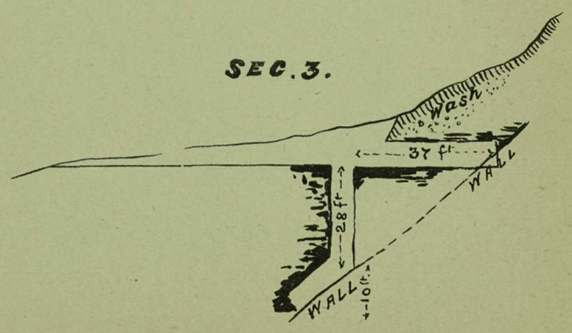
I am glad to have favourable reports to give regarding the future prospects of this creek and vicinity for gold quartz. Though it is estimated to have yielded, up to the present time, over six millions of dollars in placer gold, but little prospecting of an intelligent kind for quartz has been done. Several prospectors have worked in this direction during the past season, and made some important discoveries. On the south side of the creek, about seven miles

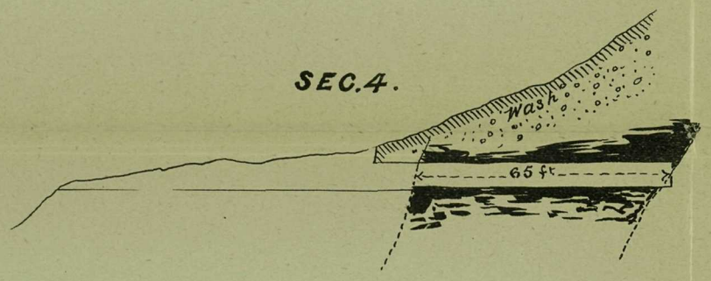
PLAN & SECTIONS
SHEWING
DEVELOPMENT WORK
AT
NORTH STAR MINE
1893.

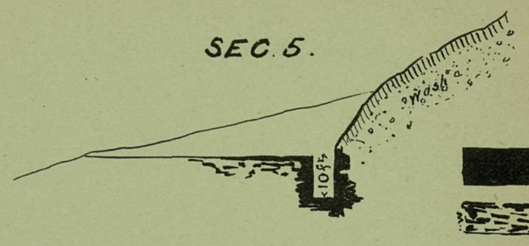
To Accompany Mr. Cummins. Report





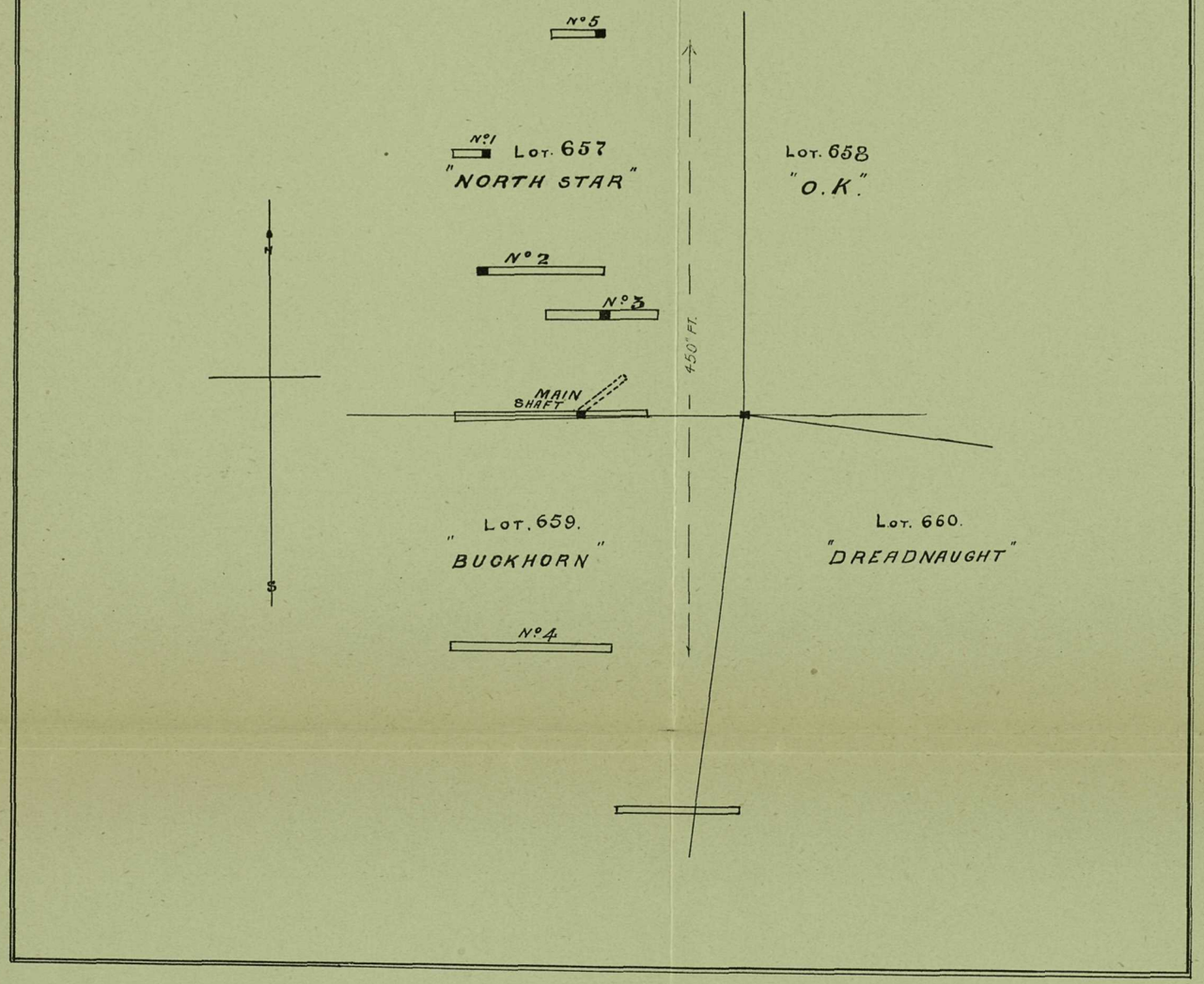






Galena

Carbonate Ore



above Fort Steele, three claims were located by Messrs. Banks and Young on a strong lead stated to be cropping continuously for over 2,000 feet. The following particulars are derived from a reliable and disinterested person, after the examination of the ground in the end of October: The width of the ledge varies from 2 feet to 4½ feet. The strike is about east and west. It runs through about the centre of a belt of porphyritic rock, about 100 feet wide, the country rock on east side of this belt being quartzite. The ledge cuts the formation very clearly at about 30° and dips into the hill, or south at about 45°. There is evidence of the lead becoming more vertical in depth. Picked samples can easily be obtained from the Western or Dardenelles claim showing quantities of free gold, the richest streak being on the hanging wall. The lead is described as having all the characteristics of a true fissure. Up to the end of October, the discoverers had done but little work on the lead, as they had been engaged in building a trail to the claim and putting up a cabin in order to work all the winter.

About three miles further down the creek, but on the opposite side, about 1,500 feet in elevation above the hydraulic properties, a ledge, known for some time, has been prospected by Messrs. Dougherty and Griffith. On the surface the quartz had a very favourable appearance for gold, but nothing could be panned from it, even after sinking a shaft to a depth of 20 feet. From this depth to 30 feet, which had been reached when last heard from, most satisfactory results were obtained by panning. So far, they have sunk two pits, one 30 feet deep and one 15 feet. No gold has been found yet in the latter. The pits are about 200 feet apart. The lead appears to strike in a north-westerly and south-easterly direction, but seems on the surface a good deal mixed with the quartzite formation, making it difficult to judge its exact width, which appears to be from 2 to 6 feet and possibly more. It is stated that a slate foot wall has been struck near the bottom of the 30-foot shaft. The owners are sanguine of having a good free milling gold property.

Another discovery of free gold quartz, near this locality, was made in the latter part of the season, on the front range facing the Kootenay Valley, between what is known as Horse Shoe Cañon and Mouse Creek. Numerous specimens shewn me from here contained considerable quantities of free gold, plainly visible without a magnifier, in a copper stained quartz, grey copper being also present. The discoverers stated that the vein could be traced for a considerable distance and ranged in width from about 8 inches to 2 feet. The samples I saw seemed to me to come from the narrower portions of the vein. No work whatever has been done.

NORTH STAR MINE.

In last year's report, page 538, a description is given of the discovery of an immense body of steel galena, near the St. Mary's River, about 20 miles north-west of Fort Steele. It is also mentioned that this property had been bonded by Mr. D. D. Mann, of Montreal. The property, consisting of four 1,500 feet square claims, taken up in a square block or nearly so, was purchased by Mr. D. D. Mann and associates on 1st July last, after having been examined and reported on by Mr. George Attwood, the well-known mining engineer. A considerable amount of development work has been done on the property, both during the currency of the bond and since the purchase was completed. I annex a plan and sections explanatory of this work, which will set forth the work and its results better than any lengthy verbal description. The work extends over about 450 feet of the lode, the greatest depth from the surface reached is 66 feet in the main shaft, sunk at the original discovery cut, where the first body of ore was bared by the discoverers by removing the overlying wash material. The vast body of mineral run through at section 4, where the drift shows solid galena and carbonates for the remarkable width of 65 feet, was not opened out until after the purchase of the mine was made. It seems fair to conclude that the work has shown the existence of huge mineral deposits. Though such bodies cannot be looked for in a regular width and richness throughout, there seem very good indications in this case for their continuance in length and depth.

The only regular sampling, the results of which I am aware, gave: Silver, 47.43 ozs.; gold, nil; lead, 67.50%; iron, 6.63%; zinc, 1.90%. Assays of over 85 ozs. have been obtained, whilst the carbonate ore appears generally to run somewhat lower in silver. The ore is asserted to be of the very finest quality for smelting.

The advantageous position of this mine, and neighbouring properties, as regards water communication, can be seen by referring to the annexed general sketch map of the District, (see Group 15). The mine is within sixteen miles of the Kootenay River, on which there are at present two steamboats running, one in connection with the Great Northern Railroad at Jennings, the other with the Canadian Pacific at Golden. The country between the mine and

the river is easy for waggon road construction. It will also be seen that the located line of the C. P. R. Crow's Nest Pass Railroad passes within about an equal distance from these mines.

One of the important features regarding the smelting ores of this region, is their proximity on the proposed lines of railroad to the inexhaustible supplies of cokeing coal in the Crow's Nest Pass.

A number of other locations have been made on the hill on which the North Star is situated, but little or no work has yet been done on these claims so far as I am aware.

SULLIVAN GROUP OF PROSPECTS.

About 2 to 3 miles to the north of the North Star Mine, on the other side of Mark Creek, outcrops of galena, apparently of a similar nature and size to the North Star, have been located. Great masses of steel galena and iron have here been bared in several places, but sufficient work has not yet been done to enable one to say much about them.

MOYIE LAKE CLAIMS.

Some important discoveries of silver-bearing galena were made last spring, on the mountains on the east shore of the Upper Moyie Lake. Large outcrops of fine looking galena, 5 to 6 feet in width in some places, occur on the St. Eugene claim, about 1,400 feet above the lake. The little work done here has exposed large quantities of mineral, but has not gone sufficiently deep to show the existence of a lead of a continuous nature. Adjoining the St. Eugene claim, to the north, is the Queen of the Hills claim. A line of claims extend from here westward down to the lake. A continuous vein is supposed to run through these claims, but sufficient work has not yet been done to determine the fact.

LOCATIONS AT THE HEAD OF ST. MARY'S RIVER.

On the various forks of the St. Mary's River no less than 46 mineral claims were located in the early part of the summer. There appears to have been a rush into that locality of prospectors from West Kootenay. Most of these locators returned to the Kootenay Lake country, forwarding their records to Fort Steele. I regret to say that it has not been possible for me to obtain information as to the importance of these discoveries. I am, however, indebted to Mr. Sandilands, of Ainsworth, for some information derived from some of the prospectors. It is stated that the claims on the West and Middle Forks contain large bodies of galena assaying from 26 to 66 ozs. in silver, and 65% lead. The leads in some cases carry copper.

All the discoveries on the South Fork carry copper and silver, assaying 56 ozs. silver and 31% copper, and are described as strong ledges 4 to 6 feet in width.

LOST CREEK, BULL RIVER, AND SAND CREEK.

Nothing beyond assessment work was done on the claim on Lost Creek this season.

Promising prospects are reported from both Bull River and Sand Creek. The average of 5 assays from the galena and grey copper leads, about half a mile above the bridge over Bull River Cañon, gave: Silver, 76 ozs.; gold, $21; copper, 22%.

A large lead containing copper glance and carbonates, was located on Sand Creek. There appears to be plenty of mineral in the lead, but the grade of the ore at the surface is not high.

A number of claims are stated to have been located near the International Boundary Line, to the east of the Kootenay River. These claims have been recorded in the State of Montana. It is, however, considered by some of the residents on Tobacco Plains, that these claims are really on the British Columbia side of the line.

KIMBASKET LAKE

Is situated in the Donald Mining Division, to the north of the C. P. R., about 35 miles down the Columbia from Beaver, the nearest point on the railway. A trail has been cut northward from Donald by the Government, with a view to giving access to this region, which now reaches as far as the lower end of Kimbasket Lake. The country affords favourable indications for mineral and placer gold, and has tracts of very fine timber. It is satisfactory to find that prospectors are giving some attention to this region.

The important discovery of a lead of great width, carrying silver-bearing galena, has been made on the west shore of the lake. The lead is described as 80 feet wide, and can be traced in a north-westerly and south-easterly direction for about a mile.

It is mineralized with galena for about 1,500 feet, the rest being mostly iron copper. The work done consists of an open cut of 35 feet about 25 feet deep. The ore disclosed is about one-quarter mineral and would need concentrating, and assays from 19 ozs. to 26 ozs. in silver. The Columbia River would admit of easy steamboat navigation from the lake to Beaver Station, on C. P. R., a distance of about thirty-five miles, with the exception of about three miles at Surprised Rapids.

The banks along the rapids offer a good location for a road or tram.

There were 355 free miners' certificates issued, and 347 mineral claims recorded in the District during 1893.

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

The Honourable
The Minister of Mines,
Victoria.

LILLOOET.

MR. PHAIR'S REPORT.

GOVERNMENT OFFICE, CLINTON, B.C.,
January, 3rd, 1894.

SIR,—I have the honour to submit herewith the annual Mining Report for the District of Lillooet, for the year 1893.

The quantity of gold mined, which has been reported to me from reliable sources, is valued at $51,376, showing an increase of $11,613 when compared with the previous year's yield, Mr. A. W. Smith, M.P.P., of Lillooet, having purchased $24,616, and Mr. F. W. Foster, of Clinton, $11,060 of it. A large number of leases for hydraulic mining, especially near Lillooet, has been granted during the year, and applications for several more have been received.

The North American hydraulic claim has been bonded for $10,000, a deposit having been paid, and it is the intention to bring water on to the ground from Cayoosh Creek at a cost of about $30,000, the route for which has been surveyed.

A company of six men has been engaged during the season opening out a hydraulic claim on Bridge River. The Vancouver Company, on Cayoosh Creek, have not taken out as much gold as was expected, owing to the difficulty of meeting with large boulders, which have had to be blasted, but that claim is now open.

The leases of the Lillooet Hydraulic, North American, and Mina companies have paid better than during the past years.

Cayoosh Creek, which yielded a rich harvest to many Chinese, is almost abandoned, but undoubtedly it still contains a great deal of gold which cannot be taken out by unskilled miners with the pick and shovel, but, if capital were introduced, the creek could be profitably worked.

There is nothing to report as to mineral claims, none of them having been worked to any extent during the year.

The silver mining properties on the North Thompson River have given no returns.

Work on the coal prospecting leases on the North Thompson River, has been carried on, but I am not in a position to say with what results.

I have the honour to be,
Sir,
Your obedient servant,
C. PHAIR,
Acting Gold Commissioner.

The Honourable
The Minister of Mines, Victoria.

YALE.

Kamloops Division.

MR. TUNSTALL'S REPORT.

KAMLOOPS, January 9th, 1894.

SIR,—I have the honour to enclose my annual Mining Report for the Kamloops Division of Yale District, with a few general comments on the mining interests of the Yale and Similkameen Divisions, over which I have mining jurisdiction.

The Thompson River Hydraulic Mining Company have obtained a transfer of the bench lands on the right bank of Tranquille River, formerly leased by Messrs. Bannerman and Thibaudeau. The pay streak is reported by the superintendent to return at the rate of 50 cents per cubic yard. A ditch 5,000 feet long is at present being constructed, with a carrying capacity of 2,000 inches of water, and arrangements have been made for the transportation of the necessary lumber as soon as the ice on the river will permit the crossing of loaded teams. The approach of spring will witness the first hydraulic mining in operation on this stream.

About twelve or thirteen Chinese still work in the bed of the Thompson River, which has been continuously mined for its gold since 1860. They do not make over $1 per day, but with the assistance derived from gardens and the raising of chickens, they are enabled to make a comfortable living.

The group of Cinnabar mines at Savona has attracted numerous inquiries from persons who had seen the samples of ore at the World's Fair, Chicago, and it is probable this property will be purchased shortly by a company possessed of sufficient capital to work it to advantage.

A tunnel has been run in the Rose Bush, a distance of 98 feet, leaving about ten feet more to strike the main body of ore, at a depth of about sixty feet from the surface. Work was discontinued last summer pending negotiations for the bonding of these mines to a syndicate, which, in consequence of a disagreement among some of the shareholders, prevented the bond from being effected. Works for the treatment of the ore, once in successful operation, would employ a large number of men, and shed prosperity on a wide extent of country.

There has been some alluvial prospecting done on Deadman's Creek, which resulted in coarse gold being found; also on Chris's Creek, a tributary of the former, but the large number of immense boulders encountered rendered the work done unprofitable. The formation in this locality is of volcanic origin and will probably be valuable for its mineral wealth. The surface is covered with a lava rock which renders it very difficult to trace the ore veins.

The copper claims on the west side of Copper Creek are separated from the Cinnabar deposits by the intersection of a large volcanic dyke that pursues a northerly course, parallel to the Copper Creek valley. They exist in a porphyry and sandstone formation. So far only assessment work has been accomplished on most of them.

An open cut 4 feet deep and 4 feet wide, and a timbered approach to a shaft 12 feet deep, represent the work done on the Caledonia claim, owned by Messrs. McRae, Bruce and Squires. This location is reported to show up well in native copper, and assays of vein matter give a high percentage of the above metal. Lack of means has prevented more work being prosecuted, but measures will be taken next spring to sink a shaft from 75 to 100 feet deep. The Last Chance is the property of the parties above mentioned. The work performed has been of a superficial character and little is known of its value.

The Tenderfoot has a shaft six feet square, 15 feet deep, which shows well in carbonates and silver glance. The former assay about $100 to the ton in copper and silver.

The Glen Iron Mining Company, at Cherry Creek, forwarded five hundred tons of ore to Tacoma, Washington, up to the 1st of last April, after which further export ceased owing to the prevailing financial depression. The passage of the Wilson Bill, which grants a considerable reduction in the duty imposed on iron ore, will cause a renewed demand for its production on a larger scale than formerly, and with more profitable returns.

One of the most important mineral discoveries in this division was made last summer about the middle of June by Mr. J. G. Meyers, a prospector from the State of Washington, who located the Mountain Chief and several other claims for parties in the United States,

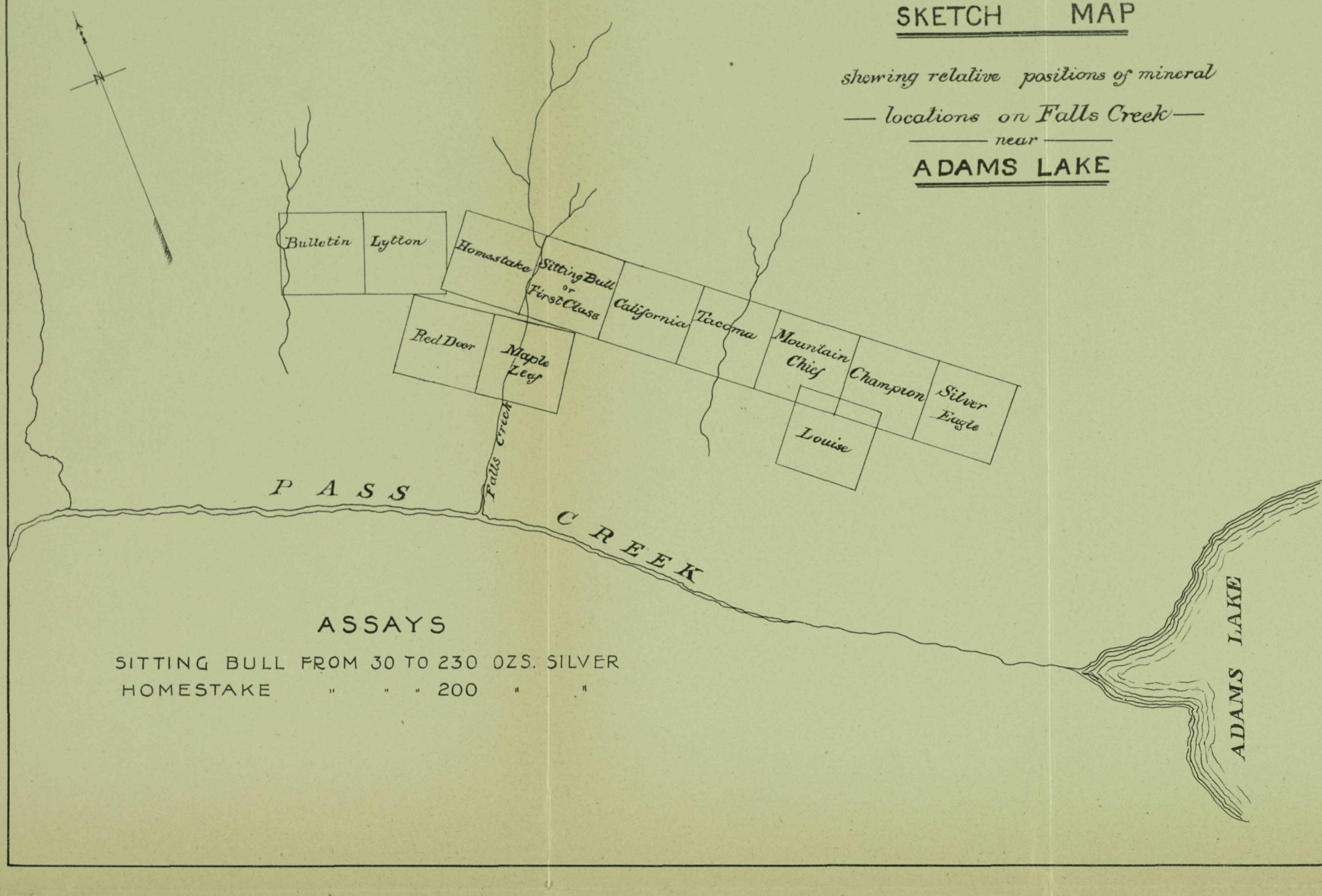
SKETCH MAP

showing relative positions of mineral

— locations on Falls Creek —

near

ADAMS LAKE



ASSAYS

SITTING BULL FROM 30 TO 230 OZS. SILVER

HOMESTAKE " " " 200 " "

SKETCH MAP

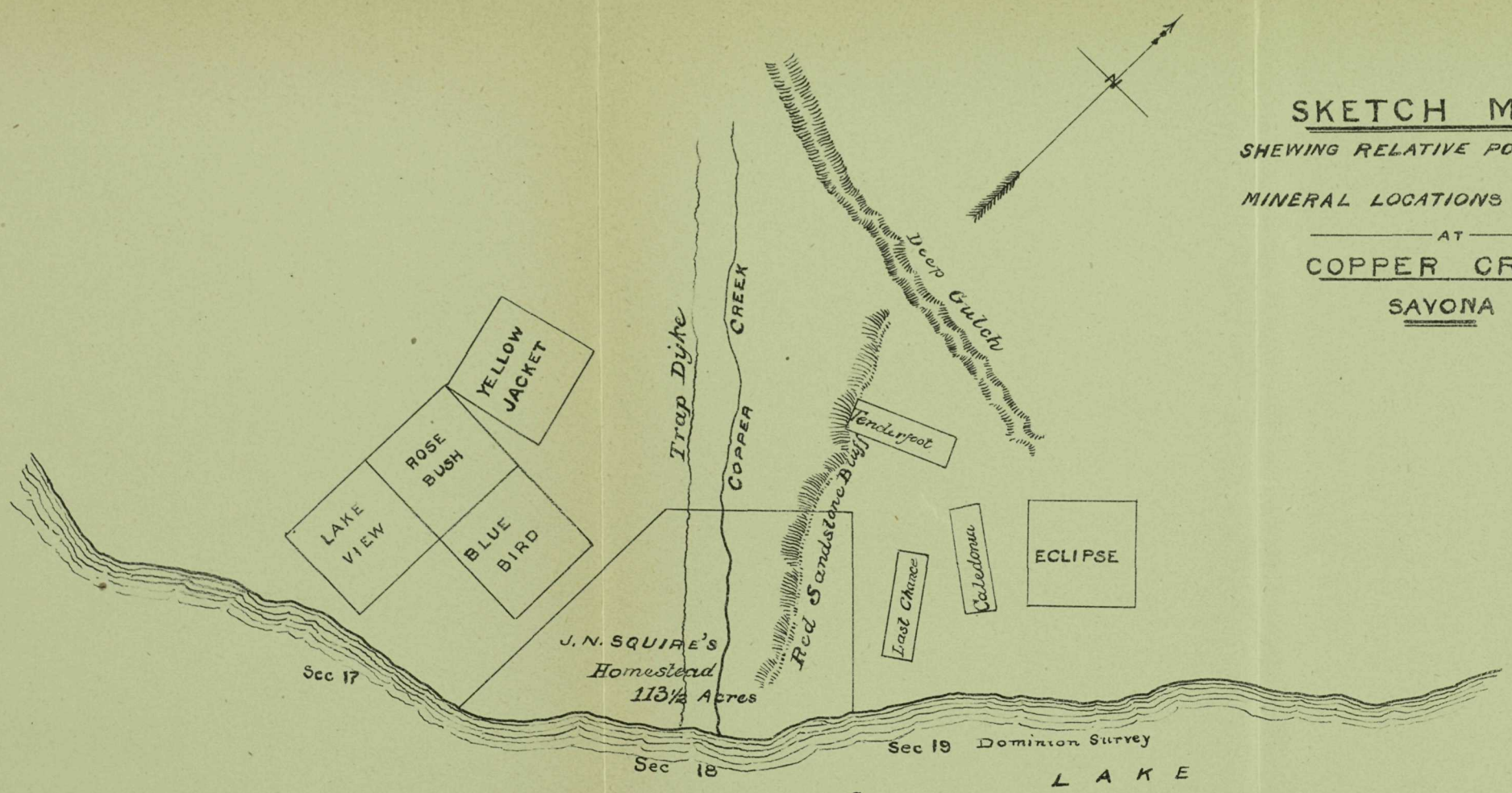
SHEWING RELATIVE POSITIONS OF

MINERAL LOCATIONS SITUATED

— AT —

COPPER CREEK

SAVONA



Note - The Cinnabar claims are all West of Copper Creek on Secs 17 and 18

The Copper do " " East " " " " " 19

To accompany report of G. C. Tunstall Esqr.

ASSAYS

CALEDONIA	44 per cent Copper to ton of 2000 lbs
TENDERFOOT	$100.00 Silver & Copper " " " "
do	44 per cent Copper " " " "
ROSE BUSH	7·31 per cent Quicksilver " " "

The mines are situated on Fall Creek, in the vicinity of Adams Lake, one of the largest bodies of water in the interior. They are reached by following the waggon road up the North Thompson from Kamloops, a distance of about forty miles, to its intersection with Louis Creek, and proceeding thence in an easterly direction on the creek trail over the divide to Adams Lake, fourteen miles more.

The lode, which averages from six to seven feet wide, is composed of a crystallized lime, containing copper, silver glance, and antimony. The country rock is a lime shale. Assays from two locations, the Sitting Bull and Homestake, range from 30 to 250 ounces in silver. Messrs. Buchanan and Flynn intend to work their locations this winter, and seven men with the necessary supplies started from here about a week since for that purpose.

Transportation can be made with comparatively little expense by means of a waggon road, for which a very favourable grade exists, starting from the lake and terminating at the mouth of Louis Creek, on the North Thompson River, whence the ore can be taken by steamer to railway communication at Kamloops.

On 6-Mile Creek, Grand Prairie, four mineral claims are held, on which assessment work has been accomplished without determining anything definite in regard to their value. The gypsum deposits, which are of a very pure character, will prove valuable when cheap transportation is obtained.

YALE DIVISION.

The Van Winkle Bar Hydraulic Mining Company, above Lytton, have made two satisfactory wash-ups. The cut is now close to the old channel of the river, where they expect to find the richest pay.

The Prince Albert Flat Mining Company, at Emory, have had a strong force of men at work the past summer making preparations for piping. A tunnel has been run in the leasehold at Bootanie Creek, and encouraging prospects in coarse gold obtained.

On Siwash Creek the placer mining companies have not met with the success anticipated.

About twenty-four miles of the bed of the Fraser and Thompson Rivers are already under lease for diving and dredging, and applications for over twenty miles more have been forwarded to the Lieutenant-Governor in Council.

The principal applicants are Captain Finch and partners, with whom is associated Colonel Underwood, of Chicago. These gentlemen have formed a strong company for reclaiming the rich auriferous deposits of the Thompson River by means of a powerful centrifugal pump stationed on a boat, worked in conjunction with several new devices of recent invention and a portable cofferdam, which is placed in position when needed in a strong current to enable working in still water, and for the removal of boulders by a diver, who also has entire control of the apparatus and directs its application with the assistance of submarine electric lights. The gravel is sucked up and deposited in a string of sluice boxes on the boat, where it is washed and the tailings run into the river. Should the results justify the expenditure, it is the intention of the company to build and equip fifteen boats with the requisite machinery for the active prosecution of this new branch of mining, which will employ a number of men.

Captain Finch is a professional diver and wrecker, whose wide experience in the business he has followed for many years is an ample guarantee as to the feasibility and success of the scheme in which he is interested.

SIMILKAMEEN DIVISION.

In this division the mining outlook has never been so promising since the discovery of Granite Creek, judging by the number of applications for mining leases. Last fall a strike of great importance was made in the McDougal leasehold, in the vicinity of Princeton, where a back channel of the Similkameen River was discovered, which, it is supposed, will be found to run parallel to the present channel for a long distance. The gravel is reported to be very rich for hydraulic mining. The extent of the new find has not yet been ascertained, but enough has been learned to warrant the most sanguine expectations.

In former reports I have called public attention to the benches bordering the Tulameen and Similkameen Rivers as offering profitable inducements for the investment of capital, and it is very gratifying to know that my predictions are about to be verified.

The construction of the contemplated waggon road from Nicola to Granite Creek to the point reached in the South Fork of the Otter Valley has been an inestimable boon to the settlers, and will greatly stimulate mining activity in that portion of the district it is intended to benefit, and in consequence lands available for settlement are being pre-empted.

It passes through a most attractive country, dotted here and there with lakes and groves of open timber, which give a park-like aspect to a landscape covered in summer with luxuriant grass, and beautified with many flowers of different colours. Game is also abundant, and trout are plentiful in the streams. It is one of those charming sections of the interior hitherto unknown to tourists because of its remoteness from railway communication, but the completion of the Spence's Bridge and Nicola Railway, in a couple of years more, will remove this disadvantage and bring its attractions within convenient reach of those in pursuit of pleasure and health.

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.

YALE, 24th January, 1894.

SIR,—I have the honour to forward to you herewith my mining report of the Yale Division of Yale District for the year ending 1893, and beg to remark that the general depression which has affected trade and commerce during the past year, together with the depreciation in the value of silver, has had a serious tendency in retarding operations and preventing outside capital from developing some of the most promising mineral properties in the district. However, I am pleased to report that considerable attention is being taken in the extensive auriferous gravel benches which flank the Fraser River for hydraulic mining operations, and the outlook for the coming summer is decidedly of an encouraging character, judging from the large number of applications received. In addition, applications have been made for concessions of the bed of the Fraser River for dredging purposes. About sixty miles have been granted to four companies, who are about to introduce new machinery for dealing with auriferous material from the bottom of the river. Four of these gold-dredging machines are in course of construction for use at different points along the Fraser River, all, I believe, of different designs and capacity. The one being built at Yale, and near completion, is the largest.

The dredges to be operated at the Boston Bar section of the Fraser, and at Kanaka Bar, are being constructed with local capital from Vancouver, while the one at Lytton for dredging the Thompson River is owned by a New York and Chicago company. All these machines, with their new appliances, are objects of interest keenly watched by mining men, and the respective promoters feel confident of the ultimate success of their enterprise.

I have been afforded several opportunities of witnessing the construction of the dredger in this town, and am therefore in a position to transmit to you the following particulars relating to it:—

The dredge is from the designs of Mr. Shahan, a practical mechanical engineer, who for five years had control of the engineering department of the great smelting works at Denver, Colorado, where he acquired considerable knowledge in working and saving the fine particles of gold. The dredge is especially designed for use in any part of the river where it is impossible to do remunerative work with the aid of any other appliance hitherto available, and the property it possesses of saving the fine gold is claimed as the secret of its success. The scow is made into eight watertight compartments, is sixty-six feet long by twenty-four feet wide, strongly and substantially built, and draws only twelve inches of water; everything is under cover and well protected from the exposure of the elements. It is conveniently equipped with every necessary and useful appliance for the skilful handling of auriferous

gravel. The powerful steam winch is worked, by suitable gearing, in connection with the other powerful hand winches, which can be worked together or independently, so as to allow of the greatest freedom in moving the dredge to suitable or convenient points of the river.

One duplex steam pump and one centrifugal pump are used for distributing the auriferous wash-gravel into the rotary amalgamating basin, which is six feet in diameter and ingeniously arranged for the infusion of gravel from the outlet delivery of the section pipe. Thereby the promoters claim the secret of the invention, by rapid rotation of centrifugal motion. Every precaution and advantage evidently is taken for securing, by the matt of quicksilver, which is deposited into the rotary amalgam basin, the finest particle of fine gold. One horizontal engine and one vertical engine, with 70-horse power boiler, with a powerful telescope pump attached to a projecting boom, sixteen by eighteen inches thick, and twenty-five feet in length, slightly elevated from the main deck of the scow, with a half-circle sweep of twenty-five feet, are available for raising the auriferous gravel from the bed of the stream.

One thousand cubic yards can easily be excavated within twenty-four hours, and the section pipe can be freely handled and adjusted to any suitable place for operating the auriferous gravel by one person. The dredging is partly on the principle adopted for sluicing claims, with improved appliances for saving fine gold. The electric lights to be used are of one hundred and twenty (120) candle power, and the intention of the company is to carry on operations night and day, and ten men can manipulate and carry out the necessary work of two shifts. By the electric light the owners of the project claim they can see the operations working at the bed of the river. A trial test of the gold-dredging machinery was made a few days ago which resulted very satisfactorily. Gravel was pumped from thirteen feet below the water, and several gold colours were brought up, demonstrating the fact that gold exists in the river's bed. Since the trial test, the promoters of the scheme are more sanguine than ever of the future success of the undertaking, and Mr. Shahan has applied to the Dominion Government for a patent of the new invention for gold dredging for Canada. A new era of gold mining has been inaugurated in the deep waters of the Fraser River, which for hundreds of miles in length can be remuneratively worked. From trials made in other parts of the world, extending over a period of five or six years, it has been found that wash-dirt can be elevated and the gold extracted from it in paying quantities when not more than one grain—say four cents' worth—exists per cubic yard, and I need hardly say that many rivers run through British Columbia which are known to contain very much more valuable pay-dirt.

The Prince Albert Flat Hydraulic Gold Mining Company's claim, held under lease, is situated on the west bank of the Fraser River, near Emory Bar, about four miles west of the town of Yale, and consists of about eighty acres. During the latter portion of last year, extensive preparations were made by the promoters of the company for excavating and cutting through gravel benches, in places from twenty to thirty feet deep, and equally as wide at the surface, to secure the sides of the cuttings from caving, and interrupting their course of work in diverting the water from the natural course of Emory Creek on to the initial point of operations. The company obtained prospects by panning from several points, which were sufficiently satisfactory to encourage them. A portion of ground contiguous was worked by pioneers in 1858, 1859, and 1860, which yielded $15 to the man per diem. About $8,000 have been expended in the completion of the flume, and on the ditch and steel pipes. The flume is strongly built and well laid, capable of carrying 3,500 inches of water. It is over a mile long, four feet wide, by three feet deep, and everything is in order awaiting the season to open and permit the company to commence early mining operations.

Hill's Bar Flat is situated on the east bank of the Fraser River, and stretches away in a south-westerly direction for a distance fully a mile and a half. Operations are to be resumed on an extensive scale in the forthcoming spring on the Hill's Bar Flats in a more practical form than the last working. The close proximity of the celebrated Hill's Bar, which yielded such an enormous quantity of gold within a small area, has stimulated the confidence of mining experts, owing to the indications that the continuation of the auriferous channel that made Hill's Bar so rich has permeated through these grounds.

YALE CREEK.

Operations at the Queen Gold and Silver Mine during the past year have almost remained in *statu quo*. Owing principally to the financial depression, the promoters, Messrs. Teague and Douglas, were unable to complete their negotiations with outside capitalists for further extensive developments. Nevertheless, every confidence is inspired in the future commercial

value of this promising property. Over 2,500 feet of tunnelling have been driven, and five true fissure lodes have been intersected, varying in width from three feet to six feet wide, and each of them most promising characteristics. Practical Cornish miners of large experience of general mining knowledge, gained from the great mining centres of the world, pronounced a most favourable prediction for the outcome in the deep working from the congenial appearance of what they know of the mine. The geological indications are almost identical in character with the Barrier Range, wherein the celebrated Broken Hill Mine is situated in New South Wales. The World's correspondent, writing from Sydney under date 18th Dec. last, and the contents of which appeared in the Weekly World of Vancouver on the 18th inst., are worthy of quotation: "£10,000,000 sterling this rich silver treasure yielded which was discovered "in 1863, and has developed into one of the principal mining centres of the world. In this "range the lodes occur in sillican metamorphic micaceous schists, intruded by granite, por- "phyry, and diorite, and traversed by numerous quartz reefs, and have a striking resemblance "to the quartz mines about Yale, British Columbia, especially to that known as the Queen "Mine, to the north of the town."

Siwash Creek.

Great energy was displayed in the early part of last year by the Gold Queen Mining Company, which showed considerable interest in their efforts to develop their numerous claims situated on Siwash Creek; firstly, by erecting at their own expense a wire cable 400 feet in length, stretched across the Fraser River at a favourable point. A trolley basket is attached, suspended from the wire cable, and passengers and provisions and all necessary mining material can easily be transferred to either side of the crossing, at a considerable saving to the prospector of that locality. Judging from the character of the gold taken from the alluvial claims of Siwash Creek, together with the fine samples of gold-bearing quartz, showing free gold, I consider the existing indications of a most promising character. The stratifications, too, are most encouraging features, being associated with the gold-bearing rocks of the world, which are as indispensably necessary for the production of metalliferous ores as water is for the life of man. Lithologically, the general classification belongs to the carboniferous shales, with occasionally intrusives, bands or dykes of felespar-porphyry (elvan). Two samples of surface quartz from the Roddick mineral claim, one of a granular texture, while the other was a more fleecy character, were forwarded by Mr. Wm. Teague, of Yale, through the post to the Royal School of Mines, of Cornwall, England, and were assayed by the principal chemist, Mr. J. Berrigar, who found that the former contained 10 oz. of gold to the 2,000 lbs., and the latter $26 to 2,000 lbs. free gold quartz.

I consider the prospects of the free milling gold quartz from this creek, are indeed promising. The crushings made during last summer by the little quartz mill erected by the Whatcom promoters of the Gold Queen Mining Company, were by no means discouraging. If knowledge of the proper treatment of the process in saving the gold had existed the yield would have been more satisfactory. As it was, notwithstanding the circumstance of unskilful treatment, the yield ought not to be considered at all discouraging, the crushing made realizing $4 per ton of ore taken from the lode almost at the surface.

Lytton.

The property of the Van Winkle Hydraulic Gold Mining Company is situated on the west bank of the Fraser River, two miles above the village of Lytton. It consists of five leases, containing some 660 acres.

The benches rise from 110 to 397 feet above high water mark of the river. The gravel in the prospecting shafts will run on an average of 10 cents to the cubic yard, the gold being of a coarse nature.

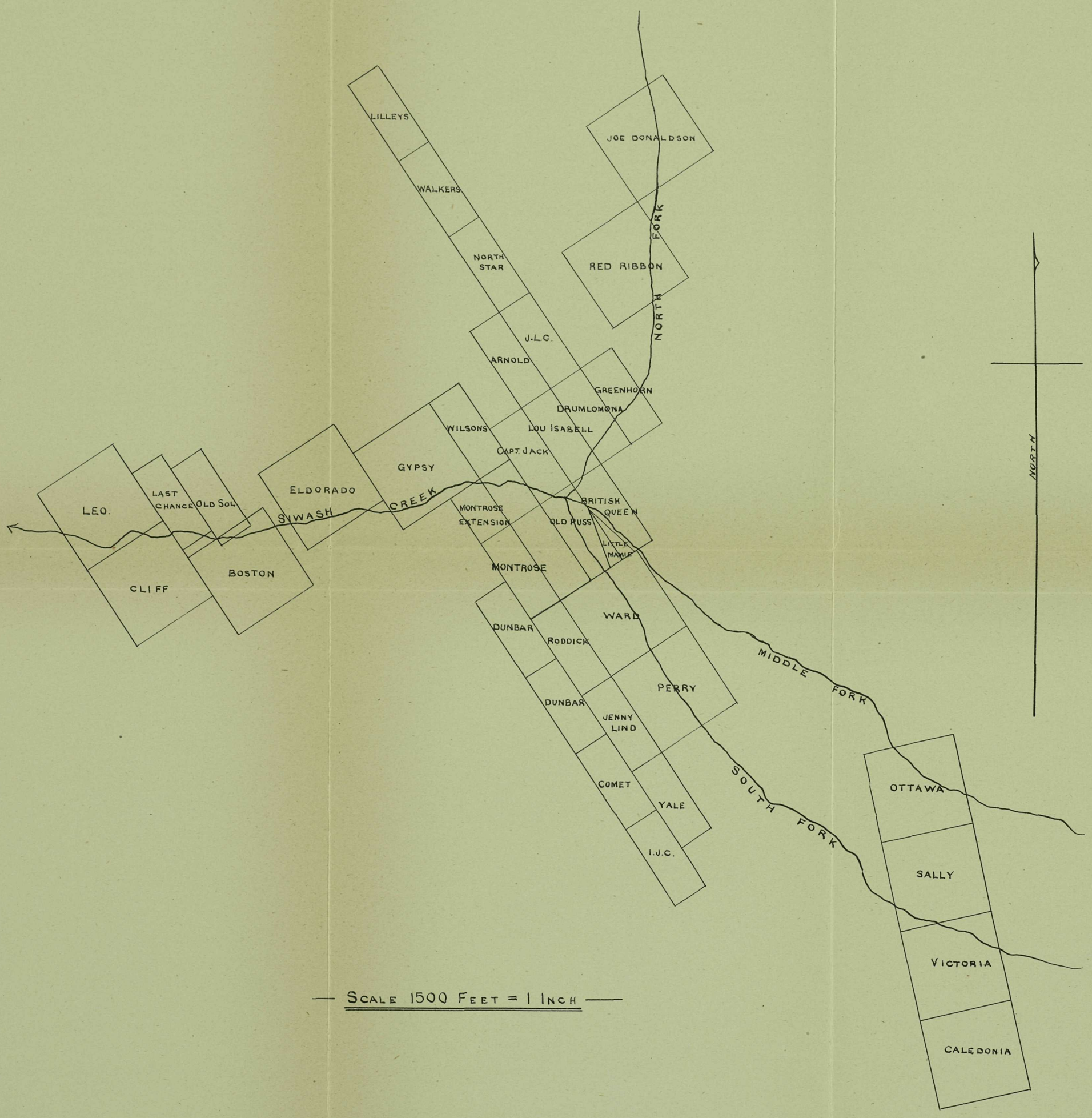
Leases of 1,000 inches of water from Last Chance Creek, were brought on to the works last summer, and additional leases have been procured for bringing 9,000 (miners) inches of water from Stryen Creek, a distance of 3½ miles, by flume and ditch, at a cost of $15,000.

Last summer the mine was opened by running a cut 800 feet through the front bench to tap the old channel, which was accomplished very satisfactorily, and the pit opened out and everything made ready for a continuous mining run in the spring. There is now a double pit capacity, 800 feet of main sluice, and 276 feet of broad sluices extending to the dump, emptying into the Fraser River. The cut at this point is some 750 feet wide, and has a rise

SKETCH OF MINERAL CLAIMS

ON SIWASH CREEK NEAR YALE

— To accompany the report of Mr Dodd —



— Scale 1500 Feet = 1 Inch —

C.M.R. del.

of 48 feet from high water mark. The grade of main sluice is 7 inches to the box of 12 feet. The company use two No. 6 monitors, with a head of 377 feet. Last summer in opening the mine the company piped 350,000 cubic yards, and found the duty of the miner's inch, 4 cubic yards, at a cost of 2.8 cents per cubic yard, they obtained $3,800 worth of gold from the sluices during the process of opening the mine, which is considered very satisfactory in the preliminary workings of a cut of 800 feet. Eighteen to twenty hands were employed last summer, and this year the company expect to employ 13 to 15 hands all told. The prospects for the coming season are very bright and afford reason to expect good results.

I have the honour to be,
Sir,
Your obedient servant,
Wm. Dodd,
Mining Recorder.

The Honourable,
The Minister of Mines, Victoria.

Osoyoos Division.

Mr. C. A. R. Lambly's Report.

Osoyoos, B. C., 5th January, 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 year 1893.

Placer Mining.

Rock Creek.

A great deal of prospecting has been done during the season for placer ground, and about $4,500 have been taken out of the creek.

On the 27th of September a company of seven men secured a lease of one and one-half miles of ground near the crossing of the Osoyoos trail, and since then they have sunk a shaft fifty feet in depth and run a tunnel from that depth one hundred and fifty feet in, and have also run a drain ditch about one hundred and seventy-five feet in length. Another company has also made application for a lease for the same quantity of ground further up the creek.

Cedar Creek.

This creek (which flows into Kettle River about twenty-five miles above the mouth of Rock Creek) was discovered last September by a Chinese named Ah She, and since then about 4,000 feet of ground have been located, principally by his countrymen. Being so late in the season, however, very little gold (about $300) has been taken out.

On Boundary Creek only one claim has been recorded, which has produced probably $250.

Siwash Creek.

This creek is virtually abandoned, two placer claims only being worked. The same remark applies to Mission Creek.

Cherry Creek.

During the season there were seven whites and thirteen Chinese working on the creek, the latter earning about $2 per day. The Cherry Creek Mining Company is running a new tunnel, and, with the aid of English capital, intend in the spring to develop their property with vigour. The following statement of the estimated yield of placer gold from the various creeks during the season, is obtained from the most reliable sources :—

Rock Creek	$4,500 00
Boundary Creek	250 00
Cedar Creek	300 00
Mission Creek	200 00
Cherry Creek	4,000 00
Siwash Creek	400 00
	$9,650 00

QUARTZ MINING.

Fairview.

Development work has been pushed with vigour in this camp during the past season; the satisfactory returns from the ore milled by the Strathyre Mining Company's mill; from a number of the principal claims, notably the Wide West, Brown Bear, Morning Star, and Victoria, being an incentive to the owners of claims adjacent to these properties to prosecute work on their claims with more than usual ardour; and I am pleased to be able to state, in many instances with marked success. A number of locations have been made on the range of mountains between the camp and Keremeos, on most of which the locators have done the annual assessment work, showing their confidence in these new discoveries.

The following information concerning the Strathyre Mining Company, Limited, and list of assays and mill tests of ore from different mines in the camp, was kindly furnished to me by Mr. George Attwood, F. G. S. :—

The Strathyre Mining Company, Limited, Dominion charter; original capital stock, $125,000, lately increased by consent of the shareholders to $500,000.

Directors :—Duncan McIntyre, President; Sir Charles Tupper, Bart.; T. G. Shaugnessy; Edmund D. Reynolds, Managing Director. Consulting Engineer, Geo. Attwood, F. G. S., Assoc. M. Inst. C. E.

Mining properties acquired by the Company are :—"The Rattler," "The Brown Bear," "The Wide West," "The Wynn M.," "The Ontario," and the Rattler Mill Site and Water Right.

The Rattler.

Work on this claim has been confined to taking out about twenty tons of ore from the old shaft.

The Brown Bear.

On this claim work has been pushed with vigour during the summer; a cross-cut tunnel has been driven some three hundred feet in length, and four veins intersected, the largest vein being over six feet in width. About one hundred tons of ore have been worked in the mill from one of the tunnel veins, and the yield in free gold and concentrates was about eight dollars per ton. Work on the tunnel is still going on, in anticipation of finding the main vein, which shows on the surface. The tunnel cuts the veins from 80 to 165 feet vertically below the surface. About ten men have been employed steadily during the summer on surface explorations and in the tunnel. The tunnel is about seven feet in height by five feet in width at the base, and it is supplied with a steel boiler-plate car, which runs on steel rails, connecting the mine with an ore bin of fifty tons capacity.

The Wide West.

The old tunnel on this claim has been extended to a length of 360 feet, and a shaft 4 x 5 feet clear of timbers sunk to a depth of 100 feet below the tunnel level, and an air-raise has been made from the tunnel to the surface. From ten to twenty men have been constantly employed on this mine during the summer, and suitable buildings have been erected for their accommodation.

The Wynn M.

Work on this claim has been confined to sinking a new shaft thirty feet in depth; some very fine specimens of rock showing free gold were taken out.

The Ontario.

Two trial pits were sunk on this claim during the summer, and a drift run to connect them.

Strathyre Quartz Mill.

A complete battery of ten rotary gravitation stamps, weighing about 750 lbs. each, has been put in place. The mortor boxes on which the stamps work, weighing over 6,000 lbs. each, and the foundations of the same have been made of timbers twenty feet long, squaring thirty inches, placed on end. Copper plates galvanized with mercury are used to collect the free gold, and the quantity employed is nearly double that of ordinary gold mills. The stamps are fed by a self-feeding apparatus called the challenge feeder, and the rock after being broken, weighed and dumped into the large bins is not again handled, as the system is automatic. The copper plates save most of the free gold, and the sands after passing over them are treated in six Frue Vanners, which collect the fine gold and amalgam which has escaped the copper plates.

ASSAYS AND MILL RETURNS.

3rd June, 1893.—Gold bar from "Wide West" ore. Ozs. $58\frac{32}{100}$.

Gold	693.5 fine.
Silver	284 "
Total	977.5 "
Value of gold per oz	$ 14.3359.
" " in bar	835.72

20th June.—50 tons of "Wide West" ore yielded $32\frac{1}{2}$ oz. of gold.

Gold	768 fine.
Silver	209.5 "
Total	977.5 "
Value of gold per oz	$ 15.876
" " in bar	515.77

One ton of concentrates was obtained from the 50 tons of ore, which assayed:—

Gold per ton, ozs. 3.68 =	$76.06
Yield of free gold per ton	10.31

31st July.—$100\frac{200}{2000}$ tons of "Wide West" ore yielded 60 ozs. gold.

Gold	791 fine.
Silver	188 "
Total	979
Value of gold per oz	$ 16.3514
" " in bar	989.25

The above ore yielded 2800 lbs. of concentrates, assaying:—

Gold, per ton, ozs. 3.88 =	$80.19.

17th August.—96 tons of "Wide West" ore yielded gold worth $1106.78, at the rate of $11.52 per ton in free gold, and two tons of concentrates assaying:—

Gold, per ton, ozs. 4.31 =	$89.80.

The present milling process has been found to be satisfactory, as the tailings when carefully saved and evaporated, and then assayed show, from numerous assays, an average loss of twenty-five cents per ton in gold. The expenditure incurred by the company in the enterprise thus far is over $112,000, for purchase of property, development of their mines, construction of the mill and assay office, dwelling and boarding houses, and the construction of branch roads.

The Morning Star.

The enterprising owners of this property, Messrs. Mangott, McEachern & Lefevre, have taken out and milled at the Strathyre Mining Co.'s mill during the season, 385 tons of ore, besides doing a large amount of surface prospecting.

The 385 tons yielded $5,059.29, as follows:—

Bar No. 1, ozs. 92.25.

Gold	728.5 fine.
Silver	252.5 "
Total	981.10 "
Value of gold per oz	$ 15.059
" " in bar	1,389.19

Bar No. 2, ozs. 90.20.

Gold	720 fine.
Silver	241 "
Total	961 "
Value of gold per oz	$ 14.8837
" " in bar	1,342.17

Bar No. 3, ozs. 154.68.

Gold	728 fine.
Silver	237 "
Total	965
Value of gold per oz	$ 15.05
" " in bar	2,327.93

Average, $13.14 per ton in free gold, and nearly two tons of concentrates which assayed:—

Gold per ton, ozs. 8.99 = ... $185.82.

The Victoria.

The owners of this claim, Messrs. Geo. Wilkinson and D. A. Carmichael, have, during the past season, in addition to other work on their claim taken out and milled $49\frac{400}{2000}$ tons of ore which yielded $1,445.10 in bullion.

$35\frac{1800}{2000}$ tons yielded $67\frac{1}{2}$ ozs. gold.

Gold	812 fine.
Silver	173 "
Total	985 "
Value of gold per oz	$ 16.785
" " in bar	1,132.98

Above ore yielded 400 lbs. of concentrates, assaying:—

Gold per ton, ozs. 12.15 = ... $251.15.

Return in gold and concentrates, taking the value of the concentrates at 80% of the assay value = $32.40 per ton. $13\frac{1600}{2000}$ tons yielded gold, ozs. $30\frac{52}{100}$ valued at $16.78 per oz. Value of gold, $512.12 = $37.38 per ton in free gold.

The ore crushed by the company's mill during the season yielded in free gold $13,404.

With one or two exceptions, nothing more than assessment work has been done on the claims located last summer on the mountain south of Fairview.

Harris Creek.

A considerable amount of prospecting work has been done on the mineral claims recorded on this creek, but I regret my inability to give the result of the assays.

Camp McKinney.

At this camp about $1,000 have been expended in sinking an air shaft 61 feet deep, to tap the tunnel on the "Cariboo," by Messrs. Jas. Monaghan & Co., of Spokane, and it is reported that they intend bringing in a mill to work their property. Little more than assessment work has been done on the balance of the claims in the camp.

Boundary Creek Mines.

On the American Boy, situate near the Boundary Creek Falls, a tunnel has been run in 85 feet, from which 83 sacks of ore were forwarded to the smelter at Tacoma, Washington, which together weighed 5,400 lbs., and gave a return of 230 ozs. in silver and 1 oz. in gold per ton. On the Providence mine, situate about five miles up the creek from the American Boy, one shaft is down 70 feet, and a second shaft 15 feet, from which, since June last, 500 sacks of ore, together weighing 32,500 lbs. have been sent to the Tacoma smelter, giving an average return of 400 ozs. in silver and one ounce in gold per ton. The Defiance claim, adjacent to the Providence, which was recorded on the 4th of September last, has a shaft down 20 feet, from which 67 sacks of ore, weighing about 4,350 lbs., have also been sent to the smelter at Tacoma, and yielded 560 ozs. in silver, and two ozs. in gold per ton. The Skylark mine, situate about three miles easterly from the Providence camp (or about half way between the Providence and Greenwood camps), was recorded on the 28th of July last, since which time two shafts have been sunk on the claim, one 55 feet and the other 15 feet, from which 425 sacks of ore, weighing 27,625 lbs., were sent to the smelter at Tacoma, and yielded 268 ozs. in silver, and one ounce in gold per ton.

The above properties are controlled by Mr. Howard C. Walters, of Spokane, Washington, and all the ore sent to the Tacoma smelter, about 34¾ tons (which gave a total return of about 11,500 ozs. in silver, and 37 ozs. in gold), was packed out on horses to Grand Prairie, Kettle River, thence conveyed by waggon to Marcus, Washington.

In the other camps, viz.:—Wellington, Greenwood, Summit, Volcano Mountain, White's, and Attwood, little more than the necessary amount of work to comply with the Mineral Act, has been done by claim-holders.

There is certainly a great necessity for a trunk road between Okanagan and Grand Prairie, Kettle River, and it would also be of great benefit to the miners if a branch road were constructed up Boundary Creek for a few miles, to connect the different mining camps on the mountains adjacent to Boundary Creek.

The following is a statement of the free miners' certificates issued, and records made in the different mining divisions of the district for the past year:—

KETTLE RIVER DIVISION.

Free miners' certificates issued	194
Mineral claims recorded	102
Certificates of work issued	66
Transfers recorded	59
Abandonments recorded	6
Water grants "	1

OSOYOOS DIVISION.

Free miners' certificates issued	224
Mineral claims recorded	85
Certificates of work issued	77
Certificates of improvement issued	5
Transfers, etc., recorded	62
Water grants "	3
Permits	5

VERNON DIVISION.

Free miners' certificates issued	63
Mining receipts, general	75

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

The Honourable
The Minister of Mines, Victoria.

Similkameen Division.

MR. HUNTER'S REPORT.

GRANITE CREEK, November 30th, 1893.

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

SIR,—I have the honour to forward the annual mining statistics for the Similkameen Division for the year 1893.

The yield of gold and platinum still continues to decrease, in consequence of a number of paying claims being worked out, and no fresh discoveries having been made.

On Granite Creek the Pogue Co.'s claim is the only one paying at present. Their tunnel is in over 1,000 feet, and they are still pushing ahead.

Several applications have been made for leases of mining ground for hydraulic purposes on this creek.

Mining on Newton Creek has been a failure this year, owing to the scarcity of water.

On the Tulameen River, above Granite Creek, two companies of Chinese have made good wages. On the lower end several companies of Chinese have been mining with most satisfactory results.

Four applications have been made for leases of mining ground for hydraulic purposes on this river.

The Tulameen Improvement Hydraulic Co., Limited, have been prospecting the lower end of their ground,—sinking shafts and drifting.

Little or no mining has been done on Slate Creek this season, the remaining ground being deep and requiring a large outlay of capital to prospect it. Several applications have been made for leases of mining ground for hydraulic purposes.

Mining on the Similkameen has been brisk, the work being done principally by Chinese, all of whom obtained small wages.

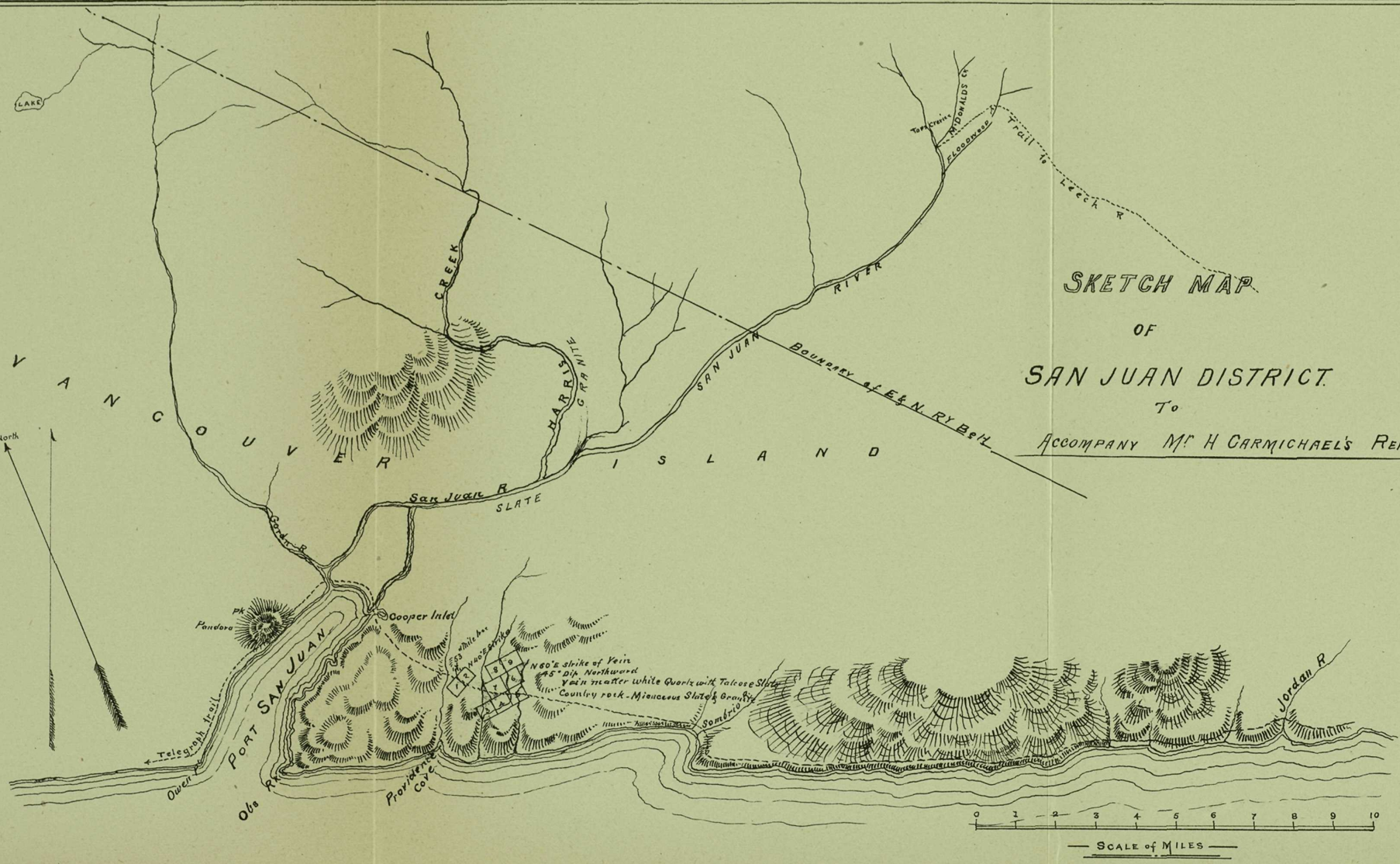
The Similkameen Gold Gravels Exploration and Hydraulic Co., Limited, whose property is situated on the above river, opposite Princeton, have been prospecting their claims with a force of fifteen whites,—sinking shafts and running drifts. From information received the prospects were most encouraging. They purpose starting to work early in the spring.

Several more applications have been made for leases of mining ground, for hydraulic purposes, on this river.

In quartz mining there is nothing new to report, owners of claims merely satisfying themselves with performing the necessary work to hold their locations.

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

SKETCH MAP
OF
SAN JUAN DISTRICT.
To
Accompany Mr H Carmichael's Report



REPORT RELATIVE TO THE MINERALS EXISTING IN THE SOUTH-WESTERN PORTION OF VANCOUVER ISLAND.

BY MR. HERBERT CARMICHAEL, GOVERNMENT ASSAYER.

LEECH RIVER DISTRICT.

A good deal of prospecting has been done on the different branches of Leech River, and the best results have been obtained from the West and South Forks, the few samples received from the North Fork proving of little value. The country rock of the southern portion of the North Fork is slate, and as the stream is followed up to its source the rock becomes mixed, and gradually verges into trap. After leaving the slate country on the North Fork there is hardly any gold found in the creek, and no ledges have been discovered of any value, but some gold has been found in the West Fork, which drains the Jordan Meadows. Gold is also got at the headwaters of the Koksilah, Jordon, and San Juan Rivers, all of which rise in the same range of mountains, and it is not improbable that quartz veins will be met with in this vicinity. Colours have been found in a bed of red gravel above the meadows on the Jordan River. A prospect hole was sunk here years ago to bed-rock, 15 feet below the surface, but after going through the red gravel no more gold was found, the bed-rock proving quite clean. All the gold in the creeks of this district is of a coarse character, and when the ledges are discovered the quartz should prove to be free milling.

SAN JUAN DISTRICT.

Gold has been found in nearly all the streams draining into San Juan Harbour. Slate is the country rock for a long distance up the main river, but towards the headwaters it changes to a barren granite. There are some good looking quartz ledges between McDonald and Floodwood Creeks, which flow into the San Juan River near where the Leech River trail strikes it. The country rock where the West Fork joins the main river is limestone, and towards the headwaters it changes into granite. Some quartz veins are said to be at the headwaters of the Gordon River. A $10 gold nugget was found on a small stream flowing into Providence Cove. This caused further prospecting, and several veins of white quartz were found, all carrying small quantities of gold on the surface croppings, which, from the nature of the rock, I should judge to be free milling. A small map is appended showing the locations.

COAST DISTRICT FROM BEECHER BAY TO CAPE BEALE.

I visited the copper deposits in Beecher Bay and between Beecher Bay and Sooke Harbour. Shafts have been sunk on both these prospects, which are copper pyrites mixed with rock matter. No work has been done for some time on either of them, so I could not gain much information on the spot as the shafts were full of water. I also looked at a copper prospect on Tzaartoos or Copper Island in Barclay Sound, but saw nothing of any value. A considerable deposit of cement rock exists about a mile and a half north-west of Carmanah light-house. The deposit is near the water, and is, I am informed, of two qualities, one, when burned, will make Roman cement, and the other, if burned with limestone, will make ordinary cement. Gravel which will give a colour to the pan in almost every place tried is said to exist in large quantities in the neighbourhood of Carmanah.

COWICHAN LAKE DISTRICT.

Several of the streams which flow into Cowichan Lake show colours of gold. Galena is found in small quantities about the lake and on Cowichan River and Nixon Creek, but I have not seen any samples of galena from the country to the south of this. A bed of magnetic iron exists about the Forks of Nixon Creek. A variety of marble is to be found at the south end of the lake. For a long distance up the Cowichan River the country is principally of a coal formation; sandstone being found at the falls.

ALBERNI DISTRICT.

For the last twenty-five or thirty years Chinese have been profitably working on China Creek, the gold saved being flour gold. Undoubtedly the percentage of loss has been large, as the ordinary rockers are unsuitable for this class of work. In the fall of 1892 some prospectors pushed up to the head of the creek in search of quartz veins; they found one, and located a claim, calling it the Golden Eagle. In the early part of last September I visited this claim, which is situated some 3,000 feet above the sea level. Two veins were then in sight, one of these could be traced for some distance up the mountain. A prospecting tunnel had been run for 18 feet on this vein, which lies nearly perpendicularly. The vein matter is made up of banded quartz intermixed with pyrites and specks of galena. The walls, which at this point are well-defined, are composed of feltspathic sandstone, while the country rock is mostly diabase. The claim was subsequently bonded by an English syndicate, who have done a considerable amount of work, driving in three tunnels on the lowest vein, the bottom tunnel being now in over 70 feet. The vein has considerably pinched in the tunnels, but the owners hope that it will widen out when run further in. A 7-foot vein, situated higher up on the claim, has as yet not been touched, owing to the quantity of snow now on it. In the neighbourhood of the Golden Eagle a number of claims have been located, and several of them promise well, notably the King Solomon, and a 30-foot ledge of a feltspathic silicate lower down the creek. Most of the quartz in this district has proved to be refractory, as the gold is generally carried in the pyrites, of which the richest have been arsenical and finely divided. I conclude that the fine flour gold of China Creek comes from these pyrites, from which it has been liberated by the process of oxidation. A good deal of work may be expected to be done here during the coming season in the way of prospecting and developing the claims already found.

MARBLE.

Some fine samples of white and grey marble came in from Deserted Cove, Nootka Sound. This deposit is said to be of great extent, and is situated at the water's edge, with every facility for shipping.

TEXADA ISLAND.

I have a report from Texada which states that some good copper ore has been uncovered during the season. Two or three shafts have been sunk, a tunnel run, and several bore-holes made. Finds of gold-bearing quartz have also been made during the season, and it is anticipated that prospecting and development work will be done next season.

The following extracts are made from Mr. Ralph's report on the survey line of the western boundary of the Esquimalt and Nanaimo Railway lands:—

"GEOLOGICAL FORMATION AND MINERALS.

"On last year's survey from the mouth of Muir Creek, on the Straits of Fuca, to the 23-mile post, the bed-rock for the first three miles is sandstone, shale, and conglomerate, indicating coal; then six miles of trap; then ten miles of auriferous slate, containing quartz veins, indicating gold; then four miles of trap.

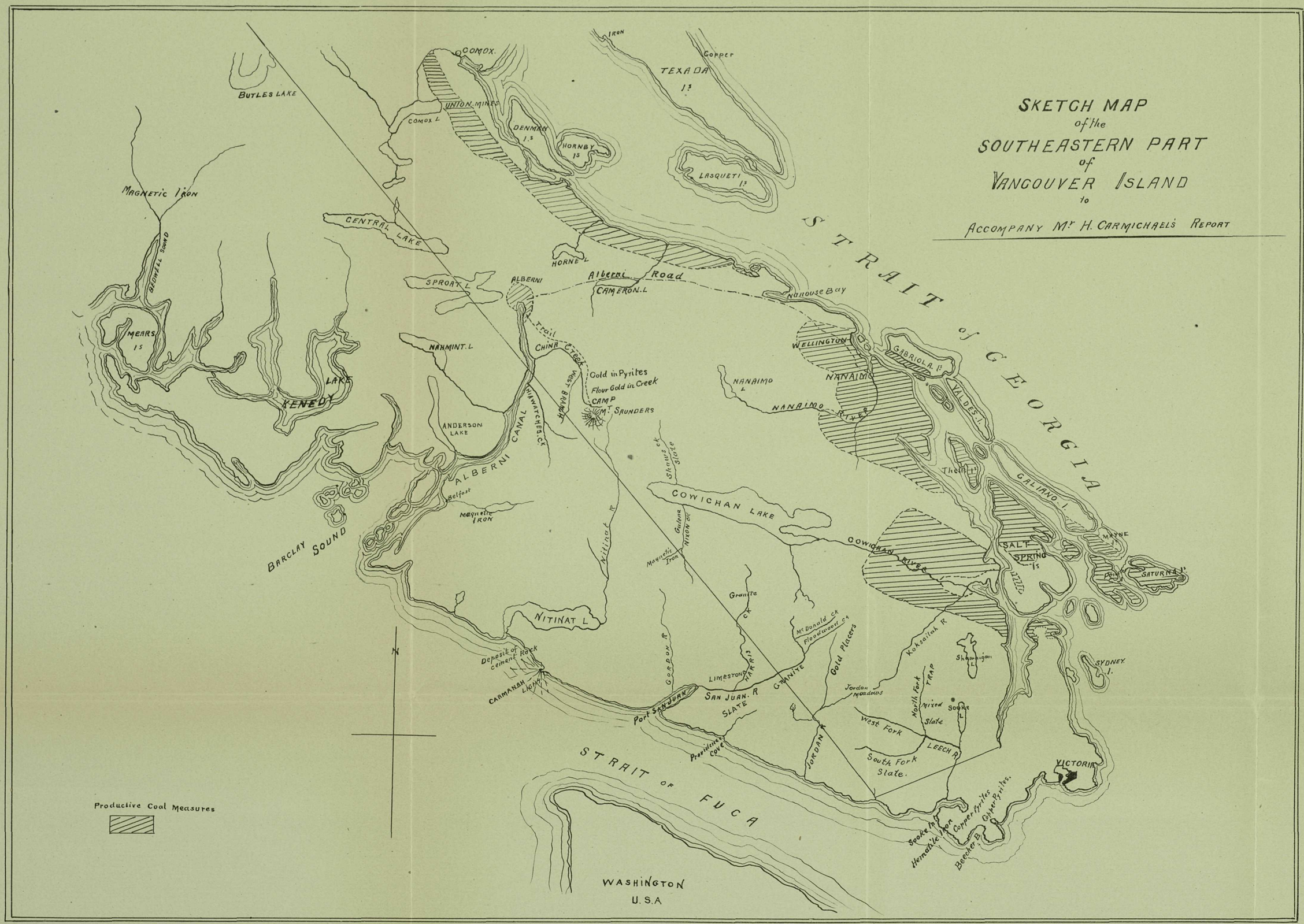
"After we pass the 25-mile post we get into alternative beds of trap, limestone, and marble, which continue to the 41st mile post; then it is all trap as far as I have gone, to the 72nd mile post.

"The limestone and marble are found in the valleys and on the mountains. Some of the mountains that are 4,000 feet high are one-half limestone. I found some large veins of magnetic iron ore at the junction of the limestone and trap-rock, on the mountains.

"The limestone contains numerous caves and craters. The craters are circular in form, and from 25 to 50 feet in diameter at the top, and funnel-shaped, narrow at the bottom. They must have been vents for escaping gas or steam in the early ages, when the mountains were heated by internal volcanic fires.

"The next place that shows indications of mineral is in the trap-rock on Vernon Creek, between the 46th and 47th mile post. Here the banks are red, like paint, where wide belts of rock, full of iron pyrites, cross the creek. The iron is partly decomposed on the surface. Mr. McCulloch, the Government Assayer, makes this rock assay $13.50 to the ton in silver.

SKETCH MAP
SHOWING
AURIFEROUS COUNTRY
IN
ALBERNI DISTRICT. V.I.
TO Accompany Mr H. Carmichaels Report
1893
Sproat Lake
Supposed extent of Coal formation
ALBERNI
ROAD to NANAIMO
Rodger Ck
STAMP HARB
CAMERON R
CAMERON L
Copper Mt. 2279
TRAIL
Trail to Cowichan Lake
CHINA CREEK
This creek has been prospected and nothing found on it
N
Magnetic
CANAL
First Narrows
ALBERNI
Hiawatches Creek.
West Branch
China Cabin
Mt Douglas 4245
4054
2066
2274
2900
Mt Spencer 4718
Iron Mt
Mt SAUNDERS over 4000
Mt MORIARTY 5185
Mt PARSONS 4554
Mt GREY 4768
NITINAT RIVER
Scale of Miles


SKETCH MAP
of the
SOUTHEASTERN PART
of
VANCOUVER ISLAND
to
ACCOMPANY Mr H. CARMICHAEL'S REPORT
STRAIT of GEORGIA
STRAIT OF FUCA
WASHINGTON
U.S.A
Productive Coal Measures
COMOX.
UNION MINES
COMOX L
DENMAN Is
HORNBY Is
TEXADA Is
Copper
IRON
LASQUETI Is
BUTLES LAKE
MAGNETIC IRON
BEDWELL SOUND
MEARS Is
KENEDY LAKE
CENTRAL LAKE
SPROAT L
ALBERNI
HORNE L
Alberni Road
CAMERON L
Nanouse Bay
WELLINGTON
NANAIMO
NANAIMO L
NANAIMO RIVER
GABRIOLA Is
VALDES I.
GALIANO I.
Thetis Is
MAYNE I.
SALT SPRING Is
SATURNA I.
SYDNEY I.
VICTORIA
NAHMINT L
ANDERSON LAKE
ALBERNI CANAL
HIAWATCHES CK
Trail
CHINA Creek
WEST BRANCH
Gold in Pyrites
Flour Gold in Creek
CAMP
Mt SAUNDERS
Belfast
Magnetic IRON
BARCLAY SOUND
Nitinat R
Shaws ck
Slate
COWICHAN LAKE
COWICHAN RIVER
Galena
NIXON CK
Magnetic Iron
Granite
CK
McDonald CK
Floodwood CK
Gold Placers
NITINAT L
Deposit of cement Rock
CARMANAH LIGHT
GORDON R
LIMESTONE
HARRIS
SAN JUAN R
SLATE
GRANITE
Port SAN JUAN
Providence Cove
JORDAN R
Jordan Meadows
Koksailah R
Shawnigan L
North Fork
TRAP
Mixed Slate
Sooke L
West Fork
LEECH R
South Fork Slate.
Sooke Inlet
Hematite Iron
Copper Pyrites
Copper Pyrites.
Beecher B.
N

"The next place is near the 57th mile post, in the pass between Mt. Grey and Mt. Spencer, at the head of Franklin River. There are several quartz veins from six to eight inches wide, rich in yellow copper ore

"From the 67th to the 68th mile post, near Alberni Canal, are good indications for minerals, such as copper, iron, and perhaps silver.

"By washing the gravel in any of the creeks along the line of survey, I could find colours of gold, but not in paying quantities. I also found fragments of silver ore when panning at the Forks of Gordon River, in the limestone country.

"There is a stream which rises in the low pass between Mt. Grey and Mt. Spencer, and runs south-east about five miles to Nitinat River. The lower part of this creek cuts through freestone rock, which, I think, would be suitable for whetstones and grindstones.

"ROCK, MINERALS, &C.

"It is a continuous bed of trap rock along the survey line from Alberni Canal to Crown Mountain, with only a slight variation in one or two places. There is a ridge of very good fine-grained granite at the 82-mile post, between Sproat and Central Lakes. A thick bed of conglomerate overlies the trap-rock on Thunder Mountain, at 89 miles. Viewing the west end of this mountain from Central Lake, I could see strata of sandstone, about 500 feet thick at the top, which indicates that there may be coal there.

"In the valley leading from Comox Lake to Alberni, and from five to ten miles east of this line, are tracts of country showing sandstone rock with some thin seams of coal in the banks of the creeks. It looks well for a coal field there.

"At a place about two miles north-east of the 115-mile post, at an elevation of 6,000 feet, on the packers' trail in the mountain pass, at the head of the west branch of Cruikshank River, are some mineral veins fifteen feet thick, containing iron, copper, and perhaps silver.

"I could see extensive belts of stratified limestone and marble on the west side of Buttle's Lake, up the sides and on the tops of the mountains. We observed some pieces of red marble in the streams, where they had been washed down from the mountains. These beds of limestone and marble are all west of the boundary line.

"At 129, 130, and 131 miles the rock is conglomerate, composed of angular pieces of trap cemented together, showing little or no wash. No slate was seen at any time, and only a few threads and bunches of quartz."

ASSAY OFFICE,
VICTORIA, 31st December, 1893.

SIR,—I have the honour to report that during 1893, the number of specimens received for examination show an increase of 15 per cent. over the average of the two preceding years.

Among the assays made the following may be mentioned as indicating the richness of the minerals of the Province.

EAST KOOTENAY DISTRICT.

Specimen from Fort Steele:—
White quartz and copper ore, $2,000 in gold to the ton of 2,000 lbs.

Specimen from the neighbourhood of Cranbrook:—
Quartz and mixed copper ore with free gold, $1,615 in gold to the ton of 2,000 lbs.

WEST KOOTENAY DISTRICT.

Specimens from the Slocan mining district:—
Quartz and galena, 358 ounces of silver to the ton of 2,000 lbs.
Black silver ore, 1,792 ounces of silver to the ton of 2,000 lbs.

YALE DISTRICT.

Specimen of sulphide of copper, 61.32 per cent. copper.

QUEEN CHARLOTTE ISLANDS.

Specimen of magnetite 62.5 per cent. iron.

A sample of clayey gravel, said to have been found in the southern portion of Vancouver Island, was received for assay. A preliminary examination leads me to think that it contains an organic body known as cymene, *(paramethylpropylbenzine)* and its homologues, but further investigation will enable me to prove its composition. If my conjecture should be correct, the discovery will be one of interest, inasmuch as I am of opinion that it is the first time that this body has been met with in British Columbia, if not in Canada.

I have the honour to be,
Sir,
Your obedient servant,
HERBERT CARMICHAEL,
Provincial Assayer.

The Honourable
The Minister of Mines, Victoria.

ASSAY OFFICES AND LABORATORY,
GOLDEN, B. C., March 10th, 1893.

DEAR SIR,—It is with great pleasure that I send the following concerning metallurgical and other features of interest gathered during my assay of the collection of mineral specimens sent from the Province to the Columbian Exposition at Chicago, 1892-1893.

Much has been heard of late concerning the vast mineral wealth of the Province, and, as is usually the case, exaggerated assay values have been circulated. The general production of precious metal is proved to be excellent, but to quote such figures as 5,000, 6,000, and even 10,000 ounces of silver to the ton, has a strong tendency to disgust any practical mining men, and materially damages the interests of the community.

I have had the honour of being selected by your Government to assay something like two hundred samples taken from various localities, and have, after carefully examining each, given returns according to the contents of the specimen under treatment.

EAST KOOTENAY.

From East Kootenay, not including Fort Steele district, there were thirty-five specimens received, some carrying argentiferous lead, others argentiferous copper, and some were quartz, carrying small quantities of silver, with a good sprinkling of gold.

The silver average, taking one with another, was ..... 45.50 oz. per ton,
The gold " " " " ..... 4.30 "

Adding these, we have a result which is exceedingly encouraging, particularly when the fact is kept fully in view that some of the specimens from which the average is obtained should not really be classified as silver-bearing at all.

The silver-lead ores which came under my notice, having reference to this particular district, were those from which a smelting company having opportunities of mixing their purchases would have no necessity for a deduction for zinc or other base metals, which are detrimental to the working of the product.

With the exception of the Monarch ores at Field, the little zinc contained in nearly every case is counterbalanced by the proportion of iron. The ores carrying most zinc are those, as a rule, which could not be concentrated on account of the considerable amount of silver contained in the zinc. There is, however, no silver in the zinc of the Monarch mine.

Copper Ore.

It will be noticed, on glancing over the returns sent to the Department by me, that the signs of the existence of copper in this district are numerous and encouraging. We have carbonates, sulphides and oxides of this metal, as well as in combination with antimony, in which latter case the silver contents invariably run exceedingly high. The Windermere Mountain deposits, and also those of the Spillimacheen, are very interesting, producing good smelting ores. The former carry it as red oxide and carbonate, and the latter carbonates. From Jubilee Mountain we have splendid showings of purple copper ore, the assays in each case covering a range of from 35 to 59 per cent., and there are instances outside of the collection sent to Chicago where even higher results than these have been obtained. In a few cases where the ore carries sulphide and a consequent decrease in the percentage of the metal

contained, a little trouble and expense would be the means of eliminating the excess of sulphur and placing on the market parcels of such ore as would pay handsomely to ship.

Gold Ore.

The samples I treated were chiefly quartz, and quartz containing as a gangue iron pyrites and arsenical pyrites. In the majority of the cases the gold was free. This would naturally be the case for surface indications; the action of the air having converted the original sulphides into oxides, leaving the precious metal, at one time probably covered by sulphur and arsenic, exposed and deposited in the cells vacated by the cubes of sulphurets, now decomposed.

FORT STEELE.

I am sorry to say the average contents of the silver and gold in the specimens from this camp was not so encouraging as from other parts of East Kootenay, but this may be accounted for by the fact that several samples were sent which should have remained where they were found. To compensate, however, the "North Star" comes in with a 47 oz. silver and 63.47 % lead ore. The partial analysis of this ore may be of interest to smelting men, showing as it does good fluxing properties:

Lead	67.50 per cent.
Iron	6.63 "
Zinc	1.90 "
Antimony	5.41 "
Silver	47.31 oz. per ton.

The coal specimens from the Crow's Nest Coal Co. were exceptionally good, judging from appearances; but not having made any test, am unable to refer to them technically.

WEST KOOTENAY.

Although the number of specimens received from the camps in West Kootenay is greatly in excess of that from East Kootenay, there remains very little to say. The average in silver is an excellent one, and also that of lead, throughout.

Thirteen specimens were received from the section which includes the following well-known mines:—Best, Great Western, Lucky Jim, Washington, Northern Belle, Monte-Christo, White Water, Wellington, Blue Bird, Reca, Bonanza King, Payne, and Dardanelles.

The silver contained averaged	237 oz. per ton,
The lead " "	58-00 per cent.

with very little detrimental impurities, if any, in a single case. So no remarks need be made. There was a little antimony, and in some cases a small percentage of zinc.

HOT SPRINGS.

Eighteen specimens, averaging in silver	58 oz. per ton.
" " lead	53.00 per cent.

No gold. A few of these were certainly refractory ores, but the majority could easily be smelted with mixing facilities. Sulphide of antimony is present.

SLOCAN.

The seventeen samples from the Slocan were truly excellent specimens of galena; but, unfortunately, owing to their richness and damage in transit, much of the beauties of the ore had been rubbed off. Some fine cubes were badly broken.

The silver average was	178 oz. per ton.
The lead " "	61.00 per cent.

As in the former case, they carried no gold. The grade is too high here also to desire comment; any of the ores would be easily reduced. They carried, with lead and silver, antimony and iron. One glance at the averages shows one what there is in store for the Slocan. Combining this group with that of the Payne and Dardanelles, etc., I doubt if any mining section of North America can equal these results.

ILLECILLEWAET.

The exhibit from this old mining locality, favourably situated on the main line of the Canadian Pacific Railroad, is an exceptionally good one. There is hardly a sample which could not be classified as high grade. Some of the eight sent, although not quite as rich in silver as the ore from the Slocan, are quite a match in smelting qualities. Clean ores, running over seventy per cent. in lead, with the balance sulphur, antimony, and a little silica, are not to be met with every day. It would be difficult, I think, to make exceptions to the rule, when I say these specimens are more than creditable to the contributors and the camp. The Elizabeth, North Star, Red Fox, and Annie, should be particularly mentioned. The Illecillewaet collection is no doubt equal if not superior to any.

The silver contents averaged ..... 111 oz. per ton.
The lead " " ..... 64.00 per cent.

There was one sample of copper ore (Peacock) from the Silver Bow which struck me as being a particularly beautiful specimen, carrying gold, silver and copper in heavy quantities.

NELSON.

I treated three pieces of quartz containing thin gold in the free state. These came from near Nelson, the exact location I do not know. The gold average was $60.12 per ton, a fact which should lead to a strict investigation of the reef from which the specimens were obtained.

TOAD MOUNTAIN.

A few samples only were sent from this part. There was one fine ferruginous quartz specimen from the Majestic, carrying much free gold. The Silver King, argentiferous copper, with silver 444 oz., and 23.50 per cent. copper, requires no further mention. The Dandy sent two specimens, but unfortunately my tests did not come anywhere near the produce generally credited to this ore. It is decidedly refractory.

TRAIL CREEK.

Sixteen specimens composed this exhibit. They contained various quantities of gold, silver, and copper. The ore is a yellow sulphide, and should be treated and converted into matte on the spot. The extent of the deposits, and the gold contained, should make these ores valuable apart from copper. I should expect to find nickel in such ore.

NAKUSP.

These ores were certainly exceedingly good and particularly clean. Eight made the total sent, all of which were good wet ores.

The silver contents averaged ..... 85.00 oz. per ton.
The lead " " ..... 64.00 per cent.

There is little else to be said of this camp, as the remarks of the Slocan are adapted to it.

LARDEAU.

I treated from the Lardeau eleven samples. The specimens were very fine and showed much metal, but in many cases it was not lead, as the assays will show. The concentrator will have to be used freely in this camp, if the surface indications are to be the index of the deposit. With development, however, we may expect more gold. These specimens shewed remarkable contrast to any other argentiferous lead ores of West Kootenay, in the gold contained. The Silver Cup was decidedly the leader in value of assay, which ran to 251 oz. silver and $40 in gold to the short ton. The future treatment of these ores will require much consideration and careful analysis.

YALE.

These, which were chiefly gold ores, were slightly disappointing. The average value for gold is small, but, owing to the extent of the reef, good results may follow. The writer may add, however, that during a private experience with these ores he has found them of good average, and in one case platinum was discovered.

CARIBOO.

A few specimens came from the pioneer camp "Cariboo." These were mainly sulphurets (iron and arsenic), carrying from one to three ounces of the yellow metal to the ton. With the modern methods of gold extraction, there is every probability that the standard mining region will more than maintain its proud position.

KAMLOOPS.

But few specimens came from this section; but these were all good. One sample of copper from the "Victoria" was first-class and carried sixty per cent. of the metal. The silver-leads were good as concentrating propositions, and should receive the attention they deserve. There was one curiosity, viz., "Cinnibar," a fine piece of rock containing this sulphide of mercury to the extent of about seven per cent. mercury. The Glen Mines iron ore was good too; and with the known existence of the North Thompson coal deposits, samples of which were sent, I should think it is only a question of time before this will be a smelting centre.

OSOYOOS DIVISION.

I was particularly struck with the nature of the exhibits from this district. The ores seem to contain silver, gold, lead, and copper, in paying quantities. In one case I met with a heavy specimen of antimony sulphide. The majority of the claims sent gold ore, the best assay amounting to $360 per ton in gold; this was from the Stemwinder. All the ores are concentrating, having quartz and arsenical and iron pyrites as their composition, with the precious metals. The gold averaged from $30 to $60 per ton.

This concludes my remarks on the ores treated. I may say this, that in individual cases the assays are below the reputed values, as a general rule. This is sure to happen in a new country, where the general idea is to boom. I have reported as fairly and conscientiously as possible; and rest assured that the collection sent to Chicago will be the means of attracting much attention. The splendid average—silver, gold, lead, and copper—of the specimens forwarded will speak for itself.

Trusting these remarks will be of some service to you and the Province,

I am, dear Sir,

Yours obediently,

W. PELLEW HARVEY.

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

MINERAL WEALTH OF BRITISH COLUMBIA.

Paper read before the Royal Colonial Institute by George M. Dawson, C.M.G., L.L.D., F.R.S., Assistant Director, Geological Survey of Canada.

For fifteen years or more I have been engaged in the exploration and geological examination of British Columbia, in connection with the Geological Survey of Canada, and have thus enjoyed the opportunity of traversing and inspecting a large part of this province of Canada. The information gained has been embodied in a series of official reports, published from year to year, and it is only because it may be assumed that such reports are seldom read, that I can venture to hope that what I have to say may possess some interest or novelty at the present time. British Columbia is the western province of the Dominion of Canada, with a coast line of over 500 miles in length, from south to north, on the Pacific. It is the largest of the Canadian provinces which has yet been defined, and may be described as possessing truly imperial dimensions. Its length of coast (without counting its extraordinary sinuosities) is nearly equal to the combined length of England and Scotland; while its area of 383,300 square miles, is over three times that of the United Kingdom, and greater than that of any country in Europe except Russia. It is in the main a land of mountains, including nearly 1,000 miles in length of that broken western margin of the American continent, which, in lieu of any better name, is known as the Rocky Mountain region or Cordillerean belt. Although it possesses valuable fisheries and remarkable resources in its forests, besides important tracts of arable and pasture land, much of its prosperity must depend on the development of its mineral wealth, which is the compensation afforded by nature for the generally rugged character of a large part of its surface.

Less than 100 years ago, the region now named British Columbia was wholly unknown. At about that time its coast began to be explored in some detail by Cook, Vancouver, and other navigators, and soon after, this coast became the resort of a certain number of trading vessels in search of furs; but none of these adventurers acquired any knowledge of the interior of the country. Almost simultaneously, however, the explorers and traders of the North-West and Hudson's Bay Companies, pushing on and extending their operations from point to point in the interior of the North American Continent, began to enter the hitherto mysterious region of the Rocky Mountains from its inland side. Mackenzie was the first to reach the Pacific, and following him came Fraser, Thompson, Campbell, and others, all Scotchmen in the service of these trading companies, till by degrees several trading posts were established, and "New Caledonia," as the whole region was then named, came to be recognized as an important "fur country." This era of discovery, with its results, constitutes the first chapter in the known history of British Columbia. It is replete with the achievements and adventures of these pioneers of commerce, who, with their limited resources, and without knowing that they had achieved fame—often without even placing their journeys on record—extended the operations of their companies across a continent. But this chapter, though full of interest, is not that with which we are at present concerned. It must suffice to say that what is now British Columbia remained a "fur country," and that alone, for many years. The existence of coal upon its coast was recognized by Dr. Tolmie, an officer of the Hudson's Bay Company, as early as 1835; but though small quantities of coal were actually obtained from natural outcrops from time to time, for the use of the blacksmiths of the Company's posts, no importance appears to have been attached to this discovery. The world was at that time very spacious, and the Pacific Ocean was still regarded rather as a field for the exploration of navigators than as a highway of commerce between America and Asia.

In 1849 gold was discovered in California, and with the resulting influx of miners, the seizure of that Mexican province by the United States, justified, if justifiable at all by its subsequent development, all are familiar. Two years later, a discovery of gold occurred on the Queen Charlotte Islands, now forming part of British Columbia. This forms an interesting episode by itself, but, though some attention was drawn to it for a time, no substantial results followed, and no alteration in the condition of the country as a whole was brought about. The meaning and the worth of this particular discovery yet remain to be determined. In 1857, however, four or five French Canadians and half-breeds, employés of the ubiquitous

Hudson's Bay Company, found gold on the banks of the Thompson, a tributary of the Fraser River, and their discovery becoming known, changed the whole fortunes of the country. California was at this time filled with gold miners, and it required only the rumour of a new discovery of gold to create a new "excitement." In the following year, it is estimated that within three months over 20,000 people arrived at the remote trading port which then stood upon the present site of the City of Victoria, while many more made their way overland to the New El Dorado.

The difficulties in the way of these fortune hunters were great. The country was without roads or other means of communication, save such rough trails and tracks as had served the purposes of the natives and those of the fur traders. The Indians, if not openly hostile, were treacherous, and not a few of the men who actually reached the Fraser Cañons, were never again heard of. The Fraser and Thompson were at this time the objective points, and much of the lengths of these rivers were impracticable torrents. It is not, therefore, surprising that by far the larger part of those engaged in this sudden migration returned disappointed, many without ever reaching their destination. Some, however, persevered, several thousand miners actually got to work on the auriferous bars of the Fraser, and a new state of affairs was thus fairly inaugurated. To follow the rapid progress of these miners along the Fraser and Thompson with their tributaries, would be full of interest, though the records of their work now existing are scanty, but this again would lead us too far afield. The gold found on the lower reaches of the Fraser was what is known to miners as "fine" gold, or gold in very small scales or dust, minutely divided. Further up "coarser" gold was obtained, and the miners very naturally jumped to the conclusion that somewhere still further up the great stream the source of all the gold should be found. Thus, with restless energy, they pushed on until before long the Cariboo country, some 400 miles from the sea, was reached; and here the richest deposits of alluvial or "placer" gold were found, and for a number of years continued to be worked, with results which, considering the comparatively small number of men engaged, were most remarkable.

Later and more thorough investigations show that the theory so readily adopted by the miners was incorrect; that there is no regular gradation in amount or "coarseness" of gold from the lower part of the Fraser to the head-waters in Cariboo, but that the gold found on the bars of the river is of more local origin. Still the theory referred to, as a matter of fact, led the miners to Cariboo, which proved not only to be the richest district so far discovered in British Columbia, but for its area one of the richest placer mining districts ever found. In this district the valleys of two streams, Lightning and Williams Creeks, have been the most remunerative, and these and their tributaries have actually yielded the greater part of the gold obtained. The work was begun by the washing of the gravels of the streams themselves, but with the experience already gained in California and Australia, the miners soon began to search deeper. The valleys through which these streams flowed were found to be filled to a considerable depth by loose material, gravel and boulder-clay, due to the glacial period or to inwash from the sides of the bordering mountain ranges; and in sinking beneath all this material the channels of older streams, the predecessors of the present were found, with their rocky beds smoothed and worn and filled with rounded boulders and gravel. These contained vastly richer deposits of gold, because they represented the concentrated accumulations of great periods of continued work by natural forces of denudation and river action.

This discovery, once made, led to the initiation of more extended mining operations, which often necessitated large expense in labour and the construction of heavy pumping machinery; but the results as a rule repaid the enterprising miners. Thus the old deeply buried channel of Lightning Creek was found to average something like $200 in gold to each running foot of its length, while considerable lengths of Williams Creek yielded as much as $1,000 to the same unit of measurement. Williams Creek affords some notable instances of the extraordinary concentration of "coarse" gold in limited areas:—Thus, from Steele's claim, 80x25 feet, over $100,000 worth of gold was obtained. From the Diller Company's claim, it is stated that in one day 200 lbs. weight of gold, valued at $38,400, was raised; and in 1863, 20 claims were producing from 70 to 400 ounces of gold each per diem. Four hundred miners were at work on Williams Creek in this year, which is still admirably spoken of as the "golden year." Though, like Williams Creek, discovered in 1861, the deep channel of Lightning Creek was not successfully reached until 1870, but great developments followed. The Butcher claim at one time yielded 350 ounces of gold a day; the Aurora, 300 to 600 ounces; and the Caledonia, 300 ounces.

It must be remembered that the Cariboo mining district is situated in a high and densely forested mountainous region, which, because of its inaccessible character, had remained almost unknown even to the wandering native hunters. At the time in which these great discoveries in it occurred, it was reached only with extreme difficulty by trails or imperfect tracks, over mountains and across unbridged rivers. Every article required by the miner was obtained at an excessive cost; but all these drawbacks did not prevent the rapid growth of typical mining camps in the centre of this remote wilderness, with their accompanying lavish expenditure and costly if rude pleasures. So long as the golden stream continued to flow in undiminished volume, everything that gold alone could buy was to be obtained in Cariboo.

Perhaps more worthy of note, is the fact that the development of these mines was carried out entirely by the miners themselves. No outside capital or backing was asked for or obtained. Money made in one venture was freely and at once embarked in another, and the investors were to be found working with pick and shovel in the shaft or drift. But the lengths of the rich old channels on both these famous creeks, which could be worked in this way, proved to be limited to a few miles. Below a certain point in each case, the "bed-rock" was found to be at so great a depth, that it was not possible to reach it through the loose and water-saturated materials filling the old valley. Thus the great yield of gold became gradually reduced to comparatively modest proportions, and at the present time, mining in Cariboo district is mainly confined to hydraulic workings, by which poorer ground is utilised and a much larger quantity of material requires to be removed to obtain a given amount of gold. But the old valleys of Cariboo have never ceased to produce gold, and in 1892 their product still amounted in value to about $200,000.

It has been impossible to follow the fortunes of the Cariboo mining district in any detail, and time can only be afforded to name the other placer mining districts of the province. The Omineca district was discovered soon after Cariboo, but little was done there till 1867. This district is situated in latitude 56°, in the drainage basin of the Peace River, and, though so remote, has produced a considerable quantity of gold. Still further to the north, in latitude 58°, is the Cassiar district, first found to be auriferous in 1872, for some years thereafter resorted to by many miners, and still a mining centre not without importance. This is the northernmost mining region of British Columbia proper, but beyond the 60th parallel (forming the northern boundary of the province) alluvial gold mining has of late years been developed in the Yukon district, embracing the numerous upper tributaries of that great river, and extending to the borders of the United States territory of Alaska. Neither must it be forgotten to note, that the working of alluvial gold deposits of greater or less importance, has occurred at many places in the southern part of the province, to the east of the Fraser River, including Big Bend, Similkameen, and Kootenay districts, from all of which some gold still continues to be produced by the old methods.

The story of the discovery and development, the palmy days and the gradual decline in importance of any one of these mining regions, rightly told and in sufficient detail, would constitute in itself a subject of interest. But without attempting to do more than name the districts here, it is of importance to note how general, throughout the whole extent of the great area of British Columbia, the occurrence of deposits of alluvial gold has been proved to be. The gold thus found in the gravels and river beds is merely that collected in those places by natural processes of waste, acting on the rocks, and the concentration of their heavy materials during the long course of time. The gold has been collected in these places by the untiring action of the streams and rivers, and it must in all cases be accepted as an indication of the gold-bearing veins which traverse the rocky substructure of the country, and which await merely the necessary skill and capital to yield to the miner still more abundantly.

Nevertheless, the results of alluvial or placer gold mining alone in British Columbia have not been insignificant, for, since the early years of the discovery, the province has contributed gold to the value of some $50,000,000 to the world. One feature in particular requires special mention, and this is a deduction which depends not alone on experience in British Columbia, but which is based as well on that resulting from the study and examination of other regions. The "heavy" or "coarse" gold, meaning by these miners' terms the gold which occurs in pellets or nuggets of some size, never travels far from its place of origin. It is from this point of view that it becomes important to note and record the localities in which rich alluvial deposits have been found, even when the working of these has been abandoned by the placer miner. Their existence points to that of neighbouring deposits in the rock itself, which may be confidently looked for, and which are likely to constitute a greater and more permanent source of wealth than that afforded by their derived gold.

Reverting for a moment to the Cariboo district, where such notably rich deposits of alluvial gold have been found within a limited area, and where, very often, the gold obtained has been actually mingled with the quartz of the parent veins, it cannot be doubted that these veins will before long be drawn upon to produce a second golden harvest. This district has suffered and still suffers from its great distance from efficient means of communication; but, notwithstanding this, praiseworthy efforts have already been made towards the development of "quartz mining," while much also remains to be done in utilizing by operations on a larger scale and with better appliances, the less accessible placer deposits which have so far baffled the efforts of the local miner. It is necessary to bear in mind that alluvial gold mining or placer mining requires but a minimum amount of knowledge on the part of the miner, though it may call for much individual enterprise and effort when a new and difficult region is to be entered. Any man of ordinary intelligence may soon become an expert placer miner. It is, after all, in the main, a poor man's method of mining; and, as a rule, the placer miner lacks the knowledge as well as the capital necessary to enable him to undertake regular mining operations on veins and lodes. However promising the indications may be for such mining, he either does not appreciate them, or passes them over as being beyond his experience or means. He would rather travel hundreds of miles to test a new reported discovery, than spend a summer in endeavouring to trace out a quartz reef, with the uncertain prospect of being able to dispose of it at some later period.

Thus, though the development of placer mining in British Columbia began a new history for that great region, raising it from the status of a "fur country" to that of an independent colony, and subsequently to that of a province of Canada, there remained a gap to be bridged in order that the province should begin to realize its proper place among the mining regions of the world. It was necessary that railways should be constructed to convey machinery and carry ores, as well as to bring to the metalliferous districts men who would not face the hardships of pioneer travel in the mountains, but who are in a position to embark the necessary capital in promising enterprises. For a portion of the province, the construction of the Canadian Pacific Railway has afforded these facilities, but by far the larger part still awaits railway communication. Had the C. P. R., in accordance with some of the surveys made for it, traversed for instance the Cariboo district, there can be no doubt that we should have already been able to note great developments there. This railway has, however, been constructed across the southern portion of the province, and in its vicinity, and concurrently with its progress, new mining interests have begun to grow up, of which something must now be said.

Before returning to these, however, I must ask to be allowed to say a few words respecting the development of the coal mines of British Columbia, which was meanwhile in progress. The discovery of coal upon the coast, at an early date in the brief history of British Columbia, has already been alluded to. Following this discovery, the Hudson's Bay Company brought out a few coal miners from Scotland, and proceeded to test and open out some of the deposits. Thus, as early as 1853, about 2,000 tons of coal were actually raised at Nanaimo. San Francisco already began to afford a market for this coal, and the amount produced increased from year to year. The principal coal mining district remained and still remains at Nanaimo, on Vancouver Island. At the close of the year 1888, about four and a half million tons in all had been produced, and the output has grown annually, till in 1891 over a million tons were raised in one year. California is still the principal place of sale for the coal, which, by reason of its superior quality, practically controls the market, and is held in greater estimation than any other fuel produced on the Pacific slope of North America. The local consumption in the province itself grows annually, and smaller quantities are also exported to the Hawaiian Islands, and to China, Japan, and other places. In the various ports of the Pacific Ocean, the coal from British Columbia comes into competition with coal from Puget Sound in the State of Washington, which, because of the high protective duty established by the United States, is enabled to achieve a large sale in California, notwithstanding its inferior quality. It has also to compete with shipments from Great Britain, brought out practically as ballast, with the coals of Newcastle in New South Wales, with coal from Japan, and in regard to the Pacific ports of the Russian Empire, with coal raised by convict labour at Duai, on Saghalien Island, in the Okotsk Sea. It is sufficient guarantee for the quality of the coal of British Columbia that it is able to hold its own against all these competitors.

Though Nanaimo has been from the first the chief point of production of coal, work has been extended within the last few years to the Comox district, also situated on Vancouver Island; while other promising coal-bearing tracts have been in part explored and examined on

this island, and on the Queen Charlotte Islands. These particular coal regions, bordering upon the Pacific Ocean, have naturally been the first to be employed, but they by no means exhaust the resources of the province in respect to coal. Deposits of good bituminous coal are known also in the inland region, and some of these in the vicinity of the line of railway are now being opened up, while others, still far from any practicable means of transport or convenient market, have been discovered, and lie in reserve. One of the most remarkable of these undeveloped fields is that of the Crow's Nest Pass, in the Rocky Mountains, where a large number of superposed beds of exceptional thickness and quality have been defined.

Besides the bituminous coals, there are also in the interior of the province widely extended deposits of lignite coals, of later geological age, which, though inferior as fuels, possess considerable value for local use. In the Queen Charlotte Islands anthracite coal is found, but has not yet been successfully worked; and in the Rocky Mountains, on the line of the Canadian Pacific Railway, coal of the same kind again occurs, near Banff and Canmore stations. The places last named lie just beyond the eastern border of British Columbia in the adjacent district of Alberta, but require mention in connection with the mineral resources of the province. The coals of British Columbia may, in fact, be said to represent in regard to quality and composition, every stage from hard and smokeless fuels, such as anthracite, to lignites, and brown coals like those of Saxony and Bohemia. Many features of interest to the geologist might be mentioned in relation to these coal deposits, did time permit, but it must not be forgotten to note one principal fact of this kind—the very recent geological age to which all the coals belong. None of the coals of British Columbia are so old as those worked in Great Britain; they are in fact all contained in the cretaceous and tertiary rocks.

The very general distribution of coals of various kinds in different parts of the province is of peculiar importance when considered in connection with the building of railways and the mining and smelting of metalliferous ores. It insures the most favourable conditions for the development of these ores, to some further examination of which we must now return. It is especially worthy of note, that wherever in the United States the Rocky Mountain or Cordilleran region has been traversed by railways, mining, and particularly that of the precious metals, has immediately followed. It appears to require only facilities of transport and travel to initiate important mining enterprises in any part of this region. The building of the Canadian Pacific Railway across the southern part of British Columbia, with the construction of other railway lines in the neighbouring States, near the frontier of the province, have already begun to bring about the same result in this new region, which, till these railways were completed, had remained almost inaccessible. It had long before been resorted to by a few placer miners in search of alluvial gold, and their efforts were attended with some success. Silver-bearing lead ores were also found to occur there, but under the circumstances existing at the time these actually possessed no economic value. It was impossible to utilise them.

In 1886, some prospectors, still in search of placer gold only, happened to camp in a high mountainous region which has since become familiarly known as Toad Mountain, and one of them, in seeking for lost horses, stumbled on an outcrop of ore, of which he brought back a specimen. This specimen was afterwards submitted to assay, and the results were such that the prospectors returned and staked out claims on their discovery. The ore, in fact, proved to contain something like $300 to the ton in silver, with a large percentage of copper and a little gold. In this manner what is now known as the "Silver King" mine was discovered, and, as consequence of its discovery, the entire Kootenay district, in which it is situated, began to be overrun with prospectors. Hundreds of these men, with experience gained in the neighbouring states of Montana and Idaho, as well as others from different parts of the world, turned their attention to Kootenay. The result has been that within about five years a very great number of metalliferous deposits, chiefly silver ores, have been discovered, and claims taken out upon them. Several growing mining centres and little towns have been established; roads, trails, and bridges have been made, steamers have been placed on the Kootenay Lake and on the Upper Columbia River, and a short line of railway has been built between the lake and the river to connect their navigable waters. The immediate centre of interest in regard to mining development in British Columbia has, in fact, for the time being, been almost entirely changed from the principal old placer mining districts to the new discoveries of silver-bearing veins. So far as they have yet been examined or opened up, the metalliferous deposits of the Kootenay district give every evidence of exceptional value. They consist chiefly of argentiferous galena, holding silver to the value of from $40 or $50 to several hundred dollars to the ton. Nelson, Hot Springs, Kaslo, Illecillewaet, and Golden are at present the principal

recognised centres in the new district, but it would be rash as yet to attempt to indicate its ultimate limits.

Though much has already been done in this Kootenay district, two principal causes have tended to prevent the more rapid growth of substantial mining up to the present time. The first of these is the difficulty still existing in respect to the local transport of large quantities of ores; the second, the exaggerated values placed by discoverers upon their claims. While it is evidently just that the prospector should receive an ample remuneration for his find, it is to be noted that the laws of British Columbia are so liberal that he (whatever his nationality) may, at a cost scarcely more than nominal, hold and establish his claim, even though he may be practically without means of developing it. Such development in all cases requires the expenditure of considerable sums, and this must always be of a more or less speculative character, while, even if thus fully proved, it becomes further necessary to incur an additional large expenditure in plant and machinery before any property reaches the status of a going concern. Scarcely an instance can be quoted of a mine which has paid its own way from the "grass" down, but almost every prospector is fully convinced that his claim is precisely of this kind.

Such circumstances, which have, unfortunately, for the last few years retarded the development of the Kootenay country, are now happily passing away; and there can be no reasonable doubt that in the next year or two this country will establish its place as one of the most important, not only in British Columbia, but in North America as a whole. So far as England is concerned, the actual investment of capital in this district has been small. The English investor would rather pay half a million for some property which, as demonstrated in a prospectus, will produce a good annual rate of interest, than embark a comparatively small sum in a promising venture. But to a man with some knowledge of mines and mining and the command of even a limited amount of capital, who will visit and live in the district himself for a time, the opportunities for profitable investment are, I believe to-day, excellent.

I have been unable to say anything in detail in regard to the actual modes of occurrence of the ores now being brought to light in the Kootenay District and their geological relations. Neither is it practicable, on the present occasion, to pursue in further detail the history or description of other districts of the Province in which more or less good work of a preliminary kind has been done in the development of metalliferous deposits of various kinds. Okanagan, Rock Creek, Nicola, Similkameen, the North Thompson, and Cayoosh Creek can only be named. It has been possible merely to endeavour to indicate in broad lines what has already been done and what must soon follow. Within a few years this Province of Canada will undoubtedly hold an important place in the list of quotations of mining stocks in London and elsewhere, and then the further development of its mines will become a subject of common interest from day to day.

In conclusion, I wish to draw attention to one or two ruling features of the actual situation which are too important to be left without mention:—The Cordilleran Belt, or Rocky Mountain region of North America, forming the wide western rim of the continent, has, whenever it has been adequately examined, proved to be rich in the precious metals, as well as in other ores. This has been the case in Mexico, and in the Western States of the American Union. Though some parts of this ore-bearing region are undoubtedly richer than others, generally speaking it is throughout a metalliferous country. The mining of placer or alluvial gold deposits has in most cases occurred in advance of railway construction; but this industry has always proved to be more or less transitory in its character, and has almost invariably been an indication of future and more permanent developments of a different kind. Placer gold mining has, in fact, often been continued for years and then abandoned, long before the gold and silver-bearing veins in the same tract of country have been discovered and opened up. This latter and more permanent phase of mining has followed the construction of railways and roads, and the series of conditions thus outlined are repeating themselves in British Columbia to-day.

There is no reason whatever to believe that the particular portions of British Columbia now for the first time opened to mining by means of the Canadian Pacific Railway, are richer in ores than other parts of the Province. On the contrary, what has already been said of the Cariboo District affords *prima facie* evidence of an opposite character. The Province of British Columbia alone, from south-east to north-west, includes a length of over 800 miles of the Cordilleran region; and, adding to this the further extension of the same region comprised within the boundaries of the Dominion of Canada as a whole, its entire length in Canada is

between 1,200 and 1,300 miles. This is almost identical with the whole length of the same region contained within the United States, from the southern boundary with Mexico to the northern with Canada.

Circumstances have favoured the development of the mines of the Western States of the Union, but it is, as nearly as may be, certain, that the northern half of the similar region will eventually prove equal in richness to the southern, and that when the mines of these Western States may have passed their zenith of productiveness, those of the north will be still increasing in this respect. The explorations of the Geological Survey of Canada have already resulted in placing on record the occurrence of rich ores of gold and silver in various places scattered along the entire length of the Cordilleran region in Canada, and though so far as we have to chronicle only an awakening of interest in the southern part of British Columbia, these discoveries stand as indications and incentives to further enterprise to the north. While the remote and impracticable character of much of this northern country places certain obstacles in the way of its development, on the other hand the local abundance of timber and water-power in it afford facilities unknown in the south, which will be of importance whenever mining operations have actually been set on foot.

No attempt has been made, in this brief sketch of the mineral wealth of British Columbia, to enumerate the various ores and minerals which have so far been found within the limits of the Province in any systematic manner. Nothing has been said of the large deposits of iron, from some of which a certain amount of ore has already been produced, and which wait to realize their true importance, merely the circumstances which would render their working on a large scale remunerative. Copper ores have also been discovered in many places. Mercury, in the form of cinnabar, promises to be of value in the near future, and iron pyrites, plumbago, mica, asbestos, and other useful minerals are also known to occur. In late years platinum has been obtained in alluvial mines in British Columbia in such considerable quantity as to exceed the product of this metal from any other part of North America. While, therefore, the more important products of this western mountain region of Canada are, and seem likely to be, gold, silver, and coal, its known minerals are already so varied that, as it becomes more fully explored, it seems probable that few minerals or ores of value will be found to be altogether wanting.

Respecting the immediate future of mining, which is the point to which attention is particularly called at the present time, it may be stated that coal mining rests already on a substantial basis of continued and increasing prosperity; while the work now actually in progress, particularly in the southern part of the Province, appears to indicate that, following the large output of placer gold, and exceeding this in amount and in permanence, will be the development of silver mines, with lead and copper as accessory products. The development of these mining industries will undoubtedly be followed by that of auriferous quartz reefs in various parts of the Province, while all these mining enterprises must react upon and stimulate agriculture and trade in their various branches. Because a mountainous country, and till of late a very remote one, the development of the resources of British Columbia has heretofore been slow, but the preliminary difficulties having been overcome it is now, there is every reason to believe, on the verge of an era of prosperity and expansion of which it is yet difficult to foresee the amount or the end.—*Extract from Western World.*

COAL.

The following table shows the output of each year from 1874 to 1893, 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	394,070
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

REPORT OF THE INSPECTOR OF MINES.

NANAIMO, B. C., 9th February, 1894.

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, 1893, for your information, in accordance with the requirements of the "Coal Mines Regulation Act" of British Columbia.

The collieries in operation during the year 1893, were:—

Nanaimo Colliery, of the New Vancouver Coal Mining and Land Company, Limited.
Wellington Colliery, owned by Messrs. Dunsmuir & Sons.
East Wellington Colliery, belonging to the East Wellington Coal Company.
Union Colliery, of the Union Colliery Company.
North Thompson Colliery, of the Kamloops Coal Company, Limited.

The output of coal during the year 1893, amounted to 978,294 tons, produced by the several collieries, as follows:—

Nanaimo Colliery,	output	469,311 tons, 15 cwt.	
Wellington Colliery,	"	337,334 "	3 "
East Wellington Colliery,	"	27,472 "	
Union Colliery,	"	143,927 "	
North Thompson Colliery,	"	250 "	
Total output in the year 1893		978,294 "	18 "
Add coal on hand 1st January, 1893		22,775 "	15 "
Total coal for disposal in 1893		1,001,070 "	13 "

The exports of coal by the collieries in 1893, are 768,917 tons, as follows: –

Nanaimo Colliery,	export	339,076 tons,	14 cwt.
Wellington Colliery,	"	205,212 "	14 "
East Wellington Colliery	"	20,272 "	
Union Colliery,	"	114,356 "	
Total coal exported in 1893		768,917 "	8 "
Add home consumption in 1893		207,851 "	10 "
Add on hand 1st January, 1894		24,301 "	15 "
		1,001,070 "	13 "

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

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

The receipts of coal at San Francisco by sea for the year 1893:—

British Columbia	490,679 tons
England	110,363 "
Scotland	17,762 "
Wales	36,685 "
Australia	155,415 "
Puget Sound	444,493 "
Oregon	31,550 "
Eastern States	16,667 "
Alaska	200 "
Japan	7,727 "
Total coal entered in San Francisco in 1893	1,311,466 "
" " " 1892	1,310,460 "

Of the British Columbia coal exported, it may be estimated that about 200,000 tons were shipped to lower ports in California, in addition to the coal entered in San Francisco. From the figures thus presented the importance of the United States as customers for our great staple product is at once appreciated.

A large quantity of fire-clay, of most superior quality, is put out and forwarded to Victoria by the Nanaimo and Wellington collieries, for manufacture at the potteries there.

Nor should the rising manufacture of the very superior and well-tested coke, now going on at the Union Colliery, be under estimated. The demand for the article produced is quite satisfactory to the manufacturers, and cannot fail to prove a source of profit and economy to them, as well as to those needing a good article of coke.

The collieries of the New Vancouver Coal Mining and Land Company, Limited, and of Messrs. Dunsmuir & Sons, and of the Union Colliery Company, are uniformly equipped and provided with machinery and appliances, both of steam and electric motive power, that will rank favourably with the collieries in any part of the world; and the freedom of the mines from serious casualties from explosions of gas, indeed from gas itself in hurtful quantity, of late years, coupled with the excellent relations that, as a rule, prevail between the employers and employed, make the mines and mining communities of our fair Province a most desirable haven and place of settlement for the worthy workman.

I believe that the turning point towards prosperity of both coal proprietors and the miners and workmen engaged in our coal industry will shortly be made, and that a prosperous year will be realized by all concerned. The capacity and power of the collieries was never greater and more equal to any demand that may arise, and a better nor more deserving array of miners and workmen, more than equal to the demand, ever waited upon the opportunity to do the work which may be demanded. So that all is ready. We have the coal, and all the men and means necessary for its production. The improvement in the market is what is looked for, and I believe the well informed on that subject give good encouragement that the

expected and needed improvement is within a short time of realization. That it may be so is the earnest desire of myself and the many other well-wishers of our mining community.

I now proceed to remark upon the several collieries, as usual, first, however, drawing your attention to the near approach of the total output for 1893, to that of what was regarded as a phenomenally productive year, viz., 1891, which attained to upwards of a million tons; and also have to point to the total of the exports for 1893, amounting to very little short of those of the same extraordinary year of trade, and trust that the volumes of output and export now attained may become normal, with a tendency to increase.

THE NANAIMO COLLIERY.

No. 1 Shaft, Esplanade, in Nanaimo.

The No. 1 pit, situated on the Esplanade in the City of Nanaimo, is the most extensive coal mine in this district (if not in the Dominion of Canada), and belongs to the New Vancouver Coal Mining & Land Company, Limited. This mine has now been proved to be a most valuable mining property, and at present no limited estimate can be formed of the extent of the coal that may be yet won from this shaft.

As I have mentioned in previous reports, this shaft is 650 feet deep, with a level driven to the north, known as No. 1 north level; and about 50 yards in this level there is a slope driven in an easterly direction for about 1,000 yards. At about 600 yards down the slope, the No. 3 north level branches off. All the workings of these two levels are under the water of Nanaimo Harbour, except the workings at the back end of No. 1 level, which is now working under Protection (or Douglas) Island. The workings of this mine are dry, but not dusty. They are quite safe from any influx of water as there is a thickness of from 500 to 700 feet of débris and hard rock between the bottom of the harbour and the workings of the mine. All the workings are on the pillar and stall system, leaving large pillars of coal.

The workings of No. 1 north level extend (as mentioned above) under Nanaimo Harbour and Protection Island, and the level is, with its windings, 4,000 yards to the face from the shaft bottom, being the longest underground hauling road in this district. For the long stretch of about two miles, the coal has been very good, varying in thickness from 5 to 10 feet, except in some small spots. At the face the roof is generally good. All the mining from the level is to the west side other than a slope (referred to in a previous report) to connect with the Protection Island shaft, which was done on January 22nd, 1893, the coal on the east side being to the dip, and this coal is left to be worked from No. 3 north level and Protection Island shaft, where they are now working.

No. 3 north level, branching from the main slope, is now in one and a half ($1\frac{1}{2}$) miles from the slope, where it connects with Protection Island shaft workings in a slope from about 100 yards south of the shaft going east. There are 22 stalls working from this No. 3 level going towards No. 1. The coal is very excellent in quality and varies from 6 to 10 feet in thickness without any plies of rock. All this working will terminate at No. 1 level. Here, in No. 3, the same as at No. 1 level, it is all solid to the east side, but at present they are putting two slopes into the solid coal, one of them about half way in No. 3 level, where the coal is 6 feet thick. The other slope is at the place where they connected with Protection Island shaft works. At this place the coal is also 6 feet thick, so that there are splendid prospects for coal to the east side, and quality and appearance keep good. Ventilation is amply sufficient. The mine is now ventilated from Protection Island shaft, on the separate split system, there being three main divisions, near to the bottom of the shaft. One goes to the face and inside panel of No. 1 level. There were 19,500 cubic feet of air passing in for the use of 20 men. To the outer panel there were 24,000 cubic feet of air travelling along for 34 men. Then there were 56,000 cubic feet going to No. 3 level. This was split, part going to 20 men and part going to stalls already mentioned, where there are 60 men at work. The total of 99,500 cubic feet of air passing per minute for the use of 134 men, not however including the men employed about the shaft, as they get their ventilation from No. 1 shaft. Neither are the mules counted; but you will see that there is sufficient air passing through the workings for all purposes.

The motive power to keep this large volume of air constantly in motion, is a large Guibal fan, erected on the surface near the No. 2 shaft, being the up-cast shaft near the No. 1 shaft. The fan is 36 feet in diameter, by 12 feet wide, and gives the above result from Protection

Island shaft, not including what goes down No. 1 shaft, which latter I never found less than 32,000 feet per minute. All this air is kept in motion with 40 revolutions per minute, water gauge $1\frac{5}{10}$ inches. And if required this fan can be worked with safety up to nearly double what it is now working at.

In the levels mentioned, the New Vancouver Coal Company has been hauling the coal out by electricity, which has been found to be a success. The Edison General Electric Company supplied and fitted up the whole of the plant. The dynamos are fixed on the surface and driven by a steam engine built for that special purpose, about 100 feet from No. 1 shaft, occupying a fine building or power-house. From the dynamos the electric current passes to and through all the different instruments to protect the plant against accident, and everything that it is possible to work insulated is covered to protect against accident to any person that may be passing the wires, which are strung up in No. 1 level for two miles, this being the distance that the electric locomotive goes. In No. 3 level the locomotive goes fully one mile from the slope, or about one and one-half miles from the shaft. The usual rate is about 6 to 8 miles an hour, taking along, generally, about 40 tons at a time. There are four electric locomotives, three of them are eight tons each and of 30-horse power, these three are at work, one in No. 1 and two of them working in No. 3 level, the smallest one, of 15-horse power, is on top. All the locomotives work very well, and so far as the New Vancouver Coal Company are concerned they are now a success. In addition to the hauling of the coal by electricity, the bottom of the shaft and the siding is all lighted by the electric spark.

I have not said anything about the machinery used here, as I have described it in former reports; but I may mention that the company's large coal washing machinery, both at this mine and at Northfield Wharf, which can wash some hundreds of tons of dross (slack or small coal) per day, if kept at work. The company are making preparation for the construction of capacious bunkers at the wharves for holding coal. The bunkers will be built so that the coal will run from them into the vessel's hold.

No. 1 and No. 2, Southfield Mines, Nanaimo Colliery.

Those once great producing mines of the New Vancouver Coal Company are now of the past, as they were stopped early in the spring, machinery, pumps, cars and rails, all being taken out and away, as they had got all the coal out that was convenient for mining.

No. 3 Pit (Chase River) Nanaimo Colliery.

This mine has been a most valuable property for the New Vancouver Coal Company, and also for the men about Nanaimo, producing some of the best coal that has been taken away from Nanaimo. They have been working part of the past year knowing that they had only a limited quantity of coal in sight, and that comprised in the pillars (coal). This mine (I am sorry to say) is also stopped, without any hope of ever starting again.

No. 5 Shaft, Southfield.

This mine also belongs to the New Vancouver Coal Mining and Land Company, Limited. The shaft is to the dip of No. 2 and No. 4 (Southfield) mines, and is connected with the latter.

In this mine they have been much troubled with faults of one kind and another, of which they do not seem to have got clear of yet, although it is much improved of late. In some places they will have the coal about 24 feet thick, and in other places quite thin, and not so hard and solid as the coal generally is. There is plenty of coal to make a good average thickness of seam, but in places it has got badly mixed with dirt, which makes it difficult to keep the coal clean. As I have said, it is much improved, and as soon as they get clear of this disturbance I expect that there will be a good seam of coal, which their perseverance deserves.

Ventilation: I found when there, on the 11th December, that there was passing into the west side and east level 21,175 cubic feet of air per minute for the use of 52 men and 3 mules; and to the east drift 19,110 cubic feet of air passing per minute for the use of 32 men and 4 mules, being a total of 40,285 feet of air travelling per minute for 84 men and 7 mules. Here the motive power for ventilating is a fan, worked by a steam engine, the shaft being partitioned off so that one side is the intake and the other the up-cast, at the same time they have an out-let by No. 4 slope. Everything about the shaft, such as machinery and head-gear, is got up in a workmanlike manner. I hope that there will be something good to be said about the coal from this mine soon.

PROTECTION ISLAND SHAFT, NANAIMO COLLIERY.

This is also the property of the New Vancouver Coal Company, and the shaft is situated at the south point of Protection Island. This shaft is the deepest in the district; to the lower, or what is called the Newcastle seam, it is 740 feet, with sump 750 feet.

The upper coal is a continuation of the Douglas seam from No. 1 Shaft, and is now connected both with No. 1 and No. 3 levels.

In No. 1 level they went through on a slope that had been put down 300 yards in good coal; and to get communication with No. 3 level they had to put down a slope from this shaft 200 yards, this being all good coal for the above distance. This slope is now down from the shaft to the east 500 yards in good coal for that distance, most of it being 6 feet thick. This slope branches off the south, about 100 yards from the shaft. There is another slope from the level on the north side, going north-east, which is now down 250 yards. This is also in good coal, but only 3½ feet thick, good and hard. This is going to be the great highway to the coal underlying the north-east side of Protection Island, Northumberland Channel, and the Gulf of Georgia, and may yet have a connection with Gabriola Island. This may seem a long way off, but a few years ago the same might have been said about Protection Island, from No. 1 Shaft. Now, however, we can walk to Douglas (or Protection) Island, and before long we may be able to walk from Nanaimo to Gabriola Island, as there is no reason to doubt that the coal extends to the latter island, which is only two miles away.

The area of coal opened out here is very large. There are places enough to put on over 100 miners to work. All these places have been at a stand since the 1st September; but I hope to see this extensive mine in operation again soon.

Protection Island Lower (Newcastle) seam of coal is 62 feet below the Douglas seam. They have done a considerable amount of mining, principally in the way of exploring to find out as to its regularity. The chief opening is by a slope to the east. This is down 350 yards in good coal for all that distance, and from 3½ to 4 feet thick, of a good quality and is very hard. There were two levels started, but only got in a short distance when they suspended work for a time. The seam kept getting easier to work as they went down, having a strong rock roof. Everything about the top is fitted up in first-class style. Large double hoisting-engine; pit head gear; bunkers; in fact, all appliances that are necessary for the handling of a large output of coal; and to complete the whole, the Company has built a large wharf, about 400 feet from the shaft, where they can load the largest ships that come to the harbour. On February 28th the steamboat "Monserrat" took on 300 tons of coal here; and on March 9th the ship "General Fairchild" tied up to the wharf for the first full cargo of coal from this mine; and the outlook is, that for many years to come ships will be supplied with cargoes from the Protection Mine and wharf.

NORTHFIELD MINE.

This mine, belonging to the New Vancouver Coal Mining and Land Company, Limited, is entered by a shaft, as are now all the mines of this Colliery. The workings are from the north and south sides, by a level on south, and by a slope on north side. In this mine the coal is worked on the longwall system; the coal averaging not more than 2 feet 4 inches in thickness, but of very good quality and very hard, so that it stands handling well, and commands the highest price both in Victoria and the California market, and any other place where it has been introduced as a household coal; but owing to the thinness of the seam and the loose nature of the roof, it makes it very expensive coal for the Company to produce.

Ventilation is good, and on the separate split system. The first or main division being at the bottom of the shaft to the north and south side. On the north side the air goes down the slope, where it is again split, this time to the north and south sides of the slope; and as all the workings are on the longwall system, the air going down the slope returns by way of the coal face when the mine is at work, and what air escapes at the different levels on the slope is caught up at the face. When I was at the mine on December 19th, I found that there was a volume of 36,720 cubic feet of air passing per minute in the north side for the use of 60 men, and on the south side there was 19,900 feet per minute going in the south level; this was for the use of 30 men—making a total of 56,620 cubic feet for 90 men. At times there is a great deal of blasting, which makes it quite thick with powder smoke, but this is soon carried away.

There is very little gas found now in any of the mines of the Nanaimo Colliery, and they are also free from coal dust.

HAREWOOD ESTATE.

There has been quite an extensive work of prospecting done in this estate, by boring and tunnelling, but so far the Company has not been very successful in developing a merchantable coal seam.

NORTHFIELD ESTATE.

Diamond Drilling.

The New Vancouver Coal Company has put down two bore holes to the coal in the Northfield Estate, to the north of the shaft, and the coal proved to be of its usual hardness, but not quite so thick as they would like it to have been.

WELLINGTON COLLIERY.

No. 1. PIT.

This is the shaft mentioned in a previons report as near to Departure Bay. In this shaft the owners (Messrs. Dunsmuir & Sons) were having work done at one of the upper seams of coal, in connection with two thick beds of fire clay. They have only worked a short time here during the past year. At present there is nothing being done ; the shaft is nearly filled with water, so that this place is in reserve for some future operations.

No. 3 PIT, WELLINGTON COLLIERY.

There has not been any mining done here in the past year, pumping having been done all the time in connection with No. 4 Pit. There is yet a large quantity of coal to be got from this mine.

No. 4 PIT, WELLINGTON COLLIERY.

This is the pit of Messrs. Dunsmuir & Sons reported by me as having to be filled with water owing to a fire in the old work, and at the time the report (for 1892) was got out it was filled with water for 107 feet up the shaft. After standing for some months, the Fan, or up-cast shaft, was opened, and a party went down to explore, of which I was one. Mr. Bryden, manager, wanted to see where the water had got up to before he would commence to get it out. When the manager had ascertained the distance reached by the water he was satisfied that all the workings in the mine, except the small space at the Fan shaft, were filled with water. Now having all things in order, they started the pumps, both No. 3 and No. 4, to work, about April 20th, and by the beginning of September they were able to get to the bottom of No. 4, but there was yet much water to be got out of the lower workings, and this is yet being pumped out by the No. 3 Pit. When everything was got dry about the shaft they started to clean up and put things in order, there being a large settlement of mud in all parts of the mine, together with caves from the roof caused by the giving way of timbers. At the end of the past year they had got quite a number of men at work sending out coal ; it will, however, be some time yet before the mine will be in the same condition as it was before they turned the water from the Millstone River into No. 3 Pit. I may say here that they had much to contend with, for in most instances the airway was blocked, so that the greatest care and caution had to be used clearing up as they went along, making it secure against falls of rock and against gas. Now that it is opened and giving work to a great many men, who were idle, waiting on work that they have now got. This was and is now a valuable coal mine.

No. 5 PIT, WELLINGTON COLLIERY.

This still continues to be the only mine of Messrs. Dunsmuir & Sons that has connection by railway with the Esquimalt & Nanaimo Railway, and thus directly in communication with Victoria. Here the cars of the railway company are run under the shutes at the mine, get filled with coal, which is carried to Victoria without once being handled, saving all the breakage that takes place every time that coal has to be lifted. At this mine the railway company's locomotives get their fuel. The railway system of Messrs. Dunsmuir & Sons is also connected from this mine to their shipping wharves at Departure Bay.

No. 5 Pit is the greatest producing mine in the Wellington Colliery. The coal is brought to the bottom of the shaft from the west side by a self-acting incline; from the east level and east slant, on the tail-rope system of haulage. This is 1,100 yards long, and is near the boundary of Northfield (Nanaimo Colliery). This coal is very good and hard, from 3 to 10 feet thick. All down this section is worked by way of pillar and stall, leaving about two-thirds of the coal in the pillars, which are taken out after the stalls are finished. Close to the bottom of the shaft there is the slope, the general bearing of the workings of this is to the east, towards the No. 1 Shaft, near Departure Bay. The coal this way is very good and hard, for which a ready sale is found even in these dull times for all that can be got out. The coal is hauled from the lower works here to the bottom of the slope by compressed air, on the tail-rope system of haulage, which—that on the east level and on this—works well. All the mining down here is now done on the pillar and stall system. All the mining in the south side, or west incline, is at the pillars (of coal).

Ventilation is good; motive power, a Guibal fan, worked by steam engine. There are 109,000 cubic feet of air per minute for the use of 200 men and 20 mules, distributed on the separate split system as follows: In No. 1 and No. 2 side-slopes there were 33,000 feet of air passing per minute for 57 men and 3 mules, and it is in this division where the haulage is done by tail-rope and compressed air. There is also working here a triple electric pump. In what is known as the longwall split, 8,000 feet are passing per minute for 12 men and a mule. In the new diagonal slope division 32,000 feet pass per minute for 58 men and 8 mules.

In No. 2 slant, 21,000 feet of air passed per minute for 38 men and 4 mules, and in the west incline 15,000 feet of air was passing per minute for 22 men and 4 mules, the other 13 men being engaged about the shaft bottom, engine, and slope in the general airway. There is now very little gas found in this mine. Occasionally gas is found in caves from the roof, and sometimes in a stall. This mine is free from dust.

In addition to the manager, there are the overman, fireman, and a staff of shot-lighters to each district in the mine, moving round from one place to another, so that the smallest change in any part of their particular district, or anything going wrong in the airway, is sure to be found out soon by someone, when it would be reported to the proper authority.

This Pit is also connected by a travelling road with No. 6 Pit, with hand boards showing the way.

Here, as in No. 1 Shaft of Nanaimo Colliery, the bottom of the pit and round about it is lighted by electricity. This mode of lighting, and the use of electric power for coal cutting, pumping, and for locomotives in hauling coal underground, is now becoming quite an important factor in the use of machinery in our mines.

No. 6 Pit, Wellington Colliery.

This pit, owned by Messrs. Dunsmuir & Sons, is mentioned in a previous report as being 900 yards from No. 4 Pit, but the workings are only separated by a narrow strip of solid coal of about 40 yards thick, which is known as the barrier between the two mines. It was put to a severe test by the filling of the workings of No. 4 Pit with water to about 107 feet up the pit, yet with all that pressure it did not show any appearance of leakage, after standing that way for months. This mine (No. 6) is connected with No. 5 Pit, but only in one place, and this place is fixed so that it could be blocked as to be able to stand a great pressure. This is done in order, in case of accident to either of the two mines, that it may serve the same purpose as the barrier served between Nos. 4 and 5 and Nos. 4 and 6 Pits.

This No. 6 Pit is quite an extensive mine. Most of the mining being done is to the east, and in a northerly direction towards the workings of No. 5 Pit. In this mine, as in all the mines of the Wellington Colliery, the coal is hard, of good quality, and greatly in demand in the California market. There has been much of the coal worked here on the longwall system during the past year, but now it is all worked on the pillar and stall system, and at the pillars (of coal). The roof is much stronger than in most of the mines of this colliery, and therefore the pillars of coal can be taken out to better advantage.

Ventilation is good; the motive power is a fan on the Murphy principle, worked by a steam engine. When I was down, on the 21st December, there was a volume of 46,000 cubic feet of air passing per minute for the use of 145 men and 17 mules. The mine is ventilated on the separate split system, as follows:—

To east level there is 23,000 cubic feet of air passing per minute; this is for 70 men, but it is again split, part of it going to what is known as the swamp, where there are 15 of the

above-mentioned men employed. In east incline, 15,000 feet of air pass per minute for 60 men and 10 mules, and on the west side 8,000 feet of air pass per minute for 15 men. The air is well conducted into the face by brattice or otherwise. Although this pit is connected with No. 5 Pit, it is independent of it so far as ventilation is concerned, there being a close partition in this shaft, one side being the intake and the other the upcast for ventilation purposes. This pit is also free from dust.

No. 2 Slope, and Alexandra Mine.

There has not been any work done at the No. 2 Slope, nor yet at the Alexandra Mine, during the past year. Both these mines belong to Messrs. Dunsmuir & Sons.

Prospecting.

Messrs. Dunsmuir & Sons have been successful with two bore holes between No. 1 Pit and the workings of No. 5 Pit, which prove that the coal extends between the two mines.

EAST WELLINGTON COLLIERY.

This mine is owned by a company in San Francisco, and gave employment to quite a number of men, while at work, having worked most of the time from January to October, and put out about 28,000 tons of coal. In all likelihood they might have worked away for years to come; but the coal being thin, there was considerable expense incurred in getting it out, and the company had to compete with all the coal producers that sent their coal to San Francisco market, where low prices prevailed. The company, seeing that they were losing money with no prospect of the mine ever paying it back, in order to make both ends meet, suggested a reduction to the miners, so that coal could be produced cheaper, but this the workmen would not entertain. The company then gave orders to the manager to have the mine cars, rails, pumps and everything that could be taken away, brought to the surface, and, this being done, the machinery was stopped and the mine allowed to fill with water, with no prospects of the same pits ever being opened again.

UNION COLLIERY, COMOX.

This colliery is the property of the Union Colliery Company. The coal mined here is a first-class article, makes a good coke, which gives satisfaction and is also highly spoken of by those who have and are now using the coke in San Francisco. The coal from the Union Colliery is used by Her Majesty's war ships. The naval officers and engineers report the coal as being equal to any that comes to Esquimalt from Cardiff, in Wales. It is also much used by the U. S. gunboats, which says a great deal for it. There has been some idle time about this colliery during the past year, several of the mines not having been opened for the twelve months, but the company are now getting them in order to resume work at all the mines.

No. 1 Shaft, Union Colliery.

In this mine there has not been any work, but they are now getting it clear of water to continue operations in mining the coal.

No. 1 Slope, Union Colliery.

This is now the most extensive mine of this colliery. As in the other mines, there has been idle time here; but they kept driving the slope ahead so that its length from the entrance, under cover, is now 4,300 feet (with 700 feet further to where the engine stands), making it the longest slope in the district, with good hard workable coal the entire distance that the slope is down, and at the bottom there is no falling off, as the coal looks as well, and if anything, is better as it goes down. In the first 400 yards of the slope it is so flat that they have to haul out the coal by the tail rope system, but after that distance there is a nice easy grade enabling the empty cars to take the rope down, and of course the engine can haul it up, and when it gets the cars to the flat it is again hooked on.

From this slope, nine levels have been started to the east side, and as many to the west side. At present, owing to the slackness in the coal trade, they are only working Nos. 6, 7, 8, and 9 levels, on the east side, employing about 60 men on one shift, with coal averaging about five feet thick, although in most of the places it is much thicker and very hard. On the west side of this slope they are at present doing all their mining from Nos. 7, 8, and 9 levels. Here, as in the east side, the coal is very good but much thicker, employing 40 men on one shift; but if the coal trade demand it, they could almost find places for double that number on both sides of the slope. At present they are getting out about 800 tons of screened coal from this mine alone; and if trade should justify it they could, with No. 1 Shaft, No. 1 Slope, and this No. 4 Slope, under the present condition, almost put out 2,000 tons of marketable coal per day.

Ventilation is good. Motive power is a Guibal Fan, which running slow passes 50,000 cubic feet of air per minute. On the east side there was 10,000 feet going down to the end of the brattice on the slope; this was increased as it went up at No. 9, 8, and 7 levels, where it had got to be 28,000 feet, and by the time it got to the upper level it was 32,000 feet. This was for 60 men and 9 mules. On the west side of slope, where they are working from Nos. 7, 8, and 9 levels, this No. 9 level has only got in a short distance; the air is increased 9,000 feet at No. 8 level, and at No. 7, until the whole volume this side is 18,000 feet per minute for 40 men and 7 mules. This seems a large quantity of air for 100 men and 16 mules, and it would be if there were no powder used, but the quantity of powder used here is very great, being nearly a pound to every ton of coal delivered on the top. It should not be so, but when they blast the coal without the shot being properly prepared they have to powder it accordingly. The manager has now working some cure to this extravagance in using powder, by instructing the shot-lighter not to let a shot be fired without he thinks that the coal is reasonably prepared. This is quite a relief to those who mine their coal properly, as there is much less smoke coming past them.

All things about this mine are got up on the best plan for labour saving and putting coal in the market in good condition, clear of rock, and well screened. In addition to their large hoisting engine and machinery, there is a coal washing machine of great capacity, from Shepherd, of Cardiff, in operation. This is of the most recent improvement for cleaning and saving fine coal. This fine coal is what they have been making the coke, which is so celebrated that they can sell all that they can produce.

NOS. 1 AND 2 TUNNELS, UNION COLLIERY.

These tunnels, or adit levels, described by me in previous reports, have been at a stand still the most of the year; and some months ago the Company had all the rails taken out of them, and they are now stopped, although there is plenty of coal, but the other mines can supply the present demand. As the roof is very strong, and the water can run out, the mine will not go much wrong by standing until they want to resume work here.

TUMBO ISLAND COAL MINING COMPANY.

This company has been doing considerable work during the past year at the island, principally in sinking the shaft, which was down at this time last year to the depth of 114 feet, but since that time there have been delays that are not counted upon by those inexperienced in mining. Here they have had stoppages in many ways, the greatest drawback has been that they had too much water for the machinery in use. They worked up to 28th August, when the depth of 245 feet was reached. At this point the water exceeded the power of the appliances for taking it out, and since then there has not been any work done in the bottom, and they are yet fully 100 feet from the coal. At the bottom where they left off they were in dark shale, and the rock will be soft until the coal is reached, but before they can resume operations in the shaft new appliances for raising the water must be placed in position, powerful enough to keep the shaft clear of water so that the miners may be able to work. If they had the proper machinery it would take only a comparatively short time to win the coal.

The company have on the ground at the shaft, one stationary engine, four steam pumps, also an air compressor, and when working there were 21 white men employed.

It is desirable that operations may be started again at this promising coal-field. There is a fine prospect here for any company having a colliery here, getting out good coal, the location being right on the water-way between Victoria and Vancouver, as well as on the way of the C.P.R. ships to and from China and Australia. The ships could go up alongside and take on their fuel.

THE NICOLA VALLEY RAILWAY COMPANY.

It has been a known fact for a long time that there was coal underlying the Nicola Valley. It could be seen cropping out on the bank of the Coldwater River, pitching into the valley, but to what extent no one cared to find out as it was too far to take it to market. Now that the Canadian Pacific Railway is built, and going past about 40 miles from the crop-out of coal, the market is brought thus nearer. And the construction of this 40 miles of railway would provide a market for the coal; but only a wealthy company could undertake the venture of building such railway, and carry on the needful work of proving the extent and value of the coal-field, and open and develop the coal mine during the construction of the railway.

The Nicola Valley Railway Company having secured from the settlers of the valley all their coal rights, with the addition of legislative right of way, attention was turned to the exploration of the coal. A diamond drilling machine was employed in boring at a spot, about half a mile to the dip of the crop-out, and here the coal was struck at the depth of 190 feet, and proved to be 5 feet 7 inches thick. The hole was continued to the depth of 600 feet. Several other smaller seams were gone through before gaining that distance, and when the hole was stopped they were still in the productive coal measures. All the coal gone through, as well as what is seen at the crop-out, is very hard, and those who have tested it report it to be of a superior quality.

The drilling machine was then removed and another hole was put down two miles further up the valley than the previous bore. At the depth of 137 feet from the surface coal was struck, 5 feet 6 inches thick. The hole was continued to the depth of 562 feet, having gone through some smaller seams of coal, thus proving that the valley has underlying it a large deposit of superior coal. This mining property seems to have fallen into the right hands for its development and use. The company has called for tenders for the construction of the railway, connecting with the C.P.R. at Spence's Bridge. In Nicola Valley it may be safely predicted that a large colliery may be established in the near future, the prospects for being so good.

THE KAMLOOPS COAL COMPANY, LIMITED.

This enterprising coal company did considerable work in and about their mine on the North Thompson River, during last winter and spring. A quantity of coal was taken out for consumption in Kamloops, in order to thoroughly test the quality of it. About 250 tons were taken into Kamloops, and it is used there exclusively for domestic purposes, except where hard coal is required. The mine is not now in operation.

ACCIDENTS

IN AND ABOUT THE COAL MINES, FOR THE YEAR ENDING 31ST DECEMBER, 1893.

January 9—Thomas Patterson, miner, was slightly burnt about the head and face by gas, while at work in No. 5 Pit, Nanaimo Colliery.

" 13—John McMillan, shotlighter in No. 5 Pit, Wellington Colliery, was killed by a fall of rock while at work.

" 16—John McLeod, miner, in No. 5 Pit, was slightly burnt about the hands by gas while at work in his stall.

" 28—John Inglis, pusher, in No. 5 Wellington Colliery, got his arm broken by a timber while pushing a mine car.

" 19—Morrison and Harris were killed by a boiler explosion at Tumbo Island, while at work for Tumbo Island Coal Company.

February 11—A Chinaman, No. 4 Pit, banksman, was killed by the cage at Protection Island Shaft.
" 22—Samuel Sutton, bellman, on No. 4 Slope, Union Colliery, got his shoulder broken and otherwise bruised by cars on the slope.
March 1—Michael Bradley, miner, working in No. 6 Pit, Wellington Colliery, was killed by a fall of rock while at work.
" 11—William Bowater, fireman, in No. 2 Pit, East Wellington Colliery, was injured by a fall of rock.
" 18—George E. Bell, miner, in No. 6 Pit, Wellington Colliery, was killed by a fall of coal while at work in his stall.
" 31—Charles Anderson, runner, in No. 5 Shaft, Nanaimo Colliery, was hurt about the hips by coal falling on him while waiting on a car.
April 13—Dong, mule driver, was burnt about the face and hands by gas, in No. 4 Slope, Union Colliery.
" 20—Neil McCuish, miner, was hurt about the head by a fall of coal while at work in his stall, in No. 5 Pit, Nanaimo Colliery.
" 22—William Gleason, miner, was slightly injured by a fall of rock, while at work in No. 4 Slope, Union Colliery.
" 28—Ah Coon, labourer, in No. 4 Slope, Union Colliery, was killed by mine cars, on the slope.
" 29—Albert Reigley, runner, in No. 6 Pit, Wellington, got one of his legs broken by a mine car, while at work.
" 29—Frank Machin, mule driver, in No. 5 Pit, Nanaimo Colliery, was hurt about the back by a fall of coal.
May 1—D. T. Richards, runner, in No. 3 Pit, Nanaimo Colliery, had one of his legs broken by a fall of coal in a stall.
" 1—Thomas L. Williams, track-layer, in No. 5 Pit, Wellington Colliery, had his arm and shoulder bruised by a mine car.
" 8—John Sop, miner, working in No. 5 Pit, Wellington Colliery, got slightly burnt about the face by powder.
" 18—Samuel Woodburn, miner, in No. 3 Pit, Nanaimo Colliery, was killed by a fall of coal while at work in his stall.
" 21—John B. L. Jones, overman, in No. 5 Pit, Wellington Colliery, was killed by a shot, blowing through to another stall.
June 10—B. Gerard, miner, in Northfield mine, Nanaimo Colliery, had one of his legs broken by a fall of rock while at work in his stall.
" 20—G. T. Pierce, miner, working in Protection Island Shaft, Nanaimo Colliery, was hurt about the back by a fall of rock, while at work in his stall.
" 21—Thomas John Thomas, trapper, in No. 5 Pit, Wellington Colliery, was injured on the face by a kick from a mule.
" 22—Ah Hinn, labourer, while cleaning the boiler tubes at No. 1 Shaft, Nanaimo Colliery, got burnt about the arms and body by hot dust.
" 27—Henry Mohalage, pusher, in No. 5 Pit, Wellington Colliery, was squeezed by a mine car when riding on the same.
July 10—John Haigh, miner, in No. 6 Pit, Wellington Colliery, got two of his ribs broken by a fall of rock.
" 14—John Teague, timber-man, in No. 1 Shaft, Nanaimo Colliery, got his leg broken by some loose rock that he was taking down.
" 15—Samuel Sutton, runner in No. 5 Shaft, had his collar broken by being crushed against the coal by a mine car, while at work.
" 18—Robert Johnson, miner, in No. 6 Pit, Wellington Colliery, had his leg broken by a piece of rock falling on him while at work in his stall.
" 28—J. V. Nicholls, miner, in No. 4 slope, Union Colliery, was slightly burnt about the neck by gas, while at work in his stall.
" 29—Yee Can, brattice-man, in No. 4 Slope, Union Colliery, was slightly burnt about the face, hands, and neck by gas while putting up brattice.
August 2—Henry Kaslin, miner, working in No. 6 Pit, Wellington Colliery, got one finger and thumb injured by a roburite cap.

August 10—J. Peredon, and Ah Kee, working in No. 4 Slope, Union Colliery, were slightly burnt about the face and hands. They had fired a shot and went back to the face with the above result.
" 15—James Snowden, miner, in No. 5 Shaft, Nanaimo Colliery, had one of his legs broken by a fall of rock while at work in his stall.
" 18—The above James Snowden died this day.
" 18—John Gray, road-man, in No. 1 Shaft, Nanaimo Colliery, had his ankle broken by getting jammed by a mine car.
September 1—Domenic Penilla, miner, in No. 4 Slope, Union Colliery, was slightly injured by a fall of coal while at work in his stall.
" 16—Robert Smith, miner, in No. 5 Pit, Wellington Colliery, was slightly burnt about the hands and face by powder, while charging a shot
" 29—George Brower, miner, working in No. 6 Pit, Wellington Colliery, was killed by a fall of rock while at work in his stall.
October 3—Mike Le Fevre, miner, was slightly hurt by a fall of coal while at work in his stall, in No. 2 Shaft, East Wellington Colliery.
" 4—David R. Davis, mule-driver, in No. Pit, East Wellington Colliery, was killed by a fall of rock while at work.
" 6—David Thomas, miner, working in No. 4 Slope, Union Colliery, was killed by a fall of rock while at work in his stall.
" 13—J. Thew, miner, working in No. 4 Slope, Union Colliery, was killed by a fall of coal, while at work in his stall.
" 25—Peter Bermadello, miner, working at No. 6 Pit, Wellington Colliery, got one of his legs broken by a fall of coal, while at work in his stall.
" 31—Robert Gibson, miner, in No. 4 Slope, Union Colliery, was killed by a fall of coal, while at work in his stall.
November 1—John Adams, mule-driver, in No. 6 Pit, Wellington Colliery, got his leg badly bruised by a run-away car in the mine.
" 18—Ben Lombart, miner, in No. 5 Pit, Wellington Colliery, was killed by a fall of coal, while at work in his stall.
" 22—John Davie, miner, working in No. 1 Shaft, Nanaimo Colliery, had both his legs broken by a fall of coal, while at work in his stall.
December 4—Alexander Dunsmore, mule-driver, Northfield, had one ankle dislocated by getting jammed by cars in the mine.
" 5—F. Pirattzi, miner, working in No. 3 Shaft, Nanaimo Colliery, was hurt about the body by a fall of coal, while at work in his stall.
" 15—Fred Alphonse, miner, in Northfield, Nanaimo Colliery, had one of his legs broken by a fall of rock.

It is with sincere regret that I have again at the close of another year to make out the above long list of accidents, both serious and fatal. The number, as a whole, is about the same as in the previous year. Many of those reported as serious, turned out to be very slight, while some of them were very severely injured.

In the above list you will observe that there have been 53 accidents reported, of those 37 were of a serious nature, and 16 were fatal accidents. Of the 37 accidents, eight occurred by falls of coal, seven by rock, ten by mine cars, seven by gas, two by powder, one by a kick from a mule, one by flue dust, and one by a roburite cap.

The fatal accidents, 16 in number, were in five instances caused by falls of coal, six by falls of rock, one by mine cars, one by a shot, one by the cage in a shaft, and two by an explosion from the bursting of a boiler.

I have enquired into the circumstances and cause of all the accidents, in many instances getting to the scene of the accident before I got written notice, which generally is sent by mail. When any person gets hurt in the mines the news starts at once, but the mail abides its regular time.

These remarks do not apply to cases of fatal accident, as in such cases a messenger is dispatched at once, so that I may be at the mine as soon as possible, and before anything is disturbed except what may be necessary for the relief of the injured.

With respect to the fatal accidents, in those cases where there was a public enquiry held and evidence taken at inquests, I have always been present, with the exception of one occasion,

where the inquest was held at Victoria on the bodies of those killed on 29th January, on Tumbo Island.

As all the evidence taken at the inquisitions is filed in the Attorney-General's Department, I beg leave to refer to the same for full details.

On examining the list of accidents you will perceive that nearly all the casualties happened when the men were at work. You will also see that with the exception of the accident at Tumbo Island and another where two were slightly burnt, the persons injured were single in their misfortune.

Considering the large extent of the mines in this district and the numerous employés, the fact that only seven persons, some of them very slightly, were burnt by gas, speaks volumes for the excellency of the ventilation of the mines, and is at the same time evidence of the carefulness of the miners in this respect. The accidents from the falling of rock and coal, and those caused by cars in the mine, ought to be greatly diminished. More care should be taken in spragging of the coal, and more promptness in the propping of the roof. I know the risks that are sometimes taken, just to do something, at times when the workman so doing is well aware that his action is unsafe. This is too often a sad mistake, and is the cause of too many accidents that might be avoided, by the workman himself. It is to be hoped that far more caution will be used, so that the casualties may be confined to those which are regrettably unavoidable, owing to the hazardous nature of the miner's avocation.

In addition to the miners and other workmen looking after their safety, there are the manager, overman, fireman, shot-lighter, and other persons having authority, on the move from one part of the mine to another, never being long in one place, excepting something wrong has required their presence to superintend, so that with due care exercised there should be fewer accidents. This I am constantly urging, and doing all in my power to bring about.

All the old waste places and works that can be got at are examined frequently, to search for any accumulations of gas.

There is one class of accidents, viz., those caused by the mine cars, which runs up the list of the past year. As in the mining by the miner, the pusher (or runner), in order to get ahead with his work, sometimes omits to sprag a car when it ought to have been done, and so incurs great risk of injury; this is a matter that I have often pointed out for attention, and is one for the runner's own personal benefit and safety, as the slightest mishap to the cars is liable to lead to serious accident.

In the Nanaimo Colliery a deputation from the men, in each of the mines, is appointed to examine the works periodically, and the result of such examination is posted up in a conspicuous place, so that all the workmen may know the condition of the mine. There is also a record book of the reports of the examiners kept by the Company. The examination is generally made once a month. The miners in the other Collieries do not avail themselves of the privilege of examination of the mines, which it would be so useful for them to do.

If all precaution within our command is exercised, by both officials and workmen, particularly where accidents are likely to happen, we shall experience the best result, by having fewer casualties and less suffering.

My remarks apply alike to all, from the Manager that conducts the mine to the boy that opens and shuts the door that keeps the air travelling in its proper course.

As Inspector, I am always ready to attend to anything or any matter that may be brought to my notice by any person who may think that there is a cause for complaint.

I append the annual Colliery Returns.

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

COLLIERY RETURNS.

NANAIMO COLLIERY RETURNS FOR 1893.

Output of coal for 12 months ending December 31st, 1893.		No. of tons sold for home consumption.		No. of tons sold for exportation.		No. of tons on hand 1st January, 1893.		No. of tons unsold, including coal in stock, Jan. 1st, 1894.	
Tons.	cwt.	Tons.	cwt.	Tons.	cwt.	Tons.	cwt.	Tons.	cwt.
469,311	15	129,502	1	339,076	14	4,617	15	6,501	15

Number of hands employed.				Wages per day.			
Whites.	Boys.	Indians.	Chinese.	Whites.	Boys.	Indians.	Chinese.
1,064	58	.....	157	$2.37 to $3.50	$1 to $2	.....	$1 to $1.25

* Total hands employed	1,279	Miners' earnings, per day	$3 to $5.

* This is the number actually employed on Dec. 31st, 1893. We employed during the year as many as 1,800 at one time.—S.M.R.

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. 3, 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 pounds per yard of standard gauge, viz., 4 feet 8½ inches; 8 hauling and pumping engines, 15 steam pumps, 5 locomotives, 232 coal cars (6 tons), besides lumber and ballast cars; fitting shops for machinery repairs, with turning lathes, boring, drilling, planing, screw-cutting machines, hydraulic press, steam hammer, etc., etc.; diamond boring machinery for exploratory work (bores to 4,000 feet); 150 horse-power electric plant engines, plant, dynamo; 2 30 horse-power 8-ton locomotives; 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 1893.

Output of coal for 12 months ending December 31st, 1893.		No. of tons sold for home consumption.		No. of tons sold for exportation.		No. of tons on hand 1st January, 1893.		No. of tons unsold, including coal in stock, Jan. 1st, 1894.	
Tons.	cwt.	Tons.	cwt.	Tons.	cwt.	Tons.	cwt.	Tons.	cwt.
337,334	3	41,121	9	295,212	14	6,408	—	1,000	—

Number of hands employed.				Wages per day.			
Whites.	Boys.	Indians.	Chinese.	Whites.	Boys.	Indians.	Chinese.
830	66	.....	87	$2 to $3.50	$1 to $1.50	.....	$1 to $1.25
Total hands employed 983				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; 3 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, $642\frac{13}{20}$ tons.

R. DUNSMUIR & SONS.

EAST WELLINGTON COLLIERY RETURNS FOR 1893.

Output of coal for 12 months ending December 31st, 1893.		No. of tons sold for home consumption.		No. of tons sold for exportation.		No. of tons on hand 1st January, 1893.		No. of tons unsold, including coal in stock, Jan. 1st, 1894.	
Tons.	cwt.	Tons.	cwt.	Tons.	cwt.	Tons.	cwt.	Tons.	cwt.
27,472	—	7,500	—	20,272	—	300	—	—	—

Number of hands employed.				Wages per day.			
Whites.	Boys.	Indians.	Chinese.	Whites.	Boys.	Indians.	Chinese.
100	20	.....	20	$2.25 to $3	$1 to $2	.....	$1 to $1.37½
Total hands employed 140				Miners' earnings, per day ..... $3.			

Name of Seams or Pits—East Wellington, Nos. 1 and 2 Shafts.
Value of Plant—$80,000.
Description of seams, tunnels, levels, shafts, &c., and number of same—2 seams; lower or main seam 2½ to 7 feet thick, upper or small seam 2 feet thick; 2 shafts.
Description and length of tramway, plant, &c.—4½ miles standard narrow gauge; 2 locomotives, 31 (4½ ton) coal cars; 2 hoisting engines; 2 donkey engines; 1 fan engine; 9 steam pumps; 1 steam saw-mill, capacity 12,000 feet per day.

W. S. CHANDLER, *Superintendent.*

UNION COLLIERY RETURNS FOR 1893.

Output of coal for 12 months ending December 31st, 1893.		No. of tons sold for home consumption.		No. of tons sold for exportation.		No. of tons on hand 1st January, 1893.		No. of tons unsold, including coal in stock, Jan. 1st, 1894.	
Tons.	cwt.	Tons.	cwt.	Tons.	cwt.	Tons.	cwt.	Tons.	cwt.
143,927	—	29,478	—	114,356	—	11,450	—	11,543	—

Number of hands employed.				Wages per day.			
Whites.	Boys.	Japanese.	Chinese.	Whites.	Boys.	Japanese.	Chinese.
288	4	12	138	$2.50 to $3	$1	$1 to $1.25	$1 to $1.50
Total hands employed..... 442				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.
Description and length of tramway, plant, &c.—12 miles of 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.
Made 262 tons of coke; sold 250 tons.

JAMES DUNSMUIR,
President, Union Colliery Company.

KAMLOOPS, B.C., February 2nd, 1894.

Archibald Dick, Esq.,
Government Inspector of Mines, Nanaimo, B.C.,

DEAR SIR,—I am in receipt of your favour of recent date, enclosing form of colliery returns, but have very little information to give in addition to last year. During last winter and spring there was considerable work done in and about the mine, and a quantity of coal taken out for consumption in Kamloops in order to thoroughly test the quality of it. The quantity brought to Kamloops was about 250 tons, and is used exclusively for domestic purposes here, except where hard coal is required. The mine is not now in operation. I enclose herewith the form received.

Respectfully yours,
M. J. McIVER,
Secretary.

NORTH THOMPSON COLLIERY RETURNS.

Output of coal for 12 months ending December 31st, 1893.		No. of tons sold for home consumption.		No. of tons sold for exportation.		No. of tons on hand 1st January, 1893.		No. of tons unsold, including coal in stock, Jan. 1st, 1894.	
Tons.	cwt.	Tons.	cwt.	Tons.	cwt.	Tons.	cwt.	Tons.	cwt.
250	—	250	—	—	—	—	—	—	—

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