CONTENTS.

1916.

NEW ZEALAND.

MINES STATEMENT

BY THE HON. W. D. S. MacDONALD, MINISTER OF MINES.

Mr. SPEAKER,—

I have the honour to present to Parliament the Mines Statement for the year ended the 31st December, 1915.

Owing to the abnormal conditions caused by the war and the shortage of miners, due to enlistment for military service abroad, there has been a small but inevitable decrease in the value of our mineral-production, but this has caused no appreciable inconvenience to the industries or to the welfare of the Dominion, and it affords me gratification to inform you that the mining community has answered the call to arms in a manner not excelled by those employed in any other industry.

The value of mineral exported, together with that of the coal-output for 1915, amounted to £3,374,523, being an increase of £621,793 above that recorded for the previous year, which, however, does not represent the actual production during those years, the exportation of gold being prohibited by statute on the 5th August, 1914, and not resumed until the following year, when the accumulated supplies were exported. The returns from the mines show that the value of gold and silver produced during 1915 amounted to £1,348,489, as compared with £1,502,649 during the previous year, a decrease of £154,160. The output of coal amounted to 2,208,624 tons, as compared with 2,275,593 tons during 1914, which was the highest annual output yet attained in the Dominion.

MINERAL-PRODUCTION.

The following table shows the quantity and value of gold, silver, and other minerals, coal, and kauri-gum exported during the years 1914 and 1915, also the quantity of native coal consumed in the Dominion during the same periods:—

Product.	Year ending 31st December, 1914. Quantity.	Year ending 31st December, 1914. Value.	Year ending 31st December, 1915. Quantity.	Year ending 31st December, 1915. Value.
		£		£
Gold	227,954 oz.	895,367	422,825 oz.*	1,694,553*
Silver	599,162 "	62,085	957,541 " *	95,583*
Mixed minerals	5,395 tons	29,224	3,644 tons	33,161
New Zealand coal exported	302,908 "	282,163	323,992 "	329,731
New Zealand coal used in New Zealand	1,972,685 "	986,342	1,884,632 "	942,316
Kauri-gum	8,473 "	497,444	4,575 "	279,133
Coke	17 "	48	23 "	46

	£
Total value for 1915	3,374,523*
" 1914	2,752,730

* The value of the bullion produced as stated in the official returns from the mines amounted to £1,348,489.

AURIFEROUS-QUARTZ MINING.

The value of bullion obtained from our quartz-mines during 1915 amounted to £1,030,524, as a result of treating 484,629 statute tons of ore, in addition to which scheelite concentrate, value £29,989, was also obtained from such ore.

The dividends distributed by gold-quartz mining companies amounted to £237,165.

The following is a statement of the quantity of quartz treated, the value of bullion obtained, and the amount of dividends paid by the more important quartz-mining companies during 1915 :—

Name of Company.	Quantity of Quartz treated.	Value of Bullion.	Dividends paid.	
			1915.	Total to End of December, 1915.
	Statute Tons.	£	£	£
Waihi Gold-mining Company (Limited)	171,725	327,394	99,181	4,676,902
Waihi Grand Junction Gold-mining Company (Limited)	112,321	200,270	46,047	151,750
Talisman Consolidated (Limited)	26,230	188,620	64,688	1,030,222
Blackwater Mines (Limited)	54,643	109,285	24,999	137,495
Other quartz-mines	119,710	204,955	2,250	*
Totals	**484,629**	**1,030,524**	**237,165**	*

* Unknown.

The average value per ton of ore treated amounted to £2 2s. 6d.

ALLUVIAL AND DREDGE MINING.

The value of the production from alluvial claims amounted to £153,360, as compared with £157,323 during the previous year. This branch of the gold-mining industry remains stationary, but the return for last year would have been greater but for the prolonged periods of dry weather experienced in parts of Otago and Southland, where the principal claims are situated.

During the year a small rush took place to the valley of the Howard River, a tributary of the Buller River near Tophouse. About 150 miners were employed during November working in the beds of the streams, but the few returns available do not indicate any sensational finds but rather that it is a poor man's field.

A steady decline continues in the dredge-mining industry, and the number of gold-dredges in commission, of which during 1906 there were 167, at the beginning of 1916 were reduced to 52, the production from which amounted in value to £164,605 during the year, as against £191,112 during 1914.

The most productive dredge was the "Success," operating at Brennan's Creek, near Hokitika, which obtained gold to the value of £7,126, and distributed in dividends £2,000.

COAL-MINING.

The output of coal during 1915 amounted to 2,208,624 tons, as compared with 2,275,593 tons during 1914, being a decrease of 66,969 tons.

The principal activity in the coal-mining industry occurred in the Westport, Greymouth, and Huntly districts.

The following is a comparative statement of the coal and lignite raised during the years 1912, 1914, and 1915 :—

Inspection District.	Output for 1914.	Output for 1915.	Increase or Decrease, 1915.	Output for 1913.	Increase, between Years 1914 and 1913.
	Tons.	Tons.	Tons.	Tons.	Tons.
Northern (North Island) ..	440,453	460,415	*Inc.* 19,962	349,586	90,867
West Coast (South Island) ..	1,351,182	1,278,994	*Dec.* 72,188	1,057,564	293,618
Southern (Canterbury, Otago, and Southland)	483,958	469,215	,, 14,743	480,855	3,103
Totals	**2,275,593**	**2,208,624**	*Dec.* **66,969**	**1,888,005**	**387,588**

The reduction of output has not been proportional to the shortage of labour owing to enlistment. Thus there has been a falling-off in the average number of persons employed at coal-mines to the extent of 13 per cent. as compared with the previous year, whereas the reduction in output has been only 3 per cent.

The comparative tonnage of the various classes of coal for the years 1914 and 1915 is summarized as follows :—

Class of Coal.	Output for 1915.	Output for 1914.	Increase or Decrease for 1915.
	Tons.	Tons.	Tons.
Bituminous and semi-bituminous ..	1,267,940	1,492,315	*Decrease* 224,375
Pitch-coal	136,460	1,998	*Increase* 134,462
Brown coal	725,001	691,367	,, 33,634
Lignite	79,223	89,913	*Decrease* 10,690
Totals	**2,208,624**	**2,275,593**	*Decrease* **66,969**

No new colliery commenced operations during the year, and no discoveries of additional coal-bearing areas to those already known were made, but developments at the Denniston and Millerton Collieries, the property of the Westport Coal Company, and the most productive collieries in the Dominion, have proved large areas of hard bituminous coal of the best quality, sufficient to supply all requirements for many years.

SCHEELITE.

The quantity of scheelite concentrate exported during the year amounted to 194 tons, valued at £27,784, a decrease of 10 tons and an increase of £6,286 above the production of 1914.

Scheelite is an ore from which tungstic acid is obtained, and it is associated with gold in the quartz-mines of some parts of Otago, Southland, and Marlborough. One of the most spectacular advances in commodity-prices occasioned by the war has been in tungsten, both metal and ore, such advance being due to the extraordinary demand for tungsten steel, an essential constituent in making high-speed-tool steel. The manufacture of immense quantities of military material has required greatly increased quantities of tool steel, and consequently corresponding quantities of tungstic acid. On the 6th September notice was given by His Excellency the Governor that the Imperial Government had instructed him to requisition all supplies of scheelite and other ore containing tungstic acid, and from that date the export to other markets was prohibited. All persons having such ore were required forthwith to notify the Mines Department, Wellington, the price fixed by the Imperial Government being £2 15s. per unit—*i.e.*, per 1 per cent. tungstic trioxide. Since this notification all consignments have been bought by the Mines Department, and shipped to the Imperial Supply Board. The price thus fixed is an increase of 80 per cent. on ante-bellum prices, but in the United States the price paid per unit during 1915 was considerably greater. Fortunately, however, the British Empire produces or controls a very large proportion of the world's tungsten supplies.

KAURI-GUM.

The quantity of kauri-gum exported during 1915 amounted to 4,575 tons, valued at £279,133, as compared with 8,473 tons, valued at £497,444, during 1913.

The considerable decline during the past two years in the export of kauri-gum is due to the fact that previous to the war the principal market was in Germany. To afford a measure of relief to unemployed gum-diggers the Government, in terms of the Kauri-gum Industry Act, 1914, has purchased from the diggers over 300 tons of gum, which is now stored in Auckland for shipment to a new market when the opportunity occurs.

This industry being under the administration of the Hon. the Minister of Lands, my reference thereto is accordingly brief.

PETROLEUM.

Drilling operations in search of petroleum, which have for a number of years been in progress in the Dominion, have not during 1915 resulted in any additional supplies to those already proved at Moturoa, Taranaki, being tapped.

The Taranaki Oil-wells (Limited) towards the end of the year furnished evidence that one million gallons of marketable crude oil had been produced from its wells during a period of about eight years, and in consequence was awarded the Government bonus offered for the first production of that quantity of crude oil. The total bonus gained by that company amounts to £10,000. Of the above quantity of oil 532,745 gallons was fed to the company refinery.

Drilling operations during 1915 were confined to enlarging existing wells preparatory to carrying them to greater depths than hitherto attained with the hope of tapping more copious oil-bearing strata. Other well-drilling operations in the Dominion were intermittent and without result.

PERSONS ENGAGED IN MINING.

The number of persons employed in and about the mines of the Dominion during 1915 is estimated at 8,361, or 843 less than the number employed during the previous year. The number employed at metalliferous mines was 4,205, and at coal-mines 4,156. The number of gum-diggers is not known.

The following table shows the number of miners in each inspection district, and the branch of mining in which they are engaged :—

Classification.	Inspection District.			Totals.		
	Northern.	West Coast.	Southern.	1915.	1914.	Decrease.
Gold, silver, and scheelite ..	1,872	1,356	965	4,193	4,444	251
Coal	903	2,322	931	4,156	4,734	578
Other minerals	6	..	6	12	26	14
Totals	**2,781**	**3,678**	**1,902**	**8,361**	**9,204**	**843**

In view of the considerable number of miners, especially of coal-miners, who have enlisted for military service, the decrease in the number of persons employed at mines is not great, but the shortage is felt at those collieries where there is considerable demand for coal.

MINING ACCIDENTS.

The number of lives lost at metalliferous mines during 1915 was ten, the proportion of deaths per 1,000 persons employed being 2·38. At collieries nine lives were lost, being at the rate of 2·16 per 1,000 persons employed.

At those operations which are regulated by the Stone-quarries Act, 1910, seven lives were accidentally lost, and the total number of persons employed at such operations was about 1,600. It appears necessary that the inspection of quarries should be differently organized, for at present this work is distributed among officials of the Public Works and Mines Departments resident in the districts in which quarries are worked, and these officials carry out, more or less, the inspection of quarries in addition to their principal duties, without extra remuneration. There is no Chief Inspector of Stone-quarries, and it appears advisable that such an appointment should be made.

GEOLOGICAL SURVEY.

Though somewhat weakened owing to the absence of two members of the staff with the Expeditionary Forces, the Geological Survey Branch has steadily carried on its work during the past year. The detailed geological surveys of the Egmont (Taranaki) and Gisborne subdivisions by members of the regular staff have been brought to a conclusion. Special surveys of the Oamaru and Tuapeka districts have been made by Professors J. Park and P. Marshall. Reports on all these areas are in course of preparation. Officers of the Survey have also visited a number of localities in order to make brief geological examinations and to furnish special reports on such subjects as limestone, phosphate-deposits, &c.

In addition to the annual report, Bulletin No. 17 and Palæontological Bulletin No. 3 were published last year. An exhaustive report on the Reefton district (Bulletin No. 18) is now in the Press. Palæontological reports by Mr. Henry Woods and Dr. Newell Arber, of Cambridge—one on Cretaceous Mollusca, and the other on the Mesozoic Flora of New Zealand—have been received, and are now in course of publication.

STATE COLLIERIES.

The output from State Collieries during 1915 was 238,200 tons, of which 129,627 tons was produced from Point Elizabeth Colliery, and 108,573 tons from Liverpool Colliery. The total output from both mines exceeded that of the previous year by 38,012 tons.

The Point Elizabeth Colliery will probably be worked out within two years, and as it is from this mine that the best class of State household coal is produced, some difficulty may be experienced in supplying the State coal depots with household coal in the near future, as a large proportion of the Liverpool coal, amounting to 65 per cent. during 1915, was slack or small coal.

The State coal business during the year ended 31st March, 1916, resulted in a profit of £2,515, as compared with a loss of £14,152 13s. 11d. during the previous year.

GOVERNMENT WATER-RACES.

The Waimea-Kumara and Mount Ida Water-races, which render possible hydraulic mining in the Kumara district, Westland, and the Naseby district, Central Otago, have during 1915, supplied ninety-one miners with water for sluicing by which gold to the value of £19,562 was obtained. The cash received for water sold amounted to £3,106, and the expenditure on the upkeep of the races was £3,593. The capital expenditure upon these races exceeds £250,000, and as the cost of upkeep has now for some years exceeded the amount received for water sold, no interest on capital or depreciation has been provided.

During 1915 the average earnings per miner using Government water, after deducting the amount paid for the same, was £180, and from this must be subtracted all expenditure on plant and material, also rent and other incidental expenses.

SCHOOLS OF MINES.

The expenditure by the Department on schools of mines during the year ended 31st March, 1916, amounted to £3,652 6s. 7d.

The number of students attending one or more classes at the seven schools situated at mining centres was 284, but only twenty-two of these presented themselves at the annual Government examinations for examination on any of the exclusively mining subjects, the majority of the students being schoolboys and some girls who attend the schools in the evening to improve themselves in mathematics, chemistry, or electricity, subjects common to other industries, and usually taught at technical schools.

SUBSIDIZED PROSPECTING.

During the year ended 31st March, 1916, thirty-four approved prospecting parties were granted subsidies amounting to £5,151 8s. 4d., of which £2,736 17s. 11d. was expended during that period; in addition to which £1,111 granted during previous years was expended by twenty parties. Altogether thirty-six parties, employing eighty-six miners, were engaged upon prospecting operations during 1915; and although no discovery of much commercial value was made, ground has been proved in a few instances which may be profitably worked.

ROADS AND TRACKS.

The expenditure on roads and tracks by subsidies and direct grants during the financial year ended the 31st March, 1916, amounted to £24,432.

COAL-MINERS' RELIEF FUND.

As required by the Coal-mines Act, 1908, the owner of every coal-mine contributes ½d. per ton on all coal sold, for the relief of coal-miners who may be injured whilst working, and for the relief of families of coal-miners who may be killed or injured.

The following is a statement of the accounts of the fund during the two last financial years :—

	Year ended 31st March, 1915.	Year ended 31st March, 1916.
	£	£
Contributions	2,068	1,966
Allowance on account of accidents, &c...	2,782	1,526
Balance	6,320	7,303

PROVISION FOR PERSONS TOTALLY INCAPACITATED BY MINERS' PHTHISIS.

By the passing of the Miners' Phthisis Act, 1915, the Gold-miners' Relief Fund was abolished, and provision is now made in the new Act for a pension of £1 per week being paid to a married man or a widower with young children, and 15s. per week to a single man who is or becomes totally incapacitated for work owing to miners' phthisis contracted while working as a miner in New Zealand. In addition to which the widow of any pensioner under the Act who dies from that disease is entitled to a pension of 12s. 6d. per week for two years. Funeral expenses to the extent of £20 are also provided for. All gold duty is now reserved for these pensions, and the Act is administered by a Commissioner under the Pensions Act, 1913.

TABLES TO ACCOMPANY THE MINES STATEMENT.

No 1.

TABLE SHOWING COMPARISON IN QUANTITY AND VALUE OF GOLD ENTERED FOR EXPORTATION, ALSO THE QUANTITY AND VALUE OF OTHER MINERALS, FOR THE YEARS ENDED THE 31ST DECEMBER, 1914 AND 1915, AS WELL AS THE TOTAL VALUE SINCE THE 1ST JANUARY, 1853.

Name of Metal or Mineral.	For Year ending the 31st December, 1915.		For Year ending the 31st December, 1914.		Total from the 1st January, 1853, to the 31st December, 1915.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Precious metals—	Oz.	£	Oz.	£	Oz.	£
Gold	422,825	1,694,553	227,954	895,367	21,585,091	84,648,463
Silver	957,541	95,583	599,162	62,085	19,340,324	2,096,382
Total gold and silver	1,380,366	1,790,136	827,116	957,452	40,875,415	86,744,845
Mineral produce, including kauri-gum—	Tons.	£	Tons.	£	Tons.	£
Copper-ore	..	..	3	11	1,498	19,209
Chrome-ore	..	..	..	..	5,869	38,002
Antimony-ore	..	..	..	..	3,768	54,941
Manganese-ore	..	..	..	..	19,364	61,905
Hæmatite ore	..	..	1	25	77	469
Mixed minerals	*3,644	33,161	5,395	29,221	50,481	375,982
Coal (New Zealand) exported	323,992	329,731	302,908	282,163	4,162,932	3,866,826
Coke exported	23	46	17	48	16,531	25,069
Coal, output of mines in Dominion (less exports)	1,884,632	942,316	1,972,685	986,342	37,670,104	18,743,241
Shale	..	..	21	21	14,444	7,236
Kauri-gum	4,575	279,133	8,473	497,444	343,823	17,536,140
Total quantity and value of minerals	2,216,866	1,584,387	2,289,503	1,795,278	42,288,891	40,729,020
Value of gold and silver, as above	1,380,366	1,790,136	..	957,452	..	86,744,845
Total value of minerals produced, including gold and silver	3,597,232	3,374,523	..	2,752,730	..	127,473,865

* Scheelite, 194 tons; gold concentrate, slime, tailing, &c., 1,537 tons; jewellers' sweepings, 4⅞ tons; pumice, sand, &c. 1,910 tons.

No. 2.

TABLE SHOWING THE QUANTITY AND VALUE OF GOLD ENTERED FOR EXPORTATION FROM NEW ZEALAND FOR THE YEARS ENDED THE 31ST DECEMBER, 1915 AND 1914, AND THE TOTAL QUANTITY AND VALUE FROM 1857 TO THE 31ST DECEMBER, 1915.

District and County or Borough.	Year ending 31st December, 1915.		Year ending 31st December, 1914.		Increase or Decrease for Year ending 31st December, 1915.		Total Quantity and Value from January, 1857, to 31st December, 1915.	
	Quantity.	Value.	Quantity.	Value.	Increase.	Decrease.		
AUCKLAND—	Oz.	£	Oz.	£	Oz.	Oz.	Oz.	£
County of Coromandel ..	1,428	5,849	943	3,960	485	..	..	..
County of Thames ..	7,581	30,996	3,964	14,672	3,617	..	..	..
County of Ohinemuri ..	58,675	240,779	36,682	149,792	21,993	..	..	..
County of Piako	409	1,697	136	574	273	..	..	..
Borough of Thames ..	1,710	6,592	..	..	1,710	..	..	..
Great Barrier Island ..	..	..	3	12	..	3	..	..
Borough of Waihi ..	144,969	577,643	74,086	286,867	70,883	..	..	..
	214,772	**863,556**	115,814	455,877	98,961	3	**6,154,427**	**23,522,972**
WELLINGTON	..	..	..	..	..	..	**188**	**706**
MARLBOROUGH—								
County of Marlborough ..	**3,568**	**13,864**	930	3,611	2,638	..	**96,982**	**377,664**
NELSON—								
County of Waimea ..	5	21	42	168	..	37	..	..
County of Collingwood ..	446	1,805	850	3,401	..	404	..	..
County of Takaka ..	..	..	3	12	..	3	..	..
County of Murchison ..	46	184	..	..	46	..	..	..
	497	**2,010**	895	3,581	46	444	**1,731,794**	**6,866,006**
WEST COAST—								
County of Buller	5,421	20,299	2,785	10,670	2,636	..	..	..
County of Inangahua ..	92,415	365,555	45,733	173,641	46,682	..	..	..
County of Grey	7,989	32,573	6,456	26,517	1,533	..	..	..
County of Westland ..	9,321	37,788	5,053	20,483	4,268	..	..	..
Ross Borough	3,191	12,768	1,366	5,465	1,825	..	..	..
Kumara	1,830	7,320	..	..	1,830	..	..	..
Hokitika	915	3,662	..	..	915	..	..	..
	121,082	**479,965**	61,393	236,776	59,689	..	**6,022,855**	**23,926,380**
CANTERBURY—								
County of Ashburton ..	**13**	**52**	..	..	13	..	**112**	**439**
OTAGO—								
County of Taieri	397	1,617	229	930	168	..	..	..
County of Tuapeka ..	16,809	68,021	10,571	41,735	6,238	..	..	..
County of Vincent ..	24,199	97,996	11,626	46,848	12,573	..	..	..
County of Maniototo ..	3,882	15,479	5,503	21,575	..	1,621	..	..
County of Waihemo ..	551	2,096	413	1,527	138	..	..	..
County of Waitaki ..	1,140	4,569	2,010	7,870	..	870	..	..
County of Bruce	1,962	7,943	716	2,864	1,246	..	..	..
County of Lake	4,003	16,164	1,825	7,373	2,178	..	..	..
County of Wallace ..	4,093	16,575	2,084	8,333	2,009	..	..	..
County of Fiord	40	161	..	..	40	..	..	..
County of Southland ..	24,147	98,515	13,615	55,178	10,532	..	..	..
County of Clutha	18	66	..	..	18	..	..	..
County of Waikouaiti ..	587	2,262	..	..	587	..	..	..
	81,828	**331,494**	48,592	194,233	35,727	2,491	**7,525,196**	**29,941,141**
Unknown	**1,065**	**3,612**	330	1,289	735	..	**3,537**	**13,155**
Totals	**422,825**	**1,694,553**	227,954	895,367	197,809	2,938	**21,535,091**	**84,648,463**

No. 3.

GOLD PRODUCED, 1857 TO 1915.

TABLE SHOWING THE TOTAL QUANTITY AND VALUE OF GOLD ENTERED FOR EXPORTATION FROM THE 1ST JANUARY, 1857, TO THE 31ST DECEMBER, 1915. (This Return shows the Output of the various Goldfields. Gold entered at Nelson from Hokitika, Greymouth, and Westport is put under the Head of "West Coast," and Gold from Invercargill and Riverton under the Head of "Otago.")

Year.	Auckland.		Nelson.		Marlborough.		West Coast.		Otago.		Wellington.		Canterbury.		Grand Totals.	
	Oz.	Value.	Oz.	Value.	Oz.	Value.	Oz.	Value.	Oz.	Value.	Oz.	Value.	Oz.	Value.	Oz.	Value.
		£		£		£		£		£		£		£		£
1857 ..	..	..	10,437	40,422	..	..	..	..	..	..	..	..	..	..	10,437	40,422
1858 ..	308	1,192	13,226	51,272	..	..	..	..	..	..	..	..	..	..	13,534	52,464
1859 ..	..	..	7,336	28,427	..	..	..	..	..	..	..	..	..	..	7,336	28,427
1860 ..	..	..	4,538	17,585	..	..	..	..	..	..	..	..	..	..	4,538	17,585
1861 ..	..	..	6,335	24,552	..	..	..	..	187,696	727,321	..	..	..	..	194,031	751,873
1862 ..	1,239	4,098	10,422	40,386	..	..	..	..	399,201	1,546,905	..	..	..	..	410,862	1,591,389
1863 ..	4,483	13,853	9,580	37,120	..	..	..	..	614,387	2,380,750	..	..	..	..	628,450	2,431,723
1864 ..	3,448	10,552	14,410	55,841	24,838	95,231	1,463	5,560	436,012	1,689,653	..	..	..	..	480,171	1,856,837
1865 ..	5,449	17,096	12,137	47,030	7,952	30,814	289,897	1,127,370	259,139	1,004,163	..	..	..	..	574,574	2,226,474
1866 ..	5,814	17,463	7,650	29,643	469	1,818	552,572	2,140,946	168,871	654,647	..	..	..	..	735,376	2,844,517
1867 ..	6,637	18,277	9,123	35,918	501	1,978	511,974	2,018,874	158,670	623,815	..	..	..	..	686,905	2,698,862
1868 ..	53,660	168,874	5,999	38,396	404	1,616	405,762	1,608,844	171,649	686,596	..	..	..	..	637,474	2,504,326
1869 ..	132,451	434,687	10,631	42,524	666	2,664	317,169	1,269,664	153,364	613,456	..	..	..	..	614,281	2,362,995
1870 ..	85,534	319,146	12,244	48,692	1,852	7,408	280,068	1,121,525	165,152	660,694	30	120	..	..	544,880	2,157,585
1871 ..	330,326	1,188,708	10,014	40,056	1,867	7,468	232,882	931,528	154,940	619,760	..	..	..	..	730,029	2,787,520
1872 ..	104,890	369,341	8,175	32,700	2,057	8,228	172,574	690,296	157,574	630,696	..	..	..	..	445,370	1,731,261
1873 ..	119,449	437,123	13,697	54,786	1,274	5,050	188,501	756,442	182,416	734,024	..	..	..	..	505,337	1,987,425
1874 ..	76,910	305,068	5,642	22,158	1,198	4,748	157,531	631,203	135,107	542,154	..	..	..	..	376,388	1,505,331
1875 ..	69,485	262,156	4,577	17,866	1,159	4,636	158,678	635,480	121,423	487,632	..	..	..	..	355,322	1,407,770
1876 ..	56,057	221,905	14,018	55,862	450	1,796	133,014	531,274	118,477	473,491	..	..	..	..	322,016	1,284,328
1877 ..	99,081	403,627	5,367	21,092	870	3,197	153,198	612,823	113,169	455,341	..	..	..	..	371,685	1,496,080
1878 ..	55,982	220,454	4,463	17,223	404	1,617	144,634	578,508	105,003	422,277	..	..	..	..	310,486	1,240,079
1879 ..	37,901	154,295	2,993	11,424	879	3,460	142,822	571,061	102,869	407,868	..	..	..	..	287,464	1,148,108
1880 ..	42,720	176,416	3,222	12,223	1,550	5,650	144,090	575,258	113,666	457,705	..	..	..	..	305,248	1,227,252
1881 ..	35,516	141,326	3,453	13,039	1,378	4,531	127,544	509,971	102,670	411,923	..	..	..	..	270,561	1,080,790
1882 ..	33,059	131,007	3,289	12,494	1,352	5,400	130,048	519,978	83,446	333,804	10	37	..	..	251,204	1,002,720
1883 ..	41,291	163,618	2,064	7,724	636	2,524	116,905	467,152	87,478	352,334	..	..	..	..	248,374	993,352
1884 ..	36,087	143,564	2,159	8,002	1,079	4,306	111,686	446,517	78,810	318,932	101	380	24	96	229,946	921,797
1885 ..	42,989	170,416	2,798	10,337	540	2,160	117,861	471,325	73,183	294,378	..	..	..	..	237,371	948,615
1886 ..	32,271	128,140	2,582	9,979	404	1,451	112,671	446,287	79,104	317,543	47	169	..	..	227,079	903,569
1887 ..	30,697	121,564	2,914	10,829	1,041	3,759	98,774	395,430	70,443	279,518	..	..	..	..	203,869	811,100
1888 ..	35,223	139,556	3,027	11,320	699	2,547	100,139	400,405	62,107	247,142	..	..	24	96	201,219	801,066
1889 ..	28,655	113,191	3,252	12,310	5,189	20,167	101,696	406,451	64,419	256,430	..	..	..	..	203,211	808,549
1890 ..	31,745	125,760	2,856	11,049	6,073	24,285	89,096	356,368	63,423	255,976	..	..	..	..	193,193	773,438
1891 ..	45,392	181,185	4,445	16,896	5,649	22,576	109,268	437,126	87,209	349,573	33	132	..	..	251,996	1,007,488
1892 ..	45,555	183,655	2,535	9,604	3,898	15,429	103,106	412,383	82,933	333,467	52	206	..	..	238,079	954,744
1893 ..	45,714	186,553	2,145	8,187	2,165	8,644	99,127	396,516	77,660	313,238	..	..	..	..	226,811	913,138
1894 ..	52,916	211,974	2,860	10,634	2,536	10,123	86,950	347,464	76,353	307,644	..	..	..	..	221,615	887,839
1895 ..	111,213	430,862	2,460	9,016	2,695	10,771	89,429	357,719	87,694	355,796	..	..	..	..	293,491	1,162,164

No. 3—*continued.*

GOLD PRODUCED, 1857 TO 1915—*continued.*

TABLE SHOWING THE TOTAL QUANTITY AND VALUE OF GOLD ENTERED FOR EXPORTATION FROM THE 1ST JANUARY, 1857, TO THE 31ST DECEMBER, 1915. (This Return shows the Output of the various Goldfields. Gold entered at Nelson from Hokitika, Greymouth, and Westport is put under the Head of "West Coast," and Gold from Invercargill and Riverton under the Head of "Otago")—*continued.*

Year.	Auckland.		Nelson.		Marlborough.		West Coast.		Otago.		Wellington.		Canterbury.		Grand Totals.	
	Oz.	Value.	Oz.	Value.	Oz.	Value.	Oz.	Value.	Oz.	Value.	Oz.	Value.	Oz.	Value.	Oz.	Value.
		£		£		£		£		£		£		£		£
1896 ..	92,346	350,355	2,753	10,333	916	3,588	79,317	317,161	88,362	359,991	..	..	..	..	263,694	1,041,428
1897 ..	105,477	392,337	1,892	7,055	810	3,195	58,817	235,430	84,649	342,187	..	..	..	..	251,645	980,204
1898 ..	142,383	527,786	1,720	6,882	781	3,003	79,948	319,789	55,343	223,231	..	..	..	..	280,175	1,080,691
1899 ..	168,769	624,737	419	1,571	..	..	90,031	360,149	130,311	526,605	..	..	28	111	389,558	1,513,173
1900 ..	166,342	605,398	3,718	14,605	535	2,147	73,923	295,733	129,075	521,629	..	..	23	90	373,616	1,439,602
1901 ..	191,968	695,551	7,212	28,138	133	513	113,286	454,006	142,940	575,492	..	..	22	83	455,561	1,753,783
1902 ..	201,583	721,977	5,947	23,649	601	2,404	118,796	475,272	181,116	728,124	..	..	2	7	508,045	1,951,433
1903 ..	232,681	832,334	7,962	31,710	972	3,845	125,241	501,090	166,458	668,852	..	..	..	..	533,314	2,037,831
1904 ..	223,010	791,529	5,049	20,141	473	1,890	122,310	489,177	169,478	684,764	..	..	..	..	520,320	1,987,501
1905 ..	232,215	935,602	6,469	25,862	..	..	109,704	438,258	172,098	694,214	..	..	..	..	520,486	2,093,936
1906 ..	295,417	1,195,541	2,944	11,746	..	..	104,743	414,292	160,739	649,325	..	..	..	..	563,843	2,270,904
1907 ..	298,101	1,187,079	3,893	15,274	795	3,009	87,069	343,146	118,352	478,982	..	..	..	..	508,210	2,027,490
1908 ..	296,971	1,171,375	3,196	12,783	297	1,145	86,052	335,722	119,907	483,900	..	..	..	..	506,423	2,004,925
1909 ..	288,614	1,142,098	2,572	10,286	39	155	95,014	369,930	120,132	484,431	..	..	..	..	506,371	2,006,900
1910 ..	286,526	1,136,057	117	466	53	212	92,036	358,099	99,556	401,494	..	..	..	..	478,288	1,896,328
1911 ..	263,791	1,049,204	2,149	8,586	229	867	92,403	368,545	96,654	389,580	..	..	..	..	455,226	1,816,782
1912 ..	179,863	693,949	3,234	12,911	439	1,643	68,269	270,580	91,358	366,048	..	..	..	..	343,163	1,345,131
1913 ..	217,637	833,928	662	2,642	1,533	5,944	81,865	317,246	74,464	299,739	..	..	..	..	376,161	1,459,499
1914 ..	115,814	455,877	895	3,581	930	3,611	61,393	236,776	48,922	195,522	..	..	..	..	227,954	895,367
1915 ..	214,772	863,556	497	2,010	3,568	13,864	121,082	479,965	82,893	335,106	..	..	13	52	422,825	1,694,553
Totals ..	6,154,427	23,522,972	312,375	1,234,849	96,828	377,087	7,442,428	29,558,114	7,528,624	29,953,862	..	..	136	535	21,535,091	84,648,463

No. 4.

TABLE SHOWING THE TOTAL QUANTITY AND VALUE OF MINERAL ORES OTHER THAN GOLD AND SHALE (THE PRODUCT OF NEW ZEALAND MINES), COAL, COKE, AND KAURI-GUM EXPORTED FROM THE DOMINION UP TO 31ST DECEMBER, 1915.

Year.	Silver.		Copper-ore.		Chrome-ore.		Antimony-ore.		Manganese-ore.		Hæmatite Ore.		Mixed Mineral Ores.*		Coal.		Coke.		Kauri-gum.		Totals.		
	Oz.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Oz.	Tons.	Value.
		£		£		£		£		£		£		£		£		£		£			£
1853 ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	830	15,972	..	830	15,972
1854 ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,661	28,864	..	1,661	28,864
1855 ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	355	4,514	..	355	4,514
1856 ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,440	18,591	..	1,440	18,591
1857 ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2,522	35,251	..	2,522	35,251
1858 ..	..	..	351	5,000	3	25	..	..	..	..	..	..	..	..	2	4	..	..	1,811	20,037	..	2,167	25,066
1859 ..	..	..	245	2,605	8	120	..	..	..	..	..	..	..	..	..	..	..	..	2,010	20,776	..	2,263	23,501
1860 ..	..	..	137	1,590	116	1,440	..	..	..	..	..	..	..	..	1	2	..	..	1,046	9,851	..	1,300	12,883
1861 ..	..	..	110	1,300	52	520	..	..	..	..	..	..	..	..	..	..	..	..	856	9,888	..	1,018	11,708
1862 ..	..	..	51	1,024	3,843	24,719	..	..	..	..	..	..	..	..	..	..	..	..	1,103	11,107	..	3,997	36,850
1863 ..	..	..	..	..	595	4,318	..	..	..	..	..	..	..	..	..	..	..	..	1,400	27,026	..	1,995	31,344
1864 ..	..	..	..	..	768	4,910	..	..	..	..	..	..	..	..	..	..	..	..	2,228	60,590	..	2,996	65,500
1865 ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,867	46,060		1,867	46,060
1866 ..	..	..	..	..	281	1,315	..	..	..	..	..	..	..	..	261	400	..	..	2,535	70,572	..	3,077	72,287
1867 ..	..	..	246	2,700	..	..	..	..	..	..	..	..	..	..	973	1,228	..	..	2,685	77,491	..	3,904	81,419
1868 ..	..	..	84	977	..	..	..	..	..	..	..	..	..	..	1,027	1,210	..	..	2,690	72,493	..	3,801	74,680
1869 ..	11,063	2,993	..	..	..	..	..	..	..	..	..	..	..	..	750	800	..	..	2,850	111,307	11,063	3,600	115,100
1870 ..	37,123	11,380	7	120	..	..	..	..	..	..	..	..	..	..	1,672	1,508	..	..	4,391	175,074	37,123	6,070	188,082
1871 ..	80,272	23,145	..	..	..	..	..	..	..	..	..	..	..	..	1,696	1,612	..	..	5,054	167,958	80,272	6,750	192,715
1872 ..	37,064	9,910	..	..	..	..	..	..	..	..	..	..	..	..	990	855	21	50	4,811	154,167	37,064	5,882	164,982
1873 ..	36,187	9,850	..	..	..	..	..	..	..	..	..	..	..	..	724	655	..	..	2,834	85,816	36,187	3,558	96,321
1874 ..	40,566	10,380	..	..	..	..	..	..	..	..	..	..	..	..	1,463	1,363	87	228	2,569	79,986	40,566	4,119	91,957
1875 ..	29,085	7,569	..	..	..	..	..	..	..	..	..	..	..	..	3,385	3,129	15	51	3,231	138,523	29,085	6,631	149,272
1876 ..	12,683	3,171	..	..	..	..	..	..	..	..	..	..	3,180	14,824	1,854	1,954	53	189	2,888	109,234	12,683	7,975	129,372
1877 ..	33,893	7,556	..	..	..	..	..	..	..	..	..	..	2,356	9,664	2,658	2,071	25	72	3,633	118,348	33,893	8,682	137,711
1878 ..	23,019	5,755	6	115	..	..	4	102	2,516	10,416	..	..	2	8	6,362	5,139	85	177	3,445	132,975	23,019	12,120	154,687
1879 ..	20,645	4,512	54	1,105	..	..	..	..	2,140	8,338	..	..	..	..	7,144	6,187	154	324	3,229	147,535	20,645	12,722	168,001
1880 ..	20,005	4,500	..	..	..	..	60	612	2,611	10,423	..	..	2,674	11,335	7,020	5,977	87	135	4,725	242,817	20,005	17,177	275,799
1881 ..	18,885	4,236	5	36	..	..	2	24	1,271	3,243	..	..	1,355	4,303	6,621	5,610	223	353	5,461	253,778	18,885	15,538	271,623
1882 ..	5,694	1,286	9	41	..	..	30	900	2,181	6,963	..	..	2,784	8,597	3,207	2,380	275	480	5,533	260,369	5,694	14,019	231,016
1883 ..	16,826	3,785	46	678	..	..	31	804	384	1,155	1	12	22	110	6,522	4,879	1,430	2,057	6,518	336,606	16,826	14,953	350,086
1884 ..	24,914	5,125	20	106	..	..	..	..	318	809	..	..	..	..	6,104	4,461	236	372	6,393	342,151	24,914	13,071	353,024
1885 ..	16,624	3,169	..	..	..	..	666	5,289	602	1,716	50	208	114	993	43,893	51,257	267	385	5,876	299,762	16,624	51,468	362,779
1886 ..	12,108	2,946	20	390	..	..	62	1,784	328	1,316	..	..	445	1,846	46,136	52,133	497	715	4,921	257,653	12,108	52,409	318,783
1887 ..	20,809	3,453	..	..	..	..	134	3,989	305	895	..	..	144	4,142	44,129	44,650	183	266	6,791	362,449	20,809	51,686	419,844
1888 ..	403	71	2	75	..	..	376	6,246	1,085	2,404	..	..	162	2,955	68,087	64,971	953	1,646	8,482	380,933	403	79,147	459,301
1889 ..	24,105	4,043	..	..	..	..	493	5,319	1,080	2,569	..	..	199	9,985	86,405	84,347	2,132	3,407	7,519	329,590	21,105	97,828	439,260
1890 ..	32,637	6,162	..	..	..	..	515	11,121	482	1,004	1	5	19	273	69,614	67,003	2,218	3,334	7,438	378,563	32,637	80,287	467,465
1891 ..	28,023	5,151	1	4	..	..	413	4,950	1,153	2,634	..	1	2	6	91,664	91,173	2,544	3,658	8,388	437,056	28,023	104,164	544,633
1892 ..	22,053	3,996	..	..	..	..	364	4,900	521	1,239	..	..	84	631	78,911	80,225	4,306	5,691	8,705	517,678	22,053	92,891	614,360
1893 ..	63,076	9,743	..	..	..	..	331	3,467	319	943	..	..	37	650	69,136	72,699	51	53	8,317	510,775	63,076	78,191	598,330
1894 ..	54,177	6,697	..	..	..	..	44	761	534	1,156	..	..	25	353	75,004	73,438	107	160	8,338	404,567	54,177	84,052	487,132
1895 ..	85,024	10,679	..	..	..	..	54	1,486	210	525	..	..	62	880	85,987	83,342	288	715	7,425	418,766	85,024	94,026	516,393
1896 ..	94,307	10,589	..	..	..	..	21	450	65	205	..	..	37	1,335	79,524	71,984	105	263	7,126	431,323	94,307	86,878	516,149
1897 ..	183,892	20,872	..	2	..	..	10	157	180	541	..	..	1,561	5,892	76,073	69,595	..	..	6,641	398,010	183,892	84,465	495,069
1898 ..	293,851	33,107	2	70	..	..	..	..	217	703	..	..	1,828	4,792	56,332	50,381	9	14	9,905	586,767	293,751	68,253	675,834

No. 4—*continued.*

TABLE SHOWING THE TOTAL QUANTITY AND VALUE OF MINERAL ORES OTHER THAN GOLD AND SHALE (THE PRODUCT OF NEW ZEALAND MINES), COAL, COKE, AND KAURI-GUM, EXPORTED FROM THE DOMINION UP TO 31ST DECEMBER, 1915—*continued.*

Year.	Silver.		Copper-ore.		Chrome-ore.		Antimony-ore.		Manganese-ore.		Hæmatite Ore.		Mixed Mineral Ores.*		Coal.		Coke.		Kauri-gum.		Total.		
	Oz.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Oz.	Tons.	Value.
		£		£		£		£		£		£		£		£		£		£			£
1899 ..	349,338	40,838	..	..	..	..	..	..	135	407	..	..	1,309	6,591	89,480	83,085	18	9	11,116	607,919	349,338	102,058	738,849
1900 ..	326,457	38,879	12	45	28	110	3	101	166	588	..	..	2,126	12,751	112,707	98,136	..	..	10,159	622,293	326,457	125,201	772,903
1901 ..	571,134	65,258	3	105	..	..	30	136	208	614	..	..	696	7,775	159,643	142,176	..	..	7,541	446,114	571,134	168,121	662,178
1902 ..	674,196	71,975	..	..	175	525	..	..	..	..	17	116	415	4,422	188,677	154,747	..	..	7,430	450,223	674,196	196,714	682,008
1903 ..	911,914	91,497	6	123	..	..	..	..	70	210	..	1	625	7,014	152,332	128,927	..	..	9,357	631,102	911,914	162,390	658,874
1904 ..	1,094,461	112,875	..	..	..	..	..	..	196	570	7	96	1,404	10,168	165,220	139,898	..	..	9,203	501,817	1,094,461	176,030	765,424
1905 ..	1,179,744	120,542	4	17	..	..	..	..	55	165	..	..	632	8,136	122,817	107,062	15	15	10,883	561,444	1,179,744	134,406	797,381
1906 ..	1,390,536	143,572	..	..	..	..	..	..	16	40	..	..	1,297	18,421	141,641	122,614	5	6	9,154	522,486	1,390,536	152,113	807,139
1907 ..	1,562,603	169,484	56	595	..	..	98	2,118	5	26	..	5	1,492	30,448	128,950	114,737	15	15	8,708	579,888	1,562,603	139,324	897,316
1908 ..	1,731,336	175,337	13	275	..	..	5	73	..	..	..	..	1,691	16,179	100,502	85,846	2	4	5,530	372,798	1,731,336	107,742	650,512
1909 ..	1,813,830	180,872	5	100	..	..	2	60	6	29	..	..	1,837	11,709	201,685	183,961	22	23	8,250	552,698	1,813,830	211,806	929,452
1910 ..	1,711,235	171,562	..	..	..	..	..	..	5	15	..	..	2,088	22,202	277,011	259,562	6	10	8,693	465,044	1,711,235	287,803	918,395
1911 ..	1,311,043	131,587	..	..	..	..	20	92	..	4	..	..	3,470	22,104	223,275	204,379	24	41	7,587	395,707	1,311,043	234,375	753,914
1912 ..	801,165	84,739	..	..	..	..	..	..	..	..	..	..	1,729	20,571	229,012	216,170	4	7	7,908	401,305	801,165	238,653	722,792
1913 ..	975,616	103,866	..	..	..	..	..	..	..	..	..	..	2,929	31,532	211,749	205,010	28	50	8,780	549,106	975,616	223,484	389,564
1914 ..	599,162	62,085	3	11	..	..	..	..	..	..	1	25	5,395	29,224	302,908	282,163	17	48	8,473	497,444	599,162	316,797	871,000
1915 ..	957,541	95,583	..	..	..	..	..	..	..	..	..	..	3,644	33,161	323,992	329,731	23	46	4,575	279,133	957,541	332,234	737,654
Totals	19,340,324	2,096,382	1,498	19,209	5,869	38,002	3,768	54,941	19,364	61,965	77	469	*50,481	*375,982	4,162,932	3,866,826	16,531	25,069	343,823	17,536,140	19,340,324	4,604,343	24,074,925

* The following are the principal minerals included under this heading :—

Year.	Scheelite-ore.		Auriferous Ore.		Sulphur.		Mixed Minerals.	
	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.
		£		£		£		£
1898	..	..	22	380	1,765	4,097	..	315
1899	32	2,788	5	153	1,227	3,483	..	167
1900	54	2,635	219	4,450	1,692	4,824	..	842
1901	2	83	390	6,663	143	360	..	669
1902	39	1,200	231	2,560	100	475	..	187
1903	42	1,439	472	4,449	..	..	..	1,126
1904	17	791	977	8,898	..	..	..	479
1905	28	1,848	535	5,997	..	..	..	291
1906	55	3,407	1,186	13,940	..	..	..	1,074
1907	137	15,486	1,244	14,650	..	..	..	312
1908	68	6,055	654	6,993	..	..	..	3,131
1909	58	4,263	182	2,450	..	..	..	4,996
1910	143	15,070	100	1,538	..	..	..	5,594
1911	138	11,853	138	1,419	..	..	..	8,832
1912	135	13,347	..	..	..	..	..	7,224
1913	221	22,933	6	226	..	..	..	8,373
1914	204	21,498	..	..	..	..	..	7,726
1915	194	27,784	34	2,257	..	..	..	5,378

No. 5.

TABLE SHOWING THE INCREASE OR DECREASE IN THE ANNUAL PRODUCTION OF COAL AND SHALE IN THE DOMINION, AND THE QUANTITY OF COAL IMPORTED SINCE 1878.

Year.	Coal and Shale raised in the Dominion.		Coal imported.		
	Tons.	Yearly Increase or Decrease.	Tons.	Increase over Preceding Year.	Decrease over Preceding Year.
Prior to 1878	709,931	..	..	..	..
1878	162,218	..	174,148	..	..
1879	231,218	*Inc.* 69,000	158,076	..	16,072
1880	299,923	„ 68,705	123,298	..	33,778
1881	337,262	„ 37,339	129,962	6,664	..
1882	378,272	„ 41,010	129,582	..	380
1883	421,764	„ 43,492	123,540	..	6,042
1884	480,831	„ 59,069	148,444	24,904	..
1885	511,063	„ 30,232	130,202	..	18,242
1886	534,353	„ 23,290	119,873	..	10,329
1887	558,620	„ 24,267	107,230	..	12,643
1888	613,895	„ 55,275	101,341	..	5,889
1889	586,445	*Dec.* 27,450	128,063	26,722	..
1890	637,397	*Inc.* 50,952	110,939	..	17,124
1891	668,794	„ 31,397	125,318	14,379	..
1892	673,315	„ 4,521	125,453	135	..
1893	691,548	„ 18,233	117,444	..	8,009
1894	719,546	„ 27,998	112,961	..	4,483
1895	726,654	„ 7,108	108,198	..	4,763
1896	792,851	„ 66,197	101,756	..	6,442
1897	840,713	„ 47,862	110,907	9,151	..
1898	907,033	„ 66,320	115,427	4,520	..
1899	975,234	„ 68,201	99,655	..	15,772
1900	1,093,990	„ 118,756	124,033	24,378	..
1901	1,239,686	„ 145,696	149,764	25,371	..
1902	1,365,040	„ 125,354	127,853	..	21,911
1903	1,420,229	„ 55,189	163,923	36,070	..
1904	1,537,838	„ 117,609	147,196	..	16,727
1905	1,585,756	„ 47,918	169,046	21,850	..
1906	1,729,536	„ 143,780	207,567	38,521	..
1907	1,831,009	„ 101,473	220,749	13,182	..
1908	1,860,975	„ 29,966	287,808	67,059	..
1909	1,911,247	„ 50,272	258,185	..	29,623
1910	2,197,362	„ 286,115	232,378	..	25,807
1911	2,066,073	*Dec.* 131,289	188,068	..	44,310
1912	2,177,615	*Inc.* 111,542	364,359	176,291	..
1913	1,888,005	*Dec.* 289,610	468,940	104,581	..
1914	2,275,614	*Inc.* 387,609	518,070	49,130	..
1915	2,208,624	*Dec.* 66,990	353,471	..	164,599

No. 6.

TABLE SHOWING THE OUTPUT OF COAL FROM THE VARIOUS COALFIELDS, AND THE COMPARATIVE INCREASE AND DECREASE, FOR THE YEARS 1914 AND 1915, TOGETHER WITH THE TOTAL APPROXIMATE QUANTITY OF COAL PRODUCED SINCE THE MINES WERE OPENED.

Name of Coalfield.	Output of Coal.		Increase.	Decrease.	Approximate Total Output of Coal up to 31st December, 1915.
	1915.	1914.			
	Tons.	Tons.	Tons.	Tons.	Tons.
North Auckland	117,882	141,133	..	23,251	3,386,128
Waikato (including Mokau)	342,533	299,320	43,213	..	4,201,057
Nelson	26,629	16,574	10,055	..	282,524
Buller	710,969	818,176	..	107,207	13,687,056
Inangahua	12,151	11,362	789	..	253,107
Grey	529,245	505,070	24,175	..	8,166,387
Canterbury	15,954	11,707	4,247	..	699,182
Otago	293,604	312,685	..	19,081	8,571,585
Southland	159,657	159,566	91	..	2,586,060
Totals	**2,208,624**	2,275,593	..	66,969	**41,833,036**

No. 7.

TABLE SHOWING THE DIFFERENT CLASSES OF COAL FROM THE MINES IN THE DOMINION.

Name of Coal.	Output of Coal.		Increase.	Decrease.	Approximate Total Output of Coal up to the 31st December, 1915.
	1915.	1914.			
	Tons.	Tons.	Tons.	Tons.	Tons.
Bituminous and semi-bituminous	1,267,940	1,492,315	..	224,375	25,246,582
Pitch	136,460	1,998	134,462	..	2,132,052
Brown	725,001	691,367	33,634	..	12,491,312
Lignite	79,223	89,913	..	10,690	1,963,090
Totals	**2,208,624**	2,275,593	..	66,969	**41,833,036**

No. 8.

A Return showing the Total Quantity and Value of Coal imported into and exported from New Zealand from and to each Country during the Year ended the 31st December, 1915.

Imported.			Exported.		
Countries whence imported.	Quantity.	Value.	Countries to which exported.	Quantity.	Value.
	Tons.	£		Tons.	£
United Kingdom	50	50	United Kingdom	183,916	194,506
Australia	347,107	338,131	Straits Settlement ..	1,793	1,299
Fiji	6,314	6,314	South African Union ..	200	210
			Canada via West Coast ..	3,350	3,350
			Australia	35,874	33,652
			Fanning Island .. .	20	38
			Fiji	12,915	10,126
			Egypt	29,621	31,355
			Argentina	1,400	1,015
			Chile	4,140	4,031
			U.S.A. via East Coast ..	3,157	2,944
			U.S.A. via West Coast ..	1,915	2,019
			German Samoa	4,949	4,512
			Gilbert and Ellice Islands .	1,123	1,323
			Guam	32,817	33,079
			Society Islands .. .	4,800	4,258
			Tonga	2,002	2,014
Totals	**353,471**	**344,459**	Totals	323 992	**329,731**

No. 9.

Number of Persons ordinarily employed in Mining during the Year ended 31st December, 1915.

County or Borough.	Number of Persons Ordinarily Employed at				Total.
	Gold-quartz Mines.	Gold Alluvial Mines.	Gold-dredges.	Mines other than Gold and Coal.	
Northern Inspection District.					
County and Borough of Thames	196	..	..	..	196
County of Ohinemuri	395	..	..	..	395
,, Coromandel	62	..	..	..	62
,, Piako	2	..	..	..	2
Borough of Tauranga	2	..	..	..	2
,, Waihi	1,207	..	..	..	1,207
Puhipuhi district	..	..	..	6	6
Rotorua	2	..	..	..	2
Great Barrier Island	6	..	..	..	6
West Coast Inspection District.					
County of Marlborough	88	4	..	..	92
,, Waimea	12	..	..	..	12
,, Collingwood	2	11	..	..	13
,, Murchison	..	50	..	..	50
,, Buller	..	48	..	..	48
,, Inangahua	677	6	47	..	730
,, Grey	..	131	23	..	154
,, Westland	5	172	11	..	188
Borough of Ross	..	69	..	..	69
Southern Inspection District.					
County of Taieri	..	..	..	2	2
,, Tuapeka	6	192	43	..	241
,, Vincent	14	69	144	..	227
,, Maniototo	..	71	6	..	77
,, Waihemo	23	..	..	5	28
,, Waitaki	..	21	..	..	21
,, Lake	4	51	11	37	103
,, Wallace	..	51	..	..	51
,, Bruce	..	..	20	..	20
,, Southland	..	73	122	..	195
Stewart Island	..	..	..	6	6
Totals	2,703	1,019	427	56	4,205

Summary of Persons ordinarily employed in or about New Zealand Mines during 1915 and 1914.

	1915.	1914.	Decrease.
Gold, silver, and scheelite	4,193	4,444	251
Other metalliferous mines	12	26	14
Coal-mines	4,156	4,734	578
Totals	8,361	9,204	843

DIAGRAM showing QUANTITY & VALUE of GOLD exported annually from N.Z.
For the years 1857 to 1915

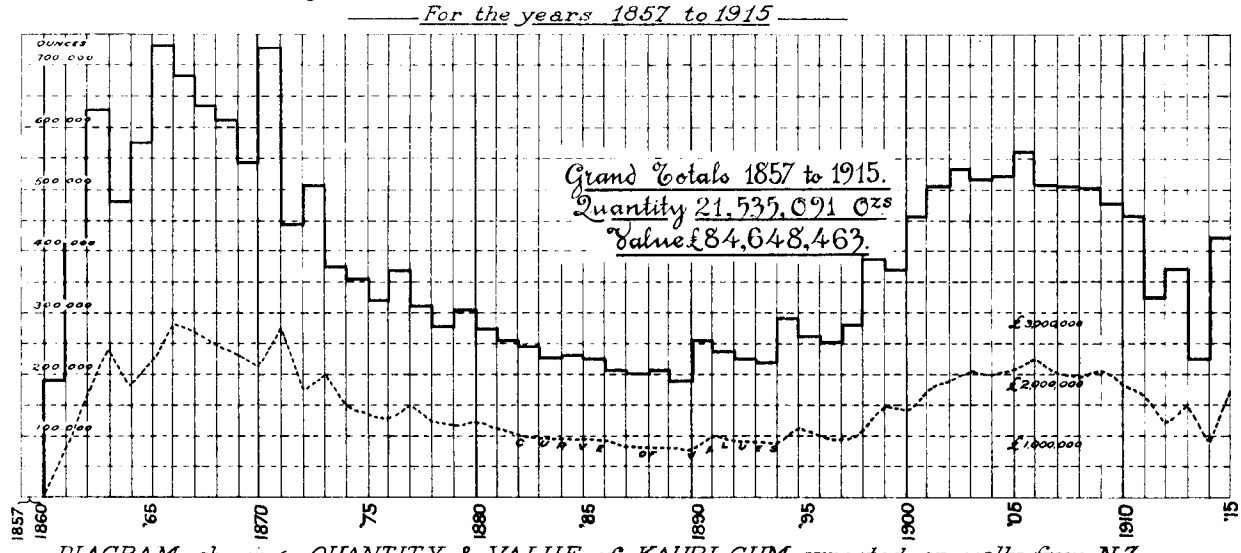


DIAGRAM showing QUANTITY & VALUE of KAURI GUM exported annually from N.Z.
For the years 1853 to 1915.

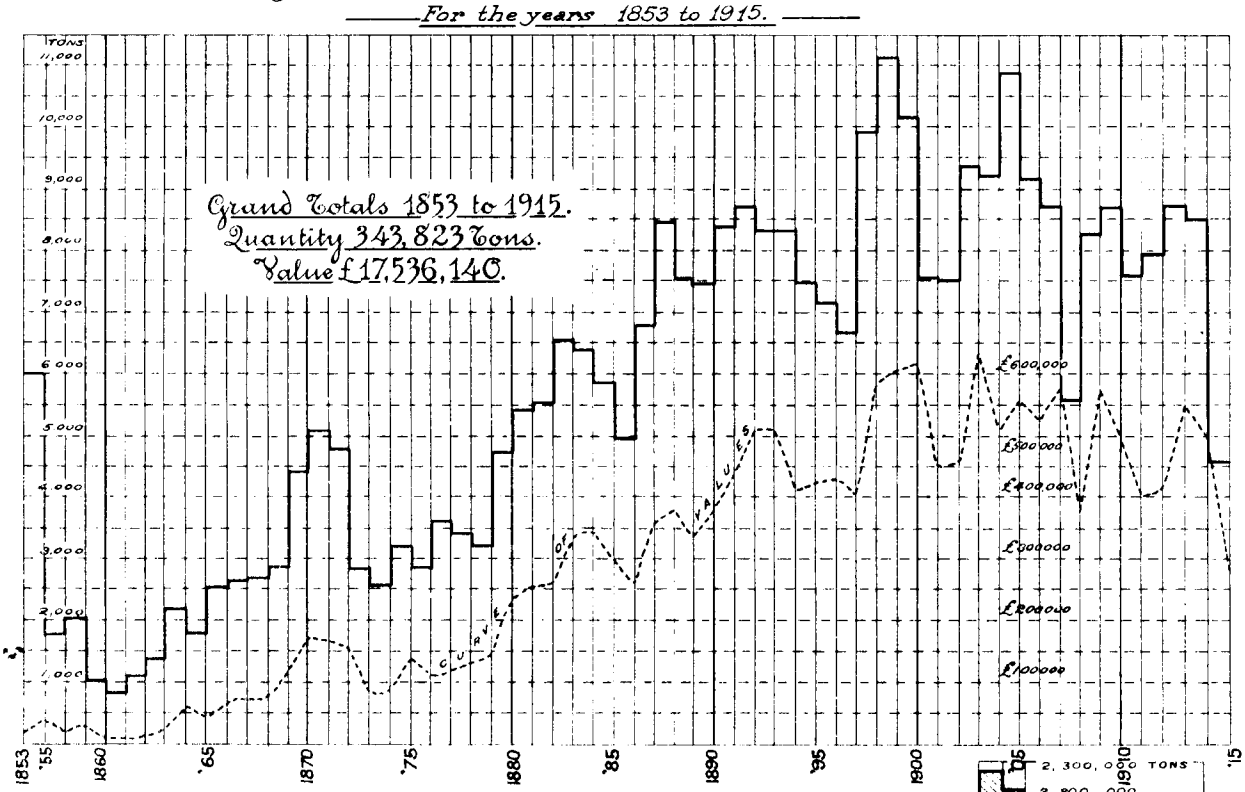
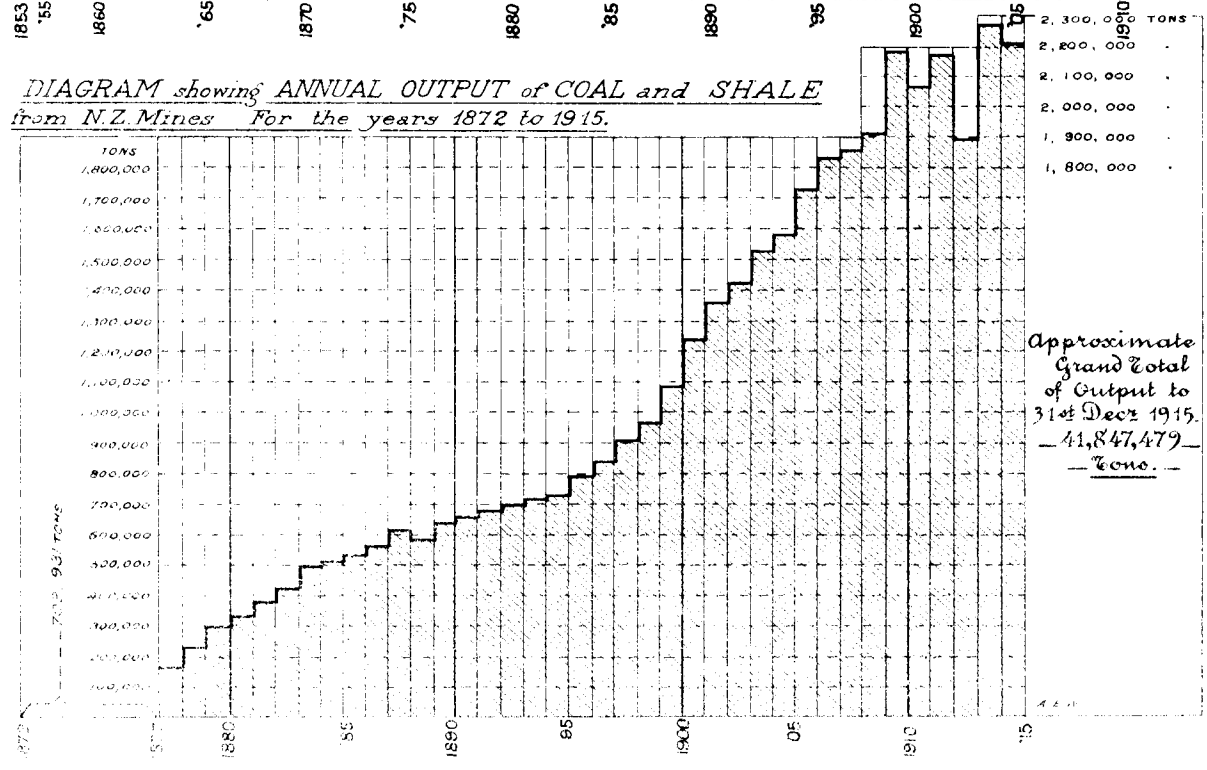


DIAGRAM showing ANNUAL OUTPUT of COAL and SHALE from N.Z. Mines For the years 1872 to 1915.



APPENDICES TO THE MINES STATEMENT.

APPENDIX A.

REPORTS RELATING TO METALLIFEROUS MINES AND STONE-QUARRIES.

The INSPECTING ENGINEER OF MINES to the UNDER-SECRETARY OF MINES.

SIR,— Wellington, 14th April, 1916.

I have the honour to present my tenth annual report on metalliferous mines, together with annexures and statistical information, for the year ended 31st December, 1915.

In accordance with the usual practice, the tables showing expenditure through the Mines Department on roads, bridges, tracks, prospecting operations, &c., are for the period covered by the financial year—viz., from the 1st April, 1915, to the 31st March, 1916.

The reports, &c., are divided into the following sections:—

I. Production of Minerals.
II. Persons employed.
III. Accidents.
IV. Gold-mining.
  (1.) Quartz-mining.
  (2.) Dredge Mining
  (3.) Alluvial Mining
V. Minerals other than Gold.
VI. Stone-quarries.
VII. State Aid to Mining.
  (1.) Subsidized Prospecting.
  (2.) Subsidized Roads on Goldfields.
  (3.) Government Prospecting-drills.
  (4.) Government Water-races.
VIII. Schools of Mines.

Annexures,—
  Reports of—
    (*a.*) Water-race Managers.
    (*b.*) Directors of Schools of Mines.
    (*c.*) Mining Statistics.
    (*d.*) Examinations under the Mining Act, 1908, and Lists of Certificate-holders.

I. PRODUCTION OF MINERALS.

The following statement shows the value of the exports from metal-mines and kauri-gum fields from the 1st January, 1853, to the 31st December, 1915:—

Classification.	1914.	1915.	Increase.	Total from the 1st January, 1853, to the 31st December, 1915.
	£	£	£	£
Gold	895,367	1,694,553	799,186	84,648,463
Silver	62,085	95,583	33,498	2,096,382
Other minerals	29,338	33,161	3,823	550,508
Kauri-gum	497,444	279,133	218,311*	17,536,140
Totals	**1,484,234**	**2,102,430**	**618,196**	**104,831,493**

* Decrease.

Owing to the prohibition by the Banking Amendment Act, 1914, which came into operation on the 5th August of that year, of the export of gold except with the consent of the Minister of Finance, the value of gold and silver exported is no indication of the annual production. During 1915 the prohibition was removed, and the quantity of bullion exported during that year considerably exceeded that won during the same period.

The official returns from gold-mines show that bullion to the value of £1,348,489 was produced during 1915, being approximately £154,160 less than the production of the previous year.

II. PERSONS EMPLOYED.

The following statement shows the number of persons ordinarily employed in or about the metalliferous mines of the Dominion during the year:—

Classification.	Inspection District.			Total, 1915.
	Northern.	West Coast.	Southern.	
Gold, silver, and scheelite	1,870	1,356	921	4,149
Cinnabar	...	...	44	44
Tin	6	...	...	6
Copper	...	...	6	6
Total for 1915	1,876	1,356	971	**4,205**
Total for 1914	1,976	1,380	1,114	4,470

The decrease in the number of persons employed may, to a considerable extent, be attributed to enlistment for military service.

III. ACCIDENTS.

The following is a summary of persons killed or seriously injured in metalliferous mines during 1915:—

Inspection District.	Explosions.		Falls of Ground.		In Shafts.		Miscellaneous Underground.		Surface.		About Dredges.		Total.	
	Killed.	Seriously Injured.	Killed.	Seriously Injured.	Killed.	Seriously Injured.	Killed.	Seriously Injured.	Killed.	Seriously Injured.	Killed.	Seriously Injured.	Killed.	Seriously Injured.
Northern	2	4	2	2	1	...	1	...	...	...	...	...	6	6
West Coast	...	...	1	3	...	...	1	1	1	1	...	...	3	5
Southern	...	...	1	...	...	...	...	...	...	...	...	2	1	2
Totals	**2**	**4**	**4**	**5**	**1**	...	**2**	**1**	**1**	**1**	...	**2**	**10**	**13**

Being at the rate of 2·38 fatalities per 1,000 persons employed.

TABLE SHOWING NUMBER OF DEATHS FROM ACCIDENTS AT NEW ZEALAND METAL-MINES AND DREDGES DURING TEN YEARS 1906 TO 1915 (INCLUSIVE).

Cause of Accident.	1906.	1907.	1908.	1909.	1910.	1911.	1912.	1913.	1914.	1915.
Explosion	3	...	3	2	2	1	...	...	...	2
Fall of ground	3	2	2	1	1	2	1	5	3	4
In shafts	1	...	1	3	5	...	1	3	1	1
Miscellaneous—										
Underground	...	...	2	1	...	...	2	...	...	2
On surface	1	2	6	5	3	2	...	2	2	1
About dredges	6	3	1	2	4	...	1	...	...	...
Total killed	14	7	15	14	15	5	5	10	6	10
Number of employees	8,716	9,389	8,880	7,651	8,121	7,400	5,239	4,941	4,470	4,205
Number of persons killed per 1,000 employed	1·60	0·84	1·69	1·83	1·84	0·67	0·95	2·02	1·34	2·38

During the past ten years the proportion of fatal accidents at metal-mines per 1,000 persons employed has averaged 1·32.

From the table describing the fatal mining accidents it will be seen that two fatalities may be attributed to absence of care by mine officials—viz., in the cases of Hugh McQuillan, at Ross Mine, and James Walker, at the Lake Hochsteller Water-race. In the case of Alfred Stone, killed at the Talisman Mine, the evidence given at the inquest showed that the deceased and his mate had exceeded the maximum number of shots (six) at one time, as provided by the regulations; there was no evidence, however, to show that the accident was due to such negligence. The fatalities to David Kennedy, Max Oertmann, and James Lanini were due to the sufferers working in dangerous situations which more careful men would have avoided. The remaining four fatal accidents may be classed as unpreventable by regulations or by reasonable supervision, although some suspicion may be attached to the gelignite which killed John P. Vocasivitch and Alfred Stone on different occasions at the Talisman Mine.

During 1915 there occurred six fatal accidents by which seven lives were lost, and seven other serious but not fatal accidents, all by premature explosion of gelignite at our coal and metal mines

and stone-quarries.* This is an abnormal and very bad record, and caused apprehension that the gelignite was defective. In consequence of this the Dominion Analyst and Chief Inspector of Explosives, J. S. Maclaurin, D.Sc., carried out a number of experiments with gelignite obtained at places where accidents had occurred, with the result that it was found that much of the gelignite imported into New Zealand during the war was made with sodium nitrate in place of the corresponding salt of potassium, owing to shortage of the latter in Great Britain. Sodium nitrate is known to absorb moisture very readily, and gelignite was found which for that reason would not detonate. The condition was readily recognized by the swelling of the cartridges, which first occurs at the ends, the contents becoming of putty-like consistency. Circulars have been issued by this Department advising that—

(1.) Gelignite should on no account be stored in a damp place.
(2.) It should be kept in the paraffin sealed packets until required for charging, and the use of powder-cans for the conveyance of explosives from the magazine to working-place should be strictly enforced.
(3.) Broken cartridges or cartridges that have become damp should not be allowed to accumulate, but should be destroyed.
(4.) Cartridges showing any considerable amount of swelling, or which on cutting show moisture throughout the mass, should not be inserted in the charge, as they might fail to carry the detonation-wave, and so leave part of the charge unexploded in the hole.
(5.) Detonators of No. 7 size should be used when obtainable in preference to No. 6.

Fatal Accidents at Mining Operations other than Coal-mining.

The following is a brief description of accidents at mining operations other than coal-mining during 1915:—

Name of Person killed.	Date of Accident.	Mine or Claim.	Cause of Accident, and Remarks.
David Kennedy ..	8/1/15	Adams and Weir's (hydraulic-sluicing) claim, Marewhenua	While removing a landslip in a tail-race 15 ft. deep, about half a ton of earth fell, burying deceased and killing him. The sufferer had but little mining experience. The Coroner's jury returned a verdict that no one was blameworthy.
John P. Vocasivich	14/1/15	Talisman Mine (quartz)	Deceased and his mate, John McClair, experienced miners, had just recommenced after a stoppage of several weeks to put a rise in the hanging-wall of the lode above No. 14. level. Immediately previous to such stoppage a round of eleven holes had been fired in two sections, eleven reports being counted. Before commencing to drill McClair states that they made a thorough examination of the face, working down all loose ground and the remains of an old hole, and they washed the face with a strong jet without disclosing the presence of any undischarged gelignite. While the seventh hole, distant 15 in. from the observed old hole, was being drilled in a different direction therefrom, an explosion occurred killing Vocasivich and inflicting minor injuries to McClair. The jury were of opinion that the drill had struck gelignite which had fallen into a vug during previous operations; and that no person is blameworthy. Owing to the frequency of late of premature explosions of gelignite, I believe that it is just as likely that inferior gelignite had remained unexploded in the butt of an old hole, and that the drill came in contact therewith.
Hugh McQuillan ..	27/1/15	Ross Mine (deep alluvial)	Deceased, the experienced driver of the electric winder, was electrocuted while endeavouring to work with his bare hand the switch of the telephone transformer, placed high up on the wall of the winding-room. Owing to a break in the transmission-line a connection had been made between the high-potential power-line and the telephone-line, causing the telephone transformer to spark. In his anxiety to save his employers' property deceased used his bare hand, no insulating-pole being kept by the management in the building, it is alleged, owing to the dampness of the same. The Coroner returned a verdict of "Accidental death by electric shock." Subsequent action by the widow claiming £2,000 damages from the company failed. Notwithstanding that deceased acted rashly, the management cannot be held blameless in not seeing that an insulating-pole was kept in a dry place in the winding-room.
James Walker ..	27/2/15	Lake Hochstetter (alluvial claim)	Deceased was the attendant in charge of an oil-engine and pump situated at the junction of an inclined and a level tunnel, driven in connection with the company's water-races. By a reversal of the natural ventilation, carbon-monoxide gas (white-damp) produced by the oil-engine, and which escaped from badly made joints and from the end of the exhaust-pipe within the drive, was inhaled by deceased, who was poisoned by this deadly gas. The Coroner found that deceased was poisoned by gas from the oil-engine in his charge. Action was taken against the company by the Public Trustee on behalf of the dependants of deceased, and compensation was paid to them.

* Since the above was written—viz., on 15th May, 1916—a premature explosion occurred in a drive at the Public Works stone-quarry, Ohakune. Six lives were lost, and two persons were injured.

FATAL ACCIDENTS AT MINING OPERATIONS OTHER THAN COAL-MINING—*continued.*

Name of Person killed.	Date of Accident.	Mine or Claim.	Cause of Accident, and Remarks.
Alfred Stone ..	31/3/15	Talisman Mine (quartz)	Deceased, and his mate, Leslie Kirk, were driving the face of the S drive, No. 15 level. After spitting and firing in one section eleven holes (in contravention to Regulation 94 (9), six holes being the maximum under those conditions), it is alleged that eleven reports were counted, they returned to the place to work down loose ground; they subsequently erected the rock-drill. After striking a few blows with the drill an explosion occurred killing deceased and injuring Kirk's eyes. The Coroner delivered a verdict that the injuries were received owing to the drill coming into contact with unexploded gelignite, which he believed had fallen from some previous charge into a crevice, and he recommended that faces should be hosed down before firing, and a search made for unexploded cartridges. The Inspector of Explosives drew attention in his evidence to the necessity of keeping all gelignite perfectly dry and the advisability of using detonators of No. 7 size in preference to No. 6. The recommendation of the Coroner is now incorporated in the new Mining Regulations, 94 (9).
Frederick Paton ..	25/4/15	Talisman Mine (quartz)	Deceased, a pumpman, with two others, was engaged repairing a sinking-pump near the bottom of the Talisman inclined (63°) shaft, when he slipped from a ladder and fell to the sump below, receiving concussion of the brain when falling. The Coroner returned a verdict of accidental death.
Peter Antwis ..	2/5/15	Waihi Grand Junction Mine (quartz)	This fatality occurred in a stope worked on the shrinkage system on the Royal lode above No. 6 level. The deceased with his mate, together with the assistant manager and shift boss, were debating where to start cribbing a double pass when a large piece of quartz fell from the back of the stope, killing deceased instantaneously. Although the highest point of the stope did not exceed 5 ft. a proper examination of the back had not been made that morning before the commencement of work. The Coroner returned a verdict of accidental death, with a rider that the attention of miners should be drawn to the importance of a thorough examination of each stope before commencing work each shift; obviously sound advice.
Max Oertmann ..	28/8/15	Ross Mine (deep alluvial)	Deceased, a competent miner, was working with his mate in one of the blocking-faces above the No. 7 level. The ground was worked on the false-set system, the roof being compact gravel. The timber was temporarily held together by two short and two long timber dogs, which were removed and refixed as further sets were erected. Deceased having stood a main set, stepped back to remove the dog from the last set to the main set next to the trucking road, his mate holding one end of the dog while he knocked out the other end. Directly he had done so one set sprung and fell to the face, pushing over the false set and the main set; deceased, who was standing so as to keep the set in position, was buried under a fall of ten or fifteen tons of coarse gravel and wash. An inquest was held and a verdict of accidental death was returned by the jury.
John Matthew ..	1/10/15	Waihi Mine (quartz)	The deceased, a Maori, was standing on the quartz at the top of an uncovered pass in a stope about 50 ft. above No. 10 level when the quartz, which had become blocked, suddenly collapsed, precipitating him down the pass and burying him; an hour later when his body was uncovered life was extinct. The Coroner returned a verdict of accidental death, with a rider drawing attention to the clause in stoping contracts providing that all passes shall be securely covered with strong poles, and that when a pass is in use no space exceeding 12 in. wide shall be left open for quartz or filling material. Deceased was mining on contract, and in charge of the stope wherein he was killed.
James Lanini ..	15/11/15	Bell Hill (sluicing-claim)	At the time of this accident deceased was working in an open channel about 45 ft. deep. The channel connects a tail-race tunnel with a sluicing-paddock, and is constructed through fine gravel and silt. It was without adequate batter or timber support, having only been completed a few days. A fall suddenly occurred during rain, burying deceased. When extricated about three hours later he was dead. A verdict of accidental death was returned by the Coroner at the inquest which followed.

IV. GOLD-MINES.

The following statement shows the value of the bullion-production, also the dividends declared, number of persons employed, and number of gold-mines and dredges :—

—	Production of Bullion, 1915.* (All Mines.)	Dividends paid, 1915. (By Registered Companies only.)	Number of Persons ordinarily employed.	Number of Working Mines, Dredges, and Claims.
	£	£		
Quartz-mining	1,030,524	237,165	2,703	62
Dredge mining †... ...	164,605	26,332	427	52
Alluvial mining ‡ ...	153,360	11,118	1,019	283
Totals, 1914 ...	**1,348,489**	**274,615**	**4,149**	**397**

* In addition to the gold produced from the gold-mines, silver was obtained from them, hence the word "bullion" is used in preference to "gold."

† The bullion-production is from 52 dredges, but the dividends given are only from 21 of these, the property of registered companies. The profits of privately owned dredges and mines are unobtainable, which renders this statement incomplete.

‡ The bullion-production is from 283 alluvial claims, but the dividends are only ascertainable from those few that are the property of registered companies.

(1.) Quartz-mining.

The following is a statement showing the tons of ore treated, the value of bullion produced, and the amount of dividends paid by quartz-mining companies in each of the inspection districts during the years 1914 and 1915 :—

Inspection District.	Statute Tons of Ore treated.		Value of Bullion.		Dividends paid. (By Registered Companies only.)	
	1915.	1914.	1915.	1914.	1915.	1914.
			£	£	£	£
Northern	330,199	347,194	796,685	911,733	210,016	266,165
West Coast	151,161	148,069	231,150	239,237	27,249	22,100
Southern	3,269	6,076	2,689	3,244	...	...
Totals	**484,629**	**501,339**	**1,030,524**	**1,154,214**	**237,265**	**288,265**

The following is a statement of the production, dividends declared, and the number of persons employed by the principal gold-quartz mining companies during 1915 :—

Name of Company.	During 1915.			Dividends paid.		Number of Persons ordinarily employed.
	Quantity of Quartz treated.	Value of Bullion.	Average Value per Ton.	1915.	Total to End of December, 1915.	
	Statute Tons.	£	£ s. d.	£	£	
Northern District—						
Waihi Gold-mining Company (Ltd.)*	171,725	327,394	1 18 1½	99,181	4,676,902	753
Waihi Grand Junction Gold-mining Company (Ltd.)	112,321	200,270	1 15 8	46,047	151,750	436
Talisman Consolidated (Ltd.) ..	26,230	188,620	7 3 10	64,688	1,030,222	280
West Coast District—						
Dominion Consolidated	17,484	12,472†	0 14 3	2,250	2,250	80
Blackwater Mines (Ltd.)	54,643	109,285	2 0 0	24,999	137,495	207
New Big River Gold-mining Company (Ltd.)	2,938	11,869	4 0 9½	..	91,200	60
Other quartz-mines throughout New Zealand	99,288	180,614	1 16 4	..	Unknown	887
Totals, 1915	**484,629**	**1,030,524**	**2 2 6**	**237,165**	Unknown	**2,703**

* The total value of the output of this company at the end of the year was £1!,114,432. The dividends here given are free of income-tax.

† In addition, scheelite concentrate, value £14,133, was obtained from the quartz treated.

There has been a decrease in the value of bullion produced from quartz-mines amounting to £123,690. To this reduction all quartz-mining districts have contributed, although slight increases have occurred at a few mines, including Waihi, Blackwater, and the Dominion Consolidated. No new developments of importance have occurred, and the year has been unimportant for the quartz-mining industry.

Northern Inspection District.

At the Waihi Mine a crosscut is being projected from No. 12 (1,447½ ft.) level in a favourable dacite country. At No. 11 (1,301 ft.) level the Edward and Empire lodes have proved payable, but the Martha lode has been very irregular in value. Turbo pumps having been installed in No. 4 shaft are now working satisfactorily: this shaft had at the end of the year attained a total depth of 1,470½ ft. from the surface.

The Waihi Grand Junction Mine main shaft has been continued to a total depth of 1,300 ft.; from 1,270 ft. downwards being through a low-grade quartz-calcite. Sinking is now suspended owing to the influx of water exceeding the capacity of the electric sinking-pump—viz., 40,000 gallons per hour. Stationary high-lift turbo pumps were installed at No. 7 (1,200 ft.) level. At that level the Empire and Royal lodes have been considerably developed, and have proved profitable, although there has been a decline in the average value of ore treated from £2 4s. 1d. to £1 15s. 8d. during the past year.

At the Talisman Consolidated Mine the Talisman shaft was sunk to a depth of 40 ft. below No. 15 level, and the Otis pump installed thereat. A cross-cut was driven westward from that shaft, connecting with the Bonanza section No. 15 level. Above No. 14 level all ore has been extracted in the Bonanza and Dubbo sections. In the Woodstock section the main south drive was connected with the Talisman shaft at a depth of 76 ft. below No. 14 level. Driving south on the Maria lode off No. 2 crosscut several short runs of ore were proved. It is proposed to considerably extend the east and west crosscuts from the main north drive, Woodstock section, also to continue driving south from No. 2 crosscut. In the Bonanza section winzes are now being sunk from No. 15 level and the north drive continued. On the occasion of my last inspection the deepest workings on the lode—viz., a winze from No. 15 level, exposed very poor mineral, containing a considerable proportion of galena in large crystals.

The Waihi-Paeroa Gold Extraction Company having installed a large Priestman dredge is now enabled to obtain a more constant supply of old tailing from the Ohinemuri River, and to deal more effectively with timber on the river-bed. During the year 148,100 tons of tailing was raised and treated for a return of £39,700, as compared with 144,300 tons for £42,950 during 1914.

West Coast Inspection District.

For much of the information herein concerning West Coast quartz-mines I am indebted to the Inspector of Mines for that district.

Dominion Consolidated Mining and Development Company: Mining has been carried on during the whole year with the best results yet obtained by this company. The value of gold obtained was £12,471 12s. 8d., and scheelite-concentrate amounting to 110 tons was sold for £14,133 2s. 3d. A dividend of £2,250 was declared. The development of the mine is not being pushed on as it should be, and work below No. 3 level is urgently required to find the ore below the fault which interrupts it at this level. An improved water-supply has now been secured, and this has enabled milling to be carried on without interference during the dry months; and this factor, together with the increased price of scheelite due to the war, has evidently produced the improved return for the year.

Development at Murray Creek Mine has been very satisfactory during the year, the lode discovered at No. 2 level having assumed a steeper dip, and at No. 3 level has been lengthened to 366 ft. At this level the country is less disturbed than above, and there is reason to expect that the lode will be as good at No. 4 level, for which the shaft is now being sunk. The gold-content of the ore as proved by crushings is nearly 1 oz. per ton, which even in a small lode should leave a fair margin of profit. The mine, however, will not be worked cheaply, owing to the small inclination of the lode; the hanging-wall is heavy, and the ore has to be trucked a very long way to the mill.

At the Energetic Mine prospecting by driving on two separate lines of lode is in progress. The situation of this claim is a good one, between the Keep-it-Dark and Wealth of Nations on the south, and the Murray Creek and Golden Treasure on the north. There appears to be a likelihood of more than one payable lode running into it.

At the Wealth of Nations Mine work has been carried on during the whole year. The return, £40,710 2s. 6d., from 10,250 tons treated, shows a slight increase upon that of 1914. The lode has been struck in No. 12 (1,980 ft.), the bottom level, and is quite payable in value and up to 25 ft. in width. Altogether this mine looks better than it did a year ago.

Work at the Keep-it-Dark Mine has been carried on during the whole year, but the yield £11,064 14s., from 10,985 tons, must have been unpayable. There is plenty of ore in the mine, but, unfortunately, it is too low-grade to pay for working, and unless something of better value is discovered in the next level it is hardly likely that work will be long continued.

The Progress Mines has had another unprofitable year, having crushed 36,160 tons for a return of £37,695, or £1 0s. 9d. per ton. No important development has occurred during the year, and the lost lode beyond the main faults remains undiscovered. Ore reserves are rapidly diminishing.

At New Big River Mine the main shaft has been deepened, and No. 11 (1,760 ft. level has been driven and a rise put up to meet the lode. This development was not completed in time to keep up the monthly returns after the ore became exhausted above No. 10 (1,575 ft.) level, and for this reason the output for the year was only £11,869, from 2,938 tons, as compared with £30,195 from 6,273 tons for 1914. The management anticipate better results again now that the new level has been opened up.

The Blackwater Mine has produced gold to the value of £109,284, from 54,643 tons, the highest annual production hitherto attained at this mine. Of this amount £24,999 8s. was distributed in dividends, and the total so paid now amounts to £137,495 2s. The year's development has not been altogether satisfactory, as the lode in the lowest levels is smaller and more disturbed than it was above, and the ore reserve in sight must be now considerably less than was the case two years ago.

At the North Blackwater Mine a main shaft is now being sunk to open up the extension of the Blackwater lode at greater depth. This lode is the most regular and persistent yet discovered in the district, being 2,500 ft. in length, and having maintained its character and quality uniformly from the the surface down to the present depth of nearly 1,100 ft. The lode as exposed in the mine is interrupted by two very well-defined faults, which show at every level and separate the stoping operations into three main blocks. These faults and also the north and south ends of the reef have a pitch of about 35° to the north, so that it is apparent that in depth the lode will cross the north boundary of the Blackwater Claim into the North Blackwater Mine. This is calculated to occur at a depth of 820 ft. below the collar of the North Blackwater shaft, and from that point every foot sunk will give approximately 2 ft. increased length of lode. The shaft is now being sunk, and is now down 230 ft. It is well timbered, and all provision has been made for ventilation and for rapid handling of material, so that the work should now continue without interruption. The adjoining Blackwater Mine has now produced some £600,000 worth of gold, so that with a prospect of developing a mine of similar value the North Blackwater Company is fully justified in its operations.

At the Blackwater South Mine during the year a crosscut has been driven which has intersected what is known as the Empire lode, at a lower level than that driven by the Blackwater Mines (Limited), which that company prospected when the property was under option to it. In driving south from the crosscut some small bunches of quartz have been met with, but nothing of any value proved, thus verifying the results which led the Blackwater Company to abandon its option.

It is reported that further work will now be done in sinking from Absalom and party's old tunnel south of the Blackwater Mines, but when this was driven, under subsidy from the Department, the prospects were not encouraging; all the information available tended to show that the limit of the lode to the south lies within the Blackwater Company's own boundaries.

At the Millerton Gold-mine the shaft was deepened to No. 3 level, and the lode was intersected by a crosscut and driven on for 60 ft. As was the case at No. 2 level, there was no value in the quartz, and all work has now been stopped for some months. This lode carried gold at two points where it had been intersected and eroded by valleys—viz., the present valley of Snowy Creek and the old valley, now filled with a deposit of alluvium, which was run into by a drive north on the lode. The gold at these two places was probably the result of mechanical enrichment by erosion of the upper portion of the lode, and as soon as this enriched portion was passed through the remainder of the lode was found to be quite unpayable.

At Mount Greenland, near Ross, a Wanganui syndicate has kept two or three men employed, but has practically no further developments of the reef to show. A small battery is being prepared to crush the stone won from development, but the concern is being run in a most unbusinesslike manner, and the future prospects are very doubtful.

(2.) Dredge Mining.

West Coast of the South Island.

During the year two new dredges were put into commission, viz., the Murray's Freehold and the Ahaura River, and a third, the Worksop No. 2, it is proposed to start early in 1916.

The Worksop No. 1, having worked out the claim, is now idle. The new dredge to replace the Hessey-Cameron dredge which sank at Capleston is now in commission, and returns from it are satisfactory.

There have been no sensational returns during the year, but all the dredges at work have more than paid their way, and the owners of the Ahaura dredge and the Worksop No. 2 expect good results in 1916.

If the Australian firm which has been prospecting Rimu Flat is successful in raising the required capital, it is reported to be their intention to use the American type of dredge with close-connected buckets of about 12 cubic feet capacity. This type of dredge has not hitherto been employed in New Zealand.

All the dredges in commission have been well kept throughout the year, and safety appliances are duly provided and maintained.

Otago and Southland.

A steady decline continues in this branch of mining in Otago and Southland. Six dredges ceased operations and were dismantled during 1915. The Clutha River has kept at a high level throughout the year, consequently the dredges operating in its gorges were unable to work.

The Pride of the Clutha dredge at Miller's Flat resumed work under new ownership after a period of suspension extending over eleven months.

An innovation in the method for saving fine gold, which is said to give good results, has been adopted on McGeorge's Freehold Nos. 2 and 3 sluice-box dredges at Waikaka. The innovation consists of the installation of a second box directly below the main box, with the space of about 2 ft. separating them. A cut 2½ in. wide is put through the bottom of the upper box over its full width a short distance below the point of discharge of gravel from the buckets. The opening is protected by the angle-iron ripples in the box, but it allows most of the fine drift to pass through to the lower box, which is lined with coconut-matting for saving the fine gold.

Statement showing the Production and Dividends paid by Dredges the property of Registered Companies, 1915.

Name of Dredge.	Production during 1915 of all Dredges.	Dividends paid by Dredges owned by Registered Companies.	
		During 1915.	To 31st December, 1915.
Otago and Southland—	£	£	£
Rise-and-Shine (2)	11,060	7,800	47,700
Rising Sun	5,739	800	22,400
Electric (2)	5,808	2,600	132,600
Earnscleugh (3)	14,901	3,300	30,250
Ngapara	4,374	1,050	2,925
New Golden Run	6,387	1,200	3,200
Golden Gate	2,492	1,000	1,000
Golden Bed	2,199	667	667
Cardrona	1,639	400	800
Lower Nevis	2,821	690	2,730
Crewe No. 2	1,964	250	9,125
Otakau	3,975	975	975
Willowbank	2,055	600	6,600
Paterson's Freehold	3,016	600	22,200
West Coast, South Island—			
Success	7,126	2,000	2,000
Red Jacks	4,357	900	900
Worksop	4,708	1,500	43,350
Thirty-one other New Zealand dredges, including those privately owned ...	79,984	*	*
Totals	**164,605**	**26,332**	*

* The profits made by privately owned dredges are unknown, not being included in returns to the Mines Department.

The following table shows the result of dredge-mining operations in New Zealand during the past ten years:—

Year.	Total Number of Dredges working.	Value of Production.	Average Production per Dredge.	Dividend-paying Dredges owned by Registered Companies.		Number of Persons employed.
				Number.	Dividends.	
		£	£		£	
1906 ..	167	505,199	3,025	66	103,722	..
1907 ..	128	419,634	3,278	65	89,707	1,150
1908 ..	123	373,818	3,039	47	75,800	1,013
1909 ..	111	327,676	2,952	37	56,788	893
1910 ..	104	315,237	3,031	35	51,918	838
1911 ..	93	297,900	3,203	31	45,318	775
1912 ..	87	257,333	2,958	28	38,841	694
1913 ..	74	195,848	2,646	11	18,750	621
1914 ..	64	191,112	2,986	16	23,080	491
1915 ..	52	164,605	3,165	21	26,333	427

The greatest weekly output by a gold-dredge was attained by the "Lady Ranfurly," on the 4th November, 1904. This dredge, operating on the River Molyneux (Clutha), obtained 1,273 oz. of gold in six consecutive days; it was owned by the Electric Gold-dredging Company, who at the end of 1913 had obtained gold to the value of £222,155 by dredging, of which £130,643 was distributed as dividends.

(3.) Alluvial Mining.

The value of the production from alluvial claims amounted to £153,360, as compared with £157,323 during the previous year. The returns would have been better but for the prolonged dry weather in parts of Otago and Southland, where the principal claims are situated. On the west coast of the South Island, where formerly alluvial mining was very profitable, no registered alluvial-gold mining company distributed a dividend during 1915.

Early in the year a small rush took place to the valley of the Howard River, a tributary of the Buller River, neat Tophouse, regarding which Mr. T. O. Bishop, Inspector of Mines, reported during May as follows:—

"There has been some little excitement of late by the discovery of coarse gold in the Howard Valley, and the locality has been the scene of a small rush. On this visit I found about sixty men engaged in digging in the bed of the Louis Creek, a tributary of the Howard. This creek is being worked from end to end. The wash is very shallow, and consists of large stones resting on a soft granite bottom and filled in with fine gravel. The gold, which is all coarse, is found lying on the granite and stuck in small crevices, and in most of the claims the men save it not in a sluice-box, but by picking it up with a pocket-knife (fossicking) after moving the stones and washing the bottom. There is a considerable extent of alluvial terrace in this locality, and this has not yet been tried. No doubt in the coming spring and summer there will be a lot of prospecting done, and if the terraces prove payable there will be plenty of room for extensive mining. There will, however, be a great difficulty in obtaining any large water-supply for sluicing purposes should that be required."

During his last visit to the rush, in November, the Inspector found that there were about one hundred and fifty men employed, and all appeared satisfied with their earnings, of which, however, there is no record, as the greater number of miners are employed at ordinary claims, which make no returns to the Government. On the fourteen registered claims in operation twenty-one men were engaged, and gold to the value of £2,022 was produced therefrom. This, our latest alluvial discovery, may therefore only be regarded at present as a poor man's field.

For much of the following information regarding alluvial mining on the West Coast and in Otago and Southland, I am indebted to the reports of Inspectors of Mines, T. O. Bishop and A. Whitley respectively.

In the Maruia Valley there are still three parties making good wages by sluicing, and a newly formed company has commenced operations during the year at Taylor's Creek. It is reported that the wash is highly payable, but the water-supply is small and the ground which is exposed is rough and stony. The results of the next few months' work will prove the claim definitely.

The Carthage Gold-mining Company is still operating on the old beach lead at Fairdown. Six men are employed, and the returns should leave a fair margin of profit over working-expenses.

At Addison's Flat a few parties of working-men continue to make a living, but the English syndicate which spent considerable capital in opening up the old Shamrock lead got into financial difficulties and had to cease work. The ground was very stony, and the gold won was not sufficient to pay all expenses.

The Addison's Gold-mining Company, a newly established concern, undeterred by the fate which has attended so many other companies in this district, has taken over Carmody and party's claim, and is erecting a bucket elevator to handle the tailings and bringing in a water-race for power and sluicing purposes. The producing stage will not be reached for some time yet.

The few miners who remain at Charleston continue to make very good wages, and Messrs. Powell Bros., who are now treating black sand on a large scale, are doing very well.

The various tributary streams of the Grey River continue to support a few miners, and the returns from this source are about the same as for the past three years.

The Lake Hochstetter Company, which proposes to sluice the low-grade terraces near Riverview, Ahaura River, has not yet completed its water-race from Lake Hochstetter. Upon the result of this company's work the future of alluvial mining in Westland may largely depend. If it be proved that sluicing the higher terraces on a fairly large scale can be made to pay, then there may probably be several other similar ventures made.

Messrs McKay and party at Barrytown have had a year of steady and profitable work, but apart from this claim mining has practically ceased in the district.

From Maori Gully to Stafford there are about one hundred men engaged in sluicing operations on a small scale, and of these some are doing very well indeed, while others are making but small wages.

The Golden Terrace Company at Maori Gully has ten men employed, chiefly on water-race construction. From actual sluicing £542 worth of gold was won during the year, so that when the race is completed, if sluicing can be carried on full time with a good water-supply, the result should be payable.

The Hohonu Diamond Terrace Company has carried on sluicing at its claim with the old and limited supply of water, and has won £646 worth of gold during the year. The water-race construction has also been gone on with, and is almost completed for four miles and a half from the claim. The company is short of capital, and work will probably be suspended for some time pending new financial arrangements being made.

In the Hokitika district all work ceased during the year at the Montezuma Claim and the plant was removed to a new claim south of Ross. This also has proved a failure, and it is understood that the concern will now be wound up.

Golden Flat Claim, Kanieri: A very complete Kershaw pumping plant was installed on a pontoon on this claim and a paddock was opened out, but, after a run of a few weeks, work ceased, and the plant is now idle. The usual mistakes which are made in mining ventures were all repeated in this case—viz., insufficient capital, failure to ascertain by prospecting the value and nature of the ground to be worked, and a quite unsuitable plant for the claim. There can only be one result for all ventures which are conducted in this way.

The returns from the claims worked by small parties in the Rimu district show a slight falling-off, and there are fewer men employed than for the previous year. Those who remain are making good wages, and some a little better than that. Rimu Flat is again being prospected, this time on behalf of Sydney mining speculators.

On the 11th April, 1916, the shareholders of the Ross Goldfields Reconstructed (Limited), agreed to the voluntary winding-up of the company, being of opinion that the Ross Flat had, after exhaustive testing, proved valueless as a mining proposition, the sole cause of the company's failure being the low value of wash found in the mine.

Since the Cassius Claim was closed by influx of water in 1872 several costly attempts have been made to work the deep leads at Ross Flat, and the large sum of £234,100 has been expended in such attempts by the following companies: 1882—Ross Gold-mining Company, £30,000; 1885–87—Ross United Company, £97,000; 1907–11—Ross Goldfields (Limited), £51,928; 1911–16—Ross Goldfields Reconstructed (Limited), (two companies of that name), £35,173. The value of gold obtained by such companies was as follows: Ross United, £8,416, during six weeks' operations: Ross Goldfields (Limited), £1,928 from 10,336* trucks of wash, being 3s. 8½d. per truck; Ross Goldfields Reconstructed—to 31st December, 1914, £7,823, from 53,573 trucks of wash, being 2s. 10d. per truck; during 1915, £6,985, from 30,984 trucks of wash, being 4s. 6d. per truck; from 1st January to 15th April, 1916, £1,530, from 7,473 trucks of wash, being 4s. 1d. per truck.

Prior to the inundation and stoppage of the earlier claims during 1872, the returns from the deep-mining operations at Ross Flat are incomplete, but it was officially recorded at the time that from the Morning Star, Excelsior, and Cassius Claims £43,865 was obtained during a very brief period.

The whole of the operations at Ross since 1907 were confined to extending the Ross United and Cassius workings at from 161 ft. to 191 ft. below high-water level; no attempt was made to reach the main bottom, which the Ross United shaft, although carried by that company to a depth of 265 ft. below high-water level, had failed to do. Notwithstanding this, however, there exists no reason to believe that the Ross deep leads will ever pay to work, owing, chiefly, to the high cost of pumping. The quantity of water dealt with during recent operations varied between 1,700 and 2,200 gallons per minute. Owing to the nature of the leads, and the capacity of the plant, only a small daily output of wash was possible. A great deal of capital was lost on account of the unreliability of the hydro-electric pumping and transmission plant, which failed frequently during the earlier operations.

In his final report to the directors of the company, dated the 23rd March, 1916, Mr. K. M. Barrance, mining superintendent, stated as follows:—

"Development under Jones's Flat: The east drive off No. 2 shoot, which last year had advanced 350 ft., has been continued right under Cassius workings, and is now well under that area of Jones's Flat worked from the Morning Star shaft towards the Excelsior lease. Beyond disclosing—between 450 ft. and 700 ft. east of No. 2 shoot—an area of brown heavy pay-wash, about 200 ft. long by 80 ft. wide and 4 ft. 6 in. deep, there was no ground opened up which would pay a company to operate. The values met with after this run of pay-wash was confined to a depth of 2 ft., and were neither so good nor so consistent. For the last 300 ft. the wash has been low-grade in this direction. After passing the payable wash the underlying bottom continued to rise about 3 ft. 6 in. every 100 ft., and there is evidence at No. 19 North drive that the area of blue wash is only 120 ft. wide. At both ends of this drive the terrace-bottom rises up almost abruptly, possibly forming on the surface those low-grade terraces on either side of Jones's Flat which are commonly spoken of now as the "old man bottom." It appears very evident from the position and vertical depth of the east drive that the sumps of both the Morning Star and drainage shafts must have been very close to if not actually in this bottom, and therefore one can discredit the theory of a layer of pay-wash below their lowest workings.

"Other developments undertaken included four test rises above the main east drive, and the extension of an east drive off No. 17 north drive for 48 ft. No pay-wash was encountered in either case.

"The north-west extension on the Ross United lead was followed by driving for 245 ft. from No. 3 shoot at a lower level than the driving off No. 2 shoot. The values in the blocking around this drive showed that they were confined to a depth of 2 ft. over a width of 35 ft. As the wash at the end was only just payable and had a tendency to dip underfoot the drive was not persisted with.

"Pay-wash reserves: There are no reserves beyond a few pillars, which will be taken out during the next week.

"Transmission-line: During the year about a dozen interruptions have occurred through faulty insulators, but to no serious extent has this interfered with continuous mining operations.

"Power-station at Kanieri Forks: The power plant has continued to be equal to the demands required of it, and with a total cost of $\frac{1}{10}$d. per kilowatt-hour compared favourably with larger installations."

Otago and Southland.

The past year has been unfavourable for this class of mining, owing to the prolonged periods of dry weather experienced in parts of the district, and an absence of heavy falls of snow in the high country, upon which most of the claimholders depend for supply of water to carry them over the early summer months.

At the claim of the Gabriel's Gully Sluicing Company, Lawrence, three elevators have been kept steadily at work treating tailings from the Blue Spur cement-deposit with satisfactory results. In places the tailing is 90 ft. in depth. The amount available for treatment is fairly extensive. Twenty-two men are employed. Gold to the value of £7,548 was won during the year, and dividends to the amount of £3,472 were paid.

* The mine trucks are of ten cubic feet capacity, and it is estimated that four trucks represent one cubic yard of solid gravel, but only about one-third of the gravel and boulders mined was considered as worth trucking and sending to the surface.

The Golden Crescent Sluicing Company, Weatherstone, continues to give satisfactory result. Water under a pressure of 680 ft. is available for breaking up the cement, rendering the use of explosives almost unnecessary, and thereby reducing the working-costs.

Efforts were made at the Golden Rise Claim to test the auriferous cement on Weatherstone Flat. Results were disappointing, for, owing to the low pressure of the water-supply, the hard cement could not be satisfactorily dealt with.

The Sailor's Gully Sluicing Company, Waitahuna, purchased the adjoining claim, together with water-races and plant, from the Norwegian syndicate. The syndicate's water-supply will be brought on to the claim under a pressure of 600 ft., which will enable operations to be carried on much more advantageously than in the past.

The Havelock Sluicing Company obtained satisfactory results during the year. Elevating is in progress on the river-flat below the township. A good supply of water is available under a pressure of 300 ft. Gold won for the year amounted to 945 oz., valued at £3,619. Dividends amounting to £1,900 were paid.

The Ladysmith Gold-mining Company, Roxburgh, continues to be a consistent gold-producer. The year's operations resulted in the production of gold to the value of £4,609, and payment of dividends amounting to £2,481.

At the Roxburgh Amalgamated Gold-mining Company's claim operations in Louden's section have not proved as successful as were expected. Very little ground now remains to be worked, and the company proposes to prospect new ground near Commissioners Flat with the view of shifting the plant thereon if prospects warrant it.

The whole of the conduits for sluicing and elevating at the Teviot Molyneux Company's claim on White's Flat have been completed. The length of the race from the intake in the Teviot Gorge to the penstock above White's Flat is 4 miles 61½ chains. The dimensions of the open race are 7 ft. on the bottom, 10 ft. on the top, and 3 ft. deep, with a fall of 16 ft. to the mile. Seven ravines on the line of race are crossed by means of inverted siphons 3 ft. in diameter. A rock-tunnel 700 ft. in length was driven at the intake end, and 5,000 ft. of pipe-line 3 ft. in diameter laid down between the tunnel and the open race. The power-line between White's Flat penstock and the claim consists of steel pipes, 2 ft. 6 in. in diameter, laid down over a length of 91 chains. Water will be delivered at the claim, having an hydraulic head of 600 ft. A start has been made to sluice off the surface gravels preparatory to sinking the elevator for the first paddock. A considerable amount of work has also been done on the extension of the race towards the company's claim at Anderson's Flat.

At Round Hill Mining Company's claim, No. 2 paddock, which has been in operation for the past two years, is the main working claim, of which about 20 acres has been worked to an average depth of 45 ft. No. 1 paddock is worked on an average two shifts per diem. Water-supply has been very regular throughout the year. Twenty-eight men were employed.

Ourawera Gold-mining Company is paddocking in Italian Gully, elevating 62 ft. Nine heads of water are in use under a pressure of 450 ft. Eight men were employed.

The Muddy Terrace Sluicing Company, Waikaia, constructed during 1915 a water-race 92 chains in length, and sluicing commenced in Long Gully, at the southern end of the company's claim. Four faces are kept working when water is available. The depth of the faces vary from 6 ft. to 40 ft. Twenty-four men were employed.

The Nokomai Sluicing Company during the year had only sufficient water to keep two elevators working. Nos. 2 and 3 were kept in almost continuous operation, while very little was done with No. 1. The results obtained were not so good as formerly, owing mainly to the difficulty experienced in locating the main gutter in that part of the claim where No. 3 elevator is installed, and to the low-grade wash dealt with by No. 2 elevator in Victoria Gully. Thirty-six men were employed.

*Statement showing the Value of Production and Dividends paid by the Principal Sluicing Companies in Otago and Southland during 1915.**

Name of Company or Party.	Value of Gold produced.	Dividends declared.	
		During 1915.	Totals to End of 1915.
	£	£	£
Naseby Sluicing Company	665	250	4,750
Gabriel's Gully Sluicing Company	7,548	3,472	5,335
Golden Crescent Sluicing Company ..	2,308	700	11,200
Sailor's Gully Sluicing Company	2,197	250	5,000
Havelock Sluicing Company	3,619	1,900	7,400
Ladysmith Gold-mining Company	4,609	2,481	13,895
Nokomai Hydraulic Sluicing Company ..	5,129	1,200	44,483
Round Hill Gold-mining Company	6,426	565	11,580
Ourawera Gold-mining Company	2,981	300	13,915
128 other claims (mostly privately owned) ..	58,436	Unknown	Unknown
Totals	93,828	11,118	Unknown

* No other alluvial gold-mining companies in the Dominion paid a dividend during 1915.

V. MINERALS OTHER THAN GOLD.

SCHEELITE.

The quantity of scheelite exported during the year amounted to 194 tons, valued at £27,784 as compared with 204 tons, valued at £21,498, in 1914. The following statement shows the quantity and value of scheelite exported since the year 1899 :—

Year.	Quantity.	Value.	Year.	Quantity.	Value.
	Tons.	£		Tons.	£
1899	32	2,788	1909	58	4,263
1900	54	2,635	1910	143	15,070
1901	2	83	1911	138	11,853
1902	39	1,200	1912	135	13,347
1903	42	1,439	1913	221	22,933
1904	17	791	1914	204	21,498
1905	28	1,848	1915	194	27,784
1906	55	3,407			
1907	137	15,486	Totals ..	**1,567**	**152,480**
1908	68	6,055			

One of the most spectacular advances in commodity-prices occasioned by the war has been in tungsten, both metal and ore, scheelite being one form of the latter.* This advance has been due to the extraordinary demand for tungsten steel, an essential constituent in making high-speed-tool steel. The manufacture of immense quantities of military material has required greatly increased quantities of tool-steel, and consequently corresponding quantities of tungstic acid (WO_3), hence the advance in price.

On the 6th September, 1915, notice was given by His Excellency the Governor that the Imperial Government had instructed him to requisition all supplies of scheelite and other ore containing tungstic acid, and from that date the export to other markets was prohibited. All persons having such ore were required forthwith to notify the Mines Department, Wellington. The price fixed by the Imperial Government was £2 15s. per unit (a unit being 1 per cent. of tungstic acid in the sample) delivered at London or Liverpool, the scheelite concentrate, in which form the ore is shipped, to contain not less than 65 per cent. (*i.e.*, 65 units) tungstic acid. Since this notification all shipments have been bought by the Mines Department and shipped to the Imperial Supply Board. Advances have been paid on assay certificates by the Dominion Analyst. Prior to 1915 the market for tungsten-ore was very poor, the price now fixed being an increase of about 80 per cent. In the United States of America ammunition-makers are reported to have paid during 1915 a considerably higher price than the above, and an attempt was made in that country to "corner" the supplies, but this was frustrated by the action of the Imperial Government in commandeering colonial supplies. Previous to the war Australia, New Zealand, Burma, and Straits Settlements supplied a very large proportion of the world's production of tungsten. Portugal and Spain are also producers, but the mines there are controlled to a large extent by British capital. The United States speculators therefore could only manipulate the supplies from Mexico and South America, which in comparison with British tungsten resources are inconsiderable.

In the following table is shown the quantity of quartz crushed and scheelite concentrate obtained for the year ended the 31st December, 1915 :—

Name of Mine or Company.	Locality.	Quartz crushed.	Scheelite (Tungstic Trioxide) Concentrate obtained.	Value.
		Statute Tons.	Tons cwt. lb.	£ s. d.
Dominion Consolidated Company ..	Wakamarina, Marlborough	17,484	110 0 0	14,133 2 3
Glenorchy Scheelite Company and fourteen parties of miners	Glenorchy, Lake County	682	60 2 34	8,520 0 0
Golden Point	Macrae's, Waihemo County	569	27 4 28	4,080 16 10
Morning Star	Ditto	9	0 14 0	130 0 0
Berry Syndicate	,, ...	11	0 16 45	140 11 5
McGregor and Innes	,, ...	16	0 19 93	185 0 0
A. A. Cockerell	,, ...	8	1 4 25	234 18 1
A. Phelan	,, ...	2	0 5 65	50 19 6
Stoneburn Mining Company ..	Stoneburn, Waihemo County	978	7 8 56	1,425 1 10
Mareburn Gold and Scheelite Company	Mount Highway, Waihemo County	641	3 17 12	616 4 8
Buckland and Ewart	Barewood, Taieri County	20	3 0 0	430 0 0
H. S. Molyneaux	,, ,,	1	0 4 103	42 9 4
Totals, 1915	..	20,421	216 9 13	29,989 3 11
Totals, 1914	..	21,745	221 18 0	21,824 18 6

In addition, certain of the above mines produced gold as follows: Dominion Consolidated, £12,472; Golden Point, £686; McGregor and Innes, £20; Stoneburn, £150; Mareburn, £246.

* Tungstic acid was first discovered by the Swedish chemist Scheele, the word "tungsten" meaning heavy stone. Scheelite is very heavy.

Tin.

The Stewart Island Tin and Wolfram Lodes (Limited) has constructed a tramway 4 miles 49 chains in length to the alluvial deposits it is proposed to sluice, and towards the Remarkable Range, where a stanniferous lode is reported to exist. The water-race and pipe in connection with the sluicing proposition are completed.

Cinnabar.

At Puhipuhi, North Auckland, the Auckland Cinnabar Mining Company has put in short drives, and has intersected a lode which is reported to contain fair-grade ore.

Iron.

At Moturoa, near New Plymouth, Messrs. Heskett and Fraser, who have installed an experimental furnace for smelting the beach ironsand, are reported to have obtained satisfactory results, and claim that pig iron can be produced by them at a cost not exceeding £3 per ton.

The following is an analysis of the pig iron produced: Iron, 94·6 per cent.; graphitic carbon, 2·8; combined carbon, 0·46; silicon, 0·9; manganese, 0·42; phosphorus, 0·5; sulphur, 0·04; titanium, 0·28: total, 100 per cent.

A company, to be called the New Zealand Iron-ore Smelting and Manufacturing Company (Limited), having a capital of £60,000, is now being formed to manufacture pig iron.

It is proposed when the company is formed to erect a first instalment of blast-furnace plant and accessories. Sufficient ovens for the manufacture of ferro-coke will be erected immediately for the production of 150 tons of pig iron per week.

The blast furnace will have a capacity of 75 tons per week, and can, it is stated, be duplicated on a small amount of capital.

Kauri-gum.

The considerable decline during 1914 and 1915 in the export of kauri-gum is due to the fact that previous to the war the principal market was in Germany. To afford a measure of relief to unemployed gum-diggers the Government, in terms of the Kauri-gum Industry Act, 1914, has purcha ed over 300 tons of gum, which is now stored in the Government's store at Auckland. The diggers have received an advance of 50 per cent. of the value of their gum, calculated on the rates ruling in June, 1914. It has now been arranged, in accordance with power granted by the Kauri-gum Industry Amendment Act, 1915, to seek a market for gum in America, and perhaps in Japan, and to purchase and sell kauri-gum. By this Act the Minister of Lands is also g.ven authority to enter into contracts for the purchase of too s and plant for the extraction and treatment of kauri-gum.

The Government at present has over two hundred men employed "face-digging" gum land, the ground on which they have worked being left in a fit condition for agriculture. This has not been the rule in the past. It has been proposed that the Government shall take over the gum industry, and control it for the benefit of the State and for those engaged in it.

The gum land aggregates nearly half a million acres, nearly all of which is the property of the Crown.

Petroleum.

Drilling operations in search of petroleum in payable quantity, which have for a number of years been in progress in the Dominion, have not during 1915 resulted in any additional supplies being tapped. The Taranaki Oil-wells (Limited) towards the latter part of the year furnished evidence that 1,000,000 gallons of marketable crude oil had been produced from its wells at Moturoa, Taranaki, during a period of about eight years, and in consequence was awarded the Government bonus offered for the production of the first million gallons of crude oil by any party. The total bonus gained by this company amounts to £10,000. At the present time the daily production is less than 300 gallons, obtained from wells Nos. 2, 3, and 5, the flow from all the productive wells having gradually declined to small proportions within a year or two of the tapping of oil-yielding stratum.

Drilling operations during 1915 were confined to No. 2 well, which has been enlarged in diameter to receive 10 in. casing for a depth of 2,000 ft.; this well had previously attained a depth of 3,030 ft., being then lined with 5 in. casing. It is now proposed to prove the field by this well at a greater depth than hitherto reached. The obstacle to the deepening of this company's wells was the small diameter of casing used.

At No. 1 (Rotary) well drilling ceased at a depth of of 2,514 ft. This well was commenced with 15 in. casing, but was relined with 4 in. casing, rendered necessary by reason of a bit being lost in the hole.

The only other active well-drilling operations were carried on intermittently by the Taranaki Oil Lands, &c., Company (Limited) at its "Blenheim" well at Moturoa, where at the end of 1915 a hole 3,802 ft. in depth, lined with 6½ in. casing, had been drilled. At the time of writing this borehole had attained a depth of 4,250 ft., and a small quantity of oil was being yielded.

VI. STONE-QUARRIES.

At those 149 quarries and places coming within the provisions of the Stone-quarries Act, 1910, which applies to every place, not being a mine, in which persons work in quarrying stone by means of explosives, and any part of which has a rock-face more than 20 ft. deep, also to any tunnel in the construction of which explosives are used, about 1,571 persons were employed during 1915. The

inspection of such places is performed without extra salary by officials of the Public Works Department and Inspectors of Mines resident in the districts where the quarries, &c., are situated. The inspection of stone-quarries does not come under my control.

Since the Stone-quarries Act, 1910, came into operation I have only heard of one prosecution thereunder. The number of fatal accidents during 1915 was six, causing the loss of seven lives, being in the proportion of 4·45 lives lost per thousand persons employed—a very high proportion indeed.

The following is a summary of persons killed or seriously injured during 1915 at stone quarries and places within the operation of the Stone-quarries Act:—

Cause of Accident.	Number of Accidents.		Number of Sufferers.	
	Fatal.	Serious.	Killed.	Seriously Injured.
Explosives	2	3	3	3
Falls of ground	2	12	2	12
Machinery	..	1	..	1
Haulage	2	7	2	7
Miscellaneous	..	5	..	5
Totals	6	28	7	28

The following are details of the fatal quarry accidents during 1915:—

Name of Deceased.	Date of Accident.	Place of Accident.	Cause of Accident.
James A. Green	Jan. 6	Patutahi Quarry ..	Premature explosion of gelignite.
Alfred Bugden			
Frederick Saul	April 30	Otira Railway Tunnel	Crushed between trucks on tramway.
Patrick Twomey	June 18	,,	Premature explosion of gelignite.
John Kyle	July 2	Cobden Quarry ..	Fall of stone.
John Chalmers	Sept. 12	Otira Railway Tunnel	Fall of earth.
J. Bryne	Oct. 12	,,	Crushed by electric locomotive.

VII. STATE AID TO MINING.

(1.) Subsidized Prospecting.

During the year ended the 31st March, 1916, thirty-four approved prospecting parties were granted subsidies amounting to £5,151 8s. 4d., of which £2,736 17s. 11d. was expended during that period. In addition to this, £1,111 1s. granted during previous years was expended by twenty parties during the past financial year.

The following statement shows the total expenditure during the year ended the 31st March, 1916, on authorities issued previous to that date, in subsidies to prospecting associations and parties of miners in the different counties:—

Name of County, &c.	Expenditure. £ s. d.
Rotorua County	26 0 0
Coromandel County	101 5 0
Ohinemuri County	152 5 0
Pelorus Road Board	131 6 8
Inangahu County	387 5 0
Murchison County	48 0 0
Grey County	52 0 0
Westland County	513 13 0
Ross Borough	10 0 0
Tuapeka County	100 0 0
Prospecting associations, &c.	2,386 10 3
Total	£3,908 4 11

Altogether thirty-six prospecting parties, employing eighty-six persons, have during 1915 been engaged upon subsidized prospecting operations, and, although no discovery of much commercial value has been made, ground has been proved in a few instances which may be profitably worked.

The following is a table prepared by the Inspectors of Mines who have inspected the subsidized operations:—

Number of Subsidized Prospectors, the Amount of Subsidy granted and paid, also the Character and Result of such Prospecting Operations, from 1st April, 1915, to 31st March, 1916.

Name of Prospecting Party.	Number of Prospectors.	Locality of Operations.	Amount of Subsidy granted.	Amount of Subsidy expended.	Distance driven.	Distance timbered.	Nature of Claim.	Character of Operations.	Remarks.
Northern Inspection District.			£ s. d.	£ s. d.	Ft.	Ft.			
Hauraki Prospecting Association—									
Luhrs and Ryan	2	Mahakirau, Coromandel	£1,000 at £2 subsidy for £1 subscribed	239 0 0	..	..	Quartz ..	Surface prospecting and driving	Several small leaders were interscected yielding good dish prospects.
Ross and Anderson	2	Waihi-Whangamata							A number of low-grade lodes varying between 18 in. to 4 ft. in thickness were dsicovered.
Turnbull and Martin ..	2	Thames							Prospecting the country between the heads of Karaka and Otanui Creeks; nothing of value discovered.
O'Keefe and party	2	Karangahake	37 10 0	34 10 0	138	..	.. ..	Driving ..	Loose boulders of surface quartz having high assay value were found, but driving through disturbed country proved nothing of value, and work was abandoned.
Dominion Gold-mining Company	3	.. .. ..	37 10 0	37 10 0	Subsidy on 150ft.; total driven, 1,842 ft.		.. ..	.. ..	A large lode visible on the surface was expected to live downwards, but 1,842 ft. was driven in very hard country and failed to intersect such lode. The company expended several thousand pounds in this unsuccessful but legitimate exploration. The subsidy was on the last 150 ft. driven.
Success Development Syndicate	3	Waitekauri (May Bell claim)	125 0 0	50 0 0	677 (total)	..	.. ..	.. ..	A low-level crosscut driven 500 ft. without success was subsidized for a further 350 ft. At about 647 ft. in an 18 in. lode value £4 16s. per ton was intersected. The lode sought for is believed to be ahead of the present face.
Power and party	2	Coromandel	50 0 0	33 15 0	135	..	.. ..	.. ..	To intersect a 2 ft. lode on the Tokatea main range a subsidy on 200 ft. of driving was granted, so far nothing of value has been proven.
Hauraki Reefs Gold-mining Company	4	.. .. ..	125 0 0	..	..	..	.. ..	.. ..	The drive is now being advanced on ore.
McGregor and party	2	Horahora	26 0 0	26 0 0	..	..	..	..	Lode of no value; cut in several places.
West Coast Inspection District.									
A. B. Alford and others ..	4	Deep Creek, Marlborough ..	104 0 0	27 6 8	..	..	Scheelite ..	Trenching and driving	A quartz lode carrying gold and scheelite has been found about two miles north of the Dominion Mine. The prospects so far are favourable.
Alpine Consolidated Company ..	4	Eight-mile Creek, Lyell ..	200 0 0	..	..	..	Quartz ..	Driving ..	A crosscut to intersect the Alpine line of lode north of the old workings. Auriferous leaders have been found.
H. A. Bauke and party ..	2	Seddon's Terrace, Rimu ..	27 10 0	..	..	..	Alluvial ..	.. ..	In progress.
Blackumer Bros.	2	Hatters, Stafford	212 10 0	15 12 0	208	..	.. ..	.. ..	To test an alluvial terrace. Prospects of success reported favourable.
Energetic Extended Syndicate No. 2	4	Murray Creek, Reefton ..	125 0 0	49 15 0	199	..	Quartz ..	.. ..	Prospecting for lodes at Murray Creek, north of the Energetic shaft. Three small lodes have been driven on, but so far nothing payable has been found.
Etheredge and party	2	Ross	80 0 0	10 0 0	50	..	Alluvial ..	.. ..	Alluvial prospecting between Mont D'Or and Mikonui. The ground has now been taken up by the Mont D'Or Company.

Number of Subsidized Propectors, the Amount of Subsidy granted and paid, also the Character and Result of such Prospecting Operations, from 1st April, 1915, to 31st March, 1916—contd.

Name of Prospecting Party.	Number of Prospectors.	Locality of Operations.	Amount of Subsidy granted.	Amount of Subsidy expended.	Distance driven.	Distance timbered.	Nature of Claim.	Character of operations.	Remarks.
West Coast Inspection District—continued.			£ s. d.	£ s. d.	Ft.	Ft.			
Fiddes and Stewart	2	Bell Hill	52 0 0	24 0 0	..	..	Quartz	Surface prospecting and trenching	In search of quartz lodes at Bell Hill. Plenty of quartz found but no gold.
S. Fry and party	..	Cedar Creek	125 0 0	..	..	..	,,	Driving	Subsidy not recommended by Inspection Branch of Mines Department. No work yet done.
Gibbons and mate	2	Totara District	26 0 0	19 0 0	..	..	,,	Surface prospecting and trenching	In search of lodes in vicinity of Cedar Creek. No results of any value.
R. A. Harcourt	3	Arahura Flat	30 0 0	..	..	..	Alluvial	Driving	Work in progress. some gold obtained; final result uncertain.
G. E. Humphries	6	Deep Creek, Marlborough	104 0 0	104 0 0	..	..	Quartz	Surface prospecting	Some lode outcrops found warrant further work. Assays up to £3 per ton in gold.
J. Jack and party	2	Hauhau Terrace	112 10 0	11 18 6	159	159	Alluvial	Driving	Work in progress.
Kulsen and Fiddes	2	Kanieri Forks	52 0 0	52 0 0	..	..	,,	Surface prospecting	Alluvial prospecting at Kanieri Lake district. Terraces payable for sluicing have been found.
McBeath and party	2	Back Creek, Rimu	30 0 0	30 0 0	300	300	,,	Driving	Nothing of value discovered.
McCormack and party	2	,, ,,	82 10 0	28 5 6	377	70	,,	,,	Work in progress.
W. J. Mitchell	2	Moonlight Creek	50 0 0	22 0 0	88	..	Quartz	,,	A lode outcrop was found, but a drive proved nothing of value.
W. S. C. Nicholl	..	Alpine Fisher	75 0 0	..	..	..	,,	,,	Proposed to drive on Alpine line of reef reef south of the old workings. Nothing yet done.
Thorpe and party	2	Back Creek, Rimu	66 5 0	8 15 0	100	100	Alluvial	,,	Attempting to trace the back creek run of gold south of the present workings. Driving has not yet proved anything of value.
Towers and party	2	Butcher's Gully	112 10 0	..	..	..	,,	,,	Driving in the terrace near Kanieri Lake Road not yet commenced.
George Willetts	1	Arthur's Town	25 0 0	..	..	..	,,	,,	To further develop a claim at Arthur's Town near Hokitika.
Humphries Bros.	2	Wairau Valley	52 0 0	..	..	..	Scheelite	Surface prospecting and driving	In search of scheelite at Top Valley.
Southern Inspection District.									
Carrick Gold-mining Company	4	Bannockburn	500 0 0	154 13 5	166	..	Quartz	Driving	Work in progress.
Browne and party	1	Lawrence	100 0 0	65 15 0	263	..	,,	,,	A number of small unimportant auriferous veins found.
Waipori Prospecting Company	5	Waipori	800 0 0	669 12 0	777	777	,,	,,	No payable quartz found. Prospect unfavourable.
Deep Dell Gold and S. Company	2	Macrae's	120 0 0	..	..	..	,,	,,	Work in progress.
Symes and party	2	Bald Hill Flat	58 0 0	58 0 0	..	..	,,	Trenching and surface prospecting	Gold-bearing lode found, prospects favourable.
Gordon and party	2	Kawarau	87 10 0	40 0 0	160	..	Alluvial	Driving	Work in progress.

(2.) Government Prospecting-drills.

Particulars of Boring during 1915.

Type of Drill.	Name of Superintendent.	To whom lent.	Mineral sought for.	Number of Holes drilled.	Approximate Depth drilled.	Diameter of Hole.	Character of Country penetrated.	Average Cost per Foot, including Transport.	Result of Drilling.
					Ft.	In.		s. d.	
Schram-Harker ..	W. H. Warburton	Liverpool Colliery, No. 1 section west	Coal ..	1	190	2½	Sandstones, shales, grits, and shaly mudstone	4 7	No coal; country faulted.
,, ..	..	Liverpool Colliery, No. 1 section in mine	,, ..	1	168	2½	Ditto	3 5	20 ft. coal at 140 ft.
.. ..	,,	Liverpool Colliery, No. 1 section, main level	.. ..	1	336	2½	Sandstones, shales, grits, fine conglomerate, shaly mudstone	4 4	12 ft. coal at 315 ft.
Hand-boring plant ..	..	Liverpool Colliery, Puru Creek	.. ..	1	83	1⅝	Shaly mudstone	13 1	11 ft. coal at 70 ft.
Schram-Harker (oil-driven)	..	Liverpool Colliery, junction Seven-mile and Waiomio Creeks	.. ..	1	408	2½	Sandstone, shales, grits, and shaly mudstone	3 6	Coal—1 ft. 6 in. at 21 ft.; 6 ft. at 50 ft.; 1 ft. at 113 ft.; 21 ft. at 204 ft.; 1 ft. 6 in. at 227 ft.; 1 ft. at 231 ft.; 25 ft. at 372 ft.
Ditto	,,	Liverpool Colliery, Spring Creek	,, ..	1	648	2½	Sandstone, shales, and grits ..	4 10	Coal—6 ft. 6 in. at 104 ft.; 1 ft. at 169 ft.; 2 ft. at 197 ft.; 1 ft. at 242 ft.; 1 ft. at 314 ft.; 3 ft. at 322 ft.; 2 ft. at 354 ft.; 2 ft. at 356 ft.; 1 ft. 6 in. at 366 ft.; 1 ft. at 371 ft.; 2 ft. at 464 ft.; 1 ft. at 467 ft. (All dirty coal.)
,, ...	,,	Liverpool Colliery, No. 3 section	,, ..	1	527	2½ in. to a depth of 70 ft., then cased and reduced to 1⅝ in.	Sandstone, shale, grits, and shaly mudstone	3 3	Coal—1 ft. 6 in. at 141 ft.; 2 ft. 6 in. at 205 ft.; 5 ft. at 258 ft.; 8 ft. 6 in. at 324 ft.; 1 ft. at 338 ft.; 1 ft. 6 in. at 370 ft.; 1 ft. 6 in. at 469 ft.; 2 ft. at 504 ft.
				1	332	2½	Ditto	3 0	Coal—1 ft. at 152 ft.; 4 ft. at 239 ft.; 5 ft. at 278 ft.
,, ...	,, ,,	,, ,,	,, ..	1	356	2½	,, ...	3 2	Coal—1 ft. at 241 ft.; 2 ft. at 296 ft.
Keystone	G. E. D. Seale ..	Round Hill Gold-mining Company, Waikaia	Alluvial gold	15	1,756	5 and 6	Gravel and clay	6 0	Some results very good—as high as 2½ oz. per yard.
.. .. ..	,, ..	Thomas Green, Gore ..	Coal ..	5	456	5 and 6	Gravel and pug	3 0	Coal-seams from 18 in. to 17 ft.
.. .. ..	,, ..	J. L. Smith, Croydon, Gore ..	,, ..	2	56	5 and 6	Coarse gravel	4 9	Unfavourable.
.. .. ..	,, ..	E. Bowmar, Gore	Water ..	1	108	6	Gravel and clay	2 3	Struck moderate supply of water.
.. .. ..	,, ..	Wallis Bros., Gore	,, ..	3	140	5 and 6	Gravel and pug	3 6	Struck splendid supply of water.
.. .. ..	,, ..	Whiterig Dairy Factory, Gore	,, ..	1	106	5 and 6	,, ...	3 3	No supply.
.. .. ..	,, ..	Dennis Daley, Brydone ..	,, ..	1	53	6	Gravel	5 0	Good supply.
.. .. ..	,, ..	McDonald Bros., Edendale ..	,, ..	1	48	6	,, ...	4 9	,,
.. .. ..	,, ..	G. Stuart, Brydone	,, ..	1	45	6	,, ...	3 6	Fair supply.
.. .. ..	,, ..	James Drysdale, Brydone ..	,, ..	1	55	6	Gravel and clay	4 6	,,
.. .. ..	,, ..	Donald McDonald, Edendale Estate	,, ..	1	36	6	Gravel	4 6	Good supply.
,, ...	,, ..	Charles Milne, Edendale ..	,, ..	1	75	6	Gravel and clay	4 0	Fair supply.
,, ...	,, ..	Balclutha City Council, Balclutha	,, ..	2	88	6	Gravel	6 0	Water no good; too full of iron.
,, ...	,, ..	F. B. Powell, for Rimu Options (Limited), Rimu, Hokitika	Gold ..	7	250	6	Tight gravel	About 5/	Good results; drilling still in progress.
Sullivan (C. N.) and Schram-Harker	W. Carter ..	Westhaven Prospecting Company (Limited)	Coal ..	1	1,441†	2 13/16	Sandstones, grits, mudstones, and conglomerates	8 6	At 834 ft. the 3,000 ft. Schram-Harker drill was installed to bottom the measures. 85 seams of coal were passed through, varying in thickness from 1 ft. 7 in. down to 2 in.—aggregate of 40 ft. 1 in. Nothing of a commercial value was disclosed. A complete section of the bore has been furnished to the Mines Department.

* These drills are lent free of charge on conditions which may be obtained upon application to the Under-Secretary of Mines. † 122 ft. was bored in 1914.

(3.) Subsidized Roads on Goldfields.

The following schedule shows the amounts expended by subsidies and direct grants out of the Public Works Fund—vote, "Roads on Goldfields"—in the different counties, &c., during the year ended 31st March, 1916:—

	Direct Grants.	Subsidies.
	£ s. d.	£ s. d.
Coromandel County	625 9 10	87 4 0
Thames County	1,473 18 3	175 15 2
Thames Borough	100 0 0	..
Ohinemuri County	1,458 5 10	57 0 0
Piako County	327 6 0	..
Havelock Town Board	112 1 0	..
Collingwood County	578 12 10	..
Takaka County	139 0 0	..
Waimea County	565 8 2	..
Buller County	6,900 2 7	..
Inangahua County	4,430 3 3	..
Murchison County	271 8 9	..
Westland County	2,099 16 2	..
Grey County	3,175 13 8	..
Runanga Borough	40 0 0	..
Vincent County	550 0 0	..
Taieri County	50 0 0	..
Tuapeka County	100 0 0	..
Lake County	427 15 1	..
Wallace County	100 0 0	..
Southland County	137 0 0	450 0 0
Totals	£23,662 1 5	£769 19 2

(4.) Government Water-races.

The Waimea-Kumara and Mount Ida water-races, which render possible hydraulic mining in the Kumara district, Westland, and the Naseby district, Central Otago, have supplied ninety-one miners with water for sluicing during 1915, by which gold to the value of about £19,562 was obtained. The average earnings per mine, after deducting the sum paid for Government water, amounted to £180 for the past year, and from this must be deducted all expenditure on plant, rent, &c.

The receipts and expenditure were as follows:—

	Receipts. £	Expenditure. £
Waimea-Kumara races	1,920	2,096
Mount Ida races	1,186	1,497
Totals	£3,106	£3,593

The capital expenditure upon these races exceeds £250,000; and as the expenditure in maintenance has for some years exceeded the cash received for water sold, no interest on capital or depreciation has been provided.

VIII. SCHOOLS OF MINES.

The following is a summary of the result of the Government subsidized schools of mines annual examination, together with the attendance at such schools during 1915:—

Name of School.	Number of Students, 1915.			Number of Papers submitted at the Examination.		Average Number of Marks awarded per Paper.
	Attending one or more Classes.	Presenting themselves at the Annual Government Examination.		Senior Papers.	Junior Papers.	
		On any of the Six exclusively Mining Subjects.*	On any Subject.			
Thames	64	1	22	14	18	69·65
Coromandel	20	2	11	7	10	62·59
Karangahake	28	3	13	17	16	61·85
Waihi	65	4	20	25	8	58·09
Westport	46	4	12	14	5	52·00
Huntly	14	1	7	5	5	47·20
Reefton	47	7	25	39	3	44·83
Total	284	22	110	121	65	56·95

*Mineralogy, metallurgy, mining, ventilation, geology, and mechanics embracing pumping, haulage, and winding. Assaying is not included, as this subject is also taken up by bank and jewellers' assistants.

The University of Otago School of Mines has not been included, as special examinations are held at that school.

The effective work by a school of mines may be gauged by the result of examinations upon mining subjects. From the foregoing table it will be seen that the number of students presenting themselves for examination on mining subjects is insignificant, and as mining schools these institutions cannot now be regarded as a success. The number of students attending one or more classes on any subject affords no criterion as to the effective work as a school of mines. A considerable majority of the students, including school boys and girls, attend evening classes at the schools of mines to improve themselves in mathematics, while others attend to study electricity, chemistry, mechanical drawing, or surveying, which are common to occupations other than mining.

The following table shows the expenditure by the Government on schools of mines since their inception, exclusive of subsidies paid to the University of Otago towards the School of Mines in connection with that institution:—

Financial Years.	Subsidies towards the Erection of Schools of Mines, and Maintenance.	Chemicals and Apparatus, also Mineralogical Specimens supplied to Schools of Mines.	Scholarships.	Salaries of Teachers, and Travelling-expenses, &c.	Total Sum paid by the Department towards the Schools of Mines.
	£ s. d.	£ s. d.	£	£ s. d.	£ s. d.
1885–86 ...	...	36 19 9	...	1,223 9 10	1,260 9 7
1886–87 ...	257 16 6	409 1 4	...	2,716 9 3	3,383 7 1
1887–88 ...	253 15 9	253 14 1	...	1,714 9 6	2,221 19 4
1888–89 ...	42 10 0	6 12 9	...	1,139 4 1	1,188 6 10
1889–90 ...	142 2 0	181 14 10	...	716 3 10	1,040 0 8
1890–91 ...	217 6 6	54 8 0	...	620 9 9	892 4 3
1891–92 ...	181 14 0	...	...	689 5 9	870 19 9
1892–93 ...	312 3 4	...	...	670 1 0	982 4 4
1893–94 ...	197 0 5	...	...	858 19 4	1,055 19 9
1894–95 ...	390 0 0	45 10 10	...	773 17 8	1,209 8 6
1895–96 ...	820 0 0	...	50	849 3 0	1,719 3 0
1896–97 ...	352 14 11	58 18 6	100	834 12 8	1,346 6 1
1897–98 ...	1,089 18 6	29 19 9	100	780 19 0	2,000 17 3
1898–99 ...	740 15 2	32 19 7	50	729 10 11	1,553 5 8
1899–1900 ...	990 3 4	24 3 8	50	52 16 3	1,117 3 3
1900–1 ...	866 10 11	56 3 4	98	77 7 10	1,098 2 1
1901–2 ...	1,155 12 3	63 5 1	49	69 16 4	1,337 13 8
1902–3 ...	1,379 15 6	134 18 8	158	111 0 0	1,783 14 2
1903–4 ...	1,575 15 3	88 18 8	92	109 15 10	1,866 9 9
1904–5 ...	1,401 2 11	17 3 0	100	362 19 6	1,881 5 5
1905–6 ...	1,806 19 5	87 2 1	49	440 9 4	2,383 10 10
1906–7 ...	1,836 6 6	11 15 8	100	388 18 5	2,337 0 7
1907–8 ...	2,428 19 3	94 6 2	150	345 15 11	3,019 1 4
1908–9 ...	2,738 11 1	328 9 3	100	642 9 4	3,809 9 8
1909–10 ...	1,882 2 6	692 2 8	100	587 3 2	3,261 8 4
1910–11 ...	2,813 0 10	44 5 8	108	1,130 7 3	4,095 13 9
1911–12 ...	1,852 19 11	38 9 9	92	1,138 6 7	3,121 16 3
1912–13 ...	1,769 6 10	182 18 4	100	1,227 2 2	3,279 7 4
1913–14 ...	1,909 14 7	70 4 2	250	1,267 17 10	3,497 16 7
1914–15 ...	1,628 4 1	11 13 8	275	2,416 6 2	4,331 3 11
1915–16 ...	932 11 0	47 1 0	258	2,414 14 7	3,652 6 7
Totals ...	33,965 13 3	3,103 0 3	2,429	27,100 2 1	66,597 15 7

I have, &c.,
FRANK REED,
Inspecting Engineer.

ANNEXURE A.

EXTRACTS FROM THE REPORTS OF GOVERNMENT WATER-RACE MANAGERS.

Waimea-Kumara Water-races, Westland.—Mr. James Rochford, Manager.

Waimea Water-race.

The cash received for sales of water from this race for the year ended the 31st March, 1916, was £913 18s. 7d., and the expenditure on management, gauging, maintenance, and repairs amounted to £701 14s., showing a credit-balance of £212 4s. 7d. on the year's transactions.

The average number of miners supplied with water during the year was 24·75, a decrease of 4·91 on the previous year; and the approximate amount of gold obtained by them was 1,557 oz., valued at £6 072 6s., a decrease on that of last year of £1,786 4s.

The sales of water amounted to £933 16s. 1d., a decrease of £93 17s. 1d. on the previous year.

The cash received was £113 14s. 9d. less than the previous year, and the expenditure was decreased by £14 9s. 1d. The race was well maintained.

Kumara Water-race.

The cash received for sales of water from this race for the year ended the 31st March, 1916, was £214 14s., and the expenditure on management, gauging, maintenance, and repairs amounted to £475 9s. 10d., showing a debit balance of £260 15s. 10d. on the year's transactions.

The average number of miners supplied with water was 13·41, and increase of 2·08 on the previous year; and the approximate quantity of gold obtained by them was 652 oz., having a value of £2,542 16s., a decrease on that of last year of £495 6s.

The sales of water amounted to £341 7s. 11d., an increase of £8 3s. 5d. as compared with the previous year.

The cash received was £19 14s. 11d. less, and the expenditure £137 8s. 2d. more than the previous year. This increased expenditure was caused by repairs to the Kumara head-race tunnel, which broke down on two or three occasions during the early part of the year, and by the widening and retimbering of the Kumara Race in certain places from Dillmanstown upwards.

Branch Race to Callaghan's and Middle Branch Flat.

The cash received for sales of water from this race for the year ended the 31st March, 1916, was £285 3s. 4d., and the expenditure on management, gauging, maintenance, and repairs amounted to £428 18s. 10d., showing a debit balance of £143 15s. 6d. on the year's transactions.

The average number of miners supplied with water was 6·94, a decrease of 4·81 on the previous year.

The approximate quantity of gold obtained was 543 oz., having a value of £2,117 14s., a decrease of £1,899 6s. on last year.

The sales of water amounted to £263 9s. 7d., a decrease of £166 17s. 11d. on the preceding year, and was the lowest for fourteen years.

The cash received for sales of water was £76 10s. 8d. less than the previous year, and although the expenditure decreased by £83 2s. 9d. the race was well maintained, and in now in good order with the exception of some of the flumings, the superstructure of which in many places is much decayed and will require attention in the near future. The abnormal falling-off in the sales of water from this race cannot be looked upon as permanent, and was principally due to the following causes: The stoppage of the Waimea main tail-race by the Inspector of Mines, pending repairs, which precluded all sluicing into the main tail-race during the last three months of the year, and the fact that Roberts and Howard were engaged for two months shifting plant. The latter party has their property again in working-order, and they will be large purchasers of water during the ensuing year, and if the repairs to the Waimea main tail-race are carried out the demand for water from this race should almost equal the present available supply.

Kumara Trans-Taramakau Water-race.

The cash received for sales of water from this race for the year ended 31st March, 1916, was £158 4s., and the expenditure on management, gauging, maintenance, and repairs amounted to £185 11s., showing a debit balance of £27 7s. on the year's transactions.

The average number of miners supplied with water was 6·41, a decrease of 7·84 on the previous year; and the approximate quantity of gold obtained by them was 276 oz., having a value of £1,076 8s., a decrease on last year of £2,172 6s.

The sales of water amounted to £140 18s. 2d., a decrease of £217 14s. 7d. on the previous year. The extraordinary decrease in the sales of water was due to the falling-off in the number of parties taking water from the race, and the break which occurred in the Taramakau pipe-line preventing any water being supplied for over four months of the year.

The cash received was £102 6s. less than for the preceding year and the expenditure decreased by £105 11s. 3d.

On the 20th November, when the river was in high flood, a serious break took place in the Taramakau pipe-line at a point in the river-bed about 180 ft. from the south bank, where the 30 in. cast-iron pipe is broken, and the line disconnected. For the past two years the river has been scouring considerably, from the old No. 3 channel upwards, probably owing to the fact that very little tailings have been deposited in the river during that time; but no indication of scour was visible in the deep water where the pipe broke, and the damage may have been due to the landslip from the south bank, which occurred on the date of the break, causing a boil or scour and thereby bridging the pipes.

Lawrence and party, after going to considerable expense in driving a tail-race and equipping their claim, started sluicing a few days before the break occurred, so three parties comprising twelve men were thrown idle by the accident. Should the Government decide to restore the pipe-line, it is more than probable that five or six parties will be purchasing water from this race before the end of the ensuing year.

Erin-go-Bragh Water-race.

The cash received for sales of water from this race for the year ended 31st March, 1916, was £347 12s. 2d., and the expenditure on management, gauging, maintenance, and repairs amounted to £304 6s. 6d., showing a credit balance of £43 5s. 8d. on the year's transactions.

The average number of miners supplied with water was twelve, an increase of 1·17 on the previous year; and the approximate quantity of gold obtained by them was 816 oz., having a value of £3,182 8s., an increase of £1,076 8s. on the last year.

The sales of water amounted to £387 11s. 8d., an increase of £165 3s. 8d. on the previous year.

The cash received showed an improvement of £133 5s. 2d., and the expenditure decreased by £67 2s. 6d. as compared with the year previous. The sales of water showed a substantial improvement on the preceding year.

Wainihinihi Water-race.

There was a good supply of water from this race during the year, and, together with the water from the Kawhaka Creek and the additional supply from the new Waimea Branch Race, the Waimea siphon was running full all the year. No breaks occurred, and the race is now in good order, but about sixteen or eighteen intermediate sets of timber are required in the tunnels above Caretaker Walker's hut to ensure safety.

Waimea–Kumara Water-races.

The following is a summary of the revenue and expenditure of these races for the year ended 31st March, 1916: Sales of water, £2,067 3s. 5d.; cash received, £1,919 12s. 1d.; expenditure, £2,096 0s. 2d.; approximate value of gold obtained, £14,991 12s.; average number of miners employed, 63·51.

The sales of water showed a decrease of £305 2s. 6d., and the cash a decrease of £179 1s. 2d., on the previous year, but at least £120 of the debit balances outstanding on the 31st March should be recovered during the ensuing year.

In addition to the above sales, authorized free water to the value of £224 19s. 8d. was supplied to parties opening up new claims.

The total expenditure on the combined races was £2,096 0s. 2d., as against £2,228 17s. 7d. for the previous year, a decrease of £132 17s. 5d.

Comparing the sales of water with the expenditure, the combined races show a loss of £28 16s. 9d. for the year.

Summary, showing Results of working the Waimea–Kumara Water-races during the Year ended 31st March, 1916.

Name of Water-race.	Expenditure.	Cash received.	Sales of Water.	Outstanding Moneys on 31st March, 1916.	Collateral Advantages.		
					No. of Men employed.	Ounces of Gold obtained.	Value of Gold obtained.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.			£ s. d.
Waimea	701 14 0	913 18 7	933 16 1	39 9 6	24·75	1,557	6,072 6 0
Kumara ..	475 9 10	214 14 0	341 7 11	408 13 8	13·41	652	2,542 16 0
Callaghan's ..	428 18 10	285 3 3	263 9 7	91 10 7	6·94	543	2,117 14 0
Trans-Taramakau	185 11 0	158 4 0	140 18 2	130 2 2	6·41	276	1,076 8 0
Erin-go-Bragh ..	304 6 6	347 12 2	387 11 8	56 14 6	12·00	816	3,182 8 0
Totals and averages	2,096 0 2	1,919 12 1	2,067 3 5	726 10 5	63·51	3,844	14,991 12 0

MOUNT IDA WATER-RACE, CENTRAL OTAGO.—MR. J. C. BUCHANAN, MANAGER.

The total sales of water from the Mount Ida Water-race during the year amounted to £1,185 15s. 7d., a decrease on that of last year of £208 3s. 8d. The expenditure on maintenance, cleaning, and repairs for the same period amounted to £1,496 19s. 5d., a decrease on that of last year of £55 11s. 4d. The total cash received was £1,185 15s. 7d.

On account of payment in advance, free water was supplied to the value of £21 14s. 5d., and free water for washing up was supplied to the value of £99 2s. 6d.

The total value of water supplied from this race amounted to £1,306 12s. 6d., a decrease on that of last year of £223 17s. 9d.

The approximate quantity of gold obtained by parties using water from this race during the year was 1,187 oz., valued at £4,569 19s., a decrease on that of last year of £835 9s.

The average number of men employed was 27·583.

With the exception of two months the year just ended was one of continuous drought. October and November were the only months when a full supply of water was available; from the 1st April to the beginning of October very little rain or snow fell, and, although the greater portion of the winter was very mild and free from frost, there was not sufficient water in the creeks to fill the race. The water was on along the whole course of the race until the 27th July, when frost compelled it to be turned off from Pearce's gorge upwards. Fairly severe frost continued until a thaw set in on the 5th August. The weather continuing dry, I had the water turned out on the 16th August, and started with all the available men to clean and repair the race, which was completed and the water on again on the 14th September. The weather from this date continued dry, until good rain set in on the 5th October, which gave a full supply of water. Good rains fell at intervals to the 16th November, when dry weather again set in, and continued so to the end of the year.

The main race during the year was very free of mishaps: the falling of a quantity of debris in the Eweburn tunnel, and a few small breaks in distributing-races, where the chief contingencies.

The race at present is in good order, and when water is available the demand is rather more than equal to the carrying-capacity of the race.

ANNEXURE B.

REPORTS OF DIRECTORS OF SCHOOLS OF MINES.

Professor JAMES PARK, Dean of the Mining Faculty, to the UNDER-SECRETARY OF MINES, Wellington.

SIR,— Otago University, Dunedin, 16th March, 1916.

I have the honour to present my report on the work done at the Otago University School of Mines for the year ended the 31st December, 1915.

During the winter session of 1915 the School of Mines was attended by fifteen students entered for the full associate course, and one casual student taking field astronomy. Of the fifteen, three completed their four-years course. Of the others, one student in his fourth year went on active service before the end of the session, also one second-year student and three third-year students.

At the annual examination only three failures were recorded—namely, one in mechanics, one in mathematics, and one in senior surveying.

It is gratifying to state that our graduates have no difficulty in finding lucrative positions as soon as they leave the University, which is a welcome change from the conditions that existed a few years ago. At one time our graduates were mostly restricted to employment in or about mines and metallurgical works. The positions offering in these departments were not numerous, and this often led to a discouraging waiting for chances to turn up. The satisfactory change that has taken place is mainly due to the extension of the courses of instruction on the civil engineering and surveying sides, whereby the possible sources of employment of our graduates have been greatly enlarged.

Mining engineering has long been recognized as a branch of civil engineering. During the current year, when the Institution of Mining and Metallurgy applied to the Crown for a Royal charter of incorporation, its application was opposed by the Institution of Civil Engineers, which pleaded that their articles of association provided for and included mining engineering as a department of civil engineering, in acknowledgement of which many mining engineers had been elected members or associates of the Institution of Civil Engineers. The Royal charter was granted, and the pleadings were interesting as showing the intimate relationship of mining and civil engineering. The mining engineer may be called on to erect trestles and bridges, to construct roads, tramways, or railways, to design jetties or piers, ore-bins, vats, hauling and winding plant, pipe-lines, flumes, and water-races, to survey mines and lands, or devise a scheme of development for a mine.

The engineering branch of the School of Mines is well provided with models and testing machines; while the surveying department possesses the most up-to-date instruments for all mine, land, and engineering surveys. So that, while still specializing in mining, full courses, both practical and theoretical, are now given in the strength of materials, stresses in bridges and other structures, hydraulics, and pipe-line construction, and in all departments of surveying, including field astronomy. The course in geology, both theoretical and practical, is very comprehensive, and has long been known for its thoroughness and great value.

Of the three graduates of 1915 two immediately found employment with civil engineers, and the other was appointed surveyor to the Consolidated Goldfields (Limited), Reefton. Unfortunately, an application by cable from a wealthy London company operating in the Malay Federated States for a mine-surveyor at £480 a year could not be filled, there being no one available, as all our graduates of the last few years have gone on active service.

The Effect of the War.—In 1914 fourteen new students entered for the full course; in 1915—the year covered by this report—only two; and in 1916 none. The attendance at the school has suffered not only through the large number of undergraduates who have gone on active service, but on account of intending students joining the colours. The men to take up mining engineering as a profession are just the men to answer the call of the Empire.

Of twenty-seven undergraduates with us in 1914 and 1915 no less than nineteen, or 70 per cent., have gone on active service. Five others enlisted, but were rejected on account of defective eyesight, &c. The names of those on active service are,—Lieutenant William Gibson Allan Bishop (Military Cross), Sergeant Harold P. J. Childs, Sapper Charles A. Livingstone, Sapper Alexander S. Malcolm, Sapper Nathaniel Malcolm, Private Eric O. McPherson, Private Steedman M. Sneddon, Private George Williamson, Private Alexander Henry McLean, Sergeant Lindsay Stevenson, Corporal Dundas Samuel, Lieutenant Reginald H. Schoen, Corporal Henry Gray, Private Walter H. J. Cropp, Lieutenant Spencer G. Scoular, Sergeant William P. Dunphy, Sergeant William P. Thompson, Sergeant Harold I. Green, Sergeant J. E. K. Lambourne.

Most of these served in the Gallipoli campaign. We deplore the death of Harold Childs and Alex. S. Malcolm, both killed in action. The members of the mining faculty extend to their parents their sincerest sympathy in the loss of brave sons who gave their all for their country. Some have been wounded, and several invalided by sickness. Among these we welcome Dundas Samuel, Eric McPherson, and Steedman Sneddon, who have returned. We heartily congratulate Lieutenant W. G. A. Bishop, who proved himself an enterprising and daring leader. He was mentioned in dispatches by General Ian Hamilton for distinguished service at Gallipoli, and afterwards awarded the Military Cross, which was personally presented by His Majesty the King, in London.

The Roll of Honour of our late graduates includes the name of our colleague Professor D. W. Waters, who now holds a commission in the Tunnelling Corps.

Among our alumni who are known to have gone to the front are: David M. Tomlinson, A.O.S.M., Lieutenant, Royal Scots; E. Fletcher Roberts, A.M.I.C.E., Royal Ordinance Force; G. A. C. Ulrich, A.O.S.M., Corporal, N.Z. Expeditionary Force; Philip McDouall, A.O.S.M., Sergeant, N.Z. Expeditionary Force; Otto A. Friedlander, A.O.S.M., Sergeant, N.Z. Expeditionary Force; A. M. Finlayson, A.O.S.M., Lieutenant, Royal Scots; Geoffrey W. E. Turner, A.O.S.M., Lieutenant, N.Z. Expeditionary Force; A. Spencer, A.O.S.M., Sergeant, N.Z. Expenditionary Force; Hugh R. Macdonald, A.O.S.M., Sergeant, N.Z. Field Engineers; W. M. Durant, A.O.S.M., Lieutenant, Tunnelling Corps; J. C. Neill, A.O.S.M., Lieutenant, Tunnelling Corps; D. B. Waters, A.O.S.M., Captain, Tunnelling Corps; George Dey, A.O.S.M., Captain, Australian Expeditionary Force; Wyville Rutherfurd, A.O.S.M., Sergeant, N.Z. Expeditionary Corps; Alexander Rutherfurd, A.O.S.M., Corporal, N.Z. Expeditionary Force; Frank Hadfield Statham, A.O.S.M., Major, N.Z. Expeditionary Force; W. P. Thompson, Sergeant, N.Z Field Engineers; Colin Campbell, A.O.S.M., Royal Flying Corps; George Geoffrey Sale, A.O.S.M., Royal Flying Corps; J. F. McPadden, A.O.S.M., Lieutenant, N.Z. Expeditionary Force; A. C. Dansay, Captain, N.Z. Expeditionary Force; Aubrey Horn, A.O.S.M., Royal Flying Corps; W. A. Alexander, B.Sc., Sergeant, N.Z. Expeditionary Force.

Mr. Frank H. Statham, A.O.S.M., left New Zealand with the rank of Captain, and soon after reaching Gallipoli was promoted to the rank of Major. He proved himself a dashing and resourceful leader, and fell leading his men in the strenuous fighting which culminated in the great attack at Suvla Bay in August, 1915. To his parents, his wife, and family, the members of the mining faculty wish to extend their warmest sympathy.

Mr. W. A. Alexander was killed in action in the same engagement. He was a brilliant student, a distinguished footballer, and a man who always did his duty. Our deepest sympathy is offered his parents and relations.

New appointments.—Among the appointments secured by former students during 1915 are the following:—

Fred W. Thomas, A.O.S.M., Manager, Babylonia Silver-mines, Nicaragua.
W. H. Sargeant, A.O.S.M., County Engineer, Merriwa, N.S.W.
W. R. Frost, A.O.S.M., Assistant Engineer, N.Z. Public Works Department.
Aubrey Horn, A.O.S.M., Battery Superintendent, Dominion Exploration Company (Limited), Marlborough.
W. M. Durant, A.O.S.M., Assistant Engineer, Dunedin City Corporation.
J. H. Williamson, Director, School of Mines, Reefton.
J. McGregor Wilkie, A.O.S.M., Resident Engineer, Dunedin Harbour Board.

The number of our graduates occupying responsible positions as County, Harbour Board, and Public Works engineers is rapidly increasing.

JAMES PARK, Dean of Faculty.

Mr. U. B. INGLIS, A.O.S.M., Director of the Coromandel School of Mines, to the UNDER-SECRETARY OF MINES, Wellington.

SIR,— Coromandel, 2nd March, 1916.

I have the honour to present my report on the work done at the Coromandel School of Mines for the year ending 31st December, 1915.

Attendance.—A total of twenty individual students attended the classes in thirteen subjects of instruction, the regular average being twelve students in the first term, thirteen in the second, and fourteen in the third term. One student, R. Lincoln, joined the New Zealand Expeditionary Forces, while another, L. Spellman, was placed in the Civil Service, and two or three others took positions as pupil-teachers in the public schools.

Examinations.—At the annual Government examinations eleven students sent in twenty-four sets of answers in the various subjects, and secured seven passes in practical examinations and sixteen passes in theoretical examinations, there being only one failure. The certificates gained comprised ten first-class, five second-class, and one third-class. The average number of marks awarded per paper was 62·6, which shows a considerable improvement in the quality of the work done.

Assays.—The number of ore-samples assayed and reported on during the year was 185, of which 155 were done for prospectors free of charge, and thirty for mining companies in the vicinity of Coromandel. Several analyses of soils, limestones, waters, and of supposed phosphate-rock were also made.

General.—The lighting of the school has been vastly improved by the installation of a new dynamo; many interesting and valuable geological specimens have been added to our collection, and a number of new books have been obtained for the reference and lending library; while some small additions have been made to the stock of electrical apparatus at the school.

In conclusion, I wish to thank the members of the Council, and especially the President and the late Secretary (Sapper J. W. Barker, now at the front), for the great attention which they have given to school business during the year.

I have, &c.,
U. B. INGLIS, A.O.S.M., Director.

Mr. J. LAMONT, Director of the Huntly School of Mines, to the UNDER-SECRETARY OF MINES, Wellington.

SIR,— Huntly, 27th March, 1916.

I have the honour to present my report on the work done at the Huntly School of Mines during the year 1915.

Attendance.—The attendance for each of the terms was as follows: First term, thirteen students; second term, fifteen students; third term, fourteen students. Two students, John Bradshaw and Thomas Hughes, have gone on active service.

Examinations.—Seven students presented themselves at the annual Government examinations. Four certificates in mathematics and one certificate in each of the subjects of mining (coal); ventilation; and pumping, hauling, and winding were gained. At the examinations for underviewers' and deputies' certificates two underviewers' and three deputies' certificates were granted.

Library.—The books supplied by the Mines Department, and also the Geological Survey Bulletins, are of great use, and are much appreciated by students and members.

Equipment.—The equipment of the school is far from being complete, but I expect some improvement in this connection within the next few months.

I have, &c.,
J. LAMONT, Director.

Mr. W. H. BAKER, B.Sc., Director of the Thames School of Mines, to the UNDER-SECRATARY OF MINES, Wellington.

SIR,— Thames, 20th April, 1916.

I have the honour to present my annual report on the work done at the Thames School of Mines during the year 1915.

Attendance.—The attendance has been rather less than that of the previous year, owing to the continued mining depression and the departure of students for the front. Over forty past and present students have volunteered and are serving in almost every branch of the service.

Examinations.—At the annual Government examinations twenty-two students sat for examination and obtained twenty-three first-class, three second-class, and four third-class certificates. Two students passed the first-grade examination in electricity of the City and Guilds of London Institute.

Battery and Experimental Plant.—Eight parcels of ore were treated, ranging from ½ cwt. to 9 tons, and varying in value from £5 per pound to 10s. per ton. From a total of 15 tons treated, bullion to the value of £2,158 was obtained.

Eighty-five assays were made for the public, including several prospectors' samples, and several analyses of ore and bullion for export.

Gas-testing Plant.—The Hailwood gas-testing plant has been utilized on several occasions, and sixteen certificates were granted during the year.

In conclusion, I wish to express my appreciation of the work done by the staff and of the keen interest of the Council in the welfare of the school.

I have, &c.,
W. H. BAKER, Director.

Mr. W. F. WORLEY, Director of the Nelson School of Mines, to the UNDER-SECRETARY OF MINES, Wellington.

SIR,— Nelson, 15th March, 1916.

I have the honour to present my report on the work done at the Nelson School of Mines for the year ended the 31st December, 1915.

Owing to the war and other causes my work here was considerably curtailed. The usual blowpipe analysis classes—which for the past twenty-five years have been the outstanding feature of our work—were, I regret to say, not held. The members of these classes were always boys from the upper standards in the public schools, and the work had to be done out of school-hours. As a result of the war, the services of these boys were required to aid various patriotic movements, and to assist in places of business. They therefore had not time to attend the blowpire analysis classes, which had as a consequence to be discontinued.

Assaying.—For the first eight months of the year not a single sample was sent for assay; but a few came in towards the end of the year.

At the request of the Director of the Geological Survey I went to the Dun Mountain mineral belt to collect specimens of rocks required for exhibition in the new London offices of the High Commissioner of New Zealand. The rocks collected were dunite, websterite, chromite, anthrophyllite, rodingite, and prehinite-rodingite. Some notes on the geology of the district were also supplied to the Director of the Geological Survey.

I have, &c.,
W. F. WORLEY, Director.

Mr. H. LOVELL, Director of the Westport School of Mines, to the UNDER-SECRETARY OF MINES, Westport.

SIR,— Westport, 29th March, 1916.

I have the honour to present my report on the Westport School of Mines, and its branches at Ngakawau, Millerton, and Denniston, for the year ended 31st December, 1915.

Attendance.—Despite the departure of several students for the front, the average attendance has been well maintained, and is equal to that of last year. The average attendance for the year was forty-two, with an average class attendance of eighty. In addition to the above a teachers' science class attended by twenty teachers was held.

Examinations.—Twelve students presented themselves for examination at the annual school of mines examination, and secured eight first-class, two second-class, and three third-class certificates in the following subjects: chemistry, mining, ventilation, and mathematics.

Government Certificates.—At the examination for Govrenment certificates under the Coal-mines Act five candidates sat, W. Crowe securing a partial first-class pass, whilst P. Morganti and W. H. Hewitson secured second-class passes. In the underviewers' and deputies' examination three candidates sat for the former and two for the latter examination. The results of these examinations are not yet to hand.

The Hailwood gas-testing apparatus has proved a boon to both miners and officials alike, no less than eighty of them having used it in order to learn gas-testing. Seventy-one candidates in gas-testing secured certificates.

Assay Laboratory.—During the year thirty-four samples of ores and mineral were assayed and reported on, the majority of the samples being quartzose ores.

Library and *Museum.*—The Mines and Geological Departments still continue to send pamphlets of mining literature and geological bulletins, which are greatly appreciated, and for which thanks is tendered.

In conclusion, I wish to express my thanks to the members of the Council for the deep interest taken in the welfare of the school.

I have, &c.,
H. Lovell, Director.

Mr. J. H. Williamson, Director of the Reefton School of Mines, to the Under-Secretary of Mines, Wellington.

Sir,— Reefton, 19th April, 1916.

I have the honour to present my report on the work of the Reefton School of Mines for the year ending 31st December, 1915.

Attendance, Reefton: The average attendance for the year at Reefton was fifteen students. Waiuta Branch: Attendance at this branch averaged ten students. Greymouth Branch: During the year a branch was opened in Greymouth for coal-mining students. The attendance averaged twenty students.

Gas-testing.—Gas-testing demonstrations and examinations were held monthly at Greymouth during the year, seventy-three students receiving certificates of competency in the detection of explosive gases in coal-mines.

Examinations.—At the examinations for Government certificates held in December last, two students received certificates as first-class mine-managers, while one obtained a battery superintendent's certificate.

Assays.—During the year 123 assays were made for the general public, mainly for gold and scheelite, while forty determinations were made with regard to the commercial value of the samples.

I have, &c.
J. H. Williamson.

ANNEXURE C.

MINING STATISTICS.

Table 1.

STATEMENT SHOWING QUANTITY OF QUARTZ CRUSHED AND GOLD OBTAINED IN THE HAURAKI MINING DISTRICT FOR THE YEAR ENDED 31ST DECEMBER, 1915.

Locality and Name of Mine.	Average Number of Men employed.	Quartz crushed.	Gold obtained.		Value.
			Amalgam.	Cyanide.	
THAMES COUNTY AND BOROUGH.					
Tapu—		Tons cwt. qr. lb.	Oz. dwt.	Oz. dwt.	£ s. d.
Mahara Royal	1	Cleaning up battery	248 15	..	517 13 8
Waiomio—					
Monowai	12	566 0 0 0	1,423 0	..	1,175 1 5
Tararu—					
New Sylvia	48	7,939 0 0 0	..	10,187 5	9,545 7 1
Watchman	32	5,443 0 0 0	1,064 15	2,788 9	8,257 14 2
Old Battery	1	4 0 0 0	54 14	..	136 8 4
Waitangi	31	3,285 0 0 0	..	3,895 8	2,474 14 9
Kurunui—					
Kurunui	3	101 10 0 0	92 10	..	203 12 7
Moanataiari—					
Adelaide	3	10 10 1 12	93 17	..	254 17 2
Newcastle	2	15 1 3 4	215 10	..	510 7 3
Moanataiari	3	185 10 0 0	110 13	..	280 7 7
Waiotahi—					
Waiotahi	5	240 0 0 0	875 9	..	2,075 4 5
Cambria	3	20 0 0 6	23 17	..	63 16 11
Nonpareil	3	0 0 1 7	25 15	..	64 3 2
Golden Drop	1	28 10 0 0	24 8	..	61 15 0
Evening Star	2	9 0 0 0	26 18	..	64 15 6
Karaka—					
Occidental	8	108 4 3 8	922 16	..	2,458 1 1
Little Nell	2	62 0 1 23	109 0	..	278 11 10
Tairua—					
Golden Hills	4	575 0 0 0	635 15	..	1,462 6 7
Golden Belt	20	679 0 0 0	..	1,904 10	1,959 1 9
Prospectors	10	101 0 0 11	70 14	..	174 2 8
Totals	194	19,372 7 3 15	6,018 6	18,775 12	32,018 2 11
WAIHI BOROUGH.					
Waihi—					
Waihi Gold-mining Company	753	171,725 0 0 0	..	531,490 0	327,394 8 11
Waihi Grand Junction	436	112,321 0 0 0	..	169,415 8	200,269 17 9
Silverton Battery	2	Cleaning up battery	33 0	..	12 0 0
Totals	1,191	284,046 0 0 0	33 0	700,905 8	527,676 6 8
OHINEMURI COUNTY.					
Owharoa—					
Veritus Claim	2	2 0 0 0	6 7	..	10 15 4
Waitekauri—					
Golden Cross	6	24 0 0 0	8 0	63 19	48 10 8
Waitekauri	1	Cleaning up mill	6 10	..	12 16 9
Karangahake—					
Talisman	280	26,230 0 0 0	37,180 18	107,527 0	188,620 0 1
Crown	12	36 0 0 0	92 3	..	156 0 3
Paeroa—					
Waihi-Paeroa Gold-extraction Company	60	*	..	97,517 0	39,700 0 0
Komata—					
Komata Reefs	3	Cleaning up slags, &c.	578 0	..	1,165 15 5
Maratoto—					
Silver Stream	6	5 12 0 0	(Treated in Australia)		140 10 0
Totals	370	26,297 12 0 0	37,871 18	205,107 19	229,854 8 6
PIAKO COUNTY.					
Waiorongomai—					
Hardy's Mines	2	*	..	4,091 14	1,403 13 3

* 148,100 tons of tailing recovered from the Ohinemuri River (sludge-channel), also 1,520 tons tailing from Hardy's Mines, Waiorongomai, were re-treated. This tonnage is not included in the above statement, having being recorded when the ore was originally crushed.

Table 1—*continued.*

STATEMENT SHOWING THE QUANTITY OF QUARTZ CRUSHED AND GOLD OBTAINED IN THE HAURAKI MINING DISTRICT FOR THE YEAR ENDED 31ST DECEMBER, 1915—*continued.*

Locality and Name of Mine.	Average Number of Men employed.	Quartz crushed.	Gold obtained. Amalgam.	Gold obtained. Cyanide.	Value.
		COROMANDEL COUNTY.			
Waikoromiko—		Tons cwt. qr. lb.	Oz. dwt.	Oz. dwt.	£ s. d.
Four-in-Hand	5	0 6 0 18	459 17	..	1,313 14 9
Tokatea—					
Royal Oak	2	1 0 1 18	43 5	..	110 0 0
Kapanga—					
Kapanga Tailing Gold-reclaiming	6	Re-treating old tailings	..	42 0	109 15 0
Coromandel Hydraulic Sluicing Company	6	2 0 0 0	4 4	..	9 0 0
Venture Claim	1	2 10 0 0	7 14	..	22 10 0
Kapanga	2	64 0 0 0	64 2	..	161 12 2
Hauraki Block—					
Hauraki Reefs	14	20 0 0 0	457 7	..	1,291 16 4
Kuaotunu—					
New Waitaia	12	373 0 0 0	..	906 0	2,471 16 10
Mountain King	2	10 0 0 0	..	66 1	169 19 6
Great Barrier—					
White Cliffs	1	0 0 2 23	11 17	..	26 12 3
Prospectors	4	5 0 0 0	0 17	..	1 15 0
Totals	55	477 17 1 3	1,049 3	1,014 1	5,688 11 10
		TAURANGA COUNTY.			
Te Puke—					
Te Puke Reefs	2	5 0 0 0	..	15 18	43 14 6
		SUMMARY.			
Thames County and Borough ..	194	19,372 7 3 15	6,018 6	18,775 12	32,018 2 11
Waihi Borough	1,191	284,046 0 0 0	33 0	700,905 8	527,676 6 8
Ohinemuri County	370	26,297 12 0 0	37,871 18	205,107 19	229,854 8 6
Piako County	2	..	..	4,091 14	1,403 13 3
Coromandel County	55	477 17 1 3	1,049 3	1,014 1	5,688 11 10
Tauranga County	2	5 0 0 0	..	15 18	43 14 6
Totals, 1915	1,814	330,198 17 0 18	44,972 7	929,910 12	796,684 17 8
Totals, 1914	1,854	347,193 13 0 2	55,583 18	1,073,614 3	911,732 14 7
Decrease	40	16,994 15 3 12	10,611 11	143,703 11	115,047 16 11

During the year 58 men were employed on unproductive quartz-mining operations.

STATEMENT SHOWING THE QUANTITY OF QUARTZ CRUSHED AND GOLD OBTAINED IN MARLBOROUGH AND WESTLAND DISTRICTS FOR THE YEAR ENDED 31ST DECEMBER, 1915.

Locality and Name of Mine.	Average Number of Men employed.	Quartz crushed.	Gold obtained by Amalgamation.	Gold obtained by Cyanide.	Estimated Value.
		MARLBOROUGH.			
Wakamarina—		Tons.	Oz. dwt. gr.	Oz. dwt. gr.	£ s. d.
Dominion Consolidated* ..	80	17,484	3,334 12 0	..	12,471 12 8
		WESTLAND.			
Inangahua County—					
Keep-it-Dark	60	10,985	2,005 4 0	996 5 0	11,064 14 0
Wealth of Nations	105	25,844	7,617 13 0	2,632 7 0	40,710 2 6
Progress	165	36,160	7,532 8 0	1,912 14 0	37,695 3 2
Murray Creek	30	1,680	1,522 6 0	179 15 0	6,739 9 0
Lankey's Creek	3	830	184 13 7	..	735 16 2
Tributers, Progress	3	597	109 7 22	..	383 7 7
New Big River	60	2,938	1,951 4 0	564 3 0	11,868 16 7
Blackwater	207	54,643	24,201 2 0	2,895 16 0	109,284 17 8
W. E. Gardiner	1	..	..	65 6 0	196 7 7
Totals	634	133,677	45,123 18 5	9,246 6 0	218,678 14 3
		SUMMARY.			
Marlborough*	80	17,484	3,334 12 0	..	12,471 12 8
Westland	634	133,677	45,123 18 5	9,246 6 0	218,678 14 3
Total, 1915 ..	714†	151,161	48,458 10 5	9,246 6 0	231,150 6 11
Total, 1914 ..	752	148,069	49,646 7 17	10,891 0 0	239,237 3 1
Increase	..	3,092	1,187 17 12	1,644 14 0	8,086 16 2
Decrease	38	..	..	..	..

* Also produced 110 tons of scheelite concentrates, value £14,182 12s. 3d.

† Seventy men were employed in non-productive quartz-mining operations not shown in this table.

Table 1—*continued.*

STATEMENT SHOWING THE QUANTITY OF QUARTZ CRUSHED AND GOLD OBTAINED IN THE SOUTHERN MINING DISTRICT FOR THE YEAR ENDED 31ST DECEMBER, 1915.

Locality and Name of Mine.	Average Number of Men employed.	Quartz crushed.	Gold obtained.	Estimated Value.
VINCENT COUNTY.				
Bannockburn—		Tons.	Oz. dwt. gr.	£ s. d.
Star of the East Gold-mining Company	2	80	18 5 21	61 6 10
Bald Hill Flat—				
Advance	2	150	127 0 0	488 19 0
Totals	4	230	145 5 21	550 5 10
WAIHEMO COUNTY.				
Macrae's—				
Golden Point	6*	569	176 6 0	685 16 0
Golden Bar	5	742	270 0 0	945 0 0
Stoneburn Mining Company	3*	978	39 5 16	150 0 11
McGregor and Innes	2*	16	5 7 0	20 1 3
Mareburn Gold-mining Company	3*	641	67 13 17	246 4 0
Nenthorn	2	93	24 11 12	91 18 6
Totals	21	3,039	583 3 21	2,139 0 8
SUMMARY.				
Vincent County	4	230	145 5 21	550 5 10
Waihemo County	21	3,039	583 3 21	2,139 0 8
Totals, 1915	25	3,269	728 9 18	2,689 6 6

* Also employed at scheelite-mining during the year, but shown as quartz-miners in the return of number of persons ordinarily employed at metal-mines.

Twenty-two men were employed at unproductive mining operations not included in this table.

STATEMENT OF VALUE OF BULLION WON FROM QUARTZ CRUSHED FOR ALL DISTRICTS FOR THE YEARS ENDED 31ST DECEMBER, 1914 AND 1915.

Mining District.	Year ended 31st December, 1914.	Year ended 31st December, 1915.
	£ s. d.	£ s. d.
Hauraki	911,732 14 7	796,684 17 8
Marlborough, Nelson, and West Coast	239,237 3 1	231,150 6 11
Otago and Southland	3,244 9 6	2,689 6 6
Totals	1,154,214 7 2	1,030,524 11 1

Table 2.

GROSS TOTALS AND VALUE OF BULLION PURCHASED BY BANKS FOR THE YEAR ENDED 31ST DECEMBER, 1915.

Bank.	Bullion purchased.	Value.
Hauraki Mining District (Northern Inspection District).		
	Oz. dwt. gr.	£ s. d.
Bank of New Zealand	120,672 18 0	219,702 16 11
Bank of New South Wales	838 12 0	1,296 19 9
National Bank of New Zealand	384,245 2 10	414,386 5 0
	505,756 12 10	635,386 1 8

Table 2—*continued.*

GROSS TOTALS AND VALUE OF BULLION PURCHASED BY BANKS FOR THE YEAR ENDED 31ST DECEMBER, 1915—*continued.*

Bank.	Bullion purchased.	Value.
Marlborough, Karamea, and Westland Mining Districts (West Coast Inspection District).		
	Oz. dwt. gr.	£ s. d.
Bank of New Zealand	20,647 2 20	81,035 11 7
National Bank of New Zealand	60,291 1 1	234,863 10 9
Bank of New South Wales	5,576 11 9	22,150 10 8
Union Bank of Australia	228 2 11	892 9 10
	86,742 17 7	338,942 2 10
Otago Mining District (Southern Inspection District).		
Bank of New Zealand	40,731 1 13	156,647 15 0
Bank of New South Wales	6,070 7 10	23,276 11 1
National Bank of New Zealand	12,852 3 9	49,692 2 3
Union Bank of Australia	46 0 0	175 0 0
Bank of Australasia	821 8 18	2,773 17 8
	60,521 1 2	232,565 6 0
Totals, 1915	653,020 10 19	1,206,893 10 6
Totals, 1914	823,146 17 6	1,319,712 4 3

STATEMENT OF AFFAIRS OF MINING COMPANIES, AS PUBLISHED IN ACCORDANCE WITH THE COMPANIES ACT, 1908.

Name of Company.	Date of Registration.	Subscribed Capital.	Amount of Capital actually paid up.	Value of Scrip given to Shareholders on which no Cash paid.	Number of Shares allotted.	Amount paid per Share.	Arrears of Calls.	Number of Shareholders at present.	Number of Men employed.	Quantity and Value of Gold and Silver produced since Registration.		Total Expenditure since Registration.	Total Amount of Dividends paid.	Amount of Debts owing by Company.
										Quantity.	Value.			
AUCKLAND DISTRICT.														
		£	£	£		£ s. d.	£			Oz.	£	£	£	£
Bremner's Freehold Gold-mining Company (Limited)	5/8/10	10,000	1,883	..	100,000	0 0 5½	117	..	..	..	..	..	..	..
Dominion Gold-mining Company (No Liability)	8/9/11	8,421	3,270	..	84,208	0 0 4½	..	..	..	..	..	..	..	..
Four-in-Hand Mines (Limited)	24/8/14	3,627	586	1,250	72,545	0 0 3	8	68	8	460	1,313	3,197	..	42
Golden Belt Gold-mining Company (Limited)	22/12/11	23,451	23,451	17,027	117,255	0 4 0	..	116	20	2,836	3,642	10,197	..	2,130
Good Hope Gold-mining Company (No Liability)	10/11/10	12,975	1,982	1,622	129,746	0 0 7	..	74	..	99	277	2,071	..	89
Great Northern Waihi Gold-mining Company (Limited)	13/8/14	2,750	2,750	6,000	68,000	0 1 3	202	255	5	..	..	2,162	..	118
Hare-Ratjen Copper Company (Limited)	5/4/07	7,600	1,000	6,600	7,600	1 0 0	..	..	..	..	..	..	..	..
Hauraki Reefs (Limited)	28/4/10	17,500	10,816	5,083	175,000	0 1 9	122	449	18	2,056	5,700	16,011	..	97
Kuranui Gold-mining Company (No Liability)	5/6/14	21,750	818	..	87,000	0 0 3	..	43	..	..	17	896	..	390
Luck-at-Last Gold-mining Company (Limited)	23/8/09	2,601	3,343	..	83,250	0 0 7½	..	..	..	..	..	..	..	..
May Queen Gold-mining Company (Limited)	15/5/07	64,000	33,583	26,787	256,000	0 4 10	482	204	1	5,248	14,726	58,430	..	70
Moanataiari Gold-mining Company (Limited)	7/12/09	22,450	13,490	..	179,596	0 1 7½	319	..	..	..	..	..	..	..
Maoriland Mines (Limited)	4/8/13	442	442	..	106,000	0 0 1	..	..	..	..	..	..	..	..
Monowai Gold-mining Company (Limited)	21/9/09	25,000	16,997	..	100,000	0 3 0	86	..	..	..	..	..	..	..
Mountain King Gold-mining Company (Limited)	12/2/08	12,000	10,000	2,000	120,000	0 2 0	..	..	..	..	..	..	..	..
Mount Welcome Gold-mining Company (Limited)	8/7/09	5,000	2,959	458	100,000	Various	159	50	..	580	1,707	4,659	..	62
New Cambria Gold-mining Company (No Liability)	23/6/14	5,050	503	..	50,500	0 0 3	128	..	..	..	..	..	..	..
New Comstock Gold-mining Company (Limited)	23/11/09	28,465	1,207	3,746	113,860	Various	..	..	..	..	..	..	..	..
New Sylvia Gold-mining Company (Limited)	2/10/05	30,000	27,542	1,208	300,000	0 1 11	..	340	47	..	62,384	90,712	..	358
New Waitaia Gold-mining Company (Limited)	25/2/09	15,000	7,859	2,500	150,000	0 1 5	266	141	14	5,825	22,123	21,417	1,875	593
North Prince of Wales Consolidated Gold-mining Company (No Liability)	23/3/12	4,405	3,957	1,250	35,240	0 2 0	..	24	..	..	..	3,462	..	710
Occidental Consolidated Gold-mining Company (No Liability)	3/8/09	5,397	4,033	..	107,938	0 0 11	..	143	7	3,222	10,006	11,338	1,349	..
Ohinemuri Gold and Silver Mines (Limited)	1/6/14	66,549	4,535	55,000	133,098	Various	84	142	8	..	..	4,537	..	44
Old Hauraki Gold-mines (Limited)	3/8/07	18,003	11,252	..	180,030	0 1 3	..	275	..	6,844	20,346	28,545	2,625	124
Rising Sun Gold-mining Company (Limited)	1/10/08	16,500	10,297	2,229	110,000	0 1 10	..	9	10	..	..	11,082	..	2,288
Saxon Gold-mining Company (Limited)	2/12/07	35,000	20,590	13,333	200,000	0 2 0	244	120	..	113	306	20,466	..	12
Tellurides Proprietary (Limited)	2/11/09	21,158	14,412	..	..	0 2 0	698	..	..	..	..	..	..	..
Victoria Gold-mining Company (No Liability)	8/12/06	29,523	13,670	..	147,615	0 1 11	343	136	..	1,031	2,886	13,961	..	149
Waihi Extended Gold-mining Company (Limited)	12/8/95	149,967	1,346	5,498	149,967	0 7 8½	622	273	6	4	17	52,989	..	163
Waihi-Paeroa Gold-extraction Company (Limited)	4/3/10	125,000	65,000	60,000	125,000	1 0 0	..	147	65	361,322	158,761	238,167	12,498	3,000
Waihi Standard Gold-mining Company (No Liability)	20/11/11	19,891	2,496	5,000	198,305	0 0 3	..	..	..	..	..	..	..	..
Waitangi Consolidated Gold-mining Company (No Liability)	23/10/08	147,833	23,039	1,000	170,800	0 2 11½	301	208	24	..	3,152	33,777	..	3,224
Waitawheta Gold-mining Company (No Liability)	22/7/14	9,698	383	4,849	96,982	0 0 1	21	108	1	..	..	554	..	232
Waiotahi Gold-mining Company (Limited)	28/7/71	18,000	16,000	..	240,000	0 1 4	..	575	1	..	677,299	280,426	400,786	14

Table 3—*continued.*

STATEMENT OF AFFAIRS OF MINING COMPANIES, AS PUBLISHED IN ACCORDANCE WITH THE COMPANIES ACT, 1908—*continued.*

Name of Company.	Date of Registration.	Subscribed Capital.	Amount of Capital actually paid up.	Value of Scrip given to Shareholders on which no Cash paid.	Number of Shares allotted.	Amount paid per Share.	Arrears of Calls.	Number of Shareholders at present.	Number of Men employed.	Quantity and Value of Gold and Silver produced since Registration.		Total Expenditure since Registration.	Total Amount of Dividends paid.	Amount of Debts owing by Company.
										Quantity.	Value.			
AUCKLAND DISTRICT—*continued.*														
		£	£	£		£ s. d.	£			Oz.	£	£	£	£
Watchman Gold-mining Company (Limited) ..	4/12/11	37,500	15,000	10,625	150,000	0 2 0	..	184	30	10,957	22,976	37,765	..	329
Zeehan Consolidated (Limited)	23/10/10	15,000	2,825	3,700	150,000	0 0 6	..	..	..	..	..	..	..	..
Te Puke Gold Reefs (Limited	4/5/98	12,865	12,865	..	101,478	0 2 6	..	99	..	..	..	13,284	4,545	19
Whangarei Cinnabar (Limited)	9/7/15	3,255	914	1,598	13,022	0 3 0	85	40	3	..	..	603	..	80
United Gold-mine (Limited)	17/7/15	15,132	2,318	10,000	15,132	1 0 0	93	43	6	..	..	1,442	..	219
Gallant Gold-mining Company (Limited) ..	20/10/15	500	221	2,125	20,000	0 1 6	82	48	4	..	..	191	..	..
Komata Reefs Gold-mining Company (Limited)	16/10/00	40,000	..	..	800,000	0 1 0	..	422	5	441,579	372,313	329,392	7,467	..
Cinnabar Mines of New Zealand (Limited) ..	19/12/13	6,500	881	4,062	13,000	0 1 0	94	23	..	..	..	454	..	1,020
NELSON DISTRICT (INCLUDING WEST COAST).														
Addison's Gold-mining Company (Limited) ..	28/5/15	7,000	5,029	..	71,000	0 17 6	1,086	14	30	..	..	4,997	..	..
Blackwater River Gold-dredging Company (Limited)	27/4/00	9,475	5,892	3,000	9,475	0 18 0	..	..	..	..	..	..	..	..
Blue Creek Gold, Silver, and Lead Development Company (Limited)	14/11/10	23,795	4,087	15,000	23,795	0 1 0	92	..	..	..	..	..	..	..
Dominion Consolidated Developing Company (Limited)	18/1/11	15,000	7,000	8,000	15,000	1 0 0	..	47	80	7,810	28,971	61,631	2,250	44
Five-mile Beach Gold-extraction Company (Limited)	16/6/13	16,305	7,625	7,000	16,305	1 0 0	1,679	75	..	..	..	6,106	..	2,467
Golden Flat Mining Company (Limited) ..	11/8/13	13,000	10,500	2,500	13,000	Various	202	116	..	108	425	9,614	..	2,290
Golden Terrace Mining Company (Limited) ..	31/3/14	9,000	7,000	2,000	9,000	1 0 0	57	61	8	139	543	6,765	..	395
Keep-it-Dark Mines (Limited)	8/2/11	10,000	4,250	..	20,000	0 4 3	..	51	60	15,950	60,182	69,708	..	..
Mahinapua Gold-mining Company (Limited) ..	11/1/09	5,385	4,485	900	5,385	1 0 0	..	..	..	..	..	..	..	..
Millerton Gold-mining Company (Limited) ..	19/11/12	51,154	26,987	24,000	51,154	1 0 0	426	207	15	..	..	16,995	..	2,473
Mont d'Or Gold-mining and Water-race Company (Limited)	5/7/82	12,000	10,800	..	12,000	0 18 0	..	44	7	38,939	149,938	106,727	57,000	..
Montezuma Limited..	26/1/14	5,525	2,348	..	5,525	1 0 0	..	..	..	..	..	..	..	..
Mount Radiant Prospecting Company (New Zealand	11/1/13	17,000	8,093	7,000	24,000	0 10 0	407	..	..	..	..	..	..	..
Murray Creek Gold-mining Company (Limited)..	30/5/11	30,000	26,117	2,000	30,000	1 0 0	1,450	109	50	3,338	14,652	43,437	..	1,606
New Swastika Gold-mines (Limited)	4/12/13	38,000	1,950	32,000	38,000	1 0 0	..	91	..	..	61	1,986	..	207
Ross Goldfields Reconstructed (Limited) ..	28/8/14	70,000	6,868	63,000	70,000	0 2 0	132	267	62	2,484	9,828	19,961	..	9,205
Stafford Gold-dredging Company (Limited) ..	17/5/05	289	289	1,734	2,023	1 0 0	..	..	..	..	..	..	..	..
Star of the East Mining Company (Limited) ..	0/2/13	36,000	300	..	36,000	1 0 0	..	33	3	206	732	3,697	..	259
Swastika North Gold-mines (Limited)	16/5/13	1,440	570	720	1,440	0 6 0	6	..	..	..	..	..	..	..
Worksop Gold-dredging Company (Limited) ..	20/3/07	12,000	10,500	1,500	12,000	1 0 0	..	88	16	22,799	88,617	47,626	43,350	2,115
Parapara Hydraulic Sluicing and Mining Company (Limited)	18/6/92	50,600	26,210	20,000	40,600	Various	150	60	10	13,515	51,982	77,061	..	..

Table 3—*continued*

STATEMENT OF AFFAIRS OF MINING COMPANIES, AS PUBLISHED IN ACCORDANCE WITH THE COMPANIES ACT, 1908—*continued*.

Name of Company.	Date of Registration.	Subscribed Capital.	Amount of Capital actually paid up.	Value of Scrip given to Shareholders on which no Cash paid.	Number of Shares allotted.	Amount paid per Share.	Arrears of Calls.	Number of Shareholders at present.	Number of Men employed.	Quantity and Value of Gold and Silver produced since Registration.		Total Expenditure since Registration.	Total Amount of Dividends paid.	Amount of Debts owing by Company.
										Quantity.	Value.			
NELSON DISTRICT (INCLUDING WEST COAST)—*continued*.														
		£	£	£		£ s. d.	£			Oz.	£	£	£	£
Blackwater South Gold-mining Company (Limited)	2/11/14	6,601	3,580	45,000	45,000	0 6 0	381	247	10	..	..	3,438	..	..
Carrick Gold-mining Company (Limited) ..	0/12/14	12,571	1,581	..	12,571	1 0 0	147	126	3	..	..	975	..	1,884
North Blackwater Development Syndicate (Limited)	19/11/15	20,000	4,325	5,000	2,000	5 0 0	675	26	14	..	..	1,889	..	..
New Big River Gold-mining Company (Limited)	19/8/07	6,000	600	..	24,000	0 0 6	..	61	44	53,617	216,781	129,169	91,200	3,382
Murray's Freehold Gold-dredging Company (Limited)	0/3/14	3,750	3,750	2,750	6,500	1 0 0	..	59	10	684	2,649	6,834	..	500
OTAGO DISTRICT (INCLUDING SOUTHLAND).														
Bakery Flat Sluicing Company (Limited) ..	10/9/96	2,500	2,012	..	2,500	0 18 6	..	25	..	4,764	18,029	20,471	1,062	..
Cardrona Dredging Company (Limited) ..	29/7/09	2,000	2,000	..	2,000	1 0 0	..	9	8	..	10,628	11,163	..	150
Crewe Gold-dredging Company (Limited) ..	7/9/02	2,000	2,000	3,000	5,000	1 0 0	..	22	7	12,465	48,010	41,518	9,125	158
Deep Stream Gold-mining Company (Limited) ..	19/11/06	2,500	500	2,000	2,500	1 0 0	..	7	4	2,280	8,774	8,373	1,812	60
Earnscleugh Gold-dredging Company (Limited)..	15/7/01	8	8	10,992	11,000	1 0 0	..	17	30	51,523	197,770	171,184	30,250	693
Electric Gold-dredging Company (Limited) ..	2/9/99	26,000	..	26,000	26,000	1 0 0	..	248	20	60,289	233,041	108,197	132,522	359
Gabriel's Gully Sluicing Company (Limited) ..	2/5/07	600	180	..	600	0 6 0	..	8	22	7,054	27,251	26,073	5,335	344
Golden Bed Dredging Company (Limited) ..	29/8/13	1,300	380	..	4,498	0 4 0	..	..	..	..	..	..	..	..
Golden Crescent Sluicing Company (Limited) ..	26/11/98	3,500	3,500	..	3,500	1 0 0	..	23	8	8,881	34,604	25,910	11,200	112
Golden Gate Gold-dredging Company (Limited) ..	19/12/13	5,000	..	5,000	5,000	1 0 0	..	5	17	1,531	5,884	4,964	1,000	36
Good Chance Dredging Company (Limited) ..	24/3/09	1,250	779	..	1,250	1 0 0	..	56	8	2,714	10,563	12,340	625	30
Havelock Sluicing Company (Limited) ..	3/3/08	4,000	3,400	600	4,000	1 0 0	..	12	6	5,949	22,814	19,181	7,400	1,600
Island Block Gold-dredging and Sluicing Company (Limited)	26/2/00	24,030	12,030	12,000	25,000	1 0 0	..	111	4	8,092	31,540	41,241	2,403	1,205
Kia-Ora Victoria Gold-dredging Company (Limited)	10/8/01	9,100	5,915	..	9,100	0 13 0	..	..	..	..	..	..	..	..
Ladysmith Gold-dredging Company (Limited) ..	19/4/00	12,000	3,964	3,000	14,500	0 10 0	..	80	8	11,384	43,873	34,122	13,895	19
Lammermoor Mining Company (Limited) ..	6/7/08	4,950	4,950	1,000	5,950	1 0 0	..	..	..	..	..	..	..	..
Lower Nevis Dredging Company (Limited) ..	29/9/06	600	600	600	1,200	1 0 0	..	7	7	5,428	20,864	18,876	2,730	248
Manila Gravel and Gold-dredging Company (Limited)	24/9/13	5,893	5,893	13,954	32,241	0 4 0	205	51	..	..	..	26,575	..	1,729
Manuherikia Gold-dredging Company (Limited)	1/8/99	12,000	6,000	6,000	12,000	1 0 0	..	166	9	18,936	72,606	43,487	34,176	..
Mareburn Gold and Scheelite Mining Company (Limited)	18/4/14	6,000	5,947	..	6,000	1 0 0	53	8	3	142	527	3,792	..	246
Mount Morgan Sluicing Company (Limited) ..	2/7/02	800	800	2,000	2,800	1 0 0	..	11	3	..	7,956	6,778	210	89
Muddy Terrace Sluicing Company (Limited) ..	4/10/06	14,400	14,400	5,550	19,950	1 0 0	..	126	24	9,732	38,554	68,012	..	15,058
Naseby Dredging and Hydraulic Sluicing Company (Limited)	16/10/97	5,000	2,288	2,000	5,000	0 15 3	..	24	4	4,960	19,100	18,311	4,750	51
New Golden Run Dredging Company (Limited)	21/11/07	8,000	8,000	..	8,000	1 0 0	..	..	..	..	..	..	..	..

Table 3—*continued.*

STATEMENT OF AFFAIRS OF MINING COMPANIES, AS PUBLISHED IN ACCORDANCE WITH THE COMPANIES ACT, 1908—*continued.*

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										Quantity.	Value.			
OTAGO DISTRICT (INCLUDING SOUTHLAND)—*continued.*														
		£	£	£		£ s. d.	£			Oz.	£	£	£	£
Ngapapa Gold-dredging Company (Limited) ..	9/9/11	..	..	2,400	3,000	0 16 0	..	10	9	4,580	17,587	14,816	2,925	116
Nokomai Hydraulic Sluicing Company (Limited)	26/3/98	24,000	7,000	17,000	24,000	1 0 0	..	69	36	40,074	149,982	113,013	44,484	678
Olrig Dredging Company (Limited)	13/3/99	9,955	8,955	1,000	9,955	1 0 0	..	72	8	10,204	39,092	40,268	4,773	61
Ourawera Gold-mining Company (Limited) ..	23/5/95	3,000	3,000	..	3,000	1 0 0	..	16	9	13,151	52,424	42,288	13,915	..
Paterson's Freehold Gold-mining Company (Limited)	15/7/99	12,000	8,000	4,000	12,000	1 0 0	..	32	8	21,288	85,159	93,534	22,200	..
Phœnix Water-race Company Limited (Regd.) ..	12/10/67	1,500	1,500	..	1,000	1 10 0	..	19	1	..	..	1,351	9,134	20
Pringle and Party (Limited)	24/4/14	2,000	2,000	..	2,000	1 0 0	..	..	..	..	..	..	..	..
Pukepouri Gold-mining Company (Limited) ..	22/1/14	2,500	1,667	..	2,500	0 16 0	..	24	..	160	600	2,854	..	1,690
Red Jack's Gold-dredging Company (Limited) ..	1/7/12	4,500	3,750	750	4,500	1 0 0	..	45	9	2,199	8,577	11,961	450	472
Rise and Shine Gold-dredging Company (Limited)	24/2/00	10,000	9,746	2,000	12,000	1 0 0	254	157	22	42,139	163,654	125,845	47,700	917
Rising Sun Gold-dredging Company (Limited) ..	16/2/01	8,000	5,500	2,500	8,000	1 0 0	..	75	10	21,468	83,037	61,185	22,400	389
Round Hill Mining Company (Limited) ..	30/7/02	28,245	6,753	21,492	5,649	5 0 0	..	180	28	42,789	171,173	165,850	11,580	330
Roxburgh Amalgamated Mining and Sluicing Company (Limited)	2/3/89	29,153	13,121	15,000	29,152	0 18 6	..	..	..	..	..	..	..	..
Sailor's Gully (Waitahuna) Gold-mining Company (Limited)	3/6/96	8,400	200	8,200	8,400	1 0 0	..	22	8	5,225	19,904	15,318	5,000	607
Scandinavian Water-race Company (Limited) ..	10/12/07	7	7	9,750	9,757	1 0 0	..	20	10	6,735	25,608	28,249	..	6,209
Skipper's Sluicing Company (Limited).. ..	20/11/11	3,450	345	3,105	3,450	1 0 0	..	30	5	970	3,733	3,756	..	93
Stewart Island Tin and Wolfram Lodes (Limited)	5/12/12	5,920	5,898	3,000	8,920	Various	21	92	6	..	..	6,584	..	737
Success Gold-dredging Company (Limited) ..	25/5/10	10,000	8,000	2,000	10,000	1 0 0	..	..	..	..	..	..	..	..
Tallaburn Hydraulic Sluicing Company (Limited)	3/12/04	1,200	1,200	..	12	100 0 0	..	9	4	1,576	6,065	7,316	1,380	199
Teviot-Molyneux Gold-mining Company (Limited)	24/12/09	35,000	25,000	10,000	35,000	1 0 0	..	23	28	..	..	35,674	..	805
Tinker's Gold-mining Company (Limited) ..	29/10/10	11,500	11,500	11,500	11,500	1 0 0	..	20	9	1,825	7,106	8,828	..	1,785
United M. and E. Water-race Company (Regd.)	8/4/72 23/4/72	7,600	7,600	..	152	50 0 0	..	..	..	..	..	..	..	..
Vinegar Hill Hydraulic Sluicing Company (Limited)	23/9/00	..	6,000	..	6,000	1 0 0	..	..	..	..	..	..	..	..
Waikaka Deep Lead Gold-dredging Company (Limited)	16/6/13	6,000	6,000	..	6,000	1 0 0	..	..	..	..	..	..	..	..
Waipori Prospecting Company (Limited) ..	9/6/14	1,750	1,750	..	80	21 17 6	..	28	4	..	..	2,280	..	22
Roaring Meg Sluicing Company (Limited) ..	11/8/14	3,100	1,540	1,300	3,100	1 0 0	35	29	4	..	..	1,555	..	30
Stoneburn Mining Company (Limited).. ..	2/2/14	4,000	3,625	..	4,000	1 0 0	..	12	6	45	172	1,868	..	245
Totals	..	382,548	220,600	200,993	418,229	195 3 3	1,212	..	..	..	..	..	..	..
Grand totals	..	1,782,021	729,888	585,792	5,323,717	205 3 2½	9,622	..	..	..	..	..	..	..

ANNEXURE D.

QUESTIONS ASKED AT THE EXAMINATION HELD DURING DECEMBER, 1915, FOR MANAGERS' FIRST AND SECOND CLASS CERTIFICATES OF COMPETENCY UNDER THE MINING ACT.

SUBJECT I.—*Mining.*

1. Describe and show by sketch how you would place the penthouse in a three-compartment rectangular-framed shaft, if you had to sink with a winch from the 1,000 ft. level, two of the compartments being in use full time sending up ore to surface.
2. Give the size of timber you would use, and show by sketch how it is fitted and the sets hung in position.
3. Describe the difference between a vertical shaft, an underlay shaft, and a winze.
4. State fully how you would drive through loose running country, and how you would secure heavy swelling ground.
5. Name the different methods of stoping and beating out small lodes and large lodes respectively.
6. Describe the filling-up method you would adopt on lodes, say, 2 ft. wide and 40 ft. wide; also, how you would fill in at three different levels simultaneously the levels being directly over one another.
7. What size of trucks and style of truck-wheels would you use, weight per yard of rails, and gauge of track would you put down where a large quantity of ore had to be handled?
8. Give the relative strength of gelignite, dynamite, and gelatine-dynamite, taking blasting-powder as a unit. State the class of country for which each is best adapted.
9. What explosive would you use under water?
10. Give the reason electricity from lighting or power cables "shall not be allowed for firing shots," under the Mining Act.
11. State the number of holes you would bore with rock-drill in a hard vertical face of drive 7 ft. in height by 5 ft. wide.
12. Describe the kind of hole you would put down or bore to prove the value of a placer deposit.
13. There are three methods of boring deep holes—namely, the spring pole, warping-barrel, and diamond drill: describe each, and how they are worked, and the country for which they are best suited.

SUBJECT II.—*Mechanics.*

1. Describe fully a pumping plant, including power capable of raising 500 gallons per minute from a depth of 400 ft., and state conditions under which the plant described would be most suitable.
2. State all precautions which should be taken when an underground working is approaching a place known to contain a dangerous accumulation of water.
3. Describe and sketch a dam in an underground level, suitable for damming back water to a height of 5 ft.
4. Sketch section of pithead frame, above landing brace, showing all appliances for prevention of accident in the case of an overwind.
5. Give maximum speed at which it is safe to raise or lower cage containing men in shaft.
6. Show by calculation the size of rope and also the size of coupling-chain required for winding in shaft 1,000 ft. deep with loaded cage weighing 30 cwt.
7. Describe plant for controlling (self-acting or balance) incline tram having gradient 1 in 3, length 40 chains, and load 1 ton.
8. Trace the passage of the steam from the boiler through a compound condensing engine.
9. Describe briefly the principal parts of an electric motor. Give in electrical terms the equivalent for 1 horse-power.

SUBJECT III.—*Ventilation: Ventilation of Mines and Knowledge of Mine Gases; Rescue Apparatus used in Mines; Methods of Dealing with Underground Fires.*

1. What are the leading characteristics of the three principal gases contained in air? State generally in what respects the return mine air differs from the intake air.
2. What does a variation in the readings of the wet and dry bulbs of a hygrometer represent? How is the amount of moisture in the atmosphere calculated from this data, and what is understood by "dew-point"?
3. State what is the general efficiency of mine-fans? If the horse-power of an engine is 52·84 and the water-gauge is 4·7 inches, what quantity of air would you expect to get?
4. With a water-gauge of 0·4 inch and the fan making 65 revolutions per minute, there is produced 35,000 cubic feet of air per minute: what quantity would be produced with a water-gauge of 0·6 inch?
5. A given mass of air occupies 1 cubic foot at 60° Fahr.: what volume will it occupy at 90° Fahr., and what is the weight of the above mass of air if the barometer stands at 30 in.?

6. Comment upon the anemometer, Pitot tube, and powder-smoke for the measurement of the velocity of mine-air. State the limitations of each method.
7. Make sketches showing in plan and section the arrangement from mine shaft to chimney of a double-inlet Sirocco fan capable of producing 85,000 cubic feet of air per minute. State dimensions.

Subject IV.—*Arithmetic and Law.*

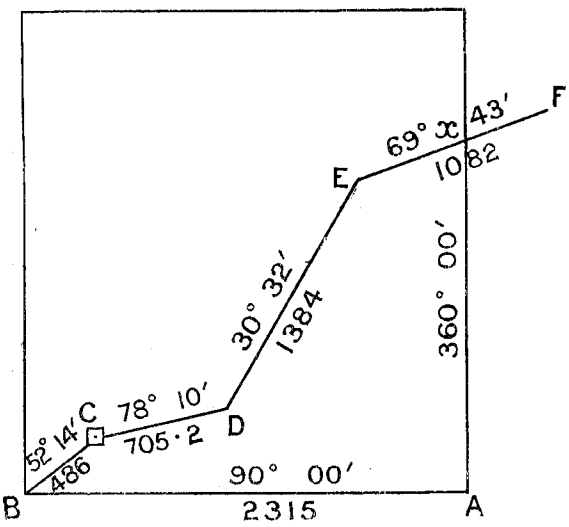
ARITHMETIC.

1. Find the cubical contents of a circular well whose diameter is $3\frac{1}{2}$ ft. and depth 28 ft.
2. Find correct to 4 places of decimals the square root of 52167809·72456139.
3. The gold reserve of a bank weights 27 tons 10 cwt. 3 qr. 3 lb.: if there be 7,000 grains in 1 lb. avoirdupois, and a sovereign weigh 123·374 grains, find the value of the reserve.
4. Determine the gross receipts of a company for the first half-year of 1913, given that the gross expenses, £285,900, were 65·86 per cent. of the receipts. Give result to nearest £1,000.
5. How many pieces of timber, each 6 ft. by $1\frac{1}{2}$ ft. by 3 in., can be cut from a piece 45 ft. long, 4 ft. wide, and 3 ft. thick?

LAW.

1. State the requirements with regard to ventilation of quartz-mines.
2. Quote in full the uniform code of signals required at all mines.
3. State the legal procedure to be followed when a fatal accident occurs.
4. What is a workmen's inspector? How is he appointed, and what are his duties?

Subject V.—*Surveying.*



1. The above diagram represents a mining claim with a shaft at C. A lode is followed from C to D, D to E, and E to F. Compute the extent of encroachment in cubic yards upon the adjoining portion, assuming the drive to be rectangular and 6 ft. high by 4 ft. wide; and what is the distance from A to x? The distances are given in links.
2. Compute the area within the figure A B C D E x.
3. A vertical shaft at G is sunk for a depth 75 ft. to H. The cap of a reef is noted at I, which is 50 ft. east of G. From H a crosscut is driven 80 ft. which cuts the reef at J. If the vertical shaft is continued 200 ft. from H to K, find the length of the crosscut K to L necessary to intersect the reef.

Subject VI.—*General and Applied Geology.*

1. Define any six of the following terms: Lode, vein, ore, contact-deposit, gash-vein, saddle-reef, deep lead, pay-wash, false bottom.
2. Give a table showing the sequence of the chief geological formations in New Zealand; *or*, as an alternative, in Great Britain or in Australia.
3. Give an account of the manner in which sedimentary deposits are formed.
4. Describe the geology of any mining district in New Zealand or elsewhere with which you are familiar.
5. Where in New Zealand are found ores or minerals containing—Tungsten, tin, molybdenum, silver, copper, antimony?
6. Describe the "ascension theory" of lode-formation. If you disagree with it, state why, and give an alternative hypothesis.
7. Give a full account of what is known as "secondary enrichment."
8. Why are some mines much troubled by water, whilst others are comparatively dry? So far as you are able, discuss the geological conditions concerned. Give examples of wet and of dry mines.
9. Why do mines get hotter in depth, and why are some mines hotter than others of equal depth? In discussing this question state the conditions in two or more of the following districts: Hauraki Goldfield, Reefton, Bendigo, Rand (Johannesburg), Lake Superior, Nevada (Comstock Lode).

10. Give sketches showing normal faults and reversed faults. Define the terms—Throw, slickenside, trough-fault, overthrust.
11. Explain as clearly as you can the nature of the movement involved in ordinary cases of faulting. More especially distinguish between apparent horizontal movement (or "heave") and actual horizontal movement (or "shift"). Give one or more illustrative figures, and, if possible, refer to actual examples of faulting known to you.
12. Describe the more common methods employed in prospecting for auriferous-quartz veins.

QUESTIONS ASKED AT THE EXAMINATION FOR BATTERY-SUPERINTENDENTS' CERTIFICATES OF COMPETENCY.

Subject I.—*Milling.*

1. Give an intelligent sketch of a crushing-battery and pulverizing-appliances, showing the relative positions of all these appliances. Also give a detailed description of a modern plant capable of treating 120 tons of ore per day of twenty-four hours.
2. Describe fully how you would construct a cyanide plant to deal with the pulverized ore mentioned in the foregoing question, and the different processes the ores undergo during the extraction of the precious metals and the rendering of them into a marketable commodity.
3. Give a detailed estimate of the cost of construction of plant as mentioned in No. 2 of the foregoing questions.
4. If you had to work a plant electrically as mentioned in the first question, what power in kilowatts would be required, and what volume and pressure would you recommend? Give your reasons for them.
5. What is meant by "electric candle-power"? How many kilowatts are required for 20 lamps of 16 c.p. and 5 lamps of 50 c.p.? Give the volume and pressure you would recommend.

Subject II.—*Amalgamation.*

1. State what kinds of gold-bearing ores are amenable to plate amalgamation.
2. Describe the relative merits of copper and Muntz-metal plates for the amalgamation of gold. Give the composition of Muntz metal.
3. State how you would prepare a new copper plate for amalagmation.
4. Describe, and illustrate with sketches, any continuous-grinding amalgamating-pan with which you are familiar.
5. State the most effective slope for amalgamating-plates for an ore containing, say, 2 per cent. of iron-pyrites.
   When crushing such an ore state what quantity of water you would admit to the stamper-box?
6. When smelting gold bullion state what precautions you would take to turn out clean well-shaped bars of the metal.

Subject III.—*Cyanide, Chlorination, and other Chemical Processes.*

1. In treating ores with KCN solutions how would you ascertain the best strength of solution to use in dealing with the ore for treatment in order to extract the largest percentage of precious metals? Also state the relative fineness the ore is to be pulverized to to get the best extraction of the metals.
2. How is KCN solution made up, and how is the strength ascertained?
3. How many pounds of pure cyanide would be required to make up 20 tons of 0·2 per cent. solution, using a sump solution of 0·03 per cent. KCN?
4. How many tons of a 4-per-cent. solution KCN are required to make up 90 tons of 0·25-per-cent. solution by using a sump solution containing 0·012 per cent. solution KCN?
5. What is meant by "chlorination"? How is it effected? Describe fully the class of ores most suitable for chlorination, and also for treatment with KCN solutions.
6. Describe fully a modern chlorination plant. (*a.*) How is chlorine produced? (*b.*) How is the precious metal dissolved from the ore? (*c.*) What reagent is employed to precipitate gold from the solution and also render the metal to a marketable commodity?
7. How are precious metals recovered from KCN solutions, and how are these metals made into a marketable commodity?
8. In the event of any of the workmen being poisoned by either chlorine gas or hydrocyanic acid, what steps would you take to relieve suffering? Give your reasons fully.

Subject IV.—*Sizing and Concentration.*

1. A gold-bearing ore contains some coarse free gold, 2 per cent of iron-pyrites that carries gold-values, and a considerable proportion of gold in the matrix existing in too finely divided a condition to be amenable to plate amalgamation. State clearly what scheme of treatment you would devise to extract a profitable percentage of the values. Illustrate your scheme by means of a flow-sheet.
2. Describe the Wilfley vanner, its action and limitations.
3. Describe the first principles underlying the magnetic separation of ores.

4. Assume that your concentrates contained both scheelite and iron-pyrites, and state how you would effect the separation of the pyrites from the scheelite.
5. State what you know of the principles and working of the Elmore oil-flotation process of ore-separation.

SUBJECT V.—*Assaying and Elementary Chemistry.*

1. Describe a trustworthy scheme for the sampling of mill-products where the ore is wet-crushed and contains some free amalgamable gold and sulphides carrying considerable values.
   The quartzose sands and slimes also carry sufficient values to warrant their treatment by the cyanide process: State how you would determine their value before and after treatment.
2. Describe simple qualitative tests for iron, copper, and zinc occurring as sulphides in an ore.
3. Free sulphuric acid is frequently liberated as a decomposition product of iron-pyrites. State how you would detect free sulphuric acid in such a decomposed ore.
4. Describe the separation of silver, iron, and copper in an aqueous solution of salts of these metals.
5. State what charge of fluxes you would use for the 400-grain fire assay of—(*a*) A fairly clean quartzose gold ore; (*b*) gold-bearing quartz containing 6 per cent. of iron-pyrites.

SUBJECT VI.—*Arithmetic and Law.*

ARITHMETIC.

1. In a sphere of gold 3 ft. in diameter of 22·5 carats, having a value of £3 17s. 6d. per ounce, how many ounces does the sphere contain, and what is its total value?
2. A pyramid 6 ft. square at its base and 9 ft. high, the top of which is 18 in. square: how many cubic feet does the pyramid contain?
3. The wages of a crushing-battery where 37 men are employed amounted as follows: 20 men in A division get £240; 10 men in B division get 90 per cent. of what each man in A division receives; 5 men in C division get 86 per cent. of what the men in B division receive; and 2 men in D division get 75 per cent. of what each man in B division receives. What did each man get, and what was the total of the month's wages?
4. The base of an excavation on a sideling is at one end 11 ft.; the length of the side on the slope of 1 to 1 is 15 ft. at one end and at the other end the base is 5 ft. and the side on the same slope is 7 ft.; the length of the excavation being 132 ft., how many cubic yards were excavated?
5. Extract the square root of 0·2169, divide the root by 0·316, and extract the cube root of the quotient arithmetically.

LAW.

1. What is the penalty for using an unregistered machine?
2. Under the Mining Act what is the definition of each of the following terms: Licensee, machine, metal, and ore?

LIST OF MINE-MANAGERS, BATTERY SUPERINTENDENTS, AND DREDGE-MASTERS WHO HAVE OBTAINED CERTIFICATES UNDER THE MINING ACTS.

First-class Mine-managers' Certificates.

Certificates of Service issued under the Mining Act, 1886, without Examination.

Adams, H. H., Waiorongomai.
*Anderson, P., Thames.
*Andrews, R., Coromandel.
Andrews, T., Thames.
Barclay, T. H., Thames.
Bennett, J., Alexandra.
*Benney, J., Coromandel.
Black, T., Waiomio.
*Bollersley, N., Boatman's.
*Bradbury, M., Reefton.
*Bray, John, Lyell.
Burch, W. H., Thames.
*Byrne, J. F., Stafford.
Cameron, A., Macetown.
*Cameron, E., Te Aroha.
Chapman, J. A., Dunedin.
*Clarke, G. S., Thames.
*Comer, R., Thames.
Conradson, M., Lyell.
*Corin, W., Thames.
*Cornes, C. A., Karangahake.
*Coutts, J., Thames.
*Crawford, T. H., Thames.
*Crowley, C., Reefton.
*Cummings, W., Reefton.
Davis, J. E., Queenstown.
*Davey, C., Ross.
*Donald, J., Cromwell.
*Dryden, S., Thames.
*Dunlop, T. A., Thames.
Edwards, J., Skipper's.
Elliott, J., Macetown.
*Evans, F., Skipper's.
Evans, J. H., Skipper's.
*Fitzmaurice, R., Reefton.
Frewen, J. B., Queenstown.
*Gavin, T., Te Aroha.
Gilbert, J., Reefton.
Gilmour, T., Thames.
*Giles, G. F., West Wanganui.
Glass, W. M., Naseby.
*Goldsworthy, J., Waiorongomai.
*Greenish, J., Reefton.
*Greenville, W., Ohinemuri.
*Hall, J. P.
*Hansen, P. C., Thames.
*Harris, J., Owen's Reefs.
Harrison, R. H., Coromandel.
*Hicks, T. B., Thames.
*Hilton, G. P., Bendigo.
*Hodge, F., Coromandel.
Hollis, W., Thames.
Hunter, R., Thames.
James, F., Thames.
Jamieson, A., Coromandel.
Jenkins, M., Wakatipu.
Johnstone, H., Bluespur.
*Julian, J., Boatman's.
Kelly, J., Lyell.
Kerr, J., Thames.
*Lawn, E., Black's Point.
*Lawn, H., Boatman's.
*Lawn, J., Reefton.
*Littlejohn, W., Karangahake.
*Lowe, E. W., Thames.
*Malfroy, J. M. C., Ross.
*Martin, W. G., Thames.
*McCallum, J., Reefton.
McCullough, R., Thames.
McGruer, G. N., Karangahake.
*McIlhaney, J., Thames.
McIntosh, D., Bluespur.
*McKay, J., Ross.
*McKenney, J., Reefton.
*McKenzie, W., Thames.
*McLeod, G., Coromandel.
*McLiver, F., Thames.
*McLiver, H., Thames.
McMaster, J., Reefton.
Moore, H. W., Thames.
*Moore, J. H., Thames.
*Morgan, R., Otago.
Morrisby, A. A., Glenorchy.
*Nasmyth, T., Reefton.
Newman, W., Naseby.
*Northey, J., Thames.
*O'Sullivan, D. E., Thames.
Polton, A., Karangahake.
Porter, J., Waipori.
*Purvis, G., Ross.
Quinn, E., Te Aroha.
*Radford, T., Thames.
Ralph, J. G., Thames.
*Ranger, J., Reefton.
*Rasmussen, C. L., Mokihinui.
Rasmussen, C. P., Mokihinui.
Reid, P., Coromandel.
Resta, L., Macetown.
*Roberts, E., Ross.
Rooney, F., Reefton.
Scott, T., Waiorongomai.
*Searight, A., Reefton.
*Senior, J., Thames.
Smith, J. E., Thames.
Stone, F., Karangahake.
*Steedman, J. B., Thames.
Sturm, A., Waipori.
*Taylor N., Thames.
Todd, C., Heriot.
Treloer, J. S., Reefton.
*Tripp, R. S., Arrowtown.
*Vivian, J. G., Thames.
*Vivian, S., Reefton.
*Waite, C. D., Thames.
*Waite, E., Thames.
Walker, J. W., Thames.
Watson, T., Reefton.
*Wearne, J. E., Endeavour Inlet.
Wearne, T., Endeavour Inlet.
*Wilcox, J., Thames.
Williams, J., Skipper's.
*Wright, G., Boatman's.
Wylie, W., Ross.
Young, G., Skipper's.

Issued after Examination under the Mining Act, 1886, and Amendment Acts.

Adams, B., Thames.
Baker, W., Thames.
Black, G., Reefton.
*Caples, P. Q., Reefton.
*Carter, J., Thames.
*Casley, G., Reefton.
Cochrane, D. L., Reefton.
Colebrook, J. D., Coromandel.
Coombe, J., Reefton.
Crawford, J. J., Thames.
*Cummings, W., Reefton.
Donaldson, W., Otago.
Fleming, M., Thames.
*Gardner, W. P., Reefton.
Harris, W., Thames.
Horn, G. W., Thames.
Horne, W., Coromandel.
Hornick, M., Thames.
Hosking, G. F., Auckland.
Kruizenza, W., Reefton.
*Lawn, T., Reefton.
Logan, H. F., Wellington.
Mangan, T., Thames.
Mouat, W. G., Dunedin.
*Truscott, G., Thames.
Watkins, W. E., Reefton.
*Wilkie, J., Reefton.

Issued on Production of Certificate from a Recognized Authority outside the Dominion under the Mining Acts, 1886, 1891, 1898, 1905, 1908, and 1913.

Argall, W. H., Coromandel.
Beckwith, L. H., Wellington.
Brook, R. H. T., Reefton.
†Cock, J., jun., Ross.
Cock, W., Waiomio.
Datson, J., Manaia.
Dodd, William, Milton.
Evans, A. W., Reefton.
Griffiths, A. P., Auckland.
Griffiths, H. P., Auckland.
Hailey, R. C., Dunedin.
Hall, E. K., Reefton
McKenna, Thomas, Dunedin.
Molineaux, H. S., Gore.
Rich, F. A., Auckland.
Williams, W. H., Auckland.

Issued after Examination under the Mining Act, 1891.

Agnew, J. A., Thames.
Annear, William, Reefton.
Arcott, R., Waihi.
Bennett, E. P., Thames.
Boydell, H. C., Coromandel.
Bradley, R. J. H., Te Puke.
*Bray, E., Reefton.
*Bruce, Malcolm, Thames.
Carroll, J., Lyell.
Cartwright, E., Thames.
Crabb, J., Reefton.
*Dobson, J. A., Auckland.
Evans, H. A., Wellington.
*Fahey, P., Reefton.
*Flannigan, Francis, Reefton.
Gilmour, J. L., Thames.
Hodge, J. H., Thames.
*Hughes, D., Thames.
*James, T., Thames.
Keam, P. E., Thames.
*Lane, J., Reefton.
Lawn, C. H., Capleston.
Linck, F. W., Thames.
*Marshall, F., Reefton.
Morrison, R., Thames.
McDermott, J., Thames.
McDermott, G., Thames.
McDermott, W., Thames.
McGregor, W. T., Thames.
McKenzie, H. J., Coromandel.
McPeake, J., Thames.
O'Keeffe, M. D., Thames.
Paul, Matthew, Thames.
Paltridge, Henry, Thames.
*Prince, F. H., Reefton.
Robertson, D. B., Stafford.
Ross, Richard, Thames.
Russell, Murray, Dunedin.
Shepherd, H. F., Thames.
Stanford, W. J., Macetown.
*Steedman, J. G., Thames.
*Sutherland, Benjamin, Reefton.
Tierney, R., Thames.
Vialoux, F., Coromandel.
Warne, George, Thames.
Waters, D. B., Skipper's.
*Watt, J., Thames.
White, G. H., Thames.
Whitley, A., Thames.
Williams, C., Capleston.

* Deceased since issue of certificate. † Alluvial.

FIRST-CLASS MINE-MANAGERS' CERTIFICATES—*continued.*

Issued after Examination under the Mining Acts, 1898, 1905, and 1908.

Allen, Henry, Waihi.
Autridge, L. E., Thames.
Baker, S. G., Thames.
Barker, B., Thames.
Barrance, K. M., Karangahake.
Bell, O., Waihi.
Bennie, Boyd, Waihi.
Bishop, Thomas Otto, Skipper's, Otago.
Blenkhorn, C., Coromandel.
Bolitho, Joseph, Reefton.
Bower, J. W., Coromandel.
Broad, R., Waihi.
Buddle, Frank, Coromandel.
Bull, C. W., Waihi.
Caisley, John, Karangahake.
Carroll, A. M., Reefton.
Carroll, John, Kuaotunu.
Carter, R. P., Waihi.
Clouston, R. E., Kaitangata.
Collier, E., Reefton,
Cooper, J. H., Thames.
Cooper, Thornhill, Waihi.
Cordes, F. M., Karangahake.
Cornes, J. G., Waihi.
*Daley, John William, Waihi.
Docherty, W. H., Coromandel.
Downey, J. T., Reefton.
Dutton, W. F., Waihi.
Ellery, John, Reefton.
Fry, S., Waimangaroa.
Evered, N. J., Waihi.
George, M. T., Waihi.
Goldsworthy, C., Karangahake.
Goldsworthy, W., Coromandel.
Gordon, J. A., Thames.
Grayden, P., Thames.
Greening, W., Karangahake.
Gudgeon, C. W., Macrae's.
Hitchcock, W. E., Barewood.
Hooker, John, Coromandel.
Irwin, Samuel, Waihi.
Jackson, G. T., Waihi.
Johnson, J. H., Coromandel.
*Katz, C. A., Waihi.
Langdon, H., Waihi.
Langford, G. S., Waihi.
Lautour, H. A. de, Waihi.
Lawn, Nicholas, Reefton.
Lewis, Ralph Reginald, Waihi.
Mackie, Portland George A., Waihi.
McConachie, W., jun., Waihi.
McDonald, R. M., Table Hill.
MacDuff, R. B., Thames.
McGruer, A., Karangahake.
MacLaren, J. A. J., Coromandel.
McMahon, J. H., Reefton.
McMahon, T., Reefton.
McMillan, T., Waihi.
Mitchell, William J., Barewood.
Moore, L. O., Waihi.
Morgan, William, Waihi.
Morrison, William, Waihi.
Moye, Michael, Reefton.
Oats, John, Black's Point, Reefton.
O'Shea, J., Reefton.
O'Sullivan, J. W., Thames.
*Rabe, John, Thames.
Rimmer, J. C., Helensville.
Rodden, John, Reefton.
Ruffin, R. C., Reefton.
Saunders, W. H., Reefton.
Scoble, E. J. Waihi.
Sheehan, D., Karangahake.
Smith, Walter, Karangahake.
Spearing, J. R., Waihi.
Stewart, F., Waihi.
Stewart, R. A., Reefton.
Sullivan, T., Reefton.
Thomson, J. R., Waihi.
Thomson, Thomas, Waihi.
Thorne, G. M., Waihi.
Tucker, E. S., Coromandel.
Turner, G. W. E., Reefton.
Turnbull, E. V., Coromandel.
Turner, C. E., Murchison.
Ulrich, G. A. C., Waihi.
Walker, A. J., Waihi.
Watson, J. L., Thames.
*Webber, J. H. A., Reefton.
*Weir, Thomas, Waihi.
*Whyte, N. McG. H., Waihi.
*Williams, C., Thames.
*Wilson, Allan, Thames.
Wood, P. H., Reefton.
Wotherspoon, James, Waihi.

Issued under Section 313 of the Mining Act, 1891.

*Edwards, George, Westport.
Hornibrooke, H. P., Coromandel.
Martin, James, Reefton.
Rickard, John, Thames.
Snow, Thomas, Huntly.
Thomas, James, Thames.
Trelease, J. H., Thames.
Williams, John, Kuaotunu.
White, John S., Karangahake.

Certificates of Competency granted to Holders of Provisional Warrants under Section 32 of the Mining Act Amendment Act, 1896.

Alexander, Thomas, Deep Creek.
Argall, A. E., Coromandel.
Battens, H., Coromandel.
*Begley, Thomas, Reefton.
Bennett, Charles Henry, Kuaotunu.
Bunney, Joseph, Waihi.
Campbell, Alexander, Cullensville.
Carlyon, Samuel, Coromandel.
Cornes, C. A., jun., Karangahake.
Daldy, Edward Arthur, Coromandel.
Draffin, Samuel, Waitekauri.
Farmer, C. S., Waitekauri.
*Goldsworthy, Thomas, Tokatea.
Goldsworthy, William, Karangahake.
*Govan, Joseph, Thames.
Harvey, A. G., Coromandel.
*Howard, Samuel, Karangahake.
James, Robert, Thames.
Jamieson, John, Reefton.
Johns, Thomas, Waihi.
Kennerley, W. H., Thames.
*Langford, James, Coromandel.
McCombie, John, Karangahake.
MacDonald, H., Coromandel.
McEnteer, James, Tararu.
*McFarlane, Charles M., Tokatea.
McLean, Benjamin J., Waitekauri.
McLean, Charles, Thames.
*McLean, James, Tararu, Thames.
Meehan, James, Westport.
Moorecraft, Walter, Coromandel.
Morgan, William, Owharoa.
Moyle, Thomas, Thames.
Patton, William, Macetown.
Pearce, Francis, Reefton.
Potter, William H., Thames.
*Rabe, Henry, Karaka.
Rillstone, Charles, Waipori.
Somervell, John, Thames.
*Stackpole, Robert, jun., Karangahake.
Thomas, Archelaus, Tapu, Thames.
Turnbull, Thomas A., Whangamata.
*Willets, Henry, Thames.
*Wilson, James R. S., Kuaotunu.

Issued to Inspectors of Mines by virtue of Office under the Mining Acts, 1886, 1891, and 1898.

Binns, G. J., Dunedin.
Cochrane, N. D., Westport.
Gordon, H. A., Wellington.
*Gow, J., Dunedin.
Green, E. R., Dunedin.
Hayes, J., Dunedin.
McLaren, J. M., Thames.
Tennent, R., Westport.
*Wilson, G., Thames.

SECOND-CLASS MINE-MANAGERS' CERTIFICATES.

Certificates of Service issued under the Mining Act, 1891.

Adams, W. J., Thames.
Agnew, J. A., Coromandel.
*Allen, Richard, Reefton.
Argall, A. E., Coromandel.
*Beard, W. T., Reefton.
*Begley, Thomas, Reefton.
Bennett, C. H., Coromandel.
Blair, Thomas, Kuaotunu.
Bolitho, James, Reefton.
Bone, William, Reefton.
*Borlase, J. H., Capleston.
*Bowler, John, Thames.
*Bray, Edwin, Reefton.
Bremner, John, Coromandel.
Brokenshire, James, Thames.
Brown, John, Macrae's.
*Brownlee, Thomas James, Thames.
Bunny, Joseph, Thames.
Byrne, John, Karangahake.
*Caird, Alexander McNeil, Reefton.
*Campbell, J., Kuaotunu.
*Climo, Noah, Coromandel.
Comer, W. W., Thames.
Comer, George, Thames.
Corbett, T., Paeroa.
*Cowan, Hugh, Kuaotunu.
Crabb, Thomas, Reefton.
Daniel, P. F., Greymouth.
Dobson, John Allen, Kuaotunu.
Edwards, George, Westport.
Ellery, John, Reefton.
*Flannigan, Francis, Reefton.
Foster, Thomas, Wellington.
*Galè, C. W., Coromandel.
Gemmings, Charles, Thames.
Gill, George, Thames.
*Glasgow, T. M., Thames.
Goldsworthy, Henry, Thames.
Goldsworthy, William, Mauku, Auckland.
*Govan, Joseph, Thames.
Gribble, James, Norsewood.
*Griffin, Patrick, Thames.
Grimmond, Joseph, Ross.
Guthrie, John, Wellington.
*Guy, Robert, Kuaotunu.
Hardman, James Edward, Thames.
*Harris, R., Thames.
*Harvey, William, Reefton.
Hetherington, William, Thames.
*Hicks, W., Thames.
Hill, Alexander Grey, Waikakaho.
Hollis, Frederick J., Waihi.
Hore, John, Wellington.
Hornibrooke, H. P., Kuaotunu.
Jamieson, John, Reefton.
Jobe, James, Thames.
Johns, Thomas, Thames.
Johnstone, William, Collingwood.
*Kendall, Henry, Thames.
Kerr, George, Kamo.
Kirker, Thomas, Thames.
Laughlin, David, Thames.
Law, John, Thames.
*Lough, H., Thames.
Loughlin, S., Thames.
Mackay, William, Nenthorn.
Martin, David, Black's Point.
Martin, James, Reefton.
Mayn, John, Coromandel.
McCombie, John, Karangahake.
*McCormick, Charles, Coromandel.

*Deceased since issue of certificate

SECOND-CLASS MINE-MANAGERS' CERTIFICATES—*continued.*

Certificates of Service issued under the Mining Act, 1891—continued.

McEwen, James, Reefton.
*McLean, James, Thames.
McLean, Alexander, Coromandel.
McLean, Charles, Thames.
*McNeill, Daniel, Thames.
McNeill, George, Upper Kuaotunu.
*McLoghry, Archibald, Karangahake.
*McQuillan, John, Reefton.
Meagher, John, Karangahake.
*Mills, George, Thames.
*Milne, John, Thames.
Morgan, William, Upper Thames.
*Moorecroft, Thomas, Thames.
Moyle, Thomas, Thames.
*Naysmith, James, Reefton.
Newdick, Alfred, Thames.
*Notman, Alexander, Reefton.
O'Keefe, M. W. D., Thames.
Page, John, Lyell.
*Parkiss, Joseph W., Reefton.
Peebles, Alexander, Kuaotunu.
Pettigrew, Robert, Sydney.
*Phillips, W. H., Thames.
*Pollock, John, Thames.
Potts, W. H., Thames.
Primrose, J., Kuaotunu.
*Rabe, Henry, Thames.
*Radford, Thomas, Thames.
Reid, Thomas Groat, Thames.
Rickard, John, Thames.
Richards, A. H., Kuaotunu.
*Rogers, Charles Henry, Reefton.
Rogers, William Henry, Kumara.
*Ross, J., Thames.
*Rowe, James, Thames.
Shaw, James, Karangahake.
Sligo, Alexander, Nenthorn.
Thomas, James, Thames.
Thomas, A., Thames.
Thomson, John, Dunedin.
*Tregellas, James, Reefton.
*Tregoweth, William, Thames.
*Wells, Charles Lewis, Thames.
*Willets, Henry, Thames.
Williams, James, Thames.
Williams, John, Thames.
*Wilson, James R. S., Kuaotunu.
Wilson, J. G., Thames.
*Whisker, Charles, Thames.
White, John S., Karangahake.
*Woodcock, James, Thames.
Worth, Robert, Waihi.

Issued after Examination under the Mining Acts, 1891 and 1898.

Benney, J., jun., Paeroa.
Bennie, Boyd, Coromandel.
Cahill, T. M., Upper Kuaotunu.
Carroll, John, Upper Kuaotunu.
Christie, William, Waitekauri.
Draffin, S., Waitekauri.
Dunkin, T., Coromandel.
Evans, H. A., Skipper's.
*Gatland, V. Y., Coromandel.
Mathewson, A., Hyde.
McNeil, A. H., Coromandel.
White, F. H., Kuaotunu.
White, G. H., Thames.

Issued under Section 313 of the Mining Act, 1891.

Connon, William, Thames.
*Coran, Henry, Thames.
Edwards, E., Coromandel.
*Kelso, Archibald, Coromandel.
McCormick, W. J., Waitekauri.

Certificates of Competency granted to Holders of Provisional Warrants under Section 32 of the Mining Act Amendment Act, 1896.

Allen, W. J., Coromandel.
Barney, Montague T., Waitekauri.
Brownlee, Henry, Thames.
Collins, Charles, Waitekauri.
Curtis, Charles, Taylorville.
Davis, James, Coromandel.
Gardner, James, Waimangaroa.
Howe, Albion S., Waitekauri.
Johnson, Frank H., Collingwood.
Kirwan, William, Reefton.
*McDonald, John, Tairua.
McInnes, John, Puriri.
Martin, William, Tararu, Thames.
Murphy, Joseph, Coromandel.
O'Brien, John, Westport.
Prescott, Arthur J., Coromandel.
*Radford, Samuel, Waihi.
Ruffin, Richard, Manaia, Coromandel.

Certificates of Service issued under the Mining Amendment Act, 1910.

Adams, Albert Augustine, Thames.
Adams, R. W., Thames.
Barker, J. W., Coromandel.
Brabyn, John, Clarendon.
Butcher, F. J., Waitekauri.
Donaldson, George, Macrae's Flat.
Gillan, Thomas, Thames.
Grace, Pierce, Waitekauri.
Hansen, Charles Hans, Puketui.
Hayes, James, Thames.
Hill, Harrold Alexander, Thames.
Hyde, Henry John, Karangahake.
Iles, E. J., Bannockburn.
Inglis, Robert, Kuaotunu.
Kell, Arthur, Karangahake.
McKenzie, D., Georgetown.
Reid, George, Glenorchy.
Reynolds, Edmond Francis, Coromandel.
Sheehan, James, Thames.
Tallentire, John, Waiorongomai.
Williams, John Paul, Puriri.

BATTERY SUPERINTENDENTS' CERTIFICATES.

Issued under the Mining Act 1891 Amendment Act, 1894, without undergoing Examination.

Adams, H. H., Waihi.
*Aitken, R. M., Reefton.
Banks, Edwin Gripper, Waihi.
Barry, Hubert Percy, Waihi.
Goldsworthy, Henry, Kuaotunu.
Goldsworthy, John, Kuaotunu.
Greenway, H. Howard, Auckland.
*Heard, G. St. Clair, Waihi.
Hope, John S., Waitekauri.
Hutchison, William, Karangahake.
Margetts, Frederick Ernest, Kuaotunu.
McKenna, T. N., Tararu.
McLellan, William, Waitekauri.
*Mellett, Richard Sheridan, Waitekauri.
*Napier, James, Karangahake.
Noble, James R., Karangahake.
Park, James, Thames.
Shepherd, Henry Franklin, Waihi.
Sims, C. F., Tararu.
Walker, James A., Kuaotunu.
Wilson, Arthur E., Waihi.
Wilson, James Kitchener, Auckland.

Issued after Examination under the Mining Act 1891 Amendment Act, 1894.

Adams, A. A., Thames.
Allen, F. B., Thames.
Allom, H. O., Thames.
Ansley, Comyn, Paeroa.
Ansley, Walter, Thames.
Banks, J. H., Waihi.
Bowers, W., Thames.
Brown, A. E., Thames.
*Carter, Samuel, Thames.
Clarke, J. L., Thames.
Clarke, R., Waitekauri.
Clarke, W. J., Waihi.
Day, A. T., Thames.
Dixon, Clement, Waihi.
*Doveton, G. D., Thames.
Fleming, G. C. S., Thames.
Fuller, J. P., Kuaotunu.
Gray, J. W., Waihi.
Hayward, F. W., Komata.
Horn, G. W., Kuaotunu.
Jackson, J. H., Paeroa.
Jones, Achison, Waihi.
Kidd, F. D., Thames.
Laurie, D. B., Karangahake.
Lee, J. W., Reefton.
Macdonald, W., Waihi.
McKenzie, H. J., Thames.
McMicken, S. D., Thames.
Morgan, P. G., Thames.
Morrin, W. S., Thames.
Noakes, H. L., Waihi.
Raithby, R. W., Reefton.
Robinson, J. R., Waitekauri.
Stafford, B. H., Waihi.
Taylor, C. H., Tararu.
Thorpe, A. H., Thames.
Vercoe, R. B., Thames.
Wingate, H. M., Maratoto.
Winslow, G., Thames.
Williams, A. G. R., Thames.

Issued after Examination under the Mining Acts, 1898, 1905, and 1908.

Adams, J. H., Coromandel.
Adams, Richard W., Tararu, Thames.
Adams, J. H., Thames.
Airey, Hubert, Karangahake.
Aitken, Alexander Hugh, Waihi.
Allen, D. V., Thames.
Allen, H. E., Wellington.
Anderson, David, Waihi.
Andrews, T. T., Waihi.
Auld, J. B., Crushington.
Baker, W. H., Thames.
Banks, C. A., Waihi.
Banks, E. J., Thames.
Barrance, K. McK., Karangahake.
Barrett, J. J., Karangahake.
Barron, William E., Waikino.
Baskett, E. G., Karangahake.
Bell, L. M., Waihi.
Bidlake, A. E., Waiomo.
Bird, A. W., Thames.
Bishop, T. O., Reefton.
Blackadder, William, Crushington.
Bradley, R. J. H., Karangahake.
Browne, E., Waitekauri.
Brown, F. M., Karangahake.
Brown, J. E., Komata.
Brown, W. E., Reefton.
Burns, William, Waiomio.
Bush, E. F., Parawai.
Bush, George Arthur, Karangahake.
Bush, H. R., Thames.
Campbell, Colin, Thames.
Carpenter, W. E., Karangahake.
Carless, Noel, Waihi.
Carter, S., Waihi.
Carroll, John, Kuaotunu.

* Deceased since issue of certificate.

BATTERY SUPERINTENDENTS' CERTIFICATES—*continued.*

Issued after Examination under the Mining Acts, 1898, 1905, and 1908—continued.

Chappell, G. A., Karangahake.
Clark, John L., Waihi.
Clarke, Thomas, Waihi.
Coote, J. M., Thames.
*Corbett, G. L., Waitekauri.
Couper, J., Thames.
Cowles, R. K., Crushington.
Crawford, H., Macrae's.
Crompton, H., Maratoto.
Croucher, Herbert, Waihi.
Dawson, B., Ellerslie.
Donnelly, Thomas, Waihi.
Donovan, Willie, Waikino.
Draffin, Eugene, Kuaotunu.
Eaton-Turner, Geoffrey William, Waihi.
Ellis, L. L., Waitekauri.
Empson, J. B., Karangahake.
Evans, G. C., Waihi.
Evans, J., Waihi.
Evans, W. B., Reefton.
Ewen, H. F., Auckland.
Fletcher, H. T., Katikati.
*Fraser, J. M., Reefton.
Fry, Sidney, Westport.
Fuller, John P. Kuaotunu.
Fyfe, A., Dunedin.
Gardner, E. A., Reefton.
Gibson, William, Waihi.
Gilpin, J., Waihi.
Gow, E. A., Crushington.
Grayden, J., Waitekauri.
Grayden, Peter, Thames.
Grumitt, P. H., Thames.
Gwilliam, Benjamin, Karangahake.
Halliwell, L. V., Karangahake.
Hargraves, E. P., Waihi.
Hay, Adam, Karangahake.
Harsant, C., Puketui.
Hazard, T. R. C., Waitekauri.
Hindmarsh, R., Reefton.
Hitchcock, W. E., Barewood.
Hogg, B., Karangahake.
Hogg, T. R., Karangahake.
Horn, G. W., Kuaotunu.
Gillooly, T., Roxburgh.
Gillstrom, Carl A., Berlin's.
Hutchison, R. M., Karangahake.
Johnson, Edward, Waihi.
Jones, R. D., Karangahake.
Kidd, R. B., Waitekauri.
Kingsford, A., Karangahake.
Kingsford, C., Waihi.
Langford, G. S., Waikino.
Launder, G. H., Waitekauri.
Lawless, L. J., Paeroa.
Lawn, H., Reefton.
Littlejohn, W. D., Karangahake.
Lovelock, J. E., Crushington.
Mackay, John, Crushington.
Maltman, A., Reefton.
Mann, C., Westport.
Matheson, A. M., Barewood.
Maxwell, W. L., Waihi.
McDonall, P. H., Waihi.
McEwin, J. A., Reefton.
McKinlay, John, Waihi.
McNeil, A. R., Karangahake.
McPadden, J., Coromandel.
Melrose, P., Waihi.
Montgomery, A. E., Opitonui.
Morgan, Robert James, Waihi.
Motherwell, William, Waihi.
Moyle, W. T., Upper Tairua.
Orbell, G. S., Waikouaiti.
Orr, F. S., Wainta.
Paltridge, F., Thames.
Pond, H. C., Auckland.
Porteous, J., Crushington.
Quick, J. N., Thames.
Reid, J. E., Great Barrier.
Reynolds, E. A., Auckland.
Roberts, H. C., Waihi.
Rodden, William, Lyell.
Rosewarne, R. H., Thames.
Royse, W. G., Reefton.
Sanford, A. G., Waihi.
Shaw, D. S., Waikino.
Shaw, L. J., Waikino.
Stephens, H., Dunedin.
Sutherland, J. A., Reefton.
Thomson, G. W., Bendigo.
Thurlow, J. R., Coromandel.
Tomlinson, A., Karangahake.
Tomlinson, David Mitchell, Barewood.
Tomlinson, W. F., Dunedin.
Turnbull, E. V., Waihi.
Ulrich, G. A. C., Komata.
Ulrich, Herstall, Whangapoua.
Walker, Alfred James Dickson, Waihi.
Waters, D. B., Waihi.
Watson, A. B., Waitekauri.
Watson, A. P., Crushington.
Watson, J. R., Reefton.
Watson, J. P., Reefton.
Watson, W. A., Crushington.
Wearne, W., Reefton.
White, A. S. H., Karangahake.
Williams, A. C., Waihi.
Williams, James, Reefton.
Williams, Joseph, Reefton.
Williams, William Eustace, Waihi.
Wilson, A. P., Crushington.

DREDGEMASTERS' CERTIFICATES.

Issued without Examination under the Mining Act, 1898, and Amendment Acts, 1901 and 1902.

Allen, Charles, Alexandra.
Anderson, L. C., Alexandra.
Andrews, Ralph, Canvastown.
Baker, J. R., Alexandra.
Ballantyne, D., Miller's Flat.
Barnes, T. J., Beaumont.
Barry, Thomas, Clyde.
Bradley, Neil, Alexandra.
Bennett, George, Gore.
Bennett, James, Kumara.
Blue, G. P., Alexandra.
Brand, Peter, Waikaka.
Brennan, Philip, Palmerston S.
Bremner, A. P., Lower Shotover.
Brice, William H., Cromwell.
Bringans, D., Alexandra.
Brown, T. G., Ahaura.
Bunting, James, Murchison.
Busbridge, P., Gore.
Butler, Ewen, Roxburgh.
Butler, M. J., Kanieri.
Cameron, Samuel, Alexandra.
Clarke, Edward, Port Chalmers.
Compton, Albert, Dobson.
Cormack, W., Greymouth.
Cornish, J. T., Miller's Flat.
Coutts, Henry, Miller's Flat.
Cowan, Alexander, Stillwater.
Cowan, James, Nelson Creek.
Crookston, W. L., Three-channel Flat.
*Crowley, J. B., Edendale.
Cumming, J. C., Beaumont.
*Cunningham, George, Kanieri.
Curtis, Charles, Stillwater.
Cutten, W. H., Dunedin.
Deniston, R. A., Cromwell.
Dewar, John, Alexandra.
Donaldson, J. G. A., Greenstone.
*Edmonds, A. R., Nelson Creek.
Faithful, William, Greymouth.
Foohy, J. M., Alexandra.
Gibb, William, Croydon Siding.
Gibson, A., Island Block.
*Goodger, G. W., Waenga.
Graham, J. M., Gore.
Grogan, William A., Miller's Flat.
*Hansen, William, Alexandra.
Hay, James, Dunedin.
Hedley, A., Cromwell.
Herbert, J., Beaumont.
Hewitt, James, Clyde.
Hogg, Thomas, Cromwell.
Hoskins, Thomas, Maori Point.
Hoy, Samuel, Alexandra.
Inwood, W. J., Rocklands Beach.
Johnston, E. A., Alexandra.
Johnstone, Alexander, Cromwell.
Keen, Thomas, Clyde.
Kennedy, Angus, Alexandra.
Kitto, Edward T., Miller's Flat.
Kitto, Francis, Lowburn.
Kitto, J., Lowburn Ferry.
Kitto, John F., Miller's Flat.
Kitto, W. H., Cromwell.
Kloogh, N. P., Lowburn Ferry.
Lawson, Edward, Dunedin.
Ledingham, J., Bannockburn.
Lee, George, Collingwood.
Lidicoat, R. H., Fern Flat.
Louden, Alexander, Clyde.
Luke, S. J., Alexandra.
Magnus, A., Roxburgh.
Magnus, Olaf, Box 130A, Christchurch.
Mailer, John, Stillwater.
Maitland, A. E., Miller's Flat.
*Maxwell, John, Dunedin.
McClure, F. C., Rongahere.
McConnell, J., Cromwell.
McCormack, D., Kanieri.
McDonald, E. A., Waitiri.
McDonald, J., Sofala.
McDonald, John, Cromwell.
McGeorge, J., Dunedin.
McGeorge, Alexander, Dunedin.
McGregor, D., Kanieri.
McGregor, G. R., Alexandra.
McIntosh, D. J., Lowburn Ferry.
*McLay, George, Cromwell.
McLean, D., Waitiri.
McMath, D. C., Ross.
McMath, Thomas, Alexandra
*McVicar, Peter, Roxburgh.
Mills, Edward, Murchison.
Mitchell, D. A., Dunedin.
Morel, C. G., Inangahua Junction.
Morris, G. S., Cromwell.
Murray, D., Clyde.
Murray, Madget, Cromwell.
Neilson, S., Miller's Flat.
Nicholson, W. E., Alexandra.
O'Leary, D., Waiau.
Olsen, Charles, Roxburgh.
Parsons, J. D., jun., Clyde.
Percy, John, Clyde.
Perkins, A. C., Dunedin.
Pettigrew, George, Nelson Creek.
Poulter, G. W., Alexandra.
Pringle, John, Miller's Flat.
Ray, J. C., Totara Flat.
Reeder, Philip, Bald Hill Flat.
Rennie, Andrew, Roxburgh.
Ross, Alexander, Cromwell.
Ross, Robert, Alexandra.
Richmond, J., Gibbston.
Ritchie, J. S., Waitiri.
Sanders, H. P., Clyde.
Sanders, John, Cromwell.
Sanders, Thomas, Alexandra.
Schaumann, H., Alexandra.
Scott, M. G., Alexandra.
Scott, Robert, Capleston.
Shore, T. M., Queenstown.
Shore, William, Gore.
Simonsen, Charles, Alexandra.
Skilton, A. G., Old Diggings.
Stigo, N. K., Ahaura.
*Smeaton, S. H., Inangahua Junction.
Smith, Alfred, Inangahua Junction.
Steel, Archibald, Kawarau Gorge.
Steel, Thomas, Dunedin.
Templeton, Ivie, Rongahere.
*Thompson, J., Alexandra.
Thompson, T., Miller's Flat.
Tough, John, Miller's Flat.
Troy, G. C., Cromwell.
Turnbull, W. D., Canvastown.
Tyson, John, Rongahere.
Von Haast, J. H., Clyde.
Wallace, John A., Miller's Flat.
*Watt, John, Cromwell.
Weaver, Charles, Alexandra.
Williamson, R., Miller's Flat.
Williamson, Walter, Miller's Flat.
Wilson, S. W., Waikaka Valley.
Wood, R. M., Cromwell.
Woodhouse, W. S., Roxburgh.
Young, Andrew, jun., Roxburgh.

* Deceased since issue of certificate.

DREDGEMASTERS' CERTIFICATES—*continued.*

Issued after Examination under the Mining Acts, 1898, 1901, 1902, 1905, and 1908.

Anderson, Andrew, Alexandra South.
Anderson, Bertram, Maori Point.
Anderson, G. B., Roxburgh.
Archer, D. J., Ngakawau.
Baird, William G., Clyde.
Bardsley, John James, Cromwell.
Bate, H. T. G., Greymouth.
Bishop, Hugh Arthur, Collingwood.
Blair, G., Abbotsford.
Borthwick, Robert, Alexandra.
Bourke, John, Clyde.
Brent, C. D., Cromwell.
Briggans, Thomas, Alexandra.
Briggans, William, Alexandra.
Broderick, T., Lyell.
Bruce, J. A., Kawarau Gorge.
Burley, J. P., Westport.
Burnside, Walter, Alexandra.
Burton, A. P., Miller's Flat.
Callaghan, E., Three channel Flat.
Campbell, G. W. T., Alexandra.
Carnegy, A., Three-channel Flat.
Carr, W., Alexandra.
Carter, W. W., Sandy Point.
Chapman, Robert, Maori Point.
Clark, D., Callaghan's Creek.
Clarke, R. S. B., Alexandra S.
Coup, George, Albertown.
Cox, R. D., Alexandra.
Craig, D. A., Shag Point.
Croawell, James, Three-channel Flat.
Curno, C. B., Alexandra.
Dalton, J. R., Three channel Flat.
Dalzell, T. L., Cromwell.
Donaldson, John, Lawrence.
Downie, Henry, Totara Flat.
Eaton, Edgar W., Alexandra.
Elder, D. D., Roxburgh.
Fache, S. C., Gore.
Faithful, Alfred, Bannockburn.
Farmer, Nathan C., Miller's Flat.
Farquharson, George, Alexandra.
Findley, David, Dunedin.
Fisher, Hurtle, Miller's Flat.
Filippi, S. de, Westport.
Foley, S., Lowburn Ferry.
Forno, D., Inangahua Junction.
Fraser, W. J., Roxburgh.
French, T. E. K., Three-channel Flat.
Gibson, William H., Cromwell.
Graham, Thomas Arthur, Gore.
Gunion, R. A., Alexandra.
Gunn, W. E., Beaumont.
Guy, Donald, Cobden.
Guyton, James, Dunedin.
Hanning, C. J., Clyde.
Hansen, H. C., Three-channel Flat.
Harden, J., Stafford.
Harliwick, Matthew, Roxburgh.
Hewetson, Sydney, Nelson Creek.
Hogg, J., Nevis.
Holden, Charles, jun., Cromwell.
Holden, John, Cromwell.
Hepburn, D. O., Alexandra.
Hughes, John L., Miller's Flat.
Johnston, John, Maori Gully.
Johnston, Louis, Beaumont.
Jones, David Rowland, Island Block.
Jones, T. R., Miller's Flat.
Junker, Frank J., Berlin's.
Kane, William, Clyde.
Kean, F. F., Waikaka.
Kellett, C. H., Dunedin.
Kennedy, A., Ophir.
Kitto, Henry, Alexandra South.
Kitto, John, Clyde.
Linney, William, Island Block.
Livingstone, D., Alexandra.
Lloyd, Arthur, Inangahua Junction.
Lloyd, Hubert, Lyell.
MacDonald, C. J., Cromwell.
MacGinnis, J. A., Cromwell.
MacGinnis, M. P., Alexandra.
MacLaren, John, Alexandra.
Marklund, C. O., Lowburn Ferry.
Mathews, James Halbert, Miller's Flat.
Matthews, A. A., Three-channel Flat.
Mayne, W. C., Nelson Creek.
McDonald, C. J., Waitere.
McDonald, G., Alexandra.
McCallum, W. S., Alexandra.
McGregor, Dougald S., Alexandra.
McKenzie, John, Roxburgh.
McKinnon, John, Alexandra.
McLean, John, Roxburgh.
Melvin, J. R., Roxburgh.
Merchant, Isaiah, Clyde.
Milne, John A., Roxburgh.
Moffitt, R. W., Miller's Flat.
Mollison, William, Stillwater.
Moncrieff, Henry, Miller's Flat.
Monson, C. H., Miller's Flat.
Morel, A. E., Noble's.
Morel, L. H., Inangahua Junction.
Morgan, Harold, Roxburgh.
Morgan, John, Alexandra.
Morris, V., Cromwell.
Mouat, W. G., Greymouth.
Munro, C. T., Waitiri.
Munro, Hugh, Alexandra South.
Munro, R. F., Ross.
Murray, H. B., Cromwell.
Murray, Robert John, Canvastown.
Nelson, Edgar, Brunnerton.
Nelson, George L., Brunnerton.
Newick, Albion Edgar Charles, Bannockburn.
Nicholson, Charles S. G., Mataura.
Noble, William, Alexandra.
Olsen, Hans, Alexandra.
Omond, Thomas, Nevis.
Orkney, H. E., Cromwell.
Orr, H. T., Cromwell.
Orr, William W., Cromwell.
Parker, P. R., Roxburgh.
Paterson, J. B., Miller's Flat.
Patterson, J., Clyde.
Plumb, E. H., Maori Point.
Poppelwell, William, Alexandra.
Rait, Hume, Albertown.
Ray, J. F., Bannockburn.
Ray, Robert Marshall, Bannockburn.
Reiderer, Edward, Cromwell.
Reynolds, T., Greymouth.
Ritchie, William John, Cromwell.
Roberts, G., Three-channel Flat.
Robertson, D. J., Alexandra.
Robertson, W. R., Alexandra.
Rooney, J. B., Roxburgh.
Rumble, Charles, Ngahere.
Rumble, Joseph, Miller's Flat.
Sanders, W. J., Ahaura.
Saunders, C. E., Cromwell.
Sawle, J., Cromwell.
Sawyer, J. F., Alexandra.
Sherwood, T. W., Greymouth.
Simpson, Edward Robert, Cromwell.
Sparrow, J. A., Upper Nevis.
Spooner, A. E., Alexandra.
Steele, Thomas, Alexandra.
Steele, W. H., Miller's Flat.
Taylor, Alexander, Alexandra.
Taylor, J. T., Dunedin.
Theyers, C., Alexandra.
Theyers, J. W., Alexandra.
Turner, T. F., Moonlight.
Vickerman, E. M., Cromwell.
Walker, J. J., Alexandra South.
Wasserbrenner, M., Alexandra.
Wathen, James, Miller's Flat.
Watson, E. H., Collingwood.
Weaver, P., Alexandra.
Weir, R., Gore.
Weir, T. R., Cromwell.
Weir, W., Nevis.
Wescombe, Alfred L., Island Block.
Westcott, P. A., Miller's Flat.
Williams, Frederick, Alexandra.
Wilson, George, Marsden.
Wilson, Stephen L., Inangahua Junction.
Wood, W. W., Cromwell.
Woodhouse, F., Bannockburn.
Woodhouse, G. G., Waitiri.
Wylde, G. R., Inangahua Junction.

APPENDIX B.

REPORTS RELATING TO THE INSPECTION OF COAL-MINES.

The INSPECTING ENGINEER OF MINES to the UNDER-SECRETARY OF MINES.

SIR,— Wellington, 11th May, 1916.

I have the honour to present my tenth annual report, together with statistical information, in regard to the coal-mines of the Dominion, for the year ended 31st December, 1915.

The report is divided into the following sections:—

I. Output of Mineral.
II. Persons employed.
III. Accidents.
IV. The Coal-mines Acts and Regulations.
V. General Remarks.

Annexures—
(*a.*) Examination of Colliery Officials, and List of Certificate-holders.
(*b.*) Statistics of Working Collieries.

SECTION I.—OUTPUT.

The output of the several classes of coal mined in each inspection direct is summarized as follows:—

Class of Coal.	Output of Coal during 1915.				Total Output to the End of 1915.
	Northern District.	West Coast District.	Southern District.	Total.	
	Tons.	Tons.	Tons.	Tons.	Tons.
Bituminous and semi-bituminous coal	118,780	1,149,160	...	**1,267,940**	25,246,582
Pitch-coal	...	129,834	6,626	**136,460**	2,132,052
Brown coal	338,270	...	386,731	**725,001**	12,491,312
Lignite	3,365	...	75,858	**79,223**	1,963,090
Totals for 1915 ...	**460,415**	**1,278,994**	**469,215**	**2,208,624**	**41,833,036**
Totals for 1914 ...	**440,453**	**1,351,182**	**483,958**	**2,275,593**	**39,624,412**

The decrease in output is due principally to a shortage of miners, the number having been reduced by 578 during 1915, owing chiefly to enlistment. The decrease in output has not, however, been proportional to the reduction in the number of miners employed: thus there has been a falling-off in the average number of persons employed to the extent of 13 per cent., whereas the reduction in output has been only 3 per cent.

The quantity of coal imported during 1915 amounted to 353,471 tons, being 164,599 tons less than that imported during the previous year. This decrease may be attributed to the abnormal conditions at present existing in the industries of the Empire.

The output of coal from each coalfield is as follows :—

Coalfield.	Output during 1915.	Total Output to End of 1915.
	Tons.	Tons.
North Auckland	117,882	3,386,128
Waikato (including Mokau)	342,533	4,201,057
Nelson	26,629	282,524
Buller	710,969	13,687,056
Inangahua	12,151	253,107
Grey	529,245	8,166,387
Canterbury	15,954	699,132
Otago	293,604	8,571,585
Southland	159,657	2,586,060
Totals	**2,208,624**	**41,833,036**

The production from, and the number of persons employed at, the principal collieries of the Dominion are shown in the following table :—

Name of Colliery.	Locality.	Class of Coal.	Output for 1915.	Total Output to 31st December, 1915.	Total Number of Persons ordinarily employed.
Northern District.			Tons.	Tons.	
Hikurangi	Hikurangi...	Semi-bituminous	69,254	1,002,519	110
Taupiri Extended and Ralphs ...	Huntly ...	Brown ...	223,328	3,171,589	469
Northern	Hikurangi...	Semi-bituminous	35,647	569,429	45
Waipa	Glenmassey	Brown ...	100,568	149,876	145
West Coast District.					
Coalbrookdale	Millerton ...	Bituminous	291,813	4,697,883	446
	Denniston	"	273,550	7,154,979	543
Westport-Stockton	Mangatini	"	144,232	846,940	236
State Coal-mines { Point Elizabeth...	Dunollie ...	Pitch ...	129,627	1,995,389	231
State Coal-mines { Liverpool ...	Rewanui ...	Bituminous	108,573	189,687	235
Blackball	Blackball ...	"	216,897	2,252,054	348
Paparoa...	Roa ...	"	43,427	196,899	48
Southern District.					
Kaitangata and Castle Hill ...	Kaitangata	Brown ...	140,342	3,281,176	350
Nightcaps	Nightcaps...	" ...	65,361	1,096,845	108
Other New Zealand collieries ...	All coalfields	Various ...	366,005	15,527,771	842
Totals	...	...	**2,208,624**	**41,833,036**	**4,156**

SECTION II.—PERSONS EMPLOYED.

Inspection District.	Average Number of Persons employed during 1915.		
	Above Ground.	Below Ground.	Total.
Northern	212	691	903
West Coast	573	1,749	2,322
Southern	265	666	931
Totals, 1915	**1,050**	**3,106**	**4,156**
Totals, 1914	1,176	3,558	4,734

SECTION III.—ACCIDENTS.

The following is a summary of coal-mining accidents during 1915, with their causes:—

—	Fatal Accidents.		Serious Non-fatal Accidents.	
	Number of Separate Fatal Accidents.	Number of Deaths.	Number of Separate Non-fatal Accidents.	Number of Persons injured, including those injured by Accidents which proved Fatal to their Companions.
Explosions of fire-damp ...	...	...	...	...
Falls in mine	4	4	6	6
Explosives...	1	1	1	3
Haulage	2	2	3	3
Miscellaneous—Underground...	1	1	1	1
On surface ...	1	1	1	1
Totals	**9**	**9**	**12**	**14**

The deaths were in the proportion of 2·16 per 1,000 persons employed. With the exception of the fatal accidents to James Colligan and Patrick McAuly, at Westport-Stockton colliery, so far as is generally known all the fatal accidents were due either to inadvertence of the sufferer or were unpreventable—*i.e.*, accidents common to the hazardous occupation of mining which cannot be prevented by regulations or reasonable supervision. In the southern inspection district, under Inspector E. R. Green, for the second successive year there has been no fatal accident, an excellent record. In the northern inspection district, under Inspector B. Bennie, there was but one fatality.

The following is a brief description of fatal accidents at coal-mines during 1915:—

Name of Person killed.	Date of Accident.	Name of Colliery.	Cause of Accident, and Remarks.
John Arthur Williams ..	15/1/15	Blackball ..	This accident occurred at 7 a.m. A hang-fire charge of gelignite had occurred at 8 p.m. the previous evening at a working-face. The deceased and his mate were informed of this before they commenced work by the previous shift, the position of the shothole being pointed out to them by a deputy. The deceased and his mate, Edwin J. Evans (the only witness of the accident who survived), the latter stated, were cleaning up loose coal when the hang-fired charge of eleven hours previous suddenly exploded, with fatal results to Williams. Evans in his evidence at the inquest stated that they had in no way interfered with the hole. It is difficult to believe that a charge should hang fire for eleven hours. The Coroner brought in a verdict that no blame was traceable to any one.
Patrick McAuly	19/4/15	Westport-Stockton	Deceased, an aged man, was sent into a large coal-storage bin by means of the shoot-door to shovel small coal which had ceased to flow through the shoot-door. About fifteen minutes later one of his mates called out to him, and, getting no reply, looked up through the shoot-door and saw deceased in a crouched attitude near the door. Upon investigation he was found to be dead. The Coroner's jury brought in a verdict that death was due to a shock caused by a slide of coal whilst he was shovelling in the bins; with a rider that suitable hand-holds should be placed in storage-bins. The case was taken by the widow to the Arbitration Court, and she was awarded £488 compensation, the Court believing that some mishap befell deceased rather than that he died suddenly from disease, as advanced by the owners of the mine.
James Colligan	1/6/15	Ditto ..	Two miners, the deceased and Andrew Hunter, were working in a main heading at the newly opened eastern section. The face of the heading was approaching a "roll" in the roof, and had been narrowed from 9ft. to 6ft. 6in. and had been reduced in height. The timber supports to the roof had been discontinued for 6 or 8 yards back from the face. Between the sandstone "roll" and the coal roof a thin wedge-shaped shell of indurated clay intruded. A piece of this, in length 7ft. or 8ft., and distant about 2ft. from the face, fell, striking deceased and inflicting wounds and shock, from which he died the following day. This fatality was the subject of a prosecution of the mine-manager by the Inspector in the Magistrate's Court, and an appeal against a conviction to the Supreme Court, the mine-manager being finally acquitted. The charges against him was that he did not cause the drive in which deceased was employed to be securely protected.

Description of Fatal Accidents at Coal-mines, &c.—continued.

Name of Person killed.	Date of Accident.	Name of Colliery.	Cause of Accident, and Remarks.
Alfred Edward Lloyd ..	13/7/15	Taupiri Extended	Deceased and another miner (L. Bumby) were engaged in the face of a bord 10 ft. high by 14 ft. wide. They had prepared for a shot to be fired, and Bumby was sounding the face—which appeared loose—with a pick, when suddenly without warning about 30 cwt. of coal fell, striking deceased, knocking him down, breaking his thigh-bones and pelvis, besides inflicting internal injuries from which he died the same night. The Coroner's verdict was to the effect that death was accidental, no blame being attachable to any one.
Maxwell Kennedy ..	11/8/15	Westport-Stockton	Deceased and F. Donovan, both miners, were engaged splitting a pillar in a place 10 ft. 6 in. high and the same width. It was well and securely timbered and had an excellent roof. A shot had been fired, the place had then been inspected by a deputy, who informed the miners that the shot had not done good work, and he ordered them to trim away loose coal and reset sprags preparatory to drilling another hole. Deceased had carried out the first two orders, when a piece of coal fell from above the sprag, knocking him down and inflicting serious injuries from which he died two days later. A subsequent examination showed that the coal had in all probability been loosened from between two converging "backs" by the action of wedging the sprags by deceased. The Coroner's verdict was accidental death, no blame being attachable to any one.
Thomas Johnston ..	16/9/15	Denniston ..	Deceased had just oiled a roller on the endless-rope-haulage incline in the Waratea section when a sudden forward movement of the haulage-rope caused a tub to strike him, knocking him down, and inflicting a fracture of the pelvis and serious internal injuries, from which he succumbed. A verdict of accidental death was returned.
Alexander Morrison ..	30/9/15	Blackball ..	Whilst talking to a trucker at a distance of about 100 yards from the face of a dip in course of being driven, a heavy "bump" in the overhead rocks occurred, the result of which was to throw a quantity of coal from a "sooty back," completely covering the deceased, and before he could be released he died from suffocation. Deceased was employed at the time trucking his own coal. The place had been examined daily for a period of eight months. The Coroner found that death was accidental, and that no blame was attachable to any one.
George Burdon	1/11/15	Denniston ..	The deceased, an elderly miner, was running down a jig when he fell and ruptured his stomach, causing peritonitis, from which he died eleven days later. The Coroner returned a verdict of accidental death. This has been included among fatal mining accidents, but if he had fallen elsewhere the result would have been similar.
William Russell	16/12/15	.. ..	This accident occurred while jigging in a heading 11 ft. wide was in progress. The deceased, aged sixty-eight years, was employed as a shiftman. He had been engaged repairing brattice, and, having completed this, left to go home. About fifteen minutes later a full tub was "jigged," and it was subsequently found that the deceased, having delayed on his way out of the mine, had been hit by the jigged tub. He subsequently admitted that no one was to blame but himself. He had evidently lost his presence of mind, as there was ample space for the tub to pass him with safety.

The most prolific cause of accident has been falls of coal or roof at the face in the bituminous coal-seams of the West Coast. Greater vigilance is required to avoid such accidents, and systematic timbering should be carried right up to all working-faces.

During the past year there has been a pronounced improvement in the management of our collieries from a safety view-point, partly due no doubt to the introduction of legislation based upon the British law.

To avoid accidents constant and sustained vigilance is necessary, as there is always a tendency to revert to less careful methods after a period of immunity from accidents. This tendency all managers and Inspectors should strictly guard against.

The following statement shows the tons of coal and shale raised, persons employed, lives lost, &c., from 1878 to 1915:—

Year.	Output.	Persons employed.			Tons raised per each Person employed Underground.	Tons raised per Life lost.	Persons employed per Life lost.	Lives lost per Thousand Persons employed.	Number of Deaths.
		Above.	Below.	Total.					
Prior ...	709,931	...	...	...	...	...	...	...	...
1878 ...	162,218	147	366	513	443	*	*	*	0
1879 ...	231,218	...	...	802	...	4,635	23	44·00	35†
1880 ...	299,923	...	...	1,038	...	149,961	519	1·92	2
1881 ...	337,262	...	...	963	...	337,262	963	1·04	1
1882 ...	378,272	...	...	1,043	...	189,136	521	1·91	2
1883 ...	421,764	361	888	1,249	475	210,882	624	1·60	2
1884 ...	480,831	393	890	1,283	540	160,277	421	2·34	3
1885 ...	511,063	338	1,145	1,483	456	170,354	494	2·01	3
1886 ...	534,353	392	1,213	1,605	440	*	*	*	0
1887 ...	558,620	388	1,111	1,499	503	139,655	375	2·66	4
1888 ...	613,895	414	1,275	1,689	481	153,474	422	2·36	4
1889 ...	586,445	466	1,251	1,717	468	146,611	313	2·37	4
1890 ...	637,397	512	1,334	1,846	477	79,674	231	4·33	8
1891 ...	668,794	416	1,277	1,693	523	167,198	423	2·36	4
1892 ...	673,315	485	1,196	1,681	563	673,315	1,681	0·66	1
1893 ...	691,548	590	1,298	1,888	533	138,309	377	2·64	5
1894 ...	719,546	506	1,393	1,899	516	119,924	316	3·16	6
1895 ...	726,654	525	1,274	1,799	618	145,331	360	3·33	5
1896 ...	792,851	590	1,347	1,937	588	12,013	29	34·07	66‡
1897 ...	840,713	531	1,381	1,912	609	210,178	478	2·09	4
1898 ...	907,033	556	1,447	2,003	627	907,033	2,003	0·49	1
1899 ...	975,234	554	1,599	2,153	609	325,078	717	1·39	3
1900 ...	1,093,990	617	1,843	2,460	593	273,497	615	1·62	4
1901 ...	1,239,686	688	2,066	2,754	600	413,228	918	1·09	3
1902 ...	1,365,040	803	2,082	2,885	655	682,520	1,443	0·69	2
1903 ...	1,420,229	717	2,135	2,852	665	355,057	713	1·40	4
1904 ...	1,537,838	763	2,525	3,288	609	384,459	822	1·21	4
1905 ...	1,585,756	833	2,436	3,269	651	264,293	546	1·83	6
1906 ...	1,729,536	1,174	2,518	3,692	687	288,256	615	1·62	6
1907 ...	1,831,009	1,143	2,767	3,910	662	152,584	326	3·07	12
1908 ...	1,860,975	992	2,902	3,894	641	372,195	778	1·28	5
1909 ...	1,911,247	1,159	3,032	4,191	633	273,035	599	1·79	7
1910 ...	2,197,362	1,136	3,463	4,599	634	137,335	283	3·55	16
1911 ...	2,066,073	1,365	2,925	4,290	706	147,577	306	3·26	14
1912 ...	2,177,615	1,130	3,198	4,328	681	241,975	355	2·08	9
1913 ...	1,888,005	1,053	3,197	4,250	590	314,667	708	1·38	6
1914 ...	2,275,614	1,176	3,558	4,734	639	46,441	96	10·35	49§
1915 ...	2,208,624	1,050	3,106	4,156	711	245,403	462	2·16	9
Totals...	**41,847,479**	...	...	...	...	...	...	...	**319**

* No life lost. † Year of Kaitangata explosion. ‡ Year of Brunner explosion. § Year of Ralph's (Huntly) explosion.

SECTION IV.—THE COAL-MINES ACTS AND REGULATIONS.

On the 26th June new regulations under the Coal-mines Act were gazetted. These regulations embrace much of those already in force, and also incorporated a considerable proportion of the British regulations contained in an Order (No. 748) dated 10th July, 1910, pertaining to the conduct of persons employed in mines; the use of stationary electric lamps; winding-ropes; signalling; explosives, including permitted explosives; safety-lamps; change-house and bath-houses; ambulance; mechanical ventilating-appliances; prevention of the inflammation of coaldust; and electricity. The regulations have, at the time of writing, been in operation nearly a year, and I believe that, while not increasing the cost of production of coal to any appreciable extent, they have tended to greater security of life and property, while greatly assisting the Inspectors of Mines in the performance of their duties.

During the year only two important cases of litigation under the safety provisions of the Coal-mines Act occurred. The first of these was in connection with the inspection of old workings (traversable standing pillar areas) at Ralph's Colliery, Huntly. The following is a brief summary of this case:—

The Royal Commission in connection with the explosion at Ralph's Colliery on the 12th September, 1914, by which forty-three lives were lost, reported on the 30th October following that the explosion

This reproduction of the mine plan supplied by the owners is to accompany the report of the Inspecting Engineer of Mines, by whom the notes regarding cover and dripping water have been added.

— TAUPIRI COAL MINES LTD —

— PLAN —
— OF A PORTION OF —
— OLD UNDER-WATER WORKINGS —
— AT —
— EXTENDED COLLIERY —
— SHOWING —
— THE POSITION OF PROPOSED DAMS —
— AGAINST —
— IRRUPTION OF WATER. —

— SCALE —

CHS 1 0 5 10 CHAINS

RIVER WAIKATO

LAKE HAKANO A

Maximum depth of Water 10 ft. Pumice bottom.

Dip

153'

135'

60'

UPCAST (EXTENDED)

B

Dip 1 in 10 (approx)

Throw 50 ft

Dooley's Dip

WIGHTS FALL Water dripping into Mine

FALL Iron pipes

Stable Tie

A

Water dripping

Throw 20 ft

A

FALL

FALL Water dripping into Mine

Old horse road

No displacement of Coalseam here

SOUTH RAILWAY ROAD

DOWNCAST (Cylindered)

152

Cabin Jig

to Coalseam

Main Stone Drive

Outcrop of Claystone (directly) roof

Pumice roof to Coalseam

Water dripping

170

167'

127

Water dripping into Mine

71

95

Barrier between Taupiri Extended & Ralph's Collieries

GREAT

Throw 25 ft

65

FALL TO SURFACE 6th July 1915.

Pumice roof to Coalseam

Water dripping

Tattley's Old Dam

Old South Jig

57

EXTENDED SIDING

Estimated line of buried

AIR SHAFT

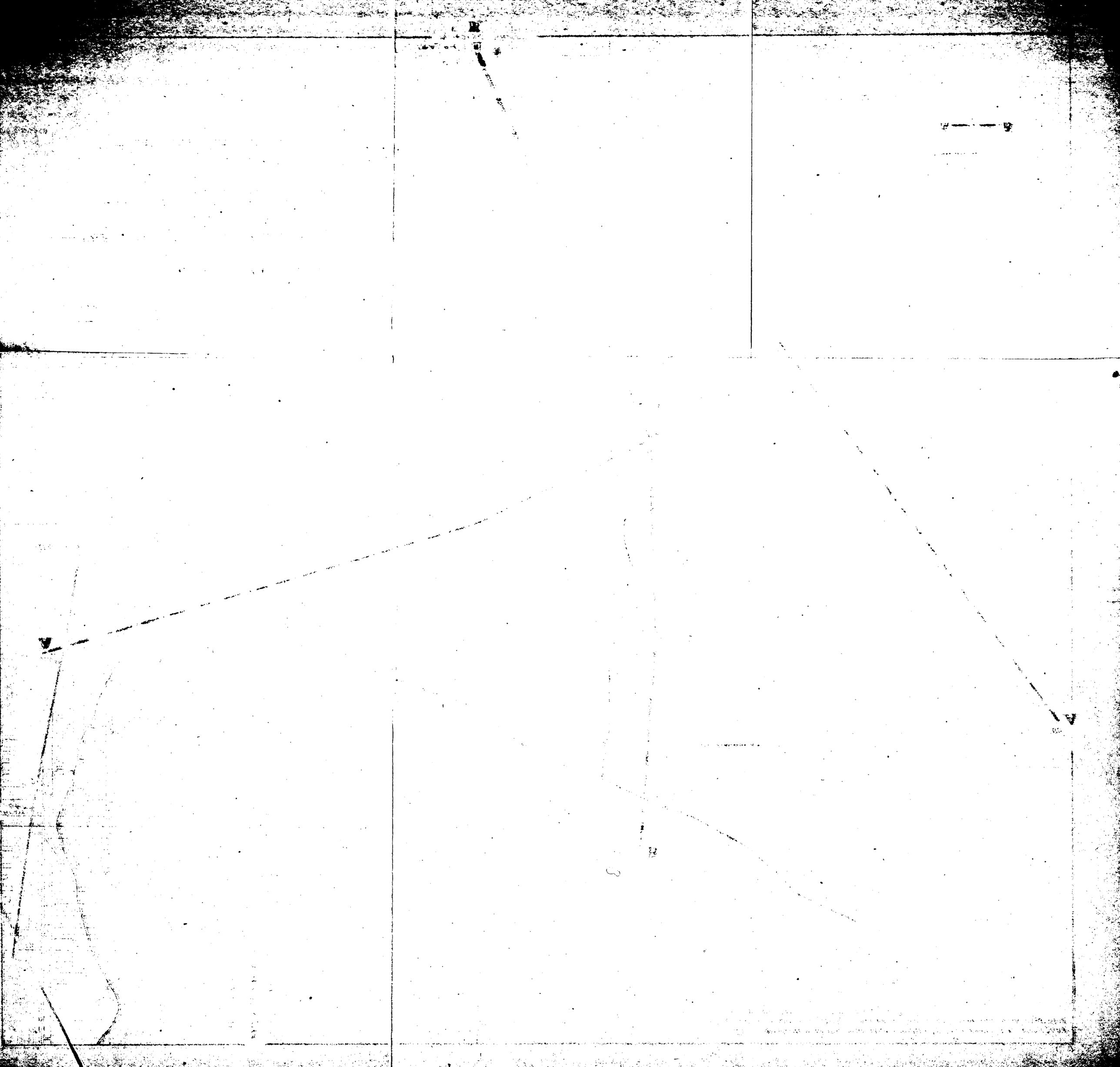
AIR SHAFT

RALPH'S WINDING SHAFT

B

— REFERENCE —

Proposed Dams	shown thus	(Pressure)
Faults	" "	
Endless-rope haulage roads	" "	
Line of Sections accompanying	" "	A—·—·—B
Thickness of Cover above workings	" "	27'

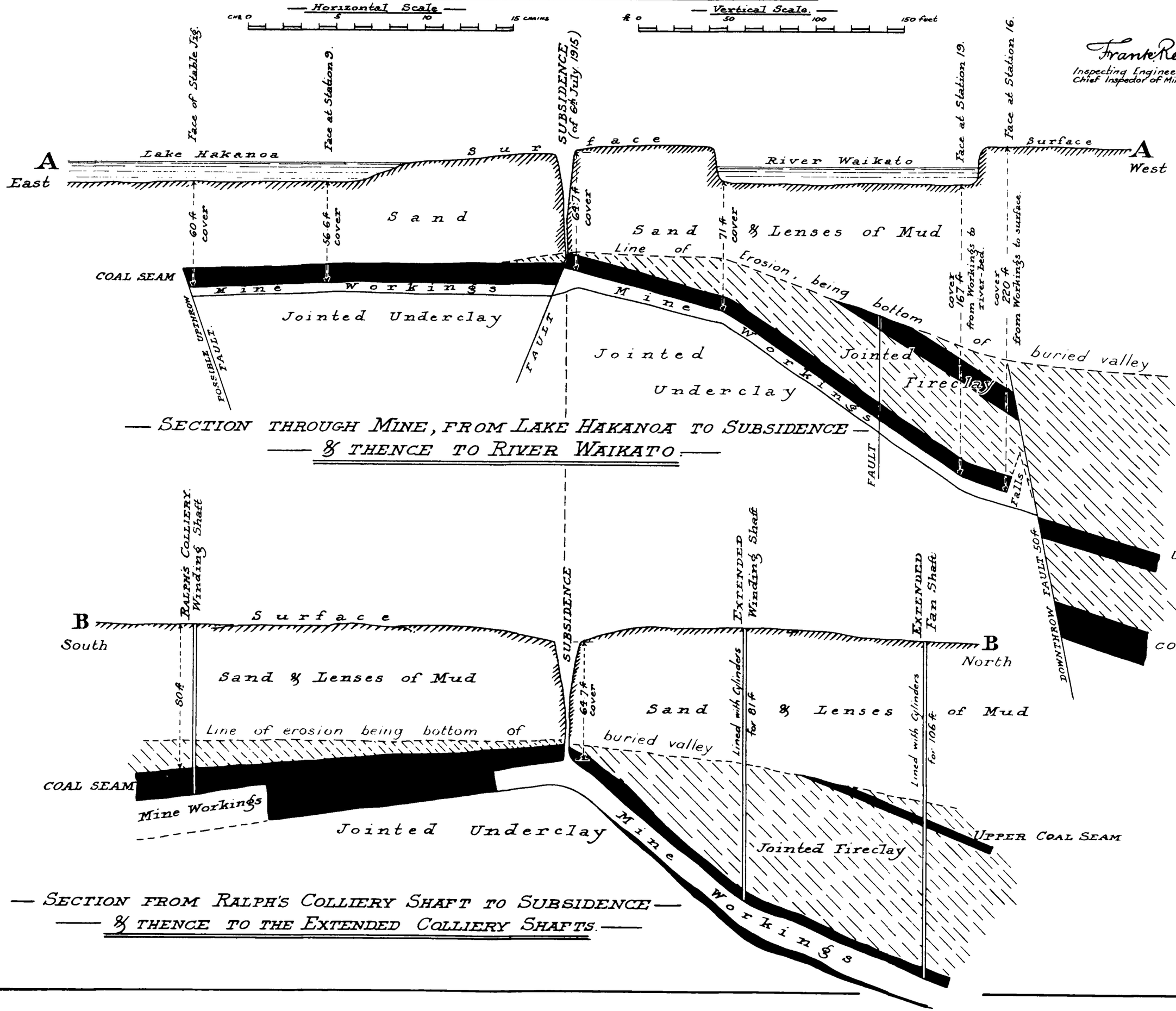


— TAUPIRI EXTENDED COLLIERY. —

Frank Reed
Inspecting Engineer, and
Chief Inspector of Mines. 24:5:16.

— Horizontal Scale —
CHS 0 5 10 15 CHAINS

— Vertical Scale. —
ft 0 50 100 150 feet



— SECTION THROUGH MINE, FROM LAKE HAKANOA TO SUBSIDENCE —
— & THENCE TO RIVER WAIKATO. —

— SECTION FROM RALPH'S COLLIERY SHAFT TO SUBSIDENCE —
— & THENCE TO THE EXTENDED COLLIERY SHAFTS. —

was due to an emission of firedamp in the old workings, and that the weekly inspection of old workings was inadequate. On the 17th and 18th November, at a conference of all Inspectors of Mines in the Dominion, held at Wellington, it was decided to enforce Special Rule 8 of the Coal-mines Act, which provides that "the underviewer shall examine *all parts* of the mine daily and also all the air-courses of the mine." In consequence of the above decision, on the 7th March, 1915, Mr. Bennie, Inspector of Mines for the North Island collieries, proceeded at the Magistrate's Court, Huntly, against the manager of Ralph's Colliery for non-compliance with the above special rule with respect to the traversable standing pillar areas at that colliery, and the defendant was convicted on all charges. An appeal was subsequently lodged against this conviction, and in July, 1915, the Full Court held that an offence had not been committed against Special Rule 8, and the conviction was therefore quashed. It was ruled that, Having regard to Special Rules 17, 23, 24, and 41, the words "all parts of the mine" in Special Rule 8 were limited to the actual mine in which the working of the mine was going on. The Judges concluded their finding by stating that "As this is a departmental prosecution necessarily brought to ascertain the law on the subject, we do not think that it is a case for the allowance of costs."

The other important case consisted in an arbitration between the Inspector of Mines (Mr. Bennie) and the manager of the Taupiri Extended Colliery, Huntly, under sections 56 and 57 of the Coal-mines Act, to decide if the Taupiri Extended Colliery was dangerous as to require the construction of an additional outlet as a means of egress for the workmen employed in the dip-workings in case of emergency from irruption of water, gas-explosion, or fire. This case was held before two assessors, with Justice Cooper as umpire, at Auckland, in November, 1915; the assessors finally deciding that the mine was not dangerous as to require such additional outlet, but in a memorandum they suggested the construction of a dam or stopping by hydraulic packing in the under-water workings at the said colliery, also the use of stronger roof-supports. During March, 1916, the miners at the Taupiri Extended Colliery refused to continue working unless precautionary measures were at once undertaken against irruption of water: and, as the result of a conference subsequently held between their representatives and the mine-owners, the latter agreed to isolate the shallow under-river and under-lake workings by the construction of seventeen timber and concrete dams, also to construct an inclined stone drive to the upcast shaft as an additional outlet. The estimated cost of these precautionary measures is quite double that of the additional outlet for which the Department took action. The construction of these measures against irruption of water by mutual consent is creditable to the mine-owners, and substantially vindicates the Mines Department in its action to prove that there was actual danger at the Taupiri Extended Colliery. For further details regarding this case see my remarks on Taupiri Extended Colliery under the heading "Section V, Mining Operations."

In reference to the two cases here referred to, the Coal-mine Owners' Association at its annual meeting in March last passed a resolution adverse to the action of the Mines Department, inferring that it was antagonistic to the welfare of the coal-mining industry. It is fair to assume that the association was not fully informed of the whole of the circumstances of the cases.

SECTION V.—GENERAL REMARKS.

Mining Operations.

North Auckland Coalfield.

Coal-mining operations in the Hikurangi district during the past year have been unimportant, and exploration has not revealed any extension of the proved coal reserves.

Hikurangi Colliery.—The output from Moodie's old section and at four small detached sections, three of which are situated near Waro Railway-station, has been obtained by pillar-extraction. Operations have been retarded by mine-fires and irruption of water. The Inspector of Mines has reported inadequate ventilation in the Waro sections, and has requested that the same shall be improved.

Northern Colliery.—The principal mine on the company's freehold is almost exhausted of coal. A new mine is being opened on the Crown lease, Section 2, Block XVI, situated to the south-east of the present mine which it is proposed to connect thereto by surface tramway.

Kiripaka Colliery.—The Panipu section having become exhausted, a new section is being developed to work a 6 ft. coal-seam proved by boring near Waitangi Creek. This section has been connected by surface tramway with the company's railway to the shipping depot at Ngunguru River.

Whangarei Colliery.—The seam hitherto worked has proved considerable faulting, but from bore-holes it is believed that an improvement may be found ahead of the present workings. This mine is operated from a shaft the winding equipment of which I found to be in an unsatisfactory condition.

Waikato Coalfield.

The output from this coalfield amounted to 342,533 tons, being an increase of 43,213 tons above that of the previous year.

Ralph's Colliery.—The output has considerably decreased, and underground development in every direction indicates that the workable coal remaining is of very limited extent. A new Sirocco double inlet fan has been installed, which I found was circulating 83,580 cubic feet of air per minute, being almost double the output of the Waddle fan previously in commission. I found the working-places and travelling-roads to be well ventilated. Safety-lamps and permitted explosives only are

used. Accumulations of gas from blowers are still possible in the extensive standing pillar area, which is only inspected weekly. In parts of such old workings, and on the sides and roof of some of the haulage and travelling roads in the present workings, coaldust in quantity sufficient to be dangerous is still to be found.

Taupiri Extended Colliery.—The output during 1915 amounted to 161,394 tons, the largest from any North Island colliery. The principal mining operations are now being carried on at a distance of nearly one mile to the westward and north-westward of the upcast shaft.

The ventilation of the working parts of the mine has been considerably increased by an alteration in the driving-wheels of the double-inlet Sirocco fan, the output of which I found to be 85,200 cubic feet per minute. Safety-lamps and Imperial permitted explosives only are used. The floor of the travelling and haulage roads is regularly watered, but in a manner more resumbling a flushing of the lower parts than by creating a mist by means of an atomizer, which is the orthodox method in England. The report-books appear to be well kept. The danger from coaldust in small quantities on the sides and roof is not sufficiently realized at this mine, in common with almost all the other coal-mines in the Dominion. It has been proved by experiment at the British experimental station at Eskmeals, Cumberland, that the finest dust is the most dangerous, and that such dust is found on the roof and sides. As little as half an ounce of coaldust per cubic foot of space is sufficient to intensify and carry on a violent explosion; no coaldust is actually safe unless it contains at least an equal proportion by weight of incombustible stonedust, or is intimately mixed with water at a proportion of one-third by weight.

During the past year considerable attention has been given to the cover at this mine. The downcast shaft is 162½ ft. deep, 81 ft. of which is cylindered mostly through running ground; and the upcast shaft is 204 ft. deep, of which 106 ft. is likewise cylindered. The strata penetrated in each shaft was 80 ft. and 90 ft. respectively of permeable pumice sand and mud, underlying which is jointed claystone (fireclay), which forms the roof to the coal-seam. In the deeper portions of the mine an upper seam exists in the claystone, but this has been eroded in the shallow south-eastern section of the mine. The workings are situated under a plain which is intersected by the River Waikato, and depressed at Lake Hakanoa: geologically this plain covers a buried valley. The underlying coal-measures, which rise towards the shafts and the lake, are inclined at about 1 in 10, and have been eroded by the ancient river to such an extent that little or no rock-cover to the coal-seam remains in the south-east portion of the mine, as shown by the sections accompanying this report: the overlying formation now consists chiefly of pumice sand and mud, more or less saturated with water, which constitutes a dead weight without any supporting strength whatever.

About twenty years ago, under different management, mining was extended under Lake Hakanoa until at one point only 56½ ft. of cover existed between the roof of the workings and the lake-bed, above which the water-level is about 10 ft. On two or more occasions during these mining operations running sand was encountered at the roof of the coal-seam. In one case a dam was constructed as a precautionary measure.

Several years ago workings were also extended under the River Waikato to the rise and approaching the coal-barrier between the Extended and the same company's Ralph's Colliery. Above the face of a bord, situated almost directly under the eastern edge of the river, only 71 ft. of cover separates the roof of the bord from the river-bed. The cover in this immediate locality is in all probability nearly all pumice sand and mud, except for a few feet of coal, which has been left on the roof of the workings throughout the mine as a precautionary measure. It is important to note that in New South Wales all Crown coal leases now contain a provision that in all workings under the ocean, or under river, lake, estuary, or tidal waters no coal shall be worked with less than 120 ft. of good sound strata as a cover. In Great Britain a greater thickness than this is required, and the cover is specified to be solid rock. In those countries, therefore, the conditions as regards cover at the Extended Mine would not be permitted.

At the Taupiri Extended Mine the overlying fireclay where it is exposed in the deeper ground is extremely jointed, slickensided, and treacherous. At many places in the shallow workings under both river and lake water drips continuously into the mine, proving permeability of cover. On the 6th July, 1915, a serious fall occurred owing to decay and collapse of old mine-timber, at a fault-crossing, in a return airway traversing the most southern workings. Owing to the water contained in the pumice cover to the coal-seam, the fall rapidly communicated to the surface 64 ft. above, forming a funnel-shaped cavity of about 70 ft. diameter on the surface, and terminating in the airway beneath. A considerable quantity of sand and water containing surface vegetation descended into the mine, from which workmen were then withdrawn. Fortunately, this fall occurred on a strip of dry land between the river and the lake workings, as shown on the accompanying plan, otherwise the result would in all probability have been very serious. In consequence of the dangerous possibilities disclosed by this fall, and as the result of investigations regarding the character and thickness of the cover to the southerly mine workings under the river and the lake, Mr. Boyd Bennie, Inspector of Mines, with full concurrence of the expert advisers of the Mines Department, notified Mr. William Wood, the mine-manager, under section 56 of the Coal-mines Act, that the mine was dangerous, and requested him to construct an additional outlet from the mine as a means of egress for the workmen employed in the dip-workings in case of emergency from irruption of water, gas-explosion, or fire. An additional means of egress was not regarded by the Department as affording perfect security, but as a third shaft at the dip-workings at Ralph's Colliery had provided means of escape for eleven men after the 1914 explosion occurred, it was also considered a reasonable precautionary measure for the Extended Mine. To this request Mr. Wood objected, in consequence of which the case went to arbitration under section 57 of the Act. The case occupied many days and much conflicting expert evidence was given, the decision finally arrived at being that the mine was not so dangerous as to require an

additional outlet, but the assessors, Messrs. W. Leitch, manager of Blackball Colliery, and Robert McEwan, of Waikato, suggested to the company the construction of an underground embankment about 4 chains in width by hydraulic filling, to separate the under-lake workings from other parts of the mine; they also recommended stronger roof-supports at falls in the under-river workings. The use of hydraulic filling as a dam or stopping did not meet with the approval of the Mines Department, the mine-owners, or the workmen's inspectors, as it was realized that it was a misapplication, hydraulic filling being employed at mines as a support of rock, not as a dam. Material used in the construction of the latter must necessarily be impervious, whereas hydraulic filling is required to be porous to enable it to drain and become consolidated from floor to roof. At the Taupiri Extended Mine, to be effective, hydraulic filling would be required to support the roof throughout the shallow under-water workings: as a dam or stopping 4 chains wide, as suggested by the assessors, it would intensify the danger.

The danger owing to defective cover at the Taupiri Extended Collieries has been known for a number of years. In the Mines Department Annual Report for 1890 Mr. Henry A. Gordon, then Inspecting Engineer of Mines and now a director of the Taupiri Coal-mines (Limited), the owners of the Extended Mine, reported thereon as follows: "Some of the workings were not carried on with safety, and I had to give written notice to the manager that the men must be withdrawn from one portion of the mine, as they were working in a very dangerous place. On my next visit I learned that the men had only left this place a few hours before the ground came in from the surface."

In his annual report for 1900 Mr. James Coutts, the Inspector of Mines for the district, stated that "as the coal worked is either under the lakes or river, or in close proximity to them, large pillars have to be left in, more especially as the covering of the seam is mostly composed of running sand."

During March of this year the miners at the Extended Mine refused to continue working unless remedial measures were at once undertaken, and as the result of a conference subsequently held between their representatives and the mine-owners the latter agreed to isolate the shallow under-river and under-lake workings, by the construction of seventeen spherical dams constructed of timber (kauri) and concrete at sites shown upon the accompanying plan; also to construct an inclined stone drive connecting the main haulage-road with the upcast shaft as an additional outlet.

Waipa Colliery.—A considerable amount of work has been carried out by this new colliery, the output of which amounted to 100,568 tons. The thickness of the seam varies from 11 ft. to smaller dimensions; as the roof is of fireclay, about 2 ft. of coal is left for safety. Mining is carried on from two adit sections. In that section situated to the westward, a fault has been encountered, at the other side of which boring operations have proved the coal-seam to be considerably reduced in thickness. To the southward, upon the freehold of Mr. W. R. Holmes, the seam rises to the surface and outcrops. In this small area pillar-extraction has been commenced. The future of this mine depends greatly upon the result of development to the northward in the direction of the Pukemiro Colliery, but between the present mine and that area there is about 100 acres of private property (Sections 5 and 6, Akatea Village Settlement), over which the Waipa company do not hold mineral rights.

Pukemiro Colliery.—This new colliery arrived at the productive stage in August. Two adit sections have been opened upon a brown-coal seam of excellent quality and thickness, the output being carried to the screens at the company's branch railway by a short electrically driven endless-rope tramway. In the northern section of the workings a 40 ft. fault temporarily caused a cessation of operations.

Grey Coalfield.

At the *Point Elizabeth State Colliery*, with the exception of a small area of solid working to the rise of No. 2 section, all operations are now confined to pillar-extraction, which will probably be completed within two years. The ventilation and timbering of the mine are excellent.

The *Liverpool State Colliery* is being developed by two mines—namely, the No. 1 Mine, situated at the top of the haulage inclines, and the No. 3 Mine, situated near the coal-bins at Rewanui; the last-named is divided into two sections—namely, No. 3 and No. 3A. At the No. 1 Mine two seams have been exposed—namely, the Upper seam and the Morgan seam—but only the former has been worked. In this seam, which averages 8 ft. in thickness, standing pillars now cover an area of about 40 acres, and an additional area of about 30 acres of solid coal may be considered available. Owing to folding of the coal-measures the coal is very friable, and makes about 70 per cent. of slack at the screens. The Morgan seam, having an average thickness of 17 ft., is situated about 170 ft. below the Upper seam, and is approached by a cross-measures drift therefrom. Of this seam an area of about 130 acres may be considered as proved, of which about 50 acres is to the rise of the mine-entrance. This seam where intersected is soft and friable. At the No. 3 Mine about 24 acres is standing on pillars, and an additional 68 acres may be considered as proved. The average thickness of the seam is 7 ft., and the coal generally is hard and of superior quality. In this mine Imperial permitted explosives are used. During the year two hundred Gray-Sussman Imperial permitted safety-lamps were installed, and after nine months' use have given every satisfaction. The miners have expressed pleasure at their introduction, owing to the superior light given. This is the only colliery in the Dominion where electric safety-lamps are in use. The ventilation at this mine is excellent. A large electrically driven single-inlet Sirocco fan is installed at the No. 1 section. There have been cases of omission by deputies to enter in their report-books the presence of fire-damp.

Paparoa Colliery.—During the year this colliery went into liquidation. Operations have since been on a reduced scale, and but few men are now employed. At this mine during 1915 over 67 per cent. of the output was slack.

Blackball Colliery.—A small decrease in the annual output has been experienced. Development has been carried out to the rise and dip of the present workings. To the dip the quantity of water encountered has proved so serious as to cause cessation of operations in the western level, notwithstanding that the pumping-capacity amounts to 1,000 gallons per minute. To the westward a rise heading was stopped in faulted ground.

Buller Coalfield.

Dennis on Colliery.—Coalbrookdale Mine: Development at this mine has been very satisfactory and a large area of excellent hard bituminous coal has been proved. In the Waratea Jig section the winning-places have advanced 50 chains in a westerly direction in excellent coal. In the Extended area winning-places have considerably advanced to the south-westward through hard coal. In the dip area and No. 8 section pillars are being won.

Ironbridge Mine: Development has been mostly confined to the south of the main haulage-road. Coal is being produced from areas north of the Waimangaroa River at Kiwi and Deep Creeks. A considerable area of unworked coal in the direction of the old Koranui Mine is being connected to the endless-rope-haulage system.

As regards safety measures the management has been thoroughly efficient, and although accidents have happened, they appear to be of the unavoidable class—namely, those which can not be controlled by regulations or reasonable supervision.

Millerton Colliery.—This, the most productive colliery in the Dominion, recorded an output of 291,813 tons, of which only 12 per cent. was small coal. The above output is less than that of the previous year by 60,258 tons, due probably to shortage of miners. A large area of unworked coal is being developed to the westward. In the Mangatini section the output has been obtained by pillar-extraction, and in the Lower section of the mine from solid workings. As at the same company's Denniston Colliery, the management devote conscientious attention to the safety of employees, and I believe that since the inauguration of this, the most important colliery company in the Dominion, nearly forty years ago, no legal proceedings have ever been taken against it for a breach of the statutory safety provisions.

Westport-Stockton Colliery.—At the original mine operations have been devoted to pillar-extraction. The newly developed area situated between Mangatini Creek and the Ngakawau River has proved to be somewhat faulted, but generally produces hard coal of superior quality. Improved conditions are probable as work proceeds. At this colliery electric power is extensively used, the aggregate horse-power of motors used on surface and underground being 1,575.

Otago Coalfield.

At the *Kaitangata* and *Castle Hill Collieries*, No. 1 Mine is worked to the dip in panels, owing to liability of the coal heating by oxidization. A considerable area of excellent coa was developed at the most distant operations, known as No. 21 dip, but this area has now been abandoned, owing to the high cost of underground transport. Only Imperial-permitted safety-lamps and explosives are used at this colliery, where firedamp is prevalent, and it is desirable that the quantity of air in circulation should be increased to dilute and render harmless such inflammable gas. Samples of mine-air taken for analysis on the 11th March, 1916, by Mr. Green, Inspector of Mines, were all found to contain methane, the highest being 2·85 per cent. (from No. 1 heading, north side), and 1·17 per cent. in the main return.

Castle Hill Colliery.—The ventilating-furnace, the only one in the Dominion, has been replaced by a double inlet Sirocco fan, which on the 15th Feburary, 1916, I found was circulating, with the assistance of natural ventilation, 15,174 cubic feet of air per minute.

At the *Kaitangata Collieries*, upon my inspections, I have found more dry coaldust on the haulage-roads than can be considered safe, but there is difficulty in allaying this efficiently, as watering would intensify the great liability to creep, and owing to constant fretting of coal along the roadways the ground is being continuously covered with small fragments of coal, which soon become reduced to dust by traffic. The dust may not be classed as highly inflammable, however, owing to the considerable proportion of inert dust also present.

Nightcaps Colliery.—Two sections are worked at this mine. There is liability to spontaneous fires. The brown coal mined is of superior quality.

ELECTRICITY AT COLLIERIES.

The following is a summary of the annual returns in accordance with new Regulation 160 (*c*), regarding electrical apparatus at collieries:—

Number of collieries at which electrical apparatus is installed	16
,, continuous-current installations	15
,, alternating-current installations	2
,, collieries electrically lighted	14
,, collieries using electrical ventilating-machines	5
,, ,, pumping plants	4
,, ,, haulage plants	2
,, ,, screening plants	2
,, ,, miscellaneous plants	2
,, ,, locomotives	1
Total horse-power employed from motors on surface	1,734
,, motors underground	577

I have, &c.,

FRANK REED,
Inspecting Engineer and Chief Inspector of Mines.

ANNEXURE A.

QUESTIONS ASKED AT THE EXAMINATION HELD DURING DECEMBER, 1915, FOR MANAGERS' FIRST-CLASS CERTIFICATES OF COMPETENCY UNDER THE COAL-MINES ACT.

SUBJECT 1.—*Mining: Opening out a Colliery; Working Coal; Timbering; Boring.*

1. Having to sink a shaft for the working of a seam of coal 6 ft. thick lying at a depth of 1,000 ft. and having a dip of 1 in 5, what size pillars would you leave for support of shaft? Give calculations and show by sketches the general arrangement of shaft-bottom to deal with an output of 1,000 tons per eight-hours shift.
2. A seam of coal 10 ft. thick and liable to spontaneous combustion is to be worked on the panel system. Make sketch-plan of workings showing position of shaft, the barriers to be left between panels, and position at which you would build stoppings in case of fire occurring in any panel; also show general course of ventilation from downcast shaft by return-air course to the upcast.
3. Describe and illustrate by sketches how you would open out longwall workings from a pair of shafts sunk in the centre of a lease of 800 acres: seam 5 ft. thick, roof strong shale, dip of strata 1 in 15; output per day from one shaft, 800 tons.
4. Describe with sketches how you would proceed to clear away a heavy fall with a rotten roof, and show what you consider the best system of timbering to apply to guard against side pressure as well as top weight.
5. Describe the process of sinking and walling a circular shaft 14 ft. diameter in the clear, 1,500 ft. deep, and dealing with 10,000 gallons of water per hour, met with at a depth of 300 ft.
6. Show by sketches the general surface arrangement of a colliery drawing 600 tons of coal per shift of eight hours, showing location of downcast and upcast shafts, and all requisite appliances for the handling and preparation of coal for market.
7. State your experience of boring, and describe the diamond drill, stating the conditions most favourable for its successful working.
8. Give your experience of extracting pillars in bord-and-pillar workings. Describe how the greatest protection from falls is to be secured, illustrating by sketches; also describle the work of drawing timber, the best appliances for use in such work, and any special precautions deemed necessary for the safety of men carrying out such work;

SUBJECT 2.—*Mechanics: Pumping-appliances and Mine-drainiage; Tapping Water and Dam-construction in Mines; Winding in Shafts; Hauling on Underground Planes; Compressed-air and Steam-power Plants; Strength of Materials; Elementary Electricity.*

1. What size hauling-engines would be required to haul 100 tons of coal per hour by direct haulage up an incline 1,000 yards long rising 1 in 6, the effective steam-pressure being 70 lb. per square inch? Assume your own dimensions of tubs, ropes, rollers, &c.
2. Describe and illustrate by sketches how you would fit up a self-acting incline to run 250 tons a shift of eight hours, grade 1 in 5 and length 200 yards. State whether you prefer to run tubs in sets or by self-acting endless rope, and what safety appliances you would adopt.
3. Sketch a Lancashire boiler, showing the position of all fittings required with names of each, and state under what condition scale occurs and the dangers likely to arise from its pressure on the plates of a boiler.
4. If you found it desirable to ascertain the general condition of a winding-engine raising a large output from a deep shaft, describe carefully and in detail what you would require to be done to make the examination thorough and complete?
5. State your views regarding the use of compressed-air and electricity in coal-mines, stating the particular purposes for which one or other of these means of transmission is best suited, and the advantages and disadvantages of each.
6. What do you understand is meant by the term "potential" and "potential difference" in electrical applicances?
7. To light a mine with 200 lamps of 16 c.p. each what amount of mechanical energy would have to be available for conversion into electricity?
8. What load will break a beam of kauri, 12 in. by 10 in., 15 ft. long, between supports: load evenly distributed along the length of the beam? State also load required to break the beam if loaded in centre.

SUBJECT 3.—*Ventilation: Ventilation of Mines and Knowledge of Mine Gases; Spontaneous Combustion of Coal, and Methods of Dealing with Underground Fires; Rescue Apparatus; Practical Knowledge of Gas-testing with a Safety-lamp.*

1. What do you consider a reasonable or ordinary velocity for air to be passed through a main airway? What is the greatest velocity you consider practicable? What are the advantages of high velocity, and what, if any, are the disadvantages of a low velocity in a fiery mine?
2. If a tunnel 50 yards long by 60 ft. cross-sectional area was filled with a mixture of fire-damp and air at the most explosive point, what quantity of air would be required to dilute it so as to be non-explosive?

3. If a ventilating-fan is producing 40,000 ft. of air per minute with 20 horse-power, what horse-power will be required to produce 60,000 cubic feet, conditions in the mine remaining the same?
4. If 36,000 cubic feet of air is passing through an airway 6 ft. by 10 ft. under pressure of 3·6 lb. per square foot, what pressure will be required to pass the same quantity in an airway 5 ft. by 10 ft?
5. Give the chemical properties of pure air and also of fire-damp, and their comparative weights. If an explosion happened when there was a mixture of 9 of air to 1 of gas by volume, what would be the resultant gases and their properties?
6. State your experience, if any, in the working of mines subject to spontaneous combustion, and say what means you would adopt to localize such outbreaks so as to avoid affecting the output of the mine.
7. Describe any rescue apparatus of which you have knowledge.
8. Describe what is meant by "splitting the air," how doing so affects the general ventilation of a mine, and what are the limits to its adoption.
9. What in your opinion is the best means of avoiding dust-explosions in coal-mines? State generally the conditions under which the presence of the various mine-gases may be expected.

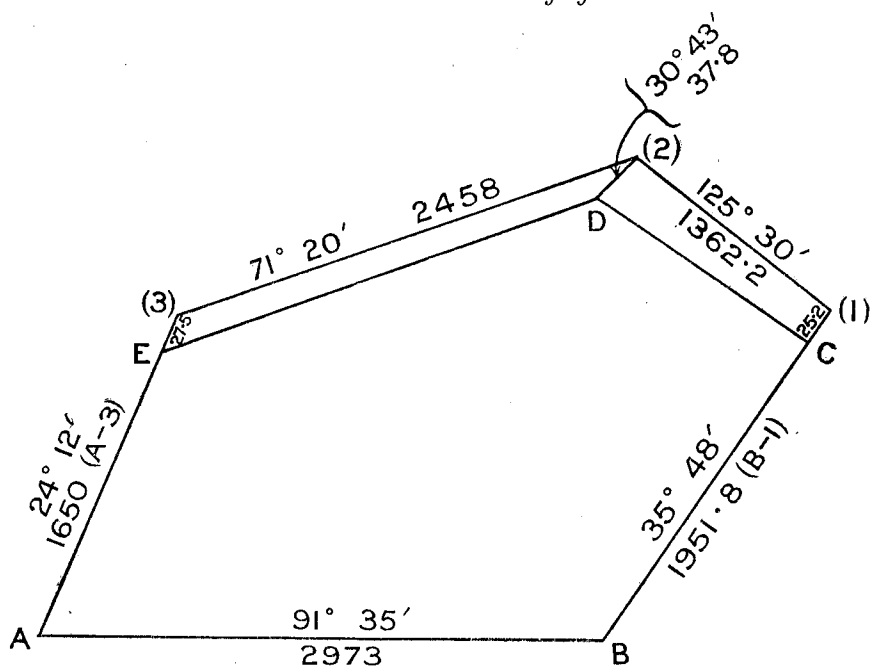
SUBJECT 4.—*Arithmetic and Law: A Knowledge of Mine Accounts; Fractions, Decimals, Percentages, Square Root, Area of Rectangle, Trapezoid, Circle, &c.; Measurement of Timber; Calculation of Workable Coal in a Mine, &c.; a Knowledge of the Coal-mines Act and Amendments.*

1. Assume output of mine to be 1,000 tons a day, 40 per cent. being large coal, 30 per cent. nut coal, and 30 per cent. slack; the gross cost of production at the mine totals £350, and the sale of large coal and nuts realizes £300: at what price would the slack have to be sold to realize 15 per cent. profit on the working?
2. Find the length of a straight line starting 80 ft. from the base to reach the top of a cliff 798 ft. high.
3. Find the depth of a circular tank, 10½ ft. diameter, to contain 5,000 gallons.
4. What will be the length of the side of a square field (in yards to two places of decimals) containing 20 acres 2 roods 2 poles 20 square yards; and if a seam of coal 4 ft. thick underlies the field, how many tons of coal would be in it, the specific gravity being 1·25?

Knowledge of Coal-mines Act.

1. Briefly state the duties of the manager, underviewer, and fireman, and deputies under the Coal-mines Act, 1908, and amendments.
2. State what you know regarding the practical working of the rules relating to the use of explosives in coal-mines.
3. State what duties outside of coal-getting are to be attended to by coal-miners. Quote special rules referring to such.

SUBJECT 5.—*Surveying.*



1. The above diagram shows the survey of a mining claim, A B C D E: find the bearings and distances of the boundaries C D and D E. The distances are given in links.

2. Compute the area of the mining claim A B C D E.
3. The angles of elevation from A to B and B to C, allowing for height of instrument and signals, are 4° 15′ and 3° 27′ respectively: what is the height of station C above station A, in feet?

SUBJECT 6.—*General and Applied Geology.*

1. Define and illustrate by diagrams—Normal fault, reversed fault, trough fault, anticline.
2. Give a brief description of the geological features of any coalfield with which you are familiar.
3. Name and define the different classes of coal. Give their approximate composition.
4. A prospecting association has an option over 3,000 acres of nearly flat open country supposed to be coal-bearing. There are rock- but no coal-outcrops, and a bore just outside the area has passed through a coal-seam of good quality at a depth of 400 ft. State fully what geological and other data ought to be obtained before any attempt to mine coal is made. How far apart ought prospecting-bores to be? Assume New Zealand conditions.
5. Give a table showing the sequence of the geological formations in New Zealand, *or* Australia, *or* Great Britain.
6. Define the following classes of rock: Conglomerate, grit, sandstone, shale, limestone, fireclay.
7. State the characteristics of a good coal-roof. Which of the rocks mentioned in question 6 would you prefer as a roof, and why?

QUESTIONS FOR MANAGERS' SECOND-CLASS CERTIFICATES OF COMPETENCY.

SUBJECT 1.—*Mining: Opening out a Colliery; Working Coal; Timbering; Boring.*

1. Under what conditions would you adopt the retreating longwall system of working? Sketch a district worked on this method, showing the packs, the timbering, and course of ventilation; state also the quantity of coal you would expect to get daily from such a district. Assume condition as to thickness of seam, &c.
2. Supposing you were working a seam of coal with naked lights and found it necessary to introduce safety-lamps, what rules and regulations would be required to be conformed to?
3. What advantages are secured by the use of tapered props?
4. Describe, with sketches, how you would proceed to clear a road through a heavy fall, the top and sides being broken.
5. Give sketches showing a panel system of working coal, stating dimensions of panel, and showing how pillars are extracted.
6. State your experience of the working of boring-machines, "Calyx" or diamond drill, and state conditions most suitable for the respective machines.
7. What are the principal things to be attended to in order to secure workers in coal-mines against accidents from falls of roof and sides? What rules would you suggest as a guide to the workers?
8. The following is a section near the surface where it is proposed to sink a shaft: soil, 2 ft.; clay, 5 ft.; quicksand, 12 ft.; and rock, 4 ft.: describe, with sketches, how you would sink through this, stating the appliances you would use, the finished size of shalt to be 14 ft. in the clear.

SUBJECT 2.—*Mechanics: Pumping-appliances and Mine-drainage; Tapping Water and Dam-construction in Mines; Winding in Shafts; Hauling on Underground Planes; Compressed-air and Steam-power Plants; Strength of Materials; Elementary Electricity.*

1. Describe what you consider a good class of pump for application to the pumping of water from the dip workings of a mine; and if required to deal with 100 gallons per minute from a tunnel dipping at the rate of 1 in 6 for 200 yards, what size of pump would you apply, and how would you transmit power to actuate it?
2. If required to drive a heading for the purpose of entering old workings (abandoned), what precautions would you adopt to guard against accident from (*a*) water and (*b*) noxious gases? Also state nature of appliances you would use.
3. What size hauling-engine would you apply, and where would you erect it, to have 100 tons per hour on an incline dipping from the shaft at a grade of 1 in 5? Give full particulars, including size of rope, &c.
4. Having to wind 100 tons per hour from a shaft 1,000 ft. deep, give size of engine and size of rope you would apply.
5. State under what conditions you would apply compressed air in preference to electricity in underground workings.
6. Describe a suitable electric-lighting plant for surface application at a colliery, giving the power required to supply current for 150 c.p. lamps, and stating the voltage you consider suitable having regard to safety.
7. What do you understand is meant by "potential" and "potential difference"?
8. What precautions do you consider should be taken to ensure safety in the installation of electric plant for use in the underground workings of coal-mines?

SUBJECT 3.—*Ventilation: Ventilation of Mines and Knowledge of Mine Gases; Spontaneous Combustion of Coal, and Methods of Dealing with Underground Fires; Rescue Apparatus; Practical Knowledge of Gas-testing with a Safety-lamp.*

1. What are the provisions of the Coal-mines Act with regard to the ventilation of coal-mines?
2. What are the effects of atmospheric changes of temperature upon the ventilation of mines where powerful fans are in use?
3. In a mine giving off a large quantity of fire-damp how would you ascertain if mine properly ventilated?
4. The water-gauge being 1 in. and the volume of air in circulation 50,000 cubic feet per minute, what will be the volume of air in circulation if water-guage increase to 1·6, the increase being due to increased power applied?
5. What are the chief causes of mine-fires, and how would you proceed to guard against them?
6. Describe what you consider a good type of oil-burning safety-lamp, having regard to testing for fire-damp and for use in the working-parts of a fiery mine.
7. Having to open out workings by driving two parallel headings giving off gas with a pillar of 20 yards thick between headings, show by sketches how you would conduct the ventilation so as to effectually prevent gas accumulating.

SUBJECT 4.—*Arithmetic and Law: A Knowledge of Mine Accounts; Fractions, Decimals, Percentages, Square Root, Area of Rectangle, Trapezoid, Circle, &c.; Measurement of Timber; Calculation of Workable Coal in a Mine, &c.; a Knowledge of the Coal-mines Act and Amendments.*

1. The shaft-pumps at a colliery raise 150 gallons a minute: if stopped 12 hours for repairs, what storage-room is required to hold the 12 hours' water? Give answer in cubic feet.
2. For driving a roadway 8 ft. wide by 7 ft. high 45s. per yard is paid: what is the cost per cubic foot?
3. Give length of straight line starting 80 ft. from the base to reach top of cliff 798 ft. high.
4. In one district of a colliery, working-hours 8 per day, 6 horses and 6 men are employed hauling coal to main rope; each horse makes 12 trips, 4 tons per trip; and allowing 9s. a day for each man, and 3s. 6d. a day for each horse, what is the cost per ton?

Knowledge of Coal-mines Act.

1. State briefly the duties of the manager, underviewer, and firemen deputies under the Coal-mines Act, 1908, and amendments.
2. State the provisions of the law regarding (*a*) the storage and use of explosives, (*b*) the duties and responsibilities of shot-firers, (*c*) what the law provides should be attended to by the working collieries in regard to the safety of their working-places.

LIST OF PERSONS WHO HAVE OBTAINED CERTIFICATES UNDER THE COAL-MINES ACTS.

First-class Mine-managers' Certificates.

Issued under the Coal-mines Acts, 1886 and 1891.

Aitken, T., Wendon.
Alexander, T., Brunnerton.
Austin, J., Sheffield.
Binns, G. J., Dunedin.
Bishop, J., Brunnerton.
*Brown, T., Westport.
Brown, T., Glentunnel.
Cameron, J., Denniston.
Campbell, J. C., Fairfield.
Cochrane, N. D., Dunedin.
Collins, W., Taupiri.
Dando, M., Brunnerton.
*Elliott, R., Wallsend.
*Ferguson, A., White Cliffs.
*Freeman, J., Green Island.
*Geary, J., Kamo.
Gray, J., Abbotsford.
*Harrison, J., Brunnerton.
*Irving, J., Kaitangata.
*Jamison, W., Waimangaroa.
*Kenyon, J., Shag Point.
Kerr, G., Kamo.
*Lindsay, W., Otago.
Lloyd, J., Invercargill.
*Louden, J., Green Island.
Love, A., Whangarei.
Mason, J., Nightcaps.
May, J., Greymouth.
Moody, T. P., Kawakawa.
Moore, W. J., Springfield.
*Nelson, J., Green Island.
Ord, J., Huntly.
*Redshaw, W., Whangarei.
Reed, F., Westport.
*Richardson, D., Abbotsford.
Shore, J., Kaitangata.
Shore, T., Orepuki.
*Shore, W. M., Kaitangata.
*Smart, W., Christchurch.
Smith, A. E., Nelson.
Smith, T. F., Nelson.
Sneddon, J., Mosgiel.
Swinbanks, J., Kawakawa.
Taylor, E. B., Huntly.
Thompson, A., White Cliffs.
Walker, J., Collingwood.
Williams, W. H., Shag Point.

Issued under the Coal-mines Acts, 1886, 1891, 1905, and 1908, after Examination.

Armitage, F. W., Auckland.
Armstrong, J., Brunnerton.
Barclay, T., Kaitangata.
Barclay, W., Kaitangata.
Bennie, Boyd, Waihi.
Bishop, T. O., Reefton.
Brown, J. C., Denniston.
Burt, A., Waihi.
Campbell, Peter, Fairfield.
Carruthers, J., Shag Point.
Carson, W., Kaitangata.
Coombe, J., Waihi.
Coulthard, J., Taylorville.
Crockett, S., Millerton.
Dixon, C. W., Granity.
Dixon, W., jun., Kaitangata.
*Dowgray, R. L., Granity.
Duggan, George, Burnett's Face.
Dunn, Andrew, Denniston.
Dunn, W., Brunnerton.
Dunn, W. R., Thames.
Elliott, R., jun., Denniston.
Fleming, J., Kaitangata.
Fletcher, James, Granity.
Fox, R. A., Denniston.
Fry, Sydney, Waimangaroa.
Gibson, John, Westport.
Gillanders, A., Shag Point.
*Gowans, W., Millerton.
Green, E. R., Abbotsford.
Green, J., Brunnerton.
Hamilton, J. S., Burnett's Face.
Herd, J., Brunnerton.
Heycock, C. R., Nightcaps.
Hill, Robert, Abbotsford.
Hosking, G. F., Auckland.
*Hughes, D., Preservation Inlet.
*Hughes, Job, Puponga.
Jebson, D., Canterbury.
*Johnson, W. P., Thames.
Jones, T., Kimihia.
Leitch, J., Blackball.
Leitch, W., Blackball.
Marshall, A. G., Denniston.
McCaffrey, Patrick, Ferntown.
McCormack, W., Denniston.
McEwan, Robert, Coromandel.
McGeachie, J., Mokau.
Milligan, J., Denniston.
Milligan, N., Westport.
Morgan, William, Waihi.
Murray, T., Westport.
*Newsome, F., Denniston.
Newton, James, Brunnerton.
Parsonage, W., Runanga.
Pearson, W., Waihi.
Penman, A., Huntly.
Scoble, E. J., Waihi.
*Shore, Joseph, Kaitangata.
Smith, George, Fairfield.
Sowerby, H., Denniston.
Talbot, H., Brunnerton.
Tattley, E. W., Huntly
Tattley, F. J., Mercer.
Taylor, A. H., Waikato.
Thomson, Thomas, Denniston.
Turner, G. F., Shag Point.
Westfield, C. H., Fairfield.
Young, James H., Waimangaroa.

Issued under the Coal-mines Act, 1886, on Production of English Certificate.

Binns, G. J., Dunedin.
Black, T. H., Waipori.
Broome, G. H., Ngakawau.
*Burt, W., Huntly.
Cater, T., Auckland.
Cochrane, N. D., Dunedin.
*Garrett, J. H., Auckland.
Hayes, J., Kaitangata.
Hodgson, J. W., Ross.
*Lindop, A. B., Springfield.
*Macalister, J., Invercargill.
*Nimmo, J., Oamaru.
Reed, F., Wellington.
*Straw, M., Westport.
Tattley, W., Auckland.

Issued to Inspectors of Mines by virtue of Office, under the Coal-mines Acts of 1886 and 1891.

*Coutts, J., Thames.
Gordon, H. A., Wellington.
*Gow, J., Dunedin.
McLaren, J. M., Thames.
*Wilson, G., Thames.

Issued under the Coal-mines Acts of 1891, 1905, and 1908, on Production of Certificate from a recognized Authority outside the Dominion.

Alison, J., Mangatini.
Alison, R., Greymouth.
Bayne, J. A. C., Roa.
Clark, W., Blackball.
Davidson, Gavin, Blackball.
Davies, D. J., Ngakawau.
*Dixon, J., Westport.
Fletcher, George, Westport.
Frame, Joseph, Kaitangata.
Gillick, J., Kaitangata.
Goold, A. L., Auckland.
Irvine, James, Dunedin.
James, Isaac Angelo, Westport.
*Jordan, R. S., Kaitangata.
Kane, D., Denniston.
Kirkwood, D., Coromandel.
Lamont, J., Devonport.
Lewis, W., Blackball.
Mark, W. S., Kaitangata.
McAvoy, H., Christchurch.
Morris, A., Huntly.
Nelson, E., Hikurangi.
*Paterson, D. S. A., Kawhia.
*Pollock, James, Green Island, Otago.
*Proud, Joseph, Wanganui.
*Scott, Joseph, Ngahere.
Tennent, R., Brunnerton.
Twining, C. E., Dunedin.
Watson, James, Greymouth.
Watson, John, Blackball.
Wight, E. S., Auckland.
Woods, William, Mokihinui.

Second-class Mine-managers' Certificates.

Issued under the Coal-mines Act, 1891.

*Carson, M., Kaitangata.
Collier, Levi, Kamo.
Clarke, Edward, Shag Point.
Elliot, Joseph, Coal Creek.
Harris, John, Denniston.
Herd, Joseph, Brunnerton.
Howie, James, Kaitangata.
*Leeming, William, White Cliffs.
Lobb, Joseph, Mokau
*Love, Alexander, Orepuki.
McIntosh, Allan, Shag Point.
McLaren, J. M., Thames.
*Marshall, J., Ngakawau.
Murray, Thomas, Denniston.
*Nimmo, George Stewart, Ngapara.
Radcliffe, William, Reefton.
*Roberts, John, Brunnerton.
*Ross, John, Kawakawa.
Sara, James, Reefton.
Smith, Charles, Whangarei.
Thomas, James, Springfield.
Wallace, William, Huntly.
*Willetts, John, Papakaio.
Willetts, John Morris, Papakaio.
Young, William, Waimangaroa.

* Deceased since issue of certificate

SECOND-CLASS MINE-MANAGERS' CERTIFICATES—*continued.*

Issued under the Coal-mines Acts, 1886, 1891, 1905, and 1908, after Examination.

Allan, J., Brunner.
Austin, W. B., Sheffield.
Ball, A., Kimihia.
Barber, John, Shag Point.
Barclay, T., Kaitangata.
Barclay, T., jun., Kaitangata.
Barclay, William, Kaitangata.
Barnes, A. E., Shag Point.
Broome, J., jun., Gore.
Brown, Robert, Kaitangata.
Cadman, J., Hikurangi.
Campbell, Peter, Fairfield.
Carruthers, J., jun., Nightcaps.
*Carson, Joseph, Kaitangata.
Charles, E., Glentunnel.
Cherrie, R. C., Mokau.
Christie, James, Saddle Hill.
Clemo, G., Whangarei.
Craig, John, Coal Creek Flat.
Crockett, S., Millerton.
Dale, E. G., Kaitangata.
Dixon, W., jun., Kaitangata.
Doel, G., Lovell's Flat.
Duncan, James, Kaitangata.
Duncan, J. E., Kaitangata.
Duncan, John, Lovell's Flat.
Ferguson, A., Kaitangata.
Ferguson, G., Roa.
Fox, R. A., Blackball.
Harris, A., Saddle Hill.
Hewitson, W. E. G., Burnett's Face.
Heyes, T., Kaitangata.
Heycock, C. R., Nightcaps.
Hill, R., Abbotsford.
Hodson, John, Kaitangata.
*Holden, J., Drury.
Hughes, Job, Roa.
Hunter, A., Southland.
Kells, F. H., Denniston.
*Kirkland, H. S. S., Nightcaps.
Lewis, David, Puponga.
Lewis, J., Nightcaps.
Lindsay, J. B., Orepuki.
McAllister, Neil, Kaitangata.
McLelland, J., Kaitangata.
McLelland, A. C., Kaitangata.
McNeill, D., Fairfield.
Milligan, J., Denniston.
Mills, Walter, Huntly.
Morganty, Louis, Ngakawau.
Mosley, J. T., Stirling.
Neilson, J., Runanga.
Neilson, Moffat, Abbotsford.
Newburn, S., Kaitangata.
Ogilvie, W. W., Saddle Hill.
Orr, Hugh, Fairfield.
Parcell, W., jun., Bannockburn.
Penman, C. P., Kaitangata.
Price, F. J., Burnett's Face.
Scoble, E. J., Blackball.
Snow, T., Mercer.
Tattley, F. J., Mercer.
Taylor, Joseph, Collingwood.
Thompson, Joseph, Blackball.
Thomson, James, Nightcaps.
Todd, T., Nightcaps.
Waldie, A. B., Mokau.
Watson, A., Soldier's Creek.
Westfield, C., Fairfield, Otago.
Whittleston, A. W., Shag Point.

Issued under the Coal-mines Acts of 1891, 1905, and 1908, on Production of Certificate from a recognized Authority outside the Dominion.

Arundel, W., Hikurangi.
Baxendale, J., Mine Creek.
Black, J., Granity.
Boyd, J., Hikurangi.
Brownlie, T., Huntly.
Burt, A., Huntly.
Clarkson, S., Kaitangata.
Cross, G., Hikurangi.
Dickinson, W., Gore.
*Dodd, W., Granity.
*Dowgray, R., Granity.
Eyeington, G., Huntly.
Greenwell, R., Huntly.
Grenall, S., Granity.
Inglis, A., Huntly.
Jones, T., Kimihia.
Kerr, D., Collingwood.
Lennox, W., Springfield.
Little, W., Wellington.
Littlewood, G. G., Denniston.
Longstaff, H. C., Kaitangata.
McCall, John, Wellington.
McGeachie, J., jun., Mokau.
McGuire, P., Mount Somers.
McGuire, William, Seddonville.
McHardy, A. J., Ferntown.
Molony, C. V. P., Auckland.
Newburn, F., Roa.
Parsonage, W., Dunollie.
Penman, A., Huntly.
Provan, P., Runanga.
*Robertson, J., Granity.
Robertson, R., Roa.
Sneddon, J., Blackball.
Strachan, J., Dunedin.
Tennant, D., Paparoa.
Talbot, H., Huntly.
Webb, T. E., Huntly.

UNDERVIEWERS' CERTIFICATES.

Issued under the Coal-mines Amendment Act, 1909.

Allan, James, Puponga.
Attrill, Charles Waterford, Mercer.
Berry, A. H., Huntly.
Bond, John, Waikaia.
Boustrage, T. Hubert, Brunnerton.
Broome, James, Gore.
Clough, Henry, Millerton.
Davidson, William, Mine Creek.
Davis, William, Runanga.
Donaldson, James, Kaitangata.
*Falconer, Andrew, Abbotsford.
Flynn, John, Bannockburn.
Green, Richard, Abbotsford.
Hawthorn, James, Puponga.
Hunter, Peter, Ngakawau.
Johnston, William Crowan, Gore.
Johnstone, Thomas, Denniston.
Levick, Harry, White Cliffs.
*Mann, William, Granity.
Marsh, Charles George, Glentunnel.
Muncaster, William, Runanga.
McAlister, Robert, Kaitangata.
McGrane, Reginald, Seddonville.
McKenzie, David, Nightcaps.
McNeill, William, Fairfield.
Newlands, George, Brunnerton.
Nimmo, Thomas, Papakaio.
Nimmo, William, Ngapara.
Penman, John, Denniston.
Proctor, William, Kaitangata.
Robertson, William, Mosgiel.
Todd, Thomas, Nightcaps.
Walker, John, Blackball.
Williams, William, Kaitangata.
Wilson, Daniel, Kaitangata.
Winter, John, Denniston.

Issued under the Coal-mines Amendment Act, 1909, after Examination.

Atkinson, John, Puponga.
Bashall, J., Puponga.
Berry, A. H., Huntly.
Boddy, A. J., Rewanui.
Brown, Charles Henry, Denniston.
Carson, F. Kaitangata.
Clark, W. S., State Collieries.
Duffy, F., Burnett's Face.
Griffen, J., Kaitangata.
Hewitson, W. E. G., Burnett's Face.
Hunter, Peter, Stockton.
Jack, W., Millerton.
Johnston, C. M., Seddonville.
King, T. H., Granity.
McDonald, Thomas, Ngakawau.
McLean, M., Granity.
McLeod, J. G., Millerton.
Morganty, L., Stockton.
Mosley, J. T., Denniston.
Nicholson, D., Huntly.
O'Brien, D. Q., Mangatini.
Peacock, Thomas, Denniston.
Pearson, William, Burnett's Face.
Pendleton, S., Blackball.
Rogers, James, Ngakawau.
Strongman, C. J., Cobden.
Sweeney, J. L., State Collieries.
Tucker, J., Kaitangata.
Turnbull, E. V., Thames.
Turner, Alfred, Kiripaka.
Turton, J., Huntly.
White, Edward, Ngaruawahia.
Whittlestone, G. F., Abbotsford.
Young, J., Huntly.

Issued under the Coal-mines Amendment Act, 1910.

Baerdsmore, E., Denniston.
Cuthbertson, Robert, Fairfield.
Evans, William, Abbotsford.
Fisher, T., Westport.
Gibson, M., Abbotsford.
Greene, M., Kaitangata.
Hadcroft, J., Runanga.
Hunt, W., Shag Point.
Jones, David, Nightcaps.
Jones, Morris, Nightcaps.
Jones, W., Waikaka Valley.
Kitto, Richard, Kaitangata.
Manderson, P., Runanga.
Mann, D., Granity.
Marshall, J. W., Westport.
Mason, Edward, Kingston Crossing.
Mitchell, Alexander, Runanga.
McCaughern, John, Kaitangata.
Neill, S., Kawakawa.
Newburn, S., Kaitangata.
Statham, Robert, Kaitangata.
Walker, J. R., Brighton.

Issued under the Coal-mines Amendment Act, 1914, on Production of Certificate of Corresponding Class granted in any British Possession or Foreign Country.

Martin, Elias, Ngakawau.
Middleton, Robert, Runanga.

* Deceased since issue of certificate.

FIREMEN AND DEPUTIES' CERTIFICATES.

Issued under the Coal-mines Amendment Act, 1909.

Aitken, George, Glentunnel.
Allan, A. George, Abbotsford.
Allan, Charles, Brunnerton.
Beardsmore, Edward, Denniston.
Berry, Albert Henry, Huntly.
Blaney, James, sen., Kaitangata.
Boyd, Robert, Waronui.
Bradley, Robert, Denniston.
Buchols, Joseph, Waikaka.
Burgess, William Charles, E. Gore.
Callaghan, Frederick, Kiripaka.
Campbell, Samuel, Millerton.
Chamley, William, Millerton.
Clausen, Emil P., c/o J. Worthington, 33 Hiropi Street, Newtown, Wellington.
Connelly, Michael, Denniston.
Connew, John, Puponga.
Coppersmith, John, Denniston.
Coulthard, Thomas, Brunnerton.
Cowan, Robert Black, Gibbston.
Cuthbertson, Robert, Fairfield.
*Darby, James, Huntly.
Davis, Evan, Denniston.
Deeming, William, Hikurangi.
Dellaway, Archibald, Denniston.
Dickson, Richard, Hikurangi.
Dillon, Lawrence M., Nightcaps.
Duncan, Frank, Huntly.
Duncan, Hugh, Kaitangata.
Evans, John, Granity.
Evans, William, Abbotsford,
Findlay, Charles, Denniston.
Foot, Frederick Ernest, Denniston.
*Fullick, George, Runanga.
Gibson, Matthew, Abbotsford.
Gibson, Robert, Millerton.
Gilmour, William, Millerton.
Glover, Richard, Runanga.
Gray, Thomas, Abbotsford.
Gribben, John, Kaitangata.
Headcroft, James, Runanga.
Hamilton, John, Hikurangi.
Hargreaves, Charles, Millerton.
Harris, John, Reefton.
Harris, Joseph T., Saddle Hill.
Hartley, John, Denniston.
Hay, James, Denniston.
Heron, Ralph, Kimihia.
Higgins, Thomas James, Denniston.
Hislop, William, Denniston.
Holden, Samuel, Granity.
Housley, Benjamin, Huntly.
Howe, George Charles, Shag Point.
Jackson, Samuel, Millerton.
Jarvie, William Marshall, Kaitangata.
Jaspers, George F., Denniston.
Jenkins, James, Ngakawau.
Johnston, C. Mountier, Seddonville.
Jones, David, Nightcaps.
Kaye, Charles, Runanga.
Kitto, Richard, Kaitangata.
Leeming, J. T., South Malvern.
Lutton, William, Millerton.
Mann, Duncan, Millerton.
Mason, William, Denniston.
Mears, Andrew David, Runanga.
Moncrieff, Thomas, Nightcaps.
Moore, Thomas, Mangatini.
Morganty, Charles, Ngakawau.
Murdoch, Colin McColl, Stirling.
McCaffrey, James, Seddonville.
McCoughern, John, Kaitangata.
McDonald, John T., Millerton.
McGarry, Isaac, Millerton.
McGhee, William, Kaitangata.
McGill, Douglas Thomas, Waikaka.
McGill, John, Huntly.
McKenzie, James, Nightcaps.
Newburn, Robert, jun., Kaitangata.
Newburn, Samuel, Kaitangata.
Nicholas, William, Kaitangata.
Oliver, William, Kaitangata.
Parcell, Henry Clyde, Bannockburn.
Park, Francis, Stirling.
*Peckham, Henry William, Huntly.
Penman, Robert, Kaitangata.
Richards, James, Brunnerton.
Rodgers, Edwin, Kaitangata.
Sanderson, John, Kurow.
Scott, Charles, Nevis.
Scott, John, Runanga.
*Skellern, John, Huntly.
*Smith, Edwin, Springfield.
Smith, William, Huntly.
Smith, William, Seddonville.
Sneddon, James, Blackball.
Southward, John, Runanga.
Statham, Robert, Kaitangata.
Taylor, David, Roa.
Taylor, James, Springfield.
Thin, William, White Cliffs.
Travis, James, Alexandra South.
Tripp, Albert, Kaitangata.
Wallace, John, Mataura.
Wardrope, Francis, Hikurangi.
Watson, Andrew, Roa.
West, George Thomas, Waronui.
White, James, Roa.
*Whorsky, John, Huntly.
Wilson, Walter William, Springfield.
Young, Thomas Gardner, Waikaia.

Issued under the Coal-mines Amendment Act, 1909, after Examination.

Allan, George, Huntly.
Allan, James, Brunnerton.
Anderson, Walter, Blackball.
Armstrong, V., Runanga.
Atkinson, J., Puponga.
Baddeley, Jesse, Dunollie.
Ball, A., Kimihia.
*Berry, T., jun., Huntly.
*Birchall, J., Burnett's Face.
Blair, Peter, Huntly.
Boddy, Archibald John, Runanga.
Bond, W. T., Huntly.
Brennen, J., Kaitangata.
Broadbent, Samuel, Huntly.
Brown, J., jun., Denniston.
Buchanan, William, Millerton.
Burdon, George, Denniston.
Burt, T., Huntly.
*Burt, W., jun., Huntly.
Callaghan, M., Blackball.
Campbell, J. C., Glentunnel.
Carson, Frederick.
Chadwick, A., Millerton.
Chapman, A. E., Kaitangata.
Chippendale, J., Millerton.
Clark, W. S., Dunollie.
Clarke, S., Roa.
Cleveland, F. L., Kaitangata.
Connolly, John, Runanga.
Connolly, John Joseph, Runanga.
Cowan, J., Millerton.
Curragh, A., Burnett's Face.
Curran, James, Ngakawau.
Cuthbertson, John, Glentunnel.
Danks, Peter, Millerton.
Darby, W., Huntly.
Davidson, Thomas, Mine Creek.
Davis, Oliver James, Runanga.
Delaney, J. E., Puponga.
Dowgray, John, Millerton.
Downes, William Norbury, Cobden.
Duggan, Francis, Runanga.
Dutton, John, Granity.
Dymond, J., Millerton.
Fannigan, P., Ngakawa.
Ferguson, A., Kaitangata.
Forrest, John, Runanga.
Gox, Henry John, Blackball.
Gilligan, H., Runanga.
Green, T., Kaitangata.
Griffen, James, Kaitangata.
Hall, R. H., Huntly.
Hardie, J., Millerton.
Harvey, D., Huntly.
Hawkins, Joseph, Burnett's Face.
Hendry, John, Millerton.
Hicks, J. R., Kiripaka.
Hilton, Thomas, Denniston.
Honey, Archibald John, Denniston.
Hopkinson, Joseph, Seddonville.
Hughes, T. E., Huntly.
Innes, Andrew, Runanga.
Isherwood, T., Runanga.
James, F. T., Seddonville.
Johnson, J. H., Hikurangi.
Johnson, Thomas, Huntly.
Jones, B., Millerton.
Jones, J., Hikurangi.
Jones, J., Kimihia.
King, Thomas Henry, Granity.
Lauder, Matt Currie, Runanga.
Lowden, W., Millerton.
McAuley, P., Ngakawau.
McAvoy, William, Ngakawau.
McDonald, J., Ngakawau.
McDonald, Thomas, Burnett's Face.
McKenty, H., Denniston.
McKernan, John, Millerton.
McLaughlin, J. W., Huntly.
McMillan, John, Huntly.
McMillan, John, Kaitangata.
Mackinson, Job, Hikurangi.
Maddison, W., Huntly.
Maher, W., Denniston.
Makepeace, Henry, Runanga.
Mitchell, A., Seddonville.
Morganti, Louis, Millerton.
Moreland, S., Hikurangi.
*Mosley, J. T., Denniston.
Moye, John Patrick, Denniston.
Myers, Richard, Millerton.
*Newton, Charles, Runanga.
Nicholson, David, Huntly.
Nicholson, J., State Collieries.
Niven, Peter, Ngakawau.
Nolan, John, Granity.
O'Brien, Denis Quinsin, Millerton.
O'Brien, Martin, Millerton.
O'Fee, J., Kaitangata.
Parker, Andrew, Greymouth.
Parr, Joseph, Burnett's Face.
Parrott, W., Waiuta.
Paul, James, Seddonville.
Pearson, Samuel George, Burnett's Face.
Pearson, William, Burnett's Face.
Pendleton, S., Blackball.
Phillips, J., Puponga.
Ponton, F., Millerton.
Powell, J., Dunollie.
Ralph, J., Huntly.
Ramsay, J. McK., Kaitangata.
Reed, W. H., Hikurangi.
Robson, W., State Collieries.
Rodgers, J., Ngakawau.
Rowse, J., Runanga.
Ruston, Edwin Walter, Huntly
Seddon, William, Huntly.
Smith, J. A., Seddonville.
Smith, Thomas W., Millerton.
Smith, W. A., Denniston.
Snell, J., Kaitangata.
Southward, William, Runanga.
Strongman, Charles James, Cobden.
Sutherland, J., Millerton.
Sweeney, John Lewis, Runanga.

* Deceased since issue of certificate.

FIREMEN AND DEPUTIES' CERTIFICATES—*continued.*

Issued under the Coal-mines Amendment Act, 1909, after Examination—continued.

Tate, Anthony, Seddonville.
Taylor, Christopher, Millerton.
Thawley, William, Denniston.
Thomson, J., Huntly.
Thomson, Thomas, Mine Creek.
Throp, J., Kaitangata.
Tipler, J. H., Blackball.
Tunstall, W., Hikurangi.
Turton, John, Huntly.
Veitch, D., Blackball.
Vurlow, Frederick Alexander, Denniston.
Walker, W. T., Granity.
Wallwork, Moses, Runanga.
Wear, Daniel, Huntly.
Webster, Oliver, Huntly.
White, Edward, Granity.
Williamson, W. R., Rewanui.
Wilson, J. T., Kamo.
Wilson, W., Shag Point.
Woods, A., Millerton.
Wood, W., Huntly.
Worthington, T., Millerton.
Young, Joseph, Huntly.
Young, Thomas, Granity.

Issued under the Coal-mines Amendment Act, 1910.

Broadfoot, W., Millerton.
Burgess, R. S., Waikaka.
Cain, Alexander, Waikaia.
Cameron, D., North Chatton.
Churchill, S. G., Alexandra South.
Clasen, Charles, Shag Point.
Crabbe, George, Alexandra South.
Cumming, J. S., Denniston.
Cunningham, Thomas, Kaitangata.
Dixon, A., Nightcaps.
Garrey, W., Kaitangata.
Gray, Hugh, Dunedin.
Halsey, W. J., Saddle Hill.
Hartshorne, W. C., Brunnerton.
Hodgetts, I., Burnett's Face.
Hunt, William, Shag Point.
Junker, F. A., Waikaia.
Kidd, G. C., Albury.
King, J., Granity.
Lee, S., Nightcaps.
Mackie, N., Longridge.
McAuley, John, Kaitangata.
McClimont, John, Mount Somers.
McDowell, R., Nightcaps.
McIntosh, A. S., Shag Point.
McIvor, W., Waikaka.
Nelson, J. H., Pukerau.
Ramsey, George, Waikaka.
Robinson, R., Ngakawau.
Russell, H. C., Bannockburn.
Saunders, W., Denniston.
Stevenson, J., Shag Point.
Thomas, B., Denniston.
Tinker, G., Nightcaps.
Whittlestone, C. F., Abbotsford.

Issued under the Coal-mines Amendment Act, 1914, on Production of Certificate of Corresponding Class granted in any British Possession or Foreign Country.

Barr, T., Coalgate.
Coan, R., Huntly.
Davies, W. C., Huntly.
Malcolm, A., Nightcaps.
Quinlan, A. E., ——.
Tucker, J., Kaitangata.

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ANNEXURE B.

STATISTICS OF WORKINGS IN COAL-MINES, 1915.

Name of Mine and Locality.	Name of Manager.	Number of Years worked.	Quality of Coal.	Number of Seams worked.	Thickness of Seams.	Thickness worked.	Dip of Seam.	System of Underground Working.	Number of Shafts.	Dimensions of Shafts. Size of Shaft or Adit.	Dimensions of Shafts. Depth of Shaft or Length of Adit.	Output delivered by	Output for 1915. Coal.	Output for 1915. Slack.	Output for 1915. Total.	Approximate Total Output to 31st December, 1914.	Approximate Total Output to 31st December, 1915.	Number of Men ordinarily employed. Above.	Below.	Total.	Power used for drawing Mineral.	Pumps. Stroke.	Pumps. Size of Barrel.	Pumps. Height of Column.	Means of Ventilation.	Date of Inspector's last Visit.
NORTHERN INSPECTION DISTRICT.													Tons.	Tons.	Tons.	Tons.	Tons.									
North Auckland Coalfields.																										
Northern Colliery	E. Nelson	18	Semi-bituminous	1	4′ to 12′	4′ to 12′	Varied	Bord and pillar	2	9′ x 6′ 6½′ x 6′	690′	Adit	35,647	..	35,647	533,782	569,429	13	32	45	Horse and steam	..	..	..	Fan	3/12/15
Goodhue and Party's Mine	James Boyd	5	Ditto	1	4′	4′	,,	Ditto	..	6′ x 5′	3 ch.	,,	2,289	..	2,289	..	2,289	1	7	8	Manual	..	..	..	Natural	9/6/15
Co-operative Colliery	R. C. Cherrie	2	,,	1	5′ to 12′	10′	1 in 7	,,	..	5′ x 6′	5 ch.	,,	6,598	..	6,598	3,314	9,912	3	8	11	Horse	Syphon			,,	17/12/15
Kiripaka Colliery	E. W. Tattley	¼	,,	1	3′ to 12′	7′	Varied	,,	..	5′ x 5′ 6′ x 5′	50′ 200′	,,	1,121	..	1,121	291,541	292,662	6	20	26	Steam and horse	..	..	..	,,	2/12/15
Kerr and Wyatt's Mine	E. J. Scoble	1	,,	1	13′	12′	1 in 10	,,	..	6′ x 6′	5 ch.	,,	1,469	..	1,469	..	1,469	2	5	7	Horse	..	..	..	,,	12/12/15
Hikurangi Colliery	,,	..	,,	1	12′ to 14′	12′	1 in 8	,,	..	6′ x 6′	Various tunnels	Adits	69,254	..	69,254	933,265	1,002,519	20	90	110	Steam	Duplex 10″ x 10″ x 8″	8″	60′	Fan	10/12/15
Whangarei Colliery	Joseph Cadman	5	,,	2	3¾′ to 8′	4′ to 8′	1 in 6	,,	2	14′ x 6′	106′	Shaft	1,504	..	1,504	13,565	15,069	3	10	13	,,	18″	6′	140′	Natural	4/12/15
Waikato Coalfield.																										
Taupiri Ralph's Colliery	A. Penman	24	Brown	1	10′ to 60′	20′	1 in 10	Bord and pillar	4	9′ x 5½′ 8½′ x 8½′ 13′ x 13′ 9′ x 5½′	190′ 155′ 160′ 232′	Shaft	41,847	20,087	61,934	2,948,261	3,171,589	41	122	163	Steam	1-18″ 1-20″ 1-18″ 1-18″ 1-10″	2-7″ 7″ 2-5″ 6″ 5″	183′ 390′ 390′ 390′ 232′	Fan	29/12/15
Taupiri Extended Colliery	William Wood	27	,,	1	10′ to 34′	20′	1 in 10	Ditto	2	10′ x 10′	166′	,,	95,928	65,466	161,394			55	251	306	,,	1-12″ 1-20″	2-5″ 1-6″	204′ 400′	,,	10/11/15
Pukemiro Colliery	A. Burt	½	,,	1	16′	6′ to 12′	Varied	,,	..	10′ x 6½′	25 yd.	Adit	9,002	2,007	11,009	..	11,009	20	35	55	Electric	..	..	..	,,	26/11/15
Waipa Colliery	T. Thomson	1¾	,,	1	11′ 6″	9′	1 in 10	,,	..	Tunnel 10′ x 8′	20 ch.	,,	66,116	34,452	100,568	49,308	149,876	40	105	145	Horse, steam, and gravity	Centrifugal	2″	40′	,,	9/12/15
Huntly Brick Company (Limited)	R. Greenwell	4	Lignite	1	18′	18′	Level	Open cut	..	..	..	..	4,263	..	4,263	6,155	10,418	6	..	6	Manual	..	..	..	Natural	4/9/15
Mangapapa (Mokau) Colliery	W. Lennox	30	Brown	1	7′ to 8′	7′ to 8′	1 in 10	Bord and pillar	..	9′ x 6′	26 ch.	Adit	3,213	152	3,365	84,786	88,151	2	6	8	Horse	..	..	..	Fan	19/10/15
Output of mines included in previous statements at which operations are suspended or abandoned		–		..	..	..	..	..	..	..	..	..	..	..	..	2,262,813	2,262,813	..	..	..	..	..	..	..	..	..
WEST COAST INSPECTION DISTRICT.																										
Nelson Coalfield.																										
Puponga Colliery	P. McCaffrey	12	Bituminous	2	6′ and 9′	Full height	1 in 3½	Bord and pillar	..	10′ x 6′ 6″	51 ch.	Direct haulage, incline shaft	9,576	7,456	17,032	174,811	191,843	25	30	55	Steam	10″ steam 10″ air	7″ 6″	201′ 226′	Fan	30/9/15
North Cape Colliery	Job Hughes	5	,,	1	3′ 6″ to 5′ 6″	,,	1 in 3	Ditto	..	7′ x 7	Dip 4 ch.	Ditto	9,540	57	9,547	22,947	32,544	19	31	50	,,	10″	6″	70′	Natural	30/9/15
Buller Coalfield.																										
Co-operative Mine	H. Chester (P.)	1	Bituminous	1	10′	Full height	1 in 4	Bord and pillar	..	10′ x 6′	4 ch.	Horse haulage, adit level	1,288	..	1,288	115	1,403	..	2	2	Horse	..	..	..	,,	3/12/15
Westport-Stockton Colliery	D. J. Davies	7	,,	1	8′ to 24′	,,	Variable	Ditto	..	8′ x 7′	5 adits, A, B, C, D, E	Endless rope, gravity electric haulage	78,264	65,968	144,232	702,708	846,940	56	180	236	Steam	..	..	..	Fan	28/10/15
Millerton Colliery	W. McCormack	24	,,	1	4′ to 40′	12′	,,	,,	..	10′ x 7′ 11′ x 7′ 12′ x 7′ 10′ x 6′	72 ch. 53 ch. 25 ch. 25 ch.	Endless rope	255,312	36,501	291,813	4,406,070	4,697,883	102	344	446	Gravity	..	..	..	,,	31/12/15
Iron Bridge Colliery	G. Smith	24	,,	2	3′ to 30′	Full thickness	,,	,,	1	10′ x 6′	76 ch.	,,	205,936	67,614	273,550	6,881,429	7,154,979	73	200	273	Steam	Two Tangyes, 8″ x 4″ x 12″			,,	23/11/15
Coalbrookdale Colliery	N. Milligan	34	,,	1	16′ to 20′	Ditto	,,	,,	1	10′ x 6′ 10′ x 6′	44 ch. 28 ch.	,,						70	200	270	,,	Cameron, 8″ x 4″ x 12″ Tangye, 8″ x 4″ x 12″			,,	23/11/15
White Cliffs Mine	J. H. Burley (P.)	15	Brown	1	16′ to 20′	9′	1 in 4	,,	..	12′ x 9′	2 ch.	Adit	No output			7,033	7,033	1	1	2	Manual	..	..	..	Natural	29/12/14
Rocklands Mine	J. P. Burley (P.)	14	Bituminous	1	16′ to 20′	8′ to 10′	1 in 4	,,	..	10′ x 8′	3 ch.	,,	86	..	86	6,773	6,859	..	2	2	,,	..	..	..	,,	29/12/14
Inangahua Coalfield.																										
Coghland's Freehold	J. Coghlan (P.)	19	Pitch	1	10′	Full height	1 in 3	Bord and pillar	..	7′ x 5′	13 ch.	Adit	86	121	207	5,307	5,514	..	2	2	Manual	..	..	..	Natural	15/12/14
Archer's Freehold	J. W. Archer (P.)	20	Bituminous	1	10′	,,	1 in 3	Ditto	..	6′ x 5′	6 ch.	,,	400	..	400	17,456	17,856	..	2	2	,,	..	..	..	,,	15/12/14
Waitahu Mine	I. Rhodes (P.)	13	,,	1	14′	8′	1 in 4	,,	..	10′ x 7′	7 ch.	,,	27	..	27	4,518	4,545	..	2	2	Horse	..	..	..	,,	25/8/15
Burke's Creek Mine	J. Harris (P.)	14	,,	1	12′ to 15′	10′	1 in 4	,,	1	12′ x 8′	7 ch.	,,	2,382	826	3,208	22,357	25,565	1	4	5	,,	..	..	..	Furnace	25/8/15
Deep Creek Mine	E. F. Lockington (P.)	14	,,	1	12′ to 15′	8′	1 in 4	,,	..	10′ x 8′	3½ ch.	,,	219	..	219	2,936	3,155	..	2	2	Manual	..	..	..	Natural	25/8/15
Phœnix and Venus Mine	W. Knight (P.)	34	,,	2	25′ to 30′	10′	1 in 3	,,	..	6′ x 4′	6 ch.	,,	808	..	808	32,927	33,735	1	2	3	..	..	..	..	,,	26/8/15
Watson and Moyle's Mine	G. Ward (P.)	7	,,	1	12′	9′	1 in 4	,,	..	8′ x 6′	8 ch.	,,	1,633	..	1,633	6,449	8,082	..	2	2	Manual	..	..	..	,,	26/8/15
Lankey's Creek Mine	F. Knight (P.)	13	,,	1	8′	8′	1 in 4	,,	..	7′ x 5′	5 ch.	,,	2,150	..	2,150	19,157	21,307	..	3	3	,,	..	..	..	,,	26/8/15
Golden Point Mine	R. L. Kearns (P.)	7	,,	..	No output for year			..	..	..	..	..	..	..	..	1,585	1,585	..	..	..	..	..	..	..	,,	28/8/15
Loughlan's Mine	R. L. Kearns (P.)	10	,,	1	6′	6′	1 in 6	Bord and pillar	..	10′ x 5′	5 ch.	Adit	229	..	229	11,086	11,315	1	2	3	Manual	..	..	..	Natural	28/8/15
Merrijigs Mine	H. Grigg (P.)	5	,,	1	6′	6′	1 in 8	Ditto	..	6′ x 6′	4 ch.	,,	1,515	..	1,515	3,147	4,662	..	3	3	,,	..	..	..	,,	28/8/15
Reefton Mine	C. A. Svensen (P.)	13	,,	..	No output for year			..	..	..	..	..	..	..	..	5,796	5,796	..	..	..	..	..	..	..	,,	24/8/15
Big River Mine	W. Kirwin (P.)	2	,,	1	Variable	8′	Variable	Bord and pillar	..	7′ x 6′	1½ ch.	Adit	1,020	..	1,020	832	1,852	1	2	3	Manual	..	..	..	Natural	13/1/16
Murray Creek, Svenson's Mine	C. A. Svensen (P.)	2	,,	1	,,	8′	,,	Ditto	..	Open cast	1½ ch.	,,	270	400	670	455	1,125	..	2	2	..	..	..	..	,,	28/8/15
Morris and Learmont's Mine	F. Gibson (P.)	2	,,	1	12′	10′	,,	,,	..	8′ x 8′	3 ch.	,,	65	..	65	60	125	..	2	2	..	..	..	..	,,	25/8/15
Grey Valley Coalfield.																										
Paparoa Colliery	J. C. Bayne	7	Bituminous	1	8′ to 16′	10′	1 in 3	Bord and pillar	..	10′ x 8′	50 ch.	Adit	29,554	13,873	43,427	153,472	196,899	10	38	48	Gravity	..	..	..	Fan	9/12/15
Blackball Colliery	J. Watson	25	,,	2	15′	Full height	Variable	Ditto	2	9′ x 6′	18½ ch.	,,	121,463	95,434	216,897	2,035,157	2,252,054	56	292	348	Steam and electric	Electric turbine 6″ and 4″ 9″ and 9″		90′ 200′	,,	4/12/15
North Brunner Colliery	James Armstrong	6	,,	1	6′ to 12′	,,	,,	,,	..	12′ x 6′	6 ch.	,,	6,682	7,108	13,790	52,286	66,076	18	50	68	Steam	..	..	..	Fan and natural	16/12/15
Brunner Colliery	R. Allison	51	,,	1	12′	,,	1 in 4	,,	..	10′ x 12′	4 ch.	,,	6,704	10,227	16,931	2,371,433	2,388,364	6	16	22	,,	11″ 6″	7″ 4″	100′ 40′	Fan	13/11/15
Point Elizabeth State Collieries—																										
No. 1 Section	J. Coulthard	11½	Pitch	1	8′ to 16′	,,	Variable	,,	..	10′ x 7′	11 ch.	,,	64,814	64,813	129,627	1,865,762	1,995,389	63	168	231	,,	Electric turbine 600 g.p.m.		320′	,,	11/11/15
No. 2 Section	J. Coulthard	11½	,,	1	4′ to 12′	,,	1 in 5	,,	..	10′ x 7′	12 ch.	,,														
Liverpool Colliery—																										
No. 1, 2, and 3A Sections	W. Parsonage	2	Bituminous	3	4′ to 16′	,,	Variable	,,	..	11′ x 7′	54·7 and 33 ch.	,,	37,312	71,261	108,573*	81,114	189,687	70	165	235	,,	..	..	..	Fans	8/12/15
No. 3 Section	George Duggan	2	,,	1	3′ to 12′	,,	,,	,,	..	11′ x 7′	7 ch.	..														
Output of mines included in previous statements at which operations have been abandoned or suspended									..	..	..	..	..	..	..	2,105,168	2,105,168	..	..	..	..	..	..	..	..	..
SOUTHERN INSPECTION DISTRICT.																										
Canterbury.																										
Broken River, Broken River	W. J. Cloudsley	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Springfield, Springfield	J. Taylor (P.)	39	Brown	2	2′	All	1 in 6	Bord and pillar	1 1	6′ x 4′ 4′ x 4′	80′ 60′	Shaft	12	106	118	92,269	92,387	1	3	4	Steam	Direct acting steam			Exhaust steam from pump	23/10/15
Bush Gully, Coalgate	J. Gillick	2	,,	2	5′ 7′	5′ 7′	50° 50°	Ditto	.. 1	12′ x 6′ 5′ x 4′	250′ 50′	Engine plane	10,503	2,511	13,014	..	13,014	9	30	39	,,	..	,,		Ditto	22/10/15
St. Helens, Whitecliffs	J. Sutherland	34	,,	3	6′, 5′, 3′	5′	1 in 3	,,	..	6′ x 5′	5 ch.	,,	1,036	..	1,036	23,311	24,347	1	3	4	,,	Tangye			,,	22/10/15
Tripp's Mount Somers	D. Kane	49	,,	1	40′	15′	1 in 9	,,	..	7′ x 6′	5 ch.	Adit	705	605	1,310	63,297	64,607	1	2	3	Horse	..	..	..	Natural	21/10/15
Albury, Albury	J. Fibbes (P.)	24	,,	1	12′	8′	1 in 6	,,	..	6′ x 5′	5 ch.	,,	464	..	464	13,737	14,201	1	1	2	,,	Steam pump			,,	19/10/15
Dalgety, Hakataramea	C. W. Ensor	34	,,	1	30′	15′	Semi-vertical	Levels	1	4′ x 3′	68′		10	..	10	3,468	3,478	..	..	..	Hand	..	..	..	,,	..
Te Moana	G. D. Macfarlane	..	,,	1	5′	5′	1 in 4	Bord and pillar	..	..	..	..	2	..	2	140	142	..	..	..	..	..	..	..	..	..
North Otago.																										
St. Andrew's, Papakaio	T. Nimmo (P.)	37	Brown	1	7′	6′	1 in 8	Bord and pillar	.. 1	6′ x 6′ 4′ x 3′	5 ch. 60′	Adit	1,536	..	1,536	51,854	53,390	1	4	5	Horse	..	..	..	Furnace	27/10/15
Prince Alfred, Papakaio	A. Beardsmore (P.)	46	,,	1	9′	7′	1 in 9	Ditto	.. 1	6′ x 5′ 4′ x 4′	5 ch. 50′	,,	1,002	..	1,002	58,967	59,969	1	2	3	,,	..	..	..	Natural	27/10/15
Ngapara, Ngapara	W. Nimmo (P.)	37	,,	1	25′	8′	1 in 7	,,	.. 1	6′ x 6′ 4′ x 4′	10 ch. 50′	,,	400	..	400	29,702	30,102	1	1	2	,,	..	..	..	,,	27/10/15
Old Shag Point, Shag Point	William Hunt (P.)	1	Pitch	1	4′	All	1 in 8	Longwall	.. 1	6′ x 5′ 4′ x 4′	300′ 60′	,,	1,248	77	1,325	405,508	406,833	1	5	6	..	..	..	..	,,	20/10/15
Shag Point Proprietary Company, (latterly Shag Point, Shag Point)	C. E. Twining	7	,,	1	5′	,,	1 in 6	,,	.. 1	6′ x 5′ 4′ x 4′	200′ 25′	,,	3,624	1,308	4,932	7,773	12,705	3	12	15	Horse	..	..	..	,,	20/10/15
Allandale, Shag Point	A. McIntosh	28	,,	1	7′	,,	1 in 4	Bord and pillar	.. 1	6′ x 5′ 5′ x 4′	1,000′ 60′	Engine plane	213	156	369	322,014	322,383	1	2	3	Steam	Tangye pump			Furnace	20/10/15
Diamond Hill, Herbert	J. Hodson	2	Brown	1	4′	,,	Level	Ditto	..	..	..	..	120	..	120	100	220	1	1	2	..	..	..	..	Natural	..

* Of this output 3,280 tons of coal and 6,944 tons of slack was won during 1914, but was inadvertently omitted in the Manager's return to the Inspector for that year. It is now included.

ANNEXURE B—*continued*.

STATISTICS of WORKINGS in COAL-MINES, 1915—*continued*.

Name of Mine and Locality.	Name of Manager.	Number of Years worked.	Quality of Coal.	Number of Seams worked.	Thickness of Seams.	Thickness worked.	Dip of Seam.	System of Underground Working.	Dimensions of Shafts. Number of Shafts.	Size of Shaft or Adit.	Depth of Shaft or Length of Adit.	Output delivered by	Output for 1915. Coal.	Slack.	Total.	Approximate Total Output to 31st December, 1914.	Approximate Total Output to 31st December, 1915.	Number of Men ordinarily employed. Above.	Below.	Total.	Power used for drawing Mineral.	Pumps. Stroke.	Size of Barrel.	Height of Column	Means of Ventilation.	Date of Inspector's last Visit.
													Tons.	Tons.	Tons.	Tons.	Tons.									
SOUTHERN INSPECTION DISTRICT—*continued*.																										
South Otago.																										
Fernhill, Abbotsford	J. Gray	38	Brown	1	15′	12′	1 in 10	Bord and pillar	1	6′ x 6′	5 ch.	Level		1,556	1,556	154,288	155,844	1	2	3	Self-acting incline				Natural	5/11/15
Freeman's Coal Company, Abbotsford	J. Sneddon	35	,,	1	7′ to 14′	All	1 in 7	Ditto	1	4′ x 4′	30′															
									1	6′ x 6′	1,400′	Engine plane and horse level	14,694	3,237	17,931	514,598	532,529	5	29	34	Steam and horse				Fan	5/11/15
									2	5′ x 4′	150′															
Green Island, Green Island	T. Barclay, jun.	28	,,	1	10′	8′	1 in 10	,,	1	6′ x 5′	5 ch.	Engine plane	2,676	..	2,676	119,173	121,849	1	3	4	Ditto				Furnace	5/11/15
Jubilee, Saddle Hill	T. Barclay	18	,,	1	8′ to 18′	All	1 in 10	,,	1	4′ x 3′	35′															
									2	6′ x 5′	10 ch.	Engine plane and horse level	17,200	3,354	20,554	280,099	300,653	6	22	28	,,				,,	5/11/15
									2	4′ x 3′	40′															
Saddle Hill (No. 1), Saddle Hill	W. W. Ogilvie	43	,,	1	20′	,,	1 in 10	,,	1	6′ x 5′	10 ch.	Engine plane	2,378	2,922	5,300	222,293	227,593	3	7	10	Steam				,,	5/11/15
Saddle Hill (No. 2), Saddle Hill	Robert Hill	14	,,	1	22′	15′	1 in 10	,,	1	4′ x 3′	100′															
									1	6′ x 5′	5 ch.	,,	4,326	11,950	16,276	200,744	217,020	8	15	23	,,				,,	18/11/15
East Taieri, Saddle Hill	A. G. Rogers (P.)	4	,,	1	10′	7′	1 in 10	,,	1	4′ x 3′	30′															
									1	6′ x 5′	300′	Adit	2,538	821	3,359	5,412	8,771	1	6	7	,,				Fan	28/10/15
Waronui, Milton	J. Carruthers	11	,,	1	18′	8′	1 in 7	,,	1	4′ x 3′	50′															
									1	6′ x 6′	15 ch.	Engine plane	17,259	2,712	19,971	146,364	166,335	14	29	43	Electric tail-rope system		Tangye		,,	11/12/15
										6′ x 6′	50′															
McGilp's, Milton	J. J. Cooper (P.)	11	,,	1	22′	15′	1 in 8	,,	1	6′ x 6′	5 ch.	Adit	3,898	..	3,898	23,035	26,933	1	3	4	Hand	..	..	..	Natural	20/9/15
Taratu, Lovell's Flat	T. Shore	14	,,	1	20′	12′ to 15′	1 in 10	,,	1	13½′ x 5½′	200′	Shaft	18,702	7,948	26,650	201,320	227,970	13	36	49	Steam		Tangye		Fan	11/18/15
									1	6′ x 4′	185′															
Hawthorn Den, Kaitangata	J. Davis (P.)	7	,,	1	9′	7′	..	,,	1	6′ x 4′	2 ch.	Adit	303	..	303	667	970	..	1	1	Hand	..	..	..	Natural	23/8/15
Longridge, Kaitangata	N. Mackie	7	,,	1	4′	All	1 in 4	,,	1	5′ x 4′	100′	,,	106	..	106	3,202	3,308	..	2	2	..	..	..	..	,,	14/10/15
Kaitangata (No. 1), Kaitangata	A. S. Gillanders	39	,,	1	30′	,,	1 in 1½ to 1 in 30	,,	1	10′ x 7′	60 oh.	Engine plane, endless rope haulage									Steam and compressed air	2′6″	6″	280′	Fan	8/12/15
									1	8′ x 4½′	580′															
Kaitangata No. 2	W. Carson	3	,,	1	30′	,,	Variable	,,	1	10′ x 6′	20 ch.	Ditto	92,896	47,446	140,342	3,140,834	3,281,176	78	272	350	Ditto	2′6″	6″	200′		7/12/15
Castle Hill	W. Carson	22	,,	1	30′	,,	1 in 1½ to 1 in 20	,,	1	11′ x 6½′	45 ch.	,,									,,	2′6″	6″	500′	Fan	10/12/15
									1	9′ diameter	526′															
Benhar, Stirling	J. Walls (P.)	52	Lignite	1	25′	12′ to 16′	1 in 10	,,	1	6′ x 6′	5 ch.	Engine plane	4,467	706	5,173	153,002	158,175	1	5	6	Steam				Exhaust steam from pump	23/8/15
									1	4′ x 4′	50′															
Mount Wallace, Stirling	W. A. Wilson	..	..	..	..	..	..	..	..	..	..	..	409	..	409	8,838	9,247	..	1	1	..	..	..	..	..	..
Mainholm, Pomahaka	J. G. Drummond (P.)	30	Lignite	1	20′	All	Open	Open	..	..	..	Open	1,773	..	1,773	65,007	66,780	2	..	2	..	..	..	..	..	20/9/15
Central Otago.																										
Coal Creek, Roxburgh	J. Barber	45	Lignite	1	20′	7′	1 in 3	Bord and pillar	..	6′ x 5′	2 ch.	Adit	466	..	466	59,489	59,955	1	1	2	Horse		Siphon		Natural	4/10/15
McPherson's, Coal Creek Flat	R. McPherson (P.)	45	,,	1	60′	All	1 in 3	Open	..	..	..	Open	2,230	..	2,230	64,854	67,084	2	..	2	,,		Drainage tunnel		,,	4/10/15
Perseverance, Coal Creek Flat	J. Craig (P.)	28	,,	1	75′	25′	1 in 3	Bord and pillar	..	7′ x 6′	5 ch.	Engine plane	1,544	..	1,544	58,074	59,618	1	2	3	Pelton wheel		Hydraulic-jet pump		,,	4/10/15
Alexandra, Alexandra	D. Mathias (P.)	34	,,	1	9′	7′	1 in 4	Ditto	..	6′ x 5′	5 ch.	,,	2,561	..	2,561	83,208	85,769	2	5	7	Steam		Snow pump		Exhaust steam	29/9/15
									1	5′ x 3½′	60′															
Cambrian, Cambrian	M. J. Miller	54	,,	1	30′	All	..	Open	..	..	..	Open	165	..	165	48,302	48,467	1	..	1	Horse					18/8/15
Laudervale, Cambrian	R. Jones	11	,,	1	12′	,,	..	,,	..	..	..	,,	171	..	171	1,054	1,225	1	..	1	,,					18/8/15
St. Bathan's, St. Bathan's	J. Enright	18	,,	1	20′	15′	..	,,	..	..	..	,,	148	..	148	5,765	5,916	1	..	1	,,					18/8/15
Rough Ridge, Oturehua	J. Beck (P.)	29	,,	1	20′	All	..	,,	..	..	..	,,	569	..	569	28,708	29,277	2	..	2	,,		Drainage tunnel			18/8/15
Idaburn, Oturehua	J. White (P.)	45	,,	1	20′	,,	..	,,	..	..	..	,,	632	..	632	44,105	44,737	1	..	1	,,		Drainage tunnel			18/8/15
Oturehua, Oturehua	R. Thomas (P.)	23	,,	1	7′	,,	..	,,	..	..	..	,,	92	..	92	2,037	2,129	1	..	1	,,		Douglas pump			18/8/15
Gimmerburn, Gimmerburn	C. Dougherty	59	,,	1	12′	,,	..	,,	..	..	..	,,	12	..	12	3,193	3,205	..	..	..	,,					..
Shepherd's Creek, Bannockburn	W. R. Parcell	38	Brown	1	8′	7′	1 in 6	Bord and pillar	..	6′ x 6′	200′	Engine plane	868	..	868	81,642	82,510	1	3	4	Steam		Tangye		Exhaust steam	17/8/15
Cairnmuir, Bannockburn	H. C. Russell (P.)	13	,,	1	12′	10′	1 in 1 to 1 in 3	Ditto	..	6′ x 6′	5 ch.	,,	2,291	..	2,291	34,707	36,998	1	5	6	,,		Tangye		,,	17/8/15
Ranfurly, Bannockburn	J. Hodson, jun. (P.)	5	,,	1	10′	All	1 in 1	Levels	..	6′ x 5′	150′	,,	3,172	..	3,172	2,603	5,775	1	4	5	..		Snow pump		,,	17/8/15
Cardrona, Cardrona	R. McDougall (P.)	31	,,	1	10′	,,	..	Open	..	..	..	Open	205	..	205	25,422	25,627	2	..	2	Horse					13/1/16
Gibbston, Gibbston	J. Duncan	29	,,	1	15′	10′	1 in 5	Bord and pillar	..	6′ x 5′	20 ch.	Adit	663	128	791	21,376	22,167	1	1	2	Steam				Natural	14/1/16
Ryder's, Nevis	R. Toms (P.)	15	,,	1	45′	30′	Semi-vertical	Levels	..	..	..	..	747	..	747	10,496	11,243	..	1	1	Horse				,,	16/12/15
Nevis, Nevis	R. A. Thomson (P.)	..	..	2	6′ to 30′	..	..	..	..	..	150′	Adit	185	..	185	5,624	5,809	..	1	1	..					16/12/15
Nevis Crossing, Nevis	R. Ritchie (P.)	12	,,	1	16′	16′	..	Open	..	..	..	Open	604	..	604	11,524	12,128	2	1	3	Horse					16/12/15
Clarke's, Nevis Crossing, Nevis	J. Ritchie	1	,,	1	9′	9′	..	,,	..	..	..	,,	180	..	180	..	180	2	..	2	..					16/12/15
Dillon's, Blackstone Hill	J. Dillon	18	Lignite	1	12′	..	..	,,	..	..	..	,,	10	..	10	254	264	..	..	..	..					..
Southland.																										
Pukerau, Pukerau	F. A. Junker (P.)	35	Lignite	1	16′	9′	1 in 8	Bord and pillar	..	7′ x 6′	10 ch.	Adit	732	..	732	39,895	40,627	..	1	1	Horse				Natural	23/9/15
Heffernan's, East Gore	E. Jones (P.)	37	,,	1	20′	12′	1 in 7	Ditto	..	6′ x 6′	5 ch.	Engine plane	3,025	..	3,025	59,015	62,040	1	1	2	Steam		Snow pump		,,	20/8/15
Green's, Gore	W. C. Johnston (P.)	27	,,	1	17′	12′	1 in 20	,,	..	10′ x 8′	10 oh.	,,	11,349	..	11,349	154,876	166,225	1	6	7	,,		Tangye		Fan	22/9/15
									1	4′ x 3′	50′															
Bushy Park, Croydon	J. Wilson	10	,,	1	20′	All	..	Open	..	..	..	Open	970	..	970	20,713	21,683	1	..	1	,,		Steam pump			26/8/15
Burnwell, North Chatton	W. McIvor (P.)	16	,,	1	20′	12′	1 in 10	Bord and pillar	..	10′ x 8′	5 ch.	Engine plane	1,955	..	1,955	34,925	36,880	1	1	2	,,		Steam pump		Natural	20/8/15
Ramsay's, North Chatton	J. Buchols (P.)	12	,,	1	20′	15′	1 in 10	Ditto	..	8′ x 6′	5 ch.	,,	7,067	..	7,067	65,794	72,861	1	3	4	,,				,,	20/8/15
Springfield, Waikaka Valley	J. Duncan (P.)	22	,,	1	17′	10′	1 in 10	,,	..	9′ x 8′	5 ch.	,,	7,853	..	7,853	41,720	49,573	1	4	5	,,		Steam pump		,,	20/8/15
									1	4′ x 3′	50′															
Glenlee, Waikaka	D. T. McGill (P.)	22	,,	1	14′	All	..	Open	..	..	..	Open	646	..	646	13,715	14,361	1	1	2	Horse					20/8/15
Edges, Waikaka	A. A. Edge (P.)	16	,,	1	16′	12′	1 in 14	Bord and pillar	..	8′ x 8′	3 ch.	Engine plane	2,124	..	2,124	42,276	44,400	1	1	2	Steam		Steam pump		Natural	20/8/15
Rosevale, Waikaia	R. Craig (P.)	12	,,	1	10′	8′	1 in 12	Ditto	..	6′ x 5′	10 ch.	Adit	2,067	..	2,067	32,695	34,762	1	2	3	Horse				,,	24/9/15
									1	4′ x 3′	60′															
Argyle, Waikaia	H. C. Hutton (P.)	24	,,	1	20′	All	..	Open	..	..	..	Open	469	..	469	4,251	4,720	2	..	2	,,				,,	24/9/15
Anderson's, Riversdale, Wendon	..	..	..	..	..	..	..	..	..	..	..	..	108	..	108	5,727	5,835	..	2	2	..				,,	24/9/15
Waimea, including Lynch's, Kingstone Crossing	J. E. Johnstone (P.)	7	,,	1	6′	All	..	Bord and pillar	..	6′ x 6′	2 ch.	Adit	1,052	..	1,052	6,534	7,586	1	1	2	Horse				,,	24/9/15
Pinchester Creek, The Key	W. O. Kempthorne	13	Brown	1	6′	,,	Irregular	Open	..	..	..	..	90	..	90	1,408	1,498	1	..	1	,,				,,	28/1/15
Mataura Collieries, Mataura	J. Broome	19	Lignite	1	17′	12′	1 in 10	Bord and pillar	..	8′ x 6′	5 ch.	Engine plane	5,337	..	5,337	168,041	173,378	2	3	5	Steam		Steam pump		,,	22/9/15
									1	4′ diameter	50′															
Mataura Lignite Pit, Mataura	William Coster (P.)	39	,,	1	18′	All	..	Open	..	..	..	Open	10,930	..	10,930	137,020	147,950	8	..	8	Horse		Steam pump			22/9/15
Waimumu, Mataura	G. W. Williams (P.)	16	,,	1	9′	7′	..	,,	..	..	..	,,	136	..	136	30,577	30,713	1	..	1	,,					5/3/15
Heatherlea, Waimumu	F. Barber	4	,,	1	..	..	..	,,	..	..	..	,,	119	..	119	236	355	1	..	1	..					5/3/15
Ota Creek, Wyndham	E. Genge (P.)	35	,,	1	6′	All	..	,,	..	..	..	,,	1,072	..	1,072	17,849	18,921	1	..	1	,,		Steam pump			22/9/15
Clarke's, Wyndham	G. W. Clarke (P.)	8	,,	1	12′	,,	..	,,	..	..	..	,,	1,080	..	1,080	12,391	13,471	1	..	1	,,		Steam pump			22/9/15
Robinhood, Pine Bush	J. Conser	34	,,	1	14′	,,	..	,,	..	..	..	,,	..	..	..	3,287	3,287	..	..	..	,,					..
Graham's, Fairfax	E. Graham	..	..	..	..	..	..	..	..	..	..	..	24	..	24	16,617	16,641	..	1	1	..					..
Nightcaps, Nightcaps	William Barclay	34	Brown	2	26′ in aggregate	24′	1 in 7	Bord and pillar	..	10′ x 10′	20 ch.	Adit, engine plane	65,361	..	65,361	1,031,484	1,096,845	27	81	108	Steam, compressed air, and horse		Three tangyes		Two fans	18/11/15
									..	9′ x 6′	20 ch.															
									1	8′ x 4′ 6″	90′															
New Brighton, Nightcaps	A. Hunter	9	,,	1	12′ to 20′	12′	1 in 7	Ditto	..	6′ x 6′	5 ch.	Adit	11,492	52	11,544	32,505	44,049	3	7	10	Steam				Natural	19/11/15
Thistle, Nightcaps	H. Fergusson (P.)	2	,,	1	9′	7′	1 in 6	,,	..	6′ x 5′	3 ch.	,,	1,942	..	1,942	210	2,152	1	4	5	..					19/11/15
Wairio, Nightcaps	C. H. Heycock	10	,,	1	17′	9′	1 in 7	,,	..	6′ x 6′	2 ch.	,,	15,496	414	15,910	9,973	25,883	4	18	22	..					19/11/15
Wairio Railway and Coal Company, Wairio	C. H. Heycock	1	,,	1	Prospecting	..	..	..	..	..	..	..	972	..	972	..	972	3	4	7	..					19/11/15
Wairaki (formerly New Wairaki), Nightcaps	R. McDowell (P.)	2	,,	1	9′	7′	1 in 6	Bord and pillar	..	6′ x 6′	2 ch.	Adit	350	..	350	..	350	1	2	3	..				Natural	19/11/15
Beaumont, Nightcaps	J. Thomson (P.)	7	,,	1	20′	15′	1 in 4	Open	..	..	..	..	2,297	..	2,297	6,709	9,006	6	..	6	Steam		Steam pump			19/11/15
Mossbank, Nightcaps	J. Thomson (P.)	1	,,	1	9′	7′	1 in 6	Bord and pillar	..	6′ x 5′	2 ch.	Adit	765	..	765	..	765	2	..	2	,,				Natural	19/11/15
Mount Linton, Nightcaps	A. Hunter	21	,,	1	20′	15′	..	Open	..	..	..	..	..	..	..	3,314	3,314	6	..	6	,,		Steam pump			19/11/15
Birrell's, Nightcaps	J. Phillips (P.)	1	,,	1	10′	All	..	,,	..	..	..	..	504	..	504	..	504	3	..	3	..					19/11/15
Beattie's, Nightcaps	G. Beattie	1	,,	1	9′	,,	..	,,	..	..	..	..	19	..	19	..	19	1	..	1	..					19/11/15
Diamond Lignite, Seaward Bush	T. Knuckey (P.)	13	Lignite	1	32′	,,	..	,,	..	..	..	..	1,537	..	1,537	11,005	12,542	1	..	1	..					28/11/15
Lynwood, Te Anau	T. Roberts (New Zealand Tourist Department)	15	,,	1	7′	,,	..	,,	..	..	..	..	171	..	171	1,998	2,169	1	..	1	..					..
Wellwood Park, Pukerau	A. M. Mason	14	,,	1	7′	,,	..	,,	..	..	..	Adit	15	..	15	304	319	..	..	..	..					..
Otikerama Station, Pukerau	W. J. Voight	18	,,	1	7′	,,	..	,,	..	..	..	,,	..	..	..	300	300	..	..	..	..					..
Riverview, Gore	J. Nicol	..	,,	..	..	..	..	..	..	..	..	..	65	..	65	1,836	1,901	..	..	..	..					..
Tuach's, Waimumu	J. Tuach	9	..	..	..	..	..	Adit	..	..	..	Adit	..	..	..	81	81	..	..	..	..					..
Output of mines included in previous statements at which operations are suspended or abandoned	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2,287,182	2,287,182	..	..	..	..					..
Totals, Southern District, South Island	..	..	..	..	..	..	..	..	..	..	..	..	381,206	88,009	469,215	11,199,919	11,669,134	265	666	931						
Totals, West Coast District, South Island	..	..	..	..	..	..	..	..	..	..	..	..	837,335	441,659	1,278,994	21,000,346	22,279,340	573	1,749	2,322						
Totals, North Island	..	..	..	..	..	..	..	..	..	..	..	..	338,251	122,164	460,415	7,126,790	7,587,205	212	691	903						
Grand totals	..	..	..	..	..	..	..	..	..	..	..	..	1,556,792	651,832	2,208,624	39,327,055	41,535,679	1,050	3,106	4,156						

	Tons.
Output of mines included in statement for 1890, but whose operations were suspended prior to 1890 (less three, which are again included in body of statement—namely, Hill's Creek, 779 tons; Lovell's Flat, 323 tons; Wyndham, 1,988 tons: total, 3,090 tons)	132,732
Output of mines included in former statements, but whose operations were suspended prior to 1889	172,529
Output of Waikaka, Adam's Flat, and Waimea Mines, inserted twice in statement for 1891	6,518
Shale exported, 1914	21
	41,847,479*

* This total includes 14,443 tons of oil-shale mined prior to 1914.