MINES STATEMENT.

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1920.

NEW ZEALAND.

MINES STATEMENT

BY THE RIGHT HONOURABLE W. F. MASSEY, MINISTER OF MINES.

MR. SPEAKER,—

In presenting my first annual statement on the mining industry of the Dominion it may at the outset be observed that such industry shows signs of revival. During the year inquiries have been received from many parts of the world for information bearing on our mineral resources, and every effort is being made by the staff of the Department to furnish those interested with full particulars.

Early this year the Head Office of the Department was reorganized so as to more closely co-ordinate the activities of the several sections, and honourable members will be pleased to learn that the results already obtained have fully justified the changes made.

In conformity with the announcement made by my predecessor in last year's Statement, the Inspecting Engineer of Metalliferous Mines was instructed to visit the United States of America, and for that purpose he left this Dominion on the 24th November, 1919, and after spending about six months in inspecting the prominent mines in California, Colorado, Oklahoma, and other important mining districts, returned to New Zealand on the 23rd May last. From the valuable experience gained by that officer the mining community in the Dominion should benefit.

STATE ASSISTANCE.

As an aid towards the development of the mining industry the Government has recently authorized the rates hitherto paid for prospecting being increased by 30 per cent. This should encourage miners to continue and increase their efforts to locate and eventually win minerals. The terms and conditions subject to which prospecting-drills are hired have also recently been amended, and the Government now loans the drills free of rent, and in addition the services of an experienced drill superintendent, whose salary and expenses are paid by the Government, are provided.

Subsidies up to £10,000, on a pound-for-pound basis, may also be paid for prospecting deep levels for gold-quartz lodes down to a depth of not less than 1,000 ft., or such less depth as the Minister of Mines may approve.

Any person engaged in prospecting or pioneer mining may be paid a subsidy of not exceeding 5s. for every £1 expended by such person in prospecting or pioneer mining during the preceding twelve months.

Any local body in a mining district may expend a portion of the revenues received by it from duty or goldfields revenue in prospecting for diamonds, gold, silver, tin, or other metals, but I am sorry to say local bodies rarely grant any monetary assistance.

Advances by way of loan of a sum not exceeding £20,000 may also be made by the Government to any company or person for carrying on mining operations, purchasing mining machinery, and for carrying on coal-mining, including the purchase of plant, and the construction of roads and railway-lines thereto.

In order to encourage the production of quicksilver the Government recently revived the offer of a bonus of 4d. per pound for the first 100,000 lb. of marketable retorted quicksilver free from impurities produced from any mine in New Zealand. It is hoped that with this assistance those engaged in mining for quicksilver will be able to produce a sufficient quantity of quicksilver to entitle them to payment of the bonus offered.

In addition to granting assistance in the above directions, applications for remission or reduction in rentals have been granted in all cases where, upon inquiry, it was found advisable in the public interest to grant such relief.

Legislation will also be introduced this session reviving the bonus provisions of the Iron and Steel Industries Act, 1914. In addition to this, arrangements are being made to obtain 20 tons of ironsand from Taranaki and 20 tons of iron-ore from Parapara for the purpose of shipping the same to England, where a test will be made under a new process to determine whether or not it is possible to produce iron on a commercial scale in New Zealand. This test will be made under the oversight of one of the recognized iron and steel experts in England, who will be required in due course to report upon the results to the Government.

Since the 19th September, 1919, the Government has been negotiating, through the High Commissioner, with the British Admiralty for the purpose of entering into an arrangement with the British Government in connection with the boring and development of mineral oil and other products in New Zealand, but up to the present time no agreement has been entered into.

I have deemed it necessary to briefly refer to these matters, because it does not appear to be generally known what may be and is being done for the encouragement of mining in the Dominion.

Honourable members will regret to learn that, owing to the scarcity of labour, to increased wages, and to the higher prices demanded for all plant and stores used in mining, there has been a decrease in the production of metals during the year 1919.

The usual official and statistical information invariably contained in the Mines Statement is given hereunder :—

MINERAL-PRODUCTION.

The following table shows the quantity and value of gold, silver, and other minerals, coal, and kauri-gum exported during the years 1918 and 1919, also the quantity of native coal consumed in the Dominion for the same period :—

Product.	Year ended 31st December, 1918. Quantity.	Value.	Year ended 31st December, 1919. Quantity.	Value.
		£		£
Gold	11,987 oz.	42,391	320,210 oz.	1,334,405
Silver	879,383 "	171,456	453,567 "	103,037
Quicksilver	4½ "	2,122	8⅗ tons	4,619
Tungsten-ore	170 tons	37,922	131 "	29,489
Mixed minerals	2,300 "	5,882	1,091 "	4,051
New Zealand coal exported	182,603 "	227,228	138,174 "	201,383
New Zealand coal used in New Zealand	1,851,647 "	2,303,449	1,709,674 "	2,491,780
Kauri-gum	2,419 "	157,313	4,128 "	255,812
Coke	70 "	146	45 "	113

Total value for 1918 .. .. £2,947,909
Total value for 1919 .. .. £4,424,689

This increase is largely due to the fact that 157,623 oz. of gold entered for export in 1918 was not exported till 1919.

AURIFEROUS-QUARTZ MINING.

The value of bullion obtained from quartz-mines during 1919 amounted to £573,662, obtained from treating 286,057 tons. Dividends paid amounted to £118,831.

The following table shows the production from the most important mines :—

Name of Company.	Quartz treated.	Value of Bullion.	Dividends paid.	
			1919.	Total to End of 1919.
	Tons.	£	£	£
Waihi Gold-mining Company (Limited)	160,511	303,586	99,181	5,338,057
Waihi Grand Junction Gold-mining Company ..	55,442	97,899	..	267,064
Talisman Consolidated Gold-mining Company ..	3,655	46,598	17,250	1,150,972
Muir's Gold Reefs	4,100	17,703	..	..
Blackwater Mines (Limited)	24,969	46,136	..	174,994
New Big River Gold-mining Company	4,254	13,198	2,400	103,200
Progress Mines of New Zealand (Limited).. ..	15,980	20,748	..	326,562
Murray Creek Gold-mining Company	4,512	9,975	..	..
All other quartz-mines	12,634	18,178	..	21,727
Totals	286,057	574,021	118,831	7,382,576*

* Does not include dividends paid by mines not now working.

ALLUVIAL AND DREDGE MINING.

The value of the production from alluvial claims amounted to £80,273, as compared with £78,895 for 1918, an increase of £1,378. There is a prospect of there being a further increase in production from alluvial mines in 1920, as one or two claims upon which a considerable capital has been expended in development are now commencing production.

The dredging industry again shows a decline in production for the year, the value of bullion won for 1919 being £47,838, as compared with £63,691 for 1918; but it is interesting to record that an American company is now building a larger and more powerful dredge near Hokitika than has ever been seen in New Zealand before, and if this company is successful it may mean a revival to some degree of dredge mining in other parts of the Dominion.

TUNGSTEN-ORE (SCHEELITE).

During the year the demand for scheelite for the English market, which had been steadily increasing during the war, practically ceased, and the price fell from 68s. to 30s. per unit; consequently there was a marked decline in production. In 1918, 169½ tons were exported, valued at £37,922; and in 1919, 131 tons, valued at £29,489; and there will probably be a still greater decline in 1920.

PETROLEUM.

Unfortunately petroleum has not yet been found in payable quantity in New Zealand, though several companies have carried on boring-work during the year. The Government has now under consideration a proposal for the development of our oil resources with the object of definitely proving whether they are of commercial value. The sum of £4,450 was paid in subsidies to oil-boring companies during the year.

KAURI-GUM.

The production of kauri-gum for 1919 was 4,128 tons, valued at £255,812, as compared with 2,419 tons, valued at £157,313, for 1918.

It is worthy of note that a company (Parenga Kauri Oils, Limited) having a capital of £200,000 has been formed to carry on the work of producing oil and gum from the large deposits of kauri peat. It is stated that the company has 6,500,000 cubic yards of peat on its properties, and that this will yield £1 worth of fine gum per yard. It is therefore probable that there will be a large production of kauri-gum from the swamps and peat-deposits hitherto not regarded as valuable.

CINNABAR.

The mining of cinnabar and production of quicksilver therefrom has been carried on by one company during the year, and 11,175 lb. of quicksilver was produced, worth £2,794. The Mines Department is assisting the company to further test the lode on its property by boring, and it is expected that this branch of the mining industry will show a considerable improvement in the near future.

PERSONS ENGAGED IN MINING.

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

Classification.	Inspection District.			Totals.		
	Northern.	West Coast.	Southern.	1919.	1918.	Decrease.
Gold, silver, and tungsten ore ..	1,153	589	443	2,185	2,566	381
Coal	939	1,891	1,114	3,944	3,994	50
Cinnabar and asbestos	14	2	..	16	16	..
Totals	2,106	2,482	1,557	6,145	6,576	431

The scarcity of coal-miners is severely felt on all the coalfields. Possibly with the recent considerable increase in wages some coal-miners who have given up that occupation, also some gold-miners, may go into the coal-pits. If this does not occur the scarcity of coal will continue, for at present there are quite a thousand coal-miners too few to efficiently man our existing collieries and to supply our requirements.

STONE-QUARRIES.

It is satisfactory to note that there has been a large increase in the output of stone-quarries during the year, and that this industry is now of great importance to the Dominion. Until the Stone-quarries Act is amended it is impossible to ascertain the value of stone produced, as the Act does not at present require owners of quarries to furnish returns.

PHOSPHATE ROCK.

The quantity of phosphate rock quarried during the year was 4,000 tons, as against 5,000 tons for 1918 and 5,050 for 1917. The total quantity produced by the Ewing Phosphate Company to the end of 1919 is 116,522 tons.

COAL-MINING.

The output of coal during 1919 amounted to 1,847,848 tons, as compared with 2,034,250 tons during 1918, being a decrease of 186,402 tons.

The following is a comparative statement of the coal and lignite raised during the years 1917, 1918, and 1919 :—

Inspection District.	Output for 1918.	Output for 1919.	Increase or Decrease, 1919.	Output for 1917.	Increase or Decrease between Years 1918 and 1917.
	Tons.	Tons.	Tons.	Tons.	Tons.
Northern	549,778	511,451	38,327†	470,638	79,140*
West Coast	997,089	845,826	151,263†	1,146,778	149,689†
Southern (Canterbury, Otago, and Southland)	487,383	490,571	3,188*	451,003	36,380*
Totals	2,034,250	1,847,848	186,402†	2,068,419	34,169†

* Increase. † Decrease.

The decrease in the coal-production was due to organized restriction of work by miners on the Grey, Buller, and Waikato coalfields. By such policy the output per person employed below ground declined from 703 tons during 1918 to 648 tons during 1919; and a coal-famine was produced by which railway traffic was

seriously curtailed, industries brought almost to a standstill, in addition to which severe hardship was suffered by many aged and infirm persons during an unusually severe winter.

The comparative tonnage of the various classes of coal raised for the years 1918 and 1919 is summarized as follows:

Class.	Output for 1919.	Output for 1918.	Decrease for 1919.
	Tons.	Tons.	Tons.
Bituminous and semi-bituminous ..	961,107	1,122,308	161,201
Brown coal	684,331	705,773	21,442
Lignite	202,410	206,169	3,759
Totals	1,847,848	2,034,250	186,402

During the year no new collieries commenced mining operations.

The quantity of coal imported into the Dominion was 391,434 tons, as against 255,332 tons during 1918 and 518,070 tons during 1914.

MINING AND QUARRY ACCIDENTS.

The deaths from accidents at coal-mines numbered ten, being 2·53 per thousand persons employed, or 5·41 per million tons of coal produced, which was slightly greater than during the previous year. For comparison it may be stated that the fatal-accident rate per million tons of coal produced in the United Kingdom for 1918 (the latest year for which statistics are available) was 5·86, which is 0·45 higher than in this Dominion during 1919. I have pleasure in stating, however, that since November last to this date there has not been any fatal colliery accident.

As time passes the inspection of our collieries becomes more searching, and it is believed more efficient, as the result of improved laws and experience.

The number of lives lost at metalliferous mines during 1919 was four, the proportion of deaths per thousand persons employed being 1·82, and of these three were lost by the capsizing of a boat being used in connection with the dismantling of a dredge. There was thus only one fatality actually arising directly from mining-work.

At stone-quarries which come under the provisions of the Act there was only one fatality during the year, or 0·71 deaths per thousand men employed. At quarries which do not come under the Act there were two fatalities, one due to a fall of ground and one due to careless handling of explosives. The inspection of mines and quarries continues to be effectively carried out, and the health and safety of workers are well looked after.

GEOLOGICAL SURVEY.

During the past year the staff of the Geological Survey has been augmented by the appointment of a Geologist, two Assistant Geologists, and a Field Assistant. With a view of expediting the work it has now been decided to still further increase the staff.

Since 1909 until this year the Geological Survey has never had more than two parties in the field at any one time, but during the latter part of the past season three field parties were employed, one in the Waikato district, one in the Whangarei district, and one in the Collingwood district. The area geographically surveyed comprised about 1,100 square miles.

SCHOOLS OF MINES.

The expenditure by the Department on the Schools of Mines at Coromandel, Thames, Karangahake, Waihi, and Huntly in the North Island, and Westport, Reefton, and Dunedin in the South Island, for the year ended 31st March, 1920, was £4,505.

SUBSIDIZED PROSPECTING.

During the year ended 31st March, 1920, thirty-eight approved prospecting-parties were granted subsidies amounting to a total of £3,554 6s. 8d., of which sum £1,520 1s. 4d. was expended during the period.

Under Part X of the Mining Act, which was amended last year so as to make more generous provision for the granting of loans to mining companies, several applications for loans have been received. One loan of £10,000 has been granted to a gold-mining company, and one of £5,000 to a coal-mining company; four applications have been declined as the conditions were not complied with, and others are under consideration.

GOVERNMENT PROSPECTING-DRILLS.

Extensive use has been made of the Department's diamond and Keystone drills, and the regulations relating to the hiring of these have been so improved that the use of such drills may be in greater demand in the future.

ROADS AND TRACKS.

The expenditure in the form of subsidies and direct grants upon roads on goldfields amounted to £13,096, as compared with £4,185 for 1918 and £6,911 for 1917.

WATER-RACES.

The Kumara and Mount Ida water-races have been maintained during the year at a cost of £4,056. Thirty-seven miners were supplied with water, and gold won to the value of £8,180. Cash received from sales of water amounted to £1,398.

STATE COLLIERIES.

The operations of the State coal-mines and State coal-depots for the year ended the 31st March, 1920, are briefly reviewed hereunder.

Output and Sales.

The gross output of the mines for the year was 156,228 tons, as compared with 214,919 tons for last year, a decrease of 58,691 tons. A comparative statement for the two years is shown below:—

Mine.	Output in Tons, 1919–20.		Output in Tons, 1918–19.	
	Gross.	Net.	Gross.	Net.
Point Elizabeth ..	35,816	33,553	86,535	82,052
Liverpool	120,412	115,650	128,384	125,229
Totals ..	156,228	149,203	214,919	207,281

Note.—The difference between the gross and net output is the allowance made for mine consumption and waste.

Point Elizabeth Colliery produced 33,553 tons of marketable coal, a decrease of 48,499 tons on the production of last year. After allowing for stocks on hand and afloat at the beginning and end of the year the disposal was as under:—

Supplied to	Screened.	Unscreened.	Small.	Totals.
	Tons.	Tons.	Tons.	Tons.
Depots	883	7,469	...	8,352
Railways	2,680	150	...	2,830
Other Government Departments	45	222	...	267
Other consumers	5,644	2,473	1,059	9,176
Shipping companies	...	13,977	74	14,051
Totals	9,252	24,291	1,133	34,676

Liverpool Colliery produced 115,650 tons of marketable coal, a decrease of 9,579 tons on the previous year's production. The disposal, allowing for stock on hand at beginning of year, was as follows :—

Supplied to	Screened.	Unscreened.	Small.	Totals.
	Tons.	Tons.	Tons.	Tons.
Depots	5,691	5,957	2,505	14,153
Railways	15,127	7,638	...	22,765
Other Government Departments	...	617	50	667
Shipping companies	52	3,840	13,626	17,518
Gas companies	404	30,550	17,791	48,745
Other consumers	2,106	8,768	452	11,326
Totals	23,380	57,370	34,424	115,174

The total sales for the year amounted to 149,850 tons, value £192,958, as compared with 202,755 tons, value £256,226, for last year, a decrease in quantity of 52,905 tons, and in value of £63,268.

For the purpose of easy comparison the figures are restated below in tabulated form :—

Comparative Statement of Sales.

Mine.	Total Sales, 1919–20.		Total Sales, 1918–19.	
	Quantity.	Value.	Quantity.	Value.
	Tons cwt. qr.	£ s. d.	Tons cwt. qr.	£ s. d.
Point Elizabeth ..	34,676 3 3	33,750 14 3	80,286 1 1	88,493 9 2
Liverpool	115,174 3 1	159,207 15 8	122,469 9 2	167,732 11 10
Totals ..	149,850 7 0	192,958 9 11	202,755 10 3	256,226 1 0

The average price per ton realized on the total sales for the year was £1 5s. 9·04d., an increase of 5·75d. on last year's average.

The sales of coal, &c., through the medium of the depots totalled 40,157 tons, value £80,083, as against 46,721 tons, value £85,200, for last year.

As will be seen, there was a decreased output of marketable coal from the Point Elizabeth and Liverpool Collieries, aggregating to 58,579 tons. This was mainly due to the operation of an organized "go-slow" policy by the miners from about the 1st September, 1919, to the 13th March, 1920, to the exhaustion of the Point Elizabeth Colliery, and also partly to the number of miners being slightly fewer than were employed during the preceding year. The diminished output by the hewers employed amounted to 13,104 tons, while their reduced earnings aggregated to £2,790.

The Point Elizabeth Colliery was finally closed on the 20th March last, having yielded since its inception a total gross output of 2,453,884 tons. The whole of the supplies now coming to hand are being won from the Liverpool Colliery, and further supplies will not be available until the new James Mine is opened.

There was a profit of £5,787 made on winning coal at the mines, and after deducting the losses sustained by the depots, amounting to £5,766, there remained a credit balance of £21 on the year's operations. Since the close of the last financial year and shortly before the termination thereof, increased hewing-rates, increased wages, increased freights, and increased cost of handling the coal until it reaches the consumers have from time to time been paid. In view of this it will be necessary to increase the selling-prices of coal, which have remained stationary since the 1st July, 1916; otherwise there will be a substantial loss to the faced at the end of the current financial year.

Before resigning his portfolio as Minister of Mines my predecessor, with a view of making the conditions of the employees of the State collieries more congenial, authorized substantial sums for improving the recreation-ground at Runanga, and for the laying-out and levelling of suitable grounds for a bowling-green and tennis-courts. Authority was also conveyed for the erection of a suitable building to enable the men after ceasing their day's work to enjoy a cup of tea.

NEW JAMES COLLIERY.

Development works have been carried out during the year, and the Public Works Department has for some time past been carrying out railway-formation works. If the construction of the railway is completed within eighteen months the Mines Department will then be in a position to win coal from this colliery.

MacDONALD STATE MINE.

Arrangements have been made to purchase the plant required for running this colliery. Roadworks have also been, and are still being, carried out to give access thereto. The railway-line has been finally located, and the Public Works Department will at the earliest possible date make a commencement with the construction works.

ITEMS FROM BALANCE-SHEET.

The following items taken from the balance-sheet will prove of interest as indicating the more important items of expenditure, and for reference in respect to the position of Capital Account, reserve funds, and other accounts shown therein :—

	£
The total amount paid as war bonus was	15,574
The amount written off for depreciation for the year was	11,472
The payments for interest totalled	8,933
The payments for sea carriage of coal amounted to	54,844
The cost of railway haulage amounted to	16,862
The total wages paid for coal-winning was	72,162
The amount paid for management and office salaries (Head Office and mines) totalled	3,588
The gross capital expenditure on the whole undertaking to 31st March last was	446,700
The total depreciation written off to date (equal to 51·78 per cent. on the gross capital expenditure) amounts to	231,340
The debenture and loan capital stands at	227,601
The sinking fund is in credit	13,200
The reserve fund stands at	5,884
The amount at credit of Profit and Loss is (last year £38,650)	38,670
The cash in hand and in the Public Account at 31st March last was (last year £119,843)	18,000
The present net book value of permanent or fixed assets is	209,106

TABLES AND REPORTS.

The usual statistical tables and departmental reports are appended.

TABLES TO ACCOMPANY THE MINES STATEMENT

No. 1.

TABLE SHOWING THE QUANTITY AND VALUE OF GOLD AND OTHER MINERALS EXPORTED DURING THE YEARS ENDED THE 31ST DECEMBER, 1918 AND 1919, AND THE TOTAL VALUE SINCE THE 1ST JANUARY, 1853. THE COAL-OUTPUT IS ALSO INCLUDED

Name of Metal or Mineral.	For Year ended the 31st December, 1919.		For Year ended the 31st December, 1918.		Total from the 1st January, 1853, to the 31st December, 1919.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Precious metals—	Oz.	£	Oz.	£	Oz.	£
Gold	320,210	1,334,405	11,987	42,391	22,378,532	88,128,359
Silver	453,567	103,037	879,383	171,456	22,247,479	2,561,285
Total gold and silver	773,777	1,437,442	891,370	213,847	44,626,011	90,689,644
Mineral produce, including kauri-gum—	Tons.	£	Tons.	£	Tons.	£
Copper-ore	..	12	..	6	1,504	19,390
Chrome-ore	..	..	..	..	5,869	38,002
Antimony-ore	..	..	13	104	3,781	55,045
Manganese-ore	..	..	..	..	19,364	61,905
Hæmatite ore	..	..	..	..	77	469
Tungsten-ore	130 9/10	29,489	169 13/20	37,922	2,294 11/20	297,933
Quicksilver	8 6/10	4,619	4 1/2	2,122	13 1/10	6,741
Sulphur (crude)	..	..	..	..	4,927	13,241
Mixed minerals*	1,089 14/20	4,039	2,286 3/4	5,772	57,049 9/20	241,367
Coal (New Zealand) exported	138,174	201,383	182,603	227,228	5,033,017	4,858,053
Coke exported	45	113	70	146	16,798	25,625
Coal, output of mines in Dominion (less exports)	1,709,674	2,491,780	1,851,647	2,303,449	45,007,671	25,426,593
Oil-shale	..	..	..	..	14,444	7,236
Kauri-gum	4,128	255,812	2,419	157,313	360,420	18,581,064
Total quantity and value of minerals	1,853,250 4/20	2,987,247	2,039,212 18/20	2,734,062	50,527,229 1/10	49,632,664
Value of gold and silver, as above	..	1,437,442	..	213,847	..	90,689,644
Total value of minerals produced, including gold and silver	..	4,424,689	..	2,947,909	..	140,322,308

* Including lime, 193 tons; pumice-sand, 1,037 tons; building-stone, 33 tons; also dressed marble and pumice-stone of weight unspecified by the Customs Department.

No. 2.

TABLE SHOWING THE QUANTITY AND VALUE OF GOLD EXPORTED FROM NEW ZEALAND FOR THE YEARS ENDED THE 31ST DECEMBER, 1917, 1918, AND 1919, AND THE TOTAL QUANTITY AND VALUE FROM 1857 TO THE 31ST DECEMBER, 1919.

District and County or Borough.	Year ending 31st December, 1917.		Year ending 31st December, 1918.		Year ending 31st December, 1919.		Total Quantity and Value from January, 1857, to 31st December, 1919.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.		
	Oz.	£	Oz.	£	Oz.	£	Oz.	£
AUCKLAND—								
County of Coromandel ..	1,206	5,112	..	..	283	1,195		
County of Thames ..	2,542	10,717	28	112	3,651	15,347		
County of Ohinemuri ..	38,234	161,853	568	1,987	53,742	227,124		
County of Piako	49	194	..	..	50	214		
Borough of Thames ..	1,689	6,154	479	1,516	873	3,552		
Great Barrier Island ..	..	..	..	..	..	..		
Borough of Waihi ..	90,517	383,208	189	725	187,507	792,005		
	134,237	567,238	1,264	4,340	246,106	1,039,437	6,724,619	25,927,954
WELLINGTON	..	..	..	..	..	..	188	706
MARLBOROUGH—								
County of Marlborough ..	1,159	4,473	..	..	2,194	8,437	102,654	399,586
NELSON—								
County of Waimea ..	1,161	4,645	..	..	8	32		
County of Collingwood ..	64	257	..	..	143	577		
County of Takaka ..	4	16	..	..	3	12		
County of Murchison ..	1,192	4,775	..	..	2,559	10,390		
	2,421	9,693	..	..	2,713	11,011	1,739,102	6,895,408
WEST COAST—								
County of Buller	1,681	6,111	..	..	993	3,890		
County of Inangahua ..	45,776	178,132	3,707	9,474	36,123	139,647		
County of Grey	1,840	7,391	..	..	542	2,200		
County of Westland ..	4,551	18,634	..	..	3,371	13,676		
Hokitika Borough.. ..	483	1,935	..	..	..	..		
Ross Borough	1,892	7,757	..	..	503	2,010		
	56,223	219,960	3,707	9,474	41,532	161,423	6,189,509	24,566,234
CANTERBURY—								
County of Selwyn	2	9	..	..	..	..	118	467
OTAGO—								
County of Taieri	88	373	41	170	43	166		
County of Tuapeka ..	2,789	11,625	1,035	4,222	4,056	16,635		
County of Vincent ..	8,753	36,038	2,205	8,926	9,610	39,518		
County of Maniototo ..	1,305	5,478	497	2,029	1,754	7,184		
County of Waihemo ..	221	878	..	..	27	103		
County of Waitaki ..	72	300	141	582	425	1,783		
County of Bruce	278	1,166	..	..	20	110		
County of Lake	1,820	7,556	396	1,586	703	2,847		
County of Wallace ..	1,215	5,538	117	489	2,922	12,265		
County of Fiord	..	..	..	..	3	12		
County of Southland ..	7,705	32,242	2,205	9,005	7,821	32,375		
County of Clutha	1	2	..	..	..	..		
	24,247	101,196	6,637	27,009	27,384	112,998	7,617,534	30,319,791
Unknown	335	1,319	379	1,568	281	1,099	4,808	18,213
Totals	218,624	903,888	11,987	42,391	320,210	1,334,405	22,378,532	88,128,359

No. 3.

GOLD PRODUCED, 1857 TO 1919.

TABLE SHOWING THE TOTAL QUANTITY AND VALUE OF GOLD EXPORTED FROM THE 1ST JANUARY, 1857, TO THE 31ST DECEMBER, 1919. (This Return shows the Output exported from 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.	
	Oz.	Value.	Oz.	Value.	Oz.	Value.	Oz.	Value.
		£		£		£		£
Prior to 1914 ..	5,823,841	22,203,539	310,983	1,229,258	92,330	359,612	7,259,953	28,841,373
1914.. ..	115,814	455,877	895	3,581	930	3,611	61,393	236,776
1915.. ..	214,772	863,556	497	2,010	3,568	13,864	121,082	479,965
1916.. ..	188,585	793,967	2,174	8,698	2,319	9,012	65,192	248,997
1917.. ..	134,237	567,238	2,421	9,693	1,159	4,473	56,223	219,960
1918.. ..	1,264	4,340	..	..	..	..	3,707	9,474
1919.. ..	246,106	1,039,437	2,713	11,011	2,194	8,437	41,532	161,423
Totals ..	6,724,619	25,927,954	319,683	1,264,251	102,500	399,009	7,609,082	30,197,968

Year.	Otago.		Wellington.		Canterbury.		Grand Totals.	
	Oz.	Value.	Oz.	Value.	Oz	Value.	Oz.	Value.
		£		£		£		£
Prior to 1914 ..	7,396,809	29,423,234	273	1,044	123	483	20,884,312	82,058,543
1914	48,922	195,522	..	..	..	..	227,954	895,367
1915	82,893	335,106	..	..	13	52	422,825	1,694,553
1916	34,346	138,519	..	..	4	19	292,620	1,199,212
1917	24,582	102,515	..	..	2	9	218,624	903,888
1918	7,016	28,577	..	..	..	..	11,987	42,391
1919	27,665	114,097	..	..	..	..	320,210	1,334,405
Totals ..	7,622,233	30,337,570	273	1,044	142	563	22,378,532	88,128,359

No. 4.

TABLE SHOWING THE OUTPUT OF COAL FROM THE VARIOUS COALFIELDS, AND THE COMPARATIVE INCREASE AND DECREASE, FOR THE YEARS 1918 AND 1919, TOGETHER WITH THE TOTAL APPROXIMATE QUANTITY OF COAL PRODUCED SINCE THE MINES WERE OPENED.

Name of Coalfield.	Output.		Increase.	Decrease.	Approximate Total Output up to 31st December, 1919.
	1919.	1918.			
	Tons.	Tons.	Tons.	Tons.	Tons.
North Auckland	115,390	125,349	..	9,959	3,854,693
Waikato (including Mokau) ..	396,061	424,429	..	28,368	5,750,473
Nelson	12,037	13,954	..	1,917	354,278
Buller	506,314	580,796	..	74,482	16,140,364
Inangahua	20,006	16,237	3,769	..	315,518
Grey	307,469	386,102	..	78,633	9,864,242
Canterbury	36,004	20,475	15,529	..	793,139
Otago	285,040	316,449	..	31,409	9,728,932
Southland	169,527	150,459	19,068	..	3,239,049
Totals	1,847,848	2,034,250	..	186,402	50,040,688

No. 5.

TABLE SHOWING THE OUTPUT OF DIFFERENT CLASSES OF COAL.

Class of Coal.	Output.		Increase.	Decrease.	Approximate Total Output to the 31st December, 1919.
	1919.	1918.			
	Tons.	Tons.	Tons.	Tons.	Tons.
Bituminous and semi-bituminous	961,107	1,122,308	..	161,201	32,132,112
Brown	684,331	705,773	..	21,442	15,164,488
Lignite	202,410	206,169	..	3,759	2,744,088
Totals	1,847,848	2,034,250	..	186,402	50,040,688

No. 6.

TABLE SHOWING THE INCREASE OR DECREASE IN THE ANNUAL PRODUCTION OF COAL AND OIL-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 below 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
1916	2,257,135	*Inc.* 48,511	293,956	..	59,515
1917	2,068,419	*Dec* 188,716	291,597	..	2,359
1918	2,034,250	„ 34,169	255,332	..	36,265
1919	1,847,848	„ 186,402	391,434	136,102	..

No. 7.

TABLE SHOWING THE TOTAL QUANTITY AND VALUE OF COAL IMPORTED INTO AND EXPORTED FROM NEW ZEALAND FROM AND TO EACH COUNTRY DURING THE YEAR ENDED 31ST DECEMBER, 1919.

Country.	Imports.*		Exports.†	
	Quantity.	Value.	Quantity.	Value.
	Tons.	£	Tons.	£
United Kingdom	155	341	85,299	137,341
Canada, via west coast	..	..	5,947	10,703
Australia	351,005	325,739	26,496	32,595
Fiji	..	..	6,109	7,939
Gilbert and Ellice Islands	..	..	300	600
Italy	..	..	54	100
Chile	..	..	247	401
United States of America, via east coast ..	40,257	55,881	12,486	17,361
United States of America, via west coast ..	15	50		
Western Samoa	..	..	555	899
Guam	..	..	3,125	3,302
Society Islands	2	5	7,094	11,764
Tonga	..	..	678	1,108
Tuamohi Archipelago	..	..	1,903	3,455
Totals	391,434	382,016	150,293	227,568

* Countries whence imported. † All coal included, bunkers and cargo, and coal mined in other countries as well as in New Zealand.

Exports of Coal not New Zealand produce = 12,119 tons, £26,185.

No. 8.

NUMBER OF PERSONS ORDINARILY EMPLOYED AT OR ABOUT MINES OTHER THAN COAL-MINES DURING THE YEAR ENDED 31ST DECEMBER, 1919.

County or Borough.	Number of Persons ordinarily employed at				Total.	
	Gold-quartz Mines.	Gold Alluvial Mines.	Gold-dredges.	Mines other than Gold and Coal.	1919.	1918.
NORTHERN INSPECTION DISTRICT.						
County and Borough of Thames ..	59	..	..	..	59	74
County of Ohinemuri	147	..	..	..	147	254
,, Coromandel	25	..	..	..	25	17
,, Piako	6	..	..	..	6	4
Borough of Waihi	866	..	..	..	866	887
Tauranga district	50	..	..	..	50	25
Puhipuhi district	..	..	..	14	14	13
Great Barrier Island	..	..	..	..	..	3
WEST COAST INSPECTION DISTRICT.						
County of Marlborough	36	6	..	..	42	68
,, Waimea	7	..	..	..	7	22
,, Collingwood	..	1	..	2	3	..
,, Murchison	..	14	..	..	14	23
,, Buller	12	26	..	..	38	29
,, Inangahua	321	7	2	..	330	403
,, Grey	5	35	2	..	42	65
,, Westland	16	72	27	..	115	139
Borough of Ross	..	..	..	..	..	14
SOUTHERN INSPECTION DISTRICT.						
County of Taieri	..	..	..	2	2	14
,, Tuapeka	..	84	..	1	85	92
,, Vincent	11	31	71	..	113	125
,, Maniototo	..	44	7	..	51	50
,, Waihemo	8	..	..	15	23	54
,, Waitaki	..	13	..	..	13	15
,, Lake	4	17	..	24	45	80
,, Wallace	..	28	..	..	28	32
,, Bruce	..	1	..	..	1	..
,, Southland	..	53	29	..	82	80
Stewart Island	..	..	..	..	..	..
Totals	1,573	432	138	58	2,201	2,582

Summary of Persons ordinarily employed in or about New Zealand Mines during 1919 and 1918.

	1919.	1918.	Increase or Decrease.
Gold, silver, and gold-scheelite mines	2,143	2,458	*Dec.* 315
Other metalliferous mines, including those worked for scheelite alone	58	124	,, 66
Coal-mines	3,944	3,994	,, 50
Totals	6,145	6,576	*Dec.* 431

APPENDICES TO THE MINES STATEMENT.

APPENDIX A.

REPORTS RELATING TO METALLIFEROUS MINES AND STONE-QUARRIES.

The Inspecting Engineer of Metalliferous Mines to the Under-Secretary of Mines.

Sir,— Wellington, 1st June, 1920.

I have the honour to present the annual report on metalliferous mines and stone-quarries, together with annexures and statistical information, for the year ended 31st December, 1919.

In accordance with the usual practice, the tables showing expenditure on roads, bridges, tracks, prospecting operations, &c., are for the period covered by the financial year—viz., from the 1st April, 1919, to the 31st March, 1920.

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

I. Minerals entered for Exportation.

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.
- (1.) Quarry Inspection and Statistics.
- (2.) Accidents.

VII. State Aid to Mining.
- (1.) Subsidized Prospecting.
- (2.) Government Prospecting-drills.
- (3.) Subsidized Roads on Goldfields.
- (4.) Government Water-races.

VIII. Schools of Mines.

Annexures:—
- (A.) Summary of Reports by Inspectors of Mines.
- (B.) Summary of Reports by Water-race Managers.
- (C.) Summary of Report by the Inspector of Stone-quarries for the North Island.
- (D.) Mining Statistics.

I. MINERALS ENTERED FOR EXPORTATION.

The following statement shows the value of minerals entered for exportation from metal-mines, quarries, and kauri-gum fields from the 1st January, 1853 to the 31st December, 1919 :—

Classification.	1918.	1919.	Increase or Decrease.	Total from the 1st January, 1853, to the 31st December, 1919.
	£	£	£	£
Gold	782,650*	923,095	Inc. 140,445	88,457,308*
Silver	171,456	103,037	Dec. 68,419	2,561,285
Quicksilver	2,122	4,619	Inc. 2,497	6,741
Tungsten-ore	37,922	29,489	Dec. 8,433	297,933
Other minerals	5,882	4,039	" 1,843	429,407
Kauri-gum...	157,313	255,812	Inc. 98,499	18,581,064

* Entered for export, but not all exported.

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, 1919.
	Northern.	West Coast.	Southern.	
Gold, silver, and tungsten	1,153	589	443	2,185
Cinnabar	14	...	...	14
Asbestos	...	2	...	2
Totals for 1919	1,167	591	443	2,201
Totals for 1918	1,277	763	542	2,582

III. ACCIDENTS.

The following is a summary of persons killed or seriously injured in metalliferous mines during 1919 :—

Inspection District.	Explosives.		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	...	...	...	...	...	...	...	...	...	2
West Coast	...	...	...	...	1	...	...	...	...	...	3	...	4	...
Southern	...	...	...	...	...	...	...	...	...	2	...	...	...	2
Totals	...	...	...	2	1	...	...	...	...	2	3	...	4	4

The proportion of fatalities per 1,000 persons employed is 1·82, but of the four fatalities included really only one occurred in or about a metal-mine. The accidental upturning of a boat belonging to a gold-dredge which was being dismantled accounted for three lives, and as dredging operations are controlled by the Mining Act these fatalities have been included among mining accidents.

The following is a description of fatal accidents reported under the Mining Act during 1919 :—

Date.	Name and Situation of Mine or Operations.	Name, Age, and Occupation of Person killed.	Description of Accident, and Remarks.
1919.			
23 April	Westland Prospecting Syndicate's dredge, Ahaura River	John Brosnahan (39), dredge hand William Crysell (50), dredge hand Thomas Reynolds (43), dredge hand	This dredge had suspended gold-dredging operations at Ahaura River, and had recently been acquired by the Westland Prospecting Syndicate for its property on the Arahura River. On this date the new owners were engaged shifting the dredge down-stream to a more convenient site for dismantling purposes. After lunch three of the dredge hands appear to have got into one of the boats, probably to return a coil of wire rope which was known to be there. The river was in flood at the time, and by some means the boat was overturned. No one saw how the accident actually happened, but it was probably caused by a submerged log coming down the flooded river and striking the boat. A cry was heard by those on the dredge, and they saw the men struggling in the water. The second boat was got out, but the unfortunate men disappeared before they could be reached. John Brosnahan's body was recovered a week later, and an inquest held, at which a verdict was returned that "The deceased met his death by drowning through the capsizing of a boat, but there was no evidence to show how the boat was capsized." The bodies of Crysell and Reynolds were recovered one month and nine months later respectively, and at formal inquiries held verdicts were returned in accordance with the inquest on Brosnahan.
14 Dec.	Dominion Consolidated Mining and Development Company, Wakamarina	Leonard S. Humphries (46), mine contractor	Humphries and his mate on the early part of the shift were engaged cleaning down the face of a rise from a stope above an adit level. Afterwards they went outside and commenced working a hole through from the surface, as the rise was expected to break through at this point. Humphries left his mate working and returned to the rise, probably to knock to him from below. Two hours or so later his mate found the deceased's body half-way down the rise, with his head caught behind a lath on the footwall. At the inquest held a verdict was returned that deceased met his death at Wakamarina through having his neck broken. At a subsequent inquiry held at Blenheim on the 23rd February, 1920, upon the application of the Inspector of Mines (under section 266 of the Mining Act, 1908) the Board found that the mine-manager had not caused the rise to be timbered securely as required by the Mining Act, and that his negligence in that respect was the cause of the fatality. His certificate was suspended for three months, and on proceedings being taken against him under section 254, subsection (11), he was fined £5.

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, 1919.* (All Mines.)	Dividends paid, 1919. (By Registered Companies only.)	Number of Persons ordinarily employed.	Number of Productive Quartz-mines, Alluvial Mines, and Dredges, 1919.
	£	£		
Quartz-mining	574,021	118,831	1,423	37
Dredge mining†	47,838	2,845	138	19
Alluvial mining‡ ...	80,273	2,068	432	131
Totals, 1919 ...	702,132	123,744	1,993	187

* 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 nineteen dredges, but the dividends given are only from four 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 131 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 1919, 1918, and 1917 :—

Inspection District.	Statute Tons of Ore treated.			Value of Bullion.			Dividends paid (by Registered Companies only).		
	1919.	1918.	1917.	1919.	1918.	1917.	1919.	1918.	1917.
				£	£	£	£	£	£
Northern	226,614	259,103	298,396	475,999	615,064	751,974	116,431	178,369	195,619
West Coast	58,937	86,495	105,589	97,712	127,846	158,007	2,400	15,150	7,450
Southern	506	1,690	5,381	310	821	1,818	..	..	..
Totals ..	286,057	347,288	409,316	574,021	743,731	911,799	118,831	193,519	203,069

The average value per ton of ore treated during 1919 amounted to £2 0s. 1d.

The following is a statement of the production, dividends declared, and the number of persons employed by the principal gold-quartz mining companies during 1919 :—

Name of Company.	During 1919.			Dividends paid.		Number of Persons ordinarily employed during 1919.
	Quantity of Quartz treated.	Value of Bullion.	Average Value per Ton.	1919.	Total to End of December, 1919.	
	Statute Tons.	£	£ s. d.	£	£	
Northern District—						
Waihi Gold-mining Company (Limited)	160,511	303,586	1 17 9	99,181	5,338,057	578
Waihi Grand Junction Gold-mining Company (Limited) ..	55,442	97,899	1 15 3	..	267,064	285
Talisman Consolidated (Limited)	3,655	46,598*	12 15 0	17,250	1,150,972	89
Muir's Gold Reefs (Limited)	4,100	17,703	4 6 4	..	..	50
West Coast District—						
Blackwater Mines (Limited)	24,969	46,136	1 16 11	..	174,994	113
New Big River Gold-mining Company (Limited) ..	4,254	13,198	3 2 6	2,400	103,200	37
Progress Mines of New Zealand (Limited)	15,980	20,748	1 6 0	..	326,562	70
Murray Creek Gold-mining Company	4,512	9,975	2 4 3	..	..	40
Other quartz-mines throughout New Zealand	12,634	18,178	1 8 9	..	21,727	161
Totals	286,057	574,021	2 0 1	118,831	7,382,576	1,423

* The final return on ceasing milling operations is included in this total.

The following is a brief summary of the operations at the principal mines during the year; more detailed references are contained in the reports of the Inspectors of Mines appearing in Annexure A accompanying this report.

Northern Inspection District.

Waihi Gold-mining Company (Limited).—There has been no development carried out at the low level (No. 12) since March, 1917, but late in the year it was unwatered, and driving east on the Dreadnought lode has just been resumed. At No. 11 level a large chamber (120 ft. by 20 ft. by 14 ft. high) has been cut out, in which is to be installed the powerful electric turbine pumps expected to arrive this year from England. The directors' annual report states that the long-deferred delivery of these pumps and the shortage of labour and coal has accounted for the delay in unwatering the low level to resume driving. The ore reserves have been further drawn upon during the year, and are now estimated at about 1,000,000 tons of a grade lower by 5s. 6d. per ton than the estimate of the preceding year. During the present year, owing to the increased price of supplies and higher wages of employees, the cost of production will be raised by 5s. per ton, so that a large quantity of ore previously considered payable at pre-war prices for gold and silver is now unpayable. Whilst greatly increased prices for gold and silver compensated the higher costs at the mine, any reduction of these prices during the present year would seriously affect the company's operations.

Early in the year the fine hydro-electric power station at Horahora was purchased by the Government, but the company retained the right of an annual supply of 2,500 kilowatts at an agreed price per unit.

Waihi Grand Junction Gold-mining Company (Limited).—Until the low level of the Waihi Mine had been unwatered very little development could be undertaken below No. 8 level, with the result that the ore reserves on the Empire and Royal lodes had been greatly diminished. During the year the two companies met in conference and an arrangement for the next three

years was arrived at, under which the Grand Junction undertakes to pay an increased proportion of the pumping-expenses. Several winzes have been commenced on these two lodes, and the main shaft is down 90 ft. below No. 8 level, so that the opening-up of another level is well in hand.

An important discovery was made by this company on extending No. 5 level on the Mary lode north into the property recently acquired from the Waihi Extended. The lode matter changed from low-grade quartz with bunches of mineral to a regular mineralized ore-body about 3 ft. wide containing payable values. This improvement of the lode has been followed for 400 ft. at No. 5 level, and has been found to extend up to No. 3 level. Work is now in progress to test the reef at No. 6 level. The extension of these drives still farther north on the Mary lode—which probably corresponds to the north footwall branch of the Martha lode in the Waihi Mine—will be interesting, as they will be penetrating a class of andesite which on the surface is favourable, and an area upon which no great amount of prospecting has as yet been attempted.

Talisman Consolidated (Limited).—This company allowed the water to rise at No. 16 level and have confined their attention to the extension south of No. 15 level. Apart from a short length of payable values extending over 50 ft. nothing favourable was encountered, and driving was suspended when broken and soft country was entered in the Dubbo section of the mine. A rise was started where the improvement had taken place in the reef, and this disclosed values going up for 80 ft. Immediately under this rise No. 16 winze was commenced, and this showed that the reef maintained its width and carried high-grade mineralized ore for some considerable distance, but at its present depth (166 ft.) it is narrow and unpayable. The extent and value of this development, some 400 ft. south of the abandoned face of No. 16 level, cannot very well be estimated until driving north and south from the bottom of the winze is in progress. Diamond drilling operations in the neighbourhood of Nos. 6 and 12 winzes at No. 15 level are in progress. As the ore reserves had become exhausted, milling operations were suspended last October, and will not be again commenced unless the development work undertaken by the company justifies resumption.

Muir's Gold Reefs.—This company, which commenced milling operations during April, treated 4,100 tons of quartz for a return of bullion valued at £17,703. Apart from the quartz won from development this ore was drawn from the stopes above the upper level. The upper and lower levels, which are 200 ft. apart, are connected by a main rise, and from this an intermediate has been commenced. This intermediate has recently been connected to the surface, and two rises have been started to cut the ore-body above the low level into stoping-blocks. A well-defined reef opening out to about 8 ft. wide has been followed for over 400 ft. at the low level, and there is every appearance of this size being maintained on the farther extension south of the present face. The company was unfortunate in having a portion of its small milling and treatment plant destroyed by fire last January. The erection of a 20-stamp battery and four tube mills is now proceeding, and alterations and additions to the existing cyanide plant are contemplated.

West Coast Inspection District.

Higher prices for supplies, increased wages, and shortage of suitable labour has already seriously affected mining operations in this district. To some small extent the increased costs have been compensated by a slightly higher price for the gold won during the last few months. A return to the former price, with the present conditions prevailing, will necessarily lead to a further reduction in the number of producing mines.

Blackwater Mines.—This company has carried the main shaft down some 300 ft. below No. 8 level and is preparing to open out at Nos. 9 and 10 levels. The discovery of a payable shoot of ore in the southern section of the reef was recorded last year, and subsequent driving to the south at Nos. 6, 7, and 8 levels has added a considerable tonnage to the ore reserves. The ore won from the last three levels on the original pay-shoot in this mine, which has a decided pitch to the northern boundary, has fallen off both in quantity and grade. This change in the reef-contents has possibly arisen from the intersection of known fault fissures at this horizon, and may reasonably be expected to be only a local disturbance.

Blackwater Mines North.—This company has recently been formed to take over the interests of the North Blackwater Development Syndicate. Arrangements are now proceeding to obtain the necessary capital to further develop the mine and erect a crushing and treatment plant. No work was carried out underground during the year.

New Big River Gold-mining Company.—This company treated a slightly reduced tonnage during the year, and the grade of ore declined 5s. 6d. per ton. Owing to shortage of labour stoping operations were curtailed and very little development attempted.

Murray Creek Gold-mining Company.—The mine was closed down during the latter part of the year, but recently underground development was resumed with a reduced staff. The company's operations are now confined to sinking two winzes below the stoping-block at No. 4 level in the southern section of the mine. At this level the reef was small and not well defined, so that the present work was necessary to disclose the vertical extent of this disturbance.

Southern Inspection District.

In Otago and Southland gold-quartz mining operations were unimportant.

(2.) Dredge Mining.

On the west coast of the South Island four dredges produced gold, but of these only two were in active commission throughout the year. At Kumara the dredge owned by the Kapitea Goldfields (Limited) treated 400,000 cubic yards of material, averaging 2½d. per cubic yard, and showed a slight profit. The Chambers Reward dredge, formerly known as Worksop No. 2, which started work in April treated 202,000 cubic yards, averaging 3½d. per cubic yard. Owing

to the heavy nature of the wash necessitating alteration to the plant, and to the loss of time in removing buried timber, the returns so far from this dredge have not been payable. At the present time one of the Government Keystone drills is employed drilling immediately in front of the dredge, with a view of confining operations to that portion of the Arahura Valley in which the gold contents are highest.

The further testing of the Rimu Flat by Keystone drilling was completed by the late A. E. Gregory early in the year, and a company with headquarters in New York has now purchased the property from the Rimu Options and Rimu No. 1 Dredging Companies. Mr. R. E. Cranston has been appointed engineer, and a dredge of the Californian type—more powerful than anything ever before seen in the Dominion—is being built to work the claim. Particulars of this dredge are as follows:—Pontoons: Length, 116 ft.; width, 50 ft.; depth, 11 ft.; freeboard, 3 ft.; draught, 8 ft. Shafting: Upper tumbler shaft, 21 in. diameter; lower tumbler shaft, 14 in. in diameter; main-drive pulley shaft, 6¼ in. in diameter. Buckets: There will be seventy-three buckets in the digging-line. These buckets are each one solid manganese-steel casting with a replaceable lip. They are 10 cubic feet capacity, and have a pitch of 36 in. The speed of the bucket-line will be about twenty buckets per minute. The bucket-pins are 6 in. in diameter. Horse-power: The horse-power of the dredge is 550, and power is supplied from a hydro-electric plant. Capacity: It is estimated that in the ground to be worked the dredge will handle a maximum of 200,000 cubic yards per month. Gold-saving tables: There is an area of 4,400 square feet of gold-saving tables on the dredge.

This is a most important event in the history of New Zealand mining, for, although the dredging industry was born here and was very successful in its early years, it has not kept pace, as regards the machinery used, with the developments in other countries. It will now be proved whether these developments applied here will lead to a revival of the industry. It is important also in that it is the first time a strong American company has acquired a mining property in New Zealand, and because the company is prepared to finance much more extensive undertakings if this one is profitable.

In Otago and Southland fifteen dredges were in commission, producing gold valued at £39,501, or an average of £2,633 per dredge. Compared with last year, when twenty-one dredges produced £63,698, or an average of £3,033, there is a marked shrinkage in the output of this class of mining.

The following is a statement showing the capacity, production, and profits of bucket gold-dredges during 1919. (NOTE.—The profits made by privately owned dredges are not obtainable for publication.)

Name of Dredge.	Locality.	Capacity of Dredge-buckets, in Cubic Feet.	Number of Buckets discharged per Minute.	Nominal Horse-power of Engines.	S = Steam. H = Hydraulic. E = Electrical. SG = Suction Gas.	Average Depth of Ground dredged.	Value of Bullion obtained during 1919.	Dividends declared.	
								During 1919.	Total.
Otago and Southland.						Ft.	£	£	£
Rise and Shine No. 1	Cromwell	5½	10	20	S	40	4,210	} ..	53,100
Rise and Shine No. 2	,,	5½	10	20	S	40	1,176		
Rising Sun	,,	7	10	25	S	45	4,650	..	24,000
Ferry (private)	,,	4½	11½	16	S	40	2,538	..	..
Electric No. 1	,,	5	10	16	S	35	2,835	..	..
Earnscleugh No. 3	Alexandra	7	12	150	E	50	5,053	} ..	30,250
Earnscleugh No. 5	,,	6	13	150	E	35	456		
Ngapara	,,	5	10½	16	S	30	735	225	5,175
Lower Nevis	Nevis	4	11	12	S	10	792	..	2,970
Nevis Crossing (private)	,,	3½	10	12	S	10	1,738	..	..
Otakau	Kyeburn	4½	12	70*	SG	16	2,630	300	3,225
Lady Florence (private)	Waikaka Valley	4½	11	12	S	16	1,603	..	..
McGeorge's Freehold No. 2 (private)	,,	6½	9	16	S	14	1,380	..	..
McGeorge's Freehold No. 3 (private)	,,	6½	9	20	S	35	3,705	..	..
Kura (private)	Waikaia	3½	9	16	S	30	6,000	1,820	6,347
West Coast.									
Kapitea	Kumara	5	10	16	S	20	4,355	500	2,000
Chambers Reward	Arahura Valley	8	15	20	S	15	3,465	..	..
Pactolus	Nelson Creek	..	..	..	S	..	215	..	..
Hessey, Cameron, and Tacon	Capleston	7	11	20	S	30	301	..	6,480
Totals, 1919	..	..	..	..	..	..	47,838	2,845	Unknown
Totals, 1918	..	..	..	..	..	..	63,691	4,925	,,
Totals, 1917	..	..	..	..	..	..	91,666	4,800	,,

* Brake horse-power.

(3.) Alluvial Mining.

There were 432 men employed on 131 alluvial claims during the year. The total output was valued at £80,273, which is slightly in excess of that of the preceding year. A large number of these claims are worked by their owners, and the returns from this class of mining show that on an average each man won gold to the value of £3 10s. per week. Messrs. Morgan Bros.' claim at Cambrian, Otago, worked by three men, furnished the highest output for the year—viz., 1,655 oz., valued at £6,620.

The position of working operations at the various alluvial mines is commented upon by the District Inspectors of Mines in Annexure A accompanying this report.

The following is a table showing the value of production of alluvial gold-mines and the dividends paid by the principal companies during 1919 :—

Name of Company.	Value of Gold produced.	Dividends declared.	
		During 1919.	Total to end of 1919.
Otago and Southland.	£	£	£
United M. & E. Water-race Company ..	1,041	228	3,534
Gabriel's Gully Sluicing Company	4,661	1,840	14,295
Eighty-two other claims	53,497	*	*
Nelson and Westland.			
Forty-seven claims	21,074	*	*
Totals, 1919	80,273	2,068	*
Totals, 1918	78,895	4,953	*
Totals, 1917	89,941	5,710	*

* The profits from these claims, which are mostly privately owned, are unobtainable.

V. MINERALS OTHER THAN GOLD.

Tungsten-ore.

The quantity of tungsten-ore exported during the year amounted to 131 tons, valued at £29,489, as compared with 169½ tons, valued at £37,922, in 1919. The following statement shows the quantity and value of ore exported :—

Year.	Quantity.	Value.	Year.	Quantity.	Value.
	Tons.	£		Tons.	£
1899	32	2,788	1911	138	11,853
1900	54	2,635	1912	135	13,347
1901	2	83	1913	221	22,933
1902	39	1,200	1914	204	21,498
1903	42	1,439	1915	194	27,784
1904	17	791	1916	266	49,070
1905	28	1,848	1917	161	28,972
1906	55	3,407	1918	169½	37,922
1907	137	15,486	1919	131	29,489
1908	68	6,055			
1909	58	4,263			
1910	143	15,070	Totals ..	2,294½	297,933

The quantity of tungsten concentrate obtained during the year was 122⅘ tons, as compared with 143$\frac{8}{10}$ tons for the previous year and 199½ tons during 1917

During the war period the Imperial Government bought the whole of the output of tungsten-ore in the Empire, and the price eventually rose to £3 8s. per unit, on a basis of 65 per cent. WO_3. After the Armistice the demand for this ore ceased, and stocks began to accumulate to such an extent that further supplies after the 30th April were refused. Owners of producing mines, and even of claims which had not yet reached the productive stage, were subsequently adequately compensated for any loss they might have been put to by the termination of their contract at an earlier date than was anticipated.

As the price of tungsten-ore has now fallen to £1 10s. per unit production during the latter part of the year has been curtailed, and until a more favourable market offers there is little likelihood of any great activity in the development of scheelite deposits unless warranted by their gold contents.

The following is a table showing the quantity of quartz crushed and scheelite concentrates obtained for the year ended 31st December, 1919:—

Name of Mine or Company.	Locality.	Quartz crushed.	Scheelite Concentrates obtained.	Value.
Marlborough—		Tons.	Tons. cwt. qr. lb.	£
Dominion Consolidated Company	Wakamarina	8,443	21 0 1 0	*
J. M. Cadigan	,, ...	Concentrates	11 0 0 0	†750 0 0
Otago and Southland—				
Glenorchy Scheelite Company, and eight parties of miners	Glenorchy, Lake County	271	65 4 0 22	15,146 14 7
J. R. Tripp	,, ,,	..	2 9 0 21	572 8 8
C. E. G. Paulin	,, ,,	20	3 6 3 16	740 7 1
Sutherland and Hood ..	,, ,,	..	1 3 2 14	278 15 5
Black and McPherson ..	,, ,,	6	2 12 2 18	563 14 8
Grant and Sinclair	,, ,,	..	0 7 0 26	86 19 4
J. J. Hall	,, ,,	..	0 5 2 15	64 6 8
Callery and Donoghue ..	Macrae's, Waihemo County	20	5 4 1 15	1,222 2 3
E. Gaytan	,, ,,	5	0 19 2 18	241 15 10
Gaytan and Innes	,, ,,	30	2 1 3 20	505 3 0
Deep Dell Mining Company ..	,, ,,	4¾	0 16 2 24	203 14 11
H. Fraser	,, ,,	4	0 9 0 1	103 7 10
Donaldson and Ellis ..	,, ,,	2	0 3 2 0	43 8 8
Cockerell and Randall ..	,, ,,	20	2 2 3 2	469 18 5
J. Donaldson	,, ,,	1	0 4 1 12	47 18 8
A. A. Cockerell	,, ,,	3	0 15 2 19	177 3 11
J. H. Evans	,, ,,	..	0 5 2 10	61 19 7
D. Peddie	,, ,,	..	0 7 0 23	74 9 1
F. A. Smith	,, ,,	10	0 16 3 14	196 13 11
G. Bertenshaw	Waipori, Tuapeka County	..	0 5 1 5	65 15 2
C. G. White	The Reefs, Taieri County	15	0 8 1 21	98 0 9
Pukerangi Mining Company ..	,, ,,	35	0 5 2 18	63 18 6
Totals, 1919	..	8,889¾	122 16 2 26	21,770 16 11
Totals, 1918	..	15,098	143 6 0 17	31,279 0 0
Decrease	..	6,208¼	20 9 1 19	9,508 3 1

* Output still on hand. † Only 5 tons sold.

Certain of the above mines also produced gold as follows: Dominion Consolidated, £4,485; Golden Point, £23; Deep Dell, £3.

PETROLEUM.

Oil-boring operations have continued at New Plymouth, Waipatiki, and Chertsey, but in several instances progress has been retarded through the delay in receiving new cables ordered or mishaps to the existing casing. No development of commercial value occurred as the result of oil-prospecting operations, and none of the existing bores yielded oil in payable quantity.

Taranaki (New Zealand) Oil-wells (Limited).—In the early part of the year the company dismantled its refinery plant which had been acquired for re-erection in Persia. Operations at No. 5 bore were confined to drilling through some cement which had been placed inside the 8 in. casing to shut off the water, and to relining the borehole with 6½ in. casing. Difficulties were still being experienced with the escaping sand and gas cutting through the inner casing when operations ceased through lack of funds. Early this year advice was received from London that the company had gone into liquidation.

Blenheim Oil-wells (Limited).—Much time was lost during the year in waiting the arrival of drilling-cable from England. In the interval the company lost its staff of expert Galician drillers, who had carried the borehole down successfully from the commencement. The well has now attained a depth of 5,534 ft., and is penetrating a dark calcareous mudstone from which there are strong gas-emissions. A small flow of petroleum occurs at 2,200 ft., and during the year 7,485 gallons of oil were collected.

British Petroleum Development Company.—This new company was formed late in the year to sink a borehole at Patch's farm, which is about seven miles from New Plymouth along the Carrington Road. It is anticipated that oil will be struck at about 2,500 ft., and operations so far have consisted in the erection of a derrick and installing the necessary machinery.

Waipatiki Oil-wells (Limited).—This company, which acquired the interests at Hawke's Bay of the Kotuku Oil-wells Syndicate, has continued boring operations during the year, but work has been delayed first through the casing breaking and afterwards by the late arrival of a new drilling-cable. There have been strong emissions of gas and a small quantity of oil from this borehole, but so far the formations penetrated have not been such as would contain an extensive oil-pool. The borehole is now down 3,600 ft.

Canterbury Petroleum Prospecting Company.—This company's borehole is still penetrating the alluvial deposits of gravel and conglomerate which form the Canterbury Plains, and has now attained a depth of 2,140 ft.

Cinnabar.

The New Zealand Quicksilver-mines (Limited), who are engaged in mining a lode containing cinnabar at Puhipuhi, North Auckland, have continued stoping the block of ore which they disclosed in their development operations about two years ago. During 1919 the company mined and retorted 650 tons of ore for a return of 11,175 lb. of quicksilver, valued at £2,794. The Customs' returns for the same period show that $8\frac{3}{5}$ tons (19,264 lb.) of quicksilver, valued at £4,619, were entered for exportation.

Development of the mine has recently been resumed, and the low level, which had to be retimbered, has been further advanced. The lode now showing in the face is about 2 ft. wide and contains a fair percentage of cinnabar. The company at an early date anticipate boring a number of holes from the surface with a diamond drill in order to determine the extent and value of this lode at a greater depth.

Kauri-gum.

During 1919 4,128 tons of kauri-gum, valued at £255,812, were exported, the total quantity and value of gum exported to the end of this year being 360,420 tons, valued at £18,581,064.

This industry is now controlled by an officer of the Lands Department, and detailed information is published in that Department's reports.

VI.—STONE-QUARRIES.

(1.) Quarrying Operations.

For several years past it has been the custom to point out that the inspection and statistical information concerning quarries in the Dominion are not as complete as they should be. Under the Stone-quarries Act, 1910, inspection is only required of places where the rock-faces exceed 20 ft. in height and explosives are used in the quarrying operations. There is little doubt that there is an equal amount of danger in handling explosives whether the rock-face is over or under 20 ft., and, again, for the safety of the worker certain quarries, whether explosives are used or not, should be under the Inspector's supervision. During the year two fatal accidents occurred in the Auckland district in quarries to which the Act does not apply. In one case at Morrinsville A. Parkinson was undercutting the face of a gravel-pit when the overburden fell in and entombed him. At the Kauroa quarry, near Raglan, where the rock-face was 18 ft. deep, T. G. Dunlop was killed by an explosion whilst forcibly recharging a hole in which a missfire had occurred.

Unlike the Coal-mines and Mining Acts the Quarries Act does not compel the owner to furnish complete annual returns. The information which is tabulated below deals only with quarries visited by the Inspectors in the course of their duties, and was courteously supplied at their request by the several owners or managers. No returns are to hand from a number of producing quarries whose operations are such that they do not require inspection.

With the information available, which is of course incomplete, it will be seen that the quarrying industry is steadily increasing. The production of 219 stone-quarries amounted to 1,056,329 tons, and required the services of 1,409 persons. The production of building-stone amounted to 27,051 tons, and limestone for agriculture and cement-manufacture to 245,192 tons, both products showing a considerable increase on the returns of last year.

The products from the quarries in the Dominion have not yet found an extensive outside market. During 1919 these exports, which consisted of small quantities of lime, serpentine, dressed marble, building-stone, and pumice sand, were valued at £4,039, of which total 1,037 tons of pumice sand, valued at £2,840, was the chief item.

Table showing the Number of Quarries under the Stone-quarries Act, 1910, also the Number of Persons ordinarily employed thereat, and the Annual Output of Crude Stone during, 1919.

Provincial District.	Name and Address of Government Inspector of Stone-quarries.	Number of Working Quarries under the Act.	Number of Persons ordinarily employed.	Output of Crude Stone.							
				Stone or Gravel for Macadamizing or Ballast.	Stone for Harbour-works.	Building-stone.	Limestone for Agriculture.	Limestone for Cement or Mortar.	Phosphate for Agriculture.	Fireclay for Bricks or Tiles.	Sand for Building or Asphalting.
				Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Auckland ..	James Newton, Mines Dept., Auckland	87	510	250,195	41,786	21,318	23,270	104,480	..	..	..
	M. Paul, Mines Dept., Waihi (Hauraki Mining District only)	11	61	37,109	..	1,730	..	..	..	..	..
Hawke's Bay	James Newton, Mines Dept., Auckland	21	108	27,425	65,397	..	21,000	..	..	..	..
Taranaki ..	Ditto	14	68	22,830	28,960	..	..	..	..	..	..
Wellington ..	„	37	163	77,989	3,794	..	10,700	..	..	..	..
Nelson	G. Duggan, Mines Dept., Greymouth	2	15	..	5,852	..	..	..	..	..	..
Westland	J. F. Downey, Mines Dept., Reefton	4	115	2,500	..	794	..	15,579	..	..	..
		2	16	375	..	..	973	..	..	..	..
		1	4	..	..	..	70	..	..	..	..
Canterbury	E. R. Green and A. Whitley, Mines Dept., Dunedin	10	88	83,325	18,979	1,100	4,000	2,000	..	..	..
Otago		24	227	78,879	2,332	2,109	36,627	21,123	4,000	2,500	6 685
Southland		6	34	7,274	15,900	..	5,370	..	..	..	..
Totals 1919	..	219	1,409	587,901	183,000	27,051	102,010	143,182	4,000	2,500	6,685
Totals 1918	..	247	1,453	611,169	90,061	4,197	86,807	36,507	5,000	2,500	6,186

Further particulars regarding the inspection of stone-quarries in the North Island are contained in the annual report by James Newton, appearing in Annexure C accompanying this report.

(2.) Quarry Accidents.

The following is a summary of persons killed or seriously injured during 1919 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	..	..	..	..
Falls of ground	..	2	..	2
Falling from face, or during ascent or descent	..	1	..	1
Miscellaneous	1	2	1	2
Totals	1	5	1	5

The fatal accidents were in the proportion of 0·71 per 1,000 persons employed. The non-fatal accidents were only five in number, two of which were occasioned by a splinter of rock injuring the eye of the worker whilst engaged in spawling.

In the case of two serious accidents—one at Karaka Bay, St. Heliers, Auckland, and the other at Mount Somers, Canterbury—proceedings were taken by the Inspector for a breach of the law. In both instances the owners were fined for employing a foreman without a permit, and in the former case the man acting as foreman was fined for carrying on without a permit as well as for failing to notify the Inspector of an accident. Nominal penalties were asked for in each case, the main object of the prosecutions being to bring before private owners the requirements of the law.

The following is a description of the fatal accident during 1919 at a quarry which is under the Stone-quarries Act:—

Date.	Name and Situation of Quarry.	Name, Age, and Occupation of Person killed.	Description of Accident, and Remarks.
1919. Oct. 6..	Harbour Board's Quarry, Rangitoto Island, Auckland	James Arrol (29), labourer	Stone from this quarry was loaded into a box which was lifted by a hand-winch. The jib which carried the hauling-pulley was stayed by one end of the radius-chain to a vertical post. On taking the weight one of the links of the radius-chain broke, allowing the jib to fall on this man, who had been engaged loading the box. The Board's Engineer stated that this chain had been regarded as a tie and had not been regularly annealed, although inspected daily when the pulley was oiled. At the inquest a verdict was returned that deceased met his death through an injury to his skull caused by a falling derrick, and that there was not sufficient evidence to show how or when the flaw was occasioned in the link of the supporting chain.

VII.—STATE AID TO MINING.

(1.) Subsidized Prospecting.

During the year ended 31st March, 1920, thirty-eight approved prospecting parties were granted subsidies amounting to £3,554 6s. 8d., of which £1,520 1s. 4d. was expended during that period. In addition to this, £985 4s. 2d. granted during previous years was expended by five parties during the past financial year

The following statement shows the total expenditure during the year ended 31st March, 1920:—

	£	s.	d.
Coromandel County	170	13	4
Thames County	292	0	0
Ohinemuri County	156	13	4
Wairau Road District	100	0	0
Takaka County	64	10	0
Buller County	51	13	4
Westland County	158	16	4
Lake County	76	10	0
Prospecting associations, &c.	1,434	9	2
Total	£2,505	5	6

In several cases, although no discovery of commercial importance has been made by the subsidized prospector, the Department's knowledge of particular localities has become more complete and the results obtained have been recorded for future reference. In other cases, where assistance has been granted to small companies carrying out systematic prospecting under capable management, the work undertaken has disclosed some promising results, and further work may enhance the value of the discovery made. In one instance the oxidized low-grade outcrop of a reef, containing a fair percentage of manganese oxides, was intersected lower down the hill by a subsidized crosscut 600 ft. long. The reef here was 24 ft. wide, but the payable portion was confined to a 6 in. seam showing distinct silver sulphide veins. This discovery is important, as the thickening of the pay-streak either laterally or at greater depth would turn a promising development into one of commercial value.

Altogether during the year thirty-five parties employing 115 persons were assisted. The work carried out was inspected from time to time by the Inspectors of Mines, who have supplied details for the table giving particulars of the assistance granted and the results achieved.

In addition to the grants of money given to prospectors and to mining companies the Department has this year attempted to render assistance to the mining industry by employing Professor Waters, of Otago University, to investigate the treatment of concentrates at the Reefton mines, with the object of evolving a process by which gold may be extracted locally, thus preventing the necessity of shipping the concentrates to Australia. Professor Waters's report, which is a very valuable one, unfortunately cannot be printed here in full owing to the shortage of paper and the necessity for reducing the size of this publication as much as possible. The following brief summary of his conclusions is, however, of great interest:—

Table showing Results of suggested Local Treatment compared with Shipping.

Mine.	Concentrates per Ton.					Local Advantages per Ton.
	Gross Value.	Realization Charges.		Net Returns.		
		Shipping.	Local.	Shipping.	Local.	
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Blackwater	12 1 11	9 0 5	6 16 0	3 1 6	5 5 11	2 4 5
New Big River	19 15 1	11 7 9	9 13 0	7 17 4	10 2 1	2 4 9
Progress	14 4 3	8 11 3	4 17 0	5 13 0	9 7 3	3 14 3
Wealth of Nations	9 17 7	8 6 11	4 2 0	1 10 8	5 15 7	4 4 11
New Keep-it-Dark	9 7 0	8 6 5	4 0 0	1 1 5	5 7 10	4 6 5
Murray Creek	16 9 10	9 10 0	6 13 0	6 19 10	9 16 10	2 17 0

The conclusions arrived at from the investigations made are:—

(1.) That local treatment is feasible and advisable from an economic point of view.

(2.) That roasting followed by treatment with alkaline cyanide solutions by percolation, followed probably by grinding and amalgamation, is the most suitable treatment under present conditions.

(3.) That the roasting must be carried out mechanically.

(4.) That an extraction of 80 per cent. of the gold contents is certain, and this may be expected to amount to 85 per cent., which will show better results than those given in the table above.

(5.) That under present conditions the most suitable place for a plant is at the Progress Mill, and operated by the Progress Mines Company.

(6.) That the saving of arsenic should be left in abeyance in the meantime, but should be considered later when general mining conditions improve and the process develops.

(7.) That the Mines Department shou'd arrange to continue investigative work with a view to (*a*) improving the gold-extraction, and (*b*) the utilization of the residues after treatment, in which direction economic results of great value are likely to be obtained.

Number of Subsidized Prospectors, Amount of Subsidy granted and paid, also the Character and Result of such Prospecting Operations from the 1st April, 1919, to 31st March, 1920.

Name of Prospecting Party.	Number of Prospectors.	Locality of Operations.	Amount of Subsidy granted.	Amount of Subsidy expended.	Distance driven.	Nature of Claim.	Character of Operations.	Remarks.
Northern Inspection District.				£ s. d.	Ft.			
Waitangi Gold-mining Company	7	Thames ..	£166 13s. 4d., at 6s. 8d. per foot	100 0 0	300	Quartz ..	Driving ..	Driving on 4 ft. lode. Average assay value, £1 per ton.
C. Wells and G. Blythe ..	2	Cabbage Bay ..	£39, at £1 10s. a week each for three months	6 0 0	..	..	Surface prospecting	Several lodes intersected. Picked samples assayed £3 per ton.
John Anderson and Son ..	2	Waikoromiko ..	£36, at £1 10s. a week each for three months	36 0 0	..	..	,,	Nothing payable discovered.
J. McClair and mate	2	Thames ..	£66 13s. 4d., on 200 ft. driving at 6s. 8d.	13 6 8	40	Quartz ..	Driving ..	Driving crosscut to intersect lode. Work in progress.
C. and J. Carroll	2	Kuaotunu ..	£39, at £1 10s. a week each for three months	12 0 0	..	..	Surface prospecting	After working one month operations suspended.
Lindsay and Strongman ..	2	Matawai ..	£33 6s. 8d., on 100 ft. driving at 6s. 8d.	10 0 0	30	Quartz ..	Driving ..	Small lode intersected. Gold freely seen in quartz broken.
Glass and Calder	2	Taupo	£51, at £1 10s. a week each for four months	24 0 0	..	..	Surface prospecting	Work in progress.
A. and H. McNeil	2	Coromandel ..	£66 13s. 4d., on 200 ft. driving at 6s. 8d.	13 6 8	40	Quartz ..	Driving ..	Lode intersected. Values low.
Regan and Sullivan	2	Tokatea ..	£50, on 150 ft. driving at 6s. 8d.	16 6 8	49	,, ..	,, ..	Work in progress. No discovery of importance made.
Madill and Andrews	2	Mahakirau ..	£39, at £1 10s. a week each for three months	27 0 0	..	..	Surface prospecting	Work in progress. Nothing payable discovered.
Campbell Bros.	2	Puru	£39, at £1 10s. a week each for three months	12 0 0	..	..	,,	Several reefs located, some giving high assay values.
Ohinemuri Gold and Silver Mines	12	Maratoto ..	£100, on 300 ft. driving at 6s. 8d.	100 0 0	300	Quartz ..	Crosscutting ..	Reef 24 ft. wide intersected. For average assay value see Inspector's report, Annexure A.
Wilson and Sadgrove	2	Waitaia	£39, at £1 10s. a week each for three months	..	..	..	Surface prospecting	Work in progress.
Kuranui Gold-mining Company ..	4	Tararu	£166 13s. 4d., on 500 ft. driving at 6s. 8d.	166 13 4	500	Quartz ..	Driving ..	Lode intersected. Gold frequently seen. No important discovery made
,, ..	4	,, ...	£100, on 300 ft. driving at 6s. 8d.	..	..	,, ..	,, ..	In progress.
Rising Sun Gold-mining Company	12	Owharoa ..	£100, on 300 ft. driving at 6s. 8d.	56 13 4	170	,, ..	,, ..	Crosscutting for lode. Work in progress.
West Coast Inspection District.			£ s. d.					
Alpine Consols	4	Lyell	..	51 13 4	155	Quartz ..	Driving ..	Driving low-level tunnel on reef-track. Nothing of value found.
P. J. Larkin and party ..	3	Enchanted Creek ..	100 0 0	100 0 0	..	Alluvial ..	Surface prospecting	Prospecting to develop a sluicing claim.
Blackwater Miners' Association ..	6	Waiuta	200 0 0	63 0 0	..	Quartz ..	,,	General prospecting. No discovery of any value.
H. F. Chaffey	..	Takaka	100 0 0	..	..	Asbestos ..	,,	Prospecting for asbestos.
Fiddes and Doolan	2	Ahaura	48 0 0	12 0 0	..	Quartz ..	,,	General prospecting. Number of small reefs located; none of special value.
Howat and Hyndman	2	Woodstock ..	100 0 0	42 15 0	342	Alluvial ..	Driving ..	Driving preparatory to blocking out ground at Brighton Terrace.

Number of Subsidized Prospectors, Amount of Subsidy granted and paid, also the Character and Result of such Prospecting Operations from the 1st April, 1919, to 31st March, 1920—continued.

Name of Prospecting Party.	Number of Prospectors.	Locality of Operations.	Amount of Subsidy granted.	Amount of Subsidy expended.	Distance driven.	Nature of Claim.	Character of Operations.	Remarks.
West Coast Inspection District—ctd.				£ s. d.	Ft.			
Jones and Burrows	2	Hokitika ..	75 0 0	28 10 0	..	Mineralized ore-body	Surface prospecting	Small copper lode found, but abandoned owing to large slip covering work.
Kulsen and party	2	Kanieri	60 0 0	24 18 0	166	Alluvial ..	Driving ..	Driving at Golden Flat, Kanieri, to drain supposed payable ground.
E. Kean	1	Greenstone ..	132 0 0	..	..	,, ..	Constructing water-race	Constructing tail-race at Argus Terrace.
Mount Greenland Extended Syndicate	2	Ross	100 0 0	62 13 4	188	Quartz ..	Driving ..	Crosscut in progress to intersect outcropping reefs.
H. F. Porter and party ..	3	Wangapeka ..	117 0 0	27 0 0	..	..	Surface prospecting	General prospecting in progress.
J. Reardon and party	4	Anatoki.. ..	156 0 0	64 10 0	..	Alluvial ..	,,	General prospecting, Takaka River Valley. Payable alluvial reported.
F. D. Walker and Honey ..	2	Waitahu ..	36 0 0	..	..	..	,,	General prospecting in progress.
Southern Inspection District.								
Otago Central Gold-mines ..	5	Bannockburn ..	483 6 8	374 15 0	1,050	Quartz ..	Driving ..	Crosscutting for and driving on reefs. No payable ore found.
R. Symes and party	2	Old Man Range ..	170 0 0	170 0 0	..	Alluvial ..	Surface prospecting	Nothing of value found.
Deep Dell Consolidated Company	3	Macrae's ..	120 0 0	39 0 0	119	Quartz ..	Driving ..	Driving on scheelite reef. Payable ore opened up.
Atley Bros.	3	Shotover River ..	117 0 0	117 0 0	..	Alluvial ..	Surface work ..	Repairing wing dam and water-races.
W. G. W. Barnard	4	Macetown ..	243 6 8	160 0 0	480	Quartz ..	Driving ..	Driving on reef. No payable ore found.
Pukerangi Gold and Scheelite Mining Company	2	The Reefs ..	173 6 8	8 16 0	24	.. ..	,, ..	Driving on scheelite lode in Pukerangi Mine.
Ditto	2	,, ..	166 13 4	43 0 0	129	,, ..	,, ..	Driving to cut reef in Marion Mine. Work in progress.

(2.) Government Prospecting-drills.

The following is a table giving the result of operations by Government drills during 1919:—

Type of Drill.	Name of Drill Superintendent.	Number of Holes drilled.	To whom lent.	Mineral sought for.	Total depth, in Feet.	Character of Country pierced.	Average Cost per Foot drilled, including Transport.	Diameter of Hole.	Results.
							s. d.	Inches.	
Schramm-Harker diamond drill No. 3 (oil-driven)	W. H. Warburton	12	Mines Department: Whangape Coal Company's area	Coal ..	(12) 180	Calcareous sandstone, sandy papa rock, clays, sandstones, and greywacke	3 6·9	2½	2 ft. coal at 72ft., 3 ft. coal at 121 ft.
Ditto	..		Ditto	.. ..	(13) 168	Ditto	3 4·7	2½	4 ft. coal at 109 ft., 16 ft. coal at 137 ft.
,, ...	,,		.. ..	.. ..	(14) 141	.. ..	3 9·9	2½	17 ft. 6 in. coal at 123 ft. 6 in.
,, ...	,,		.. ..	,, ..	(15) 135	.. ..	2 11·4	2½	17 ft. coal at 121 ft. 6 in.
,, ...	,,		.. ..	,, ..	(18) 281	.. ..	3 4·8	2½	No coal; probably faulted country.
,, ...	,,		.. ..	,, ..	(19) 249	.. ..	3 7·9	2½	No coal.
,, ...	,,		,, ...	,, ..	(20) 189	.. ..	4 4·9	2½	,,
.. .. ..	,,		Mines Department: Awaroa Land Company's area	,, ..	(16) 194	.. ..	4 2·4	2½	16 ft. coal at 177 ft.
,, ...	,,		Ditto	,, ..	(17) 175	.. ..	3 3·4	2½	17 ft. 6 in. coal at 160 ft.
Percussion drill ..	,,		,, ...	,, ..	(4A) 294	.. ..	5 0	2	17 ft. coal at 252 ft.
.. ..	,,		,, ...	,, ..	(5A) 265	.. ..	5 0	2	14 ft. coal at 255 ft.
.. ..	,,		,, ...	.. ..	(6A) 306	,, ...	5 0	2	1 ft. coal at 252 ft.
Schramm-Harker diamond drill No. 3 (oil-driven)	W. H. Warburton and A. Wick ..	3	Homebush Coal Company, Glentunnel	,, ..	(1) 392	Sandstone, clays, and shales ..	4 4·9	2½–1¾	No workable coal.
Ditto	Ditto		,, ..	,, ..	(2) 410	,, ,, ,, ..	4 2½	2½–1¾	,,
,, ...	,, ...		,, ..	,, ..	(5) 534	,, ,, ,, ..	5 10½	2½–1¾	4 ft. 6 in. coal at 130 ft.
Sullivan C.N. diamond drill (steam-driven)	W. H. Warburton and R. Pengelly	1	Waitahu Coal Company, Reefton ..	,, ..	735	Gravel, sandstone, shale, grit, and conglomerate	31 2½	2¾	8 ft. of coal at 586 ft.
Ditto	W. H. Warburton	1	Scott Bros.' Coal-prospecting Lease, Reefton	,, ..	250	Gravel	..	2¾	In progress.
Schramm-Harker diamond drill No. 2 (driven by compressed air)	W. Carter ..	2	Talisman Consolidated (Limited), Karangahake	Gold-bearing reef	(1) 428	Unaltered andesite	..	2½	Maria reef intersected about 350 ft. below low level in Woodstock section of the mine. Reef well defined; values low.
Ditto	,, ..		Ditto	Ditto ..	(2) 200	..	..	2½	Borehole in progress to intersect Maria reef at a lower level in Bonanza section of the mine.
Keystone drill No. 3 ..	H. Butland ..	24	Dunedin City Corporation reservoir area, Waipori Flat	Alluvial gold	2,496* deepest 167	Gravel	8 0	6	Unpayable results.
Keystone drill No. 1 ..	A. E. Gregory ..	9	Metals Exploration Company (New York), operating at Rimu Flat	,,	476*	River gravel	..	6	Results not yet disclosed.
Keystone drill No. 2 ..	,, ..	18	Ditto	,,	905*	,, ...	..	6	,,
Keystone drill No. 1 ..	G. E. D. Seale ..	1	Dr. Scott's coal-prospecting license, Reefton	Coal ..	(1) 131	Gravel	..	6	In progress.

* Aggregate.

The Government prospecting-drills have been freely used during the year, and although in several instances the results have been of a negative character, this information has been gained by those concerned at a minimum of expense. In the Waikato the area which was partially prospected last year has been further tested, and the results have been such that the Government has acquired a considerable holding here to develop a State coal-mine. At Rimu Flat further placer-drilling took place, and as an outcome of the extensive keystone drilling which has been carried out here during recent years an American company has decided to install a powerful gold-dredge of modern type to deal with the heavy gold-bearing gravels. The Dunedin City Council finished boring their proposed reservoir area at Waipori, and the results of the drilling carried out during the past two years clearly show that the flooding of this reserve will not result in the loss of an extensive area of payable gold-bearing gravel. An aggregate of 9,534 ft. was drilled in seventy-one holes, a summary of which is as follows:—

Number of Holes drilled.	Mineral searched for.	Type of Drill used.	Cost per Foot, including Transport.	Aggregate Depth attained, in Feet.	Results.
9	Coal ..	Diamond ..	3s. to 4s. 5d.	1,712	Very good; workable area, Waikato coal-field.
3	,, ..	Percussive ..	5s.	865	Good; workable area, Waikato coalfield.
3	,, ..	Diamond ..	4s. 3d. to 5s. 11d.	1,336	No extent of workable area as yet found; boring in progress.
1	,, ..	,, ..	31s. 2d.	735	Coal-seam 8 ft. wide located; extent not yet proved.
1	,, ..	,, ..	..	250	In progress.
2	Gold ..	,, ..	..	628	,,
24	,, ..	Keystone ..	8s.	2,496	No payable gold-bearing gravel located.
27	,, ..	,, ..	..	1,381	Results of boring not yet disclosed.
1	Coal ..	,, ..	..	131	In progress.
71	..	..	..	9,534	..

(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," and out of Consolidated Fund, in the different counties and boroughs during the year ended 31st March, 1920:—

	£	s.	d.
Public Works Fund—			
Direct grants	11,653	0	0
Subsidies	812	0	0
Consolidated Fund—			
Grants	631	0	0
Total	£13,096	0	0

(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 thirty-seven miners with water for sluicing during 1919, by which gold to the value of about £8,180 was won.

The average gross earnings of each miner, after deducting the sum paid to the Government for water supplied, amounted to about £183 for the year, but from this must be deducted all expenditure on plant, rent, &c.

The receipts and expenditure were as follows:—	Receipts. £	s.	d.	Expenditure. £	s.	d.
Waimea–Kumara races	659	10	0	2,387	0	0
Mount Ida	738	10	0	1,669	0	0
Totals	£1,398	0	0	£4,056	0	0

From this it will be seen that the expenditure on upkeep exceeded the revenue received from sales of water by £2,658. The capital expenditure on these races exceeds £250,000, and as for several years past the races have not been self-supporting no sum has been allotted for depreciation or interest on capital. For the current year the loss on the races represents £72 per miner employed, or 32 per cent. of the value of the gold won.

VIII.—SCHOOLS OF MINES.

The following table shows the expenditure by the Government on schools of mines during 1919–20:—

	£	s.	d.
Subsidies towards erection and maintenance	1,742	4	9
Salaries of teachers, travelling-expenses, &c.	2,763	1	6
Total	£4,505	6	3

The schools continue to do useful work in the training of young men for positions at the various mines and in assaying and otherwise determining the value of prospector's samples in their respective districts.

I have, &c.,
T. O. Bishop,
Inspecting Engineer of Metalliferous Mines.

ANNEXURE A.

SUMMARY OF REPORTS BY INSPECTORS OF MINES.

NORTHERN INSPECTION DISTRICT (Mr. M. PAUL, Inspector of Mines).

Quartz-mining.

WAIHI BOROUGH.

Waihi Gold-mining Company (Limited).—The following are the particulars of the principal development works carried out in this mine during the year:—

No. 12 level (1,447½ ft. below the collar of the No. 4 shaft): About the end of November this level was unwatered for the first time since 1917. Air-pipes have been put in the drive on the Dreadnought lode, and also in the north-west crosscut.

No. 12 level (1,447½ ft. below the collar of the No. 4 shaft): About the end of November this 69 ft. from the south branch of the Martha lode, and at 28 ft. the north section of the Empire lode was intersected and proved to be 25 ft. wide, worth £1 18s. 6d. per ton. Driving east on the Empire lode was then continued for 233 ft. with the following results: At 50 ft., lode 15 ft. wide mixed with country rock, value 16s. 8d. per ton; at 100 ft., lode 15 ft. wide, value 10s. 9d. per ton; at 127 ft., lode 4 ft. wide, value £1 10s. 1d. per ton; at 213 ft., lode 2 ft. wide, value 5s. 9d. per ton. On driving west for 107 ft. from Lion crosscut values varying from £2 18s. 10d. to 4s. 8d. per ton were found up to 80 ft. west, while crosscuts at 50 ft. and 100 ft. showed the reef to be 23 ft. and 8 ft. wide, with ore averaging 10s. 10d. and 16s. 8d. per ton respectively. East of Pistol north-west crosscut the level was driven 59 ft., and at 50 ft. the lode is 15 ft. wide, mixed with country rock; value, 1s. 4d. per ton.

No. 10 level: The Soldier's crosscut, which is situated 444 ft. north of No. 4 shaft, has been advanced 215 ft., and at 197 ft. the north section of the Empire lode was met; width, 10 ft.; value, £1 9s. 8d. per ton. For 80 ft. east along the level the values vary from 7s. 1d. to £3 13s. 10d. per ton, and the lode is payable. West of Soldier's crosscut the level was driven 47 ft., but the ore met, varying from 5s. 1d. to £1 6s. 5d. per ton, was not payable. West of Cow crosscut 185 ft. of driving disclosed values varying from 4s. 5d. to £1 10s. 10d., and this ore is too low-grade to be payable.

Martha lode: East of Cow crosscut the level has been widened to 11 ft. on the south side from a point 32 ft. east for a distance of 50 ft. In effecting a connection between a point at 40 ft. in Cow south-east crosscut and the south side of the level on the Martha lode some 6 ft. of payable quartz with values averaging £3 10s. per ton was found.

No. 9 level (Ulster reef): This reef was driven upon for 90 ft., the lode varying in width from 1 ft. to 5 ft. and the values from 17s. 6d. to £2 12s. per ton.

Empire lode: Power north-west crosscut was extended 94 ft., and at 87 ft. the north section of the Empire lode was met; width 5 ft., and values £1 12s. per ton. On driving east for 57 ft. irregular values varying from £4 7s. to 1s. 9d. per ton over a width of 2½ ft. to 5 ft. were met.

Alexandra lode: A new shrinkage block has been timbered east and west of Rata rise.

No. 8 crosscut: Horse crosscut was extended 118 ft., and at 96 ft. the north branch of the Martha lode was intersected, having a width of 9 ft. and value of £1 9s. 6d. per ton.

No. 6 level: Marson crosscut, situated at 85 ft. east of No. 6 shaft, was driven upon for 21 ft. At 10 ft. the north section of the Martha lode was met—width 6 ft. and value £2 6s. per ton—and upon driving on this reef for 39 ft. the reef averaged 3 ft. to 6 ft., carrying values ranging from £1 7s. 9d. to £3 1s. per ton.

The south-east drive on H reef was extended 82 ft., the reef varying from 3 ft. to 5 ft. wide, and the value from 8s. 4d. to £1 15s. 6d. per ton. This drive will enable two small payable blocks on the Empire and Albert lodes to be more readily mined.

No. 5 level: The north branch of the Martha lode has been driven upon for 80 ft., the last 40 ft. showing payable ore mixed with boulders of country.

Waihi Grand Junction Gold-mining Company.—No. 1 main shaft: The pumping compartment was sunk through country rock and quartz of no value, making the total depth below the surface 1,401 ft. The presence of quartz and calcite grit in the water caused considerable delay in sinking, owing to the electric pumps being almost continuously under repair. A total of 70,391,358 gallons of water was pumped to the surface during the year. The excavation of a new pumping-chamber and water-cistern at No. 8 level is well advanced. When this work is completed the electric stationary pumps at No. 7 level will be removed and installed at No. 8 level. This should enable the sinking-pumps to cope with the present influx of water for at least another 150 ft.

No. 8 level (1,320 ft.): The drive on the lode in the main north-west crosscut, 17 ft. from the shaft-chamber, was advanced 34 ft., making a total distance of 212 ft. The average value over width of 53 in. was 1s. 5d. per ton.

Empire lode: The drive east was continued 141 ft. in country rock and now measures 1,008 ft. The crosscut at 735 ft. east was advanced 72 ft. The first 57 ft. was through country rock and calcite veins of no value; from 57 ft. to 62 ft., quartz valued at £1 4s. 6d. per ton; from 62 ft. to 72 ft., country rock. The crosscut at 1,000 ft. east was extended 5 ft. north and 92 ft. south. From the main drive to 33 ft. south there is country rock. At 33 ft. a vein of quartz 18 in. wide was passed through; value, 4s. 7d. per ton. The crosscut was continued in country rock until the footwall of the Empire lode was intersected, which assayed 3s. 9d. per ton for a width of 15 ft. On breaking out to the south wall in preparation for stoping from 470 ft.

to 574 ft. east the Empire lode assayed £1 3s. 3d. per ton for a width of 8 ft. No. 4 winze was sunk a total of 14 ft. below the level, the assays averaging 5s. 10d. per ton for a width of 3 ft. 3 in. The lode-matter contains 40 per cent. country rock. No. 5 winze sunk 22 ft. 6 in. Assays over width of 3ft. 5 in. averaged £1 3s. per ton; neither wall was exposed. No. 6 winze sunk 9 ft. 6 in. Over width of 3 ft. 8 in., assays averaged 5s. 8d. per ton. Neither wall was exposed and the lode-matter contained 60 per cent. country rock. No. 7 winze sunk 19 ft. Over a width of 3 ft. 10 in. the assays averaged £5 15s. 2d. per ton, and the walls are not exposed. No 8 winze sunk 48 ft. The first 13 ft. assayed 13s. 6d. per ton over a width of 3 ft. 2 in.; from 13 ft. to 30 ft. assays averaged £2 17s. 6d. per ton over width of 3 ft. 4 in.; from 30 ft. to 46 ft. assays averaged £1 13s. 8d. per ton over width of 3 ft. 4 in., neither wall being exposed.

Royal lode: Drive west was advanced 92 ft.; total, 692 ft. Assays averaged 8s. 11d. per ton over width of 6 ft. 7 in. In order to explore the country between the Royal and Empire lodes a crosscut was started at 230 ft. west and advanced 186 ft. without intersecting any reef. The intermediate drive from No. 9 rise (55 ft. above this level) was advanced 57 ft. west—total, 133 ft.—and holed through to the old No. 8 stopes. Assays from 80 ft. to 105 ft. over width of 6 ft. 1 in. averaged 11s. 2d. per ton with the south wall exposed. From 105 ft. to 130 ft. west the assays averaged £2 4s. 2d. per ton over a width of 5 ft. 4 in. At 120 ft. west the lode was broken out a width of 27 ft. 6 in. The first 10 ft. was quartz, value £1 11s. 10d. per ton; next 9 ft. country rock; then 3 ft. 6 in. quartz, value 14s. 1d. per ton; the remainder quartz and calcite of no value.

George lode: The main south-east crosscut was advanced 375 ft.; total, 1,010 ft. The course of this crosscut is 136° (true). At 714 ft. the George lode was intersected; width, 3 ft. 3 in.; value, 11s. 10d. per ton. The George lode was driven upon 15 ft. east, the width being 1 ft. 9 in. and value 8s. per ton. It was also driven upon 70 ft. west, the width being 4 ft. 1 in. and value £1 2s. per ton, with both walls exposed.

No. 7 level (Empire lode): An intermediate level was driven from No. 6 rise, 25 ft. below No. 6 level, a distance of 39 ft. east, disclosing a width of 4 ft. 6 in. of payable quartz on the footwall.

No. 6 level (crosscut from Dominion lode): A crosscut, started at 227 ft. east of the south-east crosscut on the Dominion lode, was advanced 61 ft., making a total of 288 ft. through country rock and quartz of no value. This crosscut will connect with the main filling shaft, which will be sunk to No. 7 level.

Mary lode: The drive east was advanced 16 ft.—total, 370 ft.—from the north-west crosscut on the line of the lode. The drive is in country rock, no quartz being discovered. A crosscut at 335 ft. east was advanced a total of 17 ft. north and 38 ft. south. In the crosscut to the south two narrow veins of quartz of no value were passed through.

No. 5 level (Mary lode): The drive east into the Waihi Extended section was advanced 297 ft.—total, 437 ft.—from the main crosscut. From 140 ft. to 400 ft. over an average width of 5 ft. 6 in. the value was £1 12s. 2d. per ton. In breaking out preparatory to stoping from 203 ft. to 305 ft. the value over an average width of 4 ft. 6 in. was £1 16s. 9d. per ton. A branch lode was intersected at 212 ft.; width, 3 ft. 6 in.; value, £1 17s. 2d. per ton. As the values obtained in this lode necessitated further exploration, work is now in progress at Nos. 3, 4, 5, and 6 levels, and the prospects of opening up payable runs of ore on this lode in the Waihi Extended section—recently purchased by this company—are distinctly encouraging.

West area: Work in this section, which has been suspended since 1909, was resumed towards the end of this year. In the interval since this section was closed down the B shaft has collapsed through the decay of the timbers. A cavity has been left 20 ft. in diameter and 25 ft. deep. Work is now in progress sinking a winze, endeavouring to locate the undamaged portion of this shaft.

Waihi Gigantic Consolidated.—The only work done in this mine during the year was repairing the crosscut leading into the large reef at No. 3 level, Favona shaft, to enable samples to be taken. The results, however, did not come up to expectations, and, the capital of the company being exhausted, protection was applied for and the mine closed down.

OHINEMURI COUNTY.

Rising Sun Mine, Owharoa.—Work has been confined during the year to stoping above the low level. In the back of the stopes in No. 1 block, which is up 155 ft., the values are low. At No. 2 block the lode continues to carry payable ore, but, owing to the hard nature of the quartz and country and the inadequate air-pressure to work the drills, work was suspended pending the installation of a more powerful electric motor to drive the air-compressor. This motor is now to hand, and preparations are being made to test this lode by means of a winze below the low level. Samples recently taken for a distance of 300 ft. along the floor of this level averaged £5 19s. per ton over an average width of 12 in.

Talisman Consolidated (Limited), Karangahake.—The principal work in progress is sinking No. 16 winze on the main lode below No. 15 level, which has now reached a depth of 130 ft. At the bottom of this winze there is a strong body of ore, 4 ft. wide, with sulphide veins showing, but the footwall is not exposed. The values over the distance sunk have varied from £1 to £7 per ton. Immediately above this winze a block of payable ore was driven through for 50 ft., and stoped to a height of 80 ft.—the average crushing-value being over £7 per ton. Boring by means of a Government diamond drill is also in progress. No. 1 borehole in the Woodstock section proved the existence of a strong body of quartz, the values, however, being low. No. 2 borehole in the Bonanza section had only been sunk a short distance when the necessity for casing became apparent. As this was not obtainable a start was made with No. 3 borehole, which has

reached over 400 ft., and the core shows a good class of country at this depth. In the meantime milling is suspended and will not be resumed until the exploration work in progress at No. 16 winze, and the completion of the boring operations, show that there is a prospect of sufficient payable ore being developed to warrant it.

New Zealand Crown Mines (Limited), Karangahake.—No. 4 level: The east crosscut, Hauraki section, has been extended 136 ft. A small lode formation, 18 in. wide, was intersected and a few feet north and south was driven upon it, but the values were low. With the exception of keeping the levels in repair, no work has been done in the rest of the mine during the year.

United Gold-mines, Maratoto.—This company erected a 10-head stamp mill with cyanide plant, constructed several miles of water-race, and also a tram-line to connect mine and mill, with the object of treating ore from the 6 ft. lode at the low level. For several hundred feet the average assay value of this lode does not exceed 13s. per ton, but as it is cheaply mined several stopes were taken along and the ore sent to the mill. As the ore did not pay expenses the mine was closed down and protection applied for in order to allow the company time to raise further capital to test the lode at greater depth by means of diamond drilling.

Ohinemuri Gold and Silver Mines, Maratoto.—The principal work carried out in this mine has been driving a crosscut to intersect the Camoola reef, which proved to be 24 ft. wide. The reef was sampled in 4 ft. sections from hanging-wall to footwall, with the following results: No. 1, 3s. per ton; No. 2, 4s. per ton; No. 3, £1 2s. per ton; No. 4, 16s. per ton; No. 5, 10s. per ton; No. 6, 5d. per ton. Driving north and south on this reef has been commenced, and the south face which had advanced 18 ft. assayed £2 per ton, with neither wall showing. A special sample taken of a 6 in. silver sulphide seam in centre of reef was highly payable. A considerable amount of work has also been done on the Queen reef from the Julia low level, and at least 2,000 tons of ore have been paddocked. A few tons of selected rich silver-ore were shipped for treatment at Australian smelting-works, and payments made showed it to be worth over £100 per ton. The ore which is awaiting treatment is said to average over £3 per ton. A start has been made to clean up and repair the Telluride low level with the object of further testing the Queen lode at a greater depth.

Komata Reefs Gold-mine (Mr. H. H. Adams, owner).—Four men have been prospecting and retimbering No. 2 level in order to reach the main pass, with the object of testing a new lode discovered in the upper level, and said to contain payable values. The pass is required to send the ore broken out of this lode down to the low level.

THAMES BOROUGH.

Waiotahi Gold-mining Company.—This company took up a claim situated at the head of Tararu Creek, formerly known as the Eclipse claim, but after cleaning up the level and sampling the lode the results did not come up to anticipations, and on the advice of their mine-manager the claim was abandoned. In the old Waiotahi Mine three tributors have been employed crushing the old tips, from which 255 tons were treated and yielded gold valued at £496 1s.

Waiotahi Creek Section.—Three small mines have been working during the year:—

(1.) The West Coast claim (Mr. R. Ross, owner) produced 81 lb. of picked stone valued at £102 16s. 6d.

(2.) Nonpariel Gold-mine (Mr. F. Sawyer, owner): This claim crushed 8 tons 2 cwt. 2 qr. 26 lb. of quartz from small leaders for a return valued at £920 19s. 3d.

(3.) The Evening Star (Messrs. Bird Bros., owners): From this claim 4 tons 3 qr. 3 lb. of quartz, including picked stone, was crushed for gold valued at £540 16s. 4d. The claim has now been formed into a company with the object of testing the Moanataiari cross-lode at its junction with the small leader the owners have been working upon. This cross-lode at its junction with other lodes has been responsible in the past for producing pockets of rich specimen stone.

Karaka Creek Section.—The Magnet Extended Gold-mine (Mr. D. Dunlop, owner) crushed 7 tons 1 qr. 22 lb., including picked stone, from small leaders, for gold valued at £252 3s. 2d.

Una Hill.—Two small claims have been worked in this portion of the goldfield, known as the Occidental No. 1 and Occidental No. 2. The former (Mr. J. Caisley, owner) has two men employed, and treated 11 loads of quartz for gold valued at £262 15s. 4d. The latter (Mr. D. Davey, owner) treated 2 loads 30 lb. of quartz for gold valued at £134 10s. 6d.

Kuranui Gold-mining Company.—The crosscut from the Magazine level to test lodes known to exist east of the Moanataiari fault was not advanced after a portion of the main slide had been passed through. The men were removed back to test a reef intersected 1,000 ft. from the mouth of the tunnel. Colours of gold have been seen in the quartz, but so far nothing payable has been discovered.

Waitangi Consolidated.—Work in this mine has been confined to driving upon the main reef at Nos. 1 and 2 levels. In No. 1 level the quartz is of low grade. At No. 2 level 250 ft. has been driven, with gold occasionally seen in the quartz, and the management is of opinion that the average assay value is over £1 per ton.

THAMES COUNTY.

Sheridan Gold-mine, Tapu (Mr. W. G. Plummer, owner).—Two men have been prospecting what is known as No. 1 leader, but so far nothing payable has been discovered.

Mount Zeehan Gold-mining Company.—Two men have been employed in this mine during the year driving on the main reef at the low level. The ore is being saved for treatment. A 10-head stamp mill has been in the course of erection for over two years, and it is expected that capital will shortly be available to complete it and further develop the mine.

Golden Belt Gold-mining Company, Tairua.—Work in this mine has been confined chiefly to prospecting. A short block of ore which is expected to be payable is now being stoped above No. 1 level. There are four men employed.

Golden Hills, Tairua (Mr. J. M. Agnew, owner).—Work has been confined to stoping on the main reef above No. 1 level. The 440 tons of ore treated produced gold valued at £1,241 0s. 9d.

PIAKO COUNTY.

Bendigo Gold-mining Company, Waiorongomai.—Five men are employed testing various sections of the Bendigo lode, but so far nothing payable has been discovered.

Hardy's Mine, Waiorongomai.—No work has been done in this mine during the year, but it is expected that capital will shortly be available to develop the low level.

COROMANDEL COUNTY.

Old Hauraki Gold-mining Company, Coromandel.—This mine was closed down for several years. A new company was recently formed, and sufficient capital is now available to test the reef-system at a greater depth. All the machinery has been overhauled, and a start made to unwater the Old Hauraki shaft. It has not yet been decided whether this company will deepen the old shaft or sink a prospecting-shaft from the floor of the 400 ft. level, where rich specimen stone was obtained.

Marshal Foch Claim.—A small syndicate has been formed to test what is known as the Mount Welcome lode by driving north and south upon it from the low level.

There are also a number of claims held and being worked, but none call for special mention.

TAURANGA COUNTY.

Muir's Gold Reefs, Te Puke.—During the year work has been confined to stoping above No. 1 level, widening out and timbering at the low level, and rising to connect with the surface for filling purposes. Practically all the ore developed at No. 1 level has been stoped out. At the low level a leading stope has been taken along for 200 ft., and at the intermediate level 80 ft. has been driven on ore expected to contain payable values. Crushing commenced early in May, and from 4,100 tons of ore treated gold valued at £17,703 7s. 6d. was obtained. Unfortunately, early in January this year the mill was burnt down. It is intended, however, to replace it with a 20-head stamp mill purchased from the Barrier Reefs Gold-mining Company, and this plant is now being removed to Te Puke.

Accidents.

No fatal accidents occurred during the year in the metal-mines under my supervision. Two serious accidents were reported, and they are briefly described hereunder:—

5th July: Charles A. Dickson and his mate were employed draining a surface tunnel at the Waihi Grand Junction for filling. Two sets had been put in at the mouth of the tunnel, which was only 20 ft. from the surface. On account of the country being apparently firm, side slabs were not used. At the time of the accident Dickson was filling a truck at the mouth of the tunnel, when a large block of mullock came away from the side between the sets and struck him on the hip. No bones were broken, but the hip was badly bruised.

1st September: Dunlop and his mate R. Preece had been engaged prospecting for several weeks, and, finding some good stone on an old tip, decided to investigate as to where it came from. They therefore entered an old drive of the Magnet Extended, Thames, where there had been no work done for over twenty-five years, and in which for over 100 ft. the water had been dammed back to a depth of 2 ft. Finding the leader, Dunlop began picking some stone into a bag held by his mate. He had only struck a few blows when a large flake came away and struck him on the back and shoulder, thereby dislocating his collar-bone and severely bruising his back.

NORTH AUCKLAND INSPECTION DISTRICT (MR. BOYD BENNIE, Inspector of Mines).

New Zealand Quicksilver Mines (Limited), Puhipuhi.—During the year work at the mine consisted of mining and treating the ore previously developed. For that period 650 tons of ore was treated for a return of £2,793 15s., the mercury being sold at 5s. per pound at Auckland. It is estimated there are about 1,000 tons of ore in sight ready for mining, the value of which is a little less than the ore previously mined. With careful treatment this ore may give a little profit over working-expenses, as with the present plant it is stated only 50 per cent. of the values are saved. The mine was inspected several times during the year, and I found that mining was carried on with great care and that timber-supplies were adequate for present requirements. Supplies of mining-timber, however, in the near future will be a real difficulty, as a settler in the district has been allowed to remove standing dead kauri, totara, and rimu timber for milling purposes in nowise connected with mining or his own requirements.

Joffre Claim (Messrs. Collins Bros., owners).—I visited the mine in February and April, when the owners were driving an adit level with a view to intersecting an ore deposit which was seen outcropping some little distance to the north-east. In April the ore-body had been cut into, but was not a well-defined deposit of cinnabar. Since that visit the owners have left the mine to seek employment elsewhere and to give them an opportunity of raising capital for the future development of their claim.

McLeod's Claim.—This mine has apparently been closed down during the whole of the year.

Several claims have been granted on the mining field, but at present the New Zealand Quicksilver-mining Company is the only mining company doing any work.

WEST COAST INSPECTION DISTRICT (Mr. J. F. DOWNEY, Inspector of Mines).

Quartz-mining.

MARLBOROUGH.

Dominion Consolidated Mining and Development Company (Limited).—The number of men employed throughout the year averaged thirty as against fifty last year, and 8,443 tons of quartz was crushed, against 11,973 tons in 1918; consequently there was a considerable falling-off in values recovered. The decision of the Department of Imperial Supplies not to make any further purchases of scheelite has left the whole year's production, amounting to 21 tons 1 quarter, on the company's hands. A little development in the way of driving and rising was done, without disclosing any material change in grade of ore.

Alford and Party (Mountain Camp).—A little development work was done, and some parts of a treatment plant purchased and delivered at the foot of the Mine Hill.

Cadigan's Treatment-works.—Work was still further delayed by litigation with a neighbouring claimholder, but 11 tons of scheelite was recovered. Only 5 tons was, however, disposed of at the rate of £150 per ton.

NELSON.

Colossus Gold-mining Development Company.—A little driving was done by this company on its Blue Creek claim at Wangapeka, but no improved values were discovered.

LYELL.

New Alpine Consols Company.—The driving of the low-level tunnel on the line of the reef has been continued. This was advanced to the end of the year a total distance of 828 ft. Beyond the shoot of stone struck at 70 ft. from the crosscut nothing of any value has been met with.

New Creek Prospecting and Developing Company.—This company was formed during the year to reopen the old Victory Mine. An adit is being driven to intersect the reef about 200 ft. below the old workings. Six men are employed.

CAPLESTON.

Boatman's Consolidated Gold-mines (Limited).—A considerable amount of driving and crosscutting was done on the 1,000 ft. level of the Fiery Cross shaft in the hope of picking up the downward continuation of the Walhalla or Just-in-Time shoots. No success was, however, met with. The company now intends to do some prospecting from the 450 ft. level.

REEFTON.

Blackwater Mine.—A good deal of development work was carried out. The sinking of the main shaft another 300 ft. below No. 8 level was taken in hand, and is rapidly approaching completion. A chamber was opened out for No. 9 level, but no work was done from it, the company's intention being to get down and open out No. 10 level chamber, and develop the two levels simultaneously. A good deal of driving was also done in Nos. 6, 7, and 8 levels, particularly to the south, where the developments in all three levels were very encouraging. The two former levels have now been extended south about 1,050 ft., and No. 8 level 960 ft. in the same direction, all on fair-class stone. No dividends were paid during the year. Practically the same number of men was employed as during 1918. The quantity crushed decreased, however, from 31,728 tons to 24,969 tons.

Blackwater South Mine.—This mine has been idle throughout the year, but a new company has now been registered for working it, and during the coming year operations will be actively resumed.

Keep-it-Dark Mine.—No crushing was done at this mine during the year, work being entirely confined to shaft and level repairs and development. A certain amount of driving was done on Nos. 4, 7, and 8 levels. A winze on No. 6 level was also continued a few feet farther, and one started on No. 9 level. In these two winzes stone said to be of fair value is showing, but what quantity of it there is in either case cannot be estimated.

Murray Creek Mine.—As the working of this mine under existing conditions was not profitable the company ceased operations about the end of May. Up to that time 4,512 tons had been put through for a return of gold valued at £9,975. The company is considering a scheme for shifting the treatment plant from its present site to one on the Waitahu River where water is available for power purposes. It is considered that the change from the present steam-power to water-power would effect a considerable saving in treatment-costs, and enable the company to show a profit. The only development done was about 100 ft. driving south on No. 4 level.

New Big River Mine.—This mine had the same number of men employed as during 1918, but was nevertheless very short-handed, only one shift being worked. A slightly increased tonnage of quartz was crushed, but the total values recovered were not so good, showing a decrease from £3 7s. 11d. to £3 2s. per ton. Practically no development was done. All the ore came from between the two bottom levels, Nos. 10 and 11. One dividend, absorbing £2,400, was paid.

North Big River Mine.—A company has been recently formed to work this property, which up to the present has only been tested by two short prospecting-drives. A number of reefs outcrop, but the value of any of them at present is problematic. Good values are said to have been got at a shallow level in one of the reefs on which the drives mentioned have been carried in.

Big River South.—A syndicate has been carrying out prospecting operations on this claim during the year. A small gold-bearing reef was located and driven on for about 100 ft.

North Blackwater Mines (Limited).—During the year underground work on this mine has been at a standstill. Good progress was made with the erection of a more powerful plant. The boiler and engine erection is practically completed, and a large new compressor has arrived at Greymouth from America. Until all this plant is installed it will not be possible to resume underground operations. It is expected that during 1920 the mine will be in full work again, developing the various levels and getting ready for production.

Wealth of Nations and Energetic Mines.—There has been no crushing for the year. The work of replacing or repairing the plant destroyed by fire in 1918 has been pushed ahead, however, and is now practically complete. There will still be a lot of repair work to do in the shaft and on the levels, but this year should see the mine well on the way to the producing stage again.

Progress Mine.—An average of seventy men were employed, as against seventy-five last year. Slightly less quartz was crushed, the total being 15,980 tons, from which gold to the value of £20,748 was recovered. Very little development was done.

Ready Bullion Mine.—This mine was formerly known as the New Ulster. During the year a new company was formed to give it a further test, and a level is now being driven to intersect the reef-line about 250 ft. below any previous workings.

HOKITIKA AND ROSS.

Mount Greenland Company.—Work has progressed quietly. The crushing increased from 567 to 679 tons, but the total value of the gold won has only increased from £2,205 to £2,336. There has thus been apparently a fall-off in the average value of the quartz of 9s. per ton. No dividends have been paid.

Mount Greenland Extended Syndicate.—With the assistance of a Government subsidy a crosscut is being put in on this syndicate's prospecting-area to cut a reef at about 250 ft. below the outcrop. This crosscut is now in about 200 ft., and should soon meet the reef.

Jones Creek Syndicate.—After sinking two shafts on its property near Ross Township—one of them at Jones Creek to a depth of 410 ft., and the other on Bayley's Creek to about 130 ft.—this syndicate ceased work in May. Some driving was done from the latter shaft, but no reef was met with.

WESTPORT.

Bagley's Reward.—No work was done on this mine for the year.

STILLWATER.

Victory Mine.—A little development work was done, but results were negative. The battery was completed and 100 tons of ore crushed. The yield of gold was, however, only 12 oz. 16 dwt., valued at £49 5s. The large amount of stibnite in the ore made it difficult to save the gold.

GENERAL REMARKS ON QUARTZ-MINING.

Shortage of labour has undoubtedly very appreciably affected quartz-mining in this district. Practically all the working-mines have been and are still short-handed. One producing-mine only is employing two shifts. A number of companies have been formed in connection with the industry, the object of practically all of which is to give a further trial to a number of Reefton mines which are considered not to have been fairly tested in the past. Amongst these are the Millerton, New Discovery, New Ulster, Blackwater South, and New Big River properties. Some of these are perhaps deserving of further attention, but it is to be feared that the new companies will have great difficulty in securing suitable men for their work. Owing to the prevailing conditions it has not been possible to carry out development work to any extent in any of the working-mines, the Blackwater Mine having done by far the most.

Inspection of all mines has been systematically carried out, and it has been found generally that the provisions of the Act have been well observed.

A number of applications for assistance were received from men desirous of prospecting in different localities. In practically all cases subsidy was granted at the rate of £1 10s. per week per man, but no discoveries of any value have been reported.

Dredging.

The decline in the dredging industry noted last year has continued during this one, the number of hands employed shrinking from sixty-six to thirty-one, and the value of gold won from £15,848 18s. 2d. to £8,336 12s. 5d.

The Success dredge foundered and has not yet been raised, and the Hessey-Cameron, Slab Hut, Rimu No. 1, and Ahaura River dredges have all been out of commission.

The Worksop No. 2 dredge was removed from Antonio's to the Arahura River, where it was re-erected by the Westland Prospecting Syndicate under the name of "Chambers Reward." It started dredging there, but to the end of the year had not met with any great success. Very heavy ground was encountered, and parts of the machinery had to be replaced with stronger plant. Buried timber also caused great loss of time. The results so far have not been at all satisfactory, but further work will probably prove more encouraging.

The Kapitea dredge did fairly for the year.

Alluvial Mining.

MARLBOROUGH.

Practically nothing has been done for the year. Only one return came in, and this was only for 12 oz. of gold from old tailings at Wakamarina.

COLLINGWOOD.

Only one return was sent in, and this was for less than 3 oz.

HOWARD DIGGINGS.

The number of men here shows a further shortage, only eight being reported as at work. No fresh finds have been made.

MURCHISON.

Hunter's, at Matakitaki, and Beilby and Richardson's claim at Horse Terrace, continue to operate, the yield of gold being slightly higher than last year.

ADDISON'S FLAT.

On this field mining improved, gold to the value of £4,259 11s. 7d. being recovered, as against £1,406 15s. 9d. in 1918. Of this Addison's Limited produced 411 oz. 6 dwt., valued at £1,615, and Mouat and party 371 oz. 9 dwt., valued at £1,462.

CHARLESTON.

Powell's beach claim produced gold to the value of £586. This was the only return of any consequence.

GREY VALLEY.

Hochstetter Goldfields (Limited).—The construction of the tunnels was completed, the tail-race was cut, and sluicing operations were started towards the end of the year. An average of thirteen men were employed. So far actual sluicing operations have not been sufficiently long in progress to enable the possibilities of the claim to be estimated. During the short period worked 252 oz. 15 dwt. of gold was recovered, valued at £992.

The Grey Valley Sluicing Company, at Goat Terrace, recovered gold to the value of £487, and McVicar and Hurley, at Moonlight Creek, won £770 worth. From Nelson Creek Donnellan Bros. report 100 oz., valued at £395. Several other claims worked, but the returns were very small.

BARRYTOWN.

The Barrytown Hydraulic Sluicing Company worked steadily, producing gold to the value of £1,810.

KUMARA.

On the Kumara, Goldsborough, Stafford, and Callaghan's fields the productions showed a slight improvement, a recovery of 1,375 oz. being reported, valued at £5,428. The principal producers were Morgan Bros. (175 oz.), Linklater (332 oz.), and Blackmun (255 oz.), at Stafford; Havill Bros. (130 oz.), at Callaghan's; Stubbs and Steel (132 oz.), at Argus Terrace; R. Kean (154 oz.), and the Hohonu Diamond Terrace Sluicing Company (103 oz.), at Greenstone.

HOKITIKA.

Westland Prospecting Syndicate.—The head-race was completed and sluicing was started late in the year. Results were, however, not nearly as good as expected, and work was temporarily stopped.

Rimu Options.—It is now reported that the American investors who for some time past have been further testing the ground by means of Keystone drills and shafts have exercised their option, and intend to put a large modern dredge at work there. A new company is being formed in America in connection with the venture, and its representative is expected to arrive on the field early in the new year. As it is certain that a large amount of gold is in the Rimu flats, it is to be hoped that a suitable plant will now be provided to enable it to be recovered.

A few other claims produced gold to the total value of £3,066, the largest producers being the Rimu Sluicing Company (391 oz.), and Brookes and party (230 oz.), at Rimu.

REEFTON.

As during last year, Sewell's claim at Merrijigs was the only producer of any note.

At Antonio's the Antonio's Gold-mining Company (Limited) recovered 51 oz. This company has some good ground, but has experienced much difficulty in getting a supply of water to it. A lot of expense has been gone to in this respect, for a dam on the head-race has broken away several times, causing much delay. Further efforts will be made to strengthen it. When this trouble is overcome the company should obtain some satisfactory returns for their perseverance.

Accidents.

Four fatal accidents occurred during the year at the metal-mines or dredges under my supervision.

23rd April: Three dredgemen, John Brosnahan, William Crysell, and Thomas Reynolds, fell out of one of the boats belonging to a dredge and were drowned in the Ahaura River.

14th December: Leonard S. Humphries, contractor to and part-owner of the Dominion Consolidated Mine at Wakamarina, received fatal injuries to his head by falling down a rise in which he was working.

Full details of these accidents are contained in the tabulated remarks of the Inspecting Engineer of Metalliferous Mines.

No serious non-fatal accidents were reported during the year.

Southern Inspection District (Mr. A. Whitley, Inspector of Mines).

Quartz-mining.

GLENORCHY.

Glenorchy Scheelite-mining Company (Limited).—Glenorchy Mine: All operations connected with mining and treating ore for shipment were suspended on the 30th April. A small amount of development work, comprising the extension of Nos. 1A, 2A, and 5 levels, was carried out.

Junction Mine: Work was confined to the removal of surface overburden from the lode by sluicing.

Fourteen parties of miners were engaged in the production of scheelite from January to April, after which all work was suspended.

MACETOWN.

United Goldfields (Limited).—Operations were confined to the drive on Anderson's reef, which has been extended a total distance of 692 ft. without meeting with any payable ore.

MACRAE'S.

Golden Point Gold and Scheelite Company.—The Intermediate and Home levels were connected by a rise on the Home reef, and a block of ore 100 ft. in length, 110 ft. in height, and average width of 3 ft., was opened up for stoping. A trial crushing showed that the ore contained payable values in gold and also a fair percentage of scheelite.

Ounce Mine (Messrs. Callery and Donoghue, owners).—In this mine a rich scheelite reef was discovered, upon which a winze was sunk 82 ft. and drives extended therefrom a length of 63 ft. The reef averages 1 ft. in width, and is carrying high-grade ore throughout: 20 tons taken from the winze produced 5 tons 4 cwt. scheelite. In addition to the scheelite reef two smaller reefs carrying gold and scheelite have been opened up within the claim.

The output of scheelite from this locality for the year was small compared to that of former years owing to the cessation of the demand created by the war. Most of the reefs contain both gold and scheelite, but the gold values are generally too low to enable them to be profitably worked, consequently mining is practically at a standstill.

THE REEFS.

Pukerangi Mining Company and Betty and party produced small parcels of scheelite in the early part of the year.

Marion Mine.—A. Ewart prospected the Marion reef to the west of Betty and party's mine and found gold-bearing ore in a number of surface trenches. The Pukerangi Company has taken an option over the mine, and commenced driving a level to test the reef 130 ft. below the outcrop.

BANNOCKBURN.

Otago Central Gold-mines.—The Carrick low-level crosscut was extended to cut the Crown and Cross reef at 1,327 ft. from the surface. This reef was driven upon for 89 ft. to the east of the crosscut, but it is small, and disturbed by faulted and broken country.

BENDIGO.

Come-in-Time and Alto Mines.—Birley and party mined and treated 435 tons of ore during the year. The results were unprofitable, and the mines have been abandoned.

OLD MAN RANGE.

Advance Mine.—R. T. Symes crushed 40 tons of ore from White's reef at the Battery level for a return of 41 oz. gold, valued at £193 15s.

Alluvial Mining.

TUAPEKA COUNTY.

Gabriel's Gully Sluicing Company (Lawrence).—This company continues to work profitably the tailings-deposit from Blue Spur. Dividends amounting to £1,840 were paid for the year. Sixteen men were employed.

Treacy Bros. (Evans Flat).—This party purchased the Tuapeka Company's water-sluicing plant, and are working a section of their freehold property with payable results.

Lawrence Sluicing Company (Munro's Gully).—This company is engaged in elevating the old tailings-deposit from Blue Spur. The workings are approaching the cement deposit which was worked by the Cornishman syndicate with payable results. When all the available tailings are treated the company proposes to bring water on at high pressure to deal with the cement.

Golden Crescent Sluicing Company (Weatherstone's).—This company is operating upon the western side of the auriferous cement deposit, which contains very hard seams difficult to break up with water under high pressure. As the value of the cement is only 5d. per cubic yard it requires to be readily dealt with to pay for treatment.

Golden Rise Claim (Weatherstone's).—W. Smyth, owner of this claim, is sluicing off clay and gravel overlying the auriferous cement. Four men were employed.

Waitahuna Claims.—The Sailor's Gully and Havelock Sluicing Companies were operating steadily during the year. The returns from these claims show a decline in the yield of gold as compared with those of former years.

Waipori Claims.—Munro and George, with Rogers and party, were the most successful of the small parties of miners who are working in the creeks and gullies in this locality.

Waipori Flat.—The work of boring this flat, which was undertaken by the Dunedin City Corporation with the object of proving if it contained payable gold, was completed towards the end of the year. The results of the boring showed that the alluvial deposits which form the flat consist of alternate layers of clay and quartz gravels to a depth of 167 ft. below the surface, and that the area bored does not contain gold in sufficient quantity to enable it to be profitably worked.

Teviot-Molyneux Gold-mining Company (Roxburgh).—Sluicing and elevating has been carried on throughout the year. It is estimated that 195,000 cubic yards of gravel were treated for a return of gold valued at £1,287, which is equal to 1·58d. per cubic yard of material operated upon. Since the company commenced sluicing an area of about 10 acres has been worked. The results obtained show clearly that the ground does not contain sufficient gold to pay for working.

Ladysmith Gold-mining Company (Roxburgh).—During the year this company was engaged in testing new ground to the north of the old claim. As the results were unsatisfactory the company ceased operations and went into liquidation.

MANIOTOTO COUNTY.

Naseby.—A number of small parties of miners continue to work the alluvial deposits in Enterprise, Main, and Spec Gullies, where water from the Government races is available for sluicing and elevating.

Scandinavian Water-race Company (St. Bathan's).—This company is elevating material from a depth of 110 ft. in the Kildare section of the claim. Operations are hampered by a scarcity of suitable labour.

United M. and E. (St. Bathan's).—Payable returns are being obtained by this company. The year's operations resulted in the production of gold valued at £1,041, and payment of dividends amounting to £228.

Morgan Bros. (Cambrian).—This party of three men produced 1,655 oz. of gold, valued at £6,620, from a deposit of quartz drift which they discovered while sluicing in the bed of Cambrian Creek. The discovery of a rich run of gold in this old and almost abandoned field is important, and goes to show that the auriferous deposits which extend along the base of the Dunstan Range from St. Bathan's to Devonshire are by no means exhausted, as is generally supposed.

VINCENT COUNTY.

Devonshire.—Clare and party have taken up a claim on this old abandoned field, and have bought some of the Mount Morgan Company's water-rights, which will be used for sluicing and elevating. A tail-race is being constructed to convey sludge-water from the claim to Tinker's sludge-channel.

Matakanui.—The Undaunted Tinkers Gold-mining Company has worked steadily during the year. Five men were employed.

Nevis.—Mining in this locality was hampered by a scarcity of labour and the severity of the winter season. Six claims were worked during summer and autumn. In most cases the returns were small.

LAKE COUNTY.

Shotover River.—The number of claims working in this locality has decreased to six. Five of these produced gold. Atley Bros. have been engaged in repairing the water-races and dams used in working their claim near Long Gully. A considerable amount of damage was caused by floods during their absence on active service. Assistance by way of subsidy was granted towards putting the claim in order.

WAITAKI COUNTY.

Maerewhenua and Livingstone.—Returns from these localities show a decline in the yield of gold and number of men employed.

SOUTHLAND COUNTY.

Muddy Terrace Sluicing Company (Waikaia).—Two faces were worked in Maori Gully during the year. Water under a pressure of 100 ft. was used for breaking down the clay and gravel. Sixteen men were employed, and gold to the value of £1,873 produced.

Nokomai Hydraulic Sluicing Company.—This company's two claims in Victoria Gully have been worked steadily. The yield of gold for the year amounted to 1,525 oz., valued at £5,647. Thirty men were employed.

WALLACE COUNTY.

Round Hill Mining Company.—Owing to the scarcity of suitable labour the company's No. 2 claim could not be worked during the year. Sixteen men were employed at No. 1 claim and attending to water-races. Gold valued at £4,543 was produced.

Ourawera Gold-mining Company (Round Hill).—Sluicing and elevating from a depth of 50 ft. Fifteen sluice-heads of water are available under an hydraulic head of 450 ft. Eight men employed. Yield of gold for the year was valued at £2,392.

Dredge Mining.

Fifteen dredges were in commission and ten were dismantled during the year.

The Kura, a privately owned dredge, working near Freshford, was the most successful, producing gold valued at £6,000.

The Electric No. 1 dredge was purchased by Mr. James Goodger, of Cromwell, and has resumed work on the Kawarau River, near Bannockburn.

Minerals other than Gold.

Scheelite.—Owing to the cancellation of the Imperial Government's purchasing contract on the 30th April the production of scheelite ceased from that date. The output during the period of four months amounted to 90 tons 16 cwt., valued at £21,028. Producers were compensated by the Imperial authorities for cancellation of contract, and in every case were satisfied with the treatment received.

Accidents.

FATAL.

There were no fatal accidents in the Southern Inspection District during 1919.

SERIOUS.

8th August: J. Christian, Livingstone—Broken collar-bone, caused by a fall of gravel in his own claim.

8th August: J. Meikle, Maerewhenua—Fracture of leg, caused by a fall of clay in his own claim.

11th November: D. McKenzie, Junction Mine, Glenorchy—Fracture of leg, caused by a stone falling from the face.

ANNEXURE B.

SUMMARY OF REPORTS BY GOVERNMENT WATER-RACE MANAGERS.

WAIMEA–KUMARA WATER-RACES, WESTLAND (Mr. JAMES ROCHFORD, Manager).

Waimea Water-race.

The construction of the original Waimea water-race was completed about 1874. Its total length, including extension of Branch B to Scandinavian Hill and the Waimea Extension additional supply from Macpherson's Creek to the Kawhaka Saddle, is 19 miles 44 chains, and the total cost of construction approximately £127,600. The main race has a maximum carrying-capacity of 30 sluice-heads, and both it and the several branches are in good repair.

Branch Race to Callaghan's and Middle Branch Flat.

The construction of the Callaghan's water-race from the outlet of the Waimea pipe-line to Callaghan's Flat was completed in 1897 at a cost of approximately £5,950. Its length is 4 miles 62 chains, and carrying-capacity 25 sluice-heads to the junction with the Middle Branch race. The inverted siphon leading to Callaghan's will take 15 sluice-heads.

Middle Branch race was constructed in 1901. The cost of construction of this race and small storage reservoir was about £1,800. The length of this race from the reservoir to Middle Branch Flat is about one mile, and carrying-capacity 30 sluice-heads.

With the exception of some necessary repairs to several flumings both these races are in good order.

Kumara Water-race.

The original race was constructed in 1878, and some branches now included some years later. The total length, including Kapitea Hill race, is three and three-quarter miles, and its construction has cost, including Nos. 1 and 2 reservoirs and various branches, about £41,760. The head-race tunnel has a carrying-capacity of 140 sluice-heads, but from there to the Taramakau siphon the carrying-capacity is reduced to 60 sluice-heads. The tunnel and open ditching portions of the race are in fairly good repair, but many of the old 30 in. steel pipes of the inverted siphon between Dillmanstown and Kumara need replacing.

Kumara Supply Race.

The intake is in the Kawhaka Creek, about one and a quarter miles below the headworks of the Waimea water-race, and it terminates at the headwaters of the Kapitea Creek, covering a distance of about five miles. This race, which was completed in 1881 at a cost of £5,400, has a carrying-capacity of 35 sluice-heads, and was meant to augment the Kumara water-race supply.

There has been little demand for water from the Kumara reservoir of late years, and as this race has not been used for a considerable time repairs costing £600 to £700 will be required to put it in working-order.

Kumara trans-Taramakau Water-race.

This race was constructed in 1912, and comprises two miles of inverted siphon across the Taramakau Valley and 1 mile 56 chains of open ditching. The total cost of construction, including reservoir and pipe bridge, was about £21,900. The carrying-capacity of the siphon to reservoir-level is 15 sluice-heads and to water-race level 30 sluice-heads, while the open ditching from the reservoir to Quinn's Terrace will carry 60 sluice-heads. This race is in good order except for certain sections of steel piping in the inverted siphon.

Erin-go-Bragh Water-race.

This race was purchased in 1913, and takes its intake from the big Hohonu and runs to a storage reservoir at Revell's Terrace, from which a branch race leads to Argus Terrace. The expenditure on this race, including widening, repairs to ditching, and extension, has amounted to about £2,900. The carrying-capacity to the reservoir is about 12 sluice-heads, and from there to Argus Terrace about 28 sluice-heads. The length of the race is about five miles, and the whole of it is in fair order.

Wainihinihi Water-race.

This race was constructed in 1901, and comprises 95 chains of ditching and 35 chains of rock tunnel, at a total cost of about £16,000. The carrying-capacity is 35 sluice-heads, and the race is in good order.

Summary showing Results of working the Waimea–Kumara Water-races during the Year ended 31st March, 1920.

Name of Water-race.	Expenditure.	Cash received.	Sales of Water.	Authorized Free Water supplied.	Outstanding on 31/3/20.	Collateral Advantages.		
						Number of Men employed.	Gold obtained.	Value of Gold obtained.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.		Oz.	£ s. d.
Waimea	1,037 16 1	494 3 8	508 9 1	..	114 1 0	10·75	685	2,688 12 6
Kumara	410 6 5	20 15 0	19 15 0	..	394 8 11	..	..	..
Callaghan's ..	228 3 5	27 3 0	15 1 3	..	32 16 0	0·66	38	149 3 0
Trans-Taramakau	358 19 0	44 16 8	39 12 3	..	128 7 9	4·66	201	788 18 6
Erin-go-Bragh ..	351 17 9	72 13 1	72 13 1	..	23 6 10	5·66	340	1,334 10 0
Totals for 1920	2,387 2 8	659 11 5	655 10 8	180 8 11	693 0 6	24·73	1,264	4,961 4 0
Totals for 1919	1,946 13 9	875 15 8	821 19 8	23 0 11	669 7 9	23·07	1,380	5,416 10 0
Decrease ..	*440 8 11	216 4 3	166 9 0	*157 8 0	*23 12 9	1·34	116	455 6 0

* Increase.

Mount Ida Water-race, Central Otago (Mr. J. C. Buchanan, Manager).

The Mount Ida water-race is about seventy miles in length, the lower forty miles of which has a carrying-capacity of 22 to 32 sluice-heads and is in good order. The capacity of this race gradually increases, and it is from the Eweburn reservoir for a distance of twelve miles that it is capable of delivering the full 32 sluice-heads. The upper part of this race, some thirty miles in length, had formerly a carrying-capacity of 10 to 15 sluice-heads, but this portion is not in good order as no steps have been taken to repair the damage done by the flood of May, 1917.

The branch races leading from Coalpit dam, four miles in length and having a capacity of 22 sluice-heads, are in good order, as well as those, about two miles in length, leading to Upper and Lower Spec Gully.

The Blackstone Hill race, which commences at Johnstone's Creek, and after a course of eight miles terminates at the lower saddle between Ida and Upper Manuherikia Valleys, has a carrying-capacity of 15 sluice-heads. This race has not been used for a number of years, and requires repairing.

Summary showing Results of working the Mount Ida Water-race during the Year ended 31st March, 1920.

——	Expenditure.	Cash received.	Sales of Water.	Authorized Free Water supplied.	Outstanding on 31/3/20.	Collateral Advantages.		
						Number of Men employed.	Gold obtained.	Value of Gold obtained.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.		Oz.	£ s. d.
Totals for 1920 ..	1,669 6 10	738 10 5	738 10 5	61 2 7	..	15·5	836	3,218 12 0
Totals for 1919 ..	1,403 11 9	706 14 9	706 14 9	63 1 11	..	12·16	796	3,064 12 0
Increase ..	265 15 1	31 15 8	31 15 8	*1 19 4	..	2·34	40	154 0 0

* Decrease.

ANNEXURE C.

Summary of the Report by the Inspector of Stone-quarries for the North Island (Mr. James Newton).

The greater portion of the period has been spent in visiting the various districts for the purpose of actual inspection, whilst the remainder has been occupied at clerical work in the Auckland office. A large percentage of the quarries, mostly in outlying districts, have been operated intermittently, and I have inspected such places when passing through the several districts, whether work was being carried on at the time of my visit or not.

I have found generally that reasonable care with regard to the safe working of quarry-faces has been exercised by those persons in charge of operations. Most of the quarries are now being worked from the top downwards by benching, or else put on a satisfactory batter and worked from the bottom upwards in shallow faces, allowing the material to fall safely and easily to the foot of the face. This safe condition of the quarry-faces, in my opinion, has been brought about by careful inspection in the past by the Department's officials. Much improvement has also been effected in the matter of care in the storage of explosives.

I desire again to express the opinion that the minimum height of a quarry-face—namely, 20 ft.—required to bring a quarry within the scope of the Stone-quarries Act is too great. I have made a point of visiting a number of such places, and in some cases have found conditions which in my opinion should not exist, both with regard to the working of the quarry-face and the handling and care of explosives.

I regret to have to report that the industry has not been free from accidents during the period under review, one fatal and two serious accidents having occurred. Details of the former accident are supplied in the tabulated remarks of the Inspecting Engineer for Metalliferous Mines.

ANNEXURE D.

MINING STATISTICS.

Table 1.

STATEMENT SHOWING THE QUANTITY OF QUARTZ CRUSHED AND GOLD OBTAINED IN THE HAURAKI MINING DISTRICT FOR THE YEAR ENDED 31ST DECEMBER, 1919.

Locality and Name of Mine.	Average Number of Men employed.	Quartz crushed.	Gold obtained. Amalgam.	Gold obtained. Cyanide.	Value.
THAMES COUNTY AND BOROUGH.					
Tapu—		Tons cwt. qr. lb.	Oz. dwt.	Oz. dwt.	£ s. d.
Mahara Royal	2	Cleaning up battery	60 2	..	112 13 9
Tararu—					
Charles Berry	1	Sluicing in Tararu Creek	33 16	..	86 10 11
Waiotahi—					
Waiotahi	5	255 3 0 0	160 3	..	496 1 0
Nonpareil	2	8 2 2 26	357 9	..	920 19 3
Evening Star	2	4 0 3 3	250 4	..	621 4 1
Karaka—					
Magnet Extended	2	7 0 1 22	115 19	..	252 3 2
Occidental	4	15 0 1 22	151 17	..	397 5 10
West Coast	2	0 0 2 25	76 2	..	240 6 1
McGregor's Battery	1	Cleaning up battery	51 8	..	135 18 3
Thames foreshore	2	Re-treating tailings	..	123 0	214 13 10
Tairua—					
Golden Hills	2	440 0 0 0	544 19	..	1,241 0 9
Golden Belt	4	23 0 0 0	526 9	..	362 8 7
Prospectors	6	2 7 0 12	350 14	..	939 3 0
Totals	35	754 15 0 26	2,679 2	123 0	6,020 8 6
WAIHI BOROUGH.					
Waihi—					
Waihi Mine	578	160,510 16 2 18	..	411,903 5	303,586 7 11
Waihi Grand Junction	285	55,441 13 1 9	..	84,648 7	97,899 0 11
Totals	863	215,952 9 3 27	..	496,551 12	401,485 8 10
OHINEMURI COUNTY.					
Owharoa—					
Rising Sun	12	1,220 0 0 0	659 0	1,297 1	2,880 3 7
Karangahake—					
Talisman	89	3,655 0 0 0	12,204 0	9,409 16	46,598 4 0
Maratoto—					
United Mines	8	791 0 0 0	..	288 0	358 14 2
Ohinemuri Gold and Silver Mines	12	5 15 3 0	(Treated by smelt in Australia)		440 9 11
Totals	121	5,671 15 3 0	12,863 0	10,994 17	50,277 11 8
PIAKO COUNTY.					
Waiorongomai—					
Bendigo Mine	5	60 0 0 0	..	297 0	99 15 4
COROMANDEL COUNTY.					
Waikoromiko—					
Four-in-Hand Mines	2	75 0 0 0	145 0	..	406 0 0
Driving Creek—					
Zealandia	2	0 10 0 0	3 0	..	6 0 0
Prospectors	..	..	..	..	..
Totals	4	75 10 0 0	148 0	..	412 0 0
TAURANGA COUNTY.					
Te Puke—					
Muir's Gold Reefs (Limited)	50	4,100 0 0 0	..	6,426 9	17,703 7 6
SUMMARY.					
Thames County and Borough	35	754 15 0 26	2,679 2	123 0	6,020 8 6
Waihi Borough	863	215,952 9 3 27	..	496,551 12	401,485 8 10
Ohinemuri County	121	5,671 15 3 0	12,863 0	10,994 17	50,277 11 8
Piako County	5	60 0 0 0	..	297 0	99 15 4
Coromandel County	4	75 10 0 0	148 0	..	412 0 0
Tauranga County	50	4,100 0 0 0	..	6,426 9	17,703 7 6
Totals, 1919	1,078	226,614 10 3 25	15,690 2	514,392 18	475,998 11 10
Totals, 1918	1,228	259,103 5 2 25	22,269 9	786,312 7	615,063 12 11
Decrease	150	32,488 14 3 0	6,579 7	271,919 9	139,065 1 1

NOTE.—Ore treated given in long tons.

During the year seventy-five men were employed at unproductive quartz-mining operations.

STATEMENT SHOWING THE QUANTITY OF QUARTZ CRUSHED AND GOLD OBTAINED IN THE WEST COAST INSPECTION DISTRICT FOR THE YEAR ENDED 31ST DECEMBER, 1919.

Locality and Name of Mine.	Average Number of Men employed.	Quartz crushed.	Gold obtained. — Amalgam.	Gold obtained. — Cyanide.	Estimated Value.
MARLBOROUGH.					
Wakamarina—					
Dominion Consolidated ..	30	Tons. 8,443	Oz. dwt. gr. 1,196 0 0	Oz. dwt. gr. ..	£ s. d. 4,485 0 0
NELSON.					
Waiuta—					
Blackwater	113	24,969	9,661 5 0	1,451 15 0	43,582 15 5
	..	..	..	*892 8 0	2,553 19 8
Big River—					
New Big River	37	4,254	2,907 5 0	326 2 0	12,447 4 11
	..	..	..	*216 0 0	750 15 5
Globe Hill—					
Progress	70	15,980	3,578 13 0	846 15 0	17,755 7 11
	..	..	..	*951 19 0	2,992 18 6
Crushington—					
New Keep-it-Dark	12	..	..	9 11 0	20 5 10
Consolidated Goldfields ..	17	..	..	127 19 0	376 8 9
	..	..	..	*136 9 0	386 4 7
Inglewood—					
Murray Creek	40	4,512	1,910 17 0	339 14 0	8,543 11 2
	..	..	..	*352 8 0	1,431 14 9
WESTLAND.					
Ross—					
Mount Greenland	7	679	590 8 12	..	2,336 16 6
Stillwater—					
Victory Mine	5	100	12 16 0	..	49 5 7
Totals	331	58,937	19,857 4 12	5,651 0 0	97,712 9 0
SUMMARY.					
Marlborough	30	8,443	1,196 0 0	..	4,485 0 0
Nelson	289	49,715	18,058 0 0	5,651 0 0	90,841 6 11
Westland	12	779	603 4 12	..	2,386 2 1
Totals, 1919 ..	331	58,937	19,857 4 12	5,651 0 0	97,712 9 0
Totals, 1918 ..	398	86,495	27,522 18 5	4,460 19 0	127,846 8 2
Decrease	67	27,558	7,655 13 17	†1,190 1 0	30,133 19 2

* From concentrates.
† Increase. The return this year includes gold won from concentrates treated overseas. This information has not hitherto been supplied for inclusion in annual returns.

During the year, sixty-six persons were employed on unproductive mining operations. In addition to gold the Dominion Consolidated Mine produced 21 tons 1 qr. of scheelite concentrates, but did not dispose of them. James M. Cadigan, who re-treats the tailings from this mine, recovered 11 tons, of which 5 tons were sold, realizing £150 per ton.

STATEMENT SHOWING THE QUANTITY OF QUARTZ CRUSHED AND GOLD OBTAINED IN THE SOUTHERN MINING DISTRICT FOR THE YEAR ENDED 31ST DECEMBER, 1919.

Locality and Name of Mine.	Average Number of Men employed.	Quartz crushed.	Gold obtained.	Estimated Value.
VINCENT COUNTY.				
Bendigo—		Tons.	Oz. dwt. gr.	£ s. d.
Come-in-Time	2	427	17 0 0	54 14 8
Alto	2	8	9 10 0	35 10 0
Old Man Range—				
Advance	2	40	41 0 0	193 15 0
Totals	6	475	67 10 0	283 19 8
WAIHEMO COUNTY.				
Macrae's—				
Golden Point	5*	26	6 4 1	23 0 0
Deep Dell	3*	4¾	0 18 20	3 7 6
Totals	8	30¾	7 2 21	26 7 6
SUMMARY.				
Vincent County	6	475	67 10 0	283 19 8
Waihemo County	8	30¾	7 2 21	26 7 6
Totals, 1919	14†	505¾	74 12 21	310 7 2
Totals, 1918	24	1,690	226 18 22	821 7 11
Decrease	10	1,184¼	152 6 1	511 0 9

* 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.
† Nine men were employed at non-productive 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, 1917, 1918, AND 1919.

Mining District.	Inspection District.	Year ended 31st December, 1917.	Year ended 31st December, 1918.	Year ended 31st December, 1919.
		£	£	£
Hauraki	Northern ..	751,974	615,064	475,998
Marlborough, Nelson, and West Coast ..	West Coast ..	158,007	127,846	97,712
Otago and Southland..	Southern ..	1,818	821	310
Totals	..	911,799	743,731	574,020

Table 2.

GROSS TOTALS AND VALUE OF BULLION PURCHASED BY BANKS FOR THE YEAR ENDED 31ST DECEMBER, 1919.

Bank.	Bullion purchased.	Value.
Hauraki Mining District (Northern Inspection District).		
	Oz. dwt. gr.	£ s. d.
Bank of New Zealand	20,959 18 0	63,742 0 11
National Bank of New Zealand	61,519 0 0	185,405 0 11
Totals	82,478 18 0	249,147 1 10
Marlborough, Nelson, and Westland Mining Districts (West Coast Inspection District).		
Bank of New Zealand	2,640 1 12	10,434 4 4
National Bank of New Zealand	12,863 7 13	49,213 15 1
Bank of New South Wales	2,869 2 20	11,233 13 3
Private buyers	405 0 0	1,582 10 9
Totals	18,777 11 21	72,464 3 5
Otago Mining District (Southern Inspection District).		
Bank of New Zealand	15,124 2 3	58,274 19 4
National Bank of New Zealand	5,928 12 3	23,041 8 0
Bank of New South Wales	4,823 18 10	18,578 2 7
Bank of Australasia	39 1 10	149 0 7
Commercial Bank of Australia	79 8 12	286 13 3
Totals	25,995 2 4	100,330 3 9
Totals, 1919	127,251 12 1	421,941 9 0
Totals, 1918	224,774 3 7	584,358 13 3
Totals, 1917	319,013 12 9	731,065 2 4

APPENDIX B.

REPORTS RELATING TO THE INSPECTION OF COAL-MINES.

The Inspecting Engineer of Mines to the Under-Secretary of Mines.

Sir,— Wellington, 31st March, 1920.

I have the honour to present my annual report, together with statistical information, in regard to coal-mines of the Dominion, for the year ended 31st December, 1919, in accordance with section 78 of the Coal-mines Act, 1908.

The statistical tables here published are in the same form as personally compiled by me and published in the Mines Statement and Year-book during the past fourteen years, likewise as supplied in advance by me by request to the Board of Trade and published by such Board without acknowledgment in its report on the Coal Industry, 1919.

The report is divided into the following sections:—

I. Output of Mineral.

II. Persons employed.

III. Accidents.

IV. Working of the Coal-mines Act—

(*a.*) Ventilation.
(*b.*) Inflammable Gas and Safety-lamps.
(*c.*) Systematic Timbering.
(*d.*) Permitted Explosives.
(*e.*) Crushing of Coal Pillars and Subaqueous Mining.
(*f.*) Inspection of Old Workings.
(*g.*) Mine Rescue Work.
(*h.*) Electricity at Collieries.

V. Legislation affecting Coal-mining.

Annexures—

A. Summary of Annual Reports by Inspectors of Mines.
B. Colliery Statistics.

SECTION I.—OUTPUT.

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

Class of Coal.	Output of Coal during 1919.				Total Output to the End of 1919.
	Northern District.	West Coast District.	Southern District.	Total.	
	Tons.	Tons.	Tons.	Tons.	Tons.
Bituminous and semi-bituminous	115,390	845,717	...	961,107	32,132,112
Brown	393,841	109	290,381	684,331	15,164,488
Lignite	2,220	...	200,190	202,410	2,744,088
Totals for 1919 ...	511,451	845,826	490,571	1,847,848	50,040,688
Totals for 1918 ...	549,778	997,089	487,383	2,034,250	48,192,840

The decline in the annual output was chiefly due to restriction of work by miners at the principal collieries. The output per person employed below ground has declined from 750 tons during 1916 to 648 tons during 1919.

The number of operative collieries was 138, of which the 16 most productive won 1,375,789 tons, being an average of 641 tons per person employed below ground; the 122 smaller collieries, where little or no restriction occurred, produced 472,059 tons, being an average of 671 tons per person employed below ground. As the principal collieries are better developed and equipped for a larger production per miner than are the smaller collieries, the fact that the latter have produced more coal per miner during 1919 appears to be conclusive evidence as to the chief cause of the decline of coal-output for the Dominion.

No new colliery arrived at the output stage during the year.

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

Name of Colliery.	Locality.	Class of Coal.	Output for 1919.	Total Output to 31st December, 1919.	Total Number of Persons ordinarily employed.
Northern District.			Tons.	Tons.	
Hikurangi	Hikurangi...	Semi-bituminous	77,845	1,243,128	123
Taupiri Extended	Huntly ...	Brown ...	172,561	2,557,757	351
Rotowaro	Rotowaro...	" ...	73,990	107,264	120
Pukemiro	Pukemiro...	" ...	89,261	385,685	150
Waipa	Glen Massey	" ...	54,168	442,952	89
West Coast District.					
Westport (2 collieries) ...	Millerton ...	Bituminous	217,630	5,710,151	345
	Denniston	"	147,766	7,928,984	373
Westport-Stockton	Mangatini	"	129,125	1,486,737	274
State (2 collieries) Point Elizabeth...	Dunollie ...	Semi-bituminous	45,885	2,396,708	63
State (2 collieries) Liverpool ...	Rewanui ...	Bituminous	121,710	707,194	304
Blackball	Blackball ...	"	94,016	2,803,655	284
Southern District.					
Kaitangata and Castle Hill (3 collieries)	Kaitangata	Brown ...	103,550	3,736,030	297
Nightcaps (2 collieries)	Nightcaps...	" ...	48,282	1,356,231	99
122 other New Zealand collieries ...	All coalfields	Various ...	472,059	19,178,212	1,072
Totals	...	...	1,847,848	50,040,688	3,944

SECTION II.—PERSONS EMPLOYED.

Inspection District.	Average Number of Persons employed during 1919.		
	Above Ground.	Below Ground.	Total.
Northern	242	697	939
West Coast	498	1,393	1,891
Southern	355	759	1,114
Totals, 1919	1,095	2,849	3,944
Totals, 1918	1,102	2,892	3,994

There has been experienced a considerable shortage of skilled miners on the West Coast and Otago coalfields. In the North Island a number of Maoris are now working in the collieries, and they make very fair miners.

The following statement shows the tons of coal and shale raised, persons employed, lives lost by accidents in or about coal-mines, &c., from 1878 to 1919:—

Year.	Output, in Tons.	Persons employed.			Tons raised per each Person employed Underground.	Lives Lost by Mining Accidents.		
		Above Ground.	Below Ground.	Total.		Per Million Tons raised.	Per Thousand Persons employed.	Number of Lives Lost.
Prior	709,931	...	...	...	...	...	...	...
1878	162,218	147	366	513	443	*	*	0
1879	231,218	...	...	802	...	194·64	44·00	35†
1880	299,923	...	...	1,038	...	6·66	1·92	2
1881	337,262	...	...	963	...	2·96	1·04	1
1882	378,272	...	...	1,043	...	5·28	1·91	2
1883	421,764	361	888	1,249	475	4·74	1·60	2
1884	480,831	393	890	1,283	540	6·23	2·34	3
1885	511,063	338	1,145	1,483	456	5·87	2·01	3
1886	534,353	392	1,213	1,605	440	*	*	0
1887	558,620	388	1,111	1,499	503	7·16	2·66	4
1888	613,895	414	1,275	1,689	481	6·51	2·36	4
1889	586,445	466	1,251	1,717	468	6·82	2·37	4
1890	637,397	512	1,334	1,846	477	12·55	4·33	8
1891	668,794	416	1,277	1,693	523	5·98	2·36	4
1892	673,315	485	1,196	1,681	563	1·48	0·66	1
1893	691,548	590	1,298	1,888	533	7·23	2·64	5
1894	719,546	506	1,393	1,899	516	8·33	3·16	6
1895	726,654	525	1,274	1,799	618	6·88	3·33	5
1896	792,851	590	1,347	1,937	588	83·24	34·07	66‡
1897	840,713	531	1,381	1,912	609	4·75	2·09	4
1898	907,033	556	1,447	2,003	627	1·10	0·49	1
1899	975,234	554	1,599	2,153	609	3·07	1·39	3
1900	1,093,990	617	1,843	2,460	593	3·65	1·62	4
1901	1,239,686	688	2,066	2,754	600	2·42	1·09	3
1902	1,365,040	803	2,082	2,885	655	1·46	0·69	2
1903	1,420,229	717	2,135	2,852	665	2·81	1·40	4
1904	1,537,838	763	2,525	3,288	609	2·60	1·21	4
1905	1,585,756	833	2,436	3,269	651	3·78	1·83	6
1906	1,729,536	1,174	2,518	3,692	687	3·46	1·62	6
1907	1,831,009	1,143	2,767	3,910	662	6·55	3·07	12
1908	1,860,975	992	2,902	3,894	641	2·68	1·28	5
1909	1,911,247	1,159	3,032	4,191	633	3·65	1·79	7
1910	2,197,362	1,136	3,463	4,599	634	7·28	3·55	16
1911	2,066,073	1,365	2,925	4,290	706	6·77	3·26	14
1912	2,177,615	1,130	3,198	4,328	681	4·13	2·08	9
1913	1,888,005	1,053	3,197	4,250	590	3·18	1·38	6
1914	2,275,614	1,176	3,558	4,734	639	21·53	10·35	49§
1915	2,208,624	1,050	3,106	4,156	711	4·07	2·16	9
1916	2,257,135	988	3,000	3,988	750	2·65	1·50	6
1917	2,068,419	1,090	2,893	3,983	715	1·93	1·00	4
1918	2,034,250	1,102	2,892	3,994	703	2·95	1·50	6
1919	1,847,848	1,095	2,849	3,944	648	5·41	2·53	10
Totals ...	50,055,131	...	...	...	...	...	...	345

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

SECTION III.—ACCIDENTS.

The following is a summary of coal-mining accidents during 1919, 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 or coal-dust	...	...	...	...
Falls of ground	7	7	3	3
Explosives...	...	...	1	1
Haulage	3	3	6	6
Miscellaneous—Underground...	...	...	6	6
On surface ...	...	...	1	1
Totals	10	10	17	17

The death-rate from accidents was 2·53 per thousand persons employed, or 5·41 per million tons of coal produced, as compared with 5·86 per million tons for the coal-mines of the United Kingdom during 1918, the latest year of the published statistics. It is gratifying to state that since 17th November, 1919, there has been no fatal colliery accident to this date, 30th June, 1920.

The proportion of fatal accidents in the Dominion during 1919, although lower than in America or South Africa, shows an increase which is to be regretted, as there had been since 1914 a gradual decrease. As during previous years, the most prolific cause of accidents was falls of ground. A full description of the foregoing fatal accidents is given on the following page. Particulars regarding the serious non-fatal accidents referred to in the above table are contained in the reports of Inspectors of Mines, which appear in Annexure A hereto. The accidents classed as serious with non-fatal results include those which cause any fracture of the head or of any limb, or of any dislocation of a limb, or any other serious personal injury.

As regards the seven fatal accidents from falls, four of these—viz., those which happened to A. E. Hawkins, T. Blight, R. Grundy, and J. Shearer—appear from the evidence to be of that class for which the judgment of the sufferer was chiefly responsible—such accidents as are inseparable from mining. The accidents by falls to W. Kirk, R. W. Smith, and J. Penman were due to neglect in permitting the deceased to work in dangerous places, but the two first-named were contributory to such neglect. In the case of the two last-named the mine-managers respectively were convicted and fined.

In connection with the three fatalities due to haulage, that which caused the death of J. A. Weir was due to his illegally riding on a coal-truck without permission, in a low underground roadway, but for subsequent breaches of the law in connection with this case the acting-manager was convicted and substantially fined. The haulage fatalities to W. Muncaster and P. J. Rutledge were due to misadventure for which no person appeared to be blameworthy.

The following is a description of fatal accidents at or about coal-mines during 1918:—

Date.	Name and Situation of Colliery.	Name, Age, and Occupation of Person killed.	Description of Accident, and Remarks.
8 July, 1918; died 8 May, 1919.	Kaitangata No. 1 Colliery, Kaitangata	Alfred Ernest Hawkins (37), miner	A deputy on his morning round of inspection prior to the commencement of work detected on a trucking-road in No. 6 dip section several sets of broken props. Owing to a shortage of shift-men for effecting repairs it was arranged that four miners, including deceased, instead of proceeding to their working-places, should repair the timbering by erecting other props under the bars alongside the broken props. These four miners proceeded to this work and were engaged preparing props prior to erection when, without warning, a large fall of coal and timber occurred. Two of the party were partly buried, but not seriously injured, but deceased sustained a compound fracture of the right tibia, together with severe body-bruises and a wound of the scalp. On the 11th December his leg was amputated, but he died on the 8th May, 1919, of blood-poisoning. The Coroner held no person to blame. Regarding this accident it may be stated that repairing timber is a necessary but often a dangerous operation; also that timber on trucking-roads should not be allowed to become so broken as to collapse without giving warning. The admitted shortage of shift-men may have some bearing on this accident.

Date.	Name and Situation of Colliery.	Name, Age, and Occupation of Person killed.	Description of Accident, and Remarks.
1919.			
31 Jan.	Kaitangata No. 2 Colliery, Kaitangata	James Archibald Weir (42), rope-attendant	He was sitting on the front of the first truck of a rake which was being hauled at a normal speed by a winch up No. 1 dip haulage-road. When passing through a hanging brattice-screen it caught his head and he was turned over and was crushed side on against the coal roof about 1 ft. 10 in. above the truck, and then thrown violently into the truck, receiving a crushed pelvis and severe bruises on his side, the shock from which brought on heart-failure, from which he died about three days later. He had recently the influenza, and had not entirely recovered. In connection with this accident the deputy mine-manager, Mr. Frederick Carson, was prosecuted by the Inspector of Mines for a breach of section 62, paragraph (1), of the Coal-mines Act for failure to notify the Inspector by telegram of this serious accident, also with a breach of paragraph (5) of the same section by having, prior to the visit of the Inspector, the low coal roof brushed against which deceased was crushed. For each of these offences the defendant was fined £10, with £3 3s. solicitor's fee, amounting in all to £26 6s. In defence Mr. Carson stated that at the time of the accident he was not of the opinion that it was a serious accident requiring notification by telegram. At subsequent proceedings taken by the widow she was awarded £1,500 as compensation for neglect by the owners, the jury finding that the deceased was riding on a truck in a drive which was dangerously low without permission of the mine-manager, in contravention of Special Rule 54, the manager being aware of such contravention.
22 Feb.	Archer's Coal-mine, Capleston	William Kirk (46), miner	He was getting coal on the surface at a place overhanging 4 ft., being the commencement of a dip heading; no sprag or props were erected. A fall of about 2 tons of coal and stone occurred, burying him and killing him instantly. The cause of death was laceration of the lung and hæmorrhage. The mine-owner and permit-holder, Mr. F. W. Archer, stated that he instructed deceased on the previous day to put up timber at the place. The place of the accident had not been inspected by the manager on the day of the accident prior thereto. There was no other official employed; only three men and a boy were working at this mine. A breach of section 40, paragraph (42), appears to have occurred in not having such inspection. A somewhat similar fatal accident occurred during the previous year at Moss Bank Coal-mine.
25 April	Point Elizabeth State Colliery, Dunollie	William Muncaster, jun. (32), trucker	He was employed to hang on trucks at the bottom of a jig at No. 1 bank, No. 2 section. He gave a signal for a race of two trucks to be jigged. The man at the top of the jig, which was 4 chains long, inclined 1 in 5, when pushing the full trucks over the brow at the top accidentally uncoupled the front truck, which travelled down the jig at great speed, striking deceased, who was standing in the roadway, breaking his leg, also causing internal injuries and profound shock, from which he died on the following day. The coupling which became detached was not the usual chain coupling, but a piece of endless-rope clip chain. This should not have been used as a coupling. Work was immediately resumed at the place of accident, in contravention of section 62, paragraph (5), of the Coal-mines Act, the mine-manager not thinking it constituted a serious accident.
5 May	Black Diamond (late Tinker's) Colliery, near Nightcaps	Thomas Blight (36), miner	He was working at a coal-face, 12 ft. wide and between 6 and 7 ft. high, the whole thickness being mined. Passing across the face at an angle of about 45° was a clay joint or "greasy back": this continued into the roof-stone. The place was timbered with a double row of props to within 6 ft. of the face; there was no sprag or prop at the face. Without warning a piece of roof-stone weighing about 5 cwt. fell from the "greasy back," striking deceased and inflicting injuries from which he succumbed on the 7th August following. The examining deputy and workmen's inspectors considered the place adequately timbered and safe, but this accident proved otherwise. The Coroner's jury held no person blameworthy. As regards this accident, the "greasy back" at the face should have served as a warning that the roof was treacherous, and one or more props should have been put up at the face.
22 May	Westport-Stockton Colliery, near Ngakawau	Percival John Rutledge (23), electric-loco driver	He was proceeding with a race of twenty empty trucks, the loco being behind such trucks, pushing them. At a stage in the journey he gave the brakesman, who was also an experienced driver, charge of the loco, and then he went along the trucks to the first empty one in front of the race. While the race was travelling he signalled to the driver by outstretching his arms, and, overbalancing, fell out of the truck under the race, receiving a fractured thigh and pelvis, also other injuries. He died from shock the following day. At the time of the accident deceased was not in his proper place. In the Coal-mines Act, section 40 (29), provision is made that the driver of a steam-engine shall not cease to have continual supervision of such engine, but no reference is made to electric locos, an omission which requires rectifying. The Coroner found no person to be blameworthy.

Date.	Name and Situation of Colliery.	Name, Age, and Occupation of Person killed.	Description of Accident, and Remarks.
1919.			
4 Aug.	Homebush Colliery, Glentunnel	John Penman (39), miner	On the 2nd August a fall of claystone roof occurred in No. 1 right-hand level, which was driven 18 ft. wide in a 3 ft. 6 in. coal-seam. By direction of the mine-manager, Mr. David Kane, this fall had been removed on the morning of the 4th August, the stone therefrom being used to build a pillar about 7 ft. square on the rise side of the roadway, and eighteen props with cap-pieces had been put up on the rise side of the roadway; no bars were used. A large loose stone was supported at one end by the built pillar, and elsewhere by four props. On this day two miners, A. Smith and G. F. Simpson, who worked at the face of the level, stated respectively to the deputy (Thomas Burt) and to the manager, that the place required attention and was unsafe, as the roof was "working." The two latter thought the place was safe, and the deputy passed the men in to work in the level. About 5.15 p.m. two miners, John Penman and John Simpson, who had fired a shot at the left-hand face of the same level, were passing under the aforesaid large stone on their way back to their working-place when the stone fell upon Penman, killing him at once, the props under the stone being thrown aside. The jury at the inquest considered the evidence too conflicting to warrant them finding any person negligent. In connection with this fatality legal proceedings were taken by the Inspector of Mines against Messrs. David Kane, mine-manager, and Thomas Burt, fireman-deputy, for a contravention of section 40, subsection (9), of the Coal-mines Act, 1908, in that the place of the accident had not been securely protected and made safe for persons employed therein. Each defendant was convicted and fined £5 1s. and £3 3s. costs. Proceedings were also taken against the mine-owners, the Homebush Brick and Coal Company (Limited), for failure to comply with the same section of the Coal-mines Act. The company was convicted and fined £2 and costs.
26 Aug.	Brighton Colliery, Brighton	Robert William Smith (53), miner	He was an experienced miner and was working in No. 1 section in an untimbered heading about 6 ft. wide and 5½ ft. high. The certificated manager, Mr. David McNeill, who that day acted also as examining deputy and trucker, stated at the inquest that in the morning he inspected the place and, considering it safe, passed the deceased into the place to work, although a piece of roof-stone had fallen during the previous night. He also stated that later during the morning he instructed deceased to take down some loose overhead stone. In the afternoon he again visited the place and, finding that his instructions had not been obeyed, he then emphatically told deceased to take the loose stone down at once. He then left the place to do some trucking without seeing his orders carried out. A few minutes later a slab of roof-stone, weighing about half a ton, fell upon deceased, causing injuries from which he expired shortly afterwards. In this mine timber was used only intermittently; the Inspector of Mines did not insist upon systematic timbering, as the drives were narrow. The Coroner held no person blameworthy. It is unfortunate that the manager was too preoccupied with his trucking to remain with deceased and see his orders obeyed. In connection with this fatality legal proceedings were taken by the Inspector of Mines against Mr. David McNeill, mine-manager, for a breach of Special Rule 21 for failing to withdraw deceased from an unsafe working-place. The defendant was convicted, and fined £5 and costs £3 10s.; likewise, under section 7 of the Coal-mines Amendment Act of 1914, his certificate was suspended for seven days.
8 Nov.	Kaitangata No. 1 Colliery, Kaitangata	Robert Grundy (38), miner	With two mates he was employed in Mundy's dip section at pillar-extraction. They were taking down head coal by the retreating method, and to do so a shot had been fired at the lip by a fireman-deputy. Before and after firing the place had been examined and considered safe by the fireman-deputy. The height to the coal roof was about 14 ft. A 12 ft. wooden pole with an iron ferrule was provided for sounding the roof, but no ladder was available for testing the roof and sides with a pick. Some hours after firing, while the men were filling the fallen coal at the gob side of the lip where the roof was unsupported, another fall of coal occurred, nearly covering deceased and inflicting injuries from which he succumbed the same day. The roof was only partly sounded by deceased and a mate shortly before the fall, and they evidently considered it safe. At the inquest which followed the Coroner held no person to be blameworthy. The operation of filling coal in high and unsupported places outside the lip during pillar-extraction by the retreating method is one of the most hazardous operations in connection with coal-mining in New Zealand, and it is necessary that the roof shall be frequently and efficiently examined. In this case it was not.

Date.	Name and Situation of Colliery.	Name, Age, and Occupation of Person killed.	Description of Accident, and Remarks.
1919. 17 Nov.	Westport-Stockton Colliery, near Ngakawau	James Shearer (38), fireman-deputy	As fireman-deputy he charged and fired a shot at the face of a bord for two miners. The bord was 17½ ft. wide and 10 ft. high; it was timbered by two rows of props with cap-pieces. About five minutes after firing and before the smoke had sufficiently cleared deceased returned towards the face followed by the two miners for the purpose of examining the same as required by Regulation 125. When within 10 ft. of the face a stone weighing several hundredweights fell from the roof, striking deceased and inflicting serious bodily injuries, to which he succumbed the same day. Subsequent inspection showed that the shot had knocked down a prop near the face, which had supported the fallen stone; the dense smoke probably prevented the deceased from observing this on returning after firing. At the inquest the Coroner held no person blameworthy.

SECTION IV.—WORKING OF THE COAL-MINES ACT.

(*a.*) Ventilation.

[Section 40.]

The standard of ventilation required by the Coal-mines Act of New Zealand is stricter than that provided for by the statutes of any other British possession, including the United Kingdom; for whereas other countries provide for either a quality or quantity standard for mine-ventilation, in this Dominion a standard for both is specified by law.

In all coal-mining statutes pertaining to safety in the Empire the following general provision is made that every coal-mine shall be adequately ventilated (this provision had its origin in the British Coal-mines Act of 1860): "An adequate amount of ventilation shall be constantly produced in every mine to dilute and render harmless inflammable and noxious gases to such an extent that all shafts, roads, levels, stables, and workings of the mine shall be in a fit state for working and passing therein."

In the British and New Zealand coal-mines Acts there is further added a standard of quality as follows: "And in particular that the intake airways up to within 100 yards of the first working-face which the air enters shall be normally kept free from inflammable gas: Provided that an abandoned road or level not used in connection with the working of the mine shall, if properly fenced off, not be deemed to be a road or level within the meaning of this section.

"For the purpose of the last preceding paragraph a place shall not be deemed to be in a fit state for working or passing therein if the air contains either less than 19 per cent. of oxygen or more than (1 per cent. New Zealand; British, 1¼ per cent.) of carbon dioxide."*

The British law further provides that "an intake airway shall not be deemed to be normally kept free from inflammable gas if the average percentage of inflammable gas found in six samples of air taken by an Inspector in the air-current (within 100 yards of the first working-place) in that airway, at intervals of not less than a fortnight, exceeds 0·25 per cent." This paragraph, which is not included in the Coal-mines Act of New Zealand, concludes the British ventilation provisions.

In this Dominion the law does not permit any person to work in a place where firedamp may be detected by a safety-lamp. In addition to a quality standard a standard of quantity is required, as follows: "The amount of air passing into the mine shall be such amount as may be prescribed by regulations, provided that in no case shall less than 150 cubic feet of air per minute be provided for every person, and 600 cubic feet of air per minute be provided for every horse or other animal, while employed underground. All air-measurements taken pursuant to the preceding paragraphs shall be taken at the entrance to each ventilating district, and, if the Inspector so requires, at each working-face, and shall at such places be not less in volume than the minimum allowance aforesaid for every person and horse or other animal."

The quantity standard of ventilation required by law of British Columbia, New South Wales, Queensland, and West Australia (which have no quality standard) provides for the supply of not less than 100 cubic feet of pure air per minute for every person employed below ground; in this Dominion the minimum quantity is 150 cubic feet, as before stated.

For the purpose of ascertaining to what extent the provisions of the Coal-mines Act regarding ventilation were being complied with, during the early part of the year I inspected the airways and mine-workings of the principal collieries, taking air-measurements and air-samples for analysis. The points chosen for such measurements and sampling were at the beginning of every return air-course as near to the last working-place as the quantity could be accurately measured at, such position being the most suitable part of a mine for critical examination of ventilation, for the most vitiated air is there found, and all leakage has already occurred before the return is reached.

The result of my measurement and analysis of my samples by the Dominion Analyst, are shown in the following table:—

* United Kingdom Coal-mines Act, section 29; New Zealand Coal-mines Act, section 40.

Table showing an Analysis of the Ventilation in the Principal Collieries of the Dominion made by the Chief Inspector during the early part of 1920.

Name of Colliery.	Place of Observation.	Date.	Quantity of Air passing per Minute.	Number of Persons that Air has passed over.	Number of Horses that Air has passed over.	Quantity of Air per Person per Minute.*	Analysis of such Return Air by Dominion Analyst.			Remarks.
							CO_2.	Oxygen.	CH_4.	
			Cub. ft.			Cub. ft.	Per Cent.	Per Cent.	Per Cent.	
North Island.										
Taupiri Extended ..	No. 4 level, west side, return	9/4/20	15,765	39	..	404	0·15	20·36	0·06	
,, ..	No. 5 dip, west side, return	9/4/20	10,881	14	..	777	0·03	20·88	..	Atmospheric purity.
,, ..	No. 5, new dip, and No. 6, west side, return	9/4/20	3,710	13	..	284	0·07	20·70	0·14	
,, ..	No. 2 district, north side, return ..	10/4/20	13,211	43	..	307	..	†	..	
,, ..	No. 1, tail-rope district, north side, return	10/4/20	10,368	29	..	354	0·08	20·66	..	
,, ..	No. 7 district, north side, return ..	10/4/20	8,028	20	..	401	0·10	20·70	..	
,, ..	Main return at fan	8/4/20	87,000	..	..	..	0·10	21·51	0·09	Effective ventilation, 71·2 per cent.; water-gauge at fan, 2·5 in.
Pukemiro	North district return	12/4/20	12,274	40	..	307	0·03	20·70	..	Atmospheric purity.
,, ...	Straight heading, left return	12/4/20	13,740	22	..	624	0·16	20·69	..	
,, ...	Straight heading, right return	12/4/20	11,736	20	..	587	..	†	..	
,, ...	Main return at fan	12/4/20	40,837	..	..	..	0·10	20·69	..	Effective ventilation, 92·2 per cent.; water-gauge at fan, 1 in.
Rotowaro	No. 3 south return	13/4/20	9,984	40	..	249	0·07	20·78	..	
,, ...	No. 4 south return	13/4/20	4,257	12	..	355	..	†	..	
,, ...	Main jig return	13/4/20	4,150	32	..	130	0·15	20·88	..	Due to leakage and fan running at reduced speed.
,, ...	Main return at fan	13/4/20	26,845	..	..	..	..	†	..	Effective ventilation, 68·5 per cent.
Waipa	No. 4 section (Siberia) return	14/4/20	16,200	43	2	348	0·07	20·72	..	
,, ...	Pillars section return	14/4/20	3,672	8	1	384	..	†	..	
,, ...	Main return at fan	14/4/20	23,324	..	..	..	..	†	..	Effective ventilation, 85·1 per cent.
South Island.										
Liverpool No. 1 ..	Upper seam, No. 3 bank return	20/5/20	10,722	29	..	369	..	..	..	
,, ..	Upper seam, crosscut return	20/5/20	6,312	23	..	274	..	..	..	
,, ..	Morgan seam, east return	20/5/20	15,631	23	..	680	0·10	20·38	..	Effective ventilation, 66 per cent.
,, ..	Morgan seam, west return	20/5/20	9,712	27	..	360	..	..	..	
,, ..	Main return at fan	20/5/20	64,128	..	..	..	..	..	..	
Liverpool No. 3 ..	No. 1 district return	20/5/20	8,540	22	2	334	..	..	..	
,, ..	No. 2 district return	20/5/20	10,260	34	3	249	..	..	..	Effective ventilation, 78 per cent.
,, ..	No. 3 district return	20/5/20	5,675	13	..	436	..	..	..	
,, ..	Main return at fan	20/5/20	31,266	..	..	..	0·05	20·83	..	
Brunner	Main return at fan	5/2/20	3,782	12	1	400	0·12	20·72	..	

* The quantity of air per person is obtained by dividing the total quantity circulating, after an allowance of 600 ft. per horse has been deducted. † No sample taken; the mine-air was obviously wholesome.

Table showing an Analysis of the Ventilation in the Principal Collieries of the Dominion made by the Chief Inspector during the early part of 1920—continued.

Name of Colliery.	Place of Observation.	Date.	Quantity of Air passing per Minute.	Number of Persons that Air has passed over.	Number of Horses that Air has passed over.	Quantity of Air per Person per Minute.*	Analysis of such Return Air by Dominion Analyst.			Remarks.
							CO_2.	Oxygen.	CH_4.	
South Island—contd.			Cub. ft.			Cub. ft.	Per Cent.	Per Cent.	Per Cent.	
Blackball	No. 1, rise section, return	3/2/20	8,085	16	..	505	..	†	..	
,, ...	No. 3, dip section, return	3/2/20	11,795	28	..	421	0·51	20·33	..	
,, ...	Main return at fan	3/2/20	42,120	..	..	..	0·35	20·54	..	
Millerton	Nos. 1 and 2, dip section, return ..	10/2/20	15,730	42	2	346*	0·07	20·81	..	
,, ...	No. 4, west section, return	9/2/20	16,626	30	..	494	..	†	..	
,, ...	Evans section return	10/2/20	7,614	15	1	467	0·14	20·70	..	
,, ...	South-east pillars return	10/2/20	Unappreciable	10	1	Unappreciable	..	†	..	Air short-circuited.
Westport-Stockton ..	Nos. 2 and 4 sections return	11/2/20	19,800	66	3	273	0·07	20·90	..	
Coalbrookdale ..	Wareatea jig section return	24/5/20	10,810	40	4	230	0·14	20·85	..	Water-gauge, 2·5 in. at 10 ft. fan; air short-circuited through leaking stoppings; effective ventilation, 17 per cent.
,, ..	Cascade section return	24/5/20	6,302	22	2	233	..	..	..	
,, ..	Main return at fan	24/5/20	97,643	..	..	..	..	..	..	
Ironbridge ..	Kruger's dip return	13/2/20	2,142	12	1	128	0·38	20·04	..	Inadequate quantity.
Taratu	Dip section return	7/1/20	6,288	38	..	165	0·30	20·00	..	
Kaitangata No. 1 ..	Mundy's and No. 6 dip return	8/1/20	14,297	43	2	304	0·47	19·48	0·37	
,, ..	Main return at fan	8/1/20	22,542	..	..	..	0·42	20·16	0·35	Effective ventilation 63 per cent.
Kaitangata No. 2 ..	Fred's seam return	9/1/20	3,226	10	1	263	0·13	20·62	..	Air short-circuited through leaking stoppings before it could reach first miner.
,, ..	18 ft. seam return	9/1/20	Unappreciable	10	1	Unappreciable	0·10	20·70	..	
,, ..	6 ft. seam return	9/1/20	7,047	31	..	227	0·13	20·60	..	Only 37 per cent. of the air passed through workings owing to leakage.
,, ..	Main return at fan	9/1/20	27,360	..	..	..	0·19	20·68	..	
Nightcaps ..	No. 3 dip return	12/1/20	6,864	18	1	348	0·19	20·70	..	
Jubilee	Main return	15/1/20	6,547	17	1	350	0·05	20·69	..	
Saddle Hill ..	No. 1 section return	15/1/20	1,980	9	..	220	..	†	..	
,, ..	No. 2 section return	15/1/20	6,528	15	1	395	0·28	20·63	..	
Wairio	Small seam intake or return	13/1/20	Unappreciable	7	..	Unappreciable	..	†	..	No pretence at any system of ventilation. Air stagnant in this seam.

* The quantity of air per person is obtained by dividing the total quantity circulating, after an allowance of 600 ft. per horse has been deducted.

† No sample taken; the mine-air was obviously wholesome.

Quantity Standard.—From the foregoing table it will be seen that air-measurements were made in the returns from thirty-seven ventilating districts at nineteen collieries in the North and South Islands. It was found that the average quantity of air per person employed in such districts which passed the last working-place into the return airway amounted to 333 cubic feet per minute, being more than twice the quantity required by the law. In six districts only was less than 150 cubic feet per person measured, and in all but one of these the shortage was due to leakage through defective stoppings constructed of brattice-cloth.

At collieries where plastered-brick air-stoppings were used the proportion of the air, induced by fans, which passed the last working-place into the return airways (which I have termed "the percentage of effective ventilation) is very marked, as the following table will show:—

Name of Colliery.	Percentage of Effective Ventilation.	
Pukemiro	92·2	Brick stoppings.
Waipa	85·1	
Liverpool No. 3	78·0	Brattice-cloth and sawn timber-stoppings.
Taupiri Extended ...	71·2	Brick stoppings.
Rotowaro	68·5	
Liverpool No. 1	66·0	Stoppings of brattice-cloth or sawn boards.
Kaitangata No. 1 ...	63·0	
Blackball	47·0	
Kaitangata No. 2 ...	37·0	
Coalbrookdale	17·0	

As the effective air may be used, after ventilating the working-places, for "scaling" areas of old workings or standing pillars, there is absolutely no excuse for inducing air by a fan and then carelessly permitting much of it to be ineffective owing to leakage.

It is important that air shall be confined to the intake airways, and not to be used for "scaling" until it enters the return, for in the event of a "blower," or an accumulation of gas, the maximum quantity of air induced may be required to remove the gas.

Without proper distribution of air to the working-faces by means of brattice-cloth, miners may not receive the full benefit of the air induced by the fan and effectively directed to the returns. At the majority of collieries I found the brattice to be satisfactory, but at three collieries—viz., Coalbrookdale, Kaitangata No. 2, and Nightcaps—the brattice was frequently not fastened to the roof, permitting leakage of air to a large extent.

Quality Standard.—In this Dominion the quality standard for colliery ventilation is—as a maximum, 1 per cent. of carbon dioxide; as a minimum, 19 per cent. of oxygen; and as regards inflammable gas, no person is permitted to work where firedamp may be detected by a safety-lamp, which is approximately from 1 to 2 per cent. CH_4. During my inspection I found no instance of failure to comply with the above standard.

In no working-place could I get a gas cap (*i.e.*, about 1½ per cent. CH_4). In the return airways the minimum percentage of oxygen found by analysis was 19·45, the maximum percentage of carbon dioxide was 0·47, and the maximum percentage of methane (CH_4) was 0·37. All these, however, occurred at Kaitangata No. 1 Colliery, which is gaseous, and where underground fires exist. At all the other collieries the quality of the return air (after it had passed every working-place) was found after analysis by the Dominion Analyst to be almost as pure as astmospheric air.

In conclusion, I am gratified to state that as a result of my searching investigations I find that the ventilation at our principal collieries is of a high order, but it would be still improved if brick air-stoppings were more frequently used and greater attention was paid to the erection and maintenance of brattice-cloth.

(*b.*) Inflammable Gas and Safety-lamps.

[Section 40 (46).]

During the year inflammable gas was reported at seven collieries, as follows:—

Name of Colliery.	Number of Days on which Gas was reported.	Maximum Estimated Quantity of Inflammable Gas reported.
		Cubic Feet.
Taupiri Extended	125	2,000
Kaitangata No. 1	44	500
Liverpool No. 1	25	480
Liverpool No. 3	7	1,000
Ironbridge (Denniston)	7	80
Millerton	4	2
Wairaki	2	Small.

At the three last-named naked lights were then in use.

Gas-ignitions have recently been reported as follows:—

Name of Colliery.	Date.	Place.	Quantity and how caused.
Ironbridge	7/8/18	No. 8 section	About 1 cubic foot was ignited in a hole in the roof by naked light.
Wairaki	22/12/19	Dip heading	Small ignition after firing a gunpowder charge. Not then reported to the Inspector.
„	16/2/20	Dover's place off the dip heading	Ditto. This was reported. No person was injured. The mine has now been restricted to safety-lamps and permitted explosives.
Millerton	11/2/20	Old dip section	A small ignition by naked light at the face of a steeply rising place where brattice had been displaced.
„	1/6/20	No. 2 dip section	A small ignition by a naked light shortly after firing a charge of permitted explosive. No person was injured.
Rotowaro	—/3/20	Back dip heading	Shortly after firing a shot a small quantity of gas was ignited in a hole by a naked light. Not then reported to the Inspector.
Pukemiro	11/5/20	Main north section back heading	Two miners, Summers and Howie, reported igniting about 200 cubic feet of inflammable gas at their working-place with a naked light.
Liverpool Colliery ..	1/6/20	Stone drive near middle brake	A fan attendant ignited a small quantity of gas at the fan outside the drive, and received slight burns.

In only one case—viz., the last-named—were burns received, and in that case they were but slight. In every case naked lights caused the ignition, and at such places the use of such lights was permitted.

An ignition of inflammable gas, however, must be regarded as a grave warning, for it proves that gas is being emitted from the strata which if allowed to accumulate, by defective ventilation might produce a disastrous explosion, for with the highly inflammable coal-dust of our bituminous and brown coal mines it requires only a few hundred feet of inflammable gas to become ignited to produce the concussion and flame necessary to cause a violent coal-dust explosion sufficient to wreck the mine and destroy those within it.

(*c.*) Systematic Timbering.

[Section 40 (9) and Regulation 56.]

During the past five years thirty-four lives have been lost by colliery accidents, of which number twenty-three were caused by falls of roof and sides.

In the majority of cases of fatal accidents by falls the reason attributed at the inquests has been that they were due to concealed joints—*i.e.*, "sooty" or "greasy" backs or heads, variously termed. "The roof appeared safe, but when it fell upon the deceased a concealed joint became visible." And so it always has been: it is not the obviously dangerous roof which falls and kills a man, but the roof which has been given the benefit of the doubt by miner or deputy and been allowed to go unsupported by props.

To obviate this class of accidents systematic timbering has become compulsory by law in the mines of the United Kingdom and this Dominion. In sections of a mine where timber is used at the working-faces or in the roadways by the regulations pertaining to systematic timbering it is assumed that all roof is a potential source of danger, therefore by continuous and uniformly spaced rows of props, or props and bars (as may be considered most suitable), any dangerous invisible defect in the roof is as far as practicable guarded against.

In this Dominion the regulation regarding systematic timbering is very often neglected, and for this the colliery officials and miners are equally to blame. The miners frequently neglect to erect the props nearest the face within the specified distance, and deputies frequently do not enforce it with sufficient determination. The managers of collieries have not prosecuted miners for breaches of the regulations pertaining to systematic timbering, as they are unquestionably empowered to do under Special Rule 1 and Regulation 56. Unless more vigorous action is taken by mine officials, who are always on the spot, to secure efficient timbering, fatal accidents by falls of roof will inevitably continue.

The following are the maximum intervals for systematic timbering allowed at the principal collieries in the Dominion:—

Systematic Timbering (*vide* Regulation 56).	Name of Colliery.																					
	Hikurangi.	Northern.	Waipa.	Pukemiro.	Taupiri Extended.	Rotowaro.	Mount Torlesse.	Homebush.	Millerton and Denniston.	Westport-Stockton.	Blackball.	State Collieries.	North Brunner.	Paparoa.	North Cape.	Puponga.	Shag Point.	Taratu.	Kaitangata and Castle Hill.	Nightcaps.	Freemans.	Wairio.
	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.
Between each row of props ..	4	4	5	5	5	5	6	4	6	6	6	6	4	6	3½	6	6	4	6	6	6	6
Between adjacent props in the same row	5	4	5	6	6	6	6	4	6	6	6	6	4	6	3½	6	6	5½	6	5	6	6
Between the first row of props and the face	5	4	6	6	6	6	7½	3	7½	7½	7½	7½	..	7½	4½	6	7	5	6	6	8	7

The distance between holing props and sprags, also between face-sprags, is 5 ft., in accordance with Special Rule 36.

The penalties for a breach of the regulations for the first offence shall not exceed a fine of £5, and for a second or subsequent offence shall not exceed a fine of £10.

(*d.*) Permitted Explosives.

[Regulations 128 to 134 inclusive.]

Since the regulations enforcing the use of Home Office permitted explosives came into operation in New Zealand, in June, 1915, mine-owners have been fortunate in being able to obtain an adequate supply. In this Dominion no other than permitted explosives are allowed to be used in mines in which inflammable gas has been found, and with the exception of the explosive "ligdynite" no other than a Home Office permitted explosive is allowed in a mine which is not naturally wet throughout. A decision was given in April, 1919, in the Hamilton (Scotland) Sheriff Court, in the case of the Inspector of Mines *v.* Lanyon and White, that a mine which is naturally wet but has some dry parts is not naturally wet throughout, and that under the United Kingdom regulation (which is identical with that of New Zealand) unless a mine is naturally wet throughout no explosive other than a permitted explosive may be used.

The United Kingdom Explosives in Coal-mines Order of the 14th November, 1919, issued by the Home Secretary, which amends the Explosives in Coal-mines Order of 1st September, 1913, and subsequent Orders, came into force on the 1st January, 1920, from which date all previous Explosives in Coal-mines Orders amending the schedules to the Order of the 1st September, 1913, are revoked.

The following tables show the explosives that have passed the Rotherham test, with particulars of their composition, &c. :—

First Schedule.

Name of Explosive.	Name of Makers.	Permissible Maximum Charge in Ounces.	Pendulum-swing in Inches.	Detonator.
	Ammonium-nitrate Group.			
Ammonite	Miners' Safety Explosives Company (Limited)	18	2·44	6
Ammonite No. 1	" "	24	2·42	7
" No. 5	" "	26	2·41	6
Bellite No. 1	Lancashire Explosives Company (Limited)	20	2·74	6
Negro Powder No. 2	Roburite and Ammonal (Limited)	20	2·21	7
Roburite No. 4	" "	18	2·86	7
Denaby Powder	British Westfalite (Limited)	18	2·74	6
Expedite	Explosives and Chemical Products (Limited)	32	2·62	7
Kentite	British Westfalite (Limited)	18	2·64	6
New Fortex	Explosives and Chemical Products (Limited)	10	2·61	6
	Nitro-glycerine Group.			
Samsonite No. 2	Nobel's Explosives Company (Limited)	26	2·49	6
" No. 3	" "	24	2·42	6
Super-Rippite	Curtis's and Harvey (Limited)	18	2·53	6
Cambrite No. 2	Nobel's Explosives Company (Limited)	24	2·00	6
Essex Powder	Explosives and Chemical Products Company (Limited)	38	2·17	6
Haylite No. 2	National Explosives Company (Limited)	18	·96	7
du Pont Permissible No. 1	E. I. du Pont de Nemours and Company	18	2·82	6
Dynobel No. 3	Nobel's Explosives Company (Limited)	18	2·50	6
" No. 4	" "	30	2·35	6
Haylite No. 3	National Explosives Company (Limited)	16	2·44	7
Monarkite	Nobel's Explosives Company (Limited)	18	2·30	6
Monobel No. 1	" "	10	2·81	6
A2 Monobel	" "	22	2·44	6
Rex Powder	Cotton Powder Company (Limited)	20	2·61	6
Seamex	Explosives and Chemical Products Company (Limited)	36	2·54	6
Stomonal No. 1	New Explosives Company (Limited)	20	2·68	6
" No. 2	" "	30	2·57	6
Super-Cliffite No. 2	Curtis's and Harvey (Limited)	30	2·53	6
Super-Excellite No. 3	" "	36	2·73	6
Viking Powder No. 1	Nobel's Explosives Company (Limited)	26	2·44	6
" No. 2	" "	18	2·59	6
Thames Powder	British Explosives Syndicate (Limited)	32	2·78	6
" No. 2	" "	22	2·59	6

Second Schedule.*

Name of explosive: Bobbinite.

Second (A) Schedule.†

Name of Explosive.	Name of Makers.	Permissible Maximum Charge in Ounces.	Detonator.
Ligdynite	Cape Explosives Works (Limited)	18	6

* Permitted for the purpose of bringing down coal in certain mines, and only until the 31st December, 1920.

† Permitted only in mines in which fire-damp has not been reported for three years. This explosive has passed the Rotherham test but is not on the Home Office Explosives in Coal-mines Order, being the only explosive permitted in New Zealand which is not on such Order.

The Third Schedule prescribes that each cartridge, in addition to any marking required in the First or Second Schedule to the Order, shall also be marked with the outline of a crown with the letter P in the centre. In the case of compressed cartridges, which are not contained in a wrapper of paper or metal, the outline of the crown must be indented on the end of the pellet.

The Fourth Schedule prescribes the composition of fuze, and the Fifth Schedule prescribes the composition of gunpowder, squib, and Brock squib.

(*e.*) Crushing of Coal Pillars and Subaqueous Mining.

[Section 40 (39).]

At the Taupiri Extended Colliery serious crushing of coal pillars has occurred during the past two years, due to coal pillars of inadequate strength being left to support the cover.

The Taupiri Extended Colliery workings are large, extending underground from the two shafts northward and westward for one mile and a quarter. Mining operations are carried out on the bord-and-pillar system, the bords being 14 ft. wide, of variable height (generally exceeding 10 ft.), a coal roof being left as a support to the jointed fireclay cover, which is for the most part a dead-weight with but little supporting strength. The haulage-roads are 12 ft. wide. The pillars were 8 yards wide and about 22 yards in length, with stentons 5 ft. wide and 6 ft. high.

Two thick workable brown-coal seams exist of variable thickness. The workings referred to in this report are in the bottom seam.

Owing to the mining operations being under the River Waikato or under privately owned land, the surface of which it is required to protect against subsidence, no coal pillars have been extracted. As the workings advanced in the solid coal to the northward, owing to the strata dipping in that direction, the thickness and weight of the cover increased until its weight became more than the coal pillars could support without fracture, the result being crushed pillars, falls of roof, heating of the coal, and in two cases fracture to the surface, the thickness of cover necessary to bring about these results being from 360 ft. upwards.

During 1917 or early in 1918 the first of these occurrences took place in the north-west section of No. 6 dip. In consequence of their fears the miners stopped work for four days. To arrest the heating of the coal which occurred the area (about 10 acres) was flooded by the management, and it remains so.

During 1919 a similar occurrence took place in the most northerly workings of No. 5 level (tail-rope district). About 2 acres of workings were affected. The section was also flooded and closed by brick stoppings. In this case cracks appeared on the surface around an area of about 5 acres, the nearest crack to the river being 9 chains. The settlement of the surface, if any, was unappreciable.

During August, 1919, another area, of about 1½ acres, became affected—viz., No. 6 level north. These workings are situated under the River Waikato, at a depth of about 400 ft. below its bed, and, being to the rise of the haulage-road, could not be flooded, which caused anxiety among the miners, who ceased work in consequence, and at their request the Minister of Mines instructed me to investigate and report.

The safety of subaqueous mining operations is chiefly dependent upon the thickness and character of the cover, especially as regards faulting. In this case these were reasonably satisfactory, being proved by boreholes situated 6 chains westward and 23 chains eastward respectively of the affected area. The strata in these boreholes shows the cover of the seam being worked to consist of alluvium, chiefly sand and shingle, with two thin seams of clay, to a depth of about 190 ft., underlain by coal-measures consisting of claystone and coal-seams for a thickness varying between 167 ft. and 256 ft. The affected area being to the rise, and flooding being impracticable, the management isolated it by brick stoppings to produce blackdamp and thus arrest oxidization and consequent heating of the coal. Without any delay strong reinforced-concrete dams, 6 ft. in thickness, were built at the outby side of each stopping, such dams being well recessed into sides, floor, and roof, the roof-joint being finally grouted under hydraulic pressure. These dams are of ample strength to withstand the greatest hydraulic pressure possible. The coal abutments, however, although the best available consistent with maintaining the No. 6 haulage-road to the extensive unworked coalfield to the northward, are not of such strength as the dams, the coal abutments being frequently weathered and friable, and coal of insufficient depth. The precautionary measures taken by the mine-owners in No. 6 rise district against fire and irruption of river-water are, I believe, the best that could be adopted under the conditions, and I have no fear of any sudden irruption of water without warning. Possibly the crushing of pillars and falls may slowly extend from either side across the haulage-road, thereby rendering the same unworkable. In such event this road and the whole of the workings to the northward may be isolated by the construction of two concrete dams built in the solid coal near No. 5 flat-sheet. For the purpose of preventing further crushing coal pillars of larger dimensions are now being left.

The fourth occurrence of crushed pillars was observed by the Maoris resident on the west side of the river on or about the 14th March, 1920. A series of small cracks, without surface subsidence, appeared on the Rangiriri Road north of its junction with the Waikokowai Road. These cracks enclosed in somewhat circular form an area of about 5 acres immediately above the workings of No. 5 west section, north-west district, the cracks on the eastward being parallel to the river-bank for about 6 chains, and a distance of 44 ft. to 60 ft. therefrom. The cover above the workings is about 420 ft. in thickness, of which 190 ft. of the lower portion is claystone and coal-seams. The workings under the fractured and crushed area have been stopped for some time, and are flooded, but the sound of crushing has recently been heard near the edge of the flooded area.

The fifth and perhaps most serious occurrence was observed and reported by the mine-deputies in No. 4 dip, west side, on the 19th March. Considerable crushing of coal pillars, falls of roof, also heating of coal, destruction of brick stoppings, and creeping of the floor, occurred. As a result the manager stopped the workings and removed about thirty-four men employed therein preparatory to flooding the section.

I inspected the accessible portion of this area on the 22nd March, four days after it was first reported, also as near thereto as accessible on the 9th April. I found crushing much in evidence

during my first inspection, and owing to the destruction of air-stopping preventing ventilation fire-damp and black-damp were found throughout the rising bords. About 9 acres of these workings appear to be affected, in addition to which the approach to about twenty bord-faces is cut off; a valuable and extensive area of unworked coal is thus rendered temporarily inaccessible. Since the occurrence of pillar-crushing and subsidence became evident I have inspected portions of the mine on twelve occasions, and on the 14th February and the 13th December, 1918, and the 2nd May, 23rd August, and 13th October, 1919, and the 22nd March and 9th April, 1920, I inspected the crushing areas as far as accessible underground and on the surface.

(*f*.) Inspection of Old Workings.

[Section 40 (48).]

On or about the 27th May, 1919, the workmen's inspectors at Pukemiro Colliery were, by the manager, Mr. Burt, refused admittance into the old workings, consisting of standing pillars of coal, which are separated from the working-mine by several brick and two wooden stoppings and by a wooden locked door. The workmen's inspectors claimed the right given in section 8 of the Coal-mines Amendment Act, 1914, to have full liberty to make an inspection of every part of the mine, and of its machinery and workings, once in every fortnight. The manager based his refusal to permit this inspection on the decision of the Supreme Court in the case of Penman *v.* Bennie (1915), that Special Rule 8 of the Coal-mines Act requiring a daily inspection of every part of the mine by an underviewer did not extend to disused workings. The manager also believed that under section 40 (42) of the Coal-mines Act, 1908, no person could enter the old workings until a fireman-deputy within two hours prior thereto had inspected with a safety-lamp such old workings and reported them to be safe. In consequence of the refusal by the manager the miners ceased work on the 5th June, 1919. Unsuccessful endeavours were then made by Mr. Harle Giles, Conciliation Commissioner, to settle the dispute. Thereon, in pursuance of instructions from the Minister of Mines, I proceeded to the colliery and inspected the old workings on the 19th June, accompanied by the Government Inspector, the workmen's inspectors (by special permission of the manager), the mine-manager, and underviewer. Prior to entering the mine all of those who accompanied me stated that they had no knowledge of the existence of noxious gas therein. On the 31st March Mr. Bennie, Government Inspector of Mines for the district, had taken two samples of mine-air from sections 2 and 3 of these old workings, which upon analysis had been found to be comparatively pure, containing—oxygen, 18·54 and 19·50 per cent. respectively, and carbon dioxide 0·58 and 0·51 per cent. respectively. During our inspection, however, eight weeks later, we found that oxidation or absorption of oxygen by the coal-surfaces had been rapidly proceeding within the old closed-off workings. In section 1 (left) I took a sample which upon analysis was proved to contain 16·67 per cent. black-damp ($CO_2 = 0·67$ per cent., $N_2 = 16·00$ per cent.). Sections 2 and 3 (left) were found to be practically full of black-damp mixture; samples taken contained from 19·62 to 26·19 per cent. of that damp, mostly nitrogen. The lights carried by our party were several times extinguished owing to lack of oxygen. The party was thus stopped from advancing far into the old workings. As a result of this inspection Inspector Bennie, who rightly considered the area unsafe for any person to enter, immediately instructed the manager to entirely close it off by substituting brick stoppings for the wooden stoppings and door. By this action the question of inspection in dispute was settled, and the old standing pillars secured against heating by lack of oxygen within the stopped-off area.

The miners resumed work on the 20th June after a stoppage of two weeks. As a result of this stoppage legal opinions were obtained from Sir John Salmond, Solicitor-General, and Sir J. G. Findlay, K.C., on the question of this disagreement. The Solicitor-General was of the opinion that the workmen's inspectors had the right of inspection under section 8 of the 1914 Act. Sir John Findlay came to the conclusion, though not without some doubt, that the workmen's inspectors were entitled to inspect the old workings.

The point raised by the management regarding inspection by a deputy being necessary before any workmen's inspector might enter the old workings was, unfortunately, not presented to these legal authorities for an opinion. Personally I do not consider that there should be any objection to workmen's inspectors satisfying themselves as to the state of any part of the mine which may be accessible without danger to themselves or others. Old workings, however, are generally unventilated, and contain, as in this case, accumulations of noxious or inflammable gas, and are therefore dangerous, and if closed off by substantial stoppings should not be visited until ventilated.

(*g*.) Mine Rescue Work.

[1914 Act, Section 22 (*h*).]

For the guidance of the Mines Department preparatory to making regulations providing for the supply and maintenance of appliances for use in rescue work, and for the formation and training of rescue brigades, it has been decided by the Minister of Mines to establish at Runanga in connection with the State coal-mines a cottage rescue-station for training at one time two non-resident brigades (of five men each). Prior to the design and equipment of this station being undertaken complete information regarding the plan of the station and the type of most suitable apparatus is being obtained from the highest British authorities, through the office of the High Commissioner. In addition to serving the requirements of the State coal-mines, and enabling State employees to have this special and necessary training, the trained brigades will be available in case of emergency at any of the collieries and gold-quartz mines within reasonable distance; the township of Runanga being centrally situated as regards the gaseous collieries of the Grey Coalfield and the deep mines of the Inangahua Goldfield, it is also within four hours' journey by motor from the Buller collieries.

The subject of mine rescue work is at present being actively considered by both the Mine Rescue Apparatus and the Oxygen Research Committees under the Home Office Research Department, and the second report of such Committees will be shortly forthcoming. The delay in establishing rescue-stations in this Dominion will thus enable more up-to-date information regarding improvements in design to be gained.

From practical experience of breathing-apparatus in the United Kingdom it has been found that the wearers of such apparatus have on fourteen occasions lost their own lives, and it has been proved that the utmost care both in the training and management of a brigade as well as in the condition of the apparatus is necessary. There has been a tendency to abuse the use of breathing-apparatus, and for teams to use them before they were absolutely certain that they were necessary. One of the highest authorities—Colonel Blackett, President of the (British) Institution of Mining Engineers, and inventor of the "Aerophor" liquid-air apparatus—has publicly stated that his experience of rescue work had been that 99 per cent. of the work could be done quite efficiently without the use of breathing-apparatus, and that when it was necessary to wear them they should be used in a sensible way, and only by men who had had the opportunity of a long training.*

(*h.*) Electricity at Collieries.

[Regulation 160.]

During 1919 there has been but small increase in the number or capacity of electrical installations. The following is a summary of the annual returns, in accordance with Regulation 160 (*c*), regarding electrical apparatus at collieries:—

Number of collieries at which electrical apparatus is installed ...	11
Number of continuous-current installations	9
Number of alternating-current installations	2
Number of collieries electrically lighted	13
Number of collieries using electrical ventilating-machines	6
Number of collieries using electrical pumping plants	5
Number of collieries using electrical haulage plants	5
Number of collieries using electrical screening plants	2
Number of collieries using electrical miscellaneous plants	4
Number of collieries using electrical locomotives	1
Total horse-power employed from motors on surface...	2,051
Total horse-power employed from motors underground	611

SECTION V.—LEGISLATION AFFECTING COAL-MINING.

The Coal-mines Amendment Act, 1919, which was passed during the year, contains the following provisions:—

Section 2 extends the definition of "coal-mine" so as to include the mining of fireclay. Section 3 provides for the survey of lands applied for on lease or license. Section 4, in the case of an applicant for a colliery-manager's certificate already holding a metal-mine manager's certificate, reduces the qualifying period of underground experience from the usual five years to three years. Section 5 prohibits the storage in a mine of explosive in excess of the requirements of one shift. Section 6 provides that coupling-chains on cages shall be annealed at intervals not exceeding six months; that cages shall be tested in the presence of an Inspector and approved by him prior to their use; that safety catches on cages, also winding-brakes, shall be tested once a week, also that the detaching-hooks shall be tested by an overwind once at least every three months; that there shall be 10 ft. clearance between the detaching-hook (when the cage is at its uppermost landing) and the point of detachment; that approved gates and a rigid hand-bar shall be attached to all cages. Section 7 prohibits the use of winding-ropes unless authorized by the Inspector. Such ropes shall be recapped at intervals of not more than six months, and shall not be in use for more than three years and a half. Winding-ropes used for raising or lowering persons shall not be spliced. Section 8 provides for the examination of the working-places by firemen-deputies within two hours of the commencement of work.

The remaining twelve sections pertain to—Sick and Accident Fund; the compulsory acquisition by the Government of private lands for State coal-mines, also power to let such acquired land to other persons; the compulsory working of coal-bearing land by its owner, if deemed advisable; a prospecting license being held by the Minister of Mines or his appointee; prospecting on privately owned land; acquisition of vessels for carrying coal from State coal-mines; compulsory accommodation for employees by mine-owners; the suspension of the qualifications regarding age and experience necessary for a miner in charge of a place in the event of the Minister of Mines, acting upon the recommendation of a Commission, deeming such suspension necessary in the public interest; prohibition of tobacco in any form in any mine where safety-lamps are required to be used.

Under the Mining Amendment Act, 1919, section 16, provision was made for Government loans for carrying on coal-mining operations and all matters incidental to such operations.

During the current year, by Order in Council, additional regulations under the Coal-mines Acts have been made. Such regulations provide for—

26. An increase from 2½ to 5 per cent. in the amount of the allowance which may be made to a miners' association towards the expense of management of the Sick and Accident Fund.

83. (*a.*) In all working-places exceeding in height 10 ft. there shall be kept a pole, having a steel pricker attached at one end and a steel ferrule at the other end, for sounding and, if necessary, removing roof. (*b.*) In all working-places exceeding 12 ft. a ladder shall be kept.

134. The explosive "Ligdynite" is placed in the Second (A) Schedule, and is permitted only in mines in which fire-damp has not been reported for three years.

154A. When and where the Inspector deems necessary, mechanical ventilating appliance shall be installed.

Form 14 provides for a shot-firer's daily record.

I have, &c.,

Frank Reed.

Inspecting Engineer of Mines and Chief Inspector of Coal-mines.

* Report on a Conference by the North Midland Coal-owners Rescue Station Company (Limited), published by the *Colliery Guardian* for 27th January, 1920, page 589.

ANNEXURE A.

SUMMARY OF REPORTS BY INSPECTORS OF MINES.

Northern Inspection District (Mr. Boyd Bennie, Inspector).

Taupiri Collieries Extended Mine.—The mine-workings are partly under the Waikato River and on the western side of that river. The thickness of rock cover overlying the coal-seam at the point where the present workings are situated is approximately 450 ft., consisting mostly of fireclay. There are two coal-seams in this mine, the lower or main seam being about 22 ft. thick and the upper seam from 16 ft. to 18 ft. thick, separated from each other by approximately 40 ft. of fireclay. The quality of the coal is similar in both seams, but only a small area of the upper seam has been worked, and that area is some chains away from the course of the Waikato River. I understand that the management do not intend to work any section of the upper seam where it underlies the river. The mine is worked on the bord-and-pillar system, the bords in this mine being 14 ft. wide and the pillars 24 ft. wide. In the lower coal-seam the height of the bord is from 12 ft. to 17 ft.

A mine-creep and falls of roof coal occurred in the northern dip section of the mine during the year. In August signs of a creep were observed in the No. 4 level, No. 2 tail-rope section, where several heavy falls of roof coal and fireclay took place, there being signs of spontaneous combustion in the fallen debris. Fortunately that section of the mine was only connected with any other part of the mine by two drives, the main haulage-road and the return airway; the working-places were at a lower level than the roads referred to, and, the danger of mine-fire being so apparent, it was decided to flood that portion of the mine with water. This was accomplished in a short time and all danger thereby removed. Brick stoppings were built in the two main drives thus completely closing off the heated area.

At No. 5 level several heavy falls of roof coal and fireclay occurred, falling up to the floor of the upper coal-seam, a height of about 30 ft. The upper seam has not been worked in this section, and a careful examination did not reveal any fractures on this coal-seam. There is about 400 ft. of cover overlying the falls—viz., 20 ft. of coal and 340 ft. of strata—to the river-bed, some of which is good impermeable claystone, fireclay, &c. The greatest danger was from mine-fires due to spontaneous combustion among the fallen coal. The management therefore decided to close off the affected area, being Nos. 5 and 6 levels in the north dip section, and as a temporary precaution eleven brick stoppings were built, and by the end of the year reinforced-concrete dams varying in thickness from 6 ft. to 8 ft. were built outside most of the stoppings.

The present workings and old workings have been carefully and regularly inspected by the company's officials, and periodically by the workmen's inspectors, and found to be safe and free from dangerous accumulations of fire-damp, although small quantities of that gas have frequently been found during the year. Safety-lamps and permitted explosives only are used in the mine. There have been no fatal accidents in the mine for the year. Many minor accidents, necessitating miners being off work, some of them for lengthy periods, have occurred, and these have been a heavy drain on the Coal-miners' Relief Fund.

During the year the company has built a commodious bath and change house, and the workmen are making good use of them. At No. 2 shaft winding-machinery and pit-head frames have been erected for lowering and raising the workmen into and from the mine at this shaft, thus relieving the No. 1 shaft, so that more time may be available for winding coal.

Taupiri Company's Rotowaro Mine.—This mine has worked continuously throughout the year, and although for a portion of that period the daily output has been restricted, yet the coal mined for the year has been substantially increased. The mine is opening out in a most satisfactory manner, the coal-seam being from 16 ft. to 20 ft. thick. There are no features that require special mention. The mine is well ventilated by Sirocco fan. The work of installing the permanent machinery has been going on slowly owing to the difficulty of getting the necessary material. The haulage engine formerly at Ralph's Mine has been removed and erected here, and the steam boilers from the same mine are also being erected at the Rotowaro Mine. A new and up-to-date electric plant is being installed. A change and bath house has been erected and is now in use.

No. 2 mine, south-west of No. 1 mine, is being opened up, being an area of coal lying towards the Huntly–Awaroa Railway line, which will be worked from the No. 2 mine. The tramway connecting with the screening plant has been formed, and coal will be mined at the No. 2 mine in the near future.

Pukemiro Colliery.—The mine has worked almost continuously throughout the year. In June the workmen's inspectors thought their right of inspecting all parts of the mine was infringed when the manager closed off a section of the mine when the first working had been completed. This area was not used in connection with the working of any other part of the mine, and to avoid the possibility of workmen wandering into the old workings, and to further reduce the possibility of mine-fires from spontaneous combustion, brick stoppings were built into the roads leading into the said old workings. Two doors were let into the brickwork, and these were locked as required by Special Rule 16. The Miners' Union was informed that the manager was acting strictly in accordance with the Coal-mines Act and the regulations; nevertheless they stopped work from the 4th to the 23rd June. On the 19th June a special inspection of the closed-off portion of the mine was made by the mine-manager, workmen's inspectors, the Inspecting Engineer of Coal-mines, and myself, when we found that there were no dangerous conditions there to endanger either the workmen or the mine. Having satisfied the workmen's inspectors that there was no danger so long as workmen were prevented from entering those old workings, I asked that the doors referred to be removed and the aperture be filled in with brickwork; also that

several other brick stoppings be strengthened. This has been done. With the exception of this stop-work referred to, the work at the mine has gone on as usual during the year. Main headings are being extended into the newly leased south-east area, where the coal is good and the seam approximately 20 ft. thick.

Waipa Collieries.—This mine has worked continuously throughout the year (day shift only). I have examined the colliery a number of times during the year. The roof clay overlying the coal-seam is friable and much jointed, requiring careful timbering. The timber is systematically set, but not braced or strutted. There does not appear to be any danger on that account, but occasionally the timber near the bord-face is shot out when the workmen are shooting off side coal at the tail end of their bord. Recently, owing to a workman, on returning to his working-place after firing shots, being struck on the arm and slightly injured by a fall of roof claystone loosened by the shooting-out of the timber near the face, I had to direct that the miners should not continue this dangerous practice.

The endless-rope haulage-system has been installed from the ground-tram tail-rope terminus into the mine through a new stone drive, and this is a great improvement over the old system previously employed.

There have been no additions to the mining machinery during the year. An up-to-date bath and change room has been erected and is now in use. There has been no new development-work undertaken for the opening-up and extending of the mining operations to any other part of the company's property. No. 2 mine has been closed, the pillar coal being exhausted.

Waikato Extended Mine.—The mine is worked with only a few men. The coal is shipped to Hamilton and to places on the Waipa River. No special effort appears to be made to increase the output of coal from the mine. I have visited the mine several times during the year.

Huntly Coal and Fireclay Mining Company.—The coal mined is from pillars left in by a former mining company many years ago. It has been found that the coal can be mined only by the opencut method, and, the overlying cover being soft clay, and at places from 12 ft. to 15 ft. thick, the cost of mining is high, and the only advantage in mining the coal is that the company can get a regular supply for their brickworks furnaces. The company do not sell the coal to the public, and the coal available for their own use is very limited, and may fail them in the near future. The fireclay quarry gives them sufficient clay of a good quality for their own use, and the supply appears to be sufficient for many years to come. The work at the mine and quarry has been carried on with great care for the safety of the workmen.

Hunua Colliery.—This small mine is situated near Hunua Township and about eight miles east of Papakura. The coal-seam is 6 ft. thick, with a shale band of about 6 in. in the centre of the seam. The quality is slightly inferior to the Taupiri coal. There appears to be a large area of coal in the district, but, the quality being inferior to the Waikato coal, and the difficulty of constructing even a light railway being great, I do not anticipate that the coal-deposit will be worked on a large scale for many years. The coal from this mine is carried by motor-lorry to Papakura. Four men are employed at the colliery.

Greencastle Colliery, Aria.—Early in the year I visited the mine and made a careful examination of the fault referred to in my previous report, and advised the owner with a view to the coal-seam being cut into beyond the fault. Later Mr. Morgan has informed me that he has cut into the coal beyond the fault, and it appears to be much harder and of a better quality. This coal-supply is a great boon to the settlers around the mine and to the butter-factory at Aria. There is a fair supply of timber for mining purposes close to the mine.

Hikurangi Colliery.—The colliery is near Waro Station, about a mile north of Hikurangi. The Phœnix section of the mine lies under the southern end of the Waro lime-rock deposits which are of so much interest to travellers and geologists on account of the varied form of the rocks. The coal-seam is from 8 ft. to 10 ft. thick, but the area is not large. At the line of the Great North Road there is an upthrow fault-line. The first working has been completed up to the fault-line, and the pillar coal is now being worked. I believe there is sufficient pillar coal to last for two years at the present rate of working.

Nos. 2 and 6 sections, also under the lime rocks: Both mines are working pillar coal, mining from the centre back toward their respective main entrances.

Northern Company's Waro Rocks Section.—The managing director, having recently arranged for an electrical mining plant, the engineers are preparing the foundations for the erection of such machinery. It is intended to utilize electrical power for haulage, pumping, &c. It will take some time before the mine can be unwatered and cleaned up so that coal-mining may be resumed.

Northern Company's Tauronga Section.—This mine is worked on contract by a small party of miners. The coal-seam is 4 ft. thick, containing a band of stone. The contract let to the miners in this case is more to the advantage of the coal company than to the miners. The mine-manager is in the employ of the mining company and is a careful, capable man. Four men are employed.

Foot and Doel's Crown Lease (Section 4, Block XVI, Hikurangi Survey District).—Silverdale Mine: The mine on part Section 2, Block XVI, having been worked out, these men applied for a lease to mine coal on Section 4, Block XVI, and have opened a mine there. The coal-seam is about 5 ft. thick, but is intersected with a band of fireclay, which is in some places from 6 in. to 15 in. thick. They are working very carefully and doing good work. The coal is sent by motor-lorry to Hikurangi Railway-station, where it is loaded into trucks and sent where required. The County Council and Town Board are levying a tax on these miners for damage to the roads.

Kerr and Wyatt's Crown Lease (Section 39, N.E. Block XVI).—These men have done good work in locating and mining some coal left in by a former coal-mining company. In prospecting they found a small area not previously mined. The coal was very thin, but they are now working it. Previously they sold their coal to the Hikurangi Company, but the price paid for it was not enough to meet the expenses of mining the thin coal, and now they are taking their coal to

the Hikurangi Railway-station, where it is loaded into trucks and sent where required. This coal also is carried over the roads which the County Council and Town Board are complaining are being cut up.

Northern Kiripaka Mine.—Leasehold section: The greater portion of coal mined for the year came from this section. The first working has been completed and pillar coal is now being worked. There were two entrances to the area being worked—viz., the main entrance and Shepherd's tunnel. From these drives the main levels were driven until they junctioned, and from that point the pillar coal was worked, retiring towards the entrances. Thus when the first fall of roof took place the air-course previously used was closed up, and the workings became practically two separate mines requiring independent ventilation-systems. As stated in my previous report, a section of the coal inclines at a steep angle, and it will be extremely difficult to mine a high percentage of that coal, the coal being friable, and falls of roof rock in the waste will rill down and some of the pillar coal will be lost. In the first working the mine has been carefully worked, and the ventilation, which was by a small mine-fan, was generally good. The small mine on the freehold section has been worked by four men on contract.

Cunningham's Crown Lease (Co-operative Mine Section N.E. 48, Block XVI).—During the year a new mine has been opened out on the same section but fully half a mile east from the former mine. The coal is situated on a hilltop, and is good, but the area is small. A ground tram has been formed from the mine to the Hikurangi–Marua Road, and from there the coal is taken to the Hikurangi Railway-station by motor-lorry.

North New Zealand Coal-mining Company.—This mine has been closed down during the whole of the year, and it is not known when it will be drained and again worked.

Serious Accidents, 1919.

Of fatal accidents there were none. The non-fatal serious accidents were the following:—

William Everson, Taupiri Extended Mine: Severe strain of rectoral muscles causing injury to heart which has permanently disabled him for heavy work. The sprain and injury to heart was caused by his falling while trucking on the 24th July, 1919.

Matthew Robinson, Taupiri Extended Mine: Loss of sight of one eye caused by flying coal on the 3rd February, 1919.

Hector Fairless (aged 16), Pukemiro Collieries: Fracture of both thighs caused by falling between two moving trucks while uncoupling from the haulage-rope at the screening plant on the 9th April, 1919.

A. Harry, Waipa Collieries: Dislocated shoulder caused by a piece of timber falling on his shoulder while he was timbering his working-place on the 22nd August, 1919.

David Cairns, Waipa Collieries: Fractured tibia and fibula caused by a fall of roof-coal in his working-place on the 11th October, 1919.

Peter Aitkin, Hikurangi Collieries: Broken collar-bone caused by fall of roof-coal in working-place, 4th December, 1918.

Richard Wells, Kiripaka Collieries: Fractured radius caused by having his wrist caught between two trucks while coupling trucks on to the locomotive at the mine on the 29th May, 1919.

West Coast Inspection District (Mr. George Duggan, Inspector.)

New Zealand State Coal-mines.

Liverpool Colliery.—No. 1 Section: The upper-seam workings on the east side of the Seven-mile Creek are narrowing in from the east, as the seam is thinning and is split up by hard stony bands. Pillar-extraction on the west side of the Seven-mile Creek is almost completed, in much lower coal than formerly.

Morgan Seam: From April until September no coal was mined from the Morgan seam owing to the shortage of labour. Development is now proceeding to the east and west. The east levels are in 19 chains, and the main west levels 13 chains. This seam is a gaseous one, and to keep the working-faces clear it was found necessary to run the large Sirocco fan continuously. A crosscut stone tunnel is being driven at about 600 ft. lower elevation than the present entry to the Morgan seam. The drive is now in 19 chains. Axial water-feed rock-drills, driven by compressed air, are exclusively used in this tunnel.

No. 3A Section: Twelve miners are engaged in this section, mainly at pillar-extraction.

No. 3 Section: Only a small area now remains to be worked between this section and the No. 3A section, and the working-places entering this area are in thin coal, split up by thick bands of stone. Nos. 3 and 4 inclines, north of No. 4 level, have become too stony to work, and pillaring has commenced there. An incline above the fourth east level emerged at an outcrop in Garvey's Creek, and thus materially assisted the ventilation. The west-side pillars—No. 1 level—are now exhausted. Pillaring on the east side above the No. 2 level was commenced early in the year.

Point Elizabeth Mine.—Only a few miners are employed at the No. 2 section extracting the remaining pillars. A portion of the plant, including an air-compressor, has been removed to the new James Mine near the coast.

James Mine.—This is the recently prospected coal-area near Seven-mile Creek which is now under development. A Lancashire boiler has been placed in position and preparations are being made to commence the stone tunnel on the tramway to connect the mine with the coal storage-bins and screen. This tunnel will be about 1,000 ft. in length, rising at a very slight grade of 3 in. to the chain.

Grey Valley Coalfield.

Paparoa Colliery.—Most of the output from the Paparoa Mine was from pillar-extraction, the only development being the continuation of the level going south-east from the head of the first jig. Small quantities of inflammable gas are occasionally reported by the examining deputy. Owing to the small output many pillars are crushed before being extracted, and large quantities of coal are lost.

Blackball Colliery.—The output was obtained from No. 9 dip and No. 9 rise workings. The crosscut and No. 17 sections were idle until November, and in the latter section portions of the workings had to be sealed off owing to spontaneous combustion. Heating was also apparent in No. 1 rise section, and the Nos. 1, 2, and 3 banks were sealed off. Two other banks in the No. 1 rise section have been constantly advancing, and have opened up an area of approximately 10 acres. The No. 9 dip has been extended only a chain or two, and is now about 7 chains below the lower haulage-road. Places have been broken away near the bottom of the dip. The coal there is extremely hard. Black-damp is freely given off in the No. 9 section, mainly from the floor, and brattices have to be kept close up to the working-faces. All working-places, 10 ft. wide and over, are now timbered, instead of, as formerly, the coal being "arched" in some. The general safety of the mine is thereby much improved. The main levels in this section are now within 10 chains of the line of the large fault.

North Brunner Mine.—The main workings were exhausted in July, and to obtain a strip of coal to the dip of these workings a stone tunnel is being driven approximately 5 chains from the old level. This is now in over 400 ft. The fault has been crossed, and the seam should soon be pierced.

St. Kilda Mine.—The remaining coal pillars are being taken out safely, and extraction will be completed before the end of 1920. Work in the Coal-pit Heath section has again ceased. The lower portion of the fireclay drive has been abandoned, but fireclay is still being won from the upper level.

Dobson Area.—Preparations are being made to drive a dip tunnel, approximately 1,300 ft. long, at a grade of about 1 in 3, to the coal proved by the Greymouth Harbour Board's No. 1 borehole. Rock-drills driven by compressed air will be used, and the air-compressor and steam boiler are now being installed.

Boustridge's Prospecting-area (near Stillwater).—The coal in the main level became thin and unworkable, and driving ceased at 200 ft. in from the surface.

Reefton District.

Reefton Coal Company's Mine.—A crosscut stone drive from near the mine entrance proved a coal-seam at 300 ft. The seam is 5 ft. thick, hard, and of good quality. An outcrop was also found in a creek 11 chains from the mine-entrance. Another stone tunnel for ventilating purposes has been driven from the creek and connected with the crosscut. The timbering in this mine has shown a decided improvement during the year.

Konini Mine (formerly Lockington's).—A considerably increased output was obtained from this mine. Coal was produced during the year from both the lower and upper sections of the Konini Mine. A dip drive going north-west was commenced from the main level in the upper section, but owing to the lack of plant to cope with water the drive was stopped before going many yards. The Konini Company also control Lishman's lease, and the old drives on this area were cleaned out during the past year and retimbered, but coal-production has not yet recommenced.

Waitahu Mine.—Little underground development was done at this mine, but a diamond-drill borehole, 800 ft. ahead of the downthrow fault, proved the coal-seam to be 8 ft. thick at 584 ft. from the surface. Prospecting is also being done on a lower seam, east of the present workings.

Morris and Learmont's Mine.—Three miners are employed at Morris and Learmont's mine. It is proposed to strip the overburden near the mine-entrance and obtain the coal from a few acres by opencast workings.

Murray Creek Mines.—Four miners are producing coal from the thick seam at the Phœnix and Venus Mine. Owing to the disabilities of conveying coal to Reefton the output is restricted to about 8 tons per day.

A new mine, called the "Victory," was opened up during the year near Murray Creek, by Messrs. Woods and party. A traffic-road, 20 chains long, and a surface jig, about 6 chains, were made to connect this mine with the main traffic-road to Reefton. Two seams were driven on, the lower one thinned to about 3 ft., and developing was stopped when the drive was in 180 ft. The upper-seam workings are now in over 200 ft., and the coal is very hard and clean. The places are 7 ft. 6 in. high, worked to a "parting," with about 3 ft. of "tops" left on. The bottom coal is not worked, being soft and unsaleable.

Lankey's Creek Mine.—Coal from this mine is used solely for power purposes at the Energetic Gold-mine. Owing to the Energetic shaft being destroyed no coal was mined during the year.

Archer's Freehold (Capleston).—A crosscut drive through soft sandstone proved a 24 ft. seam of hard coal lying at an inclination of 45°, and, being driven a further distance of 80 ft., pierced a 6 ft. seam of good coal. Development-work is proceeding on the thick seam, and levels are being driven east and west.

Golden Point Mine.—This mine was reopened during the past year, and a dip driven a pillar-length below the old workings. A level is proceeding from the bottom of this dip. The seam is almost vertical in the level.

Railway.—A private railway connecting the Burke's Creek mines with the Reefton–Greymouth Railway will be completed about the end of January. This will replace about three miles of horse-haulage.

Numerous coal leases and coal-prospecting licenses have been granted recently in Reefton district. One coal-prospecting license was cancelled during the year, and two coal leases determined for non-compliance of the conditions imposed. Three amalgamations of small leases have been effected.

Westport District.

Coal Creek Mine (Mokihinui).—This mine is still being worked by a co-operative party, who deserve every encouragement. The working-places are well timbered, and the Coal-mines Act is being complied with. The old workings near the bins are nearing exhaustion, and the party has constructed a tramway over half a mile long, alongside the western bank of Coal Creek, to an area south of the Knights of Labour heading. This will soon be opened up, and connected to the tramway by a surface jig, about 7 chains long, rising at a grade of 1 in 5. Coal will be hauled over the tramway by a petrol locomotive.

Co-operative Mine (Seddonville).—The year's output was 3,430 tons. Much brassy coal is now being met in the pillar-extraction, and ere long the workable coal will be exhausted. A "creep" came on near the tunnel-mouth during October, and mining operations were suspended for over a month. This party were cleaning out the main tunnel of the old Seddonville State Mine to get to some coal left in the west section, but an underground fire occurred on the 4th December at the far end of the west workings, and, being near pillared ground, it was deemed impracticable to seal off the fire.

St. Helens Mine.—This is a small mine opened up during the past year on the hill immediately above the railway-tunnel, between St. Helens and Seddonville. The coal is hard, and about 7 ft. thick. Six men are employed here on the co-operative principle.

Westport-Stockton Colliery.—The B section of the old mine has been idle for the greater part of the year, and the men from the C and D sections were removed to the new mine during October, owing to the shortage of labour in the latter mine. In the L section, east of C section, old mine, the seam is much folded. The "Sandcap" section of the new mine was exhausted during the year. A new motor-haulage road has been made through the stone drive to the new mine, and the pillars near the fire area are being extracted. The high-tension cables to No. 4 substation have been removed from the wooden poles alongside the haulage-road, and placed on steel poles about 5 chains back from the haulage-road. This safety precaution is being continued from No. 4 substation to the new mine.

Millerton Collieries.

Millerton Colliery (Mangatina Section).—The proposed extension of the Mangatina south headings has not yet been commenced, and the output is still obtained from the small area along the eastern boundary of the lease.

Old Dip Section: A crosscut going south-west has been made through the coal pillars. It is proposed to extend this drive across Granity Creek, and it will then enter a proved coal area, south of the old curved drive.

Mine Creek Mine.—No air connections have yet been made to the old dip sections, but the No. 2 dip workings are near Granity Creek, and will outcrop a few chains higher up the creek than the old dip workings. Development is still proceeding in Evans section going west. A fire occurred at the Mine Creek fan-house on the 24th February, and after burning all the woodwork of the reversing-apparatus the fire was subdued.

Denniston Collieries.

Ironbridge Mine.—Very little development has been done at the Ironbridge Mine during the past year. The inner shaft section has remained idle, and the new Deep Creek section, to which an endless-rope haulage-road has been made, has not been worked, the miners demanding increased tonnage rates owing to the long distance they have to travel to and from work.

Kiwi Section: A few more solid places are being driven near the compressor and to the east of the old workings.

Coalbrookdale Mine (Wareatea Jig Section).—The main heading met a 15 ft. upthrow fault, and, as the coal met beyond the fault is stony, the places are being widened out preparatory to pillar-extraction. The splitting of pillars, &c., necessary for the formation of a new rope-road is proceeding apace, but the haulage-road will not be completed for at least six months. An over-tub safety rope is now in use on the main jig in this section.

Wareatea Extended Section: All the output from the Wareatea Extended was obtained from pillar-extraction. A little desultory prospecting has been done near the fault during the year, but no coal has yet been pierced beyond the fault.

Cascade Mine.—Pillar-extraction is still proceeding in the No. 8 section. The ground is still very heavy, and the ventilating-current, having to pass over many falls to reach the faces, is sometimes deficient in oxygen. Black-damp is occasionally reported in this section by the examining deputy. The concrete foundation of the electric power-house (to be erected near the haulage-road on the plateau) is completed. The machinery, including generators and Bellis-Morcomb steam-engines, is stored near the site ready for installing.

Nelson District.

Puponga Mine.—The small co-operative party continued pillar-extraction in the top section, and produced 3,536 tons during the year. Only a few pillars remain to be worked.

North Cape Mine.—A little solid work is still being done on the east side of the dip, but the coal is very thin and stony. The remainder of the output is from pillar-extraction. A dispute arose in May as to whether a set rider should be allowed on the main-dip haulage. Considering the steep pitch of the seam and the numerous props being set along the middle of the dip, it was decided to be an unsafe practice, and the management were notified accordingly.

Fatal Accidents.

Four fatalities occurred in the inspection district during the year.

Archer's Freehold (Capleston).—On the 22nd February William Kirk, a miner, aged forty-six years, sustained fractured ribs and hæmorrhage of the lungs by a fall of stone and coal from his working-face near the entrance to the mine. A sprag was needed, and deceased appeared to have been preparing a hitch in the floor for the sprag when the fall occurred. Three suitable sprags were lying within 20 ft. of the fall.

Point Elizabeth State Coal-mines.—On the 25th April William Muncaster, jun., trucker, thirty-two years of age, was fatally injured. He was struck by a full runaway tub at the bottom of a jig, and his left kidney was ruptured.

Westport-Stockton.—On the 22nd May Percival John Rutledge, aged twenty-three years, locomotive-driver, fell in front of a race of empty tubs being pushed along by an electric locomotive, and three of the tubs ran over him before the race could be stopped. His pelvis was fractured, and he died the next morning.

On the 17th November James Shearer, a deputy, aged thirty-two years, received fractured ribs and a displaced kidney by a fall of stone from the roof of a working-place to which he was returning after firing a shot therein. The shot had blown out a prop near the face, and the stone had been supported by the prop.

Serious non-fatal Accidents.

Westort-Stockton Colliery.—17th February: Edward Duffin, brakesman, had his foot crushed by being run over by a full race of mine-tubs on the motor-haulage road. The back portion of his foot was amputated later.

Puponga Mine.—27th January: Arthur J. Skyring, miner, while cutting supports in the bush, lost his left eye by being struck by a chip from his axe.

Liverpool State Mine.—18th June: Phillip Findlay, rope-boy, received a fracture of the dome of his skull. A haulage-rope at the bins, coming out of the sheave, struck a piece of timber, causing it to strike him.

Liverpool, No. 1 Section.—7th July: Leslie Harvey, trucker, fractured his leg by a prop falling off a mine-tub whilst he was turning the tub on a flat-sheet.

17th November: Charles McAuley, rock-driller, lost his left eye and sustained injuries to his head and face by the premature explosion of two detonators. He was preparing the fuses for a round of holes, and attaching the detonators to the fuses.

Millerton Mine.—30th June: J. Teehan, trucker, lost joints from the first, second, and third fingers of his right hand by getting it caught between the jig-wheel and jig-rope.

29th August: J. C. Brown, district manager of the Westport Coal Company, received fractured ribs and arm by falling from the upper to the lower workings while inspecting the old workings, accompanied by the mine-manager.

Prosecution for Breach of General Rules.

Reefton Coal Company's Mine.—Proceedings were instituted against the mine-manager for a breach of General Rule 2 (*h*) by allowing a naked light in a building used as a powder-magazine. Accused pleaded guilty, and was fined £5 and costs.

Explosives.

The supply of "permitted explosives" is still restricted, and numerous complaints were made regarding deterioration. In the middle of summer I have found frozen explosives in the miners' powder-tins. Should a frozen cartridge be inadvertently placed in a shot-hole, it is almost certain to entail a hang-fire. Trouble was also experienced at the Blackball and State mines owing to defective electric detonators.

Dangerous Occurrences requiring Notification (Regulation 81).

Millerton Mine.—On the 17th April, through a fall of coal from near the face of the abandoned dip in the old workings of the Mine Creek section, a quantity of water came into the workings in the south pillars.

Liverpool Mine No. 1.—In the east section of the upper seam a sheet of brattice-cloth near an outcrop was found afire on the 6th August. It had presumably caught by a miner going through with his lighted pit-lamp in his hat.

Blackball.—Heating was reported by the examining deputy on the 3rd March in the No. 1 rise workings, and Nos. 1, 2, and 3 banks had to be sealed off. On the 3rd June an outbreak of fire occurred in the No. 17 section, and it was successfully stopped off next day.

Old Seddonville Mine.—An underground fire was reported on the 4th December, but, owing to being near pillared ground, could not be sealed off.

Twelve-mile Bluff (near Greymouth).—During September a fire was reported to have broken out in a coal-seam in a cliff overlooking the road being formed between Greymouth and Barrytown. The seam being 150 ft. above the road, and about 50 ft. below the top of the cliff, men had to be lowered from the top, and by means of picks they cut away the burning coals.

SOUTHERN INSPECTION DISTRICT (Mr. E. R. GREEN, Inspector).

Mount Torlesse Collieries (Limited), Avoca.—Coal-workings on south side of Sloven's Creek in seam of 15 ft. thickness between walls inclined at an angle of 75°. The seam to rise where the ground was troubled and broken had not proved continuous. Levels were driven on the strike and the seam followed within the walls, which, however, had not maintained a true course, but bent inward in bow shape. Driving to dip easterly where the coal-seam was hard and more solid in appearance than in the rise workings; also driving on the seam north of the creek and preparing for prospecting by boring with the diamond drill. Six new wooden cottages for workmen had been built on the plateau near the head of the gorge track—each of four rooms, bathroom, scullery, and outhouses, also hot and cold water; cost, not less than £550 each.

Springfield Coal-mine, Springfield.—A short drive had been put in on the outcrop of a worked upper seam of 2 ft. thickness, but only 6 tons of coal were produced and work was again suspended.

Sheffield Coal-mine, Sheffield.—An adit had been partly driven toward the 5 ft. seam found in prospecting-shaft, but was not being persevered with.

Homebush Colliery, Glentunnel.—Viewed the several openings and outlets at outcrops of seams being worked by parties of miners on a contract basis with the owners. Timbering and method of working were being conducted safely. The Government diamond drill was at the seventh bore, with little prospect so far of a workable seam of coal. Approved No. 1 magazine for storage of 1,500 lb. of explosives for use at the mine.

St. Helens Coal-mine, White Cliffs.—Another drive put in on hillside, to which the steam plant had been moved, to recover a small known area of seam left at former working.

Tripp's Coal-mine, Mount Somers.—Pillar and head coal now practically exhausted, and this part of the property almost worked out. Wright's old mine-workings had been reopened, and there was a sufficient quantity of coal in sight to provide output at current rate for at least two years, with a reasonable prospect of much more coal behind the barrier left at first working.

Woolmer's Coal-mine, Mount Somers.—Working suspended throughout the year.

Albury Coal-mine, Albury.—The old fire had broken out again, and it appeared now to have taken possession of the pillared ground, so that the entrance may not be of further use for output. Stoppings put in could not be kept tight owing to the broken nature of the ground, and the remedy is to allow the ground to fall and fill in to smother the fire in the waste. A shaft had been sunk to the dip, and an adit was being driven to the seam on which the shaft had bottomed.

Allanholme Coal-mine, Waihao Forks.—Seam 15 ft., worked bord-and-pillar system. Ventilation good.

Meadowbank Coal-mine, Waihao Forks.—Two men employed. Seam 15 ft.; drive 50 ft. to face; shaft to be sunk on the terrace for ventilation.

St. Andrew's Coal-mine, Papakaio.—A new entrance driven to the outcrop of the seam formerly worked by Mr. Nimmo.

Prince Alfred Coal-mine, Papakaio.—A small mine worked for supply of local requirements.

Ngapara Coal-mine, Ngapara.—A small mine worked for supply of local requirements.

Shag Point (old) Mine, Shag Point.—New stone drive, down 90 ft., to tap seam known to continue, will cut off connection with old workings.

Shag Point Coal Company's Coal-mine, Shag Point.—Extension of the branch railway-line from Shag Point railway junction completed to loading-bank near mine-mouth, where fixed screens had been erected dividing the coal into three classes. The new stone drive, 460 ft. in length, had been finished, and a double line of rails was being laid for jig haulage to mine-mouth. A double-inlet Sirocco fan, 48 in. diameter, provided for ventilation.

Larsen and Brown, Kyeburn.—A small opencast pit held under lignite license.

Coal Creek Coal-mine, Coal Creek Flat.—Operations suspended meanwhile.

McPherson's Coal-mine, Coal Creek Flat.—Pit in good working-order. Water had been brought in for stripping and keeping down spontaneous fire, to which the seam has been liable.

Alexandra Coal-mine, Alexandra.—Working-places had been driven narrow throughout, and the benefit of so doing is now appreciated, as the soft and tender roof was proving incapable of adequately supporting the overlying strata of 300 ft. or more. Splitting pillars and robbing of as much available coal as possible with safety to workmen.

Cambrian Coal-mine, Cambrian.—Pit flooded, and no evidence of recent working. Stripping had become enormously heavy, which with water-drainage from natural inflow had rendered the pit unprofitable.

Morgan Brothers, Cambrian.—In the process of gold-mining the seam of lignite was exposed underlying the auriferous wash. Application for a lignite license was made and subsequently granted.

Lauderdale Coal-mine, Cambrian.—Pit in good working-order; stripping kept ahead of coal-face, which will, however, soon require to be worked by underground mining.

St. Bathan's Coal-mine, St. Bathan's.—Opencast pit, worked for supply of local demand.

Rough Ridge Coal-mine, Oturehua.—Stripping and getting lignite above water-level. This pit was nearly worked out.

Idaburn Coal-mine, Oturehua.—The recent flood had drowned the old pit in the watercourse of the creek. Opening in a new place on the "Freehold," where stripping shallow.

Oturehua Coal-mine, Oturehua.—Opencast pit recently reopened for output, workings in good order.

Cromwell Coal-mine, Cromwell.—Lower levels continued to right and left of dip haulage-way. Water inflow small as compared with former workings, between which and this mine there remained several chains of solid coal as shown on the mine-plans.

Shepherd's Creek Coal-mine, Bannockburn.—Pillar- and head-coal extraction continued safely.

Gibson's Coal-mine, Bannockburn.—Working discontinued and mine flooded.

Cardrona Coal-mine, Cardrona.—After a great deal of strenuous work removing stripping and overburden the coal-seam does not appreciably improve, as deserved by the conscientious tenant in occupation of this Crown lease.

Gibbston Coal-mine, Gibbston.—Spontaneous fire in the old workings had been reported as under control.

Nevis Coal-mine, Nevis (E. J. Williams).—No work had been done this season.

Nevis Crossing Coal-mine, Nevis.—Opencast workings on vertical seam. Coal being mined to a depth of 20 ft. and 8 ft. width.

Lower Nevis Coal-mine, Nevis.—Worked for supply to the gold-mining dredge. Where exposed the seam was about 15 ft. in width, but much crushed and broken.

Fernhill Coal-mine, Abbotsford.—Two men extracting pillars and two men putting in a prospecting-drive to tap the seam to dip.

Freeman's Coal-mine, Abbotsford.—Only three miners now on the coal. Furnace ventilation adequate.

Green Island Coal-mine, Green Island.—Extracting pillars on a small scale.

Jubilee Coal-mine, Saddle Hill.—Ventilation conducted by brattice to working-faces. A new upper seam, 8 ft. in thickness, was being opened up at near the haulage-tunnel entrance.

Saddle Hill No. 1 Coal-mine, Saddle Hill.—Inadequate bratticing between intake haulage-way and return airway to upcast furnace shaft. Ladder-way also required in shaft pending communication between workings and dip drive being driven from surface. These deficiencies were reported as having been immediately remedied.

Saddle Hill No. 2 Coal-mine, Saddle Hill.—Fan ventilation. Air conducted by brattice to working-faces. Substantial permanent stoppings in against the waste for prevention of spontaneous fires.

East Taieri Coal-mine, East Taieri.—Old dip workings abandoned. A new entrance had been made to southward between the outcrop and the dip drive. Small fan erected for ventilation. Magazine approved for storage of 275 lb. of explosives.

Brighton Coal-mine, Brighton.—An inclined shaft had been sunk for second outlet and return airway. Seam thin (5 ft. 6 in.); headings driven narrow.

Salisbury Coal-mine, North Taieri.—Work suspended, the seam having proved to be thin and unprofitable.

Waronui Coal-mine, Milton.—Upper-dip pillars and that portion of the seam to rise left at first working now being recovered may soon be expected to become exhausted. Recent prospecting by boring had proved the existence of a lower coal-seam, 13 ft. in thickness, at depth of 100 ft.

McGilp's Coal-mine, Milton.—New mine-entrance to workings; robbing of pillar and head coal continued. Fall of roof was being brought down to smother heating place in the waste.

Real Mackay Coal-mine, Akatore.—Working resumed at outcrop after being closed down for a number of years.

New Burnwell Coal-mine, Lovell's Flat.—Seam of lignite being worked by underground mining. Drive well timbered to face.

Dunlop's Coal-mine, Lovell's Flat.—A small mine recently opened by a party of practical miners from Kaitangata district.

Taratu Coal-mine, Lovell's Flat.—New dip drive in shaft seam and working-places broken away. Hauling-winch and pump underground electrically driven from surface generating plant, as also the ventilating-fan at second outlet shaft. Old workings closed with substantial fire stoppings. Barclay's seam worked to outcrop, and pillar and head coal subsequently withdrawn.

Kaituna (lately Mahara) Coal-mine, Kaitangata.—Seam thinning from 7 ft. to 4 ft., going easterly. Pillar-extraction continued. A new dip drive in northerly direction had proved the seam in regular sequence in that direction.

Wangaloa Coal-mine, Wangaloa.—New mine opened on the Coal Reserve, which had been worked for many years but had latterly been neglected. Seam 10 ft.; bord-and-pillar working.

Gage's Coal-mine, Wangaloa.—New mine being opened on the Coal Reserve; seam 10 ft. at face. Short tram-line and loading-bank being constructed.

Longridge Coal-mine, Kaitangata.—A small output produced for local consumption.

Kaitangata No. 1 Mine, Kaitangata.—Extraction of pillar and head coal in No. 6 dip and Mundy's dip sections had been brought back to the rib pillars on the haulage-ways, which had been extended in an easterly direction following the seam, and proved to be uninterrupted by faulting; also the districts were considerably larger in area than any previously worked in the colliery. The occasional presence of fire-damp had been reported at the edge of the waste beyond where men were required to work. When roof had fallen, as it invariably did, substantial stoppings were erected for prevention of heating and exudation of deleterious gases from the gob. Systematic timbering had been in vogue throughout the mine. The new Sirocco fan, 49 in. diameter, double inlet, had been installed, and a circulation of 33,000 cubic feet of air per minute was recorded. The fan was driven by a 40 h.p. motor with a 16 h.p. steam-engine for use in case of emergency when electric power might be cut off. The mine-entrance had been strengthened by a concrete archway for a length of 150 ft. A brick chimney, 113 ft. in height and over 14 ft. square at the base, had been erected for surface steam boilers. The new bath-house was completed and being utilized by workmen. The stone drive off Barclay's level, dipping 1 in 4, at 380 ft. tapped a seam of good coal 12 ft. in thickness. Levels were being driven to the prospecting-shaft for ventilation.

Kaitangata No. 2 Mine, Kaitangata.—The main haulage-way extension easterly had been extended 6 chains from the 18 ft. seam recently discovered, when a 25 ft. seam of excellent coal was struck. The seams, too, were practically free from fire-damp, which had only been reported on rare occasions. Development in the 6 ft. seam was continued. Nos. 1 and 2 dips, main seam finished and blocked off. Steel tubbing on haulage-way had been considerably reinforced during the year. The power and speed of the Sirocco ventilating-fan had also been accelerated, and over 30,000 cubic feet of air per minute was in circulation in the mine.

Castle Hill Mine, Kaitangata.—A new seam of coal had been found after driving through conglomerate easterly. Output for market was not being derived from this mine. Repairs and

ventilation, however, were maintained throughout the year. As formerly, the Inspector of the Society for the Prevention of Cruelty to Animals reported favourably on the condition of the pit horses and ponies at Kaitangata mines.

Benhar Coal-mine, Stirling.—Seam to dip troubled and faulted. An inflow of water from overlying old workings had occurred, but not so as to endanger workmen. A borehole had been put up in the roof, and water was almost drained off.

Stevenson's Collieries, Stirling.—Oil-engine and small exhaust fan procured for ventilation. New powder-magazine made near the mine for storage of 1,500 lb. of explosives.

Phillip's Coal-mine, Pukerau.—A small lignite-mine recently opened.

Miller Bros.' Coal-mine, Pukerau.—A small lignite-mine recently opened.

Whiterigg Coal-mine, East Gore.—Seam of lignite strong, and worked safely.

Green's Coal-mine, Gore.—The new air-shaft at near working-faces was acting well. Ventilating-fan and oil-engine for drive being erected.

Bushy Park Coal-mine, Gore.—Working suspended.

Burnwell Coal-mine, North Chatton.—A small output mined for local use.

Ramsay's Coal-mine, North Chatton.—Output raised for consumption in the district.

Glenlee Coal-mine, Waikaka.—An opencast pit being converted to underground mining.

Greenvale Coal-mine, Waikaka.—A small mine worked intermittently.

Pyramid Coal-mine, Riversdale.—After a considerable amount of prospecting, work is again discontinued.

Rossvale Coal-mine, Waikaia.—Pillars robbed and work now being directed to the dip area.

Waikaia Coal-mine, Waikaia.—Mine closed; work suspended.

Argyle Coal-mine, Waikaia.—Opencast seam, 15 ft. of lignite. Stripping kept well ahead by sluicing away with water.

Waikaia Oil-shale Development Company, Muddy Terrace.—Negotiations still pending for working and plant for reduction of shale-seam known to occur on the property.

Princhester Creek Coal-mine, The Key.—Opencast pit. Coal difficult to win, but a boon to the district.

Mataura Collieries, Mataura.—Ventilating-current not strong, but air clear and good; stentons well bratticed; shot-firing conducted at end of shift.

Mataura Lignite-mine, Mataura.—Ventilation fairly well conducted by brattice.

Heatherlee Coal-mine, Waimumu.—Small private pit. Work suspended.

Torrie Andrew, Waimumu.—A small opencast pit worked for local use.

Ota Creek, Wyndham.—Opencast working for the requirements of the district.

Clarke's Coal-mine, Wyndham.—An opencast pit worked intermittently.

Nightcaps No. 1 Mine, Nightcaps.—The remaining pillars having been extracted to the outcrop, this mine, of long standing, is finished and abandoned. A few men were engaged in the "Resin" seam (4 ft.) drawing pillars, as also in Lloyd's dip section, where the seam ranged from 5 ft. to 7 ft. in thickness. Ventilation here was inadequate owing to misfit brattice in certain places, as pointed out to the mine-manager, as also ambulance kits, which were not as well cared for as might have been expected. The management subsequently wrote that these matters had been rectified.

Nightcaps No. 2 Mine, Nightcaps.—Opencast and underground mining continued satisfactorily. This mine now contributes the larger portion of output from this company's mines.

Black Diamond Coal-mine, Nightcaps.—Natural ventilation rapidly becoming inadequate, and a fan was to be obtained. Systematic timbering to roof also required for safety of workmen, as pointed out to and promised by the mine-manager.

Burndale Coal-mine, Nightcaps.—Operations suspended meantime.

Coaldale Coal-mine, Nightcaps.—Prospecting by driving had not been successful. Boring operations now being conducted for location and thickness of seam.

New Brighton Coal-mine, Wairio.—Small ventilating-fan in use to be replaced by a larger Sirocco fan, which was on order. Effective timbering conducted to working-faces.

Wairio Coal-mine, Wairio.—Ventilation inadequate in the small seam, and the large seam required to be systematically timbered. The mine-manager subsequently wrote to say that these matters had been attended to.

McKenzie and Sheddan's Coal-mine, Nightcaps.—This lease is now incorporated with that held by the owners of Wairio Coal-mine, both being worked as one property.

The Willow Coal-mine, Nightcaps.—An opencast pit, hitherto worked on a small scale, but now being prospected with a view to operations being extended.

Wairaki Coal-mine, Nightcaps.—Emissions of inflammable gas with ignitions after shot-firing having been reported, it was decided by the Chief Inspector of Mines and myself that naked lights should be withdrawn and safety-lamps only substituted, with permitted explosives. I subsequently wrote the mine-manager, and in reply received his assurance that the statutory requirements would be fulfilled, the mine being closed down pending the installation of safety precautions as submitted.

Beaumont Coal-mine, Nightcaps.—Operations continue to be suspended; the pit remained filled with water from Ohai Stream.

Mossbank Coal-mine, Nightcaps.—Worked as partly opencast and partly by underground mining. Ventilation fair.

Linton Coal-mine, Nightcaps.—An opencast working on the Coal Reserve. Operations resumed, and tram-line laid to the Wairio Branch Railway line extension.

Diamond Lignite-mine, Seaward Bush.—Opencast working continued on a moderate scale.

Orepuki Coal-mine, Orepuki.—Dip drive at 358 ft. at face, where a fault was met. Four levels were being driven on either side of the dip, one being in a distance of 100 ft. The coal-seam was worked 7 ft. in height and overlain by a seam of shale 9 in. in thickness.

Lynwood Coal-mine, Te Anau.—Worked opencast for supply of fuel to the steam-launch on Lake Te Anau, the property of the Tourist Department of New Zealand.

Southport Coal-mine, Preservation Inlet.—Not at work, owing to various causes, as stated by the acting secretary to the company, among which post-war conditions, influenza epidemic, and labour shortage are enumerated.

Fatal Accidents.

Kaitangata No. 1 Mine, Kaitangata.—8th July, 1918: A. E. Hawkins, 37, miner—compound fracture of right tibia and bruised chest by fall of coal and timber from roof while repairing. Deceased died in Dunedin Hospital on the 8th May, 1919, ten months after the accident, from which he never properly recovered. Cause of death, blood-poisoning, the outcome of the accident.

8th November, 1919: Robert Grundy, 38, miner—leg fractured and body crushed by fall of coal from lip of roof in a pillar place while filling a box of coal.

Kaitangata No. 2 Mine.—31st January, 1919: Archibald Weir, 41, trucker—severely injured pelvic region; caught by ventilating-brattice and crushed against roof while riding on a rake of boxes.

Black Diamond Mine, Nightcaps.—5th May, 1919: Thomas Blight, 36, miner—injuries to back and groin region; struck by fall of stone from roof while filling a box of coal at face. Deceased died in Riverton Hospital on the 7th August, 1919, three months after the accident occurred.

Homebush Mine, Glentunnel.—4th August, 1919: John Penman, 39, miner—killed by fall of stone from roof of trucking-road which he was travelling at the time accident occurred.

Brighton Coal-mine, Dunedin.—26th August, 1919: Robert W. Smith, 53, miner—fracture of skull by fall of stone from low roof while filling a box of coal at working-face.

Serious Non-fatal Accidents.

Shag Point Mining Company's Mine.—17th April, 1919: C. Manderson, miner—injury to eye, corneal ulcer; struck by piece of coal flying from working-face; 106 days off work.

Kaitangata No. 2 Mine.—7th May, 1919: Ian Marshall, 16, engineer apprentice—injury to eye; eye cut by piece of flying steel while riveting, causing subsequent removal of eye; forty-four days off work.

Shag Point Colliery.—9th December, 1919: Charles Cook, miner—by the fall of a small piece of stone suffered fracture of small bones in the wrist; off work seventy-one days.

Coal-miners' Relief Fund.

A total of 153 accidents was reported to me during the year, mostly in connection with the Coal-miners' Relief Fund, of which seven claims were not prosecuted or disallowed, leaving 146 cases of workmen injured by accidents met with in and about coal-mines. The following is an abstract of accidents:—

	Above Ground.	Below Ground.
Fatal accidents	...	6
Non-fatal (serious and severe)	...	2
Non-fatal (ordinary)	20	126
Totals	20	134

Eye accidents from various causes comprised twenty-one of the accidents reported. Of these fourteen cases occurred at Kaitangata Mines, two at Shag Point, and one each at Homebush Waronui, Taratu, Green's, and Nightcaps Mines.

Prosecutions.

With respect to the death of John Penman, miner, at Homebush Mine, Glentunnel, on the 4th August, the Homebush Coal Company as owners, the mine-manager (David Kane), and fireman and deputy (Thomas Burt) were subsequently charged with having committed breaches of the Coal-mines Act, 1908. Kane and Burt were each fined £5 1s. and costs, and the company was fined £2 and costs, for negligence under section 59 of the Coal-mines Act, 1908, and for contravention of section 40, subsection (9), of the Act, the Magistrate holding that the drive had not been made safe for the persons employed therein.

In regard to the fatality at Brighton Mine, Dunedin, where Robert William Smith was killed on the 26th August, the mine-manager, David McNeill, was prosecuted and fined £5 and costs for failure to withdraw the workman from an unsafe working-place, as required by Special Rule No. 21 of the Coal-mines Act, 1908.

Further proceedings were taken against D. McNeill for inquiry into the matter of his certificate (2nd class) under section 7 of the Coal-mines Amendment Act, 1914, when the Court, consisting of the Stipendiary Magistrate and two assessors, declared the certificate suspended for a period of seven days.

ANNEXURE B.

COLLIERY STATISTICS, 1919.

Name of Mine and Locality.	Name of Manager.	Number of Years worked.	Quality of Coal.	Number of Seams worked.	Thickness of Seams.	Thickness worked.	System of Underground working.	Number of Shafts.	Total Output for 1919.	Approximate Total Output to 31st December, 1918.	Approximate Total Output to 31st December, 1919.	Number of Men ordinarily employed.			Means of Ventilation.
												Above.	Below.	Total.	
NORTHERN INSPECTION DISTRICT.															
North Auckland.									Tons.	Tons.	Tons.				
Northern Tauronga, Hikurangi	G. Doel	¾	Semi-bituminous	1	5′	5′	Bord and pillar	1	1,670	612,742	614,412	..	4	4	Natural.
Northern Collieries, Kiripaka ..	E. Nelson ..	4½	Ditto ..	1	5′ to 11′	Full	Ditto ..	4	28,849	354,592	383,441	18	33	51	Fan in two sections, other natural.
Northern Co-operative ..	E. A. Cunningham ..	..	„ ..	1	4′ to 6′	„	„	..	1,099	21,666	22,765	4	4	8	Natural.
Kerr and Wyatt's, Hikurangi ..	F. H. Kells ..	3	„ ..	2	2′ to 5′	„	.. .. ..	..	2,881	16,493	19,374	..	5	5	„
Dobson and Party (late Foot and Doel), Hikurangi	G. Doel	..	„ ..	1	5′ to 6′	5′ to 6′	Pillar ..	1	2,021	9,588	11,609	1	8	9	„
Silverdale, Hikurangi ..	J. Doel	½	„ ..	1	3′ 6″ to 4′	3′ 6″ to 4′	Bord and pillar	..	1,025	..	1,025	2	2	4	„
Hikurangi Colliery, Hikurangi ..	A. H. Taylor ..	27	„ ..	1	6′ to 12′	6′ to 10′	Ditto	4	77,845	1,165,283	1,243,128	35	88	123	Waddle fan.
Waikato.															
Waipa Colliery, Glen Massey ..	T. Thompson ..	7	Brown ..	1	10′	8′	Bord and pillar	..	54,168	388,784	442,952	24	65	89	Fan.
Taupiri Extended, Huntly ..	W. Wood ..	30½	„ ..	1	10′ to 34′	20′	Ditto ..	2	172,561	2,385,196	2,557,757	69	282	351	„
Taupiri Rotowaro, Rotowaro ..	A. Penman ..	2	„ ..	1	6′ to 15′	7′	„	..	73,990	33,274	107,264	35	85	120	„
Pukemiro Collieries, Pukemiro ..	A. Burt	4⅓	„ ..	1	16′ to 18′	6′ to 12′	„ ..	2*	89,261	296,424	385,685	45	105	150	„
Huntly Coal and Brick, Huntly	R. Greenwell ..	7½	Lignite ..	..	20′	7′	Splitting pillars	1	2,500	20,867	23,367	4	4	8	..
Waikato Extended, Huntly West	W. C. Davies ..	3½	Brown ..	1	16½′	16½′	Bord and pillar	..	2,762	3,174	5,936	4	7	11	Natural.
Hunua Colliery, Hunua ..	R. R. Lewis ..	⅜	„ ..	1	6′	6′	Ditto ..	..	481	..	481	1	3	4	„
Greencastle, Aria	A. Morgan ..	3	Lignite ..	1	12′	9′	Level ..	..	338	292	630	..	2	2	„
Output of mines included in previous statements at which operations are abandoned or suspended							..	..	..	3,785,360	3,785,360	..	..	..	
WEST COAST INSPECTION DISTRICT															
Nelson.															
Puponga Mine	I. Lewis (P.) ..	16	Bituminous	1	5′ 6″	Full height	Bord and pillar	..	3,536	216,182	219,718	3	5	8	Natural.
North Cape Mine	J. Walker ..	9	„	1	2½′ to 4½′	„	Ditto	..	8,501	67,922	76,423	9	14	23	Mechanical.

Buller.															
Co-operative Mine	H. Chester (P.) ..	5	Bituminous	1	10′	8′	Bord and pillar ..	..	3,430	7,474	10,904	1	6	7	Natural.
Coal Creek Mine	H. Barlow ..	4	„	1	6′	Full height	Ditto ..	..	7,563	9,038	16,601	5	11	16	„
St. Helens Mine	T. L. Bennett (P.)..	1	„	1	6′ to 7′	„	„ ..	..	691	..	691	..	6	6	„
Westport-Stockton Colliery ..	P. Hunter ..	11	„	2	4′ to 25′	„	„ ..	1†	129,125	1,357,612	1,486,737	82	192	274	Mechanical.
Millerton Colliery	T. King, W. Pearson	28	„	..	5′ to 14′	„	„ ..	2†	217,630	5,492,521	5,710,151	84	261	345	„
Ironbridge Colliery	G. Smith ..	28	„	2	3′ to 30′	„	„ ..	..	147,766	7,781,218	7,928,984	50	130	180	„
Coalbrookdale Colliery ..	R. Fox	39	„	1	4′ to 20′	„	„ ..	..				50	145	195	„
Rocklands Mine	J. P. Burley (P.) ..	17	Brown ..	1	27′	8′	„ ..	..	109	7,195	7,304	..	2	2	Natural.
Inangahua.															
Coghlan's Freehold Mine ..	J. Coghlan (P.) ..	23	Semi-bituminous	1	12′	8′	Bord and pillar ..	..	716	7,926	8,642	..	2	2	Natural.
Archer's Freehold Mine ..	F. W. Archer (P.) ..	24	Ditto	..	9′ to 24′	8′ to 10′	Ditto ..	..	2,260	21,156	23,416	..	..	..	„
Reefton Coal Company's Mine ..	A. Thompson ..	18	„ ..	2	5′ and 12′	5′ and 8′	„ ..	..	7,079	39,206	46,285	5	11	16	„
Konini (Deep Creek) Mine ..	William Lowden	18	„ ..	3	5′ to 20′	5′ to 10′	„ ..	..	2,161	4,573	6,734	3	9	12	„
Phœnix and Venus Mine ..	W. Julyan (P.) ..	38	„ ..	2	25′ to 80′	8′	„ ..	..	2,490	41,436	43,926	1	3	4	„
Loughnan's Mine	H. Griggs (P.) ..	33	„ ..	1	4′	4′	„ ..	..	1,179	16,599	17,778	1	2	3	„
Big River Mine	W. Kirwan (P.) ..	6	„ ..	1	2′ to 12′	2′ to 12′	„ ..	..	778	4,197	4,975	..	2	2	„
Waitahu Mine	I. Rhodes (P.) ..	17	„ ..	2	12′ and 6′	8′ and 5′	„ ..	..	170	4,879	5,049	2	4	6	„
Morris and Learmont's Mine ..	P. Mitchell (P.) ..	6	„ ..	1	20′	8′	„ ..	..	1,388	520	1,908	..	6	6	„
Boatman's Creek Mine ..	J. Whitfield (P.) ..	..	„ ..	1	4′ to 5″	4′ to 5′	„ ..	..	394	450	844	1	5	6	„
Victory (Murray Creek) Mine ..	O. Moyle (P.) ..	1	„ ..	2	5′ to 12′	5′ to 8′	„ ..	..	471	..	471	1	2	3	„
Golden Point Mine	W. O. Birwirth (P.)	6	„ ..	1	10′	7′	„ ..	..	920	1,585	2,505	3	5	8	„
Grey.															
Paparoa Colliery	H. Talbot ..	11	Bituminous	1	5′ to 25′	5′ to 25′	Bord and pillar ..	..	23,790	297,694	321,484	20	40	60	Mechanical.
Blackball Colliery	G. Davidson ..	29	„	2	17′	15′	Ditto ..	..	94,016	2,709,639	2,803,655	56	228	284	„
North Brunner Colliery ..	J. Armstrong ..	10	„	1	4′ 9″	Full height	„ ..	..	6,943	115,873	122,816	15	20	35	„
Brunner Colliery	R. Alison ..	55	„	1	4′ to 12′	„	„ ..	..	15,125	2,419,342	2,434,467	9	12	21	„
N.Z. State Coal-mines.															
Point Elizabeth Mine ..	W. Parsonage ..	15½	Bituminous	2	4′ to 12′	Full height	Bord and pillar ..	..	45,885	2,350,823	2,396,708	22	41	63	Mechanical.
Liverpool Colliery (No. 1 Section)	O. J. Davis ..	7	„	3	3½′ to 16′	„	Ditto ..	..	71,649	585,484	707,194	49	139	188	„
Liverpool Colliery (No. 3 Section)	C. Strongman ..	7	„	1	4′ to 12′	„	„ ..	..	50,061			26	90	116	„
Output of mines included in previous statements at which operations have been abandoned or suspended								..	..	2,158,298	2,158,298	..	..	..	..
SOUTHERN INSPECTION DISTRICT.															
Canterbury.															
Mount Torlesse, Avoca ..	W. Leitch ..	2	Brown ..	1	5′	5′	Bord and pillar ..	..	16,009	2,946	18,955	19	38	57	Fan.
Springfield, Springfield ..	James Taylor ..	40	„ ..	2	2′	All	..	1	6	92,387	92,393	..	..	..	..
Homebush, Glentunnel ..	J. Deans	46	„ ..	1	6′	6′	Bord and pillar	1	11,457	309,750	321,207	8	25	33	Natural.
St. Helens, Whitecliffs ..	J. Sutherland ..	38	„ ..	1	6′	5′	Ditto ..	1	1,096	27,562	28,658	1	4	5	„
Mount Hutt, Methven ..	James McQueen ..	1	„ ..	1	4′	..	..	..	200	..	200	..	1	1	..
Tripp's, Mount Somers ..	J. McClimont (P.) ..	53	„ ..	1	40′	15′	Bord and pillar	1	2,570	70,416	72,986	1	3	4	Natural.
Albury, Albury	T. F. Slowey (P.) ..	28	„ ..	1	16′	10′	Ditto ..	1	1,262	18,717	19,979	..	3	3	„

* Tunnels. † Air.

COLLIERY STATISTICS, 1919—*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.	System of Underground working.	Number of Shafts.	Total Output for 1919.	Approximate Total Output to 31st December, 1918.	Approximate Total Output to 31st December, 1919.	Number of Men ordinarily employed.			Means of Ventilation.
												Above.	Below.	Total.	
SOUTHERN INSPECTION DISTRICT—*continued.*															
									Tons.	Tons.	Tons.				
Canterbury—continued.															
Allanholme, Waihao Forks ..	A. Todd (P.) ..	4	Brown ..	1	15′	7′	Bord and pillar ..		3,183	2,017	5,200	1	3	4	Natural.
A. E. Kirk, Waihao Forks ..	A. E. Kirk ..	2	„ ..	1	10′	7′	Open		221	73	294	1	1	2	„
North Otago.															
St. Andrew's, Papakaio ..	George Ramsay (P.)	41	Brown ..	1	7′	6′	Bord and pillar	1	1,445	57,105	58,550	1	3	4	Natural.
Prince Alfred, Papakaio ..	A. Beardsmore (P.)	50	„ ..	1	9′	7′	Ditto ..	1	1,217	63,961	65,178	1	2	3	„
Ngapara, Ngapara	William Nimmo (P.)	41	„ ..	1	25′	8′	„ ..	1	1,159	32,216	33,375	1	2	3	„
Shag Point (old mine), Shag Point	William Hunt (P.)..	5	„ ..	1	4′	4′	„ ..	1	885	411,388	412,273	1	3	4	„
Shag Point Coal-mining Company, Shag Point	Job Hughes ..	11	„ ..	1	5′	5′	„ ..	1	17,577	44,818	62,395	11	42	53	Fan.
Waitati Mining Company, Waitati	A. Ross	1	„ ..	1	..	..	„ ..	1	216	..	216	1	1	2	Natural.
Central Otago.															
Larsen and Brown's, Kyeburn ..	Larsen and Brown	2	Lignite ..	1	2′	2′	Open		24	2	26	1	..	1	Natural.
Coal Creek, Roxburgh ..	N. Harlewich ..	49	„ ..	1	20′	7′	„		76	61,072	61,148	1	..	1	..
McPherson's, Coal Creek Flat ..	J. Weatherall ..	49	„ ..	1	60′	20′	„ ..	1	2,426	72,420	74,846	3	..	3	..
Alexandra, Alexandra ..	A. W. Whittlestone	38	„ ..	1	11′	7′	Bord and pillar	1	3,518	97,130	100,648	1	6	7	Exhaust steam.
Cambrian, Cambrian	D. Jones ..	58	„ ..	1	30′	All	Open		6	49,493	49,499	1	..	1	..
Morgan Brothers', Cambrian ..	..	1	„ ..	1	..	..	„		190	..	190	1	..	1	..
Laudervale, Cambrian ..	Reid and McIntyre	15	„ ..	1	12′	All	„		303	1,309	1,612	2	..	2	..
St. Bathan's, St. Bathan's ..	J. Enwright ..	22	„ ..	1	20′	20′	„		147	6,281	6,428	1	..	1	..
Roughridge, Oturehua ..	J. Beck (P.) ..	33	„ ..	1	20′	20′	„		916	32,380	33,296	3	..	3	..
Idaburn, Oturehua	J. White (P.) ..	49	„ ..	1	20′	20′	„		561	47,246	47,807	3	..	3	..
Oturehua, Oturehua	R. Thomas ..	25	„ ..	1	7′	All	„		848	2,339	3,187	2	..	2	..
Gimmerburn, Gimmerburn ..	C. Dougherty ..	63	„ ..	1	12′	12′	„		12	3,253	3,265	..	..	..	..
Cromwell, Cromwell	J. Hodson ..	5	„ ..	1	7′	6′	Bord and pillar ..		1,725	4,048	5,773	1	6	7	Exhaust steam.
Shepherd's Creek, Bannockburn	W. R. Parcell ..	42	„ ..	1	12′	5′	Ditto		5,375	92,257	97,632	2	8	10	„
Gibson's, Bannockburn ..	J. Gibson (P.) ..	2	„ ..	1	18′	8′	Dip and levels ..		15	316	331	..	..	..	Natural.
Cardrona, Cardrona	R. McDougall ..	35	„ ..	1	10′	10′	Open		177	26,058	26,235	4	..	4	..
Gibbston, Gibbston	R. B. Cowan (P.) ..	33	„ ..	1	15′	10′	Bord and pillar ..		1,656	24,655	26,311	1	2	3	Natural.
Nevis, Nevis..	E. J. Williams (P.)	19	„ ..	1	20′	20′	Levels		138	6,933	7,071	1	..	1	„
Nevis Crossing, Nevis.. ..	R. Ritchie ..	16	„ ..	1	16′	16′	Open		587	13,725	14,312	2	..	2	..
Dillon's, Blackstone Hill ..	J. Dillon ..	22	„ ..	1	12′	12′	„		5	292	297	..	..	..	..

South Otago.															
Fernhill, Abbotsford	G. F. Turner ..	42	Lignite ..	1	11′	8′	Bord and pillar	1	4,870	162,317	167,187	2	5	7	Natural.
Freeman's, Abbotsford ..	W. Evans (P.) ..	39	,, ..	1	10′ to 12′	All	Ditto ..	3	5,533	568,944	574,477	2	6	8	Furnace.
Green Island, Green Island ..	T. Barclay, jun. ..	32	,, ..	1	10′	8′	,, ..	1	3,566	135,009	138,575	3	4	7	Natural.
Jubilee, Saddle Hill	T. Barclay, sen. ..	22	,, ..	1	6′ to 10′	All	,, ..	2	16,128	360,468	376,596	10	23	33	Furnace.
Saddle Hill (No. 1), Saddle Hill	Robert Hill ..	47	,, ..	1	20′	20′	,, ..	1	7,572	250,085	257,657	5	10	15	,,
Saddle Hill (No. 2), Saddle Hill	Robert Hill ..	18	,, ..	1	20′	20′	,, ..	1	13,916	266,400	280,316	7	17	24	Fan.
East Taieri, Riccarton ..	D. McNeill ..	8	,, ..	1	10′	7′	,, ..	1	2,975	17,859	20,834	3	6	9	,,
Salisbury, North Taieri ..	L. C. Hazlett ..	4	,, ..	1	6′	6′	Level ..	1	290	4,448	4,738	1	1	2	Natural.
Brighton, Brighton	D. McNeill ..	4	,, ..	1	6′	6′	Bord and pillar	1	3,201	3,981	7,182	2	12	14	,,
Waronui, Milton	James Carruthers ..	15	Brown ..	1	18′	8′	Ditto ..	1	11,861	202,984	214,845	15	15	30	Fan.
McGilps, Milton	James Carruthers ..	15	,, ..	1	12′	10′	,, ..	1	11,551	58,163	69,714	2	11	13	Natural.
Real McKay, Akatore ..	Joseph Hill ..	..	,, ..	..	..	..	..	..	246	25,385	25,631	1	2	3	,,
New Burnwell, Lovell's Flat ..	D. Kerr (P.) ..	..	Lignite ..	..	..	..	..	..	545	..	545	2	2	4	,,
Dunlop's, Lovell's Flat ..	J. O'Fee (P.) ..	..	,, ..	..	..	..	..	..	434	..	434	1	2	3	,,
Taratu, Lovell's Flat	J. Gillick	18	,, ..	3	6′ to 30′	7′ to 15′	Bord and pillar	2	39,937	354,467	394,404	15	54	69	Fan and natural.
Port Arthur, Kaitangata ..	J. M. Morrison ..	10	Brown ..	1	10′	8′	Ditto ..	..	70	2,926	2,996	..	1	1	Natural.
Kaituna (late Mahara), Kaitangata	G. F Whittlestone ..	11	,, ..	1	7	6′	,, ..	..	2,733	3,787	6,520	4	9	13	,,
Wangaloa (Morrison Bros.) ..	J. Heyes	1	,, ..	1	9	7′	,, ..	..	604	2,104	2,708	1	3	4	,,
Longridge, Kaitangata ..	N. Mackie (P.) ..	11	,, ..	1	4′	4′	,, ..	..	156	3,998	4,154	1	1	2	,,
N.Z. Coal and Oil Company (Limited)—															
Kaitangata No. 1, Kaitangata	A. S. Gillanders ..	43	,, ..	1	25′ to 32′	All	Bord and pillar	1	103,550	3,632,480	3,736,030	37	111	148	Fan.
Kaitangata No. 2, Kaitangata	W. Carson ..	7	,, ..	3	26′ to 7′	,,	Ditto ..	1				35	114	149	
Castle Hill, Kaitangata ..	W. Carson ..	26	,, ..	1	18′	18′	,, ..	1							
Benhar, Stirling	J. Walls (P.) ..	56	Lignite ..	1	25′	12′ to 16′	,, ..	1	9,946	178,758	188,704	1	6	7	Exhaust steam.
Stevenson's, Stirling	A. E. Barnes ..	3	,, ..	1	15′	10	,, ..	..	4,152	3,458	7,610	3	6	9	Natural.
Southland.															
James Phillips's, Pukerau ..	James Phillips ..	1	Lignite ..	..	..	..	..	..	82	..	82	..	..	..	..
Miller Bros.', Pukerau ..	J. Broome ..	1	,, ..	..	..	..	..	..	240	..	240	1	1	2	..
Whiterigg, East Gore	R. Craig (P.) ..	41	,, ..	1	20′	12′	Bord and pillar	1	5,854	71,510	77,364	1	3	4	Exhaust steam.
Green's, Gore	J. Mason	31	,, ..	1	20′	14′	Ditto ..	1	17,979	206,396	224,375	3	10	13	Fan.
Bushy Park, Croydon	G. M. Wilson ..	14	,, ..	1	20′	18′	Open	..	193	22,929	23,122	1	..	1	..
Burnwell, North Chatton ..	W. McIvor (P.) ..	20	,, ..	1	20′	12′	Bord and pillar	1	538	41,350	41,888	1	1	2	Natural.
Ramsay's, North Chatton ..	P. Ramsay (P.) ..	16	,, ..	1	20′	15′	Ditto	..	3,703	86,843	90,546	1	3	4	,,
Glenlee, Waikaka	A. A. Edge (P.) ..	26	,, ..	1	14′	10′	Open	..	1,424	16,861	18,285	2	2	4	..
Greenvale, Waikaka	R. B. Middlemiss ..	3	,, ..	1	14′	10′	Bord and pillar	1	352	770	1,122	1	1	2	Natural.
Pyramid, Pyramid	E. Jones	3	,, ..	1	9′	8′	Ditto	..	232	2,941	3,173	1	2	3	,,
Terrace, Kingston Crossing ..	E. Jones ..	1	,, ..	..	..	..	.. ..	..	1,099	..	1,099	1	2	3	Natural.
Rossvale, Waikaia	T. D. Moffat ..	16	,, ..	1	10′	8′	Bord and pillar	1	1,170	42,126	43,296	1	2	3	,,
Argyle, Waikaia	M. C. Hutton ..	28	,, ..	1	12′	12′	Open	..	305	6,042	6,347	1	..	1	..
Princhester Creek, The Key ..	J. A. Denton ..	17	,, ..	1	6′	6′	,, ...	..	75	1,819	1,894	1	..	1	..
Mataura Collieries, Mataura ..	R. Brown ..	23	,, ..	1	17′	12′	Bord and pillar	..	12,580	197,280	209,860	5	7	12	Exhaust steam.

COLLIERY STATISTICS, 1919—*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.	System of Underground working.	Number of Shafts.	Total Output for 1919.	Approximate Total Output to 31st December, 1918.	Approximate Total Output to 31st December, 1919.	Number of Men ordinarily employed.			Means of Ventilation.
												Above.	Below.	Total.	
SOUTHERN INSPECTION DISTRICT—*continued.*															
Southland—continued.									Tons.	Tons.	Tons				
Mataura Lignite Mine, Mataura	E. Charles ..	43	Lignite ..	1	18′	14′	Bord and pillar ..		17,969	190,145	208,114	4	9	13	Exhaust steam.
Heatherlea, Waimumu ..	F. Barber ..	8	,, ..	1	10′	8′	Open		17	628	645	1	..	1	..
Torrie, Andrew, Waimumu ..	A. Torrie.. ..	2	,, ..	1	8′	All	,, ...		81	101	182	1	..	1	..
Ota Creek, Wyndham ..	E. Genge (P.) ..	39	,, ..	1	9′	9′	,, ...		1,675	22,858	24,533	2	..	2	..
Clarke's, Wyndham	J. Bushbridge ..	12	,, ..	1	12′	12′	,, ...		255	15,297	15,552	2	..	2	..
Nightcaps No. 1, Nightcaps ..	W. Barclay ..	38	Brown ..	2	6′ and 4′	All	Bord and pillar	1	33,695	1,307,949	1,356,231	15	64	79	Two fans.
Nightcaps No. 2. Nightcaps ..	W. Barclay ..	3	,, ..	1	28′	20′	Ditto and open ..		14,587			14	6	20	Natural.
Black Diamond, Nightcaps ..	James Thomson ..	4	,, ..	1	25′	10′	Bord and pillar ..		8,113	7,104	15,217	5	8	13	,,
Coaldale, Nightcaps	J. Duncan ..	2	,, ..	1	10′	6′	Ditto		252	665	917	2	5	7	..
New Brighton, Nightcaps ..	W. Dixon ..	13	,, ..	1	7′	All	,, ..	1	7,136	55,621	62,757	3	15	18	Fan.
Wairio, Nightcaps	A. Morris ..	14	,, ..	2	14′ and 6′	,,	,, ...		15,860	85,103	100,963	12	24	36	Natural.
McKenzie and Sheddan's, Nightcaps	J. Robertson ..	2	,, ..	1	14′	7′	,, ...		400	199	599	1	2	3	,,
The Willow, Nightcaps ..	J. O. Clapp ..	6	,, ..	1	12′	All	Open		102	2,563	2,665	1	..	1	..
Wairaki, Nightcaps	S. Clarkson ..	6	,, ..	1	9′	7′	Bord and pillar ..		2,361	591	2,952	6	6	12	Natural.
Mossbank, Nightcaps	A. Hunter ..	5	,, ..	1	14′	14′	Bord and open ..		13,099	6,246	19,345	8	6	14	..
Linton, Nightcaps	C. R. Heycock ..	4	,, ..	1	20′	20′	Open		3,984	3,982	7,966	18	..	18	..
Wellwood Park, Pukerau ..	A. M. Mason ..	18	Lignite ..	1	7′	7′	,, ...		22	376	398	..	..	..	..
Otikerama, Pukerau	W. J. Voight ..	22	,, ..	1	7′	7′	,, ...		120	342	462	1	..	1	..
Riverview, Gore	J. Nicol	32	,,	1	10′	10′	,, ...		24	1,998	2,022	..	..	..	..
Diamond Lignite, Seaward Bush	W. Robertson (P.)..	17	,, ..	1	25′	18′	,, ...		2,322	17,955	20,277	2	1	3	..
Orepuki, Orepuki	N. McAllister ..	23	Brown ..	1	10′	10′	Bord and pillar ..		1,518	26,454	27,972	5	5	10	..
Lynwood, Te Anau	N.Z. Tourist Dept.	9	Lignite ..	1	7′	7′	Open		109	2,379	2,488	1	..	1	..
Output of mines included in previous statements at which operations are suspended or abandoned							.. ..		..	2,724,897	2,724,897	..	..	..	..
Totals, Southern District, South Island	..	..	..	..	..	..	.. ..		490,571	13,082,906	13,573,477	355	759	1,114	..
Totals, West Coast District, South Island	..	..	..	..	..	..	.. ..		845,826	25,718,842	26,564,668	498	1,393	1,891	..
Totals, North Island ..	..	..	..	..	..	..	.. ..		511,451	9,093,735	9,605,186	242	697	939	..
Grand totals ..	..	..	..	..	..	..	.. ..		1,847,848	47,895,483	49,743,331	1,095	2,849	3,944	..
Output of some mines prior to 1890 not included in the above statement						..	..		..	..	311,779	..	..	..	..
Shale exported	..	..	..	..	..	..	.. ..		..	..	21	..	..	..	..
											50,055,131				

APPENDIX C.

REPORT OF THE BOARD OF EXAMINERS.

Mines Department, Wellington, 25th June, 1920.

The Under-Secretary, Mines Department, Wellington.

On behalf of the Boards of Examiners under the Mining Act and the Coal-mines Act, I have the honour to submit the following report for the year that ended 31st May, 1920.

The following candidates were successful at the interim examination held on the 20th May, 1919, and following days: As first-class mine-managers under the Coal-mines Act, 1908—W. E. G. Hewitson (Burnett's Face), W. C. Davies (Huntly), James Carruthers (Milton). As second-class mine-managers under the Coal-mines Act, 1908: John Brennan (Kaitangata), R. W. Duncan (Nightcaps).

Written examinations for mine-managers' and battery superintendents' certificates were held on the 16th December and following days at Waihi, Huntly, Reefton, and Dunedin. The results were considered at the annual meetings of the Boards of Examiners held in conjoint session at Wellington on the 28th and 29th January last. No candidate was successful in obtaining a first-class certificate as mine-manager under either the Mining Act or the Coal-mines Act. T. R. Hogg was granted a partial pass as a second-class mine-manager under the Mining Act, and O. Bell and S. B. Quintrell were granted partial passes in the battery superintendent's examination. F. Carson, V. Armstrong, J. Hadcroft, and C. V. P. Maloney were granted partial passes as first-class mine-managers under the Coal-mines Act. Job Makinson, who had passed the written examination for second-class mine-manager's certificate under the Coal-mines Act, and Alexander Cain and J. C. Griffen, who had completed the written examination for the same certificate, were orally examined by a committee consisting of the whole of the members of the Board of Examiners under the Coal-mines Act. All three were successful in the oral examination, and were granted certificates. In addition J. Bashall and J. Turton were granted a partial pass as second-class mine-managers under the Coal-mines Act.

In future all candidates for mine-managers' or battery superintendents' certificates who satisfy the requirements of the two Boards in the written examinations will be required to attend a meeting of the Board concerned in order to undergo oral examination. Both Boards consider that searching oral examinations are necessary, in order to ensure that only fit and proper persons shall be granted certificates. Under a regulation gazetted last year, actual travelling-expenses will be refunded to all candidates required to attend such a meeting.

Interim written examinations for the candidates who did not obtain complete passes or failed at the December examinations were held on the 25th May and following days.

As soon as the examiners' marks are all to hand the candidates will be informed privately of their success or non-success.

The following oil-well manager's permit has been issued under Regulations Nos. 199–201 during the twelve months that ended 31st May last: J. E. W. Henchman (New Plymouth).

The following holders of foreign certificates have been granted equivalent New Zealand certificates: George Edmund Robins (New Plymouth), first-class mine-managers' certificate under the Coal-mines Act, 1908; Thomas McCloy (Mosgiel), and Herbert Llewelyn Morgan (Ngakawau), second-class mine-managers' certificates under the Coal-mines Act, 1908.

In various cases during recent years applications for certificates under the exchange clauses of the Mining and Coal-mines Acts have had to be refused, because the examinations passed by the applicants were not fully equivalent to the New Zealand examinations. In other cases much trouble has been experienced in ascertaining what were the standards and requirements of foreign examinations. Uniformity in the system of examining mine officials throughout the British Empire is much to be desired. At the present time the Australasian Institute of Mining and Metallurgy is promoting a movement having as its objective the standardization of mining examinations through Australasia. If this movement is successful, the question of exchange certificates, so far as Australia and New Zealand are concerned, will no longer present any serious difficulties.

Examinations for underviewers and firemen-deputies under the Coal-mines Act were held during the year at the following places: Greymouth, on 7th June, 1919, and 16th February, 1920; Dunedin, on 7th October, 1919; Westport, on 7th February, 1920; Huntly, on 10th February, 1920. At these examinations five candidates passed as underviewers and thirty-one as firemen-deputies. In addition a fireman-deputy's certificate was issued to Henry John Fox, of Denniston, in lieu of certificate No. 5, destroyed by fire.

Lists of persons holding certificates under the Mining and Coal-mines Acts are appended.

P. G. Morgan,
Chairman of Boards.

LIST OF MINE-MANAGERS, BATTERY SUPERINTENDENTS, AND DREDGE MASTERS WHO HOLD 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.
Andrews, T., Thames.
Barclay, T. H., Thames.
Bennett, J., Alexandra.
Black, T., Waiomio.
Burch, W. H., Thames.
Cameron, A., Macetown.
Chapman, J. A., Dunedin.
Davis, J. E., Queenstown.
Evans, J. H., Skipper's.
Frewen, J. B., Queenstown.
Gilmour, T., Thames.
Glass, W. M., Naseby.
Harrison, R. H., Coromandel.
Hunter, R., Thames.
Jamieson, A., Coromandel.
Jenkins, M., Wakatipu.
Johnstone, H., Bluespur.
Kerr, J., Thames.
McGruer, G. N., Karangahake.
McIntosh, D., Bluespur.
Moore, H. W., Thames.
Morrisby, A. A., Glenorchy.
Newman, W., Naseby.
Polton, A., Karangahake.
Porter, J., Waipori.
Quinn, E., Te Aroha.
Ralph, J. G., Thames.
Reid, P., Coromandel.
Rooney, F., Reefton.
Scott, T., Waiorongomai.
Smith, J. E., Thames.
Stone, F., Karangahake.
Sturm, A., Waipori.
Todd, C., Heriot.
Treloer, J. S., Reefton.
Watson, T., Reefton.
Wearne, T., Endeavour Inlet.
Wylie, W., Ross.
Young, G., Skipper's.

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

Baker, W., Thames.
Cochrane, D. L., Reefton.
Colebrook, J. D., Coromandel.
Crawford, J. J., Thames.
Donaldson, W., Otago.
Fleming, M., Thames.
Harris, W., Thames.
Horn, G. W., Thames.
Horne, W., Coromandel.
Hornick, M., Thames.
Hosking, G. F., Auckland.
Kruizenza, W., Reefton.
Logan, H. F., Wellington.
Mouat, W. G., Dunedin.
Watkins, W. E., 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.
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.

* Alluvial.

Issued after Examination under the Mining Act, 1891.

Agnew, J. A., Thames.
Annear, William, Reefton.
Bennett, E. P., Thames.
Boydell, H. C., Coromandel.
Bradley, R. J. H., Te Puke.
Carroll, J., Lyell.
Cartwright, E., Thames.
Crabb, J., Reefton.
Gilmour, J. L., Thames.
Hodge, J. H., Thames.
Keam, P. E., Thames.
Lawn, C. H., Capleston.
Morrison, R., Thames.
McDermott, G., Thames.
McDermott, J., Thames.
McDermott, W., Thames.
McGregor, W. T., Thames.
McKenzie, H. J., Coromandel.
McPeake, J., Thames.
O'Keeffe, M. D., Thames.
Paltridge, Henry, Thames.
Paul, Matthew, Thames.
Robertson, D. B., Stafford.
Ross, Richard, Thames.
Russell, Murray, Dunedin.
Shepherd, H. F., Thames.
Stanford, W. J., Macetown.
Tierney, R., Thames.
Vialoux, F., Coromandel.
Warne, George, Thames.
Waters, D. B., Skipper's.
White, G. H., Thames.
Whitley, A., Thames.

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.
Blankhorn, 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.
Docherty, W. H., Coromandel.
Downey, J. F., Reefton.
Dutton, W. F., Waihi.
Ellery, John, Reefton.
Evered, N. J., Waihi.
Fry, S., Waimangaroa.
George, M. T., Waihi.
Goldsworthy, C., Karangahake.
Goldsworthy, W., Coromandel.
Gordon, J. A., Thames.
Graydon, P., Thames.
Greening, W., Karangahake.
Gudgeon, C. W., Macrae's.
Hitchcock, W. E., Barewood.
Hooker, John, Coromandel.
Irwin, Samuel, Waihi.
Jackson, G. T., Waihi.
Johnston, J. H., Coromandel.
Kingsford, C., Waihi.
Langdon, H., Waihi.
Langford, G. S., Waihi.
Lautour, H. A. de, Waihi.
Lawn, Nicholas, Reefton.
Lewis, Ralph Reginald, Waihi.
Lowes, G. W., Reefton.
Mackie, Portland George A., Waihi.
McConachie, W., jun., Waihi.
McDonald, R. M., Table Hill.
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.
Rimmer, J. C., Helensville.
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.
Turnbull, E. V., Coromandel.
Turner, C. E., Murchison.
Turner, G. W. E., Reefton.
Ulrich, G. A. C., Waihi.
Walker, A. J., Waihi.
Watson, J. L., Thames.
Wood, P. H., Reefton.
Wotherspoon, James, Waihi.

Issued under Section 313 of the Mining Act, 1891.

Martin, James, Reefton.
Rickard, John, Thames.
Snow, Thomas, Huntly.
Thomas, James, Thames.
Trelease, J. H., Thames.
White, John S., Karangahake.
Williams, John, Kuaotunu.

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

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.
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, William, Karangahake.
Harvey, A. G., Coromandel.
James, Robert, Thames.
Jamieson, John, Reefton.
Johns, Thomas, Waihi.
Kennerley, W. H., Thames.
McCombie, John, Karangahake.
MacDonald, H., Coromandel.
McEnteer, James, Tararu.
McLean, Benjamin J., Waitekauri.
Meehan, James, Westport.
Moorecraft, Walter, Coromandel.
Morgan, William, Owharoa.
Moyle, Thomas, Thames.
Patton, William, Macetown.
Pearce, Francis, Reefton.
Potter, William H., Thames.
Rillstone, Charles, Waipori.
Somervell, John, Thames.
Thomas, Archelaus, Tapu, Thames.
Turnbull, Thomas A., Whangamata.

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.
Green, E. R., Dunedin.
Hayes, J., Dunedin.
McLaren, J. M., Thames.

SECOND-CLASS MINE-MANAGERS' CERTIFICATES.

Certificates of Service issued under the Mining Act, 1891.

Agnew, J. A., Coromandel.
Argall, A. E., Coromandel.
Blair, Thomas, Kuaotunu.
Bolitho, James, Reefton.
Bremner, John, Coromandel.
Brokenshire, James, Thames.
Brown, John, Macrae's.
Bunny, Joseph, Thames.
Byrne, John, Karangahake.
Comer, W. W., Thames.
Comer, George, Thames.
Corbett, T., Paeroa.
Crabb, Thomas, Reefton.
Daniel, P. F., Greymouth.
Dobson, John Allen, Kuaotunu.
Edwards, George, Westport.
Ellery, John, Reefton.
Foster, Thomas, Wellington.
Gemmings, Charles, Thames.
Gill, George, Thames.
Goldsworthy, William, Mauku, Auckland.
Gribble, James, Norsewood.
Grimmond, Joseph, Ross.
Guthrie, John, Wellington.
Hardman, James Edward, Thames.
Hetherington, William, Thames.
Hill, Alexander Grey, Waikakaho.
Hollis, Frederick J., Waihi.
Hore, John, Wellington.
Jamieson, John, Reefton.
Jobe, James, Thames.
Johns, Thomas, Thames.
Johnstone, William, Collingwood.
Kerr, George, Kamo.
Kirker, Thomas, Thames.
Law, John, Thames.
Loughlin, S., Thames.
Mackay, William, Nenthorn.
Martin, David, Black's Point.
Martin, James, Reefton.
Mayn, John, Coromandel.
McCombie, John, Karangahake.
McEwen, James, Reefton.
McNeill, George, Upper Kuaotunu
Meagher, John, Karangahake.
Moyle, Thomas, Thames.
Newdick, Alfred, Thames.
O'Keefe, M. W. D., Thames.
Page, John, Lyell.
Peebles, Alexander, Kuaotunu.
Pettigrew, Robert, Sydney.
Primrose, J., Kuaotunu.
Richards, A. H., Kuaotunu.
Rickard, John, Thames.
Rogers, William Henry, Kumara.
Shaw, James, Karangahake.
Sligo, Alexander, Nenthorn.
Thomas, A., Thames.
Thomas, James, Thames.
Thomson, John, Dunedin.
White, John S., Karangahake.
Williams, James, Thames.
Williams, John, Thames.
Worth, Robert, Waihi.

Issued after Examination under the Mining Acts, 1891, 1898, and 1908.

Benney, J., jun., Paeroa.
Bennie, Boyd, Coromandel.
Birch, J. J., Waihi.
Cahill, T. M., Upper Kuaotunu.
Carroll, John, Upper Kuaotunu.
Christie, William, Waitekauri.
Draffin, S., Waitekauri.
Dunkin, T., Coromandel.
Mathewson, A., Hyde.
McNeil, A. H., Coromandel.
Tilsley, G., Thames.
White, F. H., Kuaotunu.
White, G. H., Thames.

Issued under Section 313 of the Mining Act, 1891.

Connon, William, Thames.
Edwards, E., 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.
Davis, James, Coromandel.
Gardner, James, Waimangaroa.
Howe, Albion S., Waitekauri.
Johnson, Frank H., Collingwood.
Kirwan, William, Reefton.
Murphy, Joseph, Coromandel.
O'Brien, John, Westport.
Prescott, Arthur J., Coromandel.
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.
Lynch, James, Glenorchy.
McKenzie, D., Georgetown.
Reid, George, Glenorchy.
Reynolds, Edmond Francis, Coromandel.
Sheehan, James, Thames.
Tallentire, John, Waiorongomai.

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.
Goldsworthy, Henry, Kuaotunu.
Goldsworthy, John, Kuaotunu.
Greenway, H. Howard, Auckland.
Hope, John S., Waitekauri.
Hutchison, William, Karangahake.
Margetts, Frederick Ernest, Kuaotunu.
McKenna, T. N., Tararu.
McLellan, William, Waitekauri.
Noble, James R., Karangahake.
Park, James, Thames.
Shepherd, Henry Franklin, Waihi.
Sims, C. F., Tararu.
Walker, James A., Kuaotunu.
Wilson, Arthur E., Waihi.

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.
Clarke, J. L., Thames.
Clarke, R., Waitekauri.
Clarke, W. J., Waihi.
Day, A. T., Thames.
Dixon, Clement, Waihi.
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.
Stafford, B. H., Waihi.
Taylor, C. H., Tararu.
Thorpe, A. H., Thames.
Vercoe, R. B., Thames.
Williams, A. G. R., Thames.
Wingate, H. M., Maratoto
Winslow, G., Thames.

BATTERY SUPERINTENDENTS' CERTIFICATES—*continued.*

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

Adams, J. H., Coromandel.
Adams, J. H., Thames.
Adams, Richard W., Tararu, 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., Waiomio.
Bird, A. W., Thames.
Bishop, T. O., Reefton.
Blackadder, William, Crushington.
Bradley, R. J. H., Karangahake.
Brown, F. M., Karangahake.
Brown, J. E., Komata.
Brown, W. E., Reefton.
Browne, E., Waitekauri.
Burns, William, Waiomio.
Bush, E. F., Parawai.
Bush, George Arthur, Karangahake.
Bush, H. R., Thames.
Campbell, Colin, Thames.
Carless, Noel, Waihi.
Carpenter, W. E., Karangahake.
Carroll, John, Kuaotunu.
Carter, S., Waihi.
Chappell, G. A., Karangahake.
Clark, John L., Waihi.
Clarke, Thomas, Waihi.
Coote, J. M., Thames.
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.
Fry, Sidney, Westport.
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.
Harsant, C., Puketui.
Hay, Adam, Karangahake.
Hazard, T. R. C., Waitekauri.
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.
Kitching, L. J., Thames.
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.
Metcalf, G. H., Karangahake.
Montgomery, A. E., Opitonui.
Morgan, Robert James, Waihi
Motherwell, William, Waihi.
Moyle, W. T., Upper Tairua.
Orbell, G. S., Waikouaiti.
Orr, F. S., Waiuta.
Paltridge, F., Thames.
Pond, H. C., Auckland.
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. P., Reefton.
Watson, J. R., Reefton.
Watson, W. A., Crushington.
Wearne, W., Reefton.
White, A. S. H., Karangahake.
White, E. D., 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.

Anderson, L. C., Alexandra.
Andrews, Ralph, Canvastown.
Baker, J. R., Alexandra.
Ballantyne, D., Miller's Flat.
Barnes, T. J., Beaumont.
Bradley, Neil, Alexandra.
Bennett, George, Gore.
Bennett, James, Kumara.
Blue, G. P., Alexandra.
Brand, Peter, Waikaka.
Brennan, Philip, Palmerston South.
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., Taree-channel Flat.
Cumming, J. C., Beaumont.
Cutten, W. H., Dunedin.
Deniston, R. A., Cromwell.
Dewar, John, Alexandra.
Donaldson, J. G. A., Greenstone.
Faithful, William, Greymouth.
Foohy, J. M., Alexandra.
Gibb, William, Croydon Siding.
Gibson, A., Island Block.
Graham, J. M., Gore.
Grogan, William A., Miller's Flat.
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.
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.
Luke, S. J., Alexandra.
Magnus, A., Roxburgh.
Magnus, Olaf, Box 130A, Christchurch.
Mailer, John, Stillwater.
Maitland, A. E., Miller's Flat.
McClure, F. C., Rongahere.
McConnell, J., Cromwell.
McCormack, D., Kanieri.
McDonald, E. A., Waitiri.
McDonald, J., Sofala.
McDonald, John, Cromwell.
McGeorge, Alexander, Dunedin.
McGeorge, J., Dunedin.
McGregor, D., Kanieri.
McGregor, G. R., Alexandra.
McIntosh, D. J., Lowburn Ferry.
McLean, D., Waitiri.
McMath, D. C., Ross.
McMath, Thomas, Alexandra.
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.

DREDGEMASTERS' CERTIFICATES—*continued.*

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

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.
Sligo, N. K., Ahaura.
Smith, Alfred, Inangahua Junction.
Steel, Archibald, Kawarau Gorge.
Steel, Thomas, Dunedin.
Templeton, Ivie, Rongahere.
Thompson, T., 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.
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.

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 South.
Coup, George, Albertown.
Cox, R. D., Alexandra.
Craig, D. A., Shag Point.
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.
Filippi, S. de, Westport.
Findley, David, Dunedin.
Fisher, Hurtle, Miller's Flat.
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.
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.
Hepburn, D. O., Alexandra.
Hewetson, Sydney, Nelson Creek.
Hogg, J., Nevis.
Holden, Charles, jun., Cromwell.
Holden, John, Cromwell.
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.
McCallum, W. S., Alexandra.
McDonald, C. J., Waitiri.
McDonald, G., 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.
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.
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.
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.

OIL-WELLS MANAGERS' SERVICE PERMITS.

Issued under Regulations 199-201.

Christensen, C., New Plymouth.
Fedorowicz, J., New Plymouth.
Henchman, J. E. W., New Plymouth.
Keith, L., New Plymouth.
O'Dowda, B. C., New Plymouth.

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

FIRST-CLASS MINE-MANAGERS' CERTIFICATES.

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

Aitken, T., Wendon.
Binns, G. J., Dunedin.
Bishop, J., Brunnerton.
Cameron, J., Denniston.
Cochrane, N. D., Dunedin.
Dando, M., Brunnerton.
Kerr, G., Kamo.
Lloyd, J., Invercargill.
Love, A., Whangarei.
Mason, J., Nightcaps.
May, J., Greymouth.
Moore, W. J., Springfield.
Ord, J., Huntly.
Reed, F., Westport.
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.

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

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.
Carruthers, James, jun., Milton.
Carson, W., Kaitangata.
Crockett, S., Millerton.
Crowe, W., Ngakawau.
Davies, W. C., Huntly.
Davis, O. J., Runanga.
Dixon, C. W., Granity.
Dixon, W., Kaitangata.
Duggan, George, Burnett's Face.
Dunn, Andrew, Denniston.
Dunn, W., Brunnerton.
Fleming, J., Kaitangata.
Fletcher, James, Granity.
Fox, R. A., Denniston.
Fry, Sydney, Waimangaroa.
Gibson, John, Westport.
Gillanders, A., Shag Point.
Green, E. R., Abbotsford.
Green, J., Brunnerton.
Hamilton, J. S., Burnett's Face.
Herd, J., Brunnerton.
Hewitson, W. E. G., Burnett's Face.
Heycock, C. R., Nightcaps.
Hill, Robert, Abbotsford.
Hosking, G. F., Auckland.
Hughes, Job, Puponga.
Jebson, D., Canterbury.
Jones, T., Kimihia.
King, T , Granity.
Langford, G. S., Huntly.
Leitch, J., Blackball.
Leitch, W., Blackball.
Marshall, A. G., Denniston.
McCaffrey, Patrick, Ferntown.
McCormack, W., Denniston.
McEwan, Robert, Coromandel.
McGeachie, J., Mokau.
McLean, M., Ngakawau.
Milligan, N., Westport.
Morgan, William, Waihi.
Mosley, J. T., Kaitangata.
Murray, T., Westport.
Neilson, James, Blackball.
Newton, James, Brunnerton.
Parsonage, W., Runanga.
Pearson, W., Waihi.
Penman, A., Huntly.
Scoble, E. J., Waihi.
Smith, George, Fairfield.
Sowerby, H., Denniston.
Strongman, C., Ngakawau.
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.
Whittlestone, A. W., Shag Point.

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

Binns, G. J., Dunedin.
Black, T. H., Waipori.
Broome, G. H., Ngakawau.
Cochrane, N. D., Dunedin.
Hayes, J., Kaitangata.
Hodgson, J. W., Ross.
Reed, F., Wellington.
Tattley, W., Auckland.

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

McLaren, J. M., 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.
Broadhead, A. K., Ngakawau.
Clark, W., Blackball.
Davidson, Gavin, Blackball.
Davies, D. J., Ngakawau.
Fletcher, George, Westport.
Frame, Joseph, Kaitangata.
Gillick, J., Kaitangata.
Goold, A. L., Auckland.
Hunter, Peter, Ngakawau.
Irvine, James, Dunedin.
James, Isaac Angelo, Westport.
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.
Robins, George Edmund, New Plymouth.
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.

Collier, Levi, Kamo.
Clarke, Edward, Shag Point.
Elliot, Joseph, Coal Creek.
Harris, John, Denniston.
Herd, Joseph, Brunnerton.
Howie, James, Kaitangata.
Lobb, Joseph, Mokau
McIntosh, Allan, Shag Point.
McLaren, J. M., Thames.
Murray, Thomas, Denniston.
Radcliffe, William, Reefton.
Sara, James, Reefton.
Thomas, James, Springfield.
Wallace, William, Huntly.
Willetts, John Morris, Papakaio.
Young, William, Waimangaroa.

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

Allan, J., Brunner.
Austin, W. B., Sheffield.
Ball, A., Kimihia.
Barclay, T., Kaitangata.
Barclay, T., jun., Kaitangata.
Barclay, William, Kaitangata.
Barnes, A. E., Shag Point.
Brennan, John, Kaitangata.
Broome, J., jun., Gore.
Brown, Robert, Kaitangata.
Cadman, J., Hikurangi.
Cain, Alexander, Kaitangata.
Campbell, Peter, Fairfield.
Carruthers, J., jun., Nightcaps.
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.
Davies, W. C., Huntly.
Dixon, W., jun., Kaitangata.
Doel, G., Lovell's Flat.
Duffy, Frank, Burnett's Face.
Duncan, James, Kaitangata.
Duncan, J. E., Kaitangata.
Duncan, John, Lovell's Flat.
Duncan, R. W., Nightcaps.
Ferguson, A., Kaitangata.
Ferguson, G., Roa.
Fox, R. A., Blackball.
Griffin, James C., Kaitangata.
Harris, A., Saddle Hill.
Hewitson, W. E. G., Burnett's Face.
Heyes, T., Kaitangata.
Heycock, C. R., Nightcaps.
Hill, R., Abbotsford.
Hodson, John, Kaitangata.
Hughes, Job, Roa.
Hunter, A., Southland.
Kells, F. H., Denniston.
Lewis, David, Puponga.
Lewis, J., Nightcaps.
Lindsay, J. B., Orepuki.
Lowden, W., Millerton.
Makinson, Job, Huntly.
McAllister, Neil, Kaitangata.
McLelland, J., Kaitangata.
McLelland, A. C., Kaitangata.
McNeill, D., Fairfield.
Mills, Walter, Huntly.
Morganty, Louis, Ngakawau.
Mosley, J. T., Stirling.
Neilson, J., Runanga.
Neilson, Moffat, Abbotsford.
Newburn, S., Kaitangata.
Orr, Hugh, Fairfield.
Parcell, W., jun., Bannockburn.
Penman, C. P., Kaitangata.
Price, F. J., Burnett's Face.
Robertson, J., Nightcaps.
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.
Whittlestone, A. W., Shag Point.
Whittlestone, G. F., Abbotsford.

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.
Barlow, H., Greymouth.
Baxendale, J., Mine Creek.
Black, J., Granity.
Boyd, J., Hikurangi.
Brownlie, T., Huntly.
Burley, T., Hikurangi.
Burt, A., Huntly.
Clarkson, S., Kaitangata.
Cross, G., Hikurangi.
Dickinson, W., Gore.
Dodd, W., Granity,
Eyeington, G., Huntly.
Graham, D., 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.
McCloy, Thomas, Mosgiel.
McGeachie, J., jun., Mokau.
McGuire, P., Mount Somers.
McGuire, William, Seddonville.
McHardy, A. J., Ferntown.
Molony, C. V. P., Auckland.
Morgan, H. L., Ngakawau.
Myers, T., Kiripaka.
Newburn, F., Roa.
Parsonage, W., Dunollie.
Penman, A., Huntly.
Provan, P., Runanga.
Robertson, R., Roa.
Sneddon, J., Blackball.
Strachan, J., Dunedin.
Tennant, D., Paparoa.
Talbot, H., Huntly.
Tipton, Harry, Hikurangi.
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.
Flynn, John, Bannockburn.
Green, Richard, Abbotsford.
Hawthorn, James, Puponga.
Hunter, Peter, Ngakawau.
Johnston, William Crowan, Gore.
Johnstone, Thomas, Denniston.
Levick, Harry, White Cliffs.
Marsh, Charles George, Glentunnel.
Muncaster, William, Runanga.
McAlister, Robert, Kaitangata.
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.

Ainscough, William, Huntly.
Armstrong, V., Runanga.
Atkinson, John, Puponga.
Bashall, J., Puponga.
Berry, A. H., Huntly.
Boddy, A. J., Rewanui.
Brennan, John, Kaitangata.
Brown, Charles Henry, Denniston.
Cain, A., Kaitangata.
Carson, F. Kaitangata.
Chippendale, John, Westport.
Clark, W. S., State Collieries.
Dowgray, John, Granity.
Duffy, F., Burnett's Face.
Dymond, John, Mine Creek.
*Fox, Sidney Arthur, Denniston.
*Gilbert, George, Millerton.
Griffen, J., Kaitangata.
Hadcroft, John, Dunollie.
Hall, Thomas, Kaitangata.
Hewitson, W. E. G., Burnett's Face.
Honey, A. J., Burnett's Face.
Hughes, T. G., Huntly.
Hunter, Peter, Stockton.
Jack, W., Millerton.
Johnston, C. M., Seddonville.
King, T. H., Granity.
Lowden, William, Millerton.
Maher, William, Denniston.
Makinson, J., Huntly.
McDonald, Thomas, Ngakawau.
McIvor, D., Runanga.
McKernan, John, Millerton.
McLean, Malcolm, 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, Samuel, Blackball.
Phillips, J., Taratu.
Powell, Isaac, Rewanui.
*Richardson, William, Taylorville.
Rogers, James, Ngakawau.
*Smith, Albert, Denniston.
Strongman, C. J., Cobden.
Sweeney, J. L., State Collieries.
Thomson, James, Huntly.
Tucker, J., Kaitangata.
Turnbull, E. V., Thames.
Turner, Alfred, Kiripaka.
Turton, J., Huntly.
White, Edward, Ngaruawahia.
Whittlestone, G. F., Abbotsford.
Williamson, W. R., Rewanui.
*Woods, Albert, Granity.

* Issued during the year.

Issued under the Coal-mines Amendment Act, 1910.

Beardsmore, 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.

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.
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.
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.
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.
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.
McCaughern, John, Kaitangata.
McDonald, John T., Millerton.
McGhee, William, Kaitangata.
McGill, Douglas Thomas, Waikaka.
McGill, John, Huntly.
McKenzie, James, Nightcaps.
Newburn, Robert, Kaitangata.
Newburn, Samuel, Kaitangata.
Nicholas, William, Kaitangata.
Oliver, William, Kaitangata.
Parcell, Henry Clyde, Bannockburn.
Park, Francis, Stirling.
Penman, Robert, Kaitangata.
Richards, James, Brunnerton.
Rodgers, Edwin, Kaitangata.
Sanderson, John, Kurow.
Scott, Charles, Nevis.
Scott, John, Runanga.
Smith, William, Seddonville.
Snedden, James, Blackball.
Statham, Robert, Kaitangata.
Taylor, David, Roa.
Taylor, James, Springfield.
Thin, William, White Cliffs.
Tripp, Albert, Kaitangata.
Wallace, John, Mataura.
Wardrope, Francis, Hikurangi.
Watson, Andrew, Roa.
West, George Thomas, Waronui.
Young, Thomas Gardner, Waikaia.

FIREMEN AND DEPUTIES' CERTIFICATES—*continued.*

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

*Abercrombie, William, Huntly.
Allan, George, Huntly.
Allan, James, Brunnerton.
Anderson, Walter, Blackball.
Armstrong, V., Runanga.
Atkinson, J., Puponga.
Baddeley, Jesse, Dunollie.
Ball, A., Kimihia.
Barclay, F., Kaitangata.
*Barclay, William, Kaitangata.
Birchall, J., Burnett's Face.
Blair, Peter, Huntly.
Boddy, Archibald John, Runanga.
Bond, W. T., Huntly.
*Boyd, James Langwell, Huntly.
Brennen, J., Kaitangata.
Broadbent, Samuel, Huntly.
Brown, J., jun., Denniston.
Buchanan, William, Millerton.
Burdon, George, Denniston.
Burt, T., Huntly.
Calder, Thomas, Ngakawau.
Caldwell, Thomas, Blackball.
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.
Colledge, A., Huntly.
Connolly, John, Runanga.
Connolly, John Joseph, Runanga.
Cooper, J. J., Milton.
Cowan, J., Millerton.
Cruikshank, P. G., Runanga.
Curragh, A., Burnett's Face.
Curran, James, Ngakawau.
Cuthbertson, John, Glentunnel.
*Dalzell, Joseph, Runanga.
Danks, Peter, Millerton.
Darby, W., Huntly.
Davidson, Thomas, Mine Creek.
Davies, F., Puponga.
Davis, Oliver James, Runanga.
Delaney, J. E., Puponga.
*Dick, Alexander Clark, Kaitangata.
*Doel, Charles John, Hikurangi.
Dowgray, John, Millerton.
Downes, William Norbury, Cobden.
*Duggan, Francis, Runanga.
Duggan, John, Upper Rewanui.
Dunsdale, George, Rewanui.
Dutton, John, Granity.
Dymond, J., Millerton.
Eckersley, W., Paparoa.
Fairhurst, R. W., Huntly.
Fannigan, P., Ngakawau.
Ferguson, A., Kaitangata.
*Fleming, Gavin, Pukemiro.
Forrest, John, Runanga.
Frew, W., Huntly.
Gox, Henry John, Blackball.
Gilligan, H., Runanga.
*Green, George Edward, Huntly.
Green, T., Kaitangata.
Griffen, James, Kaitangata.
*Groom, George, Huntly.
Hale, J., Kaitangata.
Hall, R. H., Huntly.
Hall, Thomas, Kaitangata.
*Halliday, Thomas, Dunollie.
Hannah, J., Glentunnel.
Hardie, J., Millerton.
Harvey, D., Huntly.
Hawkins, Joseph, Burnett's Face.
Hendry, John, Millerton.
*Heward, Nathan, Runanga.
Hicks, J. R., Kiripaka.
Hill, A., Lovell's Flat.
*Hill, Alfred, Runanga.
Hill, E. E., Brunnerton.
*Hill, Joseph, Milton.
Hilton, Thomas, Denniston.
Hogg, C., Blackball.
Hollows, W., Fairfield.
Honey, Archibald John, Denniston.
Hopkinson, Joseph, Seddonville.
Hughes, T. E., Huntly.
Innes, Andrew, Runanga.
Isherwood, T., Runanga.
*James, E. V. P., Blackball.
Johnson, J. H., Hikurangi.
Johnson, Thomas, Huntly.
Jones, B., Millerton.
Jones, J., Hikurangi.
Jones, J., Kimihia.
*Kerr, David, Green Island.
Kerry, E., Huntly.
King, Thomas Henry, Granity.
*Kyle, William, Nightcaps.
Lancaster, Herbert, Puponga.
Lauder, Matt Currie, Runanga.
Lewis, I., Puponga.
Lowden, W., Millerton.
McAuley, P., Ngakawau.
McAvoy, William, Ngakawau.
McDonald, J., Ngakawau.
McDonald, Thomas, Burnett's Face.
McGovern, R., Wairio.
McGuinness, E., Runanga.
McIvor, David, Runanga.
McKenty, H., Denniston.
McKernan, John, Millerton.
McLaughlin, J. W., Huntly.
McMillan, John, Huntly.
McMillan, John, Kaitangata.
McMillan, R., Kaitangata.
Mackie, J., Kaitangata.
Mackinson, Job, Hikurangi.
Maddison, W., Huntly.
*Maguigan, Thomas, Roa.
Maher, W., Denniston.
Makepeace, Henry, Runanga.
*Mann, John Henry, Dunollie.
Martin, T. N., Huntly.
*Mee, Albert, Kaitangata.
Miles, B. C., Millerton.
Mitchell, A., Seddonville.
Morganti, Louis, Millerton.
Moreland, S., Hikurangi.
Mosley, J. T., Denniston.
Moye, John Patrick, Denniston.
Myers, Richard, Millerton.
Nicholson, David, Huntly.
Nicholson, J., State Collieries.
Niven, Peter, Ngakawau.
Nuttall, John, Blackball.
O'Brien, Denis Quinsin, Millerton.
O'Brien, Martin, Millerton.
O'Fee, J., Kaitangata.
Oliver R., Kaitangata,
*Page, William, Dunollie.
Parker, Andrew, Greymouth.
Parr, Joseph, Burnett's Face.
Parrott, W., Waiuta.
Paul, James, Seddonville.
Pearson, James Thomas, Mataura.
Pearson, Samuel G., Burnett's Face.
Pearson, William, Burnett's Face.
Pendleton, S., Blackball.
Phillips, J., Puponga.
Ponton, F., Millerton.
Powell, J., Dunollie.
Pratt, Alexander, Millerton.
Ralph, J., Huntly.
Ramsay, J. McK., Kaitangata.
Reed, W. H., Hikurangi.
Reid, Henry, Millerton.
Reid, Henry, Huntly.
*Richardson, Ernest, Kaitangata.
Richardson, W., Dunollie.
*Richmond, William, Runanga.
*Riggans, William M., Huntly.
Robson, W., State Collieries.
Rodgers, J., Huntly.
Rodgers, J., Ngakawau.
Rogers, A. G., Kaitangata.
*Ross, Alexander, Fairfield.
Rowse, J., Runanga.
Ruston, Edwin Walter, Huntly.
Rutherford, W. R., Kaitangata.
Scott, James, Blackball.
Seddon, William, Huntly.
Sharp, J. R., Kaitangata.
*Shearer, William, Stockton.
Shore, W. M., Taratu.
Smith, C. B., Dunollie.
*Smith, Fred, Rotowaro.
Smith, J. A., Seddonville.
Smith, Thomas W., Millerton.
Smith, W. A., Denniston.
Snell, J., Kaitangata.
Snowdon, W., Kaitangata.
Southward, William, Runanga.
Strongman, Charles James, Cobden.
Sutherland, J., Millerton.
Sweeney, John Lewis, Runanga.
Tate, Anthony, Seddonville.
Taylor, Christopher, Millerton.
Thawley, William, Denniston.
Thomson, J., Huntly.
Thomson, Thomas, Mine Creek.
Throp, J., Kaitangata.
Timms, H., Huntly.
Tunstall, A. G., Hikurangi.
Tunstall, W., Hikurangi.
Turner, F., Kiripaka.
Turton, John, Huntly.
*Tyson, Isaac, Runanga.
Unwin, James, Runanga.
Veitch, D., Blackball.
Vurlow, Frederick Alexander, Denniston.
Walker, W. J., Granity.
*Walls, James, Benhar.
Wallwork, Moses, Runanga.
*Waters, Thomas Edwin, Shag Point
Wear, Daniel, Huntly.
Webster, Oliver, Huntly.
White, Edward, Granity.
Williamson, W. R., Rewanui.
Wilson, J. T., Kamo.
*Wilson, Sidney Robert, Kaitangata.
Woods, A., Millerton.
Wood, W., Huntly.
Worthington, T., Millerton.
Wyse, A., Blackball.
Young, Thomas, Granity.

* Issued during the year.

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., Kaitangata.
McAuley, John, Kaitangata.
McClimont, John, Mount Somers.
McDowell, R., Nightcaps.
McIntosh, A. S., Shag Point.
McIver, 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, G. F., Abbotsford.

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

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