MINES STATEMENT.

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1922.

NEW ZEALAND.

MINES STATEMENT

BY THE HON. G. J. ANDERSON, MINISTER OF MINES.

MR. SPEAKER,—

In presenting to Parliament my second annual statement on the mining industry of the Dominion for the year ended 31st December, 1921, I desire to congratulate honourable members and the people generally on the progress of such industry during that time, notwithstanding the acute financial position and the fact that mine costs, including the prices of stores, have not diminished to any appreciable extent.

Honourable members will be pleased to learn that the production of gold-silver bullion from quartz and alluvial gold-mines and by gold-dredges increased in quantity by no less than 77,225 oz. during the year, which speaks volumes for the efforts of those who have sunk their capital and devoted their energies to this important industry.

It is with extreme regret that I have to announce that no new goldfields have been discovered during the year. It is, however, hoped that the prospectors, who are being financially assisted by the Department, will locate a new and payable goldfield, as such a discovery would materially assist in overcoming our present difficulties, financially and otherwise.

During the year the Government has assisted prospectors and mining companies with advice and money, and had it not been for the financial difficulties which have occurred much greater aid would have been granted. As the financial position improves it will be possible to increase materially the granting of subsidies and loans for prospecting and developing promising mines.

The following statement shows the quantity and value of the production of metalliferous mines, stone-quarries under the Stone-quarries Act, and of coal-mines during 1921 and 1920:—

Mineral.	1921.		1920.	
	Quantity.	Value.	Quantity.	Value.
		£		£
Gold and silver*	551,875 oz.	547,105	474,650 oz.	528,317
Quicksilver	$\frac{14}{20}$ ton	231	$1\frac{7}{10}$ ton	1,378
Tungsten ore	$38\frac{7}{20}$,,	1,785	$39\frac{2}{20}$,,	1,956
Sulphur	873 ,,	2,619	746 ,,	2,238
Manganese	..	..	2 ,,	10
Asbestos	$\frac{5}{20}$,,	50	$1\frac{15}{20}$,,	105
Stone	..	358,362	..	314,470
Pumice	2,945 ,,	7,958	2,843 ,,	7,499
Coal	1,809,095 ,,	1,809,095	1,843,705 ,,	1,843,705
Totals	..	£2,727,205	..	£2,699,678

* The gold-silver bullion is generally exported unseparated.

The value of minerals, including kauri-gum, exported and of the coal used in the Dominion, which is shown in table No. 1 accompanying this statement, amounted to £2,919,453, as compared with £3,431,391 during 1920. The total value of such minerals exported to the end of 1921 amounted to £146,673,152.

GOLD AND SILVER MINING.

The following statement shows the quantity and value of bullion-production, the dividends paid by registered companies, and the number of productive claims and gold-dredges during 1921 and 1920:—

Class of Gold-mining.	Production of Bullion.				Dividends paid by Registered Companies.		Number of Productive Claims and Dredges.	
	1921.		1920.		1921.	1920.	1921.	1920.
	Oz.	£	Oz.	£	£	£		
Quartz	527,855	433,488	451,122	415,868	53,791	100,981	23	23
Alluvial ..	16,718	77,438	16,576	77,777	2,337	4,445	150	122
Dredging ..	7,302	36,179	6,952	34,672	600	..	11	12
Totals ..	551,875	547,105	474,650	528,317	56,728	105,426	184	157

The production of gold-silver bullion from quartz and alluvial-gold mines and by gold-dredges increased from 474,650 oz., value £528,317, during 1920 to 551,875 oz., value £547,105, during 1921, being an increase in quantity of 16 per cent. and in value 3·5 per cent. This increase may to a large extent be attributed to the encouragement given to work low-grade ore bodies or deposits by the higher value paid in England for gold owing to the low exchange on the paper pound sterling. During 1921 the average price per ounce fine, unfortunately, declined; otherwise the value of the considerably increased gold-production during that year would have been much greater.

During the year no ore bodies or deposits of importance were discovered, mining operations being confined to known ore reserves.

MINERALS OTHER THAN GOLD AND SILVER.

The Onakaka Iron and Steel Company having laid down a blast-furnace installation upon its lease at Onakaka, near Parapara, in the Nelson Provincial District, on the 26th April of the current year, the furnace was blown in for a trial run on the ore. The result was very satisfactory, a soft grey marketable foundry pig iron being produced comparable by test and analysis with that imported. The following is the analysis by the Dominion Analyst of a sample then produced: Iron, 92·10; graphitic carbon, 2·89; combined carbon, 0·19; silicon, 3·92; phosphorus, 0·22; sulphur, 0·04; and manganese, 0·64, per cent. respectively.

The iron-ore deposits in the form of limonite which occur on the surface at Onakaka and Parapara have been estimated in the "Iron-ore Resources of the World," published by the International Geological Congress, to be 64,000,000 metric tons.

Owing to the low price paid for 65 per cent. tungsten (scheelite) concentrate, which has fallen from £3 8s. per unit during the war to 9s. per unit, there was no exportation during the year, although $38\frac{7}{20}$ tons of concentrate was produced.

Operations in connection with cinnabar-mining were confined principally to development and prospecting. The New Zealand Quicksilver Mines produced 1,575 lb. of quicksilver at Puhipuhi.

Drilling in search of petroleum produced negative results at Waipatiki and Waitangi, near Whatatutu, in the North Island, and Kotuku, near Greymouth.

At Rotorua 873 tons of fumarolic sulphur was taken from a Crown lease.

COAL-MINING.

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

Class of Coal.	Output of Coal during 1921.				Total Output to the End of 1921.
	Northern District (North Island).	West Coast District (South Island.	Southern District (South Island).	Total.	
	Tons.	Tons.	Tons.	Tons.	Tons.
Bituminous and semi-bituminous	83,325	810,520	...	893,845	33,949,532
Brown	431,282	155	268,683	700,120	16,580,317
Lignite	...	200	214,930	215,130	3,163,639
Totals for 1921 ...	514,607	810,875	483,613	1,809,095	53,693,488
Totals for 1920 ...	483,492	821,507	538,706	1,843,705	51,884,393

The decline in the production of brown and bituminous coal is chiefly attributable to the considerable increase in the quantity of coal imported, which during 1921 amounted to 822,459 tons, of which 76½ per cent. came from Australia, as against 476,343 tons, of which 97 per cent. was imported from Australia, during the previous year. The annual rate of coal-consumption in the Dominion—viz., about 2,300,000 tons—has been maintained notwithstanding that the utilization of hydro-electric power is constantly increasing.

PERSONS EMPLOYED IN OR ABOUT MINES AND STONE-QUARRIES.

The following table shows the number of persons employed in each inspection district during 1920 and 1921 :—

Classification.	Inspection District.			Totals.		
	Northern (North Island).	West Coast (of South Island).	Southern (rest of South Island).	1921.	1920.	Increase.
Gold, silver, and tungsten ore	1,147	481	393	2,021	1,914	107
Ironstone, cinnabar, and asbestos	11	36	2	49	16	33
Coal	1,220	2,026	1,121	4,367	4,078	289
Stone-quarries under the Stone-quarries Act	1,060	88	413	1,561	1,468	93
Totals	3,438	2,631	1,929	7,998	7,476	522

The shortage of labour experienced during previous years, more especially as regards coal-mines, has entirely disappeared.

MINING AND QUARRY ACCIDENTS.

At metalliferous mines, at which 2,070 persons were ordinarily employed, one life was lost by accident, and seven other persons received serious injuries.

At stone-quarries under the Stone-quarries Act, in which 1,561 persons were ordinarily employed, one person was accidentally killed, and four others received serious injuries.

In or about coal-mines, at which 4,367 persons were ordinarily employed, it is regretted that ten fatalities occurred, three of which were unconnected with mining operations. Thirty-seven other persons received serious injuries.

At all the mines and quarries the proportion of fatal accidents was 1·5 per 1,000 persons employed.

GEOLOGICAL SURVEY.

During the past year geological surveys have been conducted in the Dargaville, Waiapu, and Ohura districts. The total area surveyed in detail amounted to about 1,520 square miles. Mining is being carried on in none of these districts, but all probably contain mineral resources that will be utilized in the future. The year's work has been in the nature of a "stocktaking," so that some idea of the value of the mineral resources of New Zealand may be formed. In the Dargaville district the limestone and coal deposits have been examined; in the Ohura district the extent of the thick coal of the Waitewhena coalfield has been determined as closely as possible; and in the Waiapu district the structure of the large areas over which indications of petroleum occur has been studied.

Owing to the financial stringency the only publications issued by the Geological Survey during the year were its annual report and Bulletin No. 23, in which the mineral resources of western Southland were described. In addition to the ordinary bulletins prepared by the members of the staff, these include memoirs on the fossils of New Zealand written by specialists in other countries. The base on which geology is founded is widened by the unpaid labours of these scientists, and on the correct interpretation of the geology of New Zealand depends the efficient utilization of its resources both agricultural and mineral.

STATE AID TO MINING.

Considerable use continues to be made of the Government prospecting drills. During the year five parties employed these drills, an aggregate of 4,676 ft. being drilled in search of coal, cinnabar, and alluvial gold. Workable coal-seams were proved at Glentunnel and Bush Gully, Canterbury, and a payable alluvial gold deposit at Tucker Flat, Kanieri. During the year ended 31st March, 1922, twenty-nine approved prospecting-parties were granted subsidies amounting to £1,980, of which £502 was expended during the year, in addition to £3,261 authorized during previous years. Upon these operations sixty-five persons were intermittently employed. The results attained by five parties were satisfactory.

The expenditure on roads and tracks by subsidies and direct grants out of the Public Works Fund vote, "Roads on Goldfields," during the year amounted to £11,329, as against £11,050 during the previous year.

The expenditure by the Mines Department on schools of mines for the year amounted to £5,848.

The Waimea–Kumara and Mount Ida Government Water-races, which in past years considerably aided alluvial-gold mining in the Kumara and Naseby districts, have during the year ended 31st March, 1922, supplied claims employing twenty-eight miners with water for sluicing, by which gold to the approximate value of £5,633 was obtained. The cash received for water sold amounted to £1,492 7s. 3d., the expenditure on the upkeep of the races being £3,806. During the current year considerable economies in connection with the upkeep of these races have been effected, as the result of which it is hoped that the receipts for the sales of water will meet the expenditure incurred by the Government.

MINER'S PHTHISIS ACT, 1915.

The benefits under this Act were extended by the Finance Acts, 1919 and 1920.

In order to qualify an applicant must be totally incapacitated for work owing to miner's phthisis (pneumoconiosis) contracted while working as a miner in the mines of New Zealand.

The pension for a married man or widower with children under the age of fourteen years is £1 15s. a week, for a single man £1 5s. a week, and for the widow of a miner entitled to a pension and who dies of miner's phthisis 17s. 6d. a week during widowhood. It is further provided that a miner in receipt of a pension may be absent from New Zealand for a period not exceeding two years and still be entitled to a pension.

The following is a statement showing the amount of pensions payable, in force, and granted to the 31st March, 1922 :—

	£
Amounts paid since inception :—	
Year ended 31st March, 1916 (five months) ..	1,509
Year ended 31st March, 1917	8,066
Year ended 31st March, 1918	13,275
Year ended 31st March, 1919	13,276
Year ended 31st March, 1920	16,652
Year ended 31st March, 1921	26,972
Year ended 31st March, 1922	31,212
	£110,962
Number of new grants for 1921–22	78
Annual value of new grants	£5,538
Number of pensions in force at 31st March, 1922 ..	506
Annual value of pensions in force at 31st March, 1922	£31,505
Average pension payable per annum	£62
Total number of pensions granted to 31st March, 1922..	868

Total number of pensions granted to 31st March, 1922, includes the following: To unmarried miners, 151 ; to married miners, 302 ; to widows of miners, 415.

STATE COLLIERIES.

Coal-control Department and State Firewood Depot.

The bulk of the activities of the Coal-control Department and the Firewood Depot were transferred to the Mines Department on the 1st September, 1921, and as the result of such transfer considerable economies were effected, which are estimated at £4,350 per year. The activities of the Firewood Depot will be brought to a close within a few weeks.

James Mine.

The underground development has been continued during the year, and the erection of the coal-tipping and screening plant and the installation of the machinery connected therewith have been completed.

The mine sawmill, which was situated at Dunollie for many years, has been dismantled and re-erected at Runanga in a central position for supplying timber to both the James and Liverpool Collieries.

Macdonald Mine.

As already announced on more than one occasion to honourable members, the Government has decided to cease developing this colliery, and, with the exception of tree-planting, work was stopped in March, 1922. Since that time arrangements have been made to dispose of a part of the plant, and efforts are being made to sell the remainder. As I have already informed honourable members, the Government was compelled to close the mine owing to the enormous increase in the estimated cost of developing and equipping the colliery, including the erection of houses, drainage, and lighting, as well as the construction of a railway-line, and also owing to the acute financial position prevailing.

A total area of 37½ acres has been planted with trees suitable for mining purposes, at a cost of £511.

Output and Sales, Liverpool Colliery.

The operations of the State coal-mines and State coal-depots for the year ended 31st March, 1922, are briefly reviewed hereunder :—

The only colliery producing coal was the Liverpool Colliery. The gross output for the year was 137,908 tons, as compared with 153,722 tons for last year, a

decrease of 15,814 tons. A comparative statement for the two years is shown below :—

Mine.	Output in Tons, 1921–22.		Output in Tons, 1920–21.	
	Gross.	Net.	Gross.	Net.
Liverpool	137,908	133,636	153,722	149,054

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

The disposal, inclusive of stock on hand at beginning of year, was as follows :—

Supplied to	Screened.	Unscreened.	Small.	Totals.
	Tons.	Tons.	Tons.	Tons.
Depots	9,563	5,354	3,254	18,171
Railways	607	8,874	...	9,481
Other Government Departments	2,817	1,742	311	4,870
Shipping companies	234	30,874	2,742	33,850
Gas companies	1,308	38,231	17,135	56,674
Other consumers	2,379	5,308	...	7,687
Totals	16,908	90,383	23,442	130,733

The total sales of State coal from the mine for the year amounted to 130,733 tons, value £222,819, as compared with 148,335 tons, value £222,127, for last year, a decrease of 17,602 tons, but an increase in value of £692.

The average price realized by the mine on the total sales for the year was £1 14s. 1·05d., an increase of 4s. 1·65d. on last year's average.

The sales of coal, &c., through the medium of the depots totalled 87,871 tons, value £213,860, as against 60,912 tons, value £137,910, for last year.

The profit at the mines was £13,831, and at the depots, &c., £7,935, making a total of £21,766, out of which £4,552 was applied to Sinking Fund Account, leaving £17,214 to be carried forward.

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 amount written off for depreciation for the year was	15,075
The payments for interest totalled	9,177
The payments for sea carriage of coal amounted to	69,112
The cost of railway haulage amounted to	21,064
The total wages paid for coal-winning was	77,793
The amount paid for management and office salaries (Head Office and mines) totalled	4,786
The gross capital expenditure on the whole undertaking to the 31st March last was	514,078
The total depreciation written off to date (equal to 51 per cent. on the gross capital expenditure) amounts to	262,231
The debenture and loan capital stands at	227,601
The net profits of the State Coal-mines Account from inception to the 31st March, 1922	93,762
The net profit for the year ended 31st March, 1922, was	21,766
The sinking fund is in credit	24,580
General reserve stands at	51,467
The amount at credit of Profit and Loss is	17,214
The cash in hand and in the Public Account at the 31st March last was (last year £18,293)	32,971
The present net book value of permanent or fixed assets is ..	243,984

TABLES AND REPORTS.

The usual statistical tables and departmental reports are appended.

TABLES TO ACCOMPANY MINES STATEMENT.

No. 1.

TABLE SHOWING THE QUANTITY AND VALUE OF GOLD AND OTHER MINERALS EXPORTED DURING THE YEARS ENDED THE 31ST DECEMBER, 1920 AND 1921, 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, 1921.		For Year ended the 31st December, 1920.		Total from the 1st January, 1853, to the 31st December, 1921.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Precious metals—	Oz.	£	Oz.	£	Oz.	£
Gold*	149,595	612,168	212,973	883,748	22,741,100	89,624,275
Silver	480,023	65,647	369,400	87,665	23,096,902	2,714,597
Total gold and silver ..	629,618	677,815	582,373	971,413	45,838,002	92,338,872
Mineral produce, including kauri-gum—	Tons.	£	Tons.	£	Tons.	£
Copper-ore	..	..	..	..	1,504	19,390
Chrome-ore	..	..	..	..	5,869	38,002
Antimony-ore	..	..	..	..	3,781	55,045
Manganese-ore	..	..	2	10	19,366	61,915
Hæmatite ore	..	..	..	..	77	469
Tungsten-ore	..	..	$10\frac{2}{20}$	1,378	$2,304\frac{13}{20}$	299,311
Quicksilver	$\frac{1}{20}$	21	$1\frac{13}{20}$	900	$14\frac{16}{20}$	7,662
Sulphur (crude)	..	..	..	..	4,927	13,241
Mixed minerals†	$3,014\frac{7}{20}$	8,988	$2,895\frac{12}{20}$	8,745	$62,959\frac{8}{20}$	259,100
Coal (New Zealand) exported	53,183	109,510	80,088	128,509	5,166,288	5,096,072
Coke exported	2	10	20	63	16,820	25,698
Coal, output of mines in Dominion (less exports)	1,755,912	1,755,912	1,763,617	1,763,617	48,527,200	28,946,122
Oil-shale	..	..	..	..	14,444	7,236
Kauri-gum	3,901	367,197	6,481	556,756	370,802	19,505,017
Total quantity and value of minerals	$1,816,012\frac{23}{60}$	2,241,638	$1,853,115\frac{7}{20}$	2,459,978	$54,196,356\frac{17}{20}$	54,334,280
Value of gold and silver, as above	..	677,815	..	971,413	..	92,338,872
Total value of minerals, including gold and silver	..	2,919,453	..	3,431,391	..	146,673,152

* In respect of gold, ounces of the fineness of 20 carats and upwards. † Including lime, $48\frac{7}{20}$ tons; building-stone, $1\frac{1}{20}$ tons; pumicestone, 234 tons; pumice sand, 27 tons; also marble 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, 1920 AND 1921, AND THE TOTAL QUANTITY AND VALUE FROM 1857 TO THE 31ST DECEMBER, 1921.

District and County or Borough.	Year ended 31st December, 1920.		Year ended 31st December, 1921.		Total Quantity and Value from January, 1857, to 31st December, 1921.	
	Quantity.	Value.	Quantity.	Value.		
AUCKLAND—	Oz.	£	Oz.	£	Oz.	£
County of Tauranga	2,849	12,071	104	442		
County of Coromandel	157	625	197	730		
County of Thames	295	1,264	181	782		
County of Ohinemuri	9,285	38,555	369	1,476		
County of Piako	..	..	..	..		
Borough of Thames	452	1,924	151	638		
Great Barrier Island	..	..	..	..		
Borough of Waihi	85,959	362,156	73,882	309,372		
	98,997	416,595	74,884	313,440	6,898,500	26,657,989
WELLINGTON	..	..	..	..	188	706
MARLBOROUGH—						
County of Marlborough	1,833	7,362	422	1,526	104,909	408,474
NELSON—						
County of Waimea	..	..	4	16		
County of Collingwood	10	38	2	8		
County of Takaka	..	..	..	..		
County of Murchison	403	1,579	591	2,391		
	413	1,617	597	2,415	1,740,112	6,899,440
WEST COAST—						
County of Buller	1,260	5,185	3,124	12,337		
County of Inangahua	42,912	172,627	20,697	79,412		
County of Grey	2,852	11,721	2,179	8,779		
County of Westland	8,183	33,437	12,472	50,036		
Hokitika Borough	537	2,199	..	..		
Ross Borough	572	2,288	..	..		
Kumara Borough	993	3,972	..	..		
	57,309	231,429	38,472	150,564	6,285,290	24,948,227
CANTERBURY—						
County of Selwyn	2	6	..	..	120	473
OTAGO—						
County of Taieri	85	350	19	64		
County of Tuapeka	10,870	45,358	9,602	39,348		
County of Vincent	14,972	62,235	6,107	24,760		
County of Maniototo	4,834	20,289	9,391	38,676		
County of Waihemo	201	814	1	5		
County of Waitaki	409	1,724	2,397	9,821		
County of Bruce	236	999	6	23		
County of Lake	2,667	11,142	600	2,401		
County of Wallace	2,739	11,227	1,563	6,273		
County of Fiord	..	..	..	..		
County of Southland	16,324	67,767	5,006	20,157		
County of Clutha	361	1,566	..	..		
	53,698	223,471	34,692	141,528	7,705,924	30,684,790
Unknown	721	3,268	528	2,695	6,057	24,176
Totals	212,973	883,748	149,595	612,168	22,741,100	89,624,275

No. 3.

TABLE SHOWING THE OUTPUT OF COAL FROM THE VARIOUS COALFIELDS, AND THE COMPARATIVE INCREASE AND DECREASE, FOR THE YEARS 1920 AND 1921, 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, 1921.
	1921.	1920.			
	Tons.	Tons.	Tons.	Tons.	Tons.
North Auckland	83,325	102,801	..	19,476	4,040,819
Waikato (including Mokau)	431,282	380,691	50,591	..	6,562,446
Nelson	10,353	15,344	..	4,991	379,975
Buller	485,284	488,546	..	3,262	17,114,194
Inangahua	40,868	56,452	..	15,584	412,838
Grey	274,370	261,165	13,205	..	10,399,777
Canterbury	26,259	32,457	..	6,198	851,855
Otago	275,935	307,807	..	31,872	10,312,674
Southland	181,419	198,442	..	17,023	3,618,910
Totals	1,809,095*	1,843,705	..	..	53,693,488

* Decrease, 34,610 tons.

No. 4.

TABLE SHOWING THE OUTPUT OF DIFFERENT CLASSES OF COAL.

Class of Coal.	Output. 1921.	Output. 1920.	Increase.	Decrease.	Approximate Total Output to the 31st December, 1921.
	Tons.	Tons.	Tons.	Tons.	Tons.
Bituminous and semi-bituminous	893,845	923,575	..	29,730	33,949,532
Brown	700,120	715,709	..	15,589	16,580,317
Lignite	215,130	204,421	10,709	..	3,163,639
Totals	1,809,095*	1,843,705	..	..	53,693,488

* Decrease, 34,610 tons.

No. 5.

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. Tons.	Yearly Increase or Decrease.	Coal imported. 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	..
1920	1,843,705	„ 4,143	476,343	84,909	..
1921	1,809,095	„ 34,610	822,459	346,116	..

No. 6.

TABLE SHOWING THE TOTAL QUANTITY AND VALUE OF COAL IMPORTED INTO AND EXPORTED FROM NEW ZEALAND FROM AND TO EACH COUNTRY DURING THE CALENDAR YEAR 1921.

Imports.

Country whence imported.	Tons.	Value.
		£
United Kingdom	83,881	197,053
Canada, via west coast	3,027	7,449
Australia	627,659	814,237
Japan	43,278	141,881
United States of America, via east coast ..	64,614	160,420
Totals	822,459	1,321,040

The values shown are the fair market values in the countries of export plus 10 per cent.

Exports: Bunkers.

Country to which exported	Produce of New Zealand.		Produce of Other Countries.	
	Tons.	Value.	Tons.	Value.
		£		£
United Kingdom	29,027	69,970	6,988	20,758
Straits Settlements	750	1,805	..	..
Australia	7,342	11,265	2,192	3,651
Fiji	341	469	..	..
United States of America, via west coast	1,100	1,375	..	..
Tutuila	419	576	..	..
Totals	38,979	85,460	9,180	24,409

Exports: Cargo.

Country to which Exported	Produce of New Zealand.		Produce of Other Countries.	
	Tons.	Value.	Tons.	Value.
		£		£
Australia	9,781	15,894	..	..
Fiji	2,492	4,229	..	..
Tonga	161	798	..	..
Western Samoa	262	663	12	60
Society Islands	5	24	2	8
Tutuila	1,503	2,442	..	..
Totals	14,204	24,050	14	68

No. 7.

NUMBER OF PERSONS ORDINARILY EMPLOYED AT OR ABOUT MINES OTHER THAN COAL-MINES DURING THE YEAR ENDED 31ST DECEMBER, 1921.

County or Borough.	Number of Persons ordinarily employed at				Total.	
	Gold-quartz Mines.	Gold Alluvial Mines.	Gold-dredges.	Mines other than Gold and Coal.	1921.	1920.
NORTHERN INSPECTION DISTRICT.						
County and Borough of Thames	63	..	..	..	63	55
County of Ohinemuri	47	..	..	..	47	99
,, Coromandel	46	..	..	..	46	39
,, Piako	5	..	..	..	5	9
Borough of Waihi	924	..	..	..	924	827
County of Tauranga	62	..	..	..	62	29
Puhipuhi district	..	..	..	11	11	15
WEST COAST INSPECTION DISTRICT.						
County of Marlborough	17	5	..	..	22	34
,, Waimea	1	..	..	..	1	4
,, Takaka	..	..	..	1	1	1
,, Collingwood	..	..	..	35	35	..
,, Murchison	4	23	..	..	27	19
,, Buller	4	14	..	..	18	31
,, Inangahua	252	8	..	..	260	264
,, Grey	..	21	..	..	21	38
,, Westland	6	56	70	..	132	94
SOUTHERN INSPECTION DISTRICT.						
County of Taieri	2	..	..	..	2	3
,, Tuapeka	..	82	..	..	82	74
,, Vincent	4	52	50	..	106	114
,, Maniototo	..	50	..	..	50	37
,, Waihemo	1	2	..	..	3	8
,, Waitaki	..	7	..	..	7	10
,, Lake	..	22	..	9	31	30
,, Wallace	..	31	..	..	31	26
,, Bruce	..	..	..	..	..	1
,, Southland	..	65	16	2	83	69
Totals	1,438	438	136	58	2,070	1,930

Summary of Persons ordinarily employed in or about New Zealand Mines during 1921 and 1920.

	1921.	1920.	Increase.
Gold, silver, and gold-scheelite mines	2,021	1,903	118
Other metalliferous mines, including those worked for scheelite alone	49	27	22
Coal-mines	4,367	4,078	289
Totals	6,437	6,008	429

APPENDICES TO THE MINES STATEMENT.

APPENDIX A.

REPORTS RELATING TO METALLIFEROUS MINES AND STONE-QUARRIES.

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

Sir,— Wellington, 6th June, 1922.

I have the honour to present my fifteenth annual report on metalliferous mines and stone-quarries, together with annexures and statistical information, for the year ended 31st December, 1921.

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, 1921, to the 31st March, 1922

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

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

Annexures:

(A.) Summary of Reports by Inspectors of Mines.
(B.) Katathermometer Observations at New Zealand Mines, by Frank Reed, M.I.M.M.
(C.) Mining Statistics.

I. MINERALS PRODUCED AND EXPORTED.

The following statement shows the quantity and value of the production of metal-mines and of stone-quarries under the Stone-quarries Act during 1921 and 1920.

Mineral.	1921.		1920.	
	Quantity.	Value.	Quantity.	Value.
	Oz.	£	Oz.	£
Gold and silver (estimated)	551,875	547,105	474,650	528,317
	Tons. cwt.		Tons. cwt.	
Quicksilver	0 14	231	1 4	1,378
Tungsten-ore	38 7	1,785	39 2	1,956
Sulphur	873 0	2,619	746 0	2,238
Manganese	..	..	2 0	10
Asbestos	0 5	50	1 15	105
Stone	..	358,362	2,843 0	314,470
Pumice	2,945 0	7,958	..	7,499
Totals	..	918,110	..	855,973

The following statement shows the value of New Zealand minerals (other than coal) exported from the 1st January, 1853, to the 31st December, 1921 :—

—	1920.	1921.	Increase or Decrease.	Total from the 1st January, 1853, to the 31st December, 1921.
	£	£	£	£
Gold	883,748	612,168	Dec. 271,580	89,624,275
Silver	87,665	65,647	,, 22,018	2,714,597
Quicksilver	900	21	,, 879	7,662
Tungsten-ore	1,378	..	,, 1,378	299,311
Kauri-gum*	556,756	367,197	,, 189,559	19,505,017
Manganese	10	..	,, 10	61,915
Other minerals	8,745	8,988	Inc. 243	385,247
Totals	1,539,202	1,054,021	Dec. 485,181	112,598,024

* The quantity of kauri-gum produced is not known, but the quantity exported is recorded.

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, 1921.
	Northern.	West Coast.	Southern.	
Gold, silver, and tungsten	1,147	481	393	2,021
Cinnabar	11	..	2	13
Asbestos	..	1	..	1
Ironstone	..	35	..	35
Totals for 1921	1,158	517	395	2,070
Totals for 1920	1,073	485	372	1,930

III. ACCIDENTS.

During 1921 one fatal and seven serious but non-fatal accidents occurred in or about metalliferous mines, at which 2,070 persons were ordinarily employed.

Cause.	Fatal Accidents.		Serious Non-fatal Accidents.	
	Number of Separate Accidents.	Number of Deaths.	Number of Separate Accidents.	Number of Persons injured.
Falls of ground	1	1	2	2
Explosives	..	..	2	2
Miscellaneous, on surface	..	..	2	2
Miscellaneous, underground	..	..	1	1
Totals	1	1	7	7

The following is a description of the fatal accident which happened to Edward Murphy (57) an alluvial-gold miner. On the 3rd August, at about 10 a.m., he was employed with three others cleaning up at the sluicing-face of the Hochstetter Goldfields (Limited). The sandstone bottom rose almost vertically to a considerable height above where the men were working. While thus engaged a fall of sandstone from a higher level occurred, burying deceased ; when his body was recovered he was dead, the base of his skull having been fractured. The mates of deceased at the inquest stated in evidence that prior to the accident they did not apprehend danger. The jury returned a verdict of "Accidental death," holding no person blameworthy. Without inspection prior to the accident, it is impossible to gauge the degree of danger (if any) which existed. The work was obviously attended with some risk, but the manager of the claim had not seen the place since 4 p.m. on the previous day—*i.e.*, eighteen hours prior to the accident—and allowed the men to work without control.

Descriptions of the serious non-fatal accidents are contained in the reports of Inspectors of Mines (Annexure A hereto).

IV. GOLD-MINING.

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

	Production of Bullion, 1921.* (All Mines.)		Dividends paid, 1921. (By Registered Companies only.)†	Number of Persons ordinarily employed at Productive and Unproductive Mines.	Number of Productive Quartz-mines, Alluvial Mines, and Dredges, 1921.
	Quantity.	Value.			
	Oz.	£	£		
Quartz-mining ..	527,855	433,488	53,791	1,438	23
Dredge mining ..	7,302	36,179	600	136	11
Alluvial mining‡ ..	16,718	77,438	2,337	438	150
Totals, 1921 ..	551,875	547,105	56,728	2,012	184
Totals, 1920 ..	474,650	528,317	105,426	1,903	157

* 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 profits of privately owned dredges and mines are unobtainable, which renders this statement incomplete.
‡ The bullion-production is from 150 alluvial claims, but the dividends are only ascertainable from those few that are the property of registered companies.

The increased production as shown above, although satisfactory, should not be taken as an indication of a revival in the gold-mining industry, such improvement being due chiefly to improved methods and to the encouragement received during 1920 to work low-grade mines owing to the premium paid above the mint value of gold due to the low exchange on the paper pound sterling. The approximate mint value of fine gold is £4 5s. per ounce, but during 1920 the open market price paid in England averaged £5 12s. 6d. per ounce; unfortunately, however, the price declined during 1921 to £5 2s. 11d., until at the time of writing the premium has almost disappeared—the result of which will be the closing of the low-grade mines.

(1.) Quartz-mining.

Inspection District.	Statute Tons of Ore treated.		Value of Bullion.		Dividends paid (by Registered Companies only).	
	1921.	1920.	1921.	1920.	1921.	1920.
			£	£	£	£
Northern	214,365	194,316	334,550	325,854	49,591	99,181
West Coast	40,994	37,592	98,422	89,333	4,200	1,800
Southern	252	145	516	681	..	..
Totals	255,611	232,053	433,488	415,868	53,791	100,981

The average value per ton of ore treated during 1921 amounted to £1 13s. 11d. as compared with £1 15s. 10d. during 1920.

At the principal gold-quartz mines considerable depth is being attained with varying results.

At the Waihi Mine development of the No. 13 (1,578½ ft.) level has commenced, but the ore value in that level and at the level above has so far been low. During 1921 146,466 statute tons of ore were milled for a return of £233,331 8s. 4d. Dividends amounting to £49,590 14s. were declared. The total dividends paid by this company now amount to £5,486,828. A geological examination of this and the neighbouring mines has recently been made by Mr. P. G. Morgan, M.A., F.G.S., Director of Geological Survey, and I understand that important and somewhat favourable evidence has been obtained bearing upon the prospects of the lodes at greater depths.

Early in the current year mining and milling were suspended at the Waihi Grand Junction Mine, and operations have since been confined to the development of the Empire lode at No. 9 (440 ft.) level. During 1921 this company milled 65,964 statute tons of ore for a return of £96,398 5s. 9d.

At Muir's Gold-mines, near Te Puke, the new mill to replace that destroyed by fire having been completed, milling was resumed during 1921. Three levels have been driven, the lowest being about 200 ft. below the outcrop of the lode, the average width of which is about 5 ft. Above the upper level worked before the fire the value of ore milled averaged £4 14s. 7d., but from the lower levels the average value of the ore treated has since been £2 3s. 7d. per statute ton. It is proposed to sink a three-compartment shaft from which to prospect and subsequently work the lower levels of the mine.

The deepest development at the Blackwater Mine is at No. 9 (1,364 ft.) level, where the lode in the north drive appears promising. During 1921 34,323 statute tons of ore were treated for a return of £65,776 6s. 8d.

At the New Big River Mine, No. 11 (1,775 ft.) level, No. 2 winze has been sunk to a depth of 107 ft. on ore. During 1921, as the result of treating 3,898 statute tons of ore, bullion to the value of £21,610 was obtained, and dividends amounting to £4,200 were declared.

At Alexander Stream, Big Grey River, the Bull lode, the much-advertised find of Messrs. McVicar and Hurley during 1920, has upon prospecting proved to be disappointing, being but a fragment lacking both length, depth, and value. The opinion expressed by Mr. P. G. Morgan in his report shortly after this discovery has been substantiated by exploratory work by option-holders.

(2.) Dredge Mining.

The following is a statement showing the capacity, production, and profits of bucket gold-dredges during 1921. (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. E = Electrical.	Average Depth of Ground dredged.	Value of Bullion obtained during 1920.	Dividends declared.	
								During 1921.	Total.
Otago and Southland.						Ft.	£	£	£
Rise and Shine No. 1 ..	Cromwell	5⅛	10	20	S	40	6,212	600	53,700
Rising Sun	,, ...	7	10	25	S	45	4,605	..	24,000
Electric No. 1 (private) ..	,, ...	5	10	16	S	35	1,696	..	..
Earnscleugh No. 3 ..	Alexandra	7	12	150	E	50	3,644	..	30,250
Earnscleugh No. 5 ..	,, ...	6	13	150	E	35	4,079	..	
Nevis Crossing (private) ..	Nevis	3½	10	12	S	10	748	..	..
McGeorge's Freehold No. 2 (private)	Waikaka Valley ..	6½	9	16	S	14	4,874	..	..
McGeorge's Freehold No. 3 (private)	,, ..	6½	9	20	S	35	440	..	..
Kura (private)	Waikaia	3½	9	16	S	30	3,363	..	..
West Coast.									
Awatuna	Awatuna Beach ..	8	15	20	S	12	..	..	..
Rimu	Rimu	10	19	125	E	58	6,518	..	..
Totals, 1921 ..	..	..	..	..	..	..	36,179	600	Unknown
Totals, 1920 ..	..	..	..	..	..	..	34,672	1,400	Unknown

The Ferry, Lower Nevis, and Chambers Reward dredges were put out of commission during the year.

The American dredge Rimu commenced work upon the heavy and tight gravel at Rimu Flat, near Hokitika, towards the end of the year, lifting approximately 135 cublic yards per hour, the average value being about 9d. per cubic yard. This, the most powerful and up-to-date electrically-driven gold-dredge in Australasia, cost about £135,000. A description of this dredge is given in the report of Inspector J. F. Downey, contained in Annexure A hereto.

(3.) Alluvial Mining.

The following is a statement showing the value of production and dividends declared from alluvial gold-mines during 1921:

Name of Company.	Estimated Value of Gold produced.	Dividends declared.	
		During 1921.	Total to End of 1921.
	£	£	£
Hochstetter Goldfields (Limited)	2,286	..	6,572
Golden Crescent Sluicing Company	1,938	437	12,862
Havelock Sluicing Company	1,645	400	11,200
Nokomai Hydraulic Sluicing Company	7,678	1,200	54,683
Ourawera Gold-Mining Company	1,609	300	15,115
149 other claims	62,282	*	*
Totals	77,438	*	*

* Unknown; the dividends or profits from privately owned claims not being notified to the Mines Department.

V. MINERALS OTHER THAN GOLD.

Tungsten-ore.

Owing to the low price in the Home market for tungsten-ore no exportation was made during the year, although 38 tons 7½ cwt. of scheelite concentrate was produced in the Dominion. The mines at Macrae's and The Reefs, Otago, were idle during the year.

The following statement shows the quantity and value of ore exported:

Year.	Quantity.	Value.	Year.	Quantity.	Value.	Year.	Quantity.	Value.
	Tons.	£		Tons.			Tons.	£
1899	32	2,788	1907	137	15,486	1915	194	27,784
1900	54	2,635	1908	68	6,055	1916	266	49,070
1901	2	83	1909	58	4,263	1917	161	28,972
1902	39	1,200	1910	143	15,070	1918	169½	37,922
1903	42	1,439	1911	138	11,853	1919	131	29,489
1904	17	791	1912	135	13,347	1920	10 1/10	1,378
1905	28	1,848	1913	221	22,933	1921	..	..
1906	55	3,407	1914	204	21,498	Totals ..	2,304 3/5	299,311

The following is a statement showing the quantity of quartz crushed and tungsten concentrates obtained during 1921 :

Name of Mine or Company.	Locality.	Quartz crushed.	Scheelite Concentrates obtained.	Value.
		Tons.	Tons. cwt. lb.	£ s. d.
Dominion Consolidated Company* ..	Wakamarina, Marlborough ..	430	15 0 0	750 0 0
Black and McPherson	Glenorchy, Lake County ..	..	4 4 0	168 0 0
Logan and Paulin	,, ,, ..	..	1 9 41	73 8 3
John Tripp	,, ,, ..	..	3 12 15	180 6 8
Northcoat and Paulin	,, ,, ..	..	0 12 32	30 14 4
A. Hood	,, ,, ..	..	2 12 0	130 0 0
Birse Brothers	,, ,, ..	..	1 0 51	51 2 9
Tripp and Gaskell	,, ,, ..	..	0 13 29	33 3 0
Glenorchy Scheelite Company.. ..	,, ,, ..	45	9 4 0	368 0 0
Totals	..	475	38 7 56	1,784 15 0

* In addition to scheelite concentrate, gold to the value of £1,390 9s. 8d. was obtained.

Iron.

During the year the Onakaka Iron and Steel Company was engaged upon the construction of a blast-furnace installation on its lease at Onakaka, situated near Parapara, between Takaka and Collingwood. A description of this installation is contained in the report of Mr. J. F. Downey, Inspector of Mines, which appears in Annexure A hereto. The limonite deposit of this locality is of great extent, and is estimated in "Iron-ore Resources of the World," vol. 2, p. 889, published by the International Geological Congress, to contain 64,000,000 metric tons, of which about 30,000,000 tons occur in the Onakaka Block.

At Onakaka the ore and crystalline limestone flux occur at an altitude of about 1,200 ft. above the works, and they are conveyed thereto by aerial tramway 8,000 ft. in length.

On the 26th April, 1922, the blast furnace was blown in, and was kept in blast until the 4th May, about 80 tons of pig iron being produced. The furnace-charge consisted of Onakaka limonite, Onakaka crystalline limestone flux, and coke from Wallsend Colliery, Borehole seam, New South Wales, containing 0·37 per cent. sulphur. The results attained were very satisfactory, a soft grey marketable foundry pig iron being produced, as shown by the following analyses of samples taken by me and analysed by Dr. J. S. Maclaurin, Dominion Analyst. No doubt after a more extended run the quality of the iron would have been even better.

Table showing the Chemical Composition of Onakaka Pig-iron (tapped 29th April, 1922), and, for comparison, that of the Principal Brands of Foundry Pig-iron manufactured elsewhere.

Brand of Pig Iron.	Chemical Composition per Cent.							Kind of Iron.
	Iron.	Graphitic Carbon.	Combined Carbon.	Silicon.	Phosphorus.	Sulphur.	Manganese.	
Onakaka, sample 2	92·10	2·89	0·19	3·92	0·22	0·04	0·64	Foundry.
Carron, Scotland (as imported to New Zealand)	91·82	3·50	0·14	2·80	0·70	0·035	1·00	No. 1 foundry.
Ditto	92·63	3·35	0·20	2·15	0·70	0·06	0·91	No. 2 foundry.
Summerlee (as imported to New Zealand)	92·03	3·00	0·25	2·75	0·80	0·03	0·85	No. 3 foundry.
Lithgow (Hoskins), New South Wales, 1914	..	..	..	2·00	0·85	0·03	1·00	Foundry.
Characteristic samples quoted in "The Manufacture and Properties of Iron and Steel," by H. H. Campbell	92·37	3·52	0·13	2·44	1·25	0·02	0·28	No. 1 grey.
	92·31	2·99	0·37	2·52	1·08	0·02	0·72	No. 2 grey.
Alabama	..	3·49	0·07	2·8 to 3·5	..	..	..	No. 1 foundry.

Analyses of Ore, Flux, and Slag.

	Iron-ore (Limonite).	Crystalline Limestone (Flux).	Slag from Furnace.
Silica (SiO_2)	12·13	10·26	40·03
Alumina (Al_2O_3)	2·79	2·12	12·87
Ferrous oxide (FeO)	..	..	2·73
Ferric oxide (Fe_2O_3)	71·66*	1·76	..
Titanium dioxide (TiO_2)	0·20	0·17	0·49
Lime (CaO)	0·10	47·10	40·27
Magnesia (MgO)	0·33	1·24	1·19
Phosphorus pentoxide (P_2O_5)	0·23	0·07	0·10
Manganous oxide (MnO)	0·72	..	0·45
Calcium sulphide (CaS)	..	..	2·54
Sulphur (S)	0·13	0·21	..
Loss on ignition..	12·01	37·18	..
	100·30	100·11	100·67

* Equivalent to metallic iron, 50·16.

Cinnabar.

Operations by the New Zealand Quicksilver Mines (Limited) at Puhipuhi, North Auckland, were principally in the nature of development. During the year 1,575 lb. of quicksilver, of nominal value £231, was obtained. Three small parties operating in the same locality were engaged in unproductive work.

In the Greenvale Survey District a discovery of cinnabar was made by J. B. Graham and party, who have since been engaged prospecting the deposit.

Petroleum.

No drilling was done by the Taranaki Oil-wells (Limited) and the Blenheim Oil Company (Limited), at Moturoa, both companies having gone into liquidation.

At Waipatiki and Waitangi, near Whatatutu, boring was discontinued, results being negative.

The Kotuku Prospecting Syndicate, operating near Greymouth, drilled a hole to a depth of 930 ft., with negative result.

Asbestos.

The New Zealand Asbestos Company, operating near Takaka, produced 5 cwt., valued at £50.

Sulphur.

At Rotorua, on a Crown lease situated south of the racecourse, and held by Messrs. Donne and Birks, 873 tons 12 cwt. of crude fumarolic sulphur was obtained, as against 746 tons 3 cwt. during the previous year.

VI. STONE-QUARRY INSPECTION AND STATISTICS.

By section 2 of the Stone-quarries Amendment Act, 1920, the application of the Act was extended to include every place, not being a mine, in which persons work in quarrying stone and any part of which has a face more than 15 ft. deep, and also in any tunnel in the construction of which explosives are used. The Act, however, does not apply to any Government operations, or any road or railway-cutting, or excavations for buildings.

The stone-quarrying industry continues to advance in importance, during 1921 the value of stone, &c., produced being £358,362 as against £314,470 for the previous year.

The following is a table showing the number of quarries under the Stone-quarries Acts, also the number of persons ordinarily employed thereat, and the annual output and value of crude stone during 1921:

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 Stone.							
				Stone or Gravel for Macadamizing or Ballast.	Stone for Harbour-works.	Building or Monumental-stone.	Limestone for Agriculture.	Limestone for Cement or Mortar.	Phosphate for Agriculture.	Claystone for Bricks or Tiles.	Value at Quarry.
				Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	£
Auckland ..	James Newton, Mines Dept., Auckland	118	637	318,559	88,125	220	35,178	126,179	..	2,190	137,993
	M. Paul, Mines Dept., Waihi (Hauraki Mining District only)	12	77	33,139	..	366	..	..	..	..	13,405
Hawke's Bay	James Newton, Mines Dept., Auckland	21	89	26,484	50,677	..	..	14,000	..	..	15,564
Taranaki ..	Ditto	11	45	13,906	21,288	..	..	..	..	..	9,321
Wellington ..	„	36	212	80,637	16,121	..	11,000	..	..	..	32,594
Canterbury ..	„	10	82	77,369	5,079	30	6,920	..	..	..	28,764
Nelson, Westland	J. F. Downey, Mines Dept., Reefton	13	88	7,500	7,500	833	3,262	12,717	..	..	18,597
Otago, Southland	A. Whitley, Mines Dept., Dunedin	36	331	109,645	9,870	10,183	67,436	27,855	6,012	..	102,124
Totals 1921	..	257	1,561	667,239	198,660	11,632	123,796	180,751	6,012	2,190	358,362
Totals 1920	..	241	1,468	578,262	317,461	19,023	142,252	169,953	5,341	1,600	314,470

Quarry Accidents.

The following is a summary of serious accidents during 1921 at quarries under the Stone-quarries Act:

Cause.	Number of Accidents.		Number of Sufferers.	
	Fatal.	Serious.	Killed.	Seriously injured.
Explosives	..	1	..	1
Falls of ground	1	..	1	..
Falling from face or during ascent or descent	..	3	..	3
Totals	1	4	1	4

The fatal accident is in the proportion 0·64 per 1,000 persons employed.

The following is a brief description of the fatal accident: On the 19th April, while David Bower (60), manager of the Balclutha Borough quarry was barring down rock in the quarry, a large piece came away suddenly from the face striking him on the leg and breaking it. Later he developed pleurisy, and on the 5th June he died of embolism due to the accident. No inquest was held.

VII. STATE AID TO MINING.

(1.) Subsidized Prospecting.

During the year ended 31st March, 1922, twenty-nine approved prospecting-parties were granted subsidies amounting to £1,980, of which £502 was expended during the year. In addition, £3,261 authorized during previous years was expended.

Upon subsidized prospecting operations sixty-five persons were intermittently employed during the year; in five cases the results attained were satisfactory.

The following is a statement showing the number of subsidized prospectors, the amount of subsidy granted, and paid, also the character and result of such prospecting operations, from the 1st April, 1921, to the 31st March, 1922.

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.	£ s. d.	Ft.			
Waitangi Gold-mining Company		Thames	130 0 0		Nil	Quartz	Driving	
W. H. Madill	2	Tairua	50 14 0	39 0 0		,,	Surface prospecting	Nothing payable discovered.
Campbell Bros.	3	Puru Creek	50 14 0	50 14 0		,,	,,	Prospecting lode 12 ft. in width; assay value encouraging.
Rising Sun Gold-mining Company		Owharoa	2,000 0 0 (£1 for £1)	2,000 0 0	100	,,	Sinking shaft	Sinking shaft 100 ft. to develop lode at lower depth. Assay value for 300 ft. along floor of upper level over £6 per ton. Average width, 12 in.
Ohinemuri Gold and Silver Mines (Ltd.)		Maratoto	433 6 8	264 6 8	610	,,	Driving a low level to intersects Camoola lode	Intersected 21 ft. lode; 8 in. of footwall portion contains high silver values.
Caledonian-Kuranui		Thames	2,000 0 0	324 1 3	234	,,	Testing lode system on eastern side main fault	Prospecting lode system on the eastern side of main fault.
J. H. Benny and George Doel	2	Komata	50 14 0	50 14 0		,,	Surface prospecting	Gold seen in ore broken out; nothing payable.
J. H. Barrett and Falvey	2	Rotokohu	50 14 0	50 14 0		,,	,,	Nothing payable discovered.
W. F. McNeil	2	Tokatea	50 14 0	19 10 0		,,	,,	Gold freely seen in leader, but nothing payable.
West Coast Inspection District.								
Alpine Consols (Limited)	2	Lyell		19 1 4	44	Quartz	Driving	Nothing of value located.
C. Anderson and party		Wataroa River	50 14 6				Prospecting	
T. Barrett and R. Johnson	2	Upper Takaka	62 8 0	15 12 0			,,	Nothing of any value found.
Blackwater Miners' Prospecting Association	4	Grey River	93 12 0	148 18 0			,,	Auriferous lode found at Alexander Stream, Big Grey River.
J. Fayne and D. Danks	2	Waimangaroa	85 16 0	50 14 0			,,	Small leaders carrying gold found, but values low.
C. N. Hodder and party		Karamea River	93 12 0				,,	
P. Hughes and Samson	2	Punakaiki River	50 14 0	21 9 6			,,	Number of small unpayable lodes located.
Inangahua Miners' Prospecting Association	7	Inangahua	150 0 0	46 16 0			,,	Several unpayable lodes located.
E. Kean		Greenstone	132 0 0				Construction of tail-race	No work done.
Mount Greenland Gold and Quartz Mining Syndicate	2	Ross	30 0 0	61 19 4	143	Quartz	Driving	Lode located, but too poor to work.
E. McNair and party	2	Karamea	101 8 0	15 12 0			Prospecting	No discovery of any value recorded.
George Pettigrew		Slab Hut Creek	50 14 0				,,	No work done yet.
K. Ross and party	2	Taipo River	62 8 0	7 16 0			,,	Several lodes examined, but nothing payable found.
J. Timpson and P. McQuilkin	2	Browning's Pass	62 8 0	27 6 0			,,	Prospecting several small veins; nothing of value found.
F. D. Walker and H. Honey	2	Capleston	43 6 8	24 5 4	56		Driving	Fissure driven on, but quartz pinched out.
Webster, Knight, and party	4	Rimu		28 3 2	109	Alluvial	,,	Considerable area of pay-gravel opened up.
G. Wise and J. O'Donnell		Wangapeka	50 14 0				Prospecting	
T. Williams and S. Taylor	2	Brown Grey	50 14 0	23 8 0			,,	Several unpayable lodes located.
Hokitika Prospecting Syndicate		Arahura River	66 6 0				,,	Prospecting just started.
Forrester Bros.		Mount Domett	66 6 0				,,	,,
Southern Inspection District.								
Otago Central Gold-mines	4	Bendigo	150 0 0 and half-cost of timber	114 12 6	400	Alluvial	Driving	Work in progress.
,,	4	,,	14 19 0	13 13 0	75	,,	Sinking	Shaft sunk to ventilate prospecting-drive.
H. Fraser and J. McAuley	2	Nenthorn	15 12 0	15 12 0		,,	Surface prospecting	Nothing payable discovered.
Ballingall and Nicol	2	Nevis	125 0 0	125 0 0	500	,,	Driving	No payable ground found.
R. Symes and party	2	Old Man Range	101 8 0	50 14 0		Quartz	Surface prospecting	Prospects encouraging.
P. and W. H. Thomas	2	Hamilton's	92 19 8	65 8 8	151	Alluvial	Driving	Work in progress.
R. F. Landreth and party	3	Red Hills, north-west Otago	76 1 0	76 1 0			Prospecting	No mineral deposits of value found.

(2.) Government Prospecting-drills.

Considerable use has been made during the year of the Government prospecting-drills, which are lent to hirers free of any charge but that of maintenance. An aggregate of 6,156 ft. was drilled in thirty-one holes for five hirers upon seven properties, as follows :—

Number of Holes drilled.	Aggregate Depth drilled.	Mineral searched for.	Type of Drill used.	Cost per Foot.		Results.
				Drilling.	Transport.	
	Ft.			s. d. s. d.	s. d.	
5	1,227	Coal ..	Diamond	1 4 to 4 2	0 8½	Coal in one hole, 7 ft.
6	2,196	,, ..	,,	1 0 ,, 1 8	0 8½	Coal in three holes from 3 ft. 9 in. to 6 in.
2	370	Cinnabar ..	,,	9 2 ,, 11 5	1 2	No payable ore found.
2	1,317	Coal ..	,,	5 4 ,, 10 5	5 1	No workable coal found.
1	289	,, ..	Cable percussive	..	..	Not determined; faulted.
9	468	Alluvial gold	Keystone placer	..	..	Gold averaging 2½d. per cubic yard.
6	289	,,	Ditto ..	..	..	Gold averaging 11d. per cubic yard.

The following is a table giving details of operations by Government drills during 1921 :—

Type of Drill.	Name of Drill Superintendent.	Number of Holes drilled.	Total Depth, in Feet.	Diameter of Bore.	Mineral sought for.	Character of Country pierced.	Cost per Foot of Drilling.	Cost per Foot of Transport.	To whom lent.	Results.
				Inches.			s. d.	s. d.		
Schram-Harker oil-driven diamond drill	A. Wick ..	1	236	2½, 1¾	Coal ..	Gravel, clays, shales, and sandstones	2 8	0 8½	Homebush Brick and Coal Company, Glentunnel	No workable coal.
Ditto	,, ..	1	280	2½, 1¾	,, ..	Ditto	3 7	..	Ditto	,,
,, ...	,, ..	1	285	2½, 1¾	,, ..	,, ...	4 2	..	,, ...	,,
,, ...	,, ..	1	140	2½, 1¾	,, ..	,, ...	2 9	..	,, ...	,,
,, ...	,, ..	1	286	2½, 1¾	,, ..	,, ...	1 4	..	,, ...	7 ft. coal at 193 ft. (Sheath row seam).
,, ...	,, ..	1	306	2½, 1¾	,, ..	,, ...	1 8	..	Bush Gully	4 ft. coal at 173 ft., 4 ft. coal at 240 ft., 4 ft. 6 in. coal at 268 ft.
,, ...	,, ..	1	216	2½, 1¾	,, ..	,, ...	1 0	..	,, ...	No workable coal.
,, ...	,, ..	1	320	2½, 1¾	,, ..	,, ...	1 6	..	,, ...	,,
,, ...	,, ..	1	488	2½, 1¾	,, ..	,, ...	1 5	..	,, ...	,,
,, ...	,, ..	1	386	2½, 1¾	,, ..	,, ...	1 4	..	,, ...	3 ft. 9 in. coal at 165 ft.
,, ...	,, ..	1	480	2½, 1¾	,, ..	,, ...	1 4	..	,, ...	6 ft. coal at 111 ft., 6 ft. 6 in. coal at 292 ft., 3 ft. coal at 393 ft.
Sullivan C.N. diamond drill	R. Pengelly ..	1	150	5, 2¾	Cinnabar ..	Conglomerate, grits, mudstones, and clays	11 5½	1 2	N.Z. Quicksilver-mines, Puhipuhi	No payable ore.
Ditto	,, ..	1	220	5, 2¾	,, ..	Ditto	9 2	..	,, ,, ..	,,
,, ...	,, ..	1	713	6, 2¾	Coal ..	Shingle, sandstone ..	10 5	5 1	North Cape Coal Company, Puponga	No workable coal.
,, ...	,, ..	1	604	6, 2¾	,, ..	Conglomerate and mudstones	5 4	..	,, ,,	,,
Cable percussion ..	T. Ryan and W. H. Warburton	1	289	6, 3½	,, ..	Mudstones and sandstones	86 6	7 0	Waimangaroa–Westport Coal-mines Syndicate, Burnett's Face	Not determined; country faulted.
Keystone No. 3 placer-drill	S. W. Ford ..	9	468	6	Alluvial gold	Gravel	..	..	Rimu Gold-dredging Company (Limited), Mahinapua	Gold averaging 2½d. per cubic yard.
Ditto	,, ..	6	289	6	,,	,, ...	..	..	Rimu Gold-dredging Company (Limited), Tucker Flat, Kanieri	Gold averaging 11d. per cubic yard.

(3). Subsidized Roads on Goldfields.

The expenditure in the form of subsidies and direct grants upon roads on goldfields amounted to £11,329, as compared with £11,050 during the previous year.

(4.) Government Water-races.

The Waimea-Kumara and Mount Ida water-races, which greatly assist alluvial gold-mining in the localities of Kumara (Westland) and Naseby (Central Otago), but at an annual loss of £2,313 15s. 8d. to the Government, have, during the year ended 31st March, 1922, supplied with water for sluicing auriferous gravel claims employing an average number of 28·15 persons, by which gold to the approximate value of £5,633 5s. 6d. was obtained.

The following is a statement showing the cash received by the Government for water sold, and the expenditure on the upkeep of the races, together with the average number of miners supplied with water, and the approximate quantity and value of gold received for the year ended 31st March, 1922 :—

—	Receipts. (Sales of Water.)	Expenditure.	Debit Balance.	Average Number of Miners supplied with Water.	Approximate Quantity and Value of Gold obtained.	
Waimea-Kumara Water-races—	£ s. d.	£ s. d.	£ s. d.		Oz.	£ s. d.
Waimea Race	483 13 8	1,118 7 7	634 13 11	6·50	366	1,436 11 0
Branch Race to Callaghan's and Middle Branch Flat	20 4 2	282 6 3	262 2 1	3·00	51	200 3 6
Kumara Race	51 12 0	232 13 3	181 1 3	Nil	..	..
Kumara-Trans-Taramakau Race	27 19 11	322 11 1	294 11 2	3·25	106	416 1 0
Erin-go-Bragh Race	131 7 3	349 4 4	217 17 1	5·00	308	1,208 18 0
Mount Ida Water-races.. ..	777 10 3	1,501 0 5	723 10 2	10·40	616	2,371 12 0
Totals	1,492 7 3	3,806 2 11	2,313 15 8	28·15	1,447	5,633 5 6

This represents a loss of £82 3s. 11d. for each person employed on the claims, or 41·07 per centum of the total value of gold obtained.

In addition to the receipts for sales of water, a sum of £260 12s. 6d. was received as royalty for timber cut on the Kumara Reservoir Reserve.

Owing to the small demand for water and to the considerable loss sustained in the upkeep, the maintenance of the Kumara, Kumara-Trans-Taramakau, and Erin-go-Bragh water-races was discontinued as from the 1st January, 1922. The Erin-go-Bragh Race has since been sold.

(5.) Schools of Mines.

The total expenditure on schools of mines during the year ended 31st March, 1922, was £5,848 as against £4,427 9s. 6d. during the previous year. The goldfields schools are attended by few (if any) mining students, but numerous children of both sexes attend them for subjects not taught at the Government schools.

I have, &c.,

Frank Reed,

Inspecting Engineer of Mines.

ANNEXURE A.

SUMMARY OF REPORTS BY INSPECTORS OF MINES.

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

Quartz-mining.

Waihi Gold-mining Company (Limited).—During the year No. 4 shaft was sunk 55½ ft.; total depth, 1,616 ft. It was intended to open out No. 13 level at 1,600 ft., but owing to the shaft passing through a soft carbonaceous seam between 1,588 ft. and 1,599 ft. it was decided to open out at No. 13 level at 1,578½ ft. On the south side of the shaft the north-west crosscut was extended 197 ft. where the Dreadnought lode was intersected, having a width of 23 ft., the assay value of the last 18 ft. being 8s. 3d. per ton. In the south-east crosscut the total distance driven was 319 ft. At 258 ft. a portion of the Royal lode, width 7 ft., was intersected, worth 6d. per ton; at 279 ft. another section of this lode, width 5 ft., was met with—assay value, 12s.; at 292 ft., quartz 3 ft. wide, assay value 1s. 1d. per ton. Driving east and west is in progress on the richest portion.

No. 12 level (14,447½ ft. below collar of No. 4 shaft).—Dreadnought lode: Total distance driven east of No. 4 shaft, 530 ft.; width irregular and values low. At this point the junction of the Empire lode was met with. Beyond the junction the drive has been extended 54 ft. over width of 5 ft.; assay values vary from 6s. 8d. to £1 7s. 2d. per ton.

Bath north crosscut extended 136 ft.; total, 269 ft. At 150 ft. for a width of 10 ft. the ore assayed at 4s. 7d. per ton. At 191½ ft. a crosscut proved the Martha lode to be 66 ft. in width, of which 8 ft., near the centre, has payable values; from 38 ft. to 46 ft. ore assayed £1 8s. per ton; balance low grade.

Drive east, 141½ ft. over width of 5 ft.: assay value varies from 5s. to £3 9s. 4d. Crosscut proved width of lode 58 ft.; values varying from 1s. 8d. to £1 14s. 10d. per ton.

Drive west, Martha lode: Distance driven, 104 ft.; assay values, of width of 5 ft., vary from 1s. 1d. to 19s. 9d. Crosscut at 95 ft. west proved the lode to be 60 ft. wide, and values from 1s. 5d. to £1 2s. per ton.

Empire lode west of Bath crosscut: Drive extended 152½ ft.; at 50 ft., lode 11 ft. in width, value £1 per ton; at 118 ft., lode 8 ft. wide, value £1 0s. 10d.

West crosscut from No. 2 shaft: Advance 168 ft. during the year, making a total distance 833 ft. At 652 ft. east part of the Edward lode was met with; assay value, 3s. 10d. At 705 ft. the main portion of the Edward lode was intersected; width, 25 ft.; average value, 1s. 5d. per ton. At 827 ft. a rise was put up and connected with the bottom of No. 2 shaft, which provided adequate ventilation.

No. 4 shaft, south crosscut, advanced 92 ft.; total, 487 ft. The Royal lode was met with at 414 ft.; width, 15 ft.; value, 4s. 6d. per ton. 23 ft. was driven east and 11 ft. west; values low.

No. 11 level (1,301 ft. below collar of No. 4 shaft).—Salmon west crosscut: This is being extended for the purpose of testing the Welcome and Martha lodes at this level; distance driven, 429 ft. At 237 ft. a lode 4 ft. wide was passed through; assay value, 11s. per ton.

No. 10 level (1,152 ft. below collar of No. 4 shaft).—North section of Empire: The level was widened out to full width from 41 ft. to 91 ft. west. At 75 ft. an irregular reef was found going into the south wall; width 8 ft.; value, £1 9s. 3d. per ton. The Soldiers' south-east crosscut was extended 87 ft. with a view of testing this lode, but nothing important was met with. North section of Empire lode: The level has been widened and timbered for a length of 200 ft. ready for stoping.

No. 9 level (1,004 ft. below collar of No. 5 shaft): Charters' south crosscut advanced 184 ft. Regina lode intersected from 25 ft. to 37 ft.; payable samples were obtained, but on driving east and west the ore proved low-grade.

No. 8 level (1,852 ft. from collar of No. 5 shaft): North branch of Martha lode advanced 124 ft.; at 122 ft., 4 ft. of hard quartz and country, mixed, assayed £1 17s. 7d. per ton. The level was heightened to 11 ft. from 36 ft. to 113 ft., and 5 ft. wide.

No. 6 sublevel: No. 2 reef driven 120 ft. in payable ore 4 ft. wide.

No. 6 level: Albert lode, south of the Martha junction, driven 140 ft. in payable ore, over 5 ft. wide.

The Jellicoe lode was found 94 ft. in the south-east crosscut from No. 2 shaft; width, from 2 ft. to 5 ft.; assays vary from £1 11s. 6d. to £10 8s. 1d.

No. 5 level: Jellicoe lode driven on for 242 ft.; width varies from 9 in. to 5 ft., and values from £1 18s. 3d. to £16 15s. 6d.

A considerable amount of payable ore is still being won from the arches at and above No. 7 level.

The new high-lift turbine-pumping plant commenced operations on the 1st September, and has run continuously since that date.

Waihi Grand Junction Mine.—No. 1 shaft was sunk 12½ ft., making the total depth below collar 1,473 ft. At 150 ft. below No. 8 level a crosscut was driven 39 ft. through quartz; value, 10d. per ton. The object of this crosscut was to tap the main body of the water 30 ft. below the random of No. 9 level. No. 9 level was opened up at 120 ft. below No. 8 level. A water-cistern (capacity 10,000 gallons) has been excavated at No. 9 level. The drainage-water from the level is directed into this cistern, and from here pumped to the main pumping-station at No. 8 level. This arrangement will enable the sinking of the shaft to proceed under improved conditions. During the year 205,823,855 gallons of water were raised to the surface.

No. 9 level: The main south-east crosscut was driven a total distance of 170 ft.; from 21 ft. to 33 ft. is quartz valued at 4s. 1d. per ton, from 32 ft. to 87 ft. country rock. At 87 ft. a lode, 45 in. wide, value 3s. 7d. per ton, was passed through; from this lode to 140 ft. is country rock. At 140 ft. the Empire lode was intersected, and proved to be 24 ft. wide. The first 7 ft. is quartz, value 7s. 3d. per ton; the next 10 ft. quartz and country rock, value 2s. 6d. per ton; and the next 7 ft. quartz, value £3 2s. 4d. per ton. From 164 ft. to 170 ft. is country rock.

Empire lode: East drive driven 146 ft. The average assay value is 15s. 8d. per ton for a width of 56 in.; south wall is exposed. A crosscut at 105 ft. east exposed both walls. The lode is 16 ft. wide; the first 5 ft. on the south wall is worth 10s. 8d., and the next 11 ft. £1 1s. 11d.

West drive driven 210 ft. Value from crosscut to 75 ft. west over width of 59 in., £2 17s. 4d. per ton; from 75 ft. to 107 ft. over width of 62 in., 7s. 2d. per ton; from 107 ft. to 125 ft. over width of 50 in., £1 13s. per ton; from 125 ft. to 190 ft. over width of 54 in., £2 1s. 9d. per ton; from 190 ft. to 205 ft. over width of 58 in., £1 4s. 10d. per ton. A crosscut at 65 ft. west exposed 14 ft. of lode, of which 5 ft. is worth £2 8s. 10d. per ton, and 9 ft. worth 1s. 7d. The north wall is not exposed. In crosscut at 150 ft. west the lode is 17 ft. wide; the first 6½ ft. on the south wall is worth £2 13s. 10d. per ton, and the next 10½ ft. 2s. 4d.

Early in February, acting on report given by Mr. H. Stansfield, consulting engineer, the directors decided to close down the battery, suspend stoping operations at the upper level, and confine expenditure to development work at No. 9 level and sinking the main shaft, which at that time of writing had reached a depth of 80 ft. below No. 9 level.

Rising Sun, Owharoa.—Work in this mine has been confined to sinking a shaft below the low level, which was started 20 ft. south of the main crosscut and sunk to a depth of 100 ft. The available capital, together with Government subsidy of £2,000, having been expended, work was suspended, and an effort is now being made to raise further capital to develop the reef system from the bottom of the shaft.

Ohinemuri Gold and Silver Mines, Maratoto.—The crosscut from the Silverstream low level has been extended 852 ft. Four lodes were intersected—the first was 40 ft. in width, the second 4 ft., third 24 ft., and fourth 21 ft. The quartz in the latter has the same characteristics as met with in the Camoola lode. On the level 200 ft. above a vein about 8 in. in width on the footwall carries high silver-values. Driving north and south on this lode is now in progress. The north drive has been extended 41 ft. and the south drive 103 ft., with no walls showing. The values vary from 6s. up to £5 12s. A picked sample. 1 ton 6 cwt. 3 qr. 18 lb., sent to Australia for treatment, yielded 580·667 oz. silver, valued at £95 10s. 6d.

Waitekauri.—Several men have been prospecting near the old township. Parker and party found about a ton of quartz boulders, containing high assay values, in an old slip, which was at first thought to be a cap of a lode. A considerable amount of surface trenching and riving was done without finding any sign of quartz. Recently W. F. C. Nicholl, one of the oldest prospectors in this district, reported the discovery of a large reef by boring. Good dish prospects were obtained from the drillings, and finally an outcrop of quartz was located in a small creek. On the lower side of the road adjoining this creek large boulders of quartz containing values have been found ever since the opening of this goldfield, shed, no doubt, from the outcrop of a lode. The reef where exposed, and claimed to be the outcrop of a lode, consists of quartz boulders and rubble lying on a clayey formation. In my opinion it is quite possible that Mr. Nicholl bored on a line of these quartz boulders buried up in a large slip, and until more work is done it is impossible to express a definite opinion as to the value of this find.

Great Northern Waihi Gold-mining Company.—This claim is situated at Wharekirauponga. Work done during the year consists chiefly of driving on a 3 ft. lode at creek-level, and general prospecting. It is stated that the quartz won from the 3 ft. lode contains payable assay values. Seven men are employed. The machinery for a 10-head stamp battery has been carted to site, but no attempt has been made to proceed with its erection.

Waiotahi Mine, Thames.—This mine was sold by public auction, and purchased by Messrs. Sawyer and O'Loughlin, who are endeavouring to raise capital to give the Cure and Manaka sections a further trial above spring-tide level.

Evening Star Mine.—This claim is situated in Waiotahi Creek. A winze has been sunk to a depth of 130 ft. on the Waiotahi-Cambria reef, and a considerable amount of driving done; colours of gold have occasionally been seen in the ore broken, but nothing payable discovered.

Nonpariel Gold-mining Company.—A considerable amount of work was done in this mine, but the results proved most disappointing to shareholders.

Gloaming Mine, Karaka Creek.—This is owned and worked by Messrs. Kemp and Agnew, who treated 18 tons of ore for gold valued at £126 17s. 9d.

Kuranui Gold-mining Company.—Work was continued driving north on the 2 ft. lode from Magazine level with no signs of improvement, and work has been temporarily suspended.

Waitangi Gold-mining Company.—Work done during the year consisted of driving and rising on the main reef at Nos. 1 and 2 levels. At No. 1 level the reef is small and values low, but at No. 2 level the ore is heavily mineralized, and gold has been frequently seen in the quartz broken out.

Caledonian-Kuranui-Moanataiari Gold-mining Company.—At the beginning of the year the drive on the course of No. 9 level was retimbered and extended until the main fault was intersected at a distance of 402 ft. This fault proved to be 46 ft. wide. The crosscut was continued a farther distance of 50 ft.; at this point the country was firm, with no signs of movement; and, with the object of testing the well-known gold-producing reefs worked on the western side of this fault, crosscuts were started, one to the south to intersect the Caledonian Nos. 1 and 2 and Waiotahi-Cambria reefs, and another to the north to intersect the Moanataiari No. 9 lode. Owing to the lack of ventilation the former was discontinued after driving 15 ft., and labour was concentrated on the north crosscut. At 104 ft. a promising leader, 8 in. wide, was cut, and colours of gold were seen in the quartz. Later a distance of 9 ft. was driven upon its course, and at each breaking-down gold was seen. It has been decided to clean up the main tunnel to a point opposite this crosscut, connect with the north drive, and to rise to the surface, which will provide adequate ventilation and enable the work of proving any reefs on the eastern side of the Moanataiari fault to be carried on more vigorously.

Sylvia Mine, Tararu Creek.—During the year the Norfolk lode was driven upon a distance of 120 ft. from the bottom of the underlie shaft, and stoped to within a few feet of the level above. All ore was sent to the mill, but no return has yet come to hand. The work at present in progress consists in driving a crosscut 130 ft. north of the shaft to intersect the cross-lode.

St. Hippo Gold-mining Company, Karaka Creek.—A distance of 450 ft. was driven at the low level on the St. Hippo lode. The reef was cut through in several places, and proved of large dimensions. Gold was frequently seen in the ore broken out, but not in payable quantities. Four men were employed.

Alburnia Gold-mining Company.—An adit level 400 ft. below the collar of the Alburnia shaft is being extended for the purpose of intersecting Dixon's reef, worked with satisfactory results in the adjoining mines in the early days of the goldfield.

Bendigo Mine, Waiorongomai, Te Aroha.—Four men have been employed driving and stoping on the Bendigo reef, which will average 4 ft. in width. The ore won was treated by the oil-flotation process, but the results did not come up to the anticipations, and work has been temporarily suspended.

Horseshoe Mines (Limited), Neasville.—Work was confined to driving on the Horseshoe lode at No. 2 level, and, although the quartz carried favourable indication, no gold was seen.

Golden Hills Mine, Tairua.—Work in this mine has been confined to stoping on the Puketue reef; 195 tons of ore treated produced gold valued at £534 11s. 9d.

Old Hauraki Gold-mining Company, Coromandel.—A considerable amount of work has been done in endeavouring to locate the downward continuations of Legg's reef. It was followed down to within 25 ft. of the 300 ft. level, where the displacement was met with, and which appears to be a diorite intrusion parallel with the reef rising from the footwall side, bending and breaking the reef. In the Welcome End section some difficulty was met with in draining this portion of the mine: 380 ft. of driving has been done at the 400 ft. level, and this section is now clear of water. Work at present in progress consists of sinking below the 400 ft. level on the new reef No. 1, winze is down 33 ft. and driving on the lode has been commenced; and, although no gold has been seen, indications are similar to those existing where the gold was obtained in the level above.

Mount Welcome Syndicate.—The intermediate level was extended 190 ft., and the Puketutu lode intersected, but no gold was seen. A considerable amount of work was done also at the low level on this lode. A little gold was seen in the ore broken out, but nothing payable was met with.

Four-in-Hand Syndicate, Waikoromiko.—Two men have been constantly employed prospecting. 1 ton 30 lb. of picked stone treated yielded gold valued at £30 16s. 10d.

Muir's Gold-reefs, Te Puke.—The low level has been extended a total distance of 600 ft. In the face a fault was met with, which cut off the reef, but beyond driving a few feet on either side nothing has been done to locate it on the other side. The lode will average 5 ft. in width for the whole distance driven, and the ore is said to be payable. A winze was sunk to a depth of 100 ft. below this level with no sign of water. The lode maintains its width, and the ore is similar in appearance to that won from the level above. Driving is also in progress at the intermediate level, 100 ft above. The south face, which is now well ahead of the low level, has passed through the fault referred to. The battery, owing to the delay in obtaining electric power, did not commence crushing until the end of December. Up to the 17th February, 4,400 tons of ore were treated for bullion valued at £7,475 2s. 3d.

Quicksilver-mines.

New Zealand Quicksilver-mines (Limited), Puhupuhi.—Operations during the year were principally of a development order. The east and west faces were extended 290 ft. and 100 ft. respectively, from tramway

level. Two winzes were also sunk to the dip—No. 1 to a depth of 20 ft., and No. 2 to 96 ft. The lode-formation is most erratic in its course, and the ore occurs in bunches, and is therefore difficult to follow. To assist the company in carrying out this work a loan of £1,000 was granted. During the year twenty-one flasks (or 1,575 lb.) of mercury (nominal value, £231) were obtained.

Mount Mitchell Claim (held by T. A. Black and party).—A considerable amount of prospecting has been done. A furnace and condensing-plant has been purchased, and a portion carted to site, and the owners are sanguine that this mine will prove remunerative.

Rising Sun Mine (owned by Messrs. Fearks and Kelly).—About 500 ft. of driving has been done, proving the existance of cinnabar-ore of varying quality. Furnace and condensing-plant in course of erection, which it is reported will be running about the end of April.

Northland Mine.—This is owned by Messrs. Jamieson and Halloway, who have a small experimental plant, consisting of a Wilfrey table and jig, to try a large deposit of pebbles containing cinnabar.

Accidents.

I am pleased to state that no fatal accidents have occurred in the mines under my supervision during the year.

The following is a brief description of the more serious accidents :—

6th January, 1921 : T. Monk received injuries to his arm, and F. Hooker had his collar-bone broken and his ribs injured, by falling off a platform on to a concrete floor, a distance of about 16 ft. These accidents were caused by the guard-rail they were leaning against carrying away. The rail was not rotten, but gave way at the end where it was nailed.

6th January, 1921 : J. Parsons had his face and arms badly burnt, in the Waihi Grand Junction Company's power-house, by failing to comply with written instructions regarding the opening of feeder-switches.

27th June, 1921 : Daniel Harrison received a compound fracture of his right leg and his shoulder injured by a fall of quartz in a stope, 55 ft. above No. 10 level, on the Royal lode, Waihi Mine.

13th October, 1921 : John Shaw lost the sight of his right eye by a blasting accident in the Waihi Grand Junction Mine, due to carelessness on the part of a trucker named J. O'Connor.

13th December, 1921 : Charles Rickard had his back seriously injured by falling 30 ft. down a ladder-way of the Waihi Grand Junction Mine, leading up to Hickey and party's stope on the Mary lode, above No. 6 level. The accident was due to a small fall of quartz. Rickard's mates heard it coming and sheltered under the timbers and escaped injury. Rickard was not, however, so fortunate, as apparently a piece of rock must have struck him, causing him to lose his hold and fall away, a distance of about 30 ft.

20th December, 1921 : John E. Tubman lost the sight of one eye by a blasting accident in the Waihi Grand Junction Mine. The accident was caused by his own candle coming into contact with the fuse, causing it to spit, unnoticed by him, whilst firing a charge on a boulder, blocking the mouth of the pass.

Oil-wells.

Taranaki Oil-wells Company (Limited).—No drilling has been done during the year. No. 3 well (depth 3,045 ft.) flows about every ten days, and produced during the year 1,350 gallons of oil.

Blenheim Oil Company (Limited).—In the early part of the year this company went into liquidation. During the year the Blenheim well produced 3,398 gallons of oil.

Waipatiki Oil-wells.—At a depth of 3,600 ft. this well became blocked, and all efforts to free it, up to date, have failed. Four men are employed.

Gisborne.—Messrs. Clark and Lysnar have put down a number of drill-holes at Waitangi, near Whatatutu. In No. 1 (depth, 940 ft.) indications are stated to be favourable, but drilling had to be suspended as the casing could not be carried to a greater depth. No. 2 (depth, 343 ft.), No. 3 (depth, 98 ft.), No. 4 (depth, 54 ft.), and No. 5 (depth, 119 ft.) were abandoned. These holes were drilled close to the first bore, but abandoned without success. Petroleum was not found in any quantity.

Prosecutions.

3rd February, 1921 : T. and A. Katterfeldt, manufacturing jewellers, were prosecuted for buying gold without a license ; convicted, and fined £1, and costs £2 2s.

30th August, 1921 : J. Tallentire, mine-manager, was prosecuted for leaving twenty-six plugs of gelignite exposed ; convicted, and ordered to pay costs.

22nd September, 1921 : E. Higgins, miner, prosecuted for leaving gelignite exposed ; convicted, and fined £1 and costs.

21st October, 1921 : James O'Connor was prosecuted under section 265 of the Mining Act ; convicted, and fined £5 and costs.

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

Quartz-mining.

MARLBOROUGH DISTRICT.

Dominion Consolidated Mining and Development Company (Limited).—Work was confined principally to the reconstruction of the treatment plant. The company replaced the old steam-driven air-compressor with a new compressor driven by water-power, and thereby materially reduced the cost of working. The amalgamating and concentrating portions of the plant have been greatly improved and extended, the former being placed away from the stamp-house with a view to better control, and two Frue vanners and two Californian shaking-tables have been installed in place of the former ineffective concentrators. No ore was mined, but 430 tons of quartz previously broken were crushed, yielding 98 oz. gold. In addition 186 oz. of gold were recovered from cleaning-up operations about the mill. The total value received for gold won for the year was £1,390. About 15 tons of scheelite concentrate was saved, but owing to the slackness of the market for this mineral it has not been disposed of.

Alford and Party (Mountain Camp).—Owing to there being no sale for scheelite, this property was not worked during the year.

NELSON DISTRICT.

Colossus Gold-mining and Development Company.—Practically no work was done during the year, only one man being employed in general prospecting.

LYELL DISTRICT.

New Alpine Consols.—The low-level tunnel was advanced about 34 ft. during the year, making a total of 1,050 ft., and a crosscut was driven from it to the east to a distance of 75 ft., but nothing of any value was met with.

New Creek Prospecting and Development Company.—Very little work was done during the year, but preparations were being made to resume active operations.

CAPLESTON.

Boatman's Consolidated Mines (Limited).—Work was carried on continuously, an average of twelve men being employed. The principal mining operations consisted in picking up the old No. 6 Welcome tunnel as far as the northern extremity of the Fiery Cross ore-shoot, and the picking-up and driving of the old No. 1 level, Fiery Cross shaft. Almost immediately after driving was resumed in the latter a small vein of quartz was encountered, which

was followed for several hundred feet. The first 60 ft. is said to have shown fair values, but the remainder was not payable. A rise was started on the 60 ft. block referred to, to connect with the Welcome No. 6 level, and this was carried up to 50 ft. The lode lived up in it, but I understand that the values were not so good as in the drive. A start has now been made to pick up the old No. 2 Fiery Cross level, with the view to seeing if the ore-shoot found on the No. 1 level lives down to it, and shows any better values.

REEFTON.

Blackwater Mines.—During the year an average of 133 men were employed, and breaking and development were carried on actively. The principal development work was as follows: No. 5 level south extended 435 ft., of which 232 ft. were on the lode; No. 6 level south extended 55 ft., of which 33 ft. were on quartz; No. 7 level north extended 96 ft., of which 86 ft. were on quartz; No. 7 level south extended 16 ft., all on quartz; No. 9 level north extended 412 ft., of which 287 ft were on quartz; No. 9 level south extended 86 ft., of which 56 ft. were on quartz. Speaking generally, the mine was looking well, the development on No. 5 level south being particularly satisfactory. No. 9 level (the lowest in which any opening out has been done) may also be said to look well, especially in the north drive, where the quartz appears to be more continuous than in the northern and of any of the drives since No. 4 level was passed. For the year some 34,323 tons of quartz were mined and crushed, which was a considerable improvement on the results for 1920, when only 24,468 tons were handled. This increase of nearly 10,000 tons is partly the result of a plentiful supply of labour, and to a certain extent to an improvement in the class of miners available. A total of 13,830 oz. 3 dwt. of gold was recovered, for which, including premium, a total value of £65,776 was received. The figures for the previous year were 11,065 oz., and £58,887 respectively. The average value of stone crushed for the year appears to show a falling-off of about 1 dwt. per ton.

Blackwater South Mine.—The track to the site of the proposed new shaft has been completed, but no attempt has yet been made to start mining operations. It is expected that work at the shaft will begin shortly.

North Blackwater Mine.—During the year the erection of the new winding and air-compressing plant was completed, and the mine is now well equipped for future work. Just prior to the end of the year the unwatering of the shaft was accomplished. There still remained a gold deal of work to do before active mining operations could be resumed, but driving on the reef cut in No. 7 level crosscut, and which was claimed to carry good gold values, should be in operation early in the coming year. Five men, on an average, were employed during the year.

Murray Creek Mine.—After a spell of idlemess, mining was resumed in July. About 730 tons of quartz was mined and crushed, which yielded 282 oz. of gold, valued at £1,176. This return was not, however, found payable, and in December operations again ceased. The quartz mined during this period all came from the old stopes above No. 4 level. No development work was carried out.

New Big River Mine.—Work was carried on energetically throughout the year, an average of forty-one men being employed. The only development of any consequence consisted of the sinking of No. 2 winze on No. 11 (bottom) level to 107 ft. During the period 3,989 tons of quartz was mined and crushed, the whole of which came from between Nos. 10 and 11 levels. This tonnage was a considerable increase on that of the previous year, when only 2,970 tons were mined. Including premiums received, the total value realized for all gold won for the year amounted to £21,609, an increase on the figures for 1920 of £7,276. The mine was the only one in the district to declare o dividend, £4,200 being thus distributed. Estimating the ounces produced at standard price for fine gold, the gold per ton crushed seemed to have shown an improvement of approximately 4 dwt.

New Keep-it-dark Mine.—No work was done at this mine during 1921.

North Big River Mine.—No 3 adit level was continued for some distance, but no lode of any value was found. On the same level as No. 3 a crosscut tunnel was driven about 200 ft. with no better results. Six men, on an average, were employed.

New Millerton Mine.—Work was carried on steadily, an average of twenty-five men being employed. A considerable amount of development was done. No. 1 level was driven north 20 ft., No. 2 level south 202 ft., and No. 3 level north 399 ft. A number of short crosscuts, totalling 212 ft., were also put in from No. 3 level north. Rising and winzing to the extent of 161 ft. was also completed. Taking the development work as a whole, it cannot be said to have given satisfactory results. Most of the driving was on the lode, which was for the most part small and broken and of poor values. A small stamp mill was erected, driven by water-power, and crushing operations were started in August and continued to the end of the year, 1,461 tons of quartz being treated for a return of 761 oz. 6 dwt. gold, valued at £3,705. The stoping was practically confined to one shoot of stone in the southern end of the mine, the stoping-length of which was in No. 3 level 60 ft., in No. 2 level 96 ft., and in No. 1 level 100 ft. Two small stopes were started on No. 3 level north, but were subsequently discontinued. With values based on standard for fine ounce, the value recovered per ton of stone treated seems to have been £2 4s. 2d.

New Discovery Mine.—The work of driving the low-level adit tunnel was continued without break, during which it was advanced a farther 646 ft. to a total of 986 ft. It is not expected to intersect the lode till about 1,200 ft. has been driven. Six men were employed.

Ready Bullion Mine (New Ulster).—The low-level adit at this mine was also kept going steadily, but only one shift of two men was employed. The adit was extended a farther 250 ft. to 600 ft., whence a crosscut was extended easterly 75 ft., in which direction it is expected to intersect the reef-line.

Alexander Stream.—During 1920 a gold-bearing lode was discovered and named the Bull lode, by Messrs. McVicar and Hurley, at the Alexander Stream, Big Grey River. The prospectors pegged out six prospecting licenses of 100 acres each. During 1921 an option was taken over this property by the Recovery Gold-mines Syndicate, and a certain amount of exploratory work was carried out. An adit was started at a point 80 ft. below the outcrop of the Bull lode, and driven south-easterly to pass vertically under the surface outcrop. As no sign of the lode was therein discovered, a crosscut was then started about 20 ft. back from the face of the drive, and driven 115 ft. on a bearing of approximately 120° (*i.e.*, at a right angle with the apparent strike of the lode on the surface), but no indication of the lode was found.

Big River Extended.—An adit was driven about 200 ft. on an outcropping lode, but the values were apparently negligible.

Big River South.—A little work was also done on this property, a winze being sunk, from an adit driven during the previous year, on a lode which is said to have contained fair values.

Progress Mine.—No mining operations were carried out, but the bottom level, No. 11, was stripped of rails, air-pipes, &c. Treatment of sands at the mill and of concentrates sold in Australia resulted in a recovery of 1,093 oz. of gold, for which £4,440 was realized.

Energetic and Wealth of Nations Mine.—This property has also been idle all the year, owing to lack of money.

HOKITIKA AND ROSS.

Mount Greenland Mine.—Work was confined to the mining and crushing of 60 tons of quartz, which returned 54 oz. 17 dwt. gold, valued at £299.

Mount Greenland Extended.—Two men were employed in a prospecting-drive during part of the year; nothing payable was found.

STILLWATER.

Victory Mine.—The low-level adit which was started during 1920 and driven 260 ft. was extended to 335 ft., up to which point no values had been met with. Only two men were employed. The adit has since been extended to 445 ft., where a small flat-lying leader ranging from 1 in. to 6 in. wide was encountered, samples from which are said to have shown values up to 10 oz. to the ton. Exploratory work is being continued.

General Remarks on Quartz-mining.

Despite the period of acute financial stringency through which the Dominion has been passing, the quartz-mining industry has during the past year shown signs of slightly increased activity. The quantity of ore treated showed an improvement of nearly 4,000 tons on that for the previous year, and, notwithstanding a decrease in the premium received on gold disposed, the total value realized exceeded that for 1920 by over £9,000. The dividends paid during the year also showed an advance on the previous year's figures, being £4,200 as against £1,800.

No serious accidents of any kind have occurred in any of the quartz-mines for the year.

A considerable amount of prospecting has been carried out.

Dredging.

A noticeable feature during the period in connection with this branch of the mining industry has been the completion and putting into commission of the large new dredge of the Rimu Gold Dredging Company at Rimu Flat, near Hokitika. Actual dredging operations were started in September, and to the end of the year 221,591 cubic yards of gravel were treated, for a yield of 1,429 oz. gold, equal, with gold at standard value, to a return of approximately 6½d. per cubic yard. The total amount, including premium, received for the gold was £6,518. An average of fifty-eight men were employed.

This dredge is the most powerful yet put to work in New Zealand, and presents a number of features, both in construction and method of operating, new to dredging here. It cost £100,000 to construct. The pontoon, mainly of Oregon pine, is 115 ft. 6 in. long, 50 ft. wide, and 10 ft. 7¾ in. deep. The working-parts are all very massive compared with those on previous dredges here. By way of illustration, the bucket-pins are 6 in., the top tumbler-shaft 21 in., the bottom one 15 in., and the ladder-rollers 16 in. in diameter, and all are of manganese steel. The buckets, seventy-three in number, and delivering at the rate of nineteen per minute, are also wholly of the same material. The main drive, winch, pumps, stacker, &c., are all operated by electric power. To work them simultaneously 535 electrical horse-power is required, the figures for the various units being—main drive, 200 h.p.; winch, 25 h.p.; screen, 50 h.p.; stacker, 50 h.p.; high-pressure pump, 125 h.p.; low-pressure pump, 60 h.p.; and nozzle pump, 25 h.p. The power is transmitted by the Kanieri Electric (Limited) to a transformer near the dredge at a pressure of 10,000 volts, and is there stepped down to 2,000 volts.

The most novel features in connection with the dredge are the pivoting of the ladder on the upper tumbler-shaft, the dispensation with links between buckets, use of electricity for all power purposes, control of practically all work on board from one central position, stacking by means of belt conveyer, and employment of spuds in place of head-lines. The stacker and ladder are each 135 ft. in length. The former was designed to dig normally to 43 ft., but can, it is claimed, dig to about 55 ft. if required. The screen is 46 ft. long and 7 ft. internal diameter. The spuds, two in number, are 56 ft. long, and each weighs 18 tons. For saving gold, 6,000 square feet of tables are provided on the dredge. No copper plates nor any description of blanket are used, the gold being caught in shallow riffles in which mercury is placed. The dredge has not, so far, been worked to its full capacity.

This Rimu dredge was the only one in the district which won any gold during the year, but at Awatuna Beach a company known as the Awatuna Dredging Company (Limited) is re-erecting the dredge formerly worked as the Chambers Reward at Humphrey's Gully. The area on which it will operate has been well tested by drilling, and is said to contain good gold-values. Some twelve men have been employed in connection with it.

Alluvial Mining.

A slight falling-off in the number of men employed in this branch of the industry has been noticeable, and the total amount of gold won showed a proportionate decrease, being 3,911 oz., as compared with 4,245 oz. in 1920. The total value received for it was £17,570, as against £18,336.

In the following notes some particulars are given as to operations in the various localities where work was carried on:—

Howard Diggings.—Only twelve men have been employed in this field during the year, the amount of gold recovered being 298 oz., valued at £1,186.

Murchison.—For the whole of this district, including Matakitaki, Newton Flat, and Lyell, only 84 oz. of gold, valued at £330, were recovered. Seven men were employed.

Addison's Flat.—Only one claim (Mouat and party's) was worked, 219 oz. gold, valued at £914, being recovered.

Charleston and Brighton.—In these localities the amount of gold won for the year amounted to 916 oz., for which £3,819 was realized.

Grey Valley.—At the various claims twenty-one men were employed. The total gold won amounted to 684 oz., valued at £3,409. The Hochstetter Company, not finding the yield payable, closed down towards the end of the year.

Barrytown.—There was no gold won in this locality during the year, but the Waiwhero Sluicing Company was engaged in entirely reconstructing its plant.

Kumara.—On the Kumara, Greenstone, Stafford, and Callaghan's fields the total production for the year amounted to 773 oz., valued at £3,691. The principal producers were—Linklater Sluicing Company (Stafford), 283 oz. 10 dwt., valued at £1,229; Stubbs and Steel (Greenstone), 182 oz., valued at £912; and R. Kean (Greenstone), 149 oz., valued at £671. The Havill Brothers at Callaghan's completed towards the end of the year a new low-level tunnel tail-race over 2,000 ft. in length, and the Callaghan's Sluicing Company has been engaged in putting its property (formerly Honey Bros.' claims) into working-order. At the Hohonu Diamond Terrace Sluicing Company's claims at Greenstone preparations are being made for the construction of a new main race to bring a water-supply in from the Hohonu River.

Hokitika.—In this district 275 oz. gold, valued at £2,261, were won, the principal producers being Rimu United Sluicing Company (Seddon Terrace), 266 oz., valued at £1,238 15s. 1d.; and Ford and Knight (Rimu), 148 oz., valued at £752. Eighteen men were employed.

South Westland.—Some 107 oz. were won from various beach leads, the value of which was approximately £489.

Reefton.—Returns from this district show that eight men were employed, and that 279 oz. gold, valued at £1,332, were recovered. The principal producer was Antonios Limited, with 229 oz., valued at £1,151.

Marlborough.—The total return of gold was only 11 oz. 16 dwt., valued at £46 8s.

Mining other than for Gold.

Onakaka Iron and Steel Company.—This company has during the year been busily engaged in erecting a plant for smelting the iron-ores on its property at Onakaka, between Takaka and Collingwood, some thirty-five men, on an average, having been employed. The plant is not designed for a large output; its producing capacity is estimated to be about 25 tons of pig iron per day. The following is a brief description of the plant already erected, and of the general proposed scheme of operations: The furnace is of shaft type, of mild-steel plate, constructed in New Zealand. It is 64 ft. in height from feeding-platform to hearth-level, with an internal diameter of shaft 10 ft., and of hearth 5 ft. Up to the bosh the lining is of local clay and silica, and thence to the top of the shaft is of Huntly firebricks. The thickness of lining in the shaft averages 1 ft. 6 in., and in the hearth 2 ft. 6 in. The top of the furnace is fitted with a bell for distributing the feed uniformly. The furnace will be hand-fed. The bronze tuyeres are water-cooled, as are also the water-blocks used as the tuyeres-zone construction. The air required in the furnace will be heated in a U-pipe stove to 900° F. The U-pipes in the stove are of cast iron, twenty-four in number, and they will be heated by burning the waste gas from the top of the furnace under and around them. The blower was made by the Baker Company, and is of the Root type, with a rated capacity of 64·5 cubic feet per revolution. It is of iron throughout, and heavily geared. Two boilers have been installed for providing steam for driving the blower. One of these is of

Babcock and Wilcox type, nominal horse-power 100; the other is of underfired multitubular type, horse-power 90. The boilers will be heated also by waste gas from the blast furnace. Slag from the furnace will be granulated by means of water and flushed over the hillside. As a guard against possible blockage of the race, or inability to granulate owing to failure of water-supply, an endless-rope haulage, with slag-pot on bogie, is also being installed. In front of the furnace is situated the cast-house, covering a sand-pig bed where the molten metal will be flowed into pig form, and from there it will be lifted by a 5-ton overhead crane and carried to the stockyard. For supply of water an open race 60 chains in length, and a pipe-line 40 chains in length, have been provided. A considerable number of hutments have been erected for housing the employees, and the company has also provided a comfortable mess-house where the men will get their meals at a reasonable price. An up-to-date laboratory has also been erected. For the bringing of the ore from the quarries to the plant an aerial ropeway, about a mile in length, has been erected. This will deliver both the limestone and the crude ore into large ferro-concrete bins, whence the charge will be raised to the feed-floor by means of an hydraulic lift. The charges are expected to approximate 2½ tons of ore, 15 cwt. limestone, and 20 cwt. coke. The average iron content of the crude ore is expected to run from 45 to 48 per cent. This, less the moisture, 12 per cent., is expected to bring the iron content empirically to from 51 to 53 per cent. The character of the ore will, however, no doubt vary considerably during the working of the deposits. Up to the end of the year a sum of upwards of £25,000 has been spent in the erection of the plant, &c. No attempt will be made for a time to produce anything but a soft, highly siliceous pig iron, of which it is estimated 10,000 tons are used yearly for foundry purposes in New Zealand.

ASBESTOS.

New Zealand Asbestos Company (Limited).—This is the only property in the district that has turned out any asbestos for the year, and the quantity was small, being only 5 cwt. of cobbed mineral, valued at £50.

PROSPECTING FOR PETROLEUM.

Kotuku Petroleum Prospecting Syndicate.—This syndicate, whose property is situate at Kotuku, on the Greymouth–Otira line, was the only one in the West Coast Mining District to carry on active operations. Under the supervision of Mr. J. A. Davis, a driller of American experience, a well was sunk to a depth of 930 ft., but no indications of either mineral oil or gas were noted, and it has now been abandoned. The site for a new well has, however, been selected, and the ground will be further tested. Six men were employed.

Accidents.

No accidents of any kind were reported, except at the alluvial claim at Ahaura worked by the Hochstetter Goldfields (Limited), where, on the 3rd August, a man named Edward Murphy, aged fifty-seven, single, met his death.

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

Quartz and Alluvial Mining.

WAITAKI COUNTY.

Livingstone and Maerewhenua.—The Mountain Hut Race, which was the principal source of the water used in the alluvial claims at Maerewhenua, was badly damaged by a flood in the month of October. As repairs have not been effected, mining is practically at a standstill. Returns from this district show that seven men were employed, producing 178 oz. 17 cwt. gold, valued at £744.

TAIERI COUNTY.

A. C. Buckland (The Reefs).—150 tons of ore from open cuttings on the Barewood reef yielded 17 oz. 15 dwt. gold, valued at £73 11s. 2d.

TUAPEKA COUNTY.

Gabriel's Gully Sluicing Company (Blue Spur).—This company completed treating the tailings that had been deposited in Gabriel's Gully by former companies and miners who were operating on the Blue Spur cement for many years, and a start has been made to sluice the cement remaining in the solid. Water under a pressure of 600 ft. is available for breaking down and elevating. Since the company was formed in 1907 gold valued at £56,754 has been produced, and dividends paid amounting to £15,615.

Lawrence Sluicing Company (Blue Spur).—The sluicing and elevating plant has been shifted from Munro's Gully to Kitto and party's old paddock in the cement, where payable returns were obtained. The yield of gold for the year was valued at £1,287.

Golden Crescent Sluicing Company (Weatherstone).—Sluicing and elevating have been steadily carried on during the year. A jack-hammer drilling plant was installed to assist the high-pressure water in breaking up the hard portions of the cement. Gold valued at £1,938 10s. was produced, and dividends were paid amounting to £437 10s.

Sailor's Gully Sluicing Company (Waitahuna).—Operations were confined to the Norwegian section of the company's claim, where a paddock about 1 acre in area and 15 ft. deep produced 500 oz. gold. Sinking has been commenced in the cement, which gives good prospects and is expected to yield payable returns.

Havelock Sluicing Company (Waitahuna).—This company is working shallow ground near Waitahuna Township with payable results. Gold valued at £1,645 was produced, from which £400 was paid in dividends.

Waipori.—Six sluicing claims were in operation during the year. Thirteen men were employed, and the production of gold amounted to 756 oz., valued at £3,290.

Teviot Molyneaux Gold-mining Company (Roxburgh).—Eight men were employed, and the yield of gold amounted to 151 oz., valued at £740.

Murchison Bros. (Fourteen-mile Beach).—This party has installed an elevating-plant to work a beach in the Clutha Gorge between Coal Creek Flat and Alexandra.

MANIOTOTO COUNTY.

Naseby.—Twenty-four miners were employed in this locality. The gold produced was valued at £5,192.

St. Bathan's.—Only two claims, employing eight men, were worked. The Scandinavian Water-race Company produced 457 oz., valued at £2,209, and the United M. and E. Water-race Company 145 oz., valued at £662. The former was elevating from a depth of 102 ft.

Cambrian's.—The Vinegar Hill Sluicing Company suspended operations at Vinegar Hill, and shifted the sluicing-plant to new ground on the south-east side of Morgan Bros.' claim. A pipe-line one mile and a half in length has been laid from the company's water-race to the claim. The yield of gold amounted to 164 oz., valued at £709. Morgan Bros. were engaged in prospecting the south-eastern portion of their claim, with unsatisfactory results.

Patearoa.—Two claims, employing five men, were in operation. The production of gold amounted to 196 oz., valued at £878.

VINCENT COUNTY.

Matakanui.—The Undaunted Tinkers' Gold-mining Company, elevating from a depth of 57 ft., produced 241 oz., valued at £1,069. Seven men were employed.

Nevis.—Graham and party's claim at Upper Nevis continues to yield payable returns. 553 oz., valued at £2,677, were won during the year. The output of gold from the sluicing claims in this locality amounted to 1,288 oz., valued at £6,029. Thirty-two men were employed.

Bendigo.—The Otago Central Consolidated Gold-mines drove 400 ft. into a high-level terrace near the old Bendigo Mine to prospect for a lead of alluvial gold. The work, which is still in progress, has not resulted in opening up any payable ground.

Old Man Range.—R. T. Symes, owner of the Advance Mine, crushed 95 tons of ore from White's Reef, at the battery level, for a return of 105 oz., valued at £436.

LAKE COUNTY.

Glenorchy.—The Glenorchy Scheelite Company and seven parties of miners were engaged in scheelite-mining for a short period in the early part of the year. There being practically no demand for the mineral, operations ceased, and will not be resumed until the market revives.

SOUTHLAND COUNTY.

Muddy Terrace Sluicing (Waikaia).—Sluicing was carried on in Mathewson's and Nuggety Gullies when water was available. Nine men were employed, and the yield of gold amounted to 325 oz., valued at £1,600.

Nokomai Hydraulic Sluicing Company.—This company's two elevators, working in Victoria Gully, a branch of Nokomai Creek, produced 1,723 oz., valued at £7,678. Dividends amounting to £1,200 were paid. Thirty-three men were employed in the claim and attending to water-races.

Athol.—Two claims were working in this locality. Blakely and McLister produced 272 oz., valued at £1,296, and Mutch and party 215 oz., valued at £1,029.

WALLACE COUNTY.

Ourawera Gold-mining Company (Round Hill).—Eight men were employed, and gold valued at £1,609 produced.

Round Hill Mining Company.—Work was steadily carried on in the company's No. 1 claim, where elevating to a height of 60 ft. was in progress. At No. 2 claim a start was made to take a new paddock on the west side of the Ourawera Stream. The production of gold for the year amounted to 785 oz., valued at £3,994. Fifteen men were employed.

Orepuki.—Four claims, employing five men, produced 165 oz., valued at £743. H. Sorensen was the largest producer, with 75 oz.

Dredge Mining.

Nine gold-dredges were in commission during the year. Of these the Rise and Shine No. 1, working on the Clutha River above Cromwell, was the largest producer, yielding 1,258 ozz., valued at £6,212.

The following dredges were dismantled and scrapped: The Ferry, Lower Nevis, Adam's Flat, Waikaka Deep Lead Nos. 1 and 2, and Waikaka Forks.

Minerals other than Gold.

Scheelite.—23 tons of scheelite concentrates were produced in the Glenorchy district in the early part of the year. None of this was exported, as there was practically no market for the mineral, and the price offering was too low to cover the cost of production. The mines at Macrae's and The Reefs were idle throughout the year.

Cinnabar.—A discovery of cinnabar was made in the Greenvale Survey District by J. B. Graham and party. The mineral occurs in seams and impregnations over a width of from 9 in. to 2 ft. in soft sandstone. The prospecting done by the party comprises sinking to a depth of 50 ft. and driving 100 ft. on the deposit at 25 ft. from the surface. Further development will be required to prove if the mineral occurs in payable quantity.

Phosphate Rock.—6,012 tons of phosphate rock, valued at £6,012, were produced at Clarendon and Milburn by the Ewing Phosphate Company.

Petroleum.—The Canterbury Petroleum Company's borehole at Chertsey was cleared of the detached sand-pump, and sinking was resumed with 2½ in. casing. At 2,200 ft. quicksand was encountered, which prevented further drilling. The company has gone into voluntary liquidation.

Accidents.

Richard Fraher had his left leg broken by a fall of gravel in Charles Hore's sluicing claim in Main Gully, Naseby, through going too close to the working-face while sluicing operations were in progress. This was the only accident of a serious nature that occurred in the district during the year.

ANNEXURE B.

OBSERVATIONS BY KATATHERMOMETER OF THE PHYSIOLOGICAL CONDITIONS IN THE DEEP MINES OF NEW ZEALAND.

In my last annual report, Annexure B (2), appeared "Notes on the Katathermometer," an instrument invented by Dr. Leonard Hill, F.R.S., Director of Department of Applied Physiology, Medical Research Committee, for ascertaining a general measure of the cooling effect of air on the body when every physiological means of promoting heat-loss is brought into play.

It has been found that the ordinary thermometer is of very little use in indicating what the body requires, because it only gives the average temperature of the surroundings, and does not show the influence of wind, which is the most potent thing in cooling persons and animals. The wet katathermometer shows the influence of wind and humidity. A considerable amount of controversy has taken place regarding the provision contained in Regulation 94 (7) (*c*), under the Mining Act, that the maximum temperature of air in any working-place in any mine in the Hauraki Mining District (*i.e.*, Hauraki Goldfields), measured by a wet-bulb thermometer, shall not exceed 83° F., unless firing of explosives has occurred in such place within twenty minutes of the observation of the thermometer, but the Inspector may allow such higher temperature if in his opinion it is impracticable to maintain the temperature at or below 83° F., wet-bulb; but he shall fix the number of hours (not exceeding six) which any person shall be employed in any such working-places. As depth is attained at the Waihi mines it has occasionally been found impracticable to maintain the temperature below the above standard, the rate of increment of the temperature of the rocks with depth being approximately 1° F. in 33 ft. The wet-bulb temperature of the workings at times has approached 90° F., which temperature has been pronounced injurious to men at work by Dr. J. Haldane, F.R.S., and other eminent physiologists.

With a view of ascertaining to what extent the conditions existing in hot and humid working-places may be improved by the circulation of air at increased velocity, a number of observations have been recently taken by some mining engineers, consisting of Messrs. M. Paul, Inspector of Mines; A. H. V. Morgan, Director of Waihi School of Mines; E. G. Banks, superintendent, and J. L. Gilmour, manager, of the Waihi Gold-mine; W. McConachie, manager of the Waihi Grand Junction Gold-mine; and by myself. The observations were principally taken for the purpose of establishing, if possible, a katathermometer standard for warm mines as an improvement on the existing wet-bulb-thermometer standard. The places of observations were specially chosen where the velocity of the air for experimental purposes could be regulated and increased when desired, and do not always represent the working-conditions of the mines.

Upon reference to the tabulation of the results thus obtained it will be seen how rapidly the cooling-power, as indicated by katathermometer, improved with increased air-velocity, as shown by observations Nos. 2 and 3, being one series taken at the same point; Nos. 4, 5, and 6, a series taken at one point; and Nos. 11 and 12, another series at one point, increasing through each series the velocities from still air. The opinions expressed on the physiological conditions contained in the last column were conscientiously arrived at by the mining engineers, who base their opinions upon what they believed to be the conditions existing; but when compared with the standard of the inventor of the katathermometer, Dr. Hill (viz., that for sedentary workers the dry katathermometer should be kept not less than 6 and the wet 16·5, but that the cooling-power should be higher than these for severer forms of mechanical work), the standard here adopted by the New Zealand engineers (viz., 4·04 dry katathermometer and 10·6 wet katathermometer) are much less exacting, and, not being subject to medical analysis, cannot claim equal authority to Dr. Hill's standard. Thus, for the present, insufficient evidence exists by which to determine a legal katathermometer standard for mines. The observations, however, are of considerable value in showing the benefit of moving air at the working-places; likewise, observation No. 13, taken in still air in the warmest place in the warmest colliery in the North Island, provides satisfactory evidence that the temperature of our coal-mines is not excessive.

Tabulated Results of Observations taken to ascertain the Physiological Conditions at some Mines in New Zealand.

Number of Observation.	Place of Observation.	Date.	Outdoor Temperature in Shade.		Temperature at Place.		Katathermometer: Cooling-power in Mille Calories per Sqr. c.m.p. Sec.		Velocity of Air in Feet per Second.	Physiological Conditions as believed by the Mining Engineers present at the Tests.
			Wet Bulb.	Dry Bulb.	Wet Bulb.	Dry Bulb.	Wet Bulb.	Dry Bulb.		
			°F.	°F.	°F.	°F.				
1	Seatoun, Wellington (hills)	18/1/22	56·60	65·00	56·60	65·00	57·60	24·90	14·30	Salubrious conditions for arduous physical work.
	Waihi Gold-mine—									
2	No. 13 (1,450 ft.) level, Martha lode west	28/1/22	61·50	62·30	80·25	81·40	9·40	2·90	Still air	Oppressive.
3	No. 13 (1,450 ft.) level	28/1/22	61·50	62·30	78·60	80·20	33·20	15·00	12·90	Velocity of air excessive for continual physical work.
4	Royal lode west ..	30/1/22	59·00	64·00	88·00	88·70	4·90	1·57	Still air	Extremely oppressive conditions and unendurable, inducing profuse perspiration on unclothed men resting.
5	„ ..	30/1/22	59·00	64·00	84·70	88·00	21·80	4·46	6·00	Velocity of air rendered conditions satisfactory for physical work.
6	„	30/1/22	59·00	64·00	83·00	87·00	27·10	6·30	11·85	Velocity of air excessive.
7	900 ft. level, Edward lode, White's stope	14/3/22	58·00	67·50	78·00	79·50	11·10	4·04	0·70	Lower limit of satisfactory conditions, velocity just sufficient to deflect candle-flame.
8	1,150 ft. level, Edward lode, Heath's stope	14/3/22	58·00	67·50	76·50	77·50	12·40	5·04	0·54	Satisfactory stoping conditions.
9	1,265 ft. level, Edward lode, Harrison's stope	14/3/22	58·00	67·50	77·00	77·50	10·60	4·07	0·42	Lower limit of satisfactory conditions.
10	Edward lode, Salmon crosscut	14/3/22	58·00	67·50	79·00	81·00	24·20	11·30	12·60	Satisfactory conditions.
11	Waihi Grand Junction Gold-mine, No. 7 (1,200 ft. level), south-east cross-cut to Empire lode	31/1/22	62·50	67·00	76·00	77·00	11·70	4·42	0·65	Considered reasonable working-conditions for naturally hot mines.
12	Ditto	31/1/22	62·50	67·00	72·00	74·50	19·20	8·30	1·83	Good conditions for working in naturally hot mines.
13	Taupiri Extended Colliery, No. 1 west dip heading, 300 ft. deep	6/2/22	64·00	78·00	64·50	66·70	17·01	6·21	Still air	Fair conditions. Of the two miners working only one had his shirt off. Considered to be the warmest place in the colliery: if so, colliery workings on the Waikato coalfield are reasonably cool.

Notes.

The instruments used consisted of Professor Hill's katathermometer, Biram-Davis anemometer, and Sling hygrometer.

Standard of Professor Leonard Hill, F.R.S., the inventor of the katathermometer: For sedentary workers the dry katathermometer should be kept not less than 6, and the wet 16½. The cooling-power should be higher for severer forms of mechanical work. In the above tabulation the mining engineers have taken a lower standard—viz., not less than 4 dry bulb and 10·6 wet bulb.

At the Waihi Goldfield the rate of increment of the temperature of the rocks with depth is approximately 1° F. in 33 ft., thus great difficulty exists in keeping the workings in a satisfactory condition.

ANNEXURE C.

MINING STATISTICS.

STATEMENT SHOWING THE QUANTITY OF QUARTZ CRUSHED AND GOLD OBTAINED IN THE HAURAKI MINING DISTRICT FOR THE YEAR ENDED 31ST DECEMBER, 1921.

Locality and Name of Mine.	Average Number of Men employed.	Quartz crushed.	Gold obtained.		Value.
			Amalgam.	Cyanide.	
THAMES COUNTY AND BOROUGH.					
Karaka Creek—		Tons cwt. qr. lb.	Oz. dwt.	Oz. dwt.	£ s. d.
Gloaming Mine	2	18 0 0 24	45 15	..	126 17 9
Tairua—					
Golden Hills	2	195 0 0 0	178 16	89 8	561 9 9
Totals	4	213 0 0 24	224 11	89 8	688 7 6
WAIHI BOROUGH.					
Waihi—					
Waihi Goldmining Company* ..	599	146,466 0 0 0	..	412,487 6	233,331 8 4
Waihi Grand Junction* ..	325	65,964 0 0 0	..	92,611 18	96,398 5 9
Totals	924	212,430 0 0 0	..	505,099 4	329,729 14 1
OHINEMURI COUNTY.					
Karangahake—					
Talisman	2	Cleaning-up Woodstock Battery	173 19	..	115 14 11
Owharoa—					
Rising Sun Goldmining Company	10	Cleaning up mill	..	441 11	661 16 6
Ohinemuri Gold and Silver Mines†	11	1 6 3 18	..	..	95 10 6
Totals	23	1 6 3 18	173 19	441 11	873 1 11
PIAKO COUNTY.					
Waiorongomai—					
Bendigo Syndicate	4	40 0 0 0	..	183 2	53 8 0
COROMANDEL COUNTY					
Waikoromiko—					
Four-in-hand	2	1 0 1 2	9 14	..	30 16 10
Hauraki Block—					
Old Hauraki	20	80 1 2 2	223 0	..	795 18 7
Totals	22	81 1 3 4	232 14	..	826 15 5
TAURANGA COUNTY.					
Te Puke—					
Muir's Gold Reefs	62	1,600 0 0 0	..	466 17	2,378 15 11
SUMMARY.					
Thames County and Borough ..	4	213 0 0 24	224 11	89 8	688 7 6
Waihi Borough	924	212,430 0 0 0	..	505,099 4	329,729 14 1
Ohinemuri County	23	1 6 3 18	173 19	441 11	873 1 11
Piako County	4	40 0 0 0	..	183 2	53 8 0
Coromandel County	22	81 1 3 4	232 14	..	826 15 5
Tauranga County	62	1,600 0 0 0	..	466 17	2,378 15 11
Totals, 1921 ..	1,039‡	214,365 8 3 18	631 4	506,280 2	334,550 2 10
Totals, 1920 ..	918	194,316 2 3 15	805 9	433,510 3½	325,853 19 8
Totals, 1921 ..	1,039	214,365 8 3 18	631 4	506,280 2	334,550 2 10
Increase	121	20,049 6 0 3	174 5§	72,769 18½	8,696 3 2

* Waihi and Waihi Grand Junction Mines: Gold won from these mines valued at £4 4s. per ounce; silver, 2s. per ounce.
† Ohinemuri Gold and Silver Mines: 580,667 ounces silver (no gold); value, £95 10s. 6d.
‡ In addition, during the year 108 men were employed at unproductive quartz-mining operations.
§ Decrease.

STATEMENT SHOWING THE QUANTITY OF QUARTZ CRUSHED AND GOLD OBTAINED IN THE WEST COAST INSPECTION DISTRICT FOR THE YEAR ENDED 31ST DECEMBER, 1921.

Locality and Name of Mine.	Average Number of Men employed.	Quartz crushed.	Gold obtained by Amalgamation.	Gold obtained by Cyanide and Concentrates.	Estimated Value.
		MARLBOROUGH.			
Wakamarina—		Tons cwt. qr.	Oz. dwt. gr.	Oz. dwt. gr.	£ s. d.
Dominion Consolidated Development Company (Limited)	16	430 0 0	284 0 0	..	1,390 9 8
		WESTLAND.			
Ross—					
Mount Greenland	4	60 0 0	54 17 12	..	298 17 0
		NELSON.			
Hukawai—					
New Millerton Mine	25	1,461 0 0	761 6 0	..	3,705 7 10
Inglewood—					
Murray Creek Mine	5	730 0 0	282 9 0	..	1,176 1 6
Crushington—					
Wealth of Nations	2	..	..	4 0 0	16 16 4
Waiuta—					
Blackwater Mines	133	34,323 0 0	11,482 1 0	2,348 2 17	65,776 6 8
Globe Hill—					
Progress Mines (Limited) ..	4	..	..	1,093 2 10	4,440 2 8
Big River—					
New Big River Mine	41	3,989 0 0	3,765 10 0	742 2 0	21,609 17 5
Alexander River—					
Recovery Gold Mine	3	0 14 0	2 1 0	..	7 7 7
Totals	233	40,993 14 0	16,632 4 12	4,187 7 3	98,421 6 8
		SUMMARY.			
Marlborough*	16	430 0 0	284 0 0	..	1,390 9 8
Nelson	213	40,503 14 0	16,293 7 0	4,187 7 3	96,732 0 0
Westland	4	60 0 0	54 17 12	..	298 17 0
Totals, 1921 ..	233†	40,993 14 0	16,632 4 12	4,187 7 3	98,421 6 8
Totals, 1920 ..	228	37,592 0 0	14,152 2 0	2,523 8 13	89,333 17 0
Increase	5	3,401 14 0	2,480 2 12	1,663 10 14	9,087 9 8

* 15 tons of Tungsten concentrate, estimated value, £750, was also obtained. † In addition, 51 quartz-miners were employed at unproductive work.

STATEMENT SHOWING THE QUANTITY OF QUARTZ CRUSHED AND GOLD OBTAINED IN THE SOUTHERN MINING DISTRICT FOR THE YEAR ENDED 31ST DECEMBER, 1921.

Locality and Name of Mine.	Average Number of Men employed.	Quartz crushed.	Gold obtained by Amalgamation.	Gold obtained by Concentrates.	Estimated Value.
		VINCENT COUNTY.			
Old Man Range—		Tons.	Oz. dwt. gr.	Oz. dwt. gr.	£ s. d
Advance	2	95	95 0 0	10 0 0	436 15 0
		TAIERI COUNTY.			
The Reefs—					
Buckland	2	150	17 15 0	..	73 11 2
		WAIHEMO COUNTY.			
Macrae's—					
Ounce	1	7	1 6 0	..	5 15 9
		SUMMARY.			
Vincent County	2	95	95 0 0	10 0 0	436 15 0
Taieri County	2	150	17 15 0	..	73 11 2
Waihemo County	1	7	1 6 0	..	5 15 9
Totals, 1921 ..	5*	252	114 1 0	10 0 0	516 1 11
Totals, 1920 ..	8	145	130 16 23	..	680 10 8
Increase	..	107	..	10 0 0	..
Decrease	3	..	16 15 23	..	164 8 9

* In addition, two quartz-miners were employed at unproductive work.

SUMMARY OF INSPECTION DISTRICTS.

Inspection District.	Average Number of Persons employed.	Quartz crushed.	Bullion obtained.	Estimated Value.
		Statute Tons.	Oz. dwt. gr.	£ s. d.
Northern (North Island)	1,039	214,365	506,911 6 0	334,550 2 10
West Coast (of South Island)	233	40,993	20,819 11 15	98,421 6 8
Southern (Otago and Southland) ..	5	252	124 1 0	516 1 11
Totals, 1921	1,277*	255,610	527,854 18 15	433,487 11 5
Totals, 1920	1,154	232,053	451,122 0 0	415,868 7 4
Increase	123	23,557	76,732 18 15	17,619 4 1

* In addition, 161 persons were employed at unproductive quartz-mining.

APPENDIX B.

REPORTS RELATING TO THE INSPECTION OF COAL-MINES.

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

Sir,— Wellington, 12th April, 1922.

I have the honour to present my sixteenth annual report, together with statistical information, in regard to coal-mines of the Dominion for the year ended 31st December, 1921, in accordance with section 78 of the Coal-mines Act, 1908. The report is divided into the following sections :—

I. Output.

II. Persons employed.

III. Accidents.

IV. Working of the Coal-mines Act—

(*a*) Permitted Explosives.

(*b*) Dangerous Occurrences.

(*c*) Electricity at Collieries.

(*d*) Prosecutions.

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 1921.				Total Output to the End of 1921.
	Northern District (North Island).	West Coast District (South Island).	Southern District (South Island).	Totals.	
	Tons.	Tons.	Tons.	Tons.	Tons.
Bituminous and semi-bituminous	83,325	810,520	..	893,845	33,949,532
Brown	431,282	155	268,683	700,120	16,589,317
Lignite	..	200	214,930	215,130	3,163,639
Totals for 1921 ..	514,607	810,875	483,613	1,809,095	53,693,488
Totals for 1920 ..	483,492	821,507	538,706	1,843,705	51,884,393

The following is a table showing the annual production of coal and the quantity of coal imported since 1911: —

Year.	Coal produced.	Coal imported.	Total Quantity of Coal produced and imported.	Year.	Coal produced.	Coal imported.	Total Quantity of Coal produced and imported.
	Tons.	Tons.	Tons.		Tons.	Tons.	Tons.
1911 ..	2,066,073	188,068	2,254,141	1917 ..	2,068,419	291,597	2,360,016
1912 ..	2,177,615	364,359	2,541,974	1918 ..	2,034,250	255,332	2,289,582
1913 ..	1,888,005	468,940	2,356,945	1919 ..	1,847,848	391,434	2,239,282
1914 ..	2,275,593	518,070	2,793,663	1920 ..	1,843,705	476,343	2,320,048
1915 ..	2,208,624	353,471	2,562,095	1921 ..	1,809,095	822,459	2,631,554
1916 ..	2,257,135	293,956	2,551,091				

During 1921 the production of brown coal declined 15,589 tons, and that of bituminous coal declined 29,730 tons, the latter owing chiefly to the large increase of that class of coal imported into the Dominion viz., 822,459 tons, as against 476,343 tons during 1920. An increase of 10,709 tons in the production of lignite occurred. Of the coal imported 627,659 tons were produced in Australia. After making allowance for the restoration during the year of the depleted coal reserves of the Government railways, freezing-works, and other large consumers, it may be reasonably estimated that, although there is a considerable decline in the output, the annual rate of consumption—viz., about 2,300,000 tons—has been maintained, notwithstanding that the utilization of hydro-electric power is constantly increasing. New collieries are being laid down at Hikurangi by the Hikurangi Coal Company; near Pukemiro by the United Coalfields Company (Farmers' Co-operative); and by the State near Dunollie. The Kaitangata No. 1 and Castle Hill collieries, the property of the New Zealand Coal and Oil Company, have temporarily ceased production. The establishment of the proposed MacDonald State Colliery near Waikokowai in the Huntly district has been stopped.

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 1921.	Total Output to 31st December, 1921.	Total Number of Persons ordinarily employed.
Northern District.			Tons.	Tons.	
Hikurangi	Hikurangi ..	Semi-bituminous	46,984	1,358,210	89
Taupiri Extended	Huntly ..	Brown ..	157,639	2,854,782	362
Rotowaro	Rotowaro ..	,, ..	83,523	271,975	163
Pukemiro	Pukemiro ..	,, ..	117,373	593,198	198
Waipa	Glen Massey ..	,, ..	57,649	560,297	109
West Coast District.					
Westport (2 collieries)	Millerton ..	Bituminous ..	225,255	6,147,618	424
	Denniston ..	,, ..	132,620	8,188,695	411
Westport-Stockton	Mangatini ..	,, ..	100,760	1,718,762	267
Liverpool (State)	Rewanui ..	,, ..	137,334	987,047	334
Blackball	Blackball ..	,, ..	96,139	3,001,223	289
Southern District.					
Kaitangata and Castle Hill (3 collieries)	Kaitangata ..	Brown ..	99,316	3,931,437	332
Taratu	Near Kaitangata	Lignite ..	35,856	477,130	86
164 other New Zealand collieries ..	All coalfields ..	Various ..	518,647	23,603,114	1,303
Totals	..	..	1,809,095	53,693,488	4,367

SECTION II.—PERSONS EMPLOYED.

Inspection District.	Average Number of Persons employed during 1921.		
	Above Ground.	Below Ground.	Total.
Southern	374	846	1,220
West Coast	547	1,479	2,026
Northern	297	824	1,121
Totals, 1921	1,218	3,149	4,367
Totals, 1920	1,152	2,926	4,078

The following statement shows the tons of coal and shale raised, persons employed, lives lost by accidents in or about collieries, &c., to 1921 (prior to 1877 no returns of output, &c., were made to the Mines Department) :—

Year.	Output, in Statute Tons.	Persons ordinarily employed.			Tons raised per each Person employed Below Ground.	Lives Lost by Accidents in or about Collieries.		
		Above Ground.	Below Ground.	Total.		Per Million Tons produced.	Per Thousand Persons employed.	Number of Lives Lost.
Prior ..	570,947	*	*	*	*	*	*	*
1877 ..	138,984	*	*	*	*	*	*	*
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	..	8·88	3·11	3
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
1920 ..	1,843,705	1,152	2,926	4,078	630	0·54	0·24	1
1921 ..	1,809,095	1,218	3,149	4,367	574	5·52	2·28	10
Totals ..	53,707,931	..	..	..	..	..	..	358

* Unknown. † 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 accidents in and about coal-mines during 1921, 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	3	3	11	11
Explosives	1	1	4	4
Haulage	3	3	11	11
Miscellaneous—Underground	..	..	8	8
On surface	3	3	3	3
Totals	10	10	37	37

The fatalities being in the proportion of 2·28 per thousand persons employed, and 5·52 per million tons produced.

The year 1921 has been unusually prolific in accidents in or about coal-mines, ten persons having been killed and thirty-seven persons having received serious injuries.

Of the ten fatal accidents three were not connected with mining operations, having occurred on the surface, respectively by a fall from an electric-power pole, by a railway locomotive, and in connection with a bath-house; but owing to the definition of "coal-mine" in the Coal-mines Act including all works "belonging to" a colliery, these fatalities are reluctantly classed as mining accidents.

Of the seven fatal mining accidents proper, four were due to neglect or errors of judgment by other persons. In the case of Frederick Reid two labourers were convicted and fined for neglect whereby the accident was caused. Regarding the fatal accident to J. H. Robertson almost every statutory safety provision was entirely ignored by the mine-manager by permit, who was convicted and fined for several charges of neglect pertaining to the fatality; his permit was likewise cancelled. In the cases of James McDonald and E. J. Oldham the evidence at the inquest disclosed errors of judgment by others who contributed to these fatalities. The accidents to P. Revis, G. P. Jack, and J. O'Rourke appear to be solely due to misadventure, or possibly misjudgment by the sufferers.

During the previous year only one fatal colliery accident occurred, that being the lowest number recorded for thirty-four years. Expectations were raised that an era of greater immunity from accidents had been entered upon, but the record for 1921 has temporarily banished such hopes.

The following is a brief description of fatal accidents in or about coal-mines during 1921. Descriptions of the serious but non-fatal accidents are contained in the reports of Inspectors of Mines appearing in Annexure A:—

Date.	Name and Situation of Coal-mine.	Name, Age, and Occupation of Person killed.	Description of Accident, and Remarks.
26 Feb.	Ironbridge and Coal-brookdale, Denniston	Edwin Pigeon (52), foreman on construction of electrical transmission	He was sitting on the top arm of a transmission-pole, about 20 ft. from the ground, engaged tying an electric wire to the top insulator; two of his party having attached this wire to another pole to strain it while deceased was tying it, both men, having their feet on the ground, were tightening the wire by leaning on it, when it broke near the pole on which deceased was sitting. He thereon lost his balance and fell to the ground, fracturing the base of his skull and being killed instantly. No defect in the wire was observable. The method employed for tightening the wire was the usual practice on this work. The jury at the inquest held no person blameworthy. By reason of the definition of a "mine" in the Coal-mines Act this accident must be classed as a mining accident, as it occurred on a lease of the Westport Coal Company, on works belonging thereto.
28 Feb.	Mount Linton, near Nightcaps	Frederick Reid (25), trucker	He was pushing two mine-trucks through a lay-by cutting, outside a drive from the surface, when a small piece of sandstone, hurled in the air from a shot, fell upon his face, inflicting a severe fracture of the base of the skull. He succumbed in a few hours, without regaining consciousness, from shock and hæmorrhage whilst being conveyed to the Riverton Hospital. The shot which caused this accident was fired at an adjacent opencast coal-working situated at about 25 ft. higher level than the lay-by. In this opencast two persons, D. L. Baird and G. Gray, were employed removing the sandstone overburden by blasting. Gray had drilled an auger-hole about 4 ft. deep, and had charged it with about 12 oz. of Monobel, subsequently tamping it, the direction of the shot-hole being towards the lay-by. Standing by these two men was William Hunt, an unoccupied miner. Gray struck a match to light the fuse, but he dropped the match, which Hunt thereon picked up, and he ignited the fuse. The word "Fire" was called several times by these men before the blast occurred, but unfortunately no one went to the lay-by or the drive-outlet to warn persons that it was proposed to fire, any person in the cutting not being visible from the opencast. The three men alleged that they were unaware of the presence of any person in the lay-by cutting at the time of firing. The jury at the inquest brought in a verdict of accidental death, with a rider that proper precautions were not taken to protect the miners coming out of the drives, and that in or about mines only experienced miners should be allowed to use explosives. Legal proceedings were taken against Gray and Baird by the Inspector of Mines, Mr. E. R. Green, for a breach of Regulation 126 (*a*)—viz., that before firing a shot they did not see that deceased had taken proper shelter. Both were convicted, and Gray was fined £5 with £7 11s. 6d. costs. Unfortunately, there is no legal provision for shot-firers using explosives other than "permitted" explosives being certificated or otherwise qualified. I concur with the rider of the jury. In a subsequent Supreme Court action for damages by the widow she was awarded £1,500 and £100 costs.
5 May	Westport - Stockton, near Stockton	James McDonald (37), roadsman	With J. Matthias he was laying rails in Hunter's pillar place in "B" section of the mine, such place being in old standing pillars upon which extraction has commenced. Deputy H. G. Reid examined that section between 6 and 8 a.m., and reported all places safe except a creeping of the roof in Gannon's pillar place, about 3 or 4 chains from Hunter's place, where the accident subsequently occurred. Shortly after 1 p.m. the manager, Mr. James Fletcher, and underviewer, T. A. Fox, visited Hunter's place and decided, on account of the creep, to remove the men. Fox instructed Matthias and deceased to finish their job and then withdraw. Messrs. Fletcher and Fox then left the place, and two minutes later an old black-birch bar of a carrying-set, about 10 ft. in length, and upon which rested the ends of three other auxiliary or transverse bars, broke, and a fall of between 1 and 2 tons of sandstone roof occurred, burying deceased and causing a fractured skull, from which he succumbed the following day. Matthias received minor injuries. The carrying-set which collapsed was old timber in which decay was visible to a small extent. It was the only set within a roof-area exceeding 150 ft. The place was 7 ft. high. At the inquest conflicting evidence was given as regards the condition of the carrying-set prior to the fall, the mine officials and Government Inspector, Mr. G. Duggan, stating that it appeared sound, whereas the workmen's inspector stated it was decayed and unsafe. Mr. Duggan stated that decay of the timber had commenced, and that the collapsed timber was splintered as if by excessive weight, and in view of the accident a chock would have been preferable. He believed there was a relation between the creep and the fall, and that more careful examination should be made when restarting in an old place. The Coroner, acting without a jury of experienced miners, found that the accident was not due to negligence or default of any person. This was the first shift worked in the mine by deceased, and his wife and family were on their way out to the Dominion. A very sad accident.

Date.	Name and Situation of Coal-mine.	Name, Age, and Occupation of Person killed.	Description of Accident, and Remarks.
10 May	Westport - Stockton, near Stockton	Percy Revis (35), horse-driver	He was driving a horse drawing a race of six mine-trucks, each of 30 cwt. capacity, between lay-bys on an almost level roadway in the No. 2 section, Eastern Mine. During driving, as the horse was not pulling the race well, he went to remove a sprag from a truck-wheel, and after he got the horse to start he tried to put the sprag in again, when by some means unknown he was crushed between two trucks. No person witnessed the accident, and he was too injured to give much explanation; he sustained injuries to the back, hip, and side, also severe shock, from which he died on the following day after an operation in the Westport Hospital. The Coroner found that he was accidentally killed by being jammed between trucks. With this I concur.
16 May	Chamberlain, Albury	John Hector Robertson (52), miner	He was an alluvial-gold miner, who had been employed at this mine for three weeks. On the day of the accident he was working alone getting coal in an untimbered back heading. At about 10 a.m. Mr. T. F. Slowey, the mine-owner, acting by permit as mine-manager also as underviewer, ordered deceased to withdraw from the place, as he did not consider it safe; but he did not see him withdraw, and deceased continued to get coal from the place until about 4.15 p.m., when a fall of about 2 tons of coal occurred, which killed him instantly. In connection with this accident the Coal-mines Act and Regulations had been utterly disregarded by the mine-owner, in consequence of which he was prosecuted by the Inspector of Mines on charges that he neglected to carry out his duties as manager, and did not control or supervise the mine; that he failed to securely protect and make safe the working-place of deceased; also that he did not withdraw deceased from a dangerous place. He was convicted on such charges, and fined £3, with costs £8 10s. 4d.
4 July	Ironbridge, Denniston	George Potters Jack (17), rope-road worker	While working alone unclipping the chain-clips from full coal-tubs on the endless-rope haulage-road at No. 8 section curve by some mischance his left foot was caught under the tub or haulage-rope, and he was dragged towards the stationary detached tub ahead and crushed between it and the tub which he had failed to unclip. He was evidently unable, while being dragged along, to reach the signal-wire to stop the rope. He was killed instantaneously, death being due to shock and asphyxia. The youth who usually worked with him was absent at the time, having been called away to a breakdown elsewhere on the haulage-road. As a result of this accident it was promised by the manager that in the event of one of the hangers being absent the haulage-rope should not be started until his return. This is the first fatal accident on the extensive endless-rope-haulage system at the Denniston collieries during the thirty-five years it has been in operation. The Coroner returned a verdict that death was accidental, no blame being attributable to any one.
12 Sept.	Rotowaro, near Huntly	George Torby Scurr (18), temporary shunter	He was a mine-trucker, inexperienced at railway shunting, that day temporarily employed, in the place of the regular shunter, with the company's locomotive on the branch railway near the mine. About 3 p.m., when the slowed-down engine was approaching the points, he descended from it to open them; by some means he was run over, both legs being broken. It is supposed that he slipped and fell in front of the engine. He died in the Hamilton Hospital that evening. The engine was provided with a cow-catcher but no handrail. The Coroner's verdict was "Accidental death," with a rider that better provision should be made for shunting, and a handrail should be provided on locomotives. This must be classed as a coal-mining accident by the Coal-mines Act interpretation of a "coal-mine." Subsequent proceedings for damages owing to neglect were instituted by the father of deceased. The case was settled out of Court by a substantial payment.
17 Sept.	Liverpool No. 1, Rewanui	Robert Jocelyn Meade (48), bath-house attendant	While engaged upon his duties he slipped on a flat-sheet near the boiler used for heating. He strained himself, affecting an old rupture, necessitating an operation. As a result of hæmorrhage he died on the 7th October. No inquest was held. Owing to the legal definition of "coal-mine," referred to in the remarks upon the previous accident to G. Scurr, this also must be classed as a mining accident, although in no other country, to my knowledge, are similar accidents so classed.
4 Oct. ..	Kaitangata No. 1, Kaitangata	James O'Rourke (51), miner	With his mate, John Smith, both being experienced miners, he was working in No. 6 dip district, in a pillar place 32 ft. long, 20 ft. wide, and 6 ft. high, which was systematically supported by props, but there were no chocks. About 8.30 p.m. they were filling coal into a truck when they heard a prop break. They immediately ran into their trucking-road, about 7 ft. wide in solid coal, and systematically timbered with sets. A great fall of coal then occurred, filling the place and a portion of the trucking-road, and burying the two men. After strenuous and very hazardous work by many brave rescuers, Smith was extracted in five hours and O'Rourke in fifteen hours, both being then conscious, and without serious injury. Little if any warning was given prior to the fall, which was due to the settlement of the overlaying cover owing to inadequate support. The injuries received by Smith consisted of bruises and skin-abrasions; he recovered in a few days; but O'Rourke never rallied, and died on the 6th October from heart-failure due to shock. At the inquest all the witnesses, including officials, the workmen's inspector, and others who had seen the place shortly before the fall, testified that it appeared safe. A verdict of "Accidental death" was returned by the jury, consisting mostly of coal-miners, no blame being attachable to anybody.
29 Oct.	Ironbridge, Denniston	Edward James Oldham (54), shiftman	At about 8.30 a.m., when engaged upon his duties, while walking around a curve which ascended a narrow trucking-road rising 1 in 8 to a pillar place, he was crushed between a rapidly descending full truck and the centre prop of a set; the truck, which was supposed to be double-spragged, had been started off down the incline road by a trucker from a distance of only 23 ft. from the place of accident, and was out of control. The deceased could not have been aware of its approach until it was close upon him. He was not an active man, and appeared to lose his presence of mind, and when he became aware of his danger he ran backwards a few paces instead of stepping to one side. The place was systematically timbered with sets spaced 6 ft. apart. He received injuries consisting of a fracture of the left thigh and serious internal abdominal and other injuries, from which he succumbed the same day in the Denniston Hospital. The jury at the inquest returned a verdict of "Accidental death," holding no person blameworthy. In this case the trucker acted incautiously in starting off a full truck at a rapid speed and out of control without first ascertaining if the road was clear. The curve at the bottom prevented him from seeing the deceased from the place of starting, or from deceased seeing him.

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

(*a.*) Permitted Explosives.

(Regulations 128 to 134 inclusive.)

Permitted explosives which have passed the Home Office Rotherham test are solely used at all but lignite-collieries, a few small semi-bituminous mines near Hikurangi, where but little shot-firing is done, and at Waipa Colliery, near Glen Massey, where the manager refuses to take this precautionary measure. By the appointment of firemen-deputies as shot-firers instead of the miners firing promiscuously greater security has been attained, and "grunching" has to a certain extent been reduced, for which reason permitted explosives are not greatly appreciated by the coal-hewers.

The following is a table showing the quantity of permitted explosive used and the number of shots fired at New Zealand coal-mines during 1921 :—

Inspection District.	Quantity of Permitted Explosives used.						Number of Shots fired.	Number of Misfired Shots.			Approximate Quantity of Coal produced.
	A 2 Monobel.	No. 1 Monobel.	No. 1 Stomona.	Ligdynite.	Bobbinite.	Viking Powder.		By Defective Explosive.	By Defective Detonators.	By Defective Leads.	
	lb.	lb.	lb.	lb.	lb.	lb.					Tons.
Northern (*i.e.*, North Island) ..	92,877	..	289	..	2,297	..	106,866	181	225	24	359,497
West Coast (of South Island) ..	127,988	240	250	30,108	..	..	190,030	41	655	144	781,126
Southern (*i.e.*, Canterbury, Otago, and Southland)	9,401	176	..	..	..	81	14,100	..	16	..	100,639
Totals	230,266	416	539	30,108	2,297	81	310,996	222	896	168	1,241,262

Sixty-nine per cent. of the coal produced in the Dominion during 1921 was broken down by permitted explosive, and the average production per pound of explosive used was 4·7 tons, and per shot fired 4 tons.

(*b.*) Dangerous Occurrences reported.

(Regulation 81.)

Northern Inspection District.

Taupiri Extended Colliery (21/5/21).—Heating of coal in the Tail-rope section, north side. No serious consequences.

Rotowaro Colliery (21/5/21, 17/7/21, and 23/8/21).—Small accumulations of inflammable gas ignited by naked lights in the working-places of H. Crook, D. Kernochan, and J. Ponga. The whole mine is now worked with safety-lamps and permitted explosives.

On the 2nd October a serious spontaneous fire occurred, by reason of which the whole mine was sealed off for six weeks. Prior to that date only one fire was reported by the manager, Mr. A. Penman, to the Inspector of Mines, and that occurred on the 30th June, when heating was reported in a solid-coal pillar about 1 chain from the surface entrance to the main-haulage incline. The manager then reported that the heated coal had been removed. On Saturday, the 1st October, shiftmen were in the mine until 1 p.m., and observed no heating. On Sunday, the 2nd October, at 7.20 a.m. the fan-attendant oiled the bearings of the fan situated outside the entrance to the return airway; he then observed no indications of heating in the air passing through the fan. At about 8.45 a.m. smoke was seen issuing from the entrances to the mine. The manager and staff entered the mine and found that the pillars of coal between the travelling-road and the return airway were on fire within 1 chain of their entrance, embracing the main-haulage incline, the new haulage-road, and the travelling-road. These three entrances with the return airway, comprising the four entrances to the mine, are situated within a distance of 2 chains, and are connected by cut-throughs or stentons. Water was played by hose on the burning coal-pillars, and a hole was made in a brick stopping between the main intake (*i.e.*, the main-haulage incline) and the return airway, to short-circuit the ventilation; but the fire increased, until at 3 a.m. on Monday, the 3rd, the men were driven from the mine, and sealing off the four mine-entrances by means of earthen stoppings was commenced. The stoppings were subsequently completed, and, by means of pipes passing through them, steam from three boilers was introduced into the mine to suppress the fire. Shallow boreholes from the surface were drilled in the locality of the fire for the purpose of ascertaining the temperature and the conditions existing below. Fortunately, at the time of this fire originating there were no men in the mine, otherwise, owing to its suddenness and the fact that it embraced all the intake airways, there would have been grave danger by reason of the gases produced from the fire being circulated through the workings to the fan outside. About one hundred persons were normally employed in the mine, most of whom would probably have been compelled, in their endeavour to escape, to pass through the fire zone or by the vitiated return airway. Telephonic communication did not exist in the mine, it being required only by Regulation 123 when the length of the main haulage-road exceeds 1,000 yards; and to communicate with all the working-places would have been slow and difficult under the

circumstances. About six weeks later the mine was recovered and operations were resumed, but the heated area has since shown signs of recrudescence. The fire was of spontaneous origin.

West Coast Inspection District.

Liverpool State Colliery.—Some time between the 4th and 14th May a serious explosion of inflammable gas occurred in the low-level adit being driven to intersect the coal-seams near the junction of Seven-mile Creek. No person had been known to enter the adit for a considerable time, and its entrance had been temporarily boarded off. The origin of the explosion is a mystery; it has been suggested that lightning was the cause, which at first I scouted, but am now more inclined to believe. Firedamp is freely emitted from a coal-seam intersected in the adit. Safety-lamps and permitted explosives had been used prior to the temporary closing of the adit.

Blackball Colliery (6/6/21 and 11/6/21).—Fires occurred in bank 6½ and No. 17 section respectively. These were isolated by stoppings. Spontaneous fires frequently occur at this colliery.

Southern Inspection District.

Kaitangata No. 1 Colliery.—On the 13th October an outbreak of fire occurred in McGhie's level, which resulted in the loss of the whole of the Extension section of the colliery, including McGhie's level, Mundy's and No. 6 districts. The area was permanently sealed off, leaving the 18 ft. seam workings and the airways to the fan shaft as the only open parts of the mine. At this colliery spontaneous fires are of constant occurrence, and cause great anxiety, the mine being gaseous.

Fires also occurred in the following collieries:—

Très Bon Coal-mine, Milton (3/1/21).—In consequence the workings of the surface seams were closed.

Mossbank Colliery (30/4/21). The section affected was sealed off.

It is satisfactory to report that no fatal or serious accident occurred in connection with any of the dangerous occurrences here reported.

(*c.*) Electricity at Collieries.

(Regulation 160.)

During 1921 there has been an 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	18
Number of continuous-current installations	13
Number of alternating-current installations	6
Number of collieries electrically lighted	16
Number of collieries using electrical ventilating-machines	12
Number of collieries using electrical pumping plants	11
Number of collieries using electrical haulage plants	8
Number of collieries using electrical screening plants	3
Number of collieries using electrical miscellaneous plants	7
Number of collieries using electrical locomotives	1
Total horse-power employed from motors on surface	1,764
Total horse-power employed from motors below ground	1,026½

The use of electricity has never been attended by any serious accident in or about the collieries of the Dominion, although several accidents have occurred at metalliferous mines.

(*d.*) Prosecutions.

During the year nine persons, including three mine-managers and two firemen-deputies, were convicted and fined for breaches of the Coal-mines Act or regulations thereunder. Two lives were lost by reason of the said neglect.

West Coast Inspection District.

On the 30th May, James Scott, a fireman-deputy, was convicted and fined £2 and costs for behaving in a violent manner towards another deputy at Blackball Colliery, in contravention of Regulation 69.

On the 30th August, Whalan, a fan-attendant, was convicted and fined £2 and costs for failing to enter the number of revolutions of the fan and the water-gauge in the fan record-book at Coalbrookdale Colliery, in contravention of Regulation 103.

On the 1st September, W. E. G. Hewitson, certificated mine-managr, was convicted and fined £2 and costs for not providing at Coalbrookdale Colliery an automatic indicator registering the number of revolutions of a fan, or an automatic indicator registering the water-gauge, in contravention of Regulation 100.

On the 29th September, W. Saunders, a fireman-deputy, was convicted and fined £1 and costs for failing to keep all detonators issued to him at Coalbrookdale Colliery in a suitable case or box until about to be used in a shot-hole, in contravention of Regulation 125 (5) (*b*).

On the 12th September, A. Hill, mine-manager by permit, was convicted and ordered to pay costs for failure to store detonators in a proper magazine at Hunter and party's co-operative coal-mine, in contravention of the Coal-mines Act, section 40 (2) (*e*).

Southern Inspection District.

On the 22nd April, G. Gray, labourer, was convicted and fined £5, with £7 11s. 6d. costs, and D. L. Baird, labourer, was convicted of a breach of Regulation 126 (4), in that before firing a shot at opencast workings at Mount Linton Colliery they did not see that Frederick Reid, a trucker, had taken proper shelter, a stone from which shot killed him.

On the 14th June, William Lloyd, a rope-attendant, was convicted and fined £5 for a breach of Special Rule 57A, in that he neglected to attach a backstay or trailer to an ascending set of trucks on an inclined haulage-road at Nightcaps Colliery, by which neglect Thomas Prior, a roadsman, was seriously injured.

On the 25th August, Thomas F. Slowey, mine-owner and manager by permit, was convicted and fined £3, with costs £8 10s. 4d., for offences which were responsible for the death of J. H. Robertson, a miner—viz., neglecting to carry out his duties as mine-manager at Chamberlain Coal-mine, Albury, and that he did not control or supervise the mine, a contravention of the Coal-mines Act, section 24 (1); also that he failed to securely protect and make safe Robertson's working-place, in contravention of the Coal-mines Act, section 40 (9); also that he did not withdraw Robertson from a dangerous place, a contravention of section 40 (45). The permit of T. F. Slowey as mine-manager was cancelled by the Inspector of Mines.

SECTION V.—LEGISLATION AFFECTING COAL-MINES.

No amendment of the Coal-mines Act, other than provision relating to State coal-mines accounts, was made during 1921.

Regulations under the said Act by Order in Council dated the 12th April, 1921, contained provisions regarding—(2) the travelling-expenses of members of the Board of Examiners for certificates of competency; (22) the Sick and Accident Fund; (29) the Coal-miners' Relief Fund; (56) systematic timbering; (127) miss-fired shots; (154) continuously produced ventilation; (155) precautions against coal-dust; (179) precautions against spontaneous combustion of coal.

Regulations dated the 3rd May, 1921, made additional provisions regarding the Coal-miners' Medical Fund.

Leaflets relating to coal-mine explosions and ignitions of gases, and to the testing for gas by shot-firers, have been drafted, and when printed will be circulated amongst the colliery-managers throughout the Dominion for their information and guidance.

I have, &c.,

FRANK REED,

Inspecting Engineer and Chief Inspector of Coal-mines.

ANNEXURE A.

SUMMARY OF REPORTS BY INSPECTORS OF MINES.

NORTHERN INSPECTION DISTRICT (Mr. WILLIAM BARCLAY, Inspector).

Hikurangi Colliery.—Pillars are being extracted from the Phœnix dip section, and solid bord workings continued to the rise in No. 1 and No. 2 sections. The output at this colliery is decreasing owing to extraction of pillars and a restricted coal area for developing new sections.

The company have commenced the development of a new colliery about 100 chains from the present loading-bank and railway. Two concrete-lined circular shafts, 12 ft. 6 in. and 10 ft. inside diameter respectively, are being sunk to a depth of 450 ft. A coal-seam 10 ft. in thickness has been proved by several boreholes. The output from this new colliery will be delivered to the present screens and loading-bank by endless-rope tramways on the surface.

Northern Tauranga (Wilson's Collieries, Limited).—This mine, situated upon the company's freehold about a mile from the railway, is worked by a party of co-operative miners. The thickness of the coal-seam is 3 ft. 6 in.

Northern Kiripaka.—Mining operations were discontinued during the year. All plant was withdrawn and mine abandoned.

Kerr and Co. (McLeod's Freehold).—A party of co-operative miners reopened the workings in this mine, finding a number of coal pillars standing in good order. Bords have since been continued for 5 chains along the north main road. Preparations are being made to extend the dip to the west of the road.

Silverdale (Foot and Doel: Crown Lease).—There are three sections on this property, each having a separate intake and return. Pillars are being successfully extracted. Thickness of coal-seam 4 ft., with a shaly band of stone on the centre. Output is delivered to railway-siding by about 100 chains of surface tramway.

Northern Co-operative (Cunningham).—The workings are in close proximity to the Main Valley Road. Several small drives following the outcrop have been driven during the year. Heavy rains flood the drives with surface water, and considerable time and expense is incurred in unwatering. The coal-seam is 6 ft. thick.

Kerr and Wyatt.—Pillars are being extracted by the retreating method. The roof of the coal-seam is soft and friable, and strong timber is required to support the main heading. Thickness of coal-seam is 5 ft. The mine is worked by a party of co-operative miners, with a manager in charge.

Rayburn's Colliery (Christie's Freehold).—Mining operations conducted by a party of co-operative miners, with a mine-manager in charge. The coal-seam is worked from a dip drive, and a small steam-pump installed for drainage. Only a small quantitiy of coal is available, as the seam is faulted and unmarketable near the outcrop.

New Zealand Coal and Cement Company (formerly North Auckland Coal Company).—Situated about three miles from Whangarei. Operations have been suspended for a number of years. During the current year electrical machinery was installed to unwater the shafts and mine-workings, the electric power being supplied from the Whangarei town power-station. The mine-workings were found in good order after the mine was unwatered. The thickness of the coal-seam at the face of north level from main dip is 10 ft., with a strong roof. The dip is being extended to develop the thick coal area.

Wilson's Collieries (formerly Northern Waro Coal-mine).—The mine was reopened during the year, and connected to the main railway with a short branch railway from Waro Station. The following electrical equipment has been

installed: three boilers of 200 h.p. each; two unit electric plant developing 200 h.p. each unit; Zollner pump having a nominal capacity of 15,000 gallons per hour against a head of 400 ft. Ventilation is induced by a single-inlet electrically driven Sirocco fan. The coal-seam is 6 ft. in thickness, and has been worked by a former company to a distance of 15 chains from the outcrop on the surface. Dip headings are being advanced into solid coal.

Taupiri Extended Coal-mine, Huntly.—There are six separate ventilating districts in this mine, but the quantity of air circulating is restricted by the area of the downcast shaft. The workings extend in a north-westerly direction for a distance of one and a half miles. The floor of the coal is undulating, and to secure a working grade for the endless-rope haulage stone drives are driven through the undulations. For drainage, a borehole about 20 chains from the west bank of the Waikato River was sunk to a depth of 400 ft., intersecting the coal-seam and sump in No. 4 west.

Rotowaro Coal-mine, Rotowaro.—On the 2nd October, 1921, a serious outbreak of fire occurred in this mine about 100 ft. from the mine-entrance, and travelled from the main haulage-road to the travelling and new main roads. The mine was sealed up for six weeks, and the fire thus extinguished. Prospecting by boring south of mine-workings proved a coal-seam 28 ft. thick at a depth of 380 ft. from the surface. Electrical machinery is being installed on the surface to develop No. 2 Mine.

Pukemiro Coal-mine, Pukemiro.—Endless-rope haulage has been installed in the South Mine, and preparations are being made to install a subsidiary endless rope for the East section. Electric current is supplied underground, operating small winches, pumps, and auxiliary fans in development headings. An additional bath-house was erected during the year. Old workings in the mine are stopped off in sections with substantial brick stoppings.

Waikato Extended.—This mine is situated near the west bank of the Waikato River, about three miles south of Huntly. The output is delivered into barges.

Waipa Colliery, Glen Massey.—Pillars are being extracted in the West section. The roof is soft and friable, and working-places in the mine are systematically timbered with sets. The coal-seam appears to be thickening in the development headings, main road extension.

United Coalfields, Glenafton.—Three headings are being advanced into the proved coal area. Ventilation is by 30 in. Sirocco fan. A power-house has been erected and concrete foundations prepared for an electric unit. Screen buildings and workmen's houses are being constructed. The coal from the development headings is carted to Pukemiro railway-siding.

Pukemiro Junction Colliery, Pukemiro.—A new mine recently opened by a party of co-operative miners, with a manager supervising. The coal-seam is 20 ft. in thickness, dipping easterly.

Huntly Coal-mine, Huntly—The coal-seam occurs about 300 ft. above the level of the Waikato River. Prospecting by following an outcrop into the hill proved a coal-seam 16 ft. in thickness. The coal-skips are lowered down the hillside by back-balance system, and conveyed to the Huntly railway-siding by motor-lorry.

Hunua Coal-mine, Papakura.—A small coal-mine for local supplies. Coal-seam 6 ft. in thickness. Underground workings conducted safely.

Greencastle Coal-mine, Aria, Mokau.—Mining operations during the year were confined to working the available coal in sight. Prospecting beyond the fault was without result.

Stockman's Mine, Mokau.—A small private coal-mine on Chambers Bros. estate, worked for local requirements.

Rangitoto Coal-mine, Tahaia.—A coal-seam of about 20 ft. in thickness was proved over a large area by boring. Three miles of railway formation have been completed from the mine to Otorohanga. Several buildings have been erected at the mine.

Sheil's Coal-mine, Rangitoto.—A small coal-mine under development. Output conveyed to Te Kuiti and Otorohanga by motor-lorry.

Dangerous Occurrences (Regulation 81).

Taupiri Extended Mine.—16th February, 1921: Manager W. Wood reported a heating in the tail-rope section, north side.

Rotowaro Colliery.—21st May, 1921: Manager Penman reported that Deputy F. Smith reported that miners Henry Crook and mate ignited some firedamp in their place (new main heading No. 5.). 17th July, 1921: Manager Penman reported that D. Kernochan ignited gas and could hear it hissing in his place; gas burnt for a few minutes. 23rd August, 1921: Manager Penman reported that J. Ponga informed Deputy R. Coan that he ignited some gas in his working-place. 2nd October, 1921: Manager Penman reported an outbreak of fire at this colliery near the mine-entrance.

Coal-miners' Relief Fund.

A total of 438 accidents was reported during the year 1921, by claims made on the Coal-miners' Relief Fund; and, comparing the figures with the year 1920 (281 reported accidents), there is a very appreciable increase in the number. Of the reported accidents, 274 occurred at the Taupiri Extended, Rotowaro, and Waikato Extended collieries.

Serious but Non-fatal Accidents.

Taupiri Extended Mine.—T. Gardner, age 21—fracture of left shoulder caused by being jammed between boxes on rope-haulage road. Injured on the 9th October, 1921; off forty-eight days. W. Sillick, age 40—mitral incapacity and dilatation of heart, caused by lifting rails. Injured on the 19th February, 1921, and still off. R. Cummings—corneal wound of right eye caused by piece of coal from pick-point striking his eye. Injured on the 12th March, 1921; 133 days off. J. O'Brine, age 40—ulcer of left eye caused by piece of flying coal from pick-point striking eye. Injured on the 27th May, 1921; off sixty-two days. A. Veare, age 28—corneal ulcer of eye caused by piece of coal from pick-point striking eye. Injured on 30th August, 1921; off sixty-two days. G. Hulse—corneal ulcer of right eye caused by piece of coal from pick-point striking his eye. Injured on 3rd September, 1921; off sixty days. A. Anderton, age 38—contused eye caused by piece of iron from chisel-point striking his eye. Injured on 8th June, 1921; off fifty-six days. James Logan, age 36—broken rib and bruised side and back, caused by falling off a scaffold. Whilst engaged in putting up timber a piece of side coal gave way, and in trying to avoid it he fell off the scaffold. Injured on 15th March, 1921; sixty-five days off work.

Pukemiro Colliery.—Isaac Riley, age 14 years—left foot severely crushed in creeper chain. Injured on 17th May, 1921; seventy-eight days off work. John B. Smith, age 45—septic wound, cornea right eye, caused by being struck by a piece of coal. Injured on 11th August, 1921, and still off.

Hikurangi Colliery.—W. McKinley sustained a fractured leg, caused by fall of coal. Whilst engaged trucking, his box knocked out a prop and dislodged the roof coal. He was injured on 9th April, 1921; still off.

Rotowaro Colliery.—Charles Meek, age 21. He was lifting a piece of coal into a skip when a piece of coal rolled from the face and struck the piece he was lifting, severing his finger. Injured on 23rd July, 1921; off work 157 days.

WEST COAST INSPECTION DISTRICT (Mr. GEORGE DUGGAN, Inspector).

Grey Coalfield.

Liverpool State Colliery.—No. 1 Mine: The output from the upper-seam workings in this mine for the past year was solely dependent on pillar-extraction. Owing to the intrusion of stone bands in the west workings of the Morgan seam it has been decided to commence extracting the pillars there, and also from the east side workings. Work recommenced in October in the low-level tunnel to the Morgan seam. An upcast, rising 1 in 1½, is being driven from the coal-workings on the west side of the tunnel. The explosive A2 Monobel has so far proved effective for the stonework, and 6 ft. rounds have been taken out with it. Prospecting on a thick outcrop near this tunnel was started during September, locked safety-lamps being used.

No. 3A Mine: Work at this mine ceased, owing to exhaustion, on the 18th November.

No. 3 Mine: Pillaring from the remaining low coal was continued during the year.

James State Mine. At this prospective colliery, situated near Dunollie, the main haulage drive is now in 25 chains, but the coal met has been very disappointing, being thin and split up by stone bands. One place—going to the west from about the 22-chain mark—is in 2½ chains, and 3½ ft. of fairly clean coal is being obtained there. Another place is being driven westward towards Kane's Mine.

Co-operative Parties near Dunollie.—Messrs. Clarke and party are mining coal from a 9-acre lease between the Seven-mile Creek and the rise workings of No. 2 section, old Point Elizabeth Colliery. Clarke's mine is separated from these old workings by a large fault. The coal is 6 ft. thick, hard, and, save for a 3 in. band about 18 in. from the roof, is very clean. The fault has been reached and the solid work is almost completed.

Messrs. Hunter and party have a lease over 40 acres, including the No. 3 tunnel section, Point Elizabeth Colliery. The seam is thin and is divided by a stone band, which gradually thickened towards the old workings, and the coal became unprofitable to work in that direction.

Messrs. Baddeley and party have a lease of 10 acres across the Seven-mile Creek, which includes the old No. 4 tunnel. The seam is 6 ft. in thickness, hard and clean. To load the coal on to the railway-trucks a viaduct had to be constructed across the railway.

Messrs. Halliday and party's mine is about one mile and a quarter from the railway-line at Dunollie, and they are using the old Point Elizabeth No. 1 section haulage-road. Three surface jigs deliver the coal from the mine to the haulage-road. From floor to roof is 8½ ft. thick, but this includes a grey sandstone band from 8 in. to 10 in. in thickness. Only the 4 ft. 6 in. of coal above this band is being worked.

Messrs. Boote and party are also holders of a small lease on the State Coal Reserve, and they intend producing coal early in the present year.

A small lease has also been granted to Messrs. Duggan and party, near the Rewanui Railway-station.

Paparoa Colliery.—During the past year coal was produced from the solid workings in the No. 1 section and Wilson's jig pillar workings. The No. 1 section workings have met a downthrow fault running north. Beyond this fault the coal contains many stone bands. As a consequence the first working is nearly completed, and pillar-extraction will soon commence. Most of the main haulage-roads have been retimbered during the past year, 12 in. by 10 in. squared bars being used.

Blackball Colliery.—Development of the No. 9 dip section has been steadily pursued during the year. The No. 1 level is now in 45 chains from the dip, and No. 10 bank has recently been turned off this level The underground fire in No. 17 section broke over a stopping on the 11th August, and was discovered by the morning examining deputy. To seal off the whole section a stopping was put in on the main haulage-road just inbye No. 10 incline. Another stopping was put in the water level, and a third in a cut-through between No. 9 dip section and the water level. These stoppings are built of sand and clay, and are 7 ft. to 8 ft. in thickness. The Sirocco double-inlet fan has been installed, and will be used early in the present year.

St. Kilda Mine.—Production ceased from this mine on the 18th May, through exhaustion. The Tyneside Proprietary (Limited) sunk a prospect shaft on their new lease and to the north of the old Tyneside workings. After sinking 72 ft. they decided to bore from the bottom of the shaft. They report having struck 10 ft. of coal after boring 40½ ft., or a total depth from surface of 112½ ft. Preparations are in hand for resuming sinking, a boiler and winding plant having been purchased.

Dobson Mine.—The dip drive at the Dobson Mine was driven 880 ft., and a borehole was put down near the face of the drive. At a depth of 92 ft. a seam of clean coal 18 in. thick was struck. Boring continued for a farther 50 ft., and only a 3 in. seam of coal was met. This result was very disappointing, and work ceased. The coal in the Mount Buckley section is very faulted and the workings are practically finished, with no prospect of further development.

Inangahua Coalfield.

Reefton Coal Company's Mine.—Towards the latter end of the year only three pairs of miners were employed, and they were extracting pillars from the No. 2 seam workings. The dip section remained unworked during the year. A few places were driven in the No. 4 seam early in the year, but, the coal being rather soft, work in this seam was suspended.

Ferndale-Timaru Mine (formerly Lockington's).—The dip drive near the lower section workings was stopped in July, having struck a fault running north-west. The throw of the fault was not proved. A few places were broken away from the dip, but the most of the year's output was obtained from the extraction of the rise pillars.

Morris and Learmont's Mine.—This is another of the mines which has been greatly affected by the "slump" in trade. Only the mine-manager, deputy, and one miner are now employed, and they are producing a small output from the No. 2 Mine. The coal is hard and clean, but steeply inclined, and is run down chutes from the upper levels "Riddles" are again in use for sorting the saleable coal from the slack.

Birchwood Coal-mine.—This mine is near Reefton. During the early part of the year coal was produced from a seam varying from 2 ft. to 3½ ft. in thickness. A bore was put down to a lower seam, and from data obtained from this bore and from old workings to the eastward a drive was commenced, dipping 1 in 2. Soft coal 10 ft. to 12 ft. thick was struck at 200 ft. Squared sets were used to timber the drive.

Victory Mine.—The working of the upper seam was abandoned about the middle of the year owing to the seam proving too soft for the present trade. They are now working 4 ft. of the lower seam—above a clay parting. This coal is very hard and clean, and is much sought after for household purposes.

Phœnix and Venus Mine.—Three men are employed at this mine on solid work. A place has lately holed through to the old workings on the rise side.

Big River Mine.—The present block of pillars will last until March. Another drive—in coal—is being put in farther down the creek.

Archer's Freehold Mine, Capleston.—Only a few men are now employed on pillar work. A little work was done during the year in the main crosscut drive.

Coghlan's Mine, Capleston.—Work was resumed in the freehold mine during the past year, and three miners are employed there. Very little was done in the leasehold area.

Doran's Mine, Capleston.—This is a small mine where three men are employed. The area is only a small one, and was worked in former years. Only a few pillars are available.

Golden Point Mine.—The production of coal from this mine ceased during July, and the mine is practically exhausted.

Merrijigs Coal-mine.—Coal is now conveyed along a wooden flume by water from the mine to the foot of Progress Hill, a distance of two miles. A false bottom has been put in all the wooden boxes, and, if much coal goes through, will need renewing in a very short time. The coal-workings in the old level are exhausted. At a higher altitude another level is being driven in stone to cut the seam. On the southern lease the coal became very stony, and work ceased there.

Empire Coal-mine, Burke's Creek.—Three levels have been driven during the year, the bottom one being now in 9 chains. Owing to the slump no coal has been mined since August.

Woodlands Coal-mine, Burke's Creek.—A dip has been driven for 190 ft. on the seam, dipping 1 in 4. The seam is 5 ft. 6 in. thick. Above the coal is 18 in. of fireclay, then 1½ ft. to 2 ft. of hard coal, which is being left on. A Tangye boiler and winch are used for hauling the coal to surface.

Waitahu and Lankey's Creek Mines.—No work was done during the year at the Waitahu and Lankey's Creek Mines, but preparations are being made at the former for further prospecting.

Buller Coalfield.

Coal Creek Mine, Mokihinui.—All the output during 1921 was obtained from the new area near Coal Creek, 60 chains from the railway-line. The main heading has been driven 14 chains in good coal. The back heading has reached the Taipo outcrop. During the slack time—from September to December—no coal was produced, and the party reopened the old Knights of Labour workings. Two small shafts were sunk from the surface to ventilate these old workings. To prove if another seam existed below the present workings, a percussive borehole was put down—about 2 chains west of the head of the jig—for 100 ft., but without success.

Dove and Party's Mine, Seddonville.—In April the main level holed through into the old Cardiff workings. These old workings were sealed off in 1901 owing to a fire in the southern section. A dam was placed in the Cardiff main drive, and the present workings are above the level of the water retained by this dam. Although at first rather warm the temperature gradually subsided, and a considerable portion of the output was afterwards obtained from the loose coal in these old workings.

St. Helens Mine.—This is another small mine which has suffered owing to the slump. Owing to stone bands in the seam, care is needed to keep the coal clean.

Chester's Mine.—A little development work in the top seam, 3½ ft. thick, has been done during the year. A small bin has been erected near the traffic road, and coal is carted from the bin to the railway-station siding at Seddonville.

Woodford and Party's Mine.—A small party commenced mining operations early in the year on an outcrop near the railway-line between Seddonville and Mokihinui Mine. The seam is only about 2½ ft. in thickness.

Mulholland and Party's Mine, near Chasm Creek.—This party has two coal leases; one includes the bridge section workings of the old Cardiff Mine, and the other is to the south-east, across Chasm Creek. The output for the year has been produced from the latter area. The coal is variable in hardness, but fairly clean. To work the bridge area two wire ropes were stretched across Chasm Creek—a span of over 14 chains. From here the coal will be conveyed—by a surface jig and horse haulage—for a mile to the Seddonville bins.

Mokihinui-Westport Coal-mine, Seddonville.—This party's lease is north of Mulholland's mine, and they have put in a well-timbered drive about 3 chains. Owing to a "roll" the coal thinned, but coal 8 ft. thick has been proved ahead. An aerial has been constructed across Chasm Creek, and small bins erected near Dove's mine.

McLellan and Straker's Mine, near Ngakawau.—This mine is situated near the south bank of the Ngakawau River and half a mile east of Hector Railway-station, at an altitude of 420 ft. above the river. The coal is soft and friable, but an analysis proved it to be of high calorific value. One drive is in about 3½ chains, and preparations are being made for conveying the coal by an aerial across the Ngakawau River.

Rocklands Mine, Buller Road.—Worked intermittently for local sales. A lease has recently been granted over an area which includes the old Whitecliffs Mine.

Waimangaroa-Westport Coal-mining Company's Lease.—A percussive-drill borehole was put down near the southern boundary of the area known as Cook's lease. It was stopped at a depth of 289 ft., having entered broken ground.

Moynihan's Coal-prospecting Area.—Near the traffic road from Waimangaroa to Denniston a narrow heading has been driven (in coal) for 54 yards, and a crosscut (in stone) for 8 to 10 yards from the face of the heading, to prove if a lower seam existed. The coal is very soft, and low in hydrocarbons. A small bin was put up, and the coal conveyed to Waimangaroa Junction Railway-station by Ford motor-trucks. Owing to the poor quality of the coal work ceased in October.

Westport-Stockton Colliery.—Owing to the trade depression pillar work in the old mine ceased on the 26th October, and operations will be confined to the E field until trade revives. The No. 2 section workings, E field, going west, entered faulted ground and were stopped; also the coal in the places going north became thin and unworkable. The No. 5 section workings have reached the Matipo outcrop. The high coal pillars in J dip section are being worked, and the pillars near the old fire area have been extracted for some distance from the fire. About 10 acres of coal lies in a syncline between the Nos. 2 and 6 sections, and a dip has been commenced to win coal from this area. Almost all the miners employed in No. 6 section are working six-hour shifts, owing to the places being wet. Two fatalities occurred at the Stockton Mine during May, particulars of which are given elsewhere.

Millerton Colliery.—Pillar-extraction continued during the year in the Mangatina, south pillars, north-east pillars, No. 1 dip, and old dip sections. Pillaring also commenced towards the end of the year in the third west dip section. A few solid places are being driven towards a small block of unworked coal near the Mine Creek pack-track. Some pillars were left in this locality when the deviation of the main haulage-road was effected about fifteen years ago. In the top section of the fourth west some steep faults have been met, running north-east and south-west. Safety-lamps are still used in the old dip and No. 2 dip workings.

Ironbridge Colliery.—Pillars continue to be worked in the Shaft, Kruger's, and Kiwi sections of the Ironbridge Mine. In the Deep Creek section a series of small detached areas of coal are being exploited. An endless-rope haulage has been completed for 54 chains—about half the distance from the main haulage to the coal-faces—and the management intends to extend this haulage at an early date. The pillars in the 2-acre block on the west side of this haulage-road have been extracted. A few miners are employed in development work in the 47-acre block. A main heading will later be driven, going north-west from the 47-acre block to Kiels Flat. The average thickness of the coal in the Deep Creek section is 10 ft. The ventilating-fans and the pumps in the Ironbridge Mine are now driven by electric motors. The Kiwi fan, having 240 revolutions per minute, is driven by a three-phase 50-cycle 400-volt induction motor of 40 brake horse-power running at 500 revolutions per minute. The high-tension circuit of 3,300 volts is transformed outside the fan-house. A brick transformer-station has been built underground, a few chains from the junction of the Kiwi and main haulage roads. Two fatalities occurred underground at the Ironbridge Mine during the year, and a linesman was instantly killed by falling from a transmission-pole near the power-house. Reports of these fatalities are given elsewhere.

Coalbrookdale Mine.—Waratea Jig Section: The coal in the heading going south-west off the Waratea jig section and also in the places south of the heading became split up by stone bands, and, thickening, they eventually took the place of the coal. The floor continued unbroken. It appears to be the continuation of the "want" between the Waratea Extended section and the old workings. Hand-boring was resorted to in the hope of proving an upper seam, but without success. The main headings in the Waratea jig section are still in hard clean coal, and development is proceeding apace.

Waratea Extended and Cascade Sections: A crosscut going north-east has been driven through stone in the Waratea Extended section. Boring has been done, and after passing through 20 ft. of stone 11 ft. of coal was struck. When electric power is available a dip will be commenced to work the coal. Pillaring in the Waratea Extended and Cascade sections was continued during the year.

Nelson District.

Puponga Mine.—The rise section pillars becoming exhausted, this party of co-operative miners recommenced operations in the dip section by the extraction of the upper west pillars. Owing to the Terakohe Cement-works being idle there is at present no sale for the slack coal, and it is being stacked along the surface haulage-road. The prospecting between the dip and rise sections was abandoned owing to unfavourable results.

North Cape Mine.—During the past year the thin coal on the east side of the main dip has been worked on the longwall system, but owing to the very bad roof any further mining must be done by bord and pillar. Mining ceased on the 8th November, owing to a dispute between the management and miners; but, as very little coal remains to be won, it is very doubtful if operations will recommence. Two diamond-drill boreholes have been put down on the North Cape area, one 5 chains ahead of the face of the dip and the other about 40 chains north of the North Cape Mine entrance. No workable seam was proved in either borehole.

Stone's Mine, Central Takaka.—A small output was obtained from bord-and-pillar workings during the year.

Irvine's Mine, Takaka.—This is another small mine, and adjoins Stone's mine. A small output for local consumption is produced therefrom.

Brook Street Mine, near Nelson.—A small party of Nelson men are reopening this mine, which has been unworked for over twenty years. The shaft has been retimbered and sinking resumed, and it is now down 200 ft. The party anticipates sinking another 100 ft., then crosscutting to the highly inclined coal-seam.

Gladstone Mine, Motupipi.—Opencast workings near the sea-shore. Although only a brown coal, the Takaka Marble-quarries used the greater portion for steam purposes.

O'Rourke's Mine, Murchison.—A small seam worked for supplying local trade. Very little done during the year.

Fairhall's Mine, Murchison.—Worked for local sales. Seam is only 15 in. thick and lying at an inclination of 60°.

Dangerous Occurrences requiring Notification (Regulation 81).

A firedamp explosion occurred in the Morgan seam low-level tunnel some time between the 4th and 14th May. No work had been done in the tunnel since April, 1920, and a wooden stopping had been put in near the entrance. The origin of the explosion is unknown. The stopping was blown away, and pieces were subsequently found 90 yards away.

On the 6th June heating was discovered in No. 6½ bank, Blackball Mine. Some of the heated coal was filled away, and then stoppings built around the area.

On the 11th August the underground fire off No. 17 section Blackball Mine, broke over a stopping. It was discovered by the morning examining deputy. The men were withdrawn from the No. 9 dip workings owing to the fumes. Clay and sand stoppings were then built in—one on the main haulage-road just inbye No. 10 incline, another in the water level, and a third in a cut-through between No. 9 section and the water level.

Cancellation of Leases and Coal-prospecting Licenses.

The coal lease held by D. Berry near Waimangaroa was determined on the 25th May owing to non-compliance of the terms of the lease. Six coal-prospecting licenses were also cancelled during the year, as the licensees had made no proper effort to prospect the areas. Applications to cancel two other licenses have been made. Three coal-prospecting licenses were surrendered by the licensees.

Prosecutions.

On the 30th May a deputy was fined £2 and costs for behaving in a violent manner towards another deputy.

On the 30th August charges were heard against a mine-manager, a deputy, and a miner for failure to use a lever and chain in withdrawing a prop in old workings. These informations were dismissed.

On the 30th August a fan-attendant was fined £2 and costs for failure to enter the number of revolutions of the fan and the water-gauge in the fan record-book.

On the 1st September a mine-manager was fined £2 and costs for not providing an automatic indicator registering the number of revolutions of the fan, or an automatic indicator registering the water-gauge.

On the 29th September a deputy was convicted and fined £1 and costs for failing to keep all detonators issued to him in the proper box until about to be used in a shot-hole. He was testing his firing battery, and attached a detonator to the cable. He instructed a miner to take the cable up a jig. The miner misunderstood the instructions and retained the detonator, which the deputy exploded. The miner's thumb was blown off. He was also charged with a breach of section 59 of the Coal-mines Act, but the case was dismissed.

On the 12th September a mine-manager was convicted and ordered to pay costs for failing to store detonators in a proper magazine.

Serious Non-fatal Accidents.

James White, a trucker employed at the Liverpool No. 1 Mine, had his arm broken by a runaway tub on the 4th February.

D. McKenzie suffered a fractured tibia on the 16th February by a long pole slipping off the top of an empty tub while being conveyed along a haulage-road in the Ironbridge Mine.

On the 18th February Ernest Lockley, a trucker in the Blackball Mine, received severe injuries to his head and chest by a runaway tub.

On the 2nd March W. Page, a miner employed in the Stockton Mine, suffered from a fracture of the dome of the skull by a fall of coal. He was returning with the deputy after firing a shot in a pillar place.

On the 10th March D. McGinley, miner, received a fractured radius by a fall of coal in the Paparoa Mine.

W. Woods, a miner engaged in a prospecting-drive near Reefton, received severe injuries to his eyes on the 18th March by a premature explosion of gelignite. Subsequently he lost the sight of one eye. He was working alone in the drive, and whilst tamping a shot it exploded.

William Anderson, a miner employed in the No. 1 section, Liverpool Mine, had his left leg fractured by a fall of stone and coal at the face on the 14th April. The place was only 6 ft. high, in pillar workings. The place was nearly through and a "bump" occurred, and coal and stone were thrown from the face.

In the Stockton Mine, on the 5th May, R. Crackett received severe injuries to the muscles of his right arm by a fall of coal.

On the 7th July, in the Coalbrookdale Mine, William Booth, a miner, received a severe blow on the head by a fall of coal. A prop was too close to the trucking-road, and Booth had put another prop behind. The first prop was holding up a large lump of coal, and on coming out the lump fell, striking Booth.

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

Mount Torlesse Collieries.—A spontaneous fire had broken out on the return airway from the dip workings. Stoppings were erected on intake and return airways, and the fire damped down. Meanwhile output of coal was being obtained from the upper-level workings at Alum Creek. No output of ganister had been reported, and only a sample of fireclay; 13 cwt. 1 qr. had been produced during the year.

Springfield Mine.—A few tons of coal had been recovered from an outcrop of seam near the surface, previously worked underground.

Sheffield Mine.—This mine had been reopened for a short period when work became suspended, the seam being thin and sales poor.

Homebush Colliery.—Driving to dip in the thin seam near the weighbridge, with places broken away on either side. Several men engaged prospecting the outcrops of seams previously worked for extraction of stumps of pillars which may have been left at first working. Boring with the Mines Department's rotary drill had proved unsuccessful in locating any workable seam of coal outside the basin that had been worked for fifty years, and which apparently was now practically exhausted.

Bush Gully Mine.—Not at work during the year, but the rotary drill had been engaged prospecting for coal without result.

St. Helens Mine.—Recent rains caused flooding of the dip drive used for haulage from the pillars, which were almost worked out in that locality.

Steventon Mine.—Driven to dip, 1 in 3, and levels broken away; places timbered; seam 4 ft. 6 in.; ventilation good.

Clearview Mine.—Workings neatly opened with a pair of levels to northward; and air-shaft sunk for ventilation, which was good. Seam 9 ft.

Tripp's Mine.—Driving to rise, where seam reduced to 10 ft. thickness, sandstone formation having made in the roof. Timber set at regular intervals; ventilation good.

Harris Bros'. Mine.—Prospecting by driving toward a coal-outcrop known to occur on the hill-face. Drive well timbered, chiefly through dry sand strata.

Cavendish Mine (formerly Erandale).—The south level had been extended, and a drive to dip, where coal-seam found much harder than on the higher level. Air-shaft, 30 ft. in depth, provided good ventilation.

Albury Mine.—The level had been stopped and a pillar left against the former workings for prevention of blackdamp entering the workings. Through ventilation from mine-mouth to air-shaft; ventilation good.

Lambrook Mine.—An old drive had been cleaned out and timbered; seam 10 ft.; an air-shaft, 40 ft., was sunk for ventilation.

Allanholme Mine.—The seam on eastern side of haulage dip having proved thin and of poor quality, a new dip, direction south-westerly, was to be laid off in the near future. Ventilation fair.

Meadowbank Mine.—Air-shaft having been completed, ventilation good.

McIlwraith's Mine.—A new opencast working; seam 10 ft. A few tons had been mined for local use

Wharekuri Mine.—Worked for supply of local requirements.

Borton's Mine.—Working suspended during the year, the lignite being inferior and unsaleable.

St. Andrew's Mine.—The old workings finally closed and abandoned owing to the seam not living to dip continuously. Prospecting being conducted on the outcrop to rise of former workings.

Prince Alfred Mine.—Pillars being carefully withdrawn in the dip workings; timber set for security of workmen; stoppings built prevented heating from the waste, which was not now troublesome. Ventilation fair.

Ngapara Mine.—Ventilation excellent. Air conducted by brattice to working-faces, the position of the air-shaft facilitating direct ventilation through the mine.

Diamond Hill Mine.—An attempt made to reopen this small seam was quickly abandoned, and the mine became closed again.

Shag Point Mine.—After considerable expenditure by sinking and driving, a seam 5 ft. 6 in. in thickness was located and being developed on the old Broadleaf section, near the fault.

Shag Point Coal-mining Company.—Electrical power-house and plant, 45 horse-power, erected for ventilating fan drive, pumping and dip haulage underground. An improved jig screening plant had also been built on the loading-bank at the branch railway terminus. Ventilation at return air-course, 19,800 cubic feet per minute. Ventilation good, and places well timbered to working-faces.

Kyeburn Diggings Mine.—A small opencast pit worked for local supplies.

Creighton's Mine.—An opencast pit; since abandoned.

Gimmerburn Mine.—Opencast working for local requirements.

Rough Ridge Mine.—Decreased supplies now being obtained from this opencast pit.

Idaburn Mine.—Opencast working vigorously conducted; 1,174 tons won during the year.

Oturehua Mine.—An opencast pit. Flood-water and drainage from Idaburn Stream troublesome.

Lowis's Mine.—Lignite from this opencast mined for private use.

Dillon's Mine.—A small opencast pit worked for private use.

Armitage's Mine.—A small opencast pit worked for private use.

St. Bathans Mine.—This pit continues being worked opencast although the stripping is so heavy, the lessee not having experience of underground mining.

Cambrian Mine.—Working resumed by the Vinegar Hill Hydraulic Sluicing Company, and a full supply of water laid on for stripping the seam to advantage.

Lauderlane Mine.—A level has been driven northward, where a fault was struck. Water from Woolshed Creek utilized for winch dip haulage and generation of electricity for pumping. Working became suspended toward the end of the year, sales having become unprofitable owing to distance from and difficulty of placing the coal on the market in competition with other sources of supply.

Alexandra Mine.—Pillar-extraction continued to be safely conducted. The clay floor with sand on the dip haulage-road at the fault caused contraction, which required frequent attention for repairs.

McPherson's Mine.—An opencast pit worked in benches. The fire in the old worked ground kept suppressed by water laid on as required.

Cromwell Mine.—Seam improved to 13 ft. in thickness, of which 7 ft. was being worked. Seam steep, having an inclination of 45°.

Shepherd's Creek Mine.—Pillar-extraction in dip workings continued with safety. Workings in good order, and ventilation good.

Cardrona Mine.—The large proportion of stripping required to be sluiced away in order to recover the comparatively small quantity of saleable coal won militates against the financial success deserved by the persevering and optimistic lessee of this mountain pit.

Gibbston Mine.—Toward the end of the year it became necessary to close the mine on account of the fire which had followed outward from the waste, pillars having been withdrawn to rise of the lower level back to the outcrop of the seam.

Nevis Mine.—An opencast mine worked intermittently for supply of local requirements.

Nevis Crossing Mine.—The adit level near Coal Creek had been extended to 300 ft. from the surface when operations became suspended.

Graham's Prospecting License (for Coal and Shale at Nevis).—Five samples taken from bulk and treated by the Dominion Analyst yielded 13·2 gallons of oil per ton.

Fernhill Mine.—Working continued in the lower seam. Places driven narrow were standing well.

Freeman's Mine.—Pillar workings continued with safety, and ventilation good.

Jubilee Mine.—A new entrance had been made convenient to the body of the workings, and steam-power adapted for fan ventilation, dip haulage, and pumping. Places driven narrow at first working. Ventilation good, and air free from powder-smoke.

Saddle Hill No. 1 Mine (including Burnweil Mine).—A small ventilating-fan made on the premises, driven by oil-engine, was doing good work. Air underground good and clear. Some portion of the Burnweil Mine pillars, where a barrier pillar of coal left by agreement at first working, was being extracted. Stoppings in against the waste where blackdamp had accumulated.

Saddle Hill No. 2 Mine.—A dip had been driven into old workings where roof and floor had met under pressure, and coal pillars were being recovered safely.

Walton Park Mine.—A pair of dip drives were being extended under the railway and district road for the purpose of prospecting the field and recovering pillars or coal left at first working many years ago. The drives had been taken narrow and low by consent of the local authorities.

East Taieri Mine.—A new dip had been driven through old workings to recover a block of coal and pillars left at first working. The drive was well timbered, but floor inclined to heave, as it had done previously, causing contraction of roads and airways.

Gracie's Mine.—Prospecting on outcrop and forming a tram-line to the Main South Road, 20 chains distant The drive was in 20 ft., and the coal-seam was 6 ft. in thickness.

Brighton Mine.—Recently leased by two experienced miners, who were cleaning up the roads and airways underground.

Ruanui Mine.—A new opening on Duncan Settlement. A short drive to dip, with level northward to the air-shaft, sunk 42 ft. to the coal-seam.

Waronui Mine.—The former mine had been worked out, closed, and abandoned; loading-bank arrangements with ventilating-fan removed, and erected at the new mine. The seam ranged from 5 ft. to 10 ft. in thickness, being somewhat troubled, and carrying occasional boulders of hard stone. Working-places driven narrow with a view to future best extraction of pillars. Electrical power used for fan ventilation and pumping purposes.

McGilp's Mine.—Pillar-extraction had been well conducted, only a small portion of the block opened remaining for withdrawal. Ventilation good. Floor heaving, and roadways low in consequence.

Très Bon Mine.—A new opening on the hill-face, where the seam had been found occurring more regularly and less disturbed by faulting than the previous mine, lost by fire at the beginning of the year.

Crichton Mine.—A comparatively small output was being derived from this mine, which, in common with other small coal-pits in Bruce County, had been prohibited from carting on the public roads during winter months.

Dunlop's Mine.—This mine had practically been idle throughout the year.

Lakeside Mine.—A prospecting-drive had been put in, from which 315 tons of coal had been obtained, worked intermittently.

Taratu Mine.—The ventilating-fan had been duplicated, with beneficial results to the air in the dip working-places, which had benefited considerably. A new endless-rope haulage from shaft-bottom to head of dip, a distance of 10 chains, had been installed, and was working satisfactorily. Fan ventilation at return airway 21,015 cubic feet per minute. The place fallen to surface from waste, Barclay's Mine, where fire had broken out, was filled in with material from the walls of the plump, and water laid on successfully. Cages, coupling-chains, ropes, and winding-gear examined regularly and periodically tested. Electricity utilized for underground dip haulage and pumping and for fan ventilation.

Tuakitoto Mine (formerly Port Arthur).—A new opening at a lower level, where the seam had been found downthrown 50 ft.

Kaituna Mine.—The former workings had been finished and abandoned. The drive to dip had proved the seam continuing in that direction, especially on the western side, where the coal was more clean and free from faulting. Natural ventilation good; powder-smoke from blasting quickly cleared away.

Wangaloa Mine.—Had driven through the fault met with near mine-entrance, and coal-seam was found continuing.

Kaidale Mine.—Output was being maintained from the rise workings, water having accumulated in those to dip.

Kaibrook Mine.—Worked intermittently, partly owing to change of ownership and partly on account of the embargo placed on coal-carting over the Bruce County roads during winter months.

Roseneath Mine.—Opencast working on the sea-beach discontinued, and two drives put in on the cliff-face had been connected underground.

Kai Point Mine (Caird Bros.).—A new mine had been driven, and connected with the original drive for second outlet and ventilation, which latter was good.

Summerhill Mine.—Operations suspended, the seam having proved soft, and crushed apparently by ancient earth-movement at and near the surface.

Kaitangata No. 1 Mine.—The major part of the year's output had been derived from Mundy's dip and No. 6 dip sections, with a smaller proportion from the 18 ft. seam off Barclay's drive, where development work only had been proceeded with. On the 13th October an outbreak of fire was discovered on McGhie's level, among coal and timber on roof and sides, and, becoming unmanageable, stoppings were erected on the intake and return airways and the fire became damped down. Subsequently the stoppings were opened and air-circulation restored, when new stoppings were built at either end of and close to the fire region, permitting recovery of much plant, material, and tools, when the district was sealed off permanently, leaving the 18 ft. seam workings and airways to the upcast fan shaft as the only open parts of the mine. Coal-getting had also been suspended at the 18 ft. seam, but ventilation was continued pending completion of the stone prospecting-drive to the main seam proved by boring underground some time ago. Ventilation of reduced area, 22,880 cubic feet of air per minute.

Kaitangata No. 2 Mine.—Coal-output from Kaitangata Collieries was now being obtained exclusively from this mine, the districts at work being the 6 ft. seam, 18 ft. seam, and main seam workings. Timber supports to roof were plentifully used, and pillars extracted safely. Volume of air at mine-entrance, 33,915 cubic feet per minute. Ventilation good all round the working-faces. Samples of road-dust collected from the several working sections were examined by the Dominion Analyst, who reported as follows:—

"No. 1, from roadways, Kaitangata No. 1 Mine; No. 2, from roadways, Kaitangata No. 2 Mine; No. 3, from dusty roadways, Castle Hill Mine.

	"*Analyses.*	1. Per Cent.	2. Per Cent.	3. Per Cent.
"Ash	.. ..	39·92	15·60	38·15
Moisture lost at 100° C.	.. ..	13·08	14·56	13·08

"Nos. 1 and 3: The sum of the moisture and the ash exceeds 50 per cent., and the samples would therefore comply with the regulations. No. 2: Does not comply."

With respect to sample No. 2, the roadways were subsequently cleaned and gravelled, rendering the dust innocuous. Firedamp or fires underground had not been reported by the mine officials during the year.

Samples of mine-air collected at the working-face in solid coal by the Chief Inspector yielded the following results at the Dominion Laboratory:—

"Nos. 1 and 2, from main return at fan shaft, Kaitangata No. 1 Mine. No. 3, from main seam section, at Gribbon's end, off north level, being farthest-in place, Kaitangata No. 2 Mine.

	"*Analyses.*	1. Per Cent.	2. Per Cent.	3. Per Cent.
"Carbon dioxide (CO_2)	.. ..	0·23	0·21	0·26
Methane (CH_4)	.. ..	0·33	0·30	0·23"

Pit-ponies at Kaitangata Collieries, thirty in number, had been examined by the Inspector of the Society for the Prevention of Cruelty to Animals, who reported that he had found them in good condition.

Castle Hill Mine.—Ventilation at entrance, 17,875 cubic feet per minute. At No. 7 dip section the north side was ventilated but not being worked; only the roadway pillars remained intact. The Carson seam had been opened up, but coal-getting suspended pending improvement of trade. Ventilation adequate, and air clean and sweet all over the mine. No firedamp or fires underground had been reported during the year. A new inclined drive (1,300 ft.) for travelling and airway had been laid off to replace the upcast air and second outlet shaft, which will enable lengthy and expensive airways through old workings being dispensed with, and provide a practically new mine.

Benhar Mine.—Owing to water dripping from the roof in working-places two boreholes were drilled 28 ft. to the old workings above, when the small quantity of water lodged quickly drained off. Ventilation being unsatisfactory by reason of powder-smoke hanging in working-places after shot-firing, remedial measures were carried out, consisting of brick air-stoppings in lieu of brattice-cloth at road-ends on dip drive, an air-crossing over the dip from the eastern side, and enlargement of upcast shaft area, whereby an appreciable air-current was created and smoke cleared rapidly away.

Clydevale Mine.—An opencast mine, worked intermittently for private and local use.

Pukerau Mine (Miller Bros.).—A small fire in some dross had been extinguished, and no material damage was done. Ventilation fair.

Otikerama Mine.—A level had been driven a distance of 90 ft. through a fault, which not improving the seam, mining was being abandoned.

Rosedale Mine.—An opencast pit having a short drive into the face. Stripping to be kept back from the face.

McLean's Mine.—Almost worked out, the seam not having proved continuous.

Whiterig Mine.—The haulage dip had been driven below the level of former workings, from which water lodged had been drained by borcholes. Ladder required for air-shaft.

Green's Mine.—Having reached the boundary of the public road, mining would soon be transferred to the new entrance provided. Powder-magazine approved for storage of explosives.

Riverview Mine.—A small opencast pit for private use.

Todd's Mine.—An opencast pit, recently commenced.

Springfield Mine.—An opencast pit, recently reopened. Seam 10 ft.; stripping 8 ft., kept well in advance of working-face.

Glenlee Mine.—Mine worked safely and kept in good order.

Ramsay's Mine.—A new entrance was being made for a shorter haulage and cutting off the drive through old workings.

Pyramid Mine.—Underground mining practically discontinued. Further prospecting by boring was contemplated.

Wendon Mine.—A vertical seam, 15 ft., between the walls of which 10 ft. was being worked. Care had been taken in opening and timbering the drive.

Landslip Mine.—Prospecting on outcrop of the old company's workings, where a few pillars had been left unworked.

Rossvale Mine.—Several stoppings had been built on the left-hand side of dip drive, where warmth had been coming from Cain's old workings. The bottom of air-shaft had been cleaned up, and ventilation was good.

Argyle Mine.—Worked opencast; stripping sluiced away by water laid on for that purpose.

Terrace Mine, Kingston Crossing.—Some extra timber was required where the joints occurred in the roof, also a ladder in the shallow air-shaft, which were promised by the manager.

Princhester Creek Mine.—An opencast pit, worked for supply of settlers in Mararoa district.

Forest Hill Mine.—An opencast working, recently started for local supplies. Seam 10 ft. in thickness.

Mataura Collieries Company's Mine.—Workings in good order. Ventilation good.

Boghead Mine.—Underground mining commenced from the face of the terrace, where stripping becoming too heavy and costly to pay for removal.

Mataura Lignite-mine.—Mine in good order. Ventilation fair.

Terrace Mine, Mataura.—Seam 11 ft., worked opencast. Care was being taken to have the stripping kept well in advance of working-face.

Ti Tepu Mine.—Seam 12 ft., of which 6 ft. was being worked opencast.

Heatherlea Mine.—Seam 10 ft.; stripping kept well ahead.

Ota Creek Mine.—Opencast workings, in good order. Stripping 6 ft. to 8 ft., well in advance of coal-face.

Clarke's Mine.—Opencast pit, kept in good order; stripping well ahead.

Diamond Lignite-mine.—An opencast pit reopened on the opposite side of the railway, where there was more room for expansion.

Nightcaps No. 1 Mine.—Some opencast working at the outcrop near the dam was being conducted. Lloyd's dip: Workings gradually drawing to a closure, where the last of the pillars to be drawn were almost finished up to the dip-haulage roadway. Knight's section: Several pairs of men engaged driving and pillaring in this low wet seam. Prospecting by boring had not resulted in the location of a payably workable seam on the property.

Nightcaps No. 2 Mine.—The report-books showed that the fire heating in the opencast waste had travelled under surface to the upper-level underground workings, where it had been stopped off. Opencast working finished, and some remaining pillars had been drawn from underground. The new air-shaft was sunk 60 ft. to the coal-seam, and connection made with the workings. Seam to dip inclined steeply, and heavily saturated with water.

Sterling Mine.—Opencast working had been suspended during the greater part of the year. Preparations were being made for underground mining.

Burndale Mine.—Seam 5 ft. to 6 ft. in thickness; roof supported by timber, and working-places in fair condition.

Coaldale Mine.—There being evidence of faulting underground and the seam thinning to dip, a bore was sunk and a seam of coal struck, to which the dip drive was being graded for haulage. Ventilation to be augmented by the fan acquired recently.

Black Diamond Mine.—Fan ventilation good, and powder-smoke promptly removed. Excellent ambulance equipment kept in a special cabin at the mine.

New Brighton Mine.—Seam to dip improved in thickness to 9 ft., of which 7 ft. was being worked. A new dip haulage-way driven from the surface near the loading-bank to tap the dip workings will provide direct haulage and ventilation. Workings adequately timbered.

Wairio Mine.—The seams having been worked out to the fault, beyond which no mining had been done, the place was abandoned. Resin-seam Mine: Seam 4 ft. 6 in. in thickness was being worked intermittently, demand for this class of coal being limited at the present time.

Mossbank Mine.—The underground fire having become unmanageable, the openings were sealed with the object of damping it down. A new dip had been driven, from which levels were set off and output maintained. Efforts made to reopen the heated area had proved unsuccessful, a sufficient time apparently not having elapsed for extinction of the fire underground.

Wells and Party's Mine.—A new mine opened at an outlier of surface, seam 5 ft. in thickness. After working a few months mining became suspended, owing to demand for any but the better-class coal having fallen away.

Wairaki Mine.—Only safety-lamps and permitted explosives allowed to be used in the mine. Firedamp had not been reported during the year, but slight bubbling in water on the floor continued. Fan ventilation; air clear and good.

Wairaki No. 2 Mine.—Under fan ventilation; air well conducted by brattice to working-faces. Fire-damp had never been reported as occurring in this mine. Systematic-timbering notice posted at the mine, to be carried out by the management.

Linton Mine.—Fan ventilation satisfactory and air good underground. The shot-firer appointed at the opencast working rang a warning bell, erected for the purpose, before firing.

Ohai Mine.—Opencast workings. Two seams, 16 ft. and 7 ft. in thickness, in sight. Coal was being carted to the Wairio Railway terminus, three miles distant.

Birchwood Mine.—Opencast working superseded by underground mining. Seam 20 ft., of which 10 ft. was being worked bord-and-pillar.

Orepuki Mine.—A new sump had been made, and driving to dip continued. Ventilation good; working conducted safely.

Lynwood Mine.—An opencast pit, worked for supplies for the steamer owned by the Tourist Department on Lake Te Anau. Seam 7 ft., with stripping or overburden 9 ft. in thickness.

Dangerous Occurrences notified under Regulation 81.

Très Bon Mine, Milton.—3rd January: Fire discovered at mine in surface seam, necessitating the closing of the mine and opening out on another part of the area.

Pukerau Mine, Southland.—3rd March: Fire in workings extinguished; no material damage done.

Wairio Mine, Nightcaps.—19th April: Spontaneous combustion noticed in old pillar workings; was built off with stoppings.

Mossbank Mine, Nightcaps.—30th April: A spontaneous fire discovered. The workmen were not permitted to enter, and the mine was sealed to prevent fire spreading.

Mount Torlesse Mine, Avoca.—16th June: A spontaneous fire broke out in the return airway from the dip section. Stoppings were inserted and the fire damped down.

Kaitangata No. 1 Mine, Kaitangata.—14th October: A spontaneous fire was discovered on McGhie's level, south extension workings. Workmen were not admitted other than those required for erection of stoppings on intake and return airways.

Serious Non-fatal Accidents.

Nightcaps Colliery, Nightcaps.—26th January: Thomas Prior, 43, roadsman—injury to back; struck by a rake of runaway boxes on haulage-road. 23rd August: John Dallow, 29, miner—fractured left leg below knee, and injury to right loin due to fall of coal and stone from roof in low working-place. 23rd August: Henry Livingstone, 22, miner—injury to ankle by fall of coal and stone from roof in working-place. 2nd December: Arthur Pennack, 50, horse-driver—fractured right leg below knee; struck by full box which was off the rails.

Mount Torlesse Mine, Avoca.—8th March: John Donovan, 39, miner—injuries, mostly shock, due to concussion from explosion while deepening a hole in which he thought the shot had exploded.

Wairaki No. 2 Mine, Nightcaps.—14th March: Robert Harding, miner—burns of left forearm, due to ignition of half-plug powder which he had in his hand while firing a shot.

Coaldale Mine, Nightcaps.—6th June: Horace Talbot, 18, rope-attendant—extensive bruising; struck by a runaway box on haulage-way.

Homebush Mine, Glentunnel.—6th July: Lawrence Workman, 34, miner—contusions of leg and abdomen; struck by a piece of clay fallen from roof.

Fernhill Mine, Abbotsford.—2nd August: George Ritchie, 40, trucker—broken arm (left) due to drum brake-handle flying up and striking his arm while lowering rake on short jig.

Rossvale Mine, Waikaia.—10th August: James Henderson, 56, miner—injury to foot; caught between buffer and rail while lifting full box on to rails.

Lauderlane Mine, Cambrian.—20th August: Samuel Clarkson, 62, mine-manager—fracture of right thigh; foot caught in stirrup, and kicked by horse while dismounting at the mine.

Burndale Mine, Nightcaps.—24th August: James Phillips, 53, miner—injuries to right foot and sprained ankle; struck by piece of stone fallen from parting in roof.

Waronui Mine, Milton.—29th September: John Jardine, 30, pit-head-man—injury to right knee-joint; slipped on stairway, thus aggravating an old war injury.

Saddle Hill No. 1 Mine, Saddle Hill.—2nd November: John Stratton, 33, miner—burn of left hand, arm, and face. Had charged a hole, when, igniting the fuse, half a plug of powder which he held in his hand exploded.

Taratu Mine, Lovell's Flat.—3rd November: James Morris, 28, trucker—fracture of left leg below knee. After pushing the rake over the rise, timber-trolly kicked back, striking his leg. Evidently brake on haulage-drum in action with too much slack rope.

Steventon Mine, Ohai.—18th November: George Brockie, 40, miner—concussion of spine. Having ridden to work, girth of saddle gave way, and Brockie was thrown from his horse at the mine.

Prosecutions.

On the 22nd April, G. Gray, labourer, was convicted for a breach of Regulation 126 (4) by neglecting to see that all persons in the vicinity had taken proper shelter before firing a shot in the opencast workings at Linton Coal-mine, whereby Frederick Reid, miner, was fatally injured on the 28th February, 1921. Fine, £5, and £7 11s. 6d. costs. D. Baird, Gray's workmate, was convicted and discharged.

On the 14th June, William Lloyd, rope-attendant, Nightcaps Mine, was convicted for a breach of Special Rule 57A (3)—viz., neglecting to attach the back-stay or trailer to an ascending set of tubs on an inclined haulage-road. Fined £5. Thomas Prior, roadsman, was seriously injured by the runaway set, the rope-coupling chain having broken. Lloyd had been cautioned previously by the underviewer for not using the trailer.

On the 25th August, T. F. Slowey, owner and manager of Chamberlain Mine, Albury, was convicted of failure to exercise control and supervision of the mine on the occasion of the death of James H. Robertson by fall of coal on the 17th May, 1921. Fined £3, and costs £8 10s. 4d.

ANNEXURE B.

COLLIERY STATISTICS, 1921

Name of Mine and Locality.	Name of Mine Manager.	Name and Address of Owner.	Number of Years worked.	Classification of Coal.	Number of Seams worked.	Thickness of Coal-seams.	Thickness worked.	System of Underground working.	Number of Winding-shafts.	Total Output for 1921.	Total Output to 31st December, 1920.	Total Output to 31st December, 1921.	Number of Persons ordinarily employed.			Means of Ventilation.
													Above.	Below.	Total.	
NORTHERN INSPECTION DISTRICT.																
North Auckland.										Tons.	Tons.	Tons.				
Hikurangi, Hikurangi ..	A. H. Taylor ..	Hikurangi Coal Co., Ltd., Auckland	29	Semi-bituminous	1	6′ to 10′	6′ to 9′	Bord and pillar	1	46,984	1,311,226	1,358,210	34	55	89	Fan.
Northern Tauranga, Hikurangi	James Jones (P.) ..	Wilsons Colls., Ltd., Auckland ..	3	Ditto ..	1	4′	4′	Ditto		2,092	618,574	620,666	1	3	4	Natural.
Northern Kiripaka, Hikurangi ..	C. Westfield ..	Northen C.M. Co., Auckland ..	7	,, ..	1	5′ to 11′	5′ to 11′	.. ..	1	10,208	405,172	415,380	10	12	22	Fan & steam.
Kerr & Co. (McLeod's), Hikurangi	F. Kells	Kerr & Wyatt, Hikurangi ..	1½	,, ..	1	3′ to 6′	3′ to 6′	,, ...		3,843	542	4,385	3	7	10	Natural.
Silverdale, Hikurangi	Boyd Bennie ..	Foot & Doel, Hikurangi ..	3	,, ..	1	3′ to 4′	3′ to 4′	,, ...		6,620	4,744	11,364	4	9	13	,,
Northern Co-operative, Hikurangi	E. A. Cunningham(P)	E. A. Cunningham & Co., Hikurangi	3	,, ..	1	5′	5′	,, ...		1,675	24,790	26,465	4	2	6	,,
Kerr & Wyatt, Hikurangi ..	R. Dickson (P.) ..	Kerr & Wyatt, Hikurangi ..	6	,, ..	1	4′ to 5′	4′ to 5′	,, ...		2,165	21,594	23,759	1	5	6	,,
Rayburn (Christie's), Hikurangi (formerly N. Auckland Coal Co.)	W. Tunstall (P.) ..	Christie & Co., Hikurangi ..	1½	,, ..	1	4′ to 5′	4′ to 5′	,, ...		6,144	304	6,448	2	6	8	,,
Waro, Whangarei	J. Cadman ..	N.Z. Coal & Cement Co., Whangarei	11	,, ..	1	6′ to 10′	6′ to 10′	,, ..	2	839	30,658	31,497	3	14	17	Fan.
Wilson's, Hikurangi	G. Davidson ..	Wilson's Colls., Ltd., Auckland ..	4	,, ..	1	5 to 9′′	5′ to 7′	,, ...		2,755	41,087	43,842	14	30	44	,,
Waikato (including Mokau).																
Taupiri Extended, Huntly ..	W. Wood ..	Taupiri C.M., Ltd., Auckland ..	33	Brown ..	2	10′ to 34′	20′	Bord and pillar	2	157,639	2,697,143	2,854,782	72	290	362	Fan.
Rotowaro, Rotowaro	A. Penman ..	Taupiri C.M., Ltd., Auckland ..	4	,, ..	1	6′ to 15′	12′	Ditto		83,523	188,452	271,975	34	129	163	,,
Pukemiro, Pukemiro	A. Burt	Pukemiro Coll., Ltd., Auckland ..	6	,, ..	1	16′ to 18′	6′ to 12′	,, ...		117,373	475,825	593,198	58	140	198	Fans.
Waikato Extended, Huntly ..	W. C. Davies ..	Waikato Shipg. Co., Ltd., Hamilton	5½	,, ..	1	16′	12′	,, ...		7,968	14,685	22,653	3	12	15	Natural.
Waipa, Glen Massey	T. Thomson ..	Waipa Railway and Colls., Ltd., Wellington	8	,, ..	1	10′	8′	,, ...		57,649	502,648	560,297	30	79	109	Fan.
United Coalfields, Pukemiro ..	P. Hunter ..	N.Z. Co-op.Dairy Co.,Ltd.,Hamilton	1½	,, ..	1	8′ to 17′	8′	,, ...		2,143	70	2,213	14	5	19	,,
Pukemiro Junction, Pukemiro ..	C. V. Malony ..	Clare & party, Pukemiro ..	1	,, ..	1	8′ to 25′	7′ to 12′	,, ...		2,522	..	2,522	2	9	11	Natural.
Huntly, Huntly	J. Lamont ..	Lamont & Starr, Huntly ..	0½	,, ..	1	14′	9′	,, ...		540	..	540	1	2	3	,,
Hunua, Hunua	F. Westhead ..	Hunua Coll., Ltd., Papakura ..	3	,, ..	1	7′	5′	,, ...		528	1,359	1,887	1	4	5	,,
Greencastle, Aria	A. Morgan (P.) ..	A. Morgan, Aria	5	,, ..	1	12′	9′	,, ...		344	1,084	1,428	1	2	3	,,
Stockman's, Mokau	C. Wright (P.) ..	Chambers Bros., Awakino ..	1	,, ..	1	5′	5′	,, ...		780	..	780	1	1	2	,,
Rangitoto, Tahaia	F. Richardson ..	Rangitoto Coal Co., Ltd., Tahaia	1	,, ..	1	20′	5′	,, ...		99	..	99	3	6	9	,,
Shiels, Rangitoto	John R. Connew ..	C. J. Shiel, Te Kuiti	1	,, ..	1	20′	5′ to 6′	,, ...		174	..	174	1	2	3	,,
Output of collieries included in previous statements at which operations are abandoned or suspended			..	..	..	..	..	.. ..	..	..	3,748,721	3,748,721	..	..	..	..
WEST COAST INSPECTION DISTRICT.																
Nelson.																
Puponga, Puponga	A. J. McHardy ..	Puponga Coal Syn., Puponga ..	18	Bituminous	1	9′	9′	Bord and pillar	..	2,160	223,094	225,254	4	6	10	Natural.
North Cape, Collingwood ..	J. Walker ..	North Cape Coal Co., Puponga ..	11	,,	1	2½′ to 4½′	Full height	Ditto	..	7,766	87,630	95,396	10	15	25	,,
O'Rourke's	J. Burgess (P.) ..	A. O'Rourke, Murchison ..	2	,,	1	1½′ to 2′	,,	,, ...		60	83	143	..	2	2	,,
Gladstone	W. Olliver (P.) ..	W. H. Olliver, Motupipi–Takaka	2	Lignite ..	1	..	..	,, ...		200	150	350	2	..	2	,,
Stone's	W. Stone (P.) ..	Stone Bros., Takaka	2	Bituminous	..	..	..	,, ...		120	480	600	..	1	1	,,
Fairhall's	R. Fairhall (P.) ..	R. Fairhall, Murchison	2	,,	..	2′ to 4′	..	,, ...		47	48	95	..	1	1	,,
Buller.																
Westport-Stockton, Ngakawau	James Fletcher ..	Westport-Stockton Co., Ngakawau, Westport	13	Bituminous	2	4′ to 20′	Full height	Bord and pillar	..	100,760	1,618,002	1,718,762	86	181	267	Fans.
Millerton, Millerton	T. King	Westport Coal Co., Westport ..	30	,,	1	5′ to 14′	..	Ditto	..	225,255	5,922,363	6,147,618	86	338	424	,,
Millerton, Millerton	William Pearson ..	Westport Coal Co., Westport ..	30	,,	1	4′ to 20′	12′	,, ...								
Ironbridge, Denniston	G. Smith ..	Westport Coal Co., Westport ..	30	,,	2	3′ to 30′	Full height	,, ...		132,620	8,056,075	8,188,695	65	124	189	,,
Coalbrookdale, Denniston ..	William Hewitson	Westport Coal Co., Westport ..	41	,,	1	4′ to 22′	,,	,, ...					65	157	222	,,
Rocklands	J. P. Burley (P.) ..	J. P. Burley, Berlin's–Buller Road	19	Brown ..	1	27′	8′	,, ...		155	7,407	7,562	..	2	2	Natural
Co-operative, Mokihinui ..	T. Murray ..	Dove & party, Seddonville ..	7	Bituminous	1	20′	9′	,, ...		9,364	13,770	23,134	3	5	8	,,
Coak Creek, Mokihinui ..	William McGuire(P.)	McGuire & party, Seddonville ..	6	,,	1	5′ to 20′	6′	,, ...		8,302	27,710	36,012	3	13	16	,,
Chester's, Mokihinui	H. Chester (P.) ..	Chester & party, Seddonville ..	2	,,	1	6′	Full height	,, ...		1,368	399	1,767	1	2	3	,,
St. Helens, Mokihinui ..	A. Pratt (P.) ..	Bennett & party, Seddonville ..	3	,,	1	6′ to 7′	..	,, ...		4,459	4,192	8,651	..	6	6	,,

Woodford's, Mokihinui	E. C. Woodford	Woodford & party, Seddonville	1	,,	1	7′	7′	,,	92	..	92	1	2	3	,,
Mulholland's, Seddonville	R. Mulholland	Mulholland & party, Seddonville	1	,,	1	12′	8′	,,	2,825	..	2,825	3	4	7	,,
Moynihan's (Denniston Road)	T. Moynihan (P.)	Moynihan & party, Westport	1	,,	1	8′	8′	Prospect drive	84	..	84	1	2	3	,,
Reefton.															
Coghlan's	J. Coghlan (P.)	John Coghlan, Capleston	25	Semi-bituminous	1	12′	8½′	Bord and pillar	285	10,333	10,618	..	2	2	Natural.
Archer's	F. W. Archer (P.)	F. W. Archer, Capleston	26	Ditto	1	16′ to 20′	8′ to 10′	Ditto	2,254	27,815	30,069	..	3	3	,,
Doran's	J. J. Doran (P.)	Doran & party, Capleston	1	,,	..	..	..	,,	900	..	900	..	3	3	,,
Reefton Company	J. Armstrong	Reefton Coal Co., Reefton	20	,,	3	5′ to 12′	Full height	,,	9,462	59,291	68,753	6	14	20	,,
Ferndale-Timaru	E. W. Tattley	Ferndale-Timaru Co., Reefton	19	,,	2	6′ to 20′	12′	,,	6,475	16,125	22,600	2	6	8	,,
Phoenix & Venus	William Julyan (P.)	Messrs. Collins & Julyan, Reefton	30	,,	2	30′ to 80′	7′	,,	2,064	46,008	48,072	2	3	5	,,
Loughnan's	H. Griggs (P.)	Alborn & Pascoe, Reefton	35	,,	..	..	..	,,	1,500	18,684	20,184	1	2	3	,,
Big River	W. Kirwan (P.)	Big River G.M. Co., Reefton	8	,,	1	3′ to 8′	Full height	,,	952	5,677	6,629	..	3	3	,,
Morris & Learmonts	J. Baxendale	Morris & Learmont, Reefton	9	,,	3	6′ to 20′	8′	,,	6,563	15,039	21,602	2	9	11	,,
Victory	P. H. Woods (P.)	P. H. Woods & party Reefton	3	,,	2	12′	8′	,,	2,026	2,641	4,667	..	4	4	,,
Golden Point	J. Frame	W. O. Bierwirth, Reefton	9	,,	2	8′	7′	,,	4,647	10,834	15,481	3	7	10	,,
Birchwood	G. Lishman (P.)	A. R. Ayson, Reefton	2	,,	1	3½′	Full height	,,	1,035	645	1,680	1	7	8	,,
Woodlands	A. Chadwick	McKenzie & party, Reefton	1	,,	1	9½′	5½′	,,	229	..	229	1	2	3	,,
Empire	P. Mitchell (P.)	..	1	,,	2	9′ to 20′	8′	,,	2,476	..	2,476	2	6	8	,,
Grey.															
Paparoa, Roa	J. A. C. Bayne	Paparoa Coal Co., Roa	13	Bituminous	1	14′	Full height	Bord and pillar	25,492	323,120	348,612	20	45	65	Fans.
Blackball, Blackball	J. Neilson	Blackball Coal Co., Blackball	31	,,	2	17′	15′	Ditto	96,139	2,905,084	3,001,223	54	235	289	,,
Brunner, Brunnerton	R. Alison	Tyneside Propy., Ltd., Brunner	57	,,	1	4′ to 12′	Full height	,,	2,042	2,442,967	2,445,009	6	6	12	,,
Dobson, Dobson	V. Armstrong	Dobson Coal Co., Dobson	1	,,	1	5′	,,	,,	2,774	..	2,774	5	9	14	Natural.
Baddeley's Co-operative	J. Rowse (P.)	Baddeley & party, Dunollie	1	,,	1	5′	,,	,,	1,800	..	1,800	2	4	6	,,
Hunter's Co-operative	A. Hill (P.)	Hunter & party, Dunollie	1	,,	1	4½′	,,	,,	3,210	..	3,210	..	8	8	,,
Hillside Co-operative	P. Manderson (P.)	Clark & party, Dunollie	1	,,	1	7′	,,	,,	4,683	..	4,683	2	6	8	,,
Smith's Co-operative	T. Halliday (P.)	Smith & party, Dunollie	1	,,	1	7½′	6′	,,	896	..	896	3	5	8	,,
Liverpool State Colliery No. 1, Rewanui	O. J. Davis	N.Z. Government, Greymouth	9	,,	..	..	..	,,	137,334	849,713	987,047	79	162	241	Fans.
Liverpool State Colliery No. 3 Rewanui	C. Strongman	,, ,,	9	,,	..	..	..	,,				26	67	93	,,
Output of mines included in previous statements at which operations have been abandoned or suspended									..	4,690,796	4,690,796	..	..	..	..

SOUTHERN INSPECTION DISTRICT.

Canterbury.															
Mount Torlesse, Avoca	W. Leitch	Mount Torlesse Coll., Christchurch	4	Brown	3	12′	All	Bord and pillar	12,604	34,982	47,586	30	21	51	Steam, Fan, & natural.
Springfield, Springfield	J. Taylor	J. Taylor, Springfield	41	,,	1	4′	All	Ditto	92	92,393	92,485	1	1	2	Natural.
Sheffield, Sheffield	G. Bradshaw	G. Bradshaw, Sheffield	39	,,	1	3′	All	,,	80	52,284	52,364	..	1	1	,,
Homebush, Glentunnel	D. Kane	Homebush Brick & Coal Co., Ltd., Glentunnel	48	,,	1	3½′	All	,,	4,703	330,217	334,920	3	13	16	,,
St. Helens, White Cliffs	J. Sutherland	J. Sutherland, Glentunnel	40	,,	1	6′	5′	,,	903	29,773	30,676	2	3	5	,,
Steventon, White Cliffs	J. C. Campbell	Campbell & Leeming, Glentunnel	2	,,	1	½′	All	,,	1,669	144	1,813	1	3	4	,,
Clearview, Glenroy	C. C. Marsh	Smith & Marsh, Glenroy, Ch'ch.	2	,,	1	9′	6½′	,,	714	64	778	1	3	4	,,
Tripps, Mount Somers	P. Campbell	New Woolshed Creek & Mount Somers Coal Co., Ltd., Ch'ch.	55	,,	1	10′	7′	,,	1,439	73,868	75,307	1	4	5	,,
Cavendish (formerly Evandale), Evandale	J. McClimont	J. McClimont, Mount Somers	2	,,	1	14′	8′ to 6′	,,	807	18	825	..	2	2	,,
Albury, Albury	T. F. Slowey	T. F. Slowey, Timaru	30	Lignite	1	10′	6′	,,	1,374	21,524	22,898	1	1	2	,,
Lambrook, Winscombe, Fairlie	J. H. Smillie	J. H. Smillie, Fairlie	1	,,	1	9′	5½′	,,	100	..	100	1	1	2	,,
Allanholme, Waihao Forks	J. Campbell	Allanholme Coal Co., Waimate	6	,,	1	15′	8′	,,	1,059	7,507	8,566	1	2	3	,,
Meadowbank Waihao Forks	A. E. Kirk	A. E. Kirk, Waihao Forks	4	,,	1	10′	7′	,,	705	1,639	2,344	1	1	2	,,
McIlraith, "Camden," Waihao Forks	W. McIlraith	W. McIlraith, Waihao Forks	1	,,	1	10′	..	Open	10	..	10	..	..	..	..
North Otago.															
Wharekuri, Wharekuri	A. F. Shanks	A. F. Shanks, Wharekuri	2	Lignite	1	30′	7′	Bord and pillar	394	2,613	3,007	..	2	2	Natural.
Borton's, Borton's	T. H. Brooke	A. E. Gard, Borton's	1	,,	1	10′	7′	Ditto	296	..	296	..	1	1	,,
St. Andrew's, Papakaio	T. Barclay, jun.	Papakaio Coal Co., Oamaru	43	,,	1	7′	6′	,,	753	59,871	60,624	1	3	4	,,
Prince Alfred, Papakaio	A. Beardsmore	Mrs. J. E. Willetts, Papakaio	52	,,	1	9′	7′	,,	1,060	66,297	67,357	1	2	3	,,
Ngapara, Ngapara	W. Nimmo	W. Nimmo, Ngapara	43	,,	1	25′	10′ to 8′	,,	1,209	34,672	35,881	1	3	4	,,
Diamond Hill, Herbert	J. Wilson	Wilson & Calder, Diamond Hill, Herbert	3	,,	1	4′	All	,,	3	220	223	..	..	..	,,

COLLIERY STATISTICS, 1921—*continued.*

Name of Mine and Locality.	Name of Mine Manager.	Name and Address of Owner.	Number of Years worked.	Classification of Coal	Number of Seams worked.	Thickness of Coal-seams.	Thickness worked.	System of Underground working.	Number of Winding-shafts.	Total Output for 1921.	Total Output to 31st December, 1920.	Total Output to 31st December, 1921.	Number of Persons ordinarily employed.			Means of Ventilation.
													Above.	Below.	Total.	
SOUTHERN INSPECTION DISTRICT—*continued.*										Tons.	Tons.	Tons.				
Shag Point (old mine), Shag Point	W. Hunt ..	Waronui Coal Co., Vogel Street, Dunedin	7	Brown ..	1	5½′	All	Bord and pillar ..	..	218	412,389	412,607	1	2	3	Natural.
Shag Point C.M. Co., Ltd., Shag Point	J. Hughes ..	Shag Point C.M. Co., Ltd., Dunedin	13	,, ..	1	5′	All	,, ...	..	20,835	89,851	110,686	12	59	71	Fan.
Central Otago.																
Larsen & Brown, Kyeburn ..	..	Larsen & Brown, Kyeburn ..	4	Lignite ..	1	2′	All	Open	..	..	49	49	..	..	..	..
Kyeburn Diggings, Kyeburn Diggings	J. T. Weatherall ..	J. T. Weatherall, Kyeburn Diggings	2	,, ..	1	..	..	,, ...	..	26	40	66	1	..	1	..
Creighton's, Kokonga Mill ..	J. Creighton ..	J. Creighton, Kokonga ..	2	,, ..	1	..	..	,, ...	..	16	2	18	1	..	1	..
Gimmerburn, Gimmerburn ..	C. Dougherty ..	C. Dougherty, Gimmerburn ..	65	,, ..	1	12′	All	,, ...	..	48	3,289	3,337	..	..	..	..
Rough Ridge, Oturehua ..	J. T. Beck ..	Margaret Beck, Oturehua ..	35	,, ..	1	20′	All	,, ...	..	194	35,165	35,359	2	..	2	..
Idaburn, Oturehua	R. K. Deaker ..	R. K. Deaker, Oturehua ..	51	,, ..	1	20′	All	,, ...	..	1,174	48,177	49,351	3	..	3	..
Oturehua, Oturehua	Becker Bros.	Becker Bros., Oturehua ..	27	,, ..	1	17′	7′	,, ...	..	874	3,339	4,213	2	..	2	..
Lowis's, Blackstone Hill ..	T. A. Lowis ..	T. A. Lowis, Blackstone Hill ..	2	,, ..	1	10′	All	,, ...	..	30	16	46	..	..	..	..
Dillon's, Blackstone Hill ..	J. Dillon ..	J. Dillon, Blackstone Hill ..	24	,, ..	1	12′	All	,, ...	..	8	303	311	..	..	..	..
Armitage's, Blackstone Hill ..	J. Armitage ..	J. Armitage, Blackstone Hill ..	41	,, ..	1	..	16′	,, ...	..	10	4,708	4,718	..	..	..	..
St. Bathan's, St. Bathan's ..	J. Enright ..	J. Enright, St. Bathan's ..	24	,, ..	1	30′	All	,, ...	..	148	6,595	6,743	2	..	2	..
Cambrian, Cambrian	D. Jones ..	Vinegar Hill Hydraulic S. Co., St. Bathan's	60	,, ..	1	22′	20′	,, ...	..	92	49,499	49,591	1	..	1	..
Lauder Lane, Cambrian ..	S. Clarkson ..	McIntyre & Reed, Beck's ..	17	,, ..	1	12′	6′	Bord and pillar ..	..	459	2,224	2,683	2	4	6	..
Alexandra, Alexandra ..	D. Mathias ..	Alexandra C.M. Co., Alexandra ..	40	,, ..	1	9′	6′	Ditto	..	1,571	103,089	104,660	1	3	4	Exhaust Steam
McPherson's, Coal Creek Flat ..	J. Weatherall ..	N. Harlewich, Roxburgh ..	51	,, ..	1	16′	All	Open	..	2,217	77,382	79,599	3	..	3	..
Cromwell, Cromwell	R. B. Cowan ..	A. Scott, Cromwell	7	,, ..	1	13′	7′	Bord and pillar ..	..	1,357	7,081	8,438	1	2	3	Exhaust steam.
Shepherd's Creek, Bannockburn	J. Hodson, jun. ..	Bannockburn C.M. Co., Bannockburn	44	,, ..	1	13′ to 6′	to 11′	Ditto	..	3,895	101,127	105,022	1	5	6	,,
Cardrona, Cardrona	R. McDougall ..	R. McDougall, Cardrona ..	37	Brown ..	1	10′	All	Open	..	115	26,326	26,441	2	..	2	..
Gibbston, Gibbston	J. Cowan ..	Gibbston Coal Co., Ltd., Queenstown	35	,, ..	1	15′	10′	Bord and pillar ..	..	1,413	27,848	29,261	1	2	3	Natural.
Nevis, Nevis	E. J. Williams ..	E. J. Williams, Nevis	21	,, ..	1	10′	6′	Levels	..	68	7,099	7,167	..	1	1	,,
Nevis Crossing, Nevis	R. Ritchie ..	R. Ritchie, Nevis	18	,, ..	1	16′	6′	Bord and pillar ..	..	399	14,803	15,202	..	2	2	,,
South Otago.																
Fernhill, Abbotsford	G. F. Turner ..	Fernhill Coal and Sand Co., Dunedin	44	Lignite ..	1	8′	6′	Bord and pillar ..	..	1,779	173,165	174,944	1	5	6	Natural.
Freeman's, Abbotsford ..	W. Evans ..	Freeman's Coal Co., Green Island	41	,, ..	1	20′ to 8′	All	Ditto	..	5,063	578,669	583,732	2	6	8	Furnace.
Jubilee, Saddle Hill	T. Barclay, sen. ..	Jubilee Coal Co., Ltd., Dunedin	24	,, ..	2	8′ to 6′	All	,, ...	..	12,769	392,945	405,714	8	22	30	Fan.
Saddle Hill (No. 1), Saddle Hill	R. Hill	Christie Bros., Mosgiel, Dunedin	49	,, ..	1	20′	All	,, ...	..	8,641	266,117	274,758	4	9	13	,,
Harris's Burnwell, Saddle Hill ..	R. Hill	Christie Bros., Mosgiel, Dunedin	..	,, ..	1	20′	All	,, ...	..	2,075	70,408	72,483	3	7	10	,,
Saddle Hill (No. 2), Saddle Hill	R. Hill	Christie Bros., Mosgiel, Dunedin	20	,, ..	1	20′	All	,, ...	..	13,595	295,394	308,989	8	13	21	,,
Walton Park, Fairfield ..	R. Hill	Christie Bros., Mosgiel, Dunedin	1	,, ..	1	10′	6½	,, ...	..	90	..	90	3	4	7	,,
East Taieri, Riccarton ..	E. Charles ..	East Taieri Coal Co., Riccarton, Mosgiel	10	,, ..	1	8′	6′	,, ...	..	6,494	28,516	35,010	3	10	13	Natural.
Gracies, Riccarton	M. Tikey ..	M. Tikey & Co., Riccarton, Mosgiel	1	,, ..	1	6′	All	,, ...	..	4	..	4	..	..	..	,,
Brighton, Brighton	D. McColl, sen. ..	D. McColl, sen., Brighton ..	6	,, ..	1	9′	8′ to 7′	,, ...	..	160	7,192	7,352	..	1	1	,,
Ruanui, Brighton	N. McColl ..	D. L. McColl, jun., Brighton ..	1	,, ..	1	5′	All	,, ...	..	19	..	19	..	..	..	Exhaust steam.
Waronui, Milton	J. Carruthers, jun.	Bruce Rly. & Coal Co., Dunedin	17	,, ..	1	12′ to 6′	7′	,, ...	..	16,852	233,403	250,255	13	21	34	Fan.
McGilp's, Milton	J. Carruthers, jun.	Bruce Rly. & Coal Co., Dunedin	17	,, ..	1	7′	All	,, ...	..	11,178	83,200	94,378	2	9	11	Natural.
Tres Bon, Akatore	J. Hill	Hill & Perry, Milton	2	,, ..	1	14′	8′	,, ...	..	986	28,787	29,778	3	2	5	,,
Crichton, Crichton	J. Hodson, sen. ..	Crichton Coal Co., Reefton ..	2	,, ..	1	20′	7′	,, ...	..	807	463	1,270	1	2	3	,,
Dunlop's, Lovell's Flat ..	J. McMillan ..	John O'Fee & others, Kaitangata	2	,, ..	1	20′	7′	,, ...	..	246	1,536	1,782	1	3	4	,,
Lakeside	C. Penman ..	W. Stevenson, Invercargill ..	2	,, ..	1	18′	7′	,, ...	..	315	1,185	1,500	1	1	2	,,
Taratu, Lovell's Flat	J. Hadcroft ..	Sargood & Cheeseman, Dunedin ..	20	,, ..	3	40′ to 8′	7′	,, ..	1	35,856	441,274	477,130	20	66	86	Fan & natural.
Tuakitoto (late Port Arthur), Tuakitoto	J. Throp ..	J. Throp, Kaitangata ..	11	,, ..	1	7′	All	,, ...	..	379	2,996	3,375	..	3	3	Exhaust steam.

Kaituna, Kaitangata	G. F. Whittlestone	Kaituna Coal Co., Ltd., Dunedin	13	,, ..	1	14′	7′	,, ...	3,038	11,636	14,674	3	9	12	,,
Wangaloa, Wangaloa	T. Gage	T. Gage, Kaitangata	2	,, ..	1	11′	7′	,, ...	474	167	641	1	2	3	Natural.
Kaidale, Wangaloa	J. Fazakerley ..	Morrison Bros., Kaitangata ..	3	,, ..	1	16′ to 10′	6′	,, ...	1,567	5,228	6,795	1	4	5	,,
Kaibrook, Wangaloa	F. S. Edwards ..	F. S. Edwards, Kaitangata ..	2	,, ..	1	10′	8′	,, ...	650	438	1,088	1	3	4	,,
Roseneath (late Middleton's), Wangaloa	T. Middleton ..	T. Middleton, Kaitangata ..	2	,, ..	1	16′	8′	,, ...	1,899	391	2,290	1	2	3	,,
Kai Point (late Caird Bros.), Kaitangata	D. A. Anderson ..	Caird Bros., Kaitangata ..	2	,, ..	1	18′	8′	,, ...	1,611	235	1,846	..	2	2	,,
Summerhill, Kaitangata ..	J. Brennan ..	J. Brennan, Kaitangata ..	1	,, ..	1	10′	6′	,, ...	152		152	..	1	1	,,
Kaitangata No. 1, Kaitangata ..	A. S. Gillanders ..	N.Z. Coal & Oil Co., Ltd., Dunedin	45	Brown ..	3	25′ to 6′	All	,, .. 1	99,316	3,832,121	3,931,437	79	253	332	Fan.
Kaitangata No. 2, Kaitangata ..	F. Carson ..	N.Z. Coal & Oil Co., Ltd., Dunedin	9	,, ..	3	25′ to 6′	All	,, ...							
Castle Hill, Kaitangata ..	W. Carson ..	N.Z. Coal & Oil Co., Ltd., Dunedin	28	,, ..	3	20′ to 18′	All	,, .. 1							
Benhar, Stirling	J. Walls ..	P. McSkimming & Son, Benhar ..	58	Lignite ..	1	25′	10′ to 12′	,, ...	10,938	198,662	209,600	1	7	8	Exhaust steam.
Clydevale, Clydevale	M. Kean ..	M. Kean, Clydevale	5	,, ..	1	12′	All	Open	100	195	295	..	..	..	..
Southland.															
Pukerau, Pukerau	J. Broome ..	Miller Bros., Pukerau	3	Lignite ..	1	12′	8′	Bord and pillar ..	1,028	2,588	3,616	..	1	1	Natural.
Otikerama Station, Pukerau ..	D. Ballock ..	Ballock Bros., Otikerama ..	24	,, ..	1	16′	All	Open	346	855	1,201	1	..	1	..
Rosedale (late Reinke's), McNab	A. Reinke ..	E. H. Reinke, Southland ..	2	,, ..	1	14′	All	,, ...	368	520	888	1	..	1	..
McLean's, Whiterig	D. McLean ..	D. McLean, Gore	2	,, ..	1	12′	10′	Bord and pillar ..	1,656	1,347	3,003	1	2	3	Natural.
Whiterig, East Gore	R. Craig	R. Craig, East Gore	43	,, ..	1	24′	14′	Ditto	2,957	80,054	83,011	1	3	4	Exhaust steam.
Green's, Gore	J. Mason ..	T. Green & Co., Ltd., Gore ..	33	,, ..	1	19′	13′	,, ...	14,010	240,831	254,841	4	10	14	Fan.
Riverview Gore	J. J. Nicol ..	J. J. Nicol, Gore	34	,, ..	1	10′	All	Open	20	2,052	2,072	..	..	..	..
Springfield, Waikaka Valley ..	R. L. Reid ..	R. L. Reid, Waikaka Valley ..	25	,, ..	1	10′	All	,, ...	132	59,181	59,313	2	..	2	..
Glenlee, Waikaka	A. A. Edge ..	A. A. Edge, Waiakaka ..	28	,, ..	1	14′	9′	Bord and pillar ..	1,890	20,296	22,186	1	2	3	Natural.
Ramsay's, North Chatton ..	P. Ramsay ..	P. Ramsay, North Chatton ..	18	,, ..	1	20′	15′	Ditto	2,832	93,727	96,559	1	3	4	,,
Pyramid, Pyramid	D. R. Gaudion ..	J. Byrnes, Pyramid	5	,, ..	1	9′	8′	,, ...	171	3,567	3,738	1	1	2	,,
Wendon, Wendon	J. L. Hardy ..	J. L. Hardy, Wendon	1	,, ..	1	16′	10′	,, ...	166	..	166	..	1	1	,,
Landslip, Waikaia	T. Northcoat ..	T. Northcoat, Waikaia ..	22	,, ..	1	5′	All	,, ...	113	36,606	36,719	1	..	1	,,
Rossvale, Waikaia	D. R. Gaudion ..	T. D. Moffat, Waikaia	18	,, ..	1	16′	9′ to 7′	,, ...	1,853	44,578	46,431	1	3	4	,,
Argyle, Waikaia	M. C. Hutton ..	Mrs. M. C. Hutton, Waikaia ..	30	,, ..	1	12′	All	Open	444	7,071	7,515	1	..	1	..
Terrace, Kingston Crossing ..	E. Jones	E. Jones, Kingston Crossing ..	3	,, ..	1	24′	11′	Bord and pillar ..	1,600	2,769	4,369	1	2	3	Natural.
Princhester Creek, The Key ..	J. A. Denton ..	J. A. Denton, The Key ..	19	,, ..	1	6′	All	Open	99	1,986	2,085	1	..	1	..
Forest Hill, Tussock Creek ..	J. C. McDonald ..	J. C. McDonald, Tussock Creek ..	1	,, ..	1	10′	All	,, ...	60	..	60	1	..	1	..
Mataura Collieries, Mataura ..	R. Brown ..	Mataura Colls. Co., Gore ..	25	,, ..	1	17′	12′	Bord and pillar ..	7,253	221,270	228,523	2	7	9	Fan.
Boghead, Mataura	C. E. Rowe ..	C. E. Rowe, Mataura	16	,, ..	1	15′	All	Open	1,862	21,577	23,439	3	2	5	..
Mautaura Lignite, Mataura ..	A. E Barnes ..	Beattie, Coster, & Co., Ltd., Mataura	45	,, ..	1	18′	12′	Bord and pillar ..	13,119	225,625	238,744	3	7	10	Fan.
Terrace, Mataura	P. Larking ..	P. Larking, Mataura	2	,, ..	1	15′	11′	Open	782	130	912	1	..	1	..
Ti Tepu, Mataura	A. E Peck ..	Peck Bros., Box 39, Mataura ..	1	,, ..	1	12′	6′	,, ...	100	..	100	..	1	1	..
Heatherlea, Waimumu ..	P. H. Barber ..	P. H. Barber, Waimumu ..	2	,, ..	1	10′	All	,, ...	132	645	777	1	..	1	..
Ota Creek, Wyndham ..	E. Todd ..	E. George, Wyndham	41	,, ..	1	9′	All	,, ...	1,026	25,790	26,816	2	..	2	..
Clarkes, Wyndham	J. Bushbridge ..	J. Bushbridge, Wyndham ..	14	,, ..	1	13′	All	,, ...	1,644	16,903	18,547	2	..	2	..
Diamond Lignite, Seaward Bush	A. McMillan ..	S. McMillan, Invercargill ..	19	,, ..	1	32′	16′	,, ...	2,226	23,149	25,375	2	..	2	..
Nightcaps No. 1, Nightcaps ..	W. Morgan ..	Nightcaps Coal Co., Invercargill ..	40	Brown ..	2	6′ and 4′	All	Bord and pillar ..	18,885	1,393,900	1,418,988	22	38	60	Fan.
Nightcaps No. 2, Nightcaps ..	W. Morgan ..	Nightcaps Coal Co., Invercargill ..	5	,, ..	1	28′	20′	Bord and pillar and open ..	6,203			3	12	15	Natural.
Stirling, Nightcaps	T. Thomson ..	Thomson, Currie, and Dockerty, Nightcaps	3	,, ..	1	7′	All	Ditto	304	20	324	..	1	1	..
Burndale, Nightcaps	W. Buchanan ..	Burndale Coal Co., Nightcaps ..	5	,, ..	2	6′ and 5′	6′	Bord and pillar ..	2,069	957	3,026	1	4	5	Exhaust steam.
Coaldale, Nightcaps	H. Talbot ..	Coaldale Coll. Co., Ltd., Dunedin	4	,, ..	1	8′	All	Ditto	6,922	917	7,839	4	14	18	Fan.
Black Diamond, Nightcaps ..	R. W. Duncan ..	Black Diamond Coal Co., Ltd., Nightcaps	6	,, ..	1′	25′	8	,, ...	13,243	24,051	37,294	8	12	20	,,
New Brighton, Nightcaps ..	W. Dixon ..	Southland Coal Co., Invercargill	15	,, ..	1	9′	7′	,, ...	9,632	68,530	78,162	5	17	22	,,
Wairio, Nightcaps	A. Morris ..	Smith & Timpany, Invercargill ..	16	,, ..	2	14′ and 4½′	All	,, ...	11,569	118,135	129,704	6	13	19	Natural.
Mossbank, Nightcaps	A. Hunter ..	Mossbank Coal Co., Ltd., Invercargill	7	,, ..	1	18′	6′	,, ...	7,792	35,722	43,514	5	10	15	Fan.
Wells & party, Nightcaps ..	J. Thomson ..	Wells & party, Nightcaps ..	1	,, ..	1	5′	All	,, ...	420	..	420	1	3	4	Natural.
Wairaki No. 1, Nightcaps ..	A. W. Whittlestone	Wairaki Coal Co. Ltd., Nightcaps	8	,, ..	1	10′	7′	,, ...	1,323	24,325	41,192	1	3	4	Fan.
Wairaki No. 2, Nightcaps ..	A. W. Whittlestone	Wairaki Coal Co., Ltd., Nightcaps	3	,, ..	1	16′	7′	,, ...	15,544			12	22	34	,,

COLLIERY STATISTICS, 1921—*continued.*

Name of Mine and Locality.	Name of Mine Manager.	Name and Address of Owner.	Number of Years worked.	Classification of Coal.	Number of Seams worked.	Thickness of Coal-seams.	Thickness worked.	System of Underground working.	Number of Winding-shafts.	Total Output for 1921.	Total Output to 31st December, 1920.	Total Output to 31st December, 1921.	Number of Persons ordinarily employed.			Means of Ventilation.
													Above.	Below.	Total.	
SOUTHERN INSPECTION DISTRICT—*continued.*																
										Tons.	Tons.	Tons.				
Linton, Nightcaps	C. R. Heycock ..	Linton Coal Co., Ltd., Invercargill	6	Brown ..	2	18′ and 16′ to 5½′	8′ to 5½′	Bord and pillar ..		22,071	28,007	50,078	16	24	40	Fan.
Ohai (lately Willow), Nightcaps ..	C. Drain	W. Stevenson, Invercargill ..	2	,, ..	2	16′ and 7′	All	Open		1,082	2,714	3,796	4	..	4	..
Birchwood, Ohai, Nightcaps ..	J. Lloyd	Birchwood Coal Co., Ohai, Nightcaps	1	,, ..	1	22′	10′	Bord and pillar ..		2,616	..	2,616	3	6	9	Natural.
Orepuki, Orepuki	J. Gillick	N.Z. Coal & Oil Co., Ltd., Dunedin	25	,, ..	1	10′	7′	,, ...		3,633	31,018	34,651	5	8	13	Exhaust steam.
Lynwood, Te Anau	J. Porter ..	N.Z. Government Tourist Dept., Wellington	11	Lignite ..	1	7′	All	Open		222	2,676	2,898	1	..	1	..
Output of collieries included in previous statements at which operations are suspended or abandoned				..		..	..	..		..	2,765,284	2,765,284	..	..	..	..
Totals, Southern District, South Island	..	..	..	..	..	..	..	..		483,613	14,112,183	14,595,796	374	846	1,220	
Totals, West Coast District, South Island	..	..	..	..	..	..	..	..		810,875	27,386,175	28,197,050	547	1,479	2,026	
Totals, North Island ..	..	..	..	..	..	..	..	..		514,607	10,088,678	10,603,285	297	824	1,121	
Grand totals ..	..	..	..	..	..	..	..	..		1,809,095	51,587,036	53,396,131	1,218	3,149	4,367	
Output of some collieries prior to 1890 not included in the above statement			..	..	..	..	..	..		..	..	311,779	..	..	..	
Shale exported, 1914 ..	..	..	..	..	..	..	..	..		..	..	21	..	..	..	
												53,707,931				

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