

1947
NEW ZEALAND

MINES STATEMENT

BY THE HON. A. McLAGAN, MINISTER OF MINES

MR. SPEAKER,—

I have the honour to present to Parliament the annual statement on the mining industry of the Dominion for the year ended 31st December, 1946.

MINERAL PRODUCTION

The following statement shows the quantity and value of the production of metalliferous mines, quarries, and coal-mines during 1946 and 1945 :—

Mineral.	1946.		1945.	
	Quantity.	Value.	Quantity.	Value.
		£		£
Gold	119,271 oz.	1,262,524	128,364 oz.	1,353,207
Silver	224,341 oz.	59,707	244,544 oz.	36,752
Platinum	14 oz.	312	..	..
Arsenic	18 tons	316	17 tons	306
Asbestos .. .. .	..	..	31 cwt.	31
Bentonite	154 tons	777	167 tons	800
Clays (other than for brickmaking)	9,425 tons	5,186	8,251 tons	5,408
Clays (for brickmaking)*	109,809 tons	26,179	..	..
Coal	2,793,870 tons	4,190,805	2,833,576 tons	4,250,364
Diatomaceous earth	348 tons	574	255 tons	446
Dolomite	3,893 tons	1,946	4,644 tons	2,322
Fuller's earth	75 tons	318	76 tons	273
Iron-ore	7,406 tons	16,422	6,067 tons	14,648
Magnesite	374 tons	262	111 tons	100
Manganese-ore	402 tons	1,686	..	..
Mica .. .. .	..	..	882 lb.	882
Phosphate	11,047 tons	3,314	7,956 tons	2,188
Pumice	3,409 tons	12,347	2,183 tons	9,163
Quartzite	18 tons	33	39 tons	71
Serpentine	20,058 tons	3,966	13,933 tons	3,329
Silica sand	16,949 tons	38,921	20,009 tons	45,066
Stone, sand, &c.	2,701,462 tons	741,162	2,634,423 tons	710,448
Talc .. .. .	..	..	..	..
Tungsten-ore	27 tons	6,350	34 tons	10,360
Quicksilver .. .. .	..	..	2,294 lb.	2,294
Totals .. .. .	..	6,373,197	..	6,448,458

* Not previously recorded.

GOLD AND SILVER MINING

During the year 343,612 oz. of bullion, valued at £1,322,231, were produced, a decrease in quantity of 29,296 oz. and a decrease in value of £67,728 as compared with the previous year. The gold content of the bullion is estimated at 119,271 oz., valued at £1,262,524, and the silver content 224,341 oz., valued at £59,707.

The estimated gold production for the past twenty years has been as follows:—

Year.	Oz.	Year.	Oz.
1927	125,076	1937	168,487
1928	122,790	1938	152,050
1929	117,775	1939	178,955
1930	120,931	1940	185,665
1931	129,861	1941	174,656
1932	166,354	1942	165,986
1933	161,755	1943	149,150
1934	160,248	1944	142,287
1935	165,277	1945	128,364
1936	164,575	1946	119,271

There was a further decline in the production of gold in 1946, and the output shows a decrease of 9,093 oz. compared with the previous year, and is the lowest production since 1929.

Production from quartz-mines (36,352 oz.) shows a decrease of 6,452 oz., from dredges (79,228 oz.), a decrease of 2,858 oz., and from alluvial mines (3,691 oz.), an increase of 217 oz., compared with the previous year.

Dredging now accounts for two-thirds of the total production, and this is accounted for not only by the increase in dredging activities of late years, but also by the continued and persistent decline of both quartz and alluvial mining. Alluvial mining, which in 1934 accounted for a production of 43,541 oz., has continually declined, until a figure of 3,474 oz. was recorded in 1945. True, there was a slight increase during 1946 mainly due to resumption of activities on small claims in Otago which had been suspended during the war years, but it is difficult to foresee any marked and continuing increase in alluvial production, seeing that close on a century's activities have wellnigh exhausted deposits amenable to this method of mining. There has also been a persistent decline in production from quartz-mines. In 1932, 121,480 oz. were produced by quartz-mines, but production has continually declined, until in 1946 only 36,352 oz. of gold were obtained from this branch of mining. Production is now entirely dependent upon the activities of two mines, the Martha and the Blackwater, and both have been experiencing disabilities in rising costs and the shortage of skilled labour. The remission of a further 11s. 10d. New Zealand currency from the gold export duty must have offset in part rising costs, but the labour problem, particularly in the case of the Blackwater Mine, still remains acute.

There has been no activity either in the prospecting and development of new mines or in resumption of activities of mines dormant during the war years, and while it is expected that with the solution of labour difficulties some increase in production is possible, the future of this branch of the industry cannot be regarded as bright from a long-range viewpoint.

Sixteen dredges were in operation during 1946, thirteen on the west coast of the South Island and three in Otago and Southland. During the year the Gillespies Beach dredge on the west coast suspended operations, while the Blackball Creek dredge ceased activities early in the present year.

PETROLEUM OIL

There has been no resumption of the search for petroleum in New Zealand since prospecting ceased early in 1944, and all of the petroleum-prospecting licences taken out have now either lapsed or been abandoned.

There is now only one licence under the Petroleum Act current—namely, the petroleum mining licence that has been held by Moturoa Oil Fields, Ltd. From this company's wells at Moturoa 81,625 gallons of crude petroleum oil was obtained during 1946, bringing the Dominion's total production of crude petroleum oil at 31st December, 1946, to 3,584,407 gallons. Production from the Moturoa field has been declining of recent years, and the output for 1946 shows a reduction of some 10,000 gallons from the figure for 1945. The assets both of Moturoa Oil Fields, Ltd., and of New Zealand Oil Refineries, Ltd., which had refined the crude oil from the Moturoa wells, have recently been transferred, and it is understood that the new owner intends both to recondition the old wells to augment the flow of petroleum and to drill one or more additional wells, and thus endeavour to increase production so that refining operations can be maintained at an economic scale.

COAL-MINING

The total coal production of the Dominion for the year 1946 amounted to 2,793,870 tons which is 39,706 tons less than production in 1945 which amounted to 2,833,576.

The annual production of coal since 1930 has been as follows:—

Year.	Tons.	Year.	Tons.
1930	2,542,092	1939	2,342,639
1931	2,157,756	1940	2,516,099
1932	1,842,022	1941	2,639,507
1933	1,821,258	1942	2,680,041
1934	2,060,315	1943	2,787,868
1935	2,115,184	1944	2,805,970
1936	2,140,217	1945	2,833,576
1937	2,277,799	1946	2,793,870
1938	2,222,088		

Although production for 1946 shows a slight decrease from the output recorded in 1944 and 1945, it still shows the substantial increase of 451,231 tons over the output attained in 1939, the first year of the war.

During 1946, 165 mines in all were in operation, and of these, 58 mines operated wholly or principally on freehold land and the remaining 107 wholly or predominantly on Crown land.

Output from freehold land was 1,062,361 tons (38 per cent.) and output from Crown land 1,731,509 tons (62 per cent.).

In 1946, 27,185 tons of coal were imported as against no importations in 1945 and 1944, and 37,454 tons imported in 1943. Of the coal imported during 1946 all was obtained from Wyoming, in the United States of America, with the exception of one shipment of some 3,500 tons obtained from Vancouver Island, Canada.

Imports from America have been continued during the current year, and till the end of May an additional 36,500 tons have been received, with two additional shipments in transit and one in process of loading. As negotiations are proceeding for further shipments later in the year import figures for the year 1947 should show a substantial increase and approach the pre-war import figure of approximately 100,000 tons per year.

The coal imported is bituminous in type, and, while inferior to that previously obtained from New South Wales, it has proved suitable for use on the railways, and has accordingly been of assistance in eking out our bituminous-coal supplies and allowing diversion to other uses.

Exports of coal in 1946 amounted to 27,366 tons, as compared with 21,989 tons in 1945.

In 1946, 2,265,170 tons were produced from underground mines, compared with 2,380,896 tons in 1945, and from opencast mines 528,700 tons were produced in 1946, as against 452,680 in 1945. The output per miner employed underground was 593 tons, a decrease of 13 tons as compared with 1945. The production per man on the pay-roll of underground mines—*i.e.*, both underground and surface workers—was 441 tons, a decrease of 12 tons on the previous year. Production per man employed in opencast mines was 1,244 tons, a decrease of 119 tons as compared with 1945. The over-all production per man employed in the industry—*i.e.*, combined underground and opencast mines—amounted to 503 tons, a decrease of 4 tons as compared with 1944.

Comparative figures for the years from 1930 onward are given in the tabulation below :—

Year.	Output.	Men employed Underground.	Tons per Man Underground.	Men employed on Surface.	Tons per Man on Pay-roll.
<i>Underground Mines</i>					
1930	2,530,661	4,430	571	1,409	433
1931	2,143,023	4,331	495	1,375	376
1932	1,826,110	3,379	540	1,214	398
1933	1,797,869	3,194	563	1,134	415
1934	2,042,228	3,249	629	1,172	462
1935	2,098,904	3,104	676	1,083	501
1936	2,108,238	3,154	668	1,040	503
1937	2,238,651	3,288	681	1,074	513
1938	2,180,122	3,368	647	1,142	483
1939	2,296,007	3,542	648	1,164	488
1940	2,465,336	3,769	654	1,241	492
1941	2,585,324	3,633	712	1,325	521
1942	2,624,267	3,659	717	1,291	530
1943	2,725,831	3,999	682	1,329	512
1944	2,609,516	3,958	659	1,395	489
1945	2,380,896	3,932	606	1,328	453
1946	2,265,170	3,819	593	1,313	441

Year.	Output.	Men employed.	Tons per Man employed.
<i>Opencast Mines</i>			
1930	11,431	28	520
1931	14,733	39	378
1932	15,912	43	370
1933	23,389	58	403
1934	18,087	57	317
1935	16,280	44	370
1936	31,979	63	508
1937	39,148	55	712
1938	41,966	53	792
1939	46,632	56	833
1940	50,763	36	1,410
1941	54,183	33	1,642
1942	55,774	47	1,187
1943	62,037	46	1,349
1944	196,454	242	812
1945	452,680	332	1,363
1946	528,700	425	1,244

Year.	Output.	Men employed.	Tons per Man employed.
<i>All Mines</i>			
1930	2,542,092	5,867	433
1931	2,157,756	5,745	376
1932	1,842,022	4,636	397
1933	1,821,258	4,386	415
1934	2,060,315	4,478	460
1935	2,115,184	4,231	500
1936	2,140,217	4,257	503
1937	2,277,799	4,417	516
1938	2,222,088	4,563	487
1939	2,342,639	4,762	492
1940	2,516,099	5,046	499
1941	2,639,507	4,991	529
1942	2,680,041	4,997	536
1943	2,787,868	5,374	519
1944	2,805,970	5,595	502
1945	2,833,576	5,592	507
1946	2,793,870	5,557	503

It will be noted that there has been a decline of late years in the production from underground mines and that over-all production has only been maintained by the increase in production from opencast mines. This is also reflected in the progressive decline in the output per man figures for underground mines both in the output per man underground and in the output per man on pay-roll. This is due in great part to the difficulty in recruiting young able-bodied men to the industry, the more difficult mining conditions in some mines, and the increased proportion of workers underground who are not engaged in actual coal-hewing. Despite the comparatively high wages earned, the better conditions obtaining, and the provision of social amenities, the industry is not as attractive as other occupations, while it has also to carry an increased proportion of men who have been injured in the industry and are not physically capable of full effort. Under these circumstances it has been difficult to make up the inevitable wastage of hewers by skilled men, and their number, in consequence, has declined. Increase of men employed at the coal-mines cannot be obtained without an increase in the provision of housing in coal-mining centres, which is retarded by the difficulties general to the whole housing position of the country. The provision of hostels for single men in four centres now being undertaken by the National Employment Department should help to relieve the situation, while it is hoped that some skilled men may be recruited from Great Britain under the Government's immigration policy.

The most serious aspect of the coal-production position has been the decline in the production of the higher-grade bituminous coals. Since 1941, when a record production of 1,179,581 tons was achieved, there has been a gradual decline until 1946, when 958,270 tons were produced. New Zealand's resources of bituminous coal are not unlimited, and after many years of exploitation the more accessible and easily-worked deposits are approaching exhaustion, while, owing to the lenticular nature of the deposits, extensive boring is necessary before development of new mines can be undertaken with confidence. It was inevitable during the war years with shortage of man-power that essential development work had to be sacrificed to the exigencies of the times, and there is accordingly considerable leeway to be made up.

It has been disappointing that no production can be recorded from the Garvey Creek area, near Reefton, where the Mines Department have proved up a new and promising deposit of good-grade bituminous coal. Owing to the abnormally wet spring and early summer and the difficult country it was not possible to complete the access road till the end of the year, and the erection of mine buildings and screens could not be undertaken till the road was completed. However, construction work has now been completed and production commenced on a small scale, which it is hoped to expand so that a real contribution can be made to our bituminous-coal supplies.

As the result of an intensive drilling programme in the vicinity of the Liverpool Mine, at Rewanui, it has been proved that some 1,500,000 tons of recoverable coal are contained in four seams, and plans are now being prepared to open up this area so that it can replace Liverpool when that mine becomes exhausted. As the Westport Coal Co. has been opening up a new colliery on Cook's Lease and increased production can be expected from Stockton opencast when the aerial ropeway is installed, it will be seen that ample provision is being made from the long-range viewpoint, though the short-range viewpoint presents greater difficulties. It is generally difficult to increase output materially without considerable preparatory development work, and under New Zealand conditions, where access is difficult and the vagaries of the coal-deposits are notorious, it is impossible. The recent acquisition by the State of the mines of the Westport Coal Co. practically vests control of all the bituminous-coal deposits of New Zealand with the State, and henceforth coalfields can be developed as a unit and the resources of bituminous coal conserved to the utmost.

The opening-up of sub-bituminous coal deposits in order to provide replacements for mines approaching exhaustion is also receiving attention, and a drilling programme at the Morley Block, in the Ohai Coalfield, was completed during the year which justifies the opening-up of a large-scale colliery capable of producing 1,000 tons of coal per day. With the purchase by the State of the adjoining Star Mine, the way is cleared to lay out the new colliery to the best advantage, and to this purpose drilling has been commenced upon the Star area, and a commencement of development work only awaits the completion of the drilling programme.

At the present time the Kaitangata Co. is drilling an area adjoining its mine, one borehole having already proved the existence of a coal-seam comparable to that at present being worked, while the Mines Department has just commenced drilling operations at Wangaloa to determine the existence or otherwise of coal-seams in the underlying Kaitangata series. In addition, the Mines Department is boring an area adjacent to the Wilton State Coal-mine in order to prove additional reserves of coal to provide for continuity of operations at that mine.

Generally, while it is appreciated that the development of hydro-electric schemes and the use of alternative fuels such as oil for railway locomotives may lessen somewhat the demand for coal, every precaution is being taken to maintain coal production at a level in keeping with the needs of the country.

OPENCAST MINING

Opencast mining continues to be responsible for an increasing proportion of the total coal production, and in 1946, 528,700 tons of coal were produced by this method of mining, almost 20 per cent. of the total, and thus comparable with the proportion achieved by this form of mining in America, where it has been most fully developed.

The recent development of opencast mining did not commence till October, 1943, with the opening-up of the Glen Afton opencast mine, but since that date until the end of April, 1947, the aggregate production of these opencast mines which had not commenced operations in October, 1943, amounted to 1,059,223 tons.

Seven State-operated opencast mines contributed 331,477 tons to the 1946 total, almost two-thirds of the total. Of these mines, Stockton, with a production of 141,804 tons, continues to be the most important both in respect of tonnage and, seeing that it is bituminous coal, in the quality of the coal produced. Detailed topographical and geological surveys of this area have been proceeding for some time, and, subject to confirmation by drilling that has recently been commenced, it is proposed to install a high-capacity aerial ropeway and so eliminate the present transport bottleneck and allow of increased production. Generally, a long life cannot be expected for opencast mines, and during this year operations have terminated at Glen Afton opencast mine where some 54,000 tons have been produced, and at Ohai opencast, where some 95,000 tons have been produced. As a replacement for the Ohai opencast, operations have been commenced on an area acquired from the purchase of the assets of the Black Diamond Co., and consideration is now being given to a replacement for the Glen Afton opencast mine in the Huntly district. Investigations are continuing of other areas where opencast mining may be possible, and as the result of a boring programme at Wangaloa it has been proved that areas adjacent to the Wangaloa opencast mine are capable of supplying a considerable tonnage of coal by opencast methods, and at the present time an area in the Blackball district is being investigated by shallow drilling. At Kimihia, drilling from a barge on the lake has demonstrated that operations may be considerably extended. With experience now gained from actual mining operations it has been possible to produce a much cleaner product from mining operations, and the provision of screening-plants has allowed of coal being delivered to the market in much more acceptable form than that previously obtainable. Due consideration is being given to the restoration of the surface at abandoned opencast mines, and, in particular, it is proposed to plant trees at the site of the Glen Afton opencast mine.

MINING PRACTICE

Labour shortages have been responsible for urging consideration of increased mechanization of our coal-mines, and, while New Zealand coal deposits are generally not suitable for mechanization to the same degree as those overseas, the necessity exists to mechanize as many operations as the conditions permit. From experience obtained during a visit to mechanized mines in Australia, officers of the Mines Department have prepared plans which have allowed of the ordering of equipment to partially mechanize a section of the Wilton State Coal-mine. Use will be made of coal-cutters, electrical drills, and scraper loaders, and operations should not only permit of an increased tonnage being available from this mine, but allow of experimental work leading to mechanization of additional mines.

In view of increasing mechanization of mines, the question of the use of electrical power underground in coal-mines has been examined in some detail recently by a conference of officers of the inspectorate staff and of the State Coal-mines.

In conjunction with the Department of Scientific and Industrial Research, the Mines Department took advantage of the visit to Australia of Professor Jones, a British authority on coal-dust problems, and arranged with him to extend his visit to New Zealand and confer with officers of the Departments concerned. While pneumoconiosis has, fortunately, so far not been contracted by miners in New Zealand coal-mines, increasing mechanization will increase the generation of coal-dust, and much valuable information as to the control of coal-dust has been obtained as a result of Professor Jones's visit.

Along with increased mechanization, consideration is now being given to the introduction of hydraulic stowage practice into New Zealand coal-mines, thereby increasing the percentage of extractable coal and conserving limited resources.

Availability of suitable stowing material is a main prerequisite to the introduction of this practice, and at the Mangapehi State Coal-mine pumice deposits, which are very suitable, occur close to the mine. Early this year a visit to this mine was arranged of an Australian authority on hydraulic stowage, Mr. Arnold Black, underground manager of the Broken Hill South Mine. Mr. Black has reported that the pumice material available is ideal in his opinion for hydraulic stowage, and that there should be no difficulty in introducing this practice at the mine in question. Accordingly, experiments with this form of mining are to be made at the Mangapehi Mine.

INVESTIGATION OF COAL RESOURCES OF NEW ZEALAND

The investigation of coal resources was continued during the year by --

- (1) The Coal Survey, whose activities were mainly geological and chemical.
- (2) An organization set up by the Mines Department to follow up the Coal Survey with detailed topographical surveys and shallow prospecting by means of cuts, pits, and hand-drilling.
- (3) The drilling section of the Mines Department carrying out investigations by deep-core drilling, all of these organizations working in close co-operation.

While much useful information was obtained as a result of these activities it has not been sufficient in any case to modify the estimates of the coal resources of New Zealand as set out in last year's Mines Statement.

Particulars of the operations of the Coal Survey are set out elsewhere in this Statement. The most interesting feature was the preliminary survey of the Pike River area in the Grey coalfield, where there are promising indications that a field containing good-grade bituminous coal in some quantity exists. Although access to the field is at present difficult, the problem is not insuperable, and the evidence already obtained warrants a thorough investigation of this field.

The efforts of the Mines Department survey organization were in great part concentrated upon prospecting, surveying, and mapping the coal-bearing areas on the Stockton-Denniston Plateau, adjacent to the Stockton State mine. Approximately 5,000 acres have been prospected and part surveyed, and of this total, 500 acres have been completed and the final report prepared. Estimates of the coal resources and preparation of the final structural contour maps of other sections await the completion of a drilling programme, which has been recently commenced. Prospecting in the Garvey Creek area comprised the completion of trenching the lower (main) seam, and tracing and trenching this seam south. The country is rough, heavily wooded, and difficult of access. The coal-seams are seldom exposed, and in places the outcrops are heavily masked with slip debris. Consequently, prospecting and the subsequent trenching is slow and irksome. Recent prospecting indicates an extensive coal-bearing block south of the areas previously prospected.

At Iron Creek Blackball an area of shallow coal north from the northern limits of the old Blackball mine workings was prospected and trenched, but, owing to broken ground, prospecting operations failed to locate any appreciable area of good-quality coal. Shallow drilling has now been commenced upon this area. The Elliotvale Block, situated at the northern end of the Kaitangata Survey District, has been systematically prospected by trenching and shallow drilling, but prospecting work did not prove the existence of an area of workable coal sufficiently large to warrant provision of suitable access and development.

At Wangaloa drilling in Johnston Creek in the vicinity of the opencast mine has determined the limits of the area suitable for opencast mining, while scout drilling at Pivot Creek has proved the existence of an area of 15 acres, containing a coal-seam up to 20 ft. in thickness, suitable for opencast mining.

The following table shows the output of coal from the various coalfields and the comparative increases and decreases for the years 1946 and 1945, together with the approximate total production to date:—

Coalfield.	Output.		Increase.	Decrease.	Approximate Total Output up to 31st December, 1946.
	1946.	1945.			
	Tons.	Tons.	Tons.	Tons.	Tons.
North Auckland	77,773	89,525	..	11,752	6,541,952
Waikato (including Taranaki)	902,876	957,419	..	54,543	23,903,591
Nelson	6,891	7,805	..	914	758,414
Buller	535,174	540,782	..	5,608	29,497,643
Reefton	128,574	122,622	5,952	..	1,820,692
Grey	486,517	497,982	..	11,465	22,020,693
Canterbury	34,037	37,007	..	2,970	1,373,231
Otago	209,647	200,330	9,317	..	15,337,421
Southland	412,381	380,104	32,277	..	10,623,363
Totals	2,793,870	2,833,576	47,546	87,252	111,877,000

The outputs of the various classes of coal mined in each inspection district were:—

Output for 1946

Class of Coal.	Northern District (North Island).	West Coast District (South Island).	Southern District (South Island).	Total.	Total Output to 31st December, 1946.
	Tons.	Tons.	Tons.	Tons.	Tons.
Anthracite .. .. .	..	..	2,272	2,272	15,326
Bituminous .. .. .	..	955,998	..	955,998	60,453,109
Sub-bituminous	980,649	154,606	433,765	1,569,020	44,606,802
Lignite .. .. .	..	46,552	220,028	266,580	6,801,763
Totals for 1946	980,649	1,157,156	656,065	2,793,870	111,877,000
Totals for 1945	1,046,944	1,169,191	617,441	2,833,576	109,083,130

TABLE SHOWING THE INCREASE OR DECREASE IN THE ANNUAL PRODUCTION OF COAL AND THE QUANTITY OF COAL IMPORTED

Year.	Coal produced.		Coal imported.		
	Tons.	Yearly Increase or Decrease.	Tons.	Increase over Preceding Year.	Decrease below Preceding Year.
Prior to 1930	71,298,699	..	12,734,199	..	..
1930	2,542,092	Inc. 6,288	157,943	..	57,713
1931	2,157,756	Dec. 384,336	179,060	21,117	..
1932	1,842,022	Dec. 315,734	103,531	..	75,529
1933	1,821,258	Dec. 20,764	99,272	..	4,259
1934	2,060,315	Inc. 239,057	100,715	1,443	..
1935	2,115,184	Inc. 54,869	97,398	..	3,317
1936	2,140,217	Inc. 25,033	111,078	13,680	..
1937	2,277,799	Inc. 137,582	116,499	5,421	..
1938	2,222,088	Dec. 55,711	109,206	..	7,293
1939	2,342,639	Inc. 120,551	111,537	2,331	..
1940	2,516,099	Inc. 173,460	64,860	..	46,677
1941	2,639,507	Inc. 123,408	78,171	13,311	..
1942	2,680,041	Inc. 40,534	90,865	12,694	..
1943	2,787,868	Inc. 107,827	37,454	..	53,411
1944	2,805,970	Inc. 18,102	..	..	37,454
1945	2,833,576	Inc. 27,606	..	..	..
1946	2,793,870	Dec. 39,706	27,185	27,185	..

TABLE SHOWING THE QUANTITY OF COAL EXPORTED ANNUALLY FROM NEW ZEALAND FROM 1930 TO 1946

Year.	Tons.	Year.	Tons.
1930	126,118	1939	43,990
1931	48,334	1940	81,287
1932	35,866	1941	58,179
1933	34,131	1942	54,700
1934	40,361	1943	42,522
1935	46,146	1944	37,688
1936	44,872	1945	21,989
1937	113,116	1946	27,366
1938	55,711		

SUBSIDY ON COAL PRODUCTION

Payments for the financial year ended on 31st March, 1947, were—

	£
District tonnage subsidies	794,774
Subsidy on Saturday work	69,180
Subsidy on work on statutory holidays	101,521
Subsidy on shift bonuses	54,801
Subsidy on increased cost of tools	9,370
Special subsidies on uneconomic mines operated by the State	161,802
Miscellaneous	127,147
Total	1,318,595

State coal-mines received £664,471 of the total, and the balance, paid to privately-owned mines, was £654,124. In addition, privately-owned mines in the Waikato district received £135,950 in respect of guaranteed profits.

The total amount of subsidies paid from the inception in May, 1940, to the 31st March, 1947, is £4,408,543.

STATE COAL-MINES

The comments on the operations of the State coal-mines which have appeared in previous statements have been transferred this year to the introductory section of the annual report on the State coal-mines (C.—2A).

CO-OPERATIVE MINING, STATE COAL RESERVE

During the year 1946 fifteen co-operative coal-mining parties were operating on areas within the State Coal Reserve, Greymouth. The production for the year was 88,709 tons, and the number of men employed was 129. In 1945 sixteen parties produced 81,373 tons.

Co-operative parties have produced to date 2,077,217 tons of coal and have paid royalties to the Crown amounting in the aggregate to £100,123.

WAIKATO COAL-MINES CONTROL

During the year there was a continuance of control by the Waikato Coal-mines Control Board, established under the provisions of the Waikato Coal-mines Control Emergency Regulations 1942, of the mines owned by Glen Afton Collieries, Ltd., Pukemiro Collieries, Ltd., Renown Collieries, Ltd., and Taupiri Coal-mines, Ltd.

Amongst other provisions, the regulations provide for the guaranteeing by the State of the profits of the companies based on the average figure of three years prior to control and full settlement has been made of all claims lodged to date.

Since the profits of the companies are guaranteed, the full district rate of subsidy has not been paid, for such a procedure would simply have involved reduced payments under one item in Stabilization Account and increased payments under another.

The total amount paid in respect of claims under the Control Regulations to the end of the respective financial year ending in 1946 of each company has been £378,848.

No prolonged stoppages occurred at the controlled mines during 1946, but a shortage of truckers at Renown and of hewers and truckers at Taupiri is reflected in the reduced outputs from these collieries.

The following table shows the production from the Waikato controlled collieries over a period of seventeen years :—

Calendar Year.	Glen Afton.	Pukemiro.	Taupiri.	Renown.	Total.
	Tons.	Tons.	Tons.	Tons.	Tons.
1930	177,244	127,205	143,163	88,790	536,402
1931	277,107	110,069	130,754	82,749	600,679
1932	164,824	65,904	90,415	52,762	373,905
1933	122,251	69,370	94,858	109,129	395,608
1934	197,316	120,388	171,330	105,847	594,881
1935	234,522	119,600	156,698	113,591	624,411
1936	235,782	117,940	155,785	106,466	615,973
1937	223,301	112,036	158,288	114,893	608,519
1938	218,951	102,751	160,463	107,202	589,367
1939	211,768	110,987	176,020	121,164	619,939
1940	208,684	127,849	184,995	144,646	666,174
1941	222,333	134,242	203,298	128,297	688,172
1942	224,489	125,989	207,738	131,637	689,853
1943	241,709	138,530	219,643	141,974	741,856
1944	204,387	128,970	212,370	147,619	693,346
1945	189,707	116,696	195,205	130,037	631,645
1946	194,924	122,271	165,859	110,713	593,767

The peak year of 741,856 tons occurred in the first complete year of control, but production has since receded.

CARBONIZING AND BRIQUETTING

The production of the low-temperature coal carbonizing and briquetting plant of Waikato Carbonization, Ltd., at Rotowaro during 1946 was—

Raw coal carbonized	.. ..	.. ..	.. ..	.. ..	24,920 tons.
Carbonized coal produced	.. ..	.. ..	.. ..	.. ..	12,211 tons.
Average percentage of carbonized to raw coal..	.. ..	.. ..	.. ..	.. ..	49 per cent.
Carbonettes manufactured	.. ..	.. ..	.. ..	.. ..	12,575 tons.
Tar and oil treated	.. ..	.. ..	.. ..	.. ..	213,885 gallons.
Pitch produced	.. ..	.. ..	.. ..	.. ..	166 tons.
Cresote produced	.. ..	.. ..	.. ..	.. ..	164,082 gallons.
Char sold for producer gas-plants	.. ..	.. ..	.. ..	.. ..	126 tons.
Char sold for other purposes	.. ..	.. ..	.. ..	.. ..	348 tons.

During the year Smokeless Fuel and Briquettes (Canterbury), Ltd., produced 33,675 gallons of tar and 400 tons of briquettes.

MINERALS OTHER THAN GOLD

There has been a further decline in the production of minerals in which interest had been stimulated by wartime needs. Production of both mercury and mica ceased early in 1945, while the export figures for scheelite concentrates are a mere fraction of those achieved during war years.

The world shortage of base metals and the high prices for the metals and the ores of those metals resulting from this have created some interest in prospecting for the ores of copper, lead, and zinc, which, though of widespread occurrence in New Zealand, have not as yet been found in deposits of economic value. It is of interest in this connection that a shipment of copper-ore, the first for many years, has recently been made to Australia.

Production of the less spectacular minerals such as clays and limestones continues to increase, and the production of agricultural limestone for 1946 was a record and approached closely to the million tons mark.

Scheelite.—Mining operations for scheelite were continued by various small working parties in the Glenorchy district, but on a much reduced scale. During 1946 the equivalent of 27 tons of concentrates assaying 65 per cent. WO_3 was produced and shipped, as against 34 tons in 1945 and 145 tons in 1944, the peak year of wartime production. The collapse in the price of scheelite that followed the 1914-18 war has not been repeated, and the Glenorchy producers were able to enter into a contract with an English firm of ore-buyers for disposal of their concentrates at an acceptable price. Since completion of this arrangement there has been a marked and continued rise in the price of scheelite concentrates overseas, and the future market for scheelite-ores, with expanding uses of tungsten, seems assured. Producers in the Glenorchy district, in common with other sections of the mining industry, have had difficulty in securing suitable labour, and the recent drought has hampered operations.

Mercury.—There was no production of mercury during the year, and the property and plant of Mercury Mines, Ltd., has continued on a care-and-maintenance basis. The price of mercury has slumped to a fraction of the price obtained during the war owing to resumption of the marketing of mercury by the international mercury cartel from rich and extensive deposits in Spain and Italy. The present price-level precludes all possibility of production in New Zealand at a profit.

Manganese.—A shipment of 402 tons of manganese ore was made by the tributor of Mirandite Products, Ltd.'s, mine at Clevedon to Australia, which realized £1,686. Work was continued at the mine, and it is expected that another shipment will be made during 1947.

Copper.—After experiencing considerable difficulty in securing shipping space it was at last found possible to make a shipment of 580 tons of copper-ore to the smelter at Port Kembla, in Australia, from the copper-ore occurrence recently opened up at Pakotai, near Whangarei, in North Auckland. The ore proved to contain approximately 13 per cent. of copper, 3 dwt. of gold, and 33 dwt. of silver per ton. However, before the real worth of the deposit can be assessed considerable prospecting work is required, and it is expected this will be undertaken at an early date.

Iron-ore.—From the deposits in North Auckland and at Onekaka 7,406 tons of iron-ore were obtained for use in gas-purification, the manufacture of stock lies, and in the cement industry, the greater part of this production coming from the North Auckland occurrences.

Uranium.—Investigations into the occurrence of uranium-ores in New Zealand were continued by officers of the Department of Scientific and Industrial Research, and during the year one of these officers was sent to Australia to investigate the methods

used there in concentrating uranium-ores. So far New Zealand's sources of uranium-ores have proved to be exceedingly low grade, and their economic worth is difficult to assess.

Mica.—There has been no activity in mica-mining during the year as it is impossible to produce mica in New Zealand in competition with countries overseas, where cheap, coloured labour can be used for hand-dressing, for which there is so far no alternative process.

Asbestos.—The mine and plant of the Hume Pipe Co. in the Upper Takaka district continued on a care-and-maintenance basis, and there was no production of asbestos.

Bentonite.—During the year 154 tons of bentonite, of a value of £777, were produced from deposits at Porangahau, as against 167 tons, valued at £800 in 1945. Field-work by officers of the Geological Survey has shown that bentonitic material is of widespread occurrence in Marlborough and North Canterbury, and it is possible that a deposit of economic value may eventually be located.

Phosphate.—During the year 11,047 tons of low-grade phosphatic sandstone were obtained from the Clarendon deposits, bringing the production from this new deposit since commencement of operations in 1943 to a total of 40,685 tons.

Serpentine.—The demand for serpentine in the production of fertilizer has continued, and 20,058 tons were produced, as against 13,933 tons in 1945. Approximately half of this year's production came from deposits in North Auckland and half from an occurrence near Te Kuiti, at which mining operations were commenced during 1946. The total production of serpentine till the end of 1946 now amounts to 172,456 tons, valued at £101,123.

Limestone.—Production of limestone for agricultural use amounted to 929,794 tons, a record, and a substantial increase on the 812,635 tons produced for this use in 1945. In the last ten years the production of limestone for agricultural use has trebled, and it is apparent that demand for this material will still further increase.

Dolomite.—During the year 3,893 tons of dolomite were obtained from the Mount Burnett deposits, near Collingwood, as against 4,644 tons in 1945. Production would have been greater had it not been for difficulties in obtaining shipping space. In all, 26,303 tons have now been obtained from this deposit.

Clays.—During 1946, 109,809 tons of clay were produced for use in the making of bricks, tiles, and pipes, and 9,425 for other uses, such as in pottery and in the manufacture of refractories. It is expected that the production of clays of all classes will increase and that greater attention will be paid to processing so that clays of uniform grade will be available to industry.

Silica Sand.—During 1946, 16,949 tons of silica sand were produced from deposits at Parengarenga, Aramoho, Hyde, Mount Somers, Pleasant Valley, and Parapara. Of these, that at Parengarenga, which contributed 14,679 tons to this total, was the most important.

Pumice.—Production of pumice during 1946 amounted to 3,409 tons. Of this total 2,539 tons were exported and 870 tons were used in local industry.

Nephrite (Greenstone).—There have been many requests from overseas for supplies of New Zealand's semi-precious stone, nephrite. In the past boulders of this stone have been recovered from gravels incidental to gold sluicing, but with the decline in alluvial mining supplies have not been sufficient to meet local demands, much less consider export.

General.—Small amounts of platinum, arsenic, diatomaceous earth, Fuller's earth, magnesite, and quartzite were also produced during 1946.

MEN EMPLOYED IN OR ABOUT MINES AND QUARRIES

The following table shows the number of men employed in each inspection district during 1946 and 1945 :—

	Inspection District.			Totals.	
	Northern (North Island).	West Coast of (South Island).	Southern (Rest of South Island).	1946.	1945.
Gold, silver, and scheelite ..	492	521	153	1,166	1,304
Coal	2,114	2,447	996	5,557	5,592
Quarries	1,202	143	539	1,884	1,718
Silica	9	3	4	16	11
Cinnabar	2	..	..	2	9
Iron-ore	16	5	..	21	22
Manganese	1	..	..	1	1
Fuller's earth	1	..	..	1	2
Diatomaceous earth	1	..	2	3	4
Bentonite	2	..	..	2	5
Serpentine	10	..	..	10	5
Asbestos .. ..	..	..	..	..	6
Dolomite .. ..	..	10	..	10	5
Clay	3	2	..	5	16
Phosphate .. ..	..	..	3	3	3
Mica .. ..	..	..	..	..	5
Magnesite .. ..	..	2	..	2	..
Totals	3,853	3,133	1,697	8,683	8,708

MINING AND QUARRY ACCIDENTS

Fatal and serious accidents in the mining industry during the year 1946 were :—

	Men killed.	Men seriously injured.	Men ordinarily employed.
Coal-mines	4	43	5,557
Metal mines .. ..	..	3	1,166
Quarries	1	10	1,884
Totals	5	56	8,607

MINING PRIVILEGES

The table below shows the numbers and descriptions of mining privileges granted through the Warden's Courts during 1946 and 1945 :—

	1946.	1945.
Claims	23	19
Prospecting licences	83	89
Water rights	22	18
Residence-sites	29	26
Mineral licences	8	8
Miscellaneous	10	1
Totals	175	161

GEOLOGICAL SURVEY

In 1946-47 new areas have been regionally surveyed at Motatau, in North Auckland; Waitotara-Wanganui; d'Urville Island-Dun Mountain, including the so-called "Mineral Belt" of Nelson; Moeraki-Kakanui; Monowai-Sandhill Point. White Island was examined by Mr. Healy and Mr. Fleming from 7th to 14th January, and later again visited by Mr. Healy.

The coalfields have been continuously examined at Greymouth, Reefton, Wangaloa, and on occasions at Kamo, Tatu, Retaruke, Burke's Creek, Pike River, Mount Davy, Paparoa, Blackball, Elliotvale, Kaitangata, and Ohai.

Mr. Willett has prepared a map of the limestones of Southland and written a report on them and how they are being worked.

The natural-gas field at Greymouth was measured and reported on by Mr. Ower and shown to be not worth opening up.

Water-supplies have been investigated and reported on at several places in North Auckland, parts of Auckland City and suburbs, Otahuhu, Wairakei, Tongariro, Mangatainoka, Blenheim, Picton, many parts of Canterbury, Goodwood, Southland, Stewart Island. Hot-water supplies have been reported on at several centres, including Helensville, Rotorua, Wairakei, Maruia.

The active volcano, Ruapehu, has been examined periodically, and on the evidence available shown to be waning normally. Not enough work is being done in volcanology to ascertain what is likely to happen here or elsewhere in New Zealand in the future.

Titaniferous iron-sands have been mapped in detail and reported on at Waitara and Wanganui, and a duplicate collection of a hundred samples has been deposited at the Geological Survey.

The clay deposits near Wellington have been systematically collected and tested, and a report is being prepared. Many samples have been collected throughout New Zealand.

Bentonites were mapped and reported on at Blue Slip, Kekerangu, and Clarence, and more were sampled at Oaro and Waipara.

Stones for quarrying for building, roadmaking, &c., have been reported on at many places, including North Auckland, Piako, Waikato, Bluff.

Gem-stones, dredge-concentrates, building-stone, cement materials, concrete aggregate, &c., have been tested petrographically.

Dam-sites throughout the country have been reported on geologically and, where advisable, geophysically as well; and data for engineering works have been supplied at Bay of Plenty, Manawatu, Rimutaka, Wanaka.

Many small economic reports have been issued; the major reports include Dr. Marwick's bulletin on Te Kuiti Subdivision and Mr. Macpherson's memoir on "An Outline of Late Cretaceous and Tertiary Diastrophism in New Zealand."

Data is being collected on stratigraphy, palaeontology, petrography, volcanology, &c.

COAL SURVEY

The Coal Survey Laboratory has co-operated with the field staffs of the Mines Department, and the Geological Survey in continuing the physical and chemical survey of the coal resources of the Dominion. Special investigations have been made in the Westport, Stockton, Reefton, Greymouth (Rewanui and Pike River), Kaitangata, Maitara, and Ohai districts, and a total of 569 samples from headings, outcrops, and bores throughout New Zealand have been analysed.

The possibility of briquetting Maitara lignite was specially investigated by a Coal Survey Officer at the Yallourn Works, Australia, and a report on the analyses of coals from all producing mines in New Zealand was prepared.

During the year Mr. R. L. Andrew retired, and Mr. W. A. Joiner, Director of the Dominion Laboratory, was elected to fill the position of Chairman of the Coal Survey Committee.

LABORATORY INVESTIGATIONS

A large number of examinations and analyses of samples of minerals and ores forwarded by prospectors and other members of the public was carried out during the year.

Since discontinuance of purchase of tungsten-ores by the Imperial Government, the number of analyses of scheelite has greatly decreased.

Work on the systematic survey of the clay resources, including brickmaking clays in the Wellington district, was continued in conjunction with the Geological Survey.

A special feature of the year's work was the large number of samples of marls, limestones, and cementstones examined as raw materials for Portland cement manufacture, as well as cements examined more especially for alkali content.

Other samples included mine airs and gases, serpentine for the manufacture of serpentine-superphosphate, phosphate rock, feldspar, chalk, limestone, bentonite, flints, glass sand, and diatomaceous earth.

DRILLING OPERATIONS

An extensive drilling programme has been carried out during the year, active drilling operations being conducted at Kawakawa, Kimihia, Rewanui, Brunner, Dunollie, Strongman Mine, and the Morley Block, Ohai. In all, sixty-six holes, the total depth of which amounted to 16,556 ft. were drilled during 1946 by the Department's drills, while an additional nineteen holes, totalling 1,097 ft. in depth, were drilled by the Scientific and Industrial Research Department's drill on behalf of the Mines Department. Despite the acquisition of many new drills during the past few years, drilling-equipment has proved inadequate to the many demands of the Department. A new Sullivan 37 drill and a new Longyear-Porta drill have recently arrived from America, and the Sullivan drill is already in commission at Wangaloa, while consideration is at present being given to further increasing the number of drills to cope with the heavy programme facing the Department.

Details of the drilling programme are as under :—

Rewanui.—Hole No. 262, which had reached 681 ft. at the end of 1945, was bottomed at 1,210 ft., while Hole No. 265 was drilled to 1,121 ft. This completed the programme in this section, which indicated that the area contained 1,500,000 tons of recoverable coal. The drill from this area was then dismantled preliminary to shifting to the Mount Davey area, but, owing to difficulties in access, all the time so far has been spent in installing aerial ropeways and constructing camps, and drilling has not yet commenced.

Brunner.—Hole No. 266, which was drilled in 1945 to a depth of 2,020 ft., was successful in proving seams of coal under the overlying Brunner series, and accordingly hole No. 273 was commenced a mile distant to establish continuity of the seams. This hole was drilled to 2,413 ft. during the early part of 1946, but was unsuccessful in disclosing coal, and the remainder of the year was spent in providing access to a new borehole site where drilling commenced early this year. By the end of May this hole had attained a depth of 1,300 ft. and drilling was still proceeding.

Fisher and Party, Dunollie.—Drilling was commenced on this area in order to locate a seam for a co-operative party, and during 1946 five holes were drilled with a total depth of 1,979 ft. Results have been generally disappointing in not proving a sufficiently large block of coal to justify development, and after additional drilling during the present year the area was abandoned.

Ohai.—Drilling operations were continued during the year at the Morley Block, and seven holes, with a total depth of 5,169 ft., were drilled. Sufficient tonnage of coal has now been established to justify the opening-up of a large-scale colliery, and drilling has been meantime suspended to allow of drilling at Mossbank and later at the Star Mine.

Wangaloa.—The new Sullivan 37 drill, after a satisfactory test at Stockton, has now commenced work at Wangaloa to prove the existence or otherwise of coal-seams in the underlying Kaitangata series. Difficult drilling conditions are to be expected in this area, but so far progress has been satisfactory.

Stockton.—Drilling has been urgently required at Stockton, and, as no Department drill has been available, arrangements have now been made to hire a suitable drill from the Public Works Department, and drilling has recently commenced.

Strongman Mine.—Underground drilling was carried out at this coal-mine for the greater part of the year, and five holes, with a total depth of 728 ft., were drilled from various parts of the workings to locate either upper or lower seams.

Co-operative Mines.—Two shallow underground holes, totalling 293 ft. in depth, were drilled for Kaye and party, but were unsuccessful in locating coal. One hole, 149 ft. in depth, was drilled underground for Armstrong and party, and was successful in locating a seam of coal 13 ft. 6 in. thick at the point of intersection.

Kawakawa.—Five holes, of a total depth 666 ft., were drilled at Kawakawa during the year, but no coal was disclosed, and drilling was abandoned.

Kimihia.—Drilling from a barge was undertaken at Lake Kimihia, and thirty-eight holes, with a total depth of 3,509 ft., were completed during the year, proving an additional area to which opencast mining can be extended. Nineteen holes, of a total depth of 1,097 ft., were also drilled in this vicinity by the drill of the Department of Scientific and Industrial Research.

Wilton Mine.—Drilling operations have recently been commenced in an area adjoining the Wilton No. 3 workings.

COAL-MINES COUNCIL

During the year the Coal-mines Council dealt with a large number of disputes in coal-mines relating to rates of pay and conditions of employment. Eighty-five separate decisions have been issued by the Council affecting mines from North Auckland to Southland. Travelling and incidental activities made for a strenuous year for all members of the Council.

Mr. John Dowgray, who has given sterling service as Chairman since July, 1944, resigned towards the end of the year by reason of failing health, and Mr. C. H. Benney has been appointed Chairman in his place.

I desire to express my thanks to Mr. Dowgray on behalf of the Government for his unflinching devotion to the cause of industrial harmony in the industry during the difficult years of war.

SCHOOLS OF MINES

The expenditure on Schools of Mines for the year ended 31st March, 1947, was £5,099. In the previous year the amount was £4,190. One candidate obtained a scholarship at the annual examination. All the scholarship entries were from the Otago University School of Mines.

It is hoped in the near future to arrange a representative conference to discuss ways and means of adjusting the curriculum of the Otago University School to the needs of the coal-mining industry and attracting graduates to the technical force of the industry.

RESCUE STATIONS

The training of rescue teams continued during the year at the Dobson, Rotowaro, and Ohai rescue stations, and refresher courses for trained men were held at regular intervals.

In these districts trained teams, using the station equipment, have repeatedly assisted to bring underground fires and heatings under control.

Owing to the difficult building situation, it has, unfortunately, not been possible to complete the new Granity Station and bring it into active operation.

SOCIAL AMENITIES

During the financial year 1946-47 the sum of £5,029 was expended in the provision of improved social amenities for mining communities.

In the main, the expenditure was for the improvement of bowling-greens, tennis-courts, swimming-pools, and sports-grounds. In general, the social-amenities programme is severely restricted by the prevailing shortage of man-power and materials.

HOUSING

During the financial year 1946-47 housing loans were granted to twenty-three employees to a total amount of £12,417.

Three loans were for the construction of new houses, fourteen for the purchase of existing houses, and the remaining six for alterations or renovations. The locations of the houses are: Runanga, 5; Dumollie, 2; Stockton, 3; Ngauwahia, 3; Taylorville, 5; Ohura, 3; Dobson, 1; Glen Massey, 1.

The following table gives details of loans granted for the last ten years:—

Year ended	Erection of New Houses.		Purchase of Existing Houses.		Repairs and Renovations.		Total.	
	Number.	Amount.	Number.	Amount.	Number.	Amount.	Number.	Amount.
		£		£		£		£
31/3/38 ..	3	1,200	..	..	1	390	4	1,590
31/3/39 ..	8	3,830	1	250	3	788	12	4,868
31/3/40 ..	9	5,225	..	..	1	250	10	5,475
31/3/41 ..	16	10,221	..	..	3	909	19	11,130
31/3/42 ..	14	9,088	..	..	1	120	15	9,208
31/3/43 ..	6	5,500	11	6,230	1	495	18	12,225
31/3/44 ..	10	10,335	15	6,788	3	1,025	28	18,148
31/3/45 ..	4	4,549	7	3,925	1	395	12	8,869
31/3/46 ..	2	2,000	7	2,748	2	560	11	5,308
31/3/47 ..	3	4,160	14	7,195	6	1,062	23	12,417

COAL-MINERS' RELIEF FUND

Receipts from the levy of $\frac{1}{2}$ d. per ton for the year ended 31st March, 1947, were £6,212, and expenditure for the year was £8,299.

Interest earned was £78, and the amount standing to the credit of the fund on 31st March, 1947, was £1,841.

At the close of the previous year the figures were: receipts, £5,706; expenditure, £9,219; interest, £165; balance as at 31st March, 1946, £3,851.

ASSISTANCE TO MINING

Financial assistance to the mining industry by subsidies and loans during the year ended 31st March, 1947, amounted to £21,314. Of this sum, £354 was for gold-mining, £420 for cinnabar-mining, £40 for scheelite-mining, and the balance for coal-mining.

MINERS' BENEFITS

The provision for payment of a miner's benefit is contained in the Social Security Act, 1938, which has been operative since 1st April, 1939. One of the necessary qualifications is that the applicant should be seriously and permanently incapacitated by miner's phthisis or totally and permanently incapacitated by heart or other occupational disease associated with mining service in New Zealand.

The rate of benefit for a miner is £104 per annum, increased, in the case of an applicant who is married, by £104 per annum for his wife. The widow of a miner who died while in receipt of a miner's benefit may be granted a benefit of £78 per annum during widowhood.

This scheme, which originated with the Miner's Phthisis Act, 1915, is administered by the Social Security Commission, and the following is a summary of the operations for the year ended 31st March, 1947:—

	£
Payments from 1st November, 1915, to 31st March, 1946 ..	1,663,026
Payments for 1946-47	105,416
	<hr/>
	£1,768,442
Number of new grants for year 1946-47—	
Males	44
Females	4
	— 48
Number of benefits in force at 31st March, 1947—	
Males	634
Females	84
	—718
Annual value of benefits in force at 31st March, 1947 ..	£101,956
Dissection of benefits in force at 31st March, 1947—	
Single miners	320
Married miners	314
Widows	84
	<hr/>
	718
	<hr/>

LEGISLATION

The Coal-mines Act, 1925, was amended by section 17 of the Statutes Amendment Act, 1946, to provide that leases under Part I of the Act may be restricted to a specified seam of coal or to a defined coal-bearing horizon.

APPENDICES TO THE MINES STATEMENT

APPENDIX A

REPORTS RELATING TO METALLIFEROUS MINES AND QUARRIES

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

Wellington, 21st May, 1947.

SIR,—

I have the honour to present my report on metalliferous mines and quarries for the year ended 31st December, 1946.

ACCIDENTS

During 1946 there were no fatal accidents in the metalliferous mines, at which 1,166 men were ordinarily employed. Three serious accidents occurred, causing injuries to three men. All these were in the West Coast Inspection District and took place on dredges.

GOLD-MINING

Production of gold for the year shows a decline of 9,093 oz. when compared with 1945. Quartz-mining output decreased by 6,452 oz., dredging by 2,858 oz., and alluvial mining increased by 217 oz.

Sixteen dredges operated during the year and produced 79,228 oz.—*i.e.*, slightly more than 66 per cent. of the total output.

The Martha and Blackwater Mines continue to be the only significant producers in the quartz-mining section.

MINERALS OTHER THAN GOLD

The production figures for minerals other than gold are shown in detail elsewhere in the Statement. The most promising development is the steady and substantial increase in the quantity of limestone produced for agricultural use, which now amounts to nearly 1,000,000 tons per annum.

QUARRY OUTPUTS

The following table shows the outputs of quarries and the numbers of men ordinarily employed during 1946 :—

District.	Number of Quarries.	Men employed.	Road Metal.	Stone for Harbour-works	Building or Monumental Stone.	Limestone for Agriculture.	Limestone or Marl for Cement	Miscellaneous.	Value at Quarry.
			Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	£
Auckland	178	836	427,047	..	..	220,929	275,748	420,862*	320,738
Hauraki	31	116	121,321	..	218	..	..	..	50,896
Hawke's Bay ..	27	85	49,969	..	..	46,326	..	1,200	25,790
Taranaki	22	62	33,257	..	..	..	..	..	12,778
Wellington ..	44	103	41,172	..	..	99,221	..	26,150	56,886
Nelson, Westland, Buller, and Marlborough	34	143	8,436	415	..	35,045	61,038	4,148	18,413
Canterbury, Otago, and Southland	110	542	104,654	54,357	14,728	528,273	105,681	114,494†	272,091
Totals, 1946 ..	446	1,887	785,856	54,772	14,946	929,794	442,467	566,854	757,592
Totals, 1945 ..	398	1,718	861,096	43,673	2,480	812,635	436,036	478,503	710,448

* Includes clays for brickmaking, &c., 67,334 tons, valued at £9,387. † Includes phosphate for agriculture, 11,047 tons, valued at £3,314, and clays for pottery, &c., 28,848 tons, valued at £10,476. Excludes 14,002 tons of sand, valued at £6,747, produced at pits not subject to inspection.

QUARRY ACCIDENTS

The following is a summary of fatal and serious accidents at quarries during 1946 :—

Cause.	Number of Accidents.		Number of Men.	
	Fatal.	Serious.	Killed.	Seriously injured.
Falls from face	1	2	1	2
Falls of ground .. ..	..	5	..	5
Explosives .. ..	..	1	..	1
Miscellaneous .. ..	..	2	..	2
Totals	1	10	1	10

STATE AID TO MINING

SUBSIDIZED PROSPECTING

A total amount of £21,314 was advanced during the year 1946-47 to the mining industry by way of subsidies, loans, and other forms of financial assistance.

The Mines Department expended £25,144 in surveying, prospecting, and developing of areas.

GOVERNMENT DRILLS

No Mines Department drills were available for hire to private concerns during 1946. The Department's own operations show a substantial footage of drilling which is recorded in detail elsewhere in the Mines Statement.

SUBSIDIZED ROADS

A sum of £7,015 was expended in subsidies for the maintenance and construction of roads in mining districts during the 1946-47 year. The expenditure in the previous year was £4,603.

I have, &c.,

R. H. SCHOEN,

Inspecting Engineer of Mines.

ANNEXURE A

SUMMARY OF REPORTS BY INSPECTORS OF MINES

NORTHERN INSPECTION DISTRICT (E. J. SCOBLE, Inspector of Mines)

QUARTZ-MINING

Martha Gold-mining Co. (Waihi), Ltd. (K. A. Birchall, Manager).—The ore produced for the year amounted to 107,845 tons, which yielded 28,533 oz. of gold and 222,264 oz. of silver, valued at £305,657 16s. 8d. and £59,270 6s. 9d. respectively. The heading value of the ore per ton was, gold 5 dwt. 5 gr., and silver 2 oz. 5 dwt. 20 gr., and the extraction, based on assay, was, gold 92.8 per cent., and silver 80.3 per cent. The bulk of the ore was won from the Martha, Royal, Empire, and Welcome lodes. Development work totalled 5,285 ft., made up as follows: drives and crosscuts, 4,535 ft.; winzes and rises, 750 ft. This footage was practically all of a secondary nature, and consisted of the reopening of former workings and the driving of sub-levels for the extraction of ore from supporting arches. During the year a Gardner-Denver mechanical loader was installed on No. 9 level to handle ore won by "cave" stoping on the Martha lode. The loader is operated by compressed air and has a capacity of about 3 cubic feet. It can deal with 15 tons of ore per hour under favourable conditions, and has given entire satisfaction. The delivery column of the pump, broken by ground movement in No. 4 shaft during October, 1945, was dismantled down to No. 8 level, then carried along the main crosscut south to No. 5 shaft, and connected to the old "C" pump column in July, 1946. From then until the end of the year, 144,553,500 gallons of water were raised to the surface. Dividends for the year amounted to £8,265. The number of men employed averaged 481.

Golden Dawn Gold-mines, Ltd., Ouharua.—The treatment of old battery residues yielded 81 oz. 10 dwt. of gold and 96 oz. 8 dwt. of silver, valued at £873 1s. 4d. and £25 12s. respectively.

Grace Claim, Karangahake.—Approximately 200 tons of material were treated from this property for a return of 76 oz. 8 dwt. of bullion, valued at £449 17s. 4d.

Morris' Battery Site, Karangahake.—A final clean-up gave a return of 11 oz. 5 dwt. of bullion worth £43 0s. 7d., after which all plant was sold and transferred to a claim at Komata.

Waitaheia Claim, Karangahake.—Production amounted to 26 oz. 16 dwt., valued at £131 14s. 5d.

Sylvia Mines Consolidated, Ltd., Thames.—No development work was undertaken, and entirely unsatisfactory results were obtained from a geophysical survey made of the claim. Following this, the pumps and other equipment were withdrawn from the mine. Operations were suspended at about the end of March.

Kernick's Freehold, Tapu.—A limited amount of development work was carried out, but this proved nothing of importance. Two tons of ore that were won and treated gave a return of 2 oz. 14 dwt. of bullion, valued at £22 12s. 10d.

PROSPECTING

R. Schulzki and mate were prospecting both on the surface and underground in the vicinity of the old Dubbo Mine, Karangahake. Good values were got in places, but the quantity of stone available is yet to be determined. Charlton and party, Kuaotunu, were employed in treating tailings from old mines. The work was largely of an experimental nature.

MISCELLANEOUS

Mercury.—N.Z. Mercury Mines, Ltd., Puhipuhi: There was no production, but 9 cwt. 2 qr. 12 lb. was sold from stock, and this realized £1,055 5s. The caretaker staff (mentioned in last report) is still on the property.

The crudes were bought and treated by N.Z. Oil Refineries, Ltd., which was registered in October, 1931, but this company, together with Moturoa Oilfields, Ltd., has disposed of its rights to Mr. F. J. Dobson, Wairoa, who, having purchased the modern rotary equipment used by the N.Z. Petroleum Co. at Gisborne, will probably drill one or more holes in the locality. The total quantity of oil handled by the refinery since it commenced operations, and particulars of fractions recovered, are given below:—

Crude oil bought—

Well—							Gallons.
Blenheim No. 2	..	..	..	..	..	..	16,117
No. 5	..	..	..	..	..	..	9,195
Moturoa No. 1	..	..	..	..	..	..	71,786
Moturoa No. 2	..	..	..	..	..	..	1,405,268
Moturoa No. 3	..	..	..	..	..	..	1,000
Moturoa No. 4	..	..	..	..	..	..	380,583
Total							1,883,949
Difference							16,589
Total							1,900,538
Fractions recovered—							
Petrol	..	..	..	..	..	..	399,287
Distillate	..	..	..	..	..	..	118,443
Power kerosene	..	..	..	..	..	..	319,880
Cleaning kerosene	..	..	..	..	..	..	210,264
Diesel oil	..	..	..	..	..	..	202,900
Residue oil	..	..	..	..	..	..	569,440
Loss	..	..	..	..	..	..	80,324
Total in still							1,900,538

ACCIDENTS

There are no fatalities or accidents of a serious nature to record.

PROSECUTIONS

There were no prosecutions.

WEST COAST INSPECTION DISTRICT (G. W. LOWES, Inspector of Mines)

QUARTZ-MINING

This section of the mining industry has not been able to survive the acute labour shortage and high production costs, consequently, there is only one mine left working in this inspection district.

Inangahua County

Blackwater Mine, Waitua.—A total of 21,548 tons won from stopes and development were treated for 7,425 oz. 12 dwt. of gold recovered by amalgamation and cyanidation, which realized £79,407 18s. 9d. The total footage driven was 1,105½ on Nos. 15 and 16 Levels north and south, with 709 feet on reef of average value of 13.46 dwt., average width 27.8 inches, and 216 feet of crosscutting was carried out in connection with the various development drives when faulting caused displacement of reef. Out of a total of 289 feet of rising on two lowest levels, 235 feet was on reef averaging 13.34 dwt. over width of 24 inches. At three points in No. 15 Level 101 feet of winze-sinking was completed, 75 feet being on reef averaging 10.34 dwt. over a width of 22.5 inches. During the year, in addition to excavating for pump chambers, magazines, and other purposes, 1,711½ feet of development was carried out, 1,019 feet being on reef, average value being 13.24 dwt. over width of 26.5 inches.

With the labour force being much below mine requirements, development footages receded to a point seriously affecting ore reserves, a position somewhat balanced by a lower output to mill. The tonnage crushed is less than half of the capacity of mill, but any attempt to increase returns by increasing output with present labour force would soon be reflected in a quick decrease of ore reserves and finally laying up of mill. The only remedy for improvement is the employment of additional labour to step up development at least 100 per cent. above the footages for 1946.

DREDGE MINING
Inangahua County

Slab Hut Dredge, Mauheraiti.—The dredge operated for the year 52 per cent. of the possible working-time, the major causes of stoppages being dredge sinking 12 per cent., maintenance 21 per cent., and holidays 8 per cent of possible dredging-time. A total of nearly 700,000 cubic yards were dredged, which included 370,870 cubic yards of tailings, the latter accounting for the low return of 3·7d. per cubic yard, while the cost of production was 4·6d. per cubic yard. The yardage recovered was won from an average depth of 16 ft. and produced by ten men.

Snowy River Dredge, Ikamatua.—On account of it being unnecessary to devote more than a small percentage of total working-time to maintenance and repairs, the plant dredged 37 acres of an average depth of 19·25 feet and produced therefrom 1,152,000 cubic yards, which averaged 1·63 grains per cubic yard. Thirteen men constituted a full working crew, and the shareholders had another profitable year.

Grey River Dredge, Ikamatua.—During the year the company's 16 cubic feet electrically operated dredge was in continuous operation, with results as shown by the following figures:—

Working-days	.. .. .	310
Working-hours	.. .. .	7,440
Hours digging	.. .. .	6,046
Percentage time digging	.. .. .	81·3
Area dug, in acres	.. .. .	89·323
Average depth, in feet	.. .. .	31·7
Cubic yards handled	.. .. .	4,572,202
Cubic yards handled per day	.. .. .	14,749
Cubic yards handled per digging-hour	.. .. .	756
Ounces of bullion produced (crude ounces)	.. .. .	8,392·74
Value of product	.. .. .	£87,104
Value of product per day	.. .. .	£281
Value of product per cubic yard	.. .. .	4·57d.
Operating-cost per cubic yard (excluding export taxes and realization costs)	.. .. .	2·90d.
Total operating cost per cubic yard (including export taxes, realization costs, and overhead)	.. .. .	3·80d.

During the early part of the year the dredge was taken through the New Zealand Railways Greymouth to Reefton line, also through the main highway. Due to the willing co-operation of the Departments concerned, these crossings were carried out with the minimum expense and trouble.

Grey County

Redjacks Dredge (Associated Gold Dredges, Ltd.), Redjacks Creek, Ngahere.—Out of the total possible dredging-hours of 7,264, the dredge worked 75 per cent. of the time for a total yardage of 1,110,130 cubic yards from 39 acres of ground dredged with an average of 21 feet. Total gold recovered was 2,651 crude ounces, an average of 1·146 grains per cubic yard, with total cost of recovery being 4·035d. per cubic yard.

Atarau Dredge (Associated Gold Dredges, Ltd.), Moonlight Creek, Atarau.—Out of the total possible dredging-hours of 7,264, the dredge worked 80 per cent. of the time for a yardage of 1,348,103 cubic yards from an area of 56 acres averaging 19·75 feet in depth. The recovery effected was 1·010 grains per cubic yard, yielding 2,837 crude ounces. The cost of production was 3·832d. per cubic yard.

Marsden Dredge (Associated Gold Dredges, Ltd.), New River, Marsden.—A percentage of 83·8 of possible working-time was worked out of a total of 7,264 hours. Yardage worked was 1,550,517 cubic yards for a recovery of 3,160 crude ounces. Recovery was 0·978 grains per cubic yard and the total costs per cubic yard were 2·842d. An acreage of 47·5 acres was dredged of an average depth of 29·75 feet.

The average number of men employed by the above company was the usual complement of ten men at each dredge and eighteen men employed in workshops, repair gangs, and clean-up crew, comprising a total of forty-eight men on the company's pay-roll for the three dredges.

Ngahere Dredge, Ngahere.—This dredge worked 74·74 per cent. of the total working-time of 7,296 hours and dredged 15·251 acres, which yielded 8,378 oz. of bullion from 2,343,596 cubic yards. The yardage per hour was 429 cubic yards, giving a bucket efficiency of 49·32 per cent. The average recovery was 1·68 grains per cubic yard from the following digging depths:—

Maximum	.. .. .	Ft.
Minimum	.. .. .	108
Average	.. .. .	79
Average height above water-level	.. .. .	95·2
Average depth below water-level	.. .. .	24·8
Maximum height above water-level	.. .. .	70·4
Maximum depth below water-level	.. .. .	43
Maximum depth below water-level	.. .. .	77

The average number of men employed during the year was twenty-seven.

Blackball Creek Dredge, Blackball.—Despite the comparatively small yardage which was dredged during the year owing to the necessity of devoting much of the working-time to repairs and maintenance, 1,260 oz. of gold were recovered from a small acreage of ground averaging between 35 feet and 40 feet in depth. The removal of a considerable quantity of buried timber had also a detrimental effect on the yardage; consequently, operating-costs at times exceeded the value of gold recovered.

Barrytown Dredge, Barrytown.—The dismantlement of this dredge was carried on continuously and is now 50 per cent. complete.

Westland County

Maori Gold Dredge, Callaghans.—Early in the year a syndicate represented by Mr. J. S. Langford took over the assets of the Maori Gold Dredging Co. at Callaghans and in May commenced reconditioning the dredge. In July dredging commenced on two shifts, the day shift being devoted to carrying out further repairs required by the Department. By the end of the year the provision of seven water-tight compartments had been made, also a pumping system installed to deal with any inflow of water that might occur through holing of the pontoon. For a recovery of 362 oz. 16 dwt., 112,231 cubic yards were treated. The average number of men employed was thirteen.

Rimu Dredge, Rimu.—It is computed from 304 working-days available that 5,655 digging-hours, equal to a percentage of 77.5 per cent., were worked. An acreage of 27.08 acres was dug averaging 43.7 ft. in depth and 1,910,522 cubic yards were handled. The normal turnover of the plant was 6,285 cubic yards per day, equal to 338 cubic yards per digging-hour. Bullion produced was 8,818.21 crude ounces, valued at £91,230. The daily yield was £301, equivalent to 11.45d. per cubic yard. Operating-costs, excluding export taxes and realization costs, amounted to 6.56d. per cubic yard; and the total costs, including the above-mentioned taxes, was 8.34d. per cubic yard. Except for a shut-down of two weeks owing to a prolonged dry spell, operations throughout the year were normal.

Kanieri Dredge (Gold Mines, N.Z., Ltd.), Kanieri.—Digging an average depth of 42.8 ft., this dredge turned over 38.32 acres and the yardage treated amounted to 2,644,000 cubic yards, not including 32,046 cubic yards of tailings, out of a possible dredging-time of 7,296 hours, 78.6 per cent. of which were worked, requiring the services of forty-three employees. Bullion recovered amounted to 13,623.8 crude ounces, which showed a recovery of 2.5 grains per cubic yard.

Arahura Dredge (Gold Mines, N.Z., Ltd.), Arahura.—Dredging 28.23 acres of ground of an average depth of 75.4 ft., this dredge dug and treated 3,437,000 cubic yards and won 9,481.9 crude ounces bullion, equal to a recovery of 1.33 grains per cubic yard. Actual dredging-time amounted to 5,954 hours, equal to 81.62 per cent. of the total time available. An average number of forty-four employees were required ashore and afloat to operate the dredge.

Gillespies Beach Dredge, Weheka.—After operating for the first month of the year, work ceased and a final clean-up was made which yielded 34 oz. 3 dwt. gold. The company went into liquidation in March and has since sold the plant, power-station, and transmission line.

ALLUVIAL MINING

Buller County

Addison's Flat Gold-mining Co., Ltd., Addison's Flat.—Owing to lack of suitable labour, the company could only treat 75,000 cubic yards, a 50 per cent. drop on the previous year. The yield was 209 oz. 11 dwt. of gold, but, despite the fact that operating-costs on this claim were the lowest in the district, barely covered working-expenses. Shallow cemented beach leads were worked during the year, and one section worked with suction pipe 22½ chains in length between the face and hydraulic elevator delivering to tables.

Inangahua County

Waitahu Sluicing Claim, Waitahu, Reefston.—A party of seven water-tributors took over the claim in August, and after several months preparatory work on main water-race and pipe-lines commenced operations towards the end of the year. Out of three small paddocks worked from a branch of the main run of gold 225 oz. 11 dwt. 11 gr. gold were recovered. The gold was won by ground sluicing where ample fall for tailings was available, and the next year's work will be carried out in deep ground where hydraulic elevating will be necessary.

Grey County

Moonlight Sluicing Claim, Blackball.—Primarily due to shortage of labour and secondly to under-estimation of extent of work required to get the claim into working-order on the new lines adopted by Mutch and party as tributors, virgin ground was not reached until nearly the end of the year, consequently a return of 25 oz. 16 dwt. was the amount recovered from debris and overburden sluiced away when constructing the main and tail race.

Golden Sands Sluicing, Barrytown.—Denmehy Bros., operating this claim on tribute, won 575 oz. 11 dwt. 12 gr. gold. Values are maintained in the wash, but the workings have almost reached the boundary of the Barrytown Gold Dredging Co.'s claim, therefore, its future remains somewhat uncertain.

MISCELLANEOUS MINERALS

Asbestos and Mica.—There was no asbestos or mica produced in this inspection district during the year, both companies concerned having ceased operations.

Pottery Clay.—From Polglaze's underground clay-pit at Kaka, Waimea County, 270 tons of high-grade pottery clay were produced. The output is down to a tenth of that of the previous year, due to cessation of overseas demand for insulators that were previously manufactured from the raw material produced in Kaka. From Mellor Quarry in same district the amount of pottery clay produced was 134 tons.

Iron-ore.—A total of 306 tons of iron-ore were quarried and reduced by grinding to a state suitable for use in gasworks—106 tons were sold, while 200 tons were stacked at the wharf ready for shipment.

Talc and Magnesite.—Lime and Marble, Ltd., quarried 374 tons talc and magnesite from mineral licence held by the company at Takaka.

Arsenic.—From the roasting-furnace at Blackwater Mine treatment plant an amount of 17 tons 10 cwt. 3 qr. arsenic was obtained, valued at £18 per ton.

Clays.—In the Greymouth district, 1,100 tons of clay were used for brickmaking, valued at approximately £550.

GENERAL REMARKS: MINING AND PROSPECTING

Anticipations in 1945 of an improvement in labour situation, supply of plant, and material required in the mining industry have not been realized, consequently a further decline in output has to be recorded, primarily due to restrictions of operations. There are few claims and plants working to their full capacity, and many remain idle that were shut down during the years of war. The foregoing trend would be speedily reversed if conditions for expansion became favourable, for there is a strong belief prevalent that the price of gold will increase or, alternatively, strong inducements offered to step up production to meet demands for international currency exchange required under the new trading agreements which are to be made in the near future.

Prospecting remains dormant, no new areas being tested. On alluvial areas 1,121 ft. were bored ahead of operating dredges. The footage was drilled by three crews, who put down fourteen holes.

FATAL ACCIDENTS

Nil.

SERIOUS NON-FATAL ACCIDENTS

Three serious non-fatal accidents occurred during the year:—

Dredges.—On 9th March, 1946, M. Topp, an employee of Slab Hut Dredge, had his foot caught between a dredge bucket and a ladder roller when cleaning the ladder. The winchman had previously been directed to stop the buckets by cutting off the power, and Topp immediately attempted to cross the bucket line, evidently being under the impression that the buckets would stop simultaneously with the cutting-off of the power. After cutting off the current the buckets travel 18 in. before coming to a dead stop. It was during this movement that the injury occurred. It was found necessary later to amputate the big toe.

On 27th May, 1946, Jas. B. Outram, workshops labourer, Redjacks Dredge, suffered a fractured lower end of right radius caused when trying to start a tractor by cranking, and the engine back-fired.

On 26th October, 1946, H. Olson, employee, Arahura Dredge, slipped and fell from the dredge ladder while assisting to break the bucket line and fell 24 ft. into the well hole. He suffered a fractured thigh and considerable bruising.

PROSECUTIONS UNDER THE MINING ACT

Nil.

SOUTHERN INSPECTION DISTRICT (T. McMILLAN, Inspector of Mines)

QUARTZ AND ALLUVIAL MINING

Waitaki County

Sluicing operations have been carried out in the auriferous gravels of the Livingstone and Maerwhenua Goldfields.

Waihemo County

The Callery Syndicate have continued mining and development operations at their Round Hill Mine and treatment operations at their Deep Bell Battery, where 1,225 tons of quartz have been treated.

Maniototo County

The alluvial mines at Naseby, Kyeburn, Cambrian, and Patearoa have been operated steadily when water was available.

Tuapeka County

Mining operations have been continued at the Sailor's Gully tribute mine, Waitahuna Gully.

No work has been carried out by the Blue Spur and Gabriel's Gully party.

Some work was carried out by a tribute party at the Tuapeka Mouth alluvial mine, but operations ceased early.

The Young party have installed a kerosene-operated pumping-plant at the old Holy Cross Mine, about three miles upstream from Tuapeka Mouth.

Southland County

Sluicing operations have been carried out in the Waikaia auriferous areas at Happy Valley, Chinaman's Gully, Winding Creek, and Piano Flat.

Wallace County

Sluicing operations have been carried out in the Orepuki old township workings.

During the year the Round Hill Gold-mining Co., operating on the flat between the Ourawera Creek and Lake George, have sluiced and elevated 2 acres to a depth of 80 ft. The upper horizon contained a large quantity of buried timber, and this had to be hauled and stacked by means of a main and tail haulage system. Below the buried timber the overburden consisted mainly of hard clay which had to be drilled and blasted in order to speed up sluicing operations. The water-supply has been good.

Lake County

Paradise.—The tributers have continued to operate by sluicing on the outcrop of the Paradise Reef, and are now 30 ft. below the bottom level.

Glenorchy.—No work has been carried out in the Glenorchy State Scheelite-mine. A tributer has done some work on the Kelly lode, and operations will be continued.

The State Mine Treatment Plant.—This plant has been kept in good order by the tributers. Scheelite-bearing ore from the Paradise, Mount McIntosh, Bonnie Jean, and the tributers has been treated during the year.

Heather Jock Syndicate (Wylie Bros.), (Western Slopes of Mount Larkin).—The aerial ropeway from the mine to the Grove's treatment plant has been completed. Stopping operations have been carried out in the mine. A low level has also been driven a distance of 100 ft. The Grove's Mine treatment plant is now owned and operated by this syndicate.

Bonnie Jean Mine (Elliot Bros. and Tripp), (South-western Slopes of Mount Larkin).—Stripping and mining operations have been carried on during the working season, and full advantage was taken of the flush water season to strip the heavy overburden from the northern section of the reef.

Buckleburn-Bonnie Jean Terminal.—Section of the Macalister Reef has been opened up by ground sluicing above the Buckleburn aerial ropeway terminal, and preparations are being made to bring an adequate water-supply on to this area.

The Valpy Buckleburn Crossing River Mine has ceased to operate.

The Hercules Mine (G. Ross and Party), (on the Lower Southern Slopes of Mount McIntosh).—Stopping-operations were continued until all the visible ore was extracted. Prospecting operations were then commenced on a reef-line outcropping beneath the Buckleburn aerial ropeway by open cutting, driving, and sinking, but nothing of any importance was located, and prospecting operations were resumed in the bottom level of the Hercules Mine in an endeavour to locate the downward extension of the ore-body which yielded such good results below and above the upper level.

Long Gully Reef Extended (B. Gollop and Partner).—Mining operations were carried out at this mine during the January to May working season, but mining operations were not resumed after the winter season as a portion of the sluicing-plant had been removed to the McAlister Reef above the terminal of the aerial ropeway.

Muddy Terrace Mine, Upper Rees Valley.—Mining operations have been resumed at this mine and some good ore is being won.

The Glenorchy Miners' Association now market the scheelite concentrates, and sales have been made in London and New York during the year, also the sale of the 1947 output is assured.

Twelve-mile or Few's Creek, Lake Wakatipu.—A considerable amount of work has been carried out at this alluvial mine in the replacement of fluming, cleaning water-race, &c. The late Mr. Angelo's partner intends to continue operations.

Dynamo Flat (Left-hand Branch of Skipper's Creek).—The Mount Aurum Syndicate has continued to operate Currie's Reef during the working season.

Copper Creek Gold-mining Party.—A reef outcrop has been located on the left-hand bank of Copper Creek in the Mount Aurum Basin, and preparations are being made for the prospecting of this outcrop by driving. A track is to be made from Dynamo Flat to the reef so that mining-plant and timber for a hut can be transported.

Floodburn, Upper Shotover.—Frequent floods have hindered operations in this area.

The Scheib-Sutherland party, who took over Short's River Mine, were also hindered by heavy floods.

River mining operations have also been carried out in the Shotover River between Long Gully and Deep Creek by G. Thompson, and the Atley Bros. have carried out prospecting operations at their river mine between Long Gully and the Moke Creek junctions.

Very little work has been carried out in the Arrow River Basin, but the Golden Arrow Sluicing Co. intend to resume operations in the bed of the Arrow River above Arrowtown.

Vincent County

Driving operations have been carried out at the Nees' Long Drive Mine near the Gum Trees, Roaring Meg, on the right-hand terrace of the Kawarau River.

Sluicing operations are also to be resumed on the Gees Flat at the Homer Mine.

The Nevis Valley alluvial mines operated actively during the working season.

Williamson's Mine, Stone Huts.—Sluicing and elevating operations are being carried out in the auriferous lead downstream from the Stone Huts.

Jones' Mine, Whitton's Creek.—Sluicing and elevating operations are being carried out in the new area to the south of Whitton's Creek.

McLean Mine, Old Township Workings, Mid-Nevis.—Sluicing and elevating operations were carried out in the new area at the upstream end of the old workings. D. Adie is ground sluicing at the downstream section of the old township workings.

DREDGING

Vincent County

Austral New Zealand Mining, Ltd.—This large electrically operated dredge has continued to operate on the Clutha River flats above the Lowburn Bridge. During the early months the dredge worked in an upstream direction in the river channel and then turned and dredged downstream in the western river flat. During the year ending 31st December, 1946, the acreage dredged was 49.5, and this yielded 3,407,000 cubic yards for a recovery of 10,873 oz. of bullion. The average dredging depth was 49 ft. This dredge is now in good running-order.

Clutha River Gold Dredging, Ltd.—This electrically operated paddock dredge continued to dredge the Alexandra Flat, continuing its first cut to the east (downstream) until the ground formerly dredged by the Kakanui (Alexandra Lead) was reached. At this point a turn to the west was made, and the course is upstream towards the river and on the north side of the ground dredged in coming east. The dredge operated for 4,930 hours and dredged 19 acres, treating 2,114,000 cubic yards for a return of 6,556 oz. of gold. The average depth of the gravels was 68.2 ft. The height of the bank above water-level in the dredge pond has been as much as 50 ft., the average being about 46 ft. The greatest depth below water-level was 44 ft. The tailings were stacked at times to a height of over 80 ft. above water-level—probably higher than tailings have been stacked by any other dredge. The dredge is now in good running-order.

The electrically operated dredge of the Molyneux Gold Dredging Co., Ltd., is still tied up in the Kawarau River at Scotland's Point.

Southland

The dredge operated by the Rainbow Dredging Co. at Maitland, Waikaka Valley, resumed dredging operations early in 1946. This is a small diesel-operated dredge suitable for working shallow ground.

ACCIDENTS

There were no fatal or serious accidents in the mines during the year.

QUARRIES ACCIDENTS

There was no fatal accidents during the year.

There were three accidents of a serious nature :—

At the Totara Lime-quarry, in the Oamaru district, on 15th March, James Bryan, quarry foreman, suffered very serious injury to his right arm, which had later to be amputated just below the shoulder, through falling over the quarry face.

On 2nd October at the North-east Valley Quarry, Dunedin, Gerald Francis Shiel suffered a depressed fracture of the skull through being hit by a piece of rock thrown from a shot.

On 19th November at Willock's Clay Quarry, Benhar, Ivan Edwards suffered a fractured left tibia and fibula through the tilting of a large lump of clay jamming his leg between the back of the lorry and the clay.

ANNEXURE B

QUARRIES

REPORT BY THE INSPECTOR OF QUARRIES FOR THE NORTH ISLAND

(R. C. RUFFIN)

Report for the year ended 31st December, 1946, for surface and underground work done in the North Island District under the Quarries Act, 1944.

QUARRIES

A total of 271 quarries were worked during the year 1946, being an increase of 22 compared with last year, while the number of men employed at quarrying for the year was 1,086, showing an increase of 109 over the number for 1945.

OUTPUT OF STONE

The output of stone used for roading, filling, hydro-electric-dam construction, and concrete products is 999,657 tons, being an increase of 22,068 tons for 1946.

For agricultural requirements 366,476 tons of limestone were quarried during 1946, which is an increase of 64,814 tons over that for 1945; also, 275,748 tons of limestone were produced for the manufacture of cement, compared with 274,995 tons for 1945.

The increase of 64,814 tons of limestone for agricultural requirements will not satisfy the demand imposed on the industry for this product; also, the figures of the output of limestone for the manufacture of cement show that the desired increase is not at hand.

ACCIDENTS (fatal, 1; serious 7)

Fatal Accident

A fatal accident occurred at the Auckland City Council's Quarry, Mount Eden, on 31st May, 1946. Walter Morgan was killed when he fell over a vertical quarry face 20 ft. in height.

Serious Accidents

At Otaika Quarry, North Auckland, Joe Josephs was injured on 26th February, 1946, when he lost the first joint of thumb and forefinger, also two joints of the middle finger of his right hand. The accident occurred when Josephs, intending to destroy a detonator attached to a fuse, cut off a length of the fuse, leaving a small piece in the detonator; on spitting the fuse he intended to throw it away, but held it too long, and it exploded in his hand.

At the N.Z. Soluble Slags, Ltd.'s, Pukemiro Quarry, G. Koti, on 17th May, 1946, received slight concussion when an aerial bucket of limestone was tipped on him when he was in the holding-bin cleaning down.

At the Waunganui City Council's Hilton Quarry on 31st May, 1946, William Jackson suffered slight concussion, shock, and abrasions when he fell 20 ft. over the face of the quarry. Jackson had been attached to a rope when, after disengaging himself from the rope, he slipped and fell over the face.

At the N.Z. Soluble Slags, Ltd.'s, Pukemiro Quarry on 24th May, 1946, Ted Manukau received injuries resulting in a fractured base of the skull when he was working on a bench preparing for drilling. A fragment of rock detached from a small fall from high up on the quarry face struck Manukau and knocked him off the bench to the quarry floor, a distance of approximately 8 ft.

At the Amalgamated Brick and Pipe Co.'s No. 3 Pottery-pit, Avondale, on the 21st June, 1946, Tai Kaa suffered a fractured pelvis resulting from a fall of clay. Tai Kaa was buried from the waist down.

At the Auckland City Council's Mount Eden Quarry on 23rd August, 1946, John Moody suffered a fractured spine when he was caught in a slip of rock which carried him over the quarry face. Moody was suspended on a rope 30 ft. above a rock pile, otherwise he would have been instantly killed.

At the Akitio County Council's Pongaroa-Akitio Highway Quarry on 25th October, 1946, J. C. Nielsen, while barring down rock, sustained a broken first finger of the right hand.

PROSECUTIONS UNDER THE QUARRIES ACT, 1944

Four informations were laid during the year for breaches against the Quarries Act 1944 :—

On 25th May, 1946, at Masterton, a quarryman was fined for acting in the capacity of quarry-manager, he not being the holder of a quarry-manager's certificate, contrary to section 9 (3), Quarries Act, 1944.

On 25th May, 1946, at Masterton, a quarry occupier was fined for employing a quarryman as manager of his quarry, the quarryman not being the holder of a quarry-manager's certificate, contrary to section 9 (4), Quarries Act, 1944.

On 10th July, 1946, at Huntly, a quarry foreman was fined for failing to keep a daily report book, contrary to the regulations under the Quarries Act, 1944.

On 26th July, 1946, at Auckland, a company was fined for operating a quarry without there being a qualified manager in charge, contrary to section 8 (1) and (2), Quarries Act, 1944.

APPENDIX B

REPORTS RELATING TO THE INSPECTION OF COAL-MINES

The INSPECTING ENGINEER and CHIEF INSPECTOR OF COAL-MINES to the UNDER-SECRETARY OF MINES.

Wellington, 2nd May, 1947.

SIR,—

I have the honour to present my annual report on the coal-mining industry of New Zealand for the year ended 31st December, 1946.

OUTPUT

The total output for the year was 2,793,870 tons, a decrease of 39,706 tons on the 1945 production.

The output from the Southern District increased by 38,624 tons, but the outputs from the Northern and the West Coast Districts decreased by 66,295 tons and 12,035 tons respectively.

The following statement shows tons of coal raised, men employed, and lives lost by accidents in or about collieries to 1946 :—

Year.	Output, in Statute Tons.	Persons ordinarily employed.			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 to 1941 ..	95,336,168	..	..	..	..	..	526
1941 ..	2,639,507	1,358	3,633	4,991	1.51	0.80	4
1942 ..	2,680,041	1,338	3,659	4,997	2.24	1.20	6
1943 ..	2,787,868	1,375	3,999	5,374	2.87	1.50	8
1944 ..	2,805,970	1,637	3,958	5,595	4.28	2.14	12
1945 ..	2,833,576	1,660	3,932	5,592	2.12	1.07	6
1946 ..	2,793,870	1,738	3,819	5,557	1.43	0.72	4
Totals ..	111,877,000	..	..	..	..	..	566

ACCIDENTS

The following is a summary of accidents in and about coal-mines during 1946 :—

	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.
Carbon-monoxide poisoning ..	..	..	..	..
Explosions of fire-damp or coal-dust ..	..	..	1	1
Falls of ground	4	4	14	14
Explosives .. ..	..	..	1	1
Haulage .. ..	..	..	13	13
Miscellaneous—Underground ..	..	..	10	10
On surface .. ..	..	..	4	4
Totals	4	4	43	43

Three of the fatalities occurred in the West Coast District and one in the Northern District.

Twenty-nine of the non-fatal accidents were in the West Coast District (ten due to falls of ground), five in the Southern District (two due to falls of ground), and nine in the Northern District (two due to falls of ground).

DANGEROUS OCCURRENCES

Thirty-six dangerous occurrences were reported to Inspectors during 1946. Thirty-four cases related to fire or heating in underground workings, one to a surface fire, and one to an inflow of gas from a borehole breached by advancing workings.

LEGISLATION

An amendment to the Coal-mines Act, 1925, made by section 17 of the Statutes Amendment Act, 1946, enables leases under Part I of the Act to be limited to specified seams or coal-bearing horizons.

PROSECUTIONS

Five informations were laid by Inspectors for breaches of the Act and regulations. Two convictions were obtained.

I have, &c.,

R. H. SCHOEN,

Inspecting Engineer and Chief Inspector of Coal-mines.

ANNEXURE A

SUMMARY OF REPORTS BY INSPECTORS OF COAL-MINES

NORTHERN INSPECTION DISTRICT (C. HUNTER, Inspector of Coal-mines)

SUMMARY OF OPERATIONS OF EACH COLLIERY FOR THE YEAR 1946

North Auckland District

Kamo Colliery.—During the year development work has been carried on in the Main Slant Dip, which has been advanced to a face distance of 57 chains from the main mine haulage system and is at present standing on inferior coal, no work having been done here for several months. To the east off Main Slant Dip and approximately 7 chains from face a pair of levels have been driven for a distance of 11 chains, the coal here being about 6 ft. in thickness. Work was discontinued some months ago due to ventilation difficulties. Fourteen chains back from dip face a pair of dips known as No. 3 Right have been advanced to a distance of 12 chains from dip side; at 10 chains from dip a step-down fault of 10 ft. was intercepted. This fault was crossed, proving coal of 10 ft. thickness on inbye side of it. In the East Dip Section a fair amount of development work has been accomplished. In June the extraction of pillars in No. 4 Mine was completed and the mine closed down, only pumping operations being carried on. A new ventilating-drive for No. 3 Mine has been started and is down approximately 2 chains from portal, grade of drive is 1 in 3, the dimensions of drive are 8 ft. by 7 ft. 6 in.

Waro Colliery.—The production for the year has been solely from the extraction of pillars, and present indications are that, due to the fast rate of extraction and to occasional compulsory retreat caused by flooding, the area should be exhausted during the current year.

Avoca Opencast.—This small undertaking closed down in April, the output for the working period being 186 tons.

Whareora Opencast.—Only 16 tons were secured for the year before closing down.

Waikato District

Pukemiro Colliery.—The output of 122,271 tons for the year has been won chiefly from the extraction of pillars, the only solid work performed being in the recovery of old sections and the development of small areas adjacent to the extremities of the field. The colliery accommodates forty-seven pairs of miners, twelve pairs being placed in the North Mine and the remainder in the South.

North Mine: In the North Mine it is the intention of the manager to leave an area of unextracted pillars for the support of colliery houses, and as the line of extraction reaches this predetermined position the miners are transferred to the South Mine. On the south side of the main haulage road, five pairs are placed, with seven to the north of the haulage road.

South Mine: The work in this mine is carried on over a large area with eight groups of men placed in small sections more or less isolated from one another; this makes for duplication of workmen in some classes of work, which, as conditions are, is very difficult to avoid. Along the southern boundary three sections are located, these being known as South Straight, New Panel, and Nelson's Jig Sections, ten pairs being accommodated between the three, the Nelson's Jig Section carrying three pairs on back-shift; this is necessary to expedite the extraction of pillars and to avoid spontaneous heating. The Taupiri Section, which is subdivided into three sections, is located alongside the Hangapipi Road. In all, twelve pairs engaged on pillar-extraction are placed in this area. In Horne's Dip Section the coal is of a very friable nature with heavy roof conditions and the floor tends to creep; five pairs are placed here. In the No. 1 Right South Section five pairs are employed in solid work developing behind the Old Rope Section.

A new airway has been completed to the surface and preparations for installing an additional fan are well in hand.

To provide extra floor space, 750 square feet has been added to the bath-house.

Renown Colliery.—No. 2 Mine main headings have been advanced to a total distance of 80 chains from the portal. At this point a downthrow fault of major importance has been intercepted and the work of advancement stopped. About 4 chains ahead of the present position a borehole was put down, but only 4 ft. of coal was recorded. It would appear that the fault is the continuation of the one that stopped the further development of the workings in the No. 1 Mine. To the south-east of the main haulage road five panels have been formed, and a sixth is at present being formed. It is intended upon completion of the No. 6 panel to commence pillar-extraction. To the north-west very little developing could be done due to the existence of faulted country running parallel to direction of haulage road and about 3 chains from it. All the coal is machine cut.

A new bathhouse of excellent design capable of accommodating ninety-two persons was put into use towards the end of the year.

In the No. 1 Mine four pairs have been engaged in pillar-extraction in each of the following sections: No. 3 East Rope End, No. 3 East Panel, and No. 5 West Heading Section. Developing-work is being carried on in a small area of No. 5 West Heading Section, three pairs being so employed; the coal here is thinning out and also running into faulted country. In No. 5 North, three pairs are engaged driving towards No. 4 North Panel with a view to extracting No. 4 pillars, the coal to be transported to main rope road through the No. 5 Section.

Wilton Colliery.—No. 2 Mine: The output from the mine has been secured from pillar-extraction in the Dawson's Dip area, where eight pairs of miners are placed.

No. 3 Mine: Five pairs of miners are engaged completing the extraction of the remaining pillars in B Panel.

No. 3 Extended Mine: Nineteen pairs of miners are engaged on development work in the Nos. 2, 3, and 4 East Heading Sections and Nos. 3 and 4 West Sections. In the Nos. 2 and 3 East Sections the headings have been advanced to a distance of 16 chains and 14 chains respectively from the main haulage road, the output from both sections being handled by means of endless-rope haulage systems installed during the year. The No. 2 Section consists of six headings with necessary crosscuts, and the No. 3 Sections consists of five headings with necessary crosscuts, the coal in both of these sections being mechanically cut by means of machines of the Korfmann type; in No. 3 East Section several faults have been intercepted. In the No. 4 East headings a downthrow fault of approximately 15 ft. was encountered, stopping further advancement, it being the intention to open up on the inside beyond the fault from No. 3 Section. In the No. 4 West headings after advancing for a distance of 11 chains a downthrow fault of approximately 8 ft. was encountered. From the No. 3 West headings, which were standing on coal only 2 ft. 6 in. in thickness, slant headings are being driven towards the No. 4 headings, which they will intercept ahead of their present position; the slants, which have advanced for a distance of 4 chains, are in 6 ft. of good-quality coal. The main mine haulage rope has been extended into the No. 4 West Heading Section. It appears that the coal-seam deteriorates in quality and tends to thin out as it advances to the west; this is disappointing from an output point of view, as only a one-sided mine is provided.

Rotovaro Colliery.—No. 1 Colliery (Top Seam): Pillar-extraction was continued until August in No. 4 Section, when, due to heating, this section was temporarily sealed off. In the Hill 60 and New Haulage or No. 1 Sections pillar-extraction has been continued intermittently during the year.

Callaghan's Dip Section (Bottom Seam): The main headings have been advanced to 55 chains from the No. 1 Main Haulage. A stone band has been met with and appears to be thickening. No. 6 Panel headings have been broken away from the main headings. No. 5 Panel headings have been advanced to 13 chains from the main heading. No. 5A Panel is in process of formation, coal being cut with coal-cutting machines. In No. 5 Panel the development work was completed and pillar-extraction commenced during the year. In No. 4 Panel, pillar-extraction was continued throughout the yearly period.

No. 3 Mine: Pillar-extraction was continued in Brown's Section, Wilkie's Dip, and New Dip Sections, whilst development work is being carried out in the Shaft Section.

In the Callaghan's Dip area an extensive boring programme has been carried out proving fairly large deposits of workable coal.

Alison No. 1 Colliery: Pillar-extraction was continued throughout the year in all panels and in No. 2 Dip.

In No. 1 Dip and Rope End, pillars heating necessitated the closing of these two sections in the latter part of the year.

Development in the top-seam panel, No. 4A Jig, was discontinued early in the year owing to shortage of miners.

In the North Drive the headings were advanced to a distance of 8 chains beyond the fault where the seam cut out. Development of bords to the rise is being carried out.

Alison No. 2 Colliery: The main dip headings were advanced 4 chains beyond the fault, while the return airway has been completed back through the fault.

B Section headings have been advanced to 20 chains from the main dip.

B South Slant headings were commenced during the year and advanced a distance of 3 chains from B Section heading.

Development of B1 Panel was continued by machines throughout the year.

"A" Section has been closed throughout the year owing to shortage of miners.

Pillar-extraction continued throughout the year in the rise panel.

Two new Mavor and Coulson coal-cutters were delivered in December and will be installed in this colliery early in the New Year.

Glen Afton No. 1 Colliery.—Output during the year was secured from pillar-extraction in E2 Panel, E2 Rope End Section, and L Section. The only work of development carried out was in the driving of a pair of headings from H Section towards K rope road, the purpose of these being to secure an easy haulage way for the extraction of K roadside pillars and, if possible, the opening-up of a small area of coal lying between the E and K rope roads.

Glen Afton No. 2 (MacDonald Colliery).—The output for the year has been won from extraction of pillars in E and H Sections and development work carried on in the extension of K rope road and panel formation to east and west from it. The rope road is 5 chains inside the McKinnon boundary, with which it runs parallel. Present position of face of rope road is approximately 7 chains to nearest position of K Section, No. 1 Mine.

Two 32-volt electric drilling-machines have been installed to be used in conjunction with the coal-cutting machines.

Two boreholes have been put down between H3 Left Section and Tapp's boundary in the No. 2 Mine for the purpose of proving whether further development can be carried out.

No. 4 Mine (MacDonald).—With the exception of No. 1 Jig Section, the output has been won from pillar-extraction. No. 1 Jig Section consists of four places between two old pillared sections, the coal here being cut with machine.

Waikato Extended Opencast (Roose Shipping Co.).—During the year 14,661 tons were produced from opencast workings. The coal is loaded by mechanical shovel into motor-trucks and conveyed to the side of the Waikato River approximately half a mile away. Total number employed, including truck-drivers, nine men.

Bell and Deelin's Mine.—Work at this party mine terminated in December, all working-material being removed to a new area. The output for the year was 2,288 tons.

Huntly Brickworks.—No coal was mined during the year; however, the clay for brickmaking was secured from a clean face, the surface subsoil having been stripped by bulldozer.

Glen Afton Potteries Opencast.—Ninety-seven tons was won during the year from an opencast face approximately 6 ft. thick; work is only carried on as required by the works.

Te Pahu Colliery, Karamu.—No work has been carried on since September. Output for year, 50 tons. Two men were employed intermittently.

Dally's Mine, Hauturu.—No coal was produced during the year.

Whatawhata Campbell Colliery.—The Main Dip has been advanced approximately 1 chain during the year, making a total of approximately 10 chains from surface. To the left from the bottom of dip a level has been driven for about 2 chains in good coal, whilst to the right a level has been driven for about 1 chain. Working has been carried out in a small area adjacent to 15 ft. upthrow fault, also to the right of jig on south-east side, where three solid places have been worked between the fault and top of main jig.

Rangitoto Opencast Coal-mine (Hamilton and Harvey), Otorohanga.—Four men have been employed during the year for an output of 2,850 tons from opencast workings. For a short period during the year work was suspended at the opencast whilst an attempt was made to open part of the lease by mining. Due to the dangerous tactics adopted to win coal, this was closed down in July, when the work was transferred back to opencast.

Kimihia State Opencast Mine.—No. 1 Area: This mine produced consistently during the year except for a period of eight weeks during mid-winter when reserves of coal were exhausted and because wet weather conditions seriously hampered stripping operations. This experience emphasizes the necessity of intensive stripping during the summer months so that prior to the onset of winter conditions ample reserves of stripped coal are available for continuity of supply.

Spoil removed during the year amounted to 291,760 cubic yards, making a total yardage since operations commenced of 592,960 cubic yards.

No. 1 Area Extension: An area to the south-west of No. 1 has been bored from a barge on the lake during the year and a deposit of from 24 feet to 28 feet of good-quality coal has been proved over an area which is estimated to contain 450,000 tons. Preparations are being made to commence work on the stopbank so that the area can be enclosed, the water pumped out, and the coal eventually stripped and recovered.

Glen Afton State Opencast.—Spoil shifted during 1946 amounted to 89,600 cubic yards for a coal recovery of 12,587 tons of coal.

To date, 415,600 cubic yards of overburden have been removed for 39,889 tons of coal. Stripping is almost completed on this area and the remaining coal will be won during the year.

Kemp's State Opencast Mine, Glen Massey.—Total spoil shifted to the end of 1946 was 1,211,820 cubic yards, including 568,030 cubic yards during 1946.

Output for the year amounted to 52,459 tons, giving a total output to date of 86,521 tons. At this mine stripping is reasonably well ahead of coal-winning. Notwithstanding variations in thickness of coal, outputs have been consistently good during the year and the mine has been valuable producing unit.

Taranaki District

Mangapehi State Colliery.—The output for the year has been secured chiefly from the extraction of pillars in Nos. 2 East and West Panels. The work of extraction in No. 2 West panel has been completed and about half the pillars have been extracted from the No. 2 East Panel. Development work has been carried on in the No. 2 East Levels, the faces of these having been advanced to about 30 chains from side of dip; the coal opened up is of good quality and approximately 25 ft. in thickness. Two rise headings have been broken away from the levels in preparation for formation of new panel

inbye from panel in which pillars are now being extracted. A slant dip broken away 4 chains from main dip face was stopped in stone after being driven for 3½ chains. At present a new turbine pump has been installed in this vicinity and is handling all the mine water direct to surface. In No. 1 East Level reconditioning work was carried out as far as C Panel and pillar-extraction started on this panel. From the surface a new drive was put down to connect on to the No. 1 East "A" panel, where, in conjunction with pillar-extraction, it is proposed to experiment with the system of hydraulic stowage. If this system of stowage can be successfully applied it will go a long way towards reducing the loss of coal which, due to spontaneous combustion, inevitably occurs when portions of pillars have to be sealed off. During the year the whole of the mine has been piped and a high-pressure water system installed; this has proved to be invaluable in combating fires resulting from heating.

Tatu State Colliery.—In the No. 2 North-west Panel, pillar-extraction continued until August, when, due to flooding resulting from excessively heavy rainfalls, further operations became impossible. Thus work was stopped for the time being. An effort is being made to dewater this section so as to retrieve the lost pillars. In the area opened up by two dips to the north-west ahead of No. 2, work was continued until the 50 ft. fault was contacted, when four places were broken away and driven in a south-westerly direction, opening up the field ahead of the present position of main entry. This coal has proved to be of good quality and approximately 8 ft. in thickness; the prospects here appear to be good. Extensive repairs have been effected to the main return airway between the bottom of incline from the surface and the fan drift. An air-crossing over the main haulage road has considerably improved the ventilation of the mine and at the same time haulage of coal. A main and tail haulage system operated by 75 h.p. motor has been installed and is operating successfully. Prospecting work in the Haeo Gorge escarpment has continued as weather and man-power conditions permitted. Five holes have been completed and the seam has been proved to exist without any indications of major faulting.

Moynikan's Lease, Mangakara, Ohura.—Fifty chains of access roading was completed, storage bins for 40 tons erected, 10 chains of fluming built, waterways to storage dam completed, and sufficient stripping done to permit of coal being won, which was commenced in the beginning of December, 358 tons up to the end of the year being won.

Aria Colliery.—The work at this small mine has been carried on during the year developing on the dip side of trucking road. Entry to this section was achieved by driving a dip approximately 3 chains from which two levels to right and one to left were broken away. The levels to right after driving approximately 2 chains contacted a fault in which they are at present standing. The height of seam is about 9 ft. and is of fair quality. Electric power was installed for operating winch and pump.

Stockman Colliery.—This small mine operated by two men produced an output of 748 tons; the coal is brought down twenty-five miles by launch on the Mokau River to Mokau Settlement, from where it is distributed.

Paparata Colliery (Libline and Williams).—After producing 297 tons, operations ceased at this small mine.

Fougere's Opencast, Ohura.—Work has been carried on intermittently during the year for an output of 820 tons.

Waitewhena State Opencast.—Operations continued in the Lee Creek Section with satisfactory results throughout the summer months, but during the winter, creep of overburden gave continual trouble, resulting in irregular outputs, and after persevering against odds the section above the 30 ft. fault was abandoned, and with additional machines, "clam-grab," and power shovel to handle the stripping the area in the Lee Creek bed, extension of the first face operated, was worked up into the solid country.

Later a roadway was formed under atrocious conditions to the No. 2 Area, where, during the summer, reserves of stripped coal to the extent of 35,000 tons had been provided and which it was intended to transport by aerial ropeway (flying-fox) from the terrace to a roadside bin 300 ft. below and approximately 1,000 ft. distant.

The installation of the aerial ropeway was dropped for the time being, and all men and machines put to form the roadway, portion of which had to be corduroyed with heavy logs prior to metalling, and in November, production from the No. 2 area commenced, with increasing outputs. This coal is carted to the screens and bin in the Lee Creek, and then transported to the railway as graded coal.

Added reserves of stripped coal are being provided on No. 2 Area, where a combination of earthwork machines and trucks are operating, from which area outputs up to 200 tons daily can be had.

The installation of a screening-plant and bins at the Waitewhena railway siding is now well advanced, and electric power should be available when this plant is completed.

The installation of upper and roadside bins in the Waitewhena Valley for No. 2 and No. 5 Areas, together with that of the aerial ropeway associated with this installation, will follow the completion of the screening-plant now being erected at the railway siding.

A 25-ton wagon weighbridge has been installed at the railway siding.

Earthwork plant at present employed for stripping are two large bulldozers and two 12-cubic-yard carryalls, a medium bulldozer, two power shovels, and a clam-grab, the latter machines being used in conjunction with trucks transporting the spoil to a dump.

Eight 4-ton trucks transport the coal from the mine to the railway siding, a distance of twelve miles.

ROTOWARO RESCUE-STATION

Ninety-five men have been trained at the station, twelve of these during the year.

In addition to the training of new men, refresher courses have been given to all previously trained men.

During the year equipment has been installed at the State Mine, Benneydale, for the use of the two State mines in the Taranaki district.

During the year eight appeals for assistance have been received at the Station, three of these being for fire-fighting purposes, the remainder being for the opening-up of old sections which have been sealed for some considerable time.

HUNTLY SCHOOL OF MINES

The school continues to attract a considerable number of students, and classes are held regularly at Huntly, Ngaruawahia, and Rotowaro.

FATALITY

On 20th May at Kamo Colliery a miner, Allan George Saunders, received injuries which proved fatal, due to a fall of roof stone.

SERIOUS NON-FATAL ACCIDENTS

G. Ngahere, employed at Pukemiro Colliery, sustained a fracture of left clavicle on 11th January through being jammed between two props.

On 20th March in No. 3 Mine, Rotowaro, Robert Oliver, deputy, received an injury to the left leg through a piece of coal falling on it; this resulted in fracture of bone.

As a result of being jammed between two skips, F. Libeau sustained a fracture of lower end of right radius bone on 4th April at Pukemiro Colliery.

Reported from Mangapehi on 9th May that J. Dibley, miner, was struck on head by piece of coal from roof; he sustained the following injuries: twisted right knee, a broken ankle, and abrasions to back, the head injury not serious, due to hard hat being worn.

A fractured upper jaw was sustained by F. Raynor, deputy, Glen Afton Colliery, on 15th August, who, after examining the roof from the top of heap of coal, was coming down when he slipped and struck the corner of a skip standing at toe of heap.

On 10th September at Kamo Colliery Donald McFarlane, shiftman, sustained a fracture of a leg when he was struck by a timber trolley which had jumped the track.

A shiftman, A. Palmer, received a first-degree burn of the face in the No. 1 Alison Mine due to lifting the lid from a carbide container used in conjunction with an acetylene cutter and inserting his naked light to see what was inside; apparently some gas was still in the container, which ignited, causing the burn. Date of accident, 16th September.

On 9th October it was reported from Mangapehi that R. Archibald, trucker, sustained a fracture of the left arm.

Reported from Renown Collieries that on 3rd September E. Hambleton, miner, received an injury to his right eye which necessitated the removal of same.

REPORTS REGARDING DANGEROUS OCCURRENCES IN MINES

On 5th January in No. 1 East Section, Mangapehi, a fire was detected which had started under a fall of coal; fire was subdued by applying water, and is now safe and cool.

On 6th January gob-stink detected in No. 2 East Panel, Mangapehi, emanating from crack in floor; heating subdued by water, and is now cool.

On 11th January in West Pillar Section, Mangapehi, smoke was observed coming from a crushed barrier alongside the gob. This required erection of four stoppings to seal off.

On 10th February fire-stink was detected in No. 3 Left North Mine, Pukemiro; this was effectively isolated by erection of a stopping.

Reported on 10th February that minor outburst of fire occurred in return half of No. 2 East Panel, Mangapehi; the fire was in a crack in the floor. It was quickly extinguished by application of water.

On 13th February smoke was observed coming from a sealed goaf in Alison No. 2 Mine. This required an additional two stoppings to seal off the affected part.

In the E2 Second Panel Pillars, Glen Afton Colliery, on 15th February fire-stink detected coming from goaf. The heating was smothered through securing a good fall from roof.

On 25th February fire-stink was detected coming from the goaf in the E2 pillars, Glen Afton Colliery; in addition to securing a good fall, two stoppings were erected to isolate the affected area.

On 12th April in the West Section, State Coal Mine, Benneydale, a fire was discovered in some loose coal inside a board stopping through which it had burnt a hole; water applied to extinguish the fire and a clay stopping erected to seal off the area.

On 4th May in the No. 1 Section, South Mine, Pukemiro, an outbreak of fire occurred which was considered sufficiently serious to warrant calling for assistance from the Rescue-station, Rotowaro. The fire had burnt back over an existing permanent stopping. Two new stoppings were erected, and the outbreak is now under control.

On 13th May a heating occurred in the pillar workings on the east side of main haulage; the area was isolated by the erection of three stoppings.

An outbreak of fire occurred in the New Panel Section, South Mine, Pukemiro, on the 7th June whilst the remaining portion of a stump adjacent to goaf was being extracted. A stopping was erected to seal off heated area, and everything is under control.

On 26th June smoke was found in the No. 3 Jig Section, Alison No. 1 Mine; examination revealed that the smoke was issuing from the goaf in King's pillar place. One stopping was required to seal off the affected part.

On 9th July a fire occurred in the No. 2 East Panel, State Mine, Benneydale; the fire was got under control with water and then sealed off.

A heating occurred in Brown's Section, No. 3 Mine, Rotowaro, on the 15th July. The affected area was sealed off by the erection of two stoppings.

In the Rope End Section, Alison No. 1 Mine, on the 15th July, due to fire-stink in Wilson's place, it was found necessary to erect two stoppings to seal off the area. On the 16th, smoke was discovered in the place adjacent to the one sealed off on previous day. This required another two stoppings. To erect these the services of a rescue team wearing the Proto apparatus was used. It is worthy of note that a 3 per cent. cap of inflammable gas was got in a safety-lamp up on a bench where one of the stoppings was being erected. As CH₄ had never been found in this mine previously, it is conjectured that the gas found was produced by distillation behind one of the stoppings erected on previous day.

On 6th August in E Section, MacDonald Mine, a heating occurred which required four stoppings to seal off; eight places are temporarily put out of production.

On 15th August in Alison No. 1 Mine, two fires occurred, one in No. 3 Jig Section and one in Spence's place. Four stoppings were erected to effectively seal the areas affected.

In the No. 4 Jig Pillar Section, Alison No. 1 Mine, a fire was discovered. The fire had burnt around the side of a brick stopping. A new stopping was erected 2 ft. on outbye side and the space between the stoppings filled with pug clay.

On 30th August an outbreak of fire occurred in the Nelson's Jig Section, Pukemiro South Mine. This was a small outbreak and the material was filled out and sent to the surface.

On 6th October a fire occurred in the Straight Heading Section, North Mine, Pukemiro. The fire was brought under control by erecting fire stoppings.

An outbreak of fire occurred in the New Panel Section, South Mine, Pukemiro, on 13th October. This was the result of a place not falling in completely after being drawn off, and the fire broke over the old fire stopping. Fire stoppings were erected and the situation is now under control.

PROSECUTIONS

Arising out of an inspection carried out in connection with a fatal accident at Kamo Collieries on the 20th May, informations were laid which involved three officials, being a shotfirer, deputy, and underviewer. All of the cases were defended on the 24th July.

The shotfirer was charged that he "did fire a shot in a working-place of the mine, such shot not being in a properly placed shot hole," contrary to Regulation 224 (2), Coal-mines Regulations 1939. Failure to secure a conviction was due to the fact that the acting-mine-manager gave evidence contrary to facts agreed upon during the inspection of the working-place.

The information laid against the deputy was "that he, being an examining deputy, did fail to report that a source of danger existed in a working-place due to non-observance of timbering rules": section 123 (2), Coal-mines Act, 1925. A conviction was secured and a fine of £5 1s. imposed, such fine being to permit of an appeal being made against the decision. In the higher Court the decision was reserved, but ultimately a reversal of decision was given.

The case against the underviewer was "that, being an underviewer, he did fail to see that the roof and sides of a working-place were properly secured by the person working in it," contrary to Regulation 89, Coal-mines Regulations 1939. Failed to secure a conviction.

WEST COAST INSPECTION DISTRICT (J. ADAMSON and L. C. COOK, Inspectors of Coal-mines)

GREYMOUTH DISTRICT

Liverpool State Colliery, Rewanui.—Anderson Dip Section: Five pairs of colliers were employed in this section, partly in pillar-extraction and partly in solid work. A dip road and level driven through a barrier to the east of Leach's Dip, which was previously sealed off, reached solid coal to the east of this old dip. Splitting and extraction of pillars was continued to the east off the bottom of James Dip.

Kimbell West Dip Section: Splitting and extraction of pillars was continued throughout the year, six pairs of colliers being engaged on this work.

Morgan East and West Rise Sections: Sixteen pairs of miners continued with the extraction of pillars in these sections. Prospecting work continued intermittently through faulted ground at the inbye end of the main Morgan West Level. At a distance of approximately 1½ chains, coal was encountered, but it was found that the seam had split into three with 8 ft. of clean workable coal in one seam which was pitching very steeply. Stone driving is being continued.

Morgan West Dip : Development here has been pushed on a distance of 11 chains with a grade of approximately 1 in 4. The top 5 ft. of the seam has deteriorated and is now interspersed with stone bands. There is, however, 15 ft. of clean coal below these stone bands. Two pairs of miners were engaged in development work in this section.

Morgan East Dip : Two headings have been driven to the rise and to the east of the middle panel. The quality of coal is improving, and prospects look bright for another small panel in this area. Two pairs of miners were engaged on this work.

Hadcroft's Dip, Morgan East Dip Section : Development has now reached a distance of 13 chains from the bottom of Hadcroft's Dip. A new level was turned off to the east at approximately 12 chains. The thickness of coal in the dip face is 16 ft., but the level to the east appeared to be running into dirty coal. A sump is being driven off the dip heading to the west 2 chains below the bottom of Hadcroft's Dip. This will provide the main sump for all the Morgan East Dip workings. Four pairs of miners were engaged on this work.

In the top panel, Morgan East Dip, pillar-extraction was carried out, but a heating developed and the area was sealed off permanently.

Machinery installed underground included a new 40 h.p. electric winch installed in the Kimbell West Dip, a 40 h.p. main and tail compressed-air winch installed in the Anderson Dip Section, and a 20 h.p. compressed-air winch installed at the foot of Hadcroft's Dip. An electric hot-air-heating apparatus was installed in two bathhouses, while an electric system of heating water was installed in the bins bathhouse.

Strongman State Colliery.—The output was gained mainly from development work in a northerly direction from the main east haulage road and in a southerly direction in the No. 1 South Dip Section. The seam in this section deteriorated in thickness and quality due to a number of stone bands. Development was discontinued and preparations made to extract the pillars. A new dip haulage was being driven to improve the haulage facilities from this section.

A new 40 h.p. electric Carron drive haulage winch was installed for the No. 2 Dip into the lower seam, effecting a considerable improvement in the haulage for this section.

Blackball State Colliery, Blackball.—Sump Dip : Five pairs of miners on double shift developed this section with a Jeffrey coal-cutter. Workings to left of main dip are approaching No. 2 Bore. The seam is 20 ft. thick of good quality. Coal on left side of main dip seam thinned to 4 ft.

Dunn's Dip : Three pairs of miners on double shift developed this section, which is in the locality of No. 1 Bore. The coal is 15 ft. to 20 ft. thick and is of good quality.

Main and Tail Section : This section was developed by three pairs of miners on double shift with a Korfman coal-cutter. Two headings were driven 3 chains through barren ground.

Crow's Nest Section : Two pairs of miners on double shift were extracting pillars. A heating was successfully sealed.

An endless rope haulage was installed in Main and Tail Section.

Underground substation was brought into use. High tension is fed through a borehole cable, 11,000 volts, and transformed underground to 400 volts.

Blackball Creek Colliery (Balderstone and Party), Blackball.—Eight men were employed underground during the year continuing splitting and extracting pillars left behind in the old original Blackball Proprietary's workings in the top seam.

Briandale Collieries, Ltd., Ten-mile Creek.—Prospecting operations were continued in a coal-seam adjacent to the old Burnside Co-operative Mine. The quality of the coal deteriorated somewhat in very disturbed strata. A continuation of the seam is difficult to determine on this account.

Wallsend State Colliery, Brunnerton.—No. 1 Dip development was continued towards the east side, and in the area between the roll and the Dobson fault development continued for a further 2½ chains. In No. 2 Dip pumping was continued with a new Lee Howl pump, and the machine level is now dry. Brushing and retimbering was continued nearly down to this point. Concrete stoppings were erected on either side where necessary.

No. 1 Slant Dip : Splitting of pillars was continued and has now reached the line of the old dip road.

Extension Section : Development was completed and splitting of pillars commenced.

New cages with safety-catches were fitted in the main winding-shaft and a 60 h.p. electric man-haulage winch was installed at the top of No. 3 Dip. A new 6 in. compressed-air line was installed in the upcast shaft.

A stone drive connecting No. 1 Slant Dip with the old No. 2 Dip was driven to make a new return airway with a view to improving the ventilation of Nos. 1 and 2 Slant Dips and the Extension Section.

Dobson State Colliery, Dobson.—Development continued in the main dip headings and in the No. 5 West Section. A step fault developed in No. 5 West and increased in throw from north to south. There is regular formation beyond this fault, which is being pierced at No. 3 West Dip, where the displacement shows approximately 10 ft. downthrow. A new electric cable was placed down No. 2 Dip to No. 1 Pumping Station, which will be converted from compressed air to electricity.

A new transformer for the main substation is almost completed. Work has commenced on the enlarging of the main return airway for improved ventilation.

Paparoa Colliery, Roa.—Aerial Section (No. 1 Seam) : Four to five pairs of colliers were employed throughout the year, mainly in solid work. Towards the end of the year a connection was made with the old top level with the intention of driving through to the outcrop in Waterfall Creek.

West Section (No. 2 Seam): Three pairs of colliers were employed during the year. The work included the recovery of roadways above the old Slant Heading and driving of a new intake airway from the main tunnel in solid coal to the dip of the seam.

A new electric man-haulage winch was installed at Middle Flat. A slip carried away portion of the hydraulic-brake house and inflicted considerable damage to this engine and to the new man-haulage winch.

CO-OPERATIVE MINES IN THE GREY DISTRICT

Spark and Party's Mine, Rewanui.—Development continued in a north-westerly direction to the rise off the main level. The coal maintained fairly good quality with an average thickness of 8 ft. to 9 ft.

Old Runanga Mine (O'Brien and Party), Rewanui.—Pillar-extraction continued on the west side of the main level.

Moody Creek Mine (Wright and Party), Dunollie.—Development work continued to the dip in excellent-quality coal averaging 12 ft. in thickness. A level to the right of the dip haulage was driven a distance of 8 chains and stopped temporarily in good-quality coal. It is the intention of this party to install a new surface haulage and erect new bins and screening-plant on the railway-line adjacent to the mine portal.

Goldlight Mine (Williams and Party), Rewanui.—Development work was continued throughout the year to the left of the dip haulage road. The quality of the coal remains good, averaging 8 ft. in thickness. The workings on this side are now approximately 3 chains from the boundary of the lease. A drainage level to the right from the foot of the dip haulage pierced the surface, thus eliminating pumping problems and providing improvement in the ventilation.

New Point E. Mine (Guy and Party), Dunollie.—Pillar-extraction ceased at the end of the year in the dip section of this mine and the section closed down. Work has now commenced in reopening the rise coal temporarily abandoned in the early part of the year.

Hilltop Mine (Armstrong and Party), Ten-mile.—Development work was continued to the west of the main dip in good coal averaging 20 ft. in thickness. A borehole in search of a lower seam was put down at the lower extremity of the workings. The depth of the borehole is approximately 80 ft., proving 12 ft. coal.

At the latter end of the year this mine was taken over by the Kiwi co-operative party.

Boote and Party, Ten-mile.—Pillar-extraction continued throughout the year on the west side of the dip haulage road. Roof conditions were not good, necessitating constant care and adequate timbering. The percentage of coal obtained from these workings was satisfactory.

Hunter and Party's Mine, Dunollie.—Development work was carried out in an incline and two levels to left of main dip. To the right of main dip a level was stopped at 3 chains in 18 in. top coal, 1 ft. stone, 2 ft. coal, 15 in. stone, 4 ft. coal on floor.

Schultz Creek Mine (Gould and Co., Ltd.), Twelve-mile.—The output was won solely from pillar-extraction in coal from 2 ft. to 3 ft. in thickness.

Cliffdale Mine (Stuart and Party), Ten-mile.—Pillar-extraction ceased in the old mine during the year and this mine closed down. A new dip drive was commenced some 10 chains to 12 chains west of the old mine mouth. Coal was struck at approximately 1½ chains. The seam is 13 ft. thick and is of excellent quality, pitching at an average grade of 1 in 3. Development was being continued principally to the dip.

Belleve Mine, Rapahoe.—No work was done at this mine during the year. Improvements to the surface haulage are contemplated, upon the completion of which it is proposed to reopen the mine.

Jubilee Mine (Tinning and Party), Rapahoe.—Twelve men were employed during the year, principally on pillar-extraction in No. 1 Section. Working-conditions were good, thus permitting a high percentage of extraction.

Coaldale Mine (Wafer and Party), Rapahoe.—At the latter end of the year this party commenced operations in a small area of coal 4 ft. thick adjacent to the old Bellvue Mine, worked by Hadercroft and party. Work consisted mainly of the erection of bins and building of access road. Very little coal was won.

Cliffside Mine (Moore and Party), Nine-mile.—Output was won chiefly from development work in good coal averaging 12 ft. in thickness. Several pillars on the low side of the old mine were extracted with good results.

Braehead Mine (Boote and Party), Dunollie.—Output was won solely from pillar-extraction in good-quality coal 5 ft. to 6 ft. in thickness.

Halliday and Party's Mine, Dunollie.—This party reopened the mine formerly worked by Currie and party, who later abandoned it in favour of a seam to the dip and on the low side of this mine. Working-conditions, however, are difficult. The seam appears to be a slip off the main strata. Roof conditions are not good, while the thickness of coal varies considerably, also the grade, which changes rapidly in extent and direction.

Harrison and Party's Mine, Ten-mile.—Pillar-extraction continued in the early part of the year and was suspended temporarily in favour of development ahead of the main dip haulage road. The thickness of coal averaged 6 ft. to 7 ft., but deteriorated somewhat to the right of the dip, where the seam is split by a band of stone 18 in. thick.

REEFTON DISTRICT

Doran's Mine, Boatmans.—Very little prospecting work was done during the year in a small seam of coal.

Alborn's Mine, Caplestone.—Six men were employed at this mine in Nos. 1 and 2 seams, principally on pillar-extraction.

Kleen Mine (Archer Bros.), Caplestone.—Pillar-extraction was continued in a vertical seam of good-quality coal averaging 12 ft. thick.

Coghlan's Freehold Mine, Caplestone.—The output was won solely from pillar-extraction on the rise side of the main level.

Hillcrest Top Mine, Waitahu.—The output was won from pillar-extraction to the rise of the main level in coal of good quality averaging 5 ft. in thickness.

Griggs and Party's Mine, Waitahu.—Pillar-extraction on the rise side of the horse level was completed early in the year. Development was continued in a north-easterly direction for a distance of 7 chains from the lower end of the dip haulage road. Coal was of good quality. Roof conditions, however, necessitated constant care and attention.

Dauntless Mine, Waitahu.—This mine was operated by Woodbury and party at the beginning of the year, but was later taken over by the Pyramid Coal-mining Co., Ltd. The output was won from development work to the dip and level course in a north-easterly direction. The coal was of excellent quality averaging 15 ft. thick. A new dip haulage road was driven parallel with and approximately $1\frac{1}{2}$ chains from the boundary with the Pyramid Mine, thus improving the haulage facilities for the coal on this side of the mine.

New Pyramid Mine (Crown Lease), Waitahu.—Development was continued towards the boundary with the Morrisvale leases in good-quality coal 12 ft. thick. Increased quantities of water however, forced this company to abandon further development on this lease, and the company took over the Dauntless Mine adjacent. The Pyramid dip haulage road is now being used as a pumping-pit.

Burke's Creek State Mine, Reefton.—Development continued north-east and south-west of the Slant Dip Extension on level course. From the level on the north-east side it is intended to drive to the rise and connect with the bottom of the present main dip haulage. Pillar-extraction on the south-west side commenced in the second half of the year with satisfactory results. No dip development was attempted during the year. Repairs and improvements to the dip haulage road were carried out, and preparations were made for the installation of a man-haulage on this main dip haulage road. A new electric haulage winch on the surface was installed and was almost ready for operation at the close of the year.

Morrisvale Opencast Mine (Morrisvale Lease), Reefton.—An intermittent output was obtained from No. 4 seam during the year.

Perfection Valley Mine (Morrisvale Lease), Reefton.—Development was commenced in No. 3 seam adjacent to the old Perfection Mine. The workings progressed on a level course in No. 3 seam for a distance of approximately 7 chains, when disturbed conditions were encountered, the grade of the seam approaching vertical and becoming thin and dirty. Pillar-extraction later commenced at the inbye end of the workings, this work having very good results. The thickness of the coal was 4 ft. 6 in.

Pyramid Section (Morrisvale Lease), Reefton.—A small output was won from intermittent work carried out during the year.

Higrade Mine (Morrisvale Lease), Reefton.—A small output was won from an area of Reefton No. 2 seam adjacent to the Burke's Creek Mine. Pillar-extraction commenced in the vertical section during the latter part of the year with good results. The coal is of good quality.

Ferndale Mine (Lockington's Lease), Reefton.—This mine started during the year, a small output being won by opencast and underground methods. The opencasting was done in the No. 4 seam, and reopening of No. 2 seam previously worked by Watson and Hamill was attempted and abandoned after a small output was won.

Burnwell Mine (D. Hamill), Reefton.—The output was obtained solely from development work on a level course in a north-easterly direction and to the rise in a south-easterly direction. Attempts to provide a new return airway to the surface proved fruitless owing to the difficult roof conditions. However, a new attempt is being made to provide this airway.

Central Mine (D. Hamill), Reefton.—The output from this mine was won solely from development, principally on level course to the north towards the boundary of the coal-bearing land in this direction. Dip development was continued intermittently in a north-westerly direction towards Reefton Railway-station. The seam continued to pitch steeply in this direction.

Terrace Mine, Reefton.—Development was continued in this mine in three main levels working Reefton No. 4 seam towards Reddale Valley. Advancing headings were almost through to the outcrop in this valley. It is proposed to drive through to the outcrop to assist in the ventilation of the mine.

Defiance Mine, Murray Creek.—Development was continued throughout the year on level course to the east and on the rise to the north. The workings were advanced 7 chains or 8 chains from the mine entrance. The seam has thinned to 3 ft. 6 in. with a general deterioration in the quality of the coal. The general inclination of the seam increased along the main level, with indications pointing to disturbed ground ahead.

Butler's Section.—This section was closed during the year.

Clele Mine (Alborn's), Merrijigs.—Output was obtained intermittently during the year from pillar-extraction in Nos. 1 and 2 Sections.

Nicholls' Mine, Caplestone.—In the rise section four men were splitting and extracting pillars.

Banks' Opencast Mine (A. E. Eklund), Waitahu.—Production from this opencast was maintained throughout the year. Stripping of overburden is now accomplished hydraulically with good results. The seam being worked is Reefton No. 4, adjacent to the Morrisvale boundary.

Star Mine (Lewis and Party), Murray Creek.—Very little work was done at this mine during the year. The output was obtained by opencasting a small block of old workings in the Cement Town area. Coal up to 15 ft. thick with 20 ft. overburden was removed by mechanical and hydraulic stripping methods.

Royal Coal Syndicate, Rainy Creek.—The output was won from a pair of development levels and workings to the rise in a vertical seam 5 ft. thick.

Turner and Party's Opencast Mine, Murray Creek.—Coal-production from this mine is obtained from an area previously worked by underground methods. The coal is of fair quality and the method of stripping is by hydraulic means, the water being pumped from Murray Creek.

W. G. Chandler's Opencast Mine, Murray Creek.—The coal from this mine is being won from an area previously worked by underground methods and abandoned many years ago owing to fire. Stripping is done by bulldozer and filled by hand. The coal ranges in thickness from 12 ft. to 15 ft.

Golden Point Mine (Blom and Rollerson), Reefton.—Output was won from a level drive to the south and by rise workings to the east towards the outcrop. Pillar-extraction was commenced during the latter part of the year with good results. The quality of the coal is poor.

BULLER DISTRICT

Mitchell's Mine, Charleston.—No work was done at this mine during the year.

Warne's Mine, Charleston.—No work was done at this mine during the year.

Bowater and Bryan's Mines, Charleston.—Three separate mining parties operated on this lease during the year—viz., Rata Collieries, Nile Hydro Syndicate, and N. Mouat. The coal and overburden are generally removed by hydraulic means, while the coal from Mouat's Mine is loaded mechanically by steam shovel. The combined output from these mines during the year was 41,338 tons.

J. Powell's Lease, Charleston.—No coal was produced from this area by the Nile Hydro Syndicate during the year.

Allan's Mine, Charleston.—A very small output was won during the year.

Moynihan's Mine, Charleston.—Production from this mine was obtained intermittently by the Nile Hydro Syndicate. All the coal and stripping of overburden was removed by hydraulic means.

Hillside Mine (Gemmell and Bennett), Waitakere, Charleston.—A small output was obtained during the year by opencasting.

Brighton Mine (Hunter's), Brighton.—The output was won by underground methods solely from development work in coal averaging 16 ft. thick.

Glencrag Mine, Buller Gorge.—The output was won principally from development work. A small amount of coal was won from pillar-extraction towards the end of the year. The quality of the coal is good, the coal ranging from 9 ft. to 15 ft. thick. New bins were erected replacing the old structure.

Coal Creek Mine, Seddonville.—The output was obtained from this mine by driving towards a number of pillars left by the old Mokihinui Coal Co. Several chains require to be driven before a connection with these workings is obtained. The ventilation of the mine was made by a connection with the old air-shaft in a portion of the Taipo workings.

Cardiff Coal Co., Ltd., Mokihinui.—The output was won solely from pillar-extraction, the coal being mined hydraulically.

Hydro Coal-mines, Ltd., Seddonville.—The output was won entirely from pillar-extraction.

Charming Creek - Westport Coal Co., Ltd., Ngakawau.—Development was continued in the north heading, Nos. 3 East and 3 West Sections. Ten pairs of colliers were constantly employed in coal 11 ft. to 20 ft. in thickness. Towards the end of the year pillar-extraction commenced on the northern boundary, where the coal thinned to 4 ft. in thickness. The average daily output was 150 tons. Towards the end of the year extensive repairs were carried out to the suspension bridge on the loco road across the Ngakawau River.

Westport-Cascade Mine, Cascade Creek.—Three pairs of miners were continually employed on pillar-extraction in Durkin's Section. Pillar-extraction in Moynihan's Section was discontinued early in the year. Pillar-extraction commenced early in the year in the Mill Creek Section, three miners being employed. A further four miners were continually employed on development work south of the first panel in the Mill Creek Section.

Westport Coal Co., Ltd., Denniston Mine.—Pillar-extraction continued in Forsyth's Section. Development was continued in an area to the rise of the 9-Box Jig Section, but the work proved disappointing owing to the low coal, exceptionally bad roof conditions, stone bands, and intrusions. In the Waterloo Section prospecting work was continued in low coal, but as this low coal decreased again in thickness, extraction of the remaining pillars was commenced. In the Extension Section, splitting and extracting of pillars was continued with three pairs of miners.

Aerial Ropeway to Cook's Lease.—Excavation for the foundations of the pylons was commenced. This aerial when completed will transport the coal from Cook's Lease area to the terminus with the main rope road at Burnett's Face.

Concrete foundations for the bins at Wooden Bridge have been laid where the coal will be transferred from the aerial to the endless-rope haulage road to Denniston.

A temporary bi-cable aerial is being erected for the transfer of material to this work.

Westport Coal Co. Ltd., Millerton Mine.—Mangatina Area: Two pairs of colliers were employed on pillar-extraction until November, when all the available coal was extracted and the area abandoned.

Mine Creek Area: Seven pairs of colliers were employed at the beginning of the year in the 3rd West, 6th West, Pollock's Level, and North-east Sections, all on pillar-extraction. The number of colliers was later reduced to five pairs.

Old Dip Area: The year commenced with five pairs on pillar-extraction in the Settlement Area and two pairs on development work in the lower Old Dip Area. To suit operating conditions, colliers were transferred, placing four pairs on pillar-extraction in the Settlement Area, one pair splitting a block of coal prior to pillar-extraction in the upper Old Dip Area, and in the lower Old Dip Area two pairs of colliers were engaged on pillar-extraction.

On the western side of the lower Old Dip, one pair was engaged in opening up and forming pillars in a small block of coal left during the first working in this area. The policy of forming artificial panels by concrete stoppings was continued to control the fire hazard, with satisfactory results.

Stockton State Colliery, Ngakawau.—Fly Creek Section: Operations were confined to pillar-extraction in the South Section. Very wet conditions continued in about 80 per cent. of the working-faces. In the old mine area extraction was completed in No. 2 Section and continued in Nos. 4 and 5 Sections.

Webb Mine (D. Hill): Development advanced a distance of 26 chains from the main entrance in good-quality coal. Three panels were formed to the south. Development was completed in the old workings in this area and pillar-extraction commenced from the boundary of the barren belt on this area.

South-west and adjacent to the Webb Mine a fairly large area of coal suitable for opencasting has been proved.

"E" Hill Opencast Mine: During the year, 140,000 tons of good coal was produced. A new 5-yard electric shovel simplifies the stripping problem and allows a regular high daily output to be maintained.

Harris' Mine, Karamea.—This mine remained closed during the year.

Comet Mine, Inangahua.—Very little output was won, and the mine closed down for the greater part of the year.

Paine Bros.' Mine, Buller Gorge.—The output was won from pillar-extraction, the overburden being removed by bulldozers and the coal mined by hand methods.

Rahui Mine, Buller Gorge.—Splitting and extraction of pillars was continued throughout the year in coal averaging 7 ft. to 16 ft. in thickness. The coal is obtained by hydraulic means.

Heaphy's Opencast Mine, Buller Gorge.—This mine commenced coal-production during the latter part of the year. The coal is of good quality and ranges up to 25 ft. thick with very little overburden and is mined by hydraulic means.

NELSON DISTRICT

Owen Colliery, Owen River.—The output for the year was obtained solely from development with two levels in low coal 1 ft. 6 in. to 2 ft. thick.

Six-mile Mine (J. Gillespie), Murchison.—The output was won by four men working a vertical seam of irregular thickness from 6 in. to 12 ft.

Strathmore Mine (R. E. F. O'Rourke), Murchison.—A small output was won from a 4 ft. seam of good-quality coal.

Westhaven Mine, Mangarakau, Collingwood.—Five men continued with development on level course right and left of the crosscut dip. The seam averaged 5 ft. in thickness interspersed with 12 ft. stone band with 6 in. of dirt adjacent to the roof.

Victory Mine, Glenhope.—Only 5 tons of coal was produced from this mine during the year.

RESCUE-STATION

The number of fully trained men on the register at the end of the year was seventy-one. During the year five new men were trained.

Three refresher courses were given the trained men in the Reef-ton district.

The policy of keeping all rescue men familiar with the workings of district mines has been maintained by frequent visits to these mines.

The Proto apparatus was worn on each visit, thus gaining experience in its use in actual underground conditions.

FATAL ACCIDENTS

Three fatal accidents occurred during the year, as follows:—

On 14th March Robert McCabe, miner, Stockton Colliery, was struck by approximately 4 cwt. to 5 cwt. of coal and was killed instantaneously.

On 9th September Edward Matthew Nicholson, miner, Charming Creek Colliery, was killed instantaneously when a large rock fell on him while returning from work in an open truck on the company's loco line.

On 18th October Joseph Unwin Fielding, miner, Paparoa Colliery, was killed instantaneously when a large piece of coal came down off the coal face and struck him on the head.

SERIOUS NON-FATAL ACCIDENTS

Twenty-nine serious accidents occurred during the year, as follows:—

On 18th January Colin Campbell, miner, Liverpool Colliery, aged thirty-two years, was struck by a piece of coal and suffered a fractured pelvis. When trucking a box of coal the box struck a prop, knocking it out. Campbell returned to the place to replace the prop, when a piece of coal broke away from the lip and caught him.

On 29th January E. Martin, shiftman, Wallsend Colliery, sustained an injured ankle when he slipped on a flat sheet while lifting a rail. Later it was ascertained that he had a fracture of one of the bones in the ankle.

On 19th February J. Blance, miner, Wallsend Colliery, was filling some loose coal on a steep piece of floor in his place at the bottom of No. 1 Dip when a lump of coal rolled down and struck him on the right ankle. He sustained a fracture of a bone in the ankle.

On 21st February J. Clark, miner, Dobson Colliery, was employed lifting bottoms in the old slant dip off No. 4 Level. This place was being worked from the bottom and operated by a jig. A large slab of stone almost the whole width of the place and between the jig prop and the place collapsed. Fortunately, it was prevented from reaching the floor by the bench of bottoms, and although Clark was under the stone only his foot was caught, and he sustained a fracture of the right heel bone and a deep flesh wound in the left leg.

On 21st March V. Swallow, miner, Liverpool Colliery, received an injury to his back caused by falling stone. It was later discovered in hospital that a displacement to spine had been caused.

On 8th April James Steele, rope-road worker, Denniston Colliery, sustained a fracture of a small bone in the left foot while at work. The accident occurred at Wooden Bridge when a twisted clip was being removed. An iron bar was being used as a lever, and this sprang back, striking Steele in the left instep.

On 8th April Thomas Robertson, shiftman, Millerton Colliery, received a fracture of fourth left metacarpal, abrasion to right eye, and abrasions to left hand. Another miner was erecting a prop which slipped and struck Robertson, who was trucking.

On 12th April Roy Washer, miner, Kaye and Party's colliery, was casting down coal to a truck when a lump of coal weighing approximately 10 cwt. which had apparently fallen from the rib struck him. He sustained a fractured and dislocated right ankle and fractured pelvis.

On 24th April Walter Marshall, bins attendant, Boote and party's colliery, while lifting a heavy prop on to an empty race pinched his thumb between the prop and the end of a truck and sustained a broken thumb.

On 29th April D. Stone, trucker, Wallsend Colliery, fractured his left little finger while clipping on the extension rope.

On 7th May Jack McManus, miner, Harrison and party's colliery, sustained a compound fracture of left leg and injuries to right forearm, chest, and face when he was struck by a rake of trucks caused by the breakage of rope.

On 14th May W. B. Hands, trucker, Millerton Colliery, slipped in a drain and sustained a fracture of the right patella.

On 15th May Eric Wick, bins worker, Dobson Colliery, was opening a door on a railway wagon and the door fell on his toe, causing a fracture.

On 15th July Thomas Pollock, miner, Millerton Colliery, received a fracture of both bones just above the right ankle. The workmen's inspectors reported that they were of the opinion that Pollock slipped on a greasy part of the floor when trying to avoid a falling prop, which bounced off a piece of timber lying on the floor on to his ankle.

On 22nd July J. H. Phillips, winch-driver, Wallsend Colliery, received a compound fracture and dislocation of the right index finger when he was applying a small amount of grease to the clutch drum with his finger, when his finger got caught under the clutch band.

On 18th September A. McInness, miner, Wallsend Colliery, while working at the coal face, struck his right thumb against the side of a box, sustaining a fracture.

On 25th September Harold Browning, miner, Wallsend Colliery, suffered contusions to the big toe of his left foot when he was struck by a piece of coal. After an x-ray it was revealed that he suffered a fracture of the big toe.

On 26th September Steve Gugum, miner, Dobson Colliery, suffered a squashed ring-finger of the right hand when he was placing a prop in position. It was later ascertained that this injury resulted in a fracture of the tips of the ring-finger and the mid-finger.

On 9th October James Beirne, shiftman, Wallsend Colliery, was struck by a piece of side coal and his injuries at the time were described as "contusions lumbar spine and right lumbar region." Beirne was admitted to the Grey River Hospital and a series of x-ray examinations were carried out, from which it was ascertained that he suffered a fracture of the spine.

On 14th October C. G. McGregor, miner, Moody Creek Colliery, was struck in the eye by a splinter of coal, causing serious eye injury.

On 16th October David Allen, miner, Wallsend Colliery, was struck by a fall of coal and suffered a fracture of right scapula.

On 21st October A. E. Eklund, mine-manager, Banks and party's colliery, suffered a broken clavicle when covered by fall of overburden which was caused through snow melting and water filling in a crack a few feet from the face.

On 21st October Colin Watson, winch-driver, Dobson Colliery, received a compound fracture of the first joint of his thumb when he was endeavouring to replace the rope on a winch-drum.

On 21st October W. Fraser, miner, Liverpool Colliery, received a fractured left fibula through being struck by a piece of coal bursting from the face.

On 22nd October George Young, contract worker, Dobson Colliery, whilst employed enlarging the return airway fell while working in the airway and suffered a fracture of the left radius.

On 4th November W. Boyle, trucker, Stuart and party's colliery, was tipping coal into the bins when his foot became jammed between two trucks and he suffered a fracture of a small bone in his right ankle.

On 29th November B. Anderson, trucker, Denniston Colliery, sustained a compound fracture of right elbow when caught in jig rope.

On 2nd December Alan McPhie, fitter, Dobson Colliery, was operating a portable grinding-machine when the stone burst and struck him on the jaw, causing a fracture.

On 9th December E. T. Cummings, fireman, Stockton Colliery, while returning to his home at the conclusion of his dog-watch shift riding a motor-cycle, collided on the Granity bridge with a motor-car at 9.30 a.m., and as a result suffered a fracture of the head of the right femur.

DANGEROUS OCCURRENCES IN COAL-MINES (Regulation 81, Coal-mines Regulations 1939)

Liverpool Colliery, Rewanui.—On 7th January a heating was discovered in the level to the west at the bottom of Anderson Dip Section. This heating was sealed off with temporary stoppings. Further inspection revealed that leakage was taking place and the atmosphere on the outbye side of the stoppings was being fouled. Erection of permanent stoppings was then carried on continuously until the area was satisfactorily sealed off. The mine recommenced production on 10th January, 1946.

Kleen Mine, Reeflon.—On 12th January a heating was suspected and the area sealed off with temporary stoppings. Leakage, however, resulted in several men being affected by CO whilst erecting the permanent stoppings. The men were withdrawn. The permanent stoppings were completed with the aid of rescue apparatus and the area effectively sealed off on 18th January.

Liverpool Mine, Rewanui.—On 14th February a slight heating was discovered in the third bord to the right off No. 2 Bank, Morgan East. Water was led on to the heating mass of coal and stone, and by its use the heating was soon under control and everything appeared normal.

Liverpool Mine, Rewanui.—On 13th May a heating in its initial stage was discovered by the deputy in a large fall below Butler's place, No. 2 Bank, Morgan East. Water was led by pipe-line to the top of fall, and by its use the heating was controlled.

Owen Colliery, Owen River.—On 10th June fire broke out in a waste dump outside the mine. The men were withdrawn owing to the fumes from the fire entering the mine mouth, which was close by. Water was played on the fire as much as possible and the heated material moved by bulldozer.

Strongman Mine, Nine-mile.—On 27th June No. 3 North Heading struck No. 6 Bore and quantities of gas and water were given off. When the working-places were tested, it was found that there was a 2½ percentage of gas present, and five pairs of men were withdrawn.

Liverpool Mine, Rewanui.—On 5th August a heating was discovered in No. 2 Bank, Morgan East Section. Preparations were made for quenching with water, and the situation was under control the following day.

Blackball Mine, Blackball.—On 16th September a heating was discovered in the goaf in one of the pillar places in the Crow's Nest Section. Stoppings were erected and the place sealed off.

Liverpool Mine, Rewanui.—On 8th November a heating in its early stages was discovered in the goaf in Top Panel, Morgan East Dip. As it could not be attacked directly, the panel was sealed off with temporary brattice stoppings plastered with lime and cement.

PROSECUTIONS UNDER THE COAL-MINES ACT, 1925

No informations were laid during the year.

SOUTHERN INSPECTION DISTRICT (J. HUGHES, Inspector of Coal-mines)

NORTH OTAGO DISTRICT

St. Andrews, Ngapara, Shag Point, Airedale, and Willett's Mines.—Coal-production at these mines was confined to pillar-extraction only, no development work of any interest being undertaken during the year.

Rockvale Mine.—Pillar-extraction was continued and development work was continued to the west. This latter work now promises to open up a further small area of workable coal.

OTAGO CENTRAL DISTRICT

Idaburn, Oturehua, Coal Creek, and Cambrian Pits.—Opencast mining operations were carried out during the year and along similar lines to previous years.

Shepherd's Creek Mine.—Pillar-extraction is continuing and a further small area has been developed on the south side of the main dip which will give a slightly increased life to the mine.

Cairnmuir Mine.—A very limited amount of development work has been carried out to the south and this work is approaching old workings. No further development to the dip has been undertaken, and this is necessary before a reasonable output can be obtained from the mine.

SOUTH OTAGO DISTRICT

Benhar Mine.—The bulk of the output has been obtained from partial pillar-extraction in the top seam. A dip cross-measure drive was driven from the higher to the lower seam and a small amount of development work in the lower seam took place early in the year.

Wangaloa and Sunnyvale Mines.—Both of these mines are working the Wangaloa Lease. In the former mine, pillar-extraction is continuing and the quantity of coal now remaining to be won is nearing its end. The Sunnyvale Mine is developing the area at its southern end, and indications are that a large quantity of coal still remains to be won from the lease.

Wangaloa State Mine.—Opencast operations are being continued at this pit and a reasonable output is being obtained.

New Fernhill No. 1.—All available coal was won from this mine, and the mine ceased operations and was abandoned.

Fernhill No. 2 Mine.—Pillar-extraction was continued throughout the year, and the mine is nearing its end.

Fernhill No. 3 Mine.—A small amount of development work was carried out at this mine, but the area so far proven is small.

Victory Mine (Brighton).—Development work at this mine has proved an additional area of workable coal, and a new haulage road has been driven to the surface.

Willowbank Mine.—No further development work has taken place at this mine, and all work in future will be confined to pillar-extraction.

Kaitangata Mine.—The whole of the mine output has been obtained from pillar-extraction, and this work is continuing at a fairly rapid rate, practically all places being worked double shift. There is an encouraging feature of the operations, in so much that a borehole has intercepted a seam of coal 14 ft. thick at a point approximately half a mile beyond the termination of the workings of the old No. 1 Mine, thus proving the continuity of this seam. No decision has yet been made regarding the development of the new area, but its early development will be a necessity if this coal is to remain continuously on the market, as the present mine is being rapidly exhausted.

Summer Hill Mine.—A small amount of development work has been continued at this mine and the necessary reticulation work to install electric plant has been completed. However, the quality of this coal is distinctly inferior to the Kaitangata coal.

Riverside Coal-pit (Milton).—A small quantity of coal was won from this opencast pit, but operations ceased during the year and the pit was abandoned.

Viewbank Pit (Crighton).—Opencast operations were continued on a small scale. This is the old Crighton Mine.

Akatore Mine (Milton).—Development work was continued at this mine throughout the year, and although operations were on a small scale the results were encouraging, and present indications are that a fairly extensive area of coal is available for development. The seam is from 7 ft. to 12 ft. in thickness and is of reasonable quality.

SOUTHLAND DISTRICT

Hedgehope, Coster's, Waimumu, Raby, Argyle, Ota Creek, Asher's Siding, Newvale, Mataura Paper-mills, Gladfield, Taungu, Nightcaps, and Taradale Coal-pits.—Opencast operations were continued at the above coal-pits and along lines previously adopted.

Boghead, Terrace (Balfour), and Glenlee Mines.—Underground mining operations were continued throughout the year at these mines and along lines previously followed.

Black Diamond Mine.—Pillar-extraction was carried out throughout the year, and it would now appear that no further development work can be put in hand at this mine. The coal-seam is thick and very liable to spontaneous combustion, with the result that quite an appreciable quantity of coal has been permanently lost by fire. The company is now concentrating on winning the remaining coal by the opencast method, and it would appear that this will be to their advantage.

Star Mine.—In the No. 1 and No. 2 East Level Sections, pillar-extraction has continued throughout the year and the work has been remarkably free from spontaneous combustion, this being unusual in this coalfield. No attempt has been made to prove the fault which cut off development to the dip. From the lower east level some development has taken place in Magee's Dip, but this work has been attended by small faultings and the strata has been somewhat irregular in contour.

Birchwood Mine.—The whole of the output from this mine has continued to be obtained from pillar-extraction, and, as is usual under conditions such as these, there is undue crushing of the pillars, with a resultant loss of coal and increased hazard so far as spontaneous combustion is concerned. Towards the end of the year steps were being taken to prove the coal lying to the west of the No. 1 West Dip Section, this work being somewhat late in being put under way.

Mossbank State Mine.—Development work was continued in Cattie's Dip Section and was completed towards the end of the year. Pillar-extraction was continued in the balance of the mine, and it would appear that pillar-extraction is all that now remains at this particular mine until its end.

Wairaki State Mines.—No. 1 Mine: Pillar-extraction was continued in a satisfactory manner throughout the year, this work being responsible for the total mine output.

No. 3 Mine: The general development of this mine was continued throughout the year, the total output being obtained from this work, there being no pillar-extraction attempted. The results of all development work could be regarded as reasonably satisfactory and all roadways are standing in good condition.

Bar 20 State Opencast.—This pit has been exploited to the full during the year and a steady output maintained.

Black Lion Opencast.—Opencast operations were commenced during the year along the outcrop of the seam in the northern portion of the lease.

Linton No. 1 Mine.—The development of the coal-seam in No. 10 Section—*i.e.*, the lowest portion of the mine—was made the chief interest during the year, and this work yielded very satisfactory results until towards the end of the year, when faulting was encountered. In view of the fact that the

basement rocks are known to outcrop not far away to the north, it would appear that the coal-seam cannot continue to exist much farther in this direction, however, every effort is being made to prove its full extent. Pillar-extraction was continued in Section Nos. 7 and 8, and in a satisfactory manner. No further work was carried out in No. 9 Section, and only a small amount of work was done in No. 6 Section.

Linton No. 3 Mine.—Operations at this mine have been restricted during the year, chiefly due to the prevalence of complicated faulting to the north. Pillar-extraction was continued on a limited scale, and towards the end of the year development places were set off to develop the coal lying to the east—*i.e.*, in the old Black Lion Lease.

CANTERBURY DISTRICT

Mount Somers Mine.—Development work was continued throughout the year and the results were satisfactory. Headings have been driven to the north and north-east and the quality and thickness of the seam have improved.

Blackburn Mine.—Pillar-extraction was continued in the old mine, and towards the end of the year a commencement was made to form an incline to an area of coal found to exist adjacent and to the rise of the old mine.

Newburn Mine, Mount Somers.—All development work at this mine resulted in failure to prove workable coal of reasonable quality.

Sunnyvale Clay-mine.—Work was carried out very intermittently along the usual lines.

Woodbank Mine (Albury).—Development of this mine was continued on a decreased scale. The main dip heading was advanced slightly and additional levels broken away to the east.

Acheron Mine (Anthracite).—Development work was continued on a small scale at the new mine. The west dip heading was advanced slightly and levels driven north and south for a short distance. This seam is emitting CH_4 , and safety-lamps were installed towards the end of the year.

Clearview Mine.—Pillar-extraction was continued and this mine is now almost worked out.

Steventon Mine.—The bulk of the output was obtained from pillar-extraction in Nos. 12, 13, and 14 north levels. A small amount of development work took place in the lower south levels. However, in this direction the seam is divided by two stone bands, each about 9 inches thick, and the total thickness of the coal is only 8 ft.

Lucknow Clay-mine.—Mining operations were continued along lines previously followed.

Victory Mine.—The development of this seam along the north-east levels was disappointing and at a point 9 chains from the main dip the seam thinned and became unworkable. The extension of the main dip heading is now a necessity.

Klondyke Mine.—Pillar-extraction was completed in the No. 6 north level, and development work was continued in Nos. 7, 8, and 9 north levels and in No. 9 south level, the lower north level having been driven a distance of 12 chains. A cross-measure drive was driven from No. 9 north level to a lower 7 ft. seam separated by 15 ft. of strata from the main seam, but difficulty will probably be experienced in working the lower seam.

FATAL ACCIDENTS

It is very gratifying to pass through another year free from fatality, and I am grateful to all who assisted in this direction.

SERIOUS ACCIDENTS

Birchwood Mine.—On 31st January R. Holland, miner, sustained a fractured left ankle as a result of being struck by falling head coal.

Kaitangata Mine.—On 15th February A. Marshall, shiftman, sustained a fracture of the second lumbar vertebra as a result of falling on a steep haulage road whilst stepping over the haulage rope, which rose higher than the injured person anticipated.

Akatore Mine.—On 26th June C. Woodley, miner, sustained injuries which resulted in the loss of his right hand, loss of one eye, and loss of large portion of sight in the remaining eye. Woodley was in the act of removing a detonator from a tin containing eight detonators when the detonators exploded and inflicted the above-mentioned injuries. Woodley unfortunately was not able to throw any light on the cause of the ignition. This was a naked-light mine.

Wairaki No. 1 State Mine.—On 1st October J. Booth, miner, sustained a fractured pelvis as a result of being struck by a fall of roof stone in a pillar place.

Acheron Mine.—On 29th November George Craig, manager, sustained burns of the head and arms as a result of the ignition of CH_4 following upon the firing of a shot. This accident was the result of negligence in not examining the place with a safety-lamp before resuming work therein. This was a naked-light mine.

DANGEROUS OCCURRENCES

Kaitangata Mine.—On 3rd March a serious fire broke out in Haig's Dip pillar section. The area was effectively sealed, and successfully reopened early in May.

Birchwood Mine.—On 1st May a serious and unexpected fire broke out in the main dip pillar section. The area was effectively sealed and successfully reopened on July 5th.

Linton No. 1 Mine.—On 3rd October a fire broke out in the outcrop adjacent to the main mine entrance. An adjacent area of the affected coal was stripped and water laid on to the seat of the fire through boreholes.

Klondyke Mine.—On 14th October spontaneous combustion occurred in the No. 6 pillar section and was effectively sealed.

Linton Mine.—On 4th November spontaneous combustion occurred in the No. 7 Section and the area was effectively sealed.

PROSECUTIONS

On 14th August a miner was convicted and fined 30s. and costs for a breach of section 98 of the Coal-mines Act, 1935.

On 18th December a mine-manager was convicted and fined £15 and costs for a breach of section 91 of the Coal-mines Act, 1935.

OHAI RESCUE BRIGADE

During the past year the officer in charge and his men have performed a very valuable service to the industry.

A sudden and unexpected outbreak of fire at the Birchwood Mine would have been a very serious matter had the services of the brigade not been available for the process of sealing off the area.

A large quantity of coal and mining plant was also recovered following the fire at the Kaitangata Mine as a result of their work, which in this case was of a particularly hazardous nature. Mining plant and coal were also recovered as a result of their efforts following the Birchwood fire.

The brigade is to be complimented on their excellent performance of duty under trying and dangerous circumstances.

STATISTICS OF WORKINGS IN COAL-MINES, 1946

Name of Mine and Locality.	Title held (Crown Lease or otherwise).	Number of Years worked.	Classification of Coal.	Number of Seams worked.	Thickness of Coal-seams.	Thickness worked.	System of Working.	Total Output for 1946.	Total Output to 31st December, 1945.	Total Output to 31st December, 1946.	Number of Persons ordinarily employed.		
											Above.	Below.	
NORTHERN INSPECTION DISTRICT													
<i>Waikato District</i>													
Rotowaro, Rotowaro	Crown lease and freehold	29	Brown	2	7' to 27' ..	Full	Bord and pillar	165,859	4,020,962	4,186,821	112	243	355
Pukemiro, Pukemiro	Ditto	31	"	1	4' to 18' ..	4' to 18'	Ditto	122,271	3,588,029	3,710,300	50	246	296
Wilton, Glen Massey (State)	Freehold	16	"	1	6' to 8' ..	7' 6"	"	75,172	1,329,622	1,329,622	54	135	189
Waikato Extended, Huntly West (opencast)	"	2	"	"	16'	"	Opencast	14,461	139,233	153,894	9	"	9
Glen Affon No. 1, Glen Affon ..	Crown lease and freehold	26	"	1	4' to 16' ..	9'	Bord and pillar	49,837	2,273,410	2,323,247	31	93	124
MacDonald, Waikokwai	Ditto	16	"	1	6' to 20' ..	9' to 14'	Ditto	145,087	2,084,096	2,229,188	88	224	312
Whatawhata (Campbell, Whatawhata)	University endowment	25	"	1	10' 6"	10'	"	9,413	119,682	129,005	6	7	13
Renown, Renown	Freehold	19	"	2	15'	7' 6" to 9'	"	110,713	1,925,893	2,036,608	65	180	245
Glen A., Potteries, Glen Affon	Native lease	104	"	2	8'	8'	Opencast	97	3,039	3,136	1	"	1
Rangitoto, Otorohanga (opencast)	Freehold	2	"	2	5' 6"	5' 6"	Bord and pillar	2,850	15,791	18,641	4	"	4
Victory, Huntly West	Freehold	13	"	1	6' to 14'	"	Bord and pillar	2,288	1,657	3,945	2	2	4
Kinlitha (State) (opencast) ..	Crown lease and University endowment	23	"	1	"	"	Opencast	28,820	76,008	104,828	31	"	31
Glen Affon (State) (opencast)	Freehold	3	"	1	"	"	"	12,587	27,302	39,889	16	"	16
Kemp's State (opencast)	University endowment	24	"	2	"	"	Bord and pillar	52,459	341,062	86,321	51	"	51
Te Pahi, Karanui	University endowment	"	Semi-bituminous	1	4'	"	"	50	126	176	2	"	2
<i>Taranaki District</i>													
Old Stockman, Mokau	Freehold	26	Brown	1	4' 6"	All	Bord and pillar	748	16,349	17,097	"	2	2
Mangariki, Mangariki (State)	Crown lease	12 $\frac{1}{2}$	"	1	8' to 20'	7' to 8'	Ditto	54,727	206,861	361,588	27	99	126
Tatu, Ohura (State)	"	10	"	1	7'	Full	"	33,817	193,418	227,235	42	67	109
Arah, Arah	"	3	"	1	12'	9'	"	3,135	3,028	6,763	3	3	6
Waiverua (State) (opencast)	Freehold	21 $\frac{1}{2}$	"	1	11' 6"	11' 6"	Opencast	16,810	38,269	55,079	8	"	8
Waipapa, Ohura	Crown lease	1 $\frac{1}{2}$	"	1	3' 3"	3' 3"	Bord and pillar	820	38	858	3	"	3
Papapaata, Ohura	"	1 $\frac{1}{2}$	"	1	4' 6"	4' 6"	Bord and pillar	297	"	297	"	2	2
Mangakara Hydro Coal Syndicate, Ohura	"	"	"	1	5'	5'	"	358	"	358	3	"	3
<i>Hikurangi District</i>													
Waro, Hikurangi	Freehold	12	Sub-bituminous	1	4' to 6' 6"	All	Bord and pillar	25,583	193,348	218,931	15	62	77
New Kamo, Kamo	Crown lease	12 $\frac{3}{4}$	"	1	8' to 16'	8' to 9'	"	51,988	488,090	540,078	22	100	122
Avoca, Taungahine	Freehold	3	Brown	1	1' 20"	20"	Opencast	186	1,259	1,445	2	"	2
Whareora, Whareora	"	2	Sub-bituminous	1	3'	3'	"	16	149	165	"	"	"
Output of collieries now abandoned or suspended									12,659,765	12,659,765			

STATISTICS OF WORKINGS IN COAL-MINES, 1946—continued

Name of Mine and Locality.	Title held (Crown lease or otherwise).	Number of Years worked.	Classification of Coal.	Number of Seams worked.	Thickness of Coal-seams.	Thickness worked.	System of Working.	Total Output for 1946.	Total Output to 31st Decem-ber, 1945.	Total Output to 31st Decem-ber, 1946.	Number of Persons ordinarily employed.	
											Above.	Below.	Total.
WEST COAST INSPECTION DISTRICT—continued												
Reefton District—continued												
Golden Point, Reefton	Crown lease	1½	Brown	1	5'	Full	Bord and pillar	Tons, 1,780	Tons, 146	Tons, 1,296	..	2
Ferndale, Reefton	"	30	"	1	3' to 20'	9'	Ditto	2,611	23,922	26,533	1	5
Cliffdale, Ten-mile	State reserve	19	Bituminous	1	12'	Full	Bord and pillar	5,945	63,276	69,221	3	6
Blackball, Blackball	"	55	"	2	8' to 17'	"	Ditto	58,989	4,361,198	4,420,187	28	140
Blackball Creek, Blackball	"	15½	"	1	4' 6"	Full	"	5,564	175,437	181,001	1	8
Harrison's, Ten-mile	"	14	"	1	8'	"	"	6,589	49,712	56,301	1	7
Breabrad, Dunollie	"	26	"	1	6' to 9'	"	"	6,458	170,471	176,929	1	7
Braundale, Ten-mile	Crown lease	20	"	1	6'	"	"	795	102,045	102,838	3	2
Walshend, Brunerton	Crown land and Freehold	23	"	1	18'	8' to 10'	"	45,391	1,091,222	1,136,613	34	127
Dobson, Dobson	"	24	"	1	6' to 16'	9'	"	55,269	1,366,466	1,421,735	40	175
Coathlight, Rewanui	State reserve	13	"	1	6'	Full	"	9,737	123,118	139,173	3	10
Kiri (Hiltop), Ten-mile	"	11	"	1	16'	Full	"	3,426	32,837	36,899	1	3
Way's, Ten-mile	"	12	"	1	6'	Full	"	3,426	32,837	36,899	1	3
Hobbs, Rewanui	"	26	"	1	9'	Full	"	8,110	147,015	158,152	1	3
Hobbs, Reefton	"	19	"	1	9'	"	"	12,077	68,630	80,707	2	9
Muddy Creek, Dumollie	"	24	"	1	10'	"	"	5,203	117,666	122,669	2	7
Cliffside, Nine-mile	"	11½	"	1	12'	9'	"	8,499	48,804	57,303	3	5
New Point Elizabeth, Dunollie	"	20	"	1	6'	Full	"	4,506	148,367	152,873	2	8
Old Rananga, Rewanui	"	20	"	1	3' to 8'	6'	"	6,493	132,336	138,829	2	8
Paparaia, Roa	Crown lease	38	Super-bituminous	2	8' to 12' } 8' to 25' }	Full	"	26,233	1,139,030	1,165,265	18	46
Schnitz Creek, Twelve-mile	"	22	Bituminous	1	3'	"	"	1,704	47,412	49,116	1	4
Halliday's, Dunollie	State reserve	16½	"	1	7'	"	"	3,099	74,626	74,626	1	4
Strongman, Nine-mile	"	8	"	1	20'	9'	"	97,585	588,417	686,002	70	172
Liverpool, Rewanui	"	34	"	2	8' to 34'	8'	"	106,276	4,123,200	4,229,476	241	316
Spark's, Rewanui	"	24	"	1	9'	Full	"	4,369	83,326	87,695	2	7
Coaldale, Rapahoe	"	3	"	1	8'	5'	"	199	196	196	1	3
Output of collieries now abandoned or suspended								9,688,111	9,688,111	9,688,111	..	..
SOUTHERN INSPECTION DISTRICT												
Acheron, Anthracite, Coalgate	Freehold	5	Altered lignite	1	7'	7'	Bord and pillar	1,723	6,240	7,963	3	4
Blackburn, Mount Somers	Crown lease	16	Lignite	1	8'	7'	Ditto	5,018	48,441	53,450	2	9
Blackburn, Whitecliffs	Freehold	18	Anthracite	1	3'	3'	"	5,510	6,841	7,363	1	2
Clonsilla, Gloucest	"	25	Lignite	1	10' 6"	8'	"	11,590	45,585	47,173	1	6
Korangi, Coalgate	"	18	"	1	4' to 23'	4' to 8'	"	11,296	127,982	130,986	1	18
Newburn, Mount Somers	Crown lease	2	"	1	4' to 5'	3'	"	617	360	360	2	2
Stevenson, Whitecliffs	Freehold	11½	"	1	6'	5' 6"	"	3,584	54,428	58,009	2	5
Trips, Mount Somers	"	6	"	1	10'	8'	"	5,094	130,408	135,412	1	7
Victory, Coalgate	"	21	"	1	6' to 14'	4' to 9'	"	1,576	2,819	4,395	1	2
Woodbank, Albury	"	21	"	1	11'	10'	"	3,083	23,081	26,164	2	3

Canterbury District

STATISTICS OF WORKINGS IN COAL-MINES, 1946—continued

Name of Mine and Locality.	Title held (Crown lease or otherwise).	Number of Years worked.	Classification of Coal.	Number of Beams worked.	Thickness of Coal-seams.	Thickness worked.	System of Working.	Total Output for 1946.	Total Output to 31st December, 1945.	Total Output to 31st December, 1946.	Number of Persons ordinarily employed.	
											Above.	Below.
SOUTHERN INSPECTION DISTRICT—continued												
<i>Southern District</i>								Tons.	Tons.	Tons.		
Argyle, Waikaka	Crown lease	55	Lignite	1	10'	10'	Opencast	345	15,452	16,297	1	1
Birchwood, Ohai	"	22	Brown	1	9' to 25'	6' to 8'	Bord and pillar	33,653	463,590	497,243	15	45
Black Diamond, Nightcaps	"	30	"	1	25'	25'	Ditto	17,475	410,049	428,024	7	21
Black Lion, Ohai	"	25	"	1	20'	"	Opencast	1,568	292,024	292,092	6	6
Bozthead, Mataura	Freehold	20	Lignite	1	23'	10'	Bord and pillar	9,878	181,335	191,213	3	7
Bongoola, Ohai	"	1	"		(Closed)	"	"	850	850	850		
Costers, Edendale	Crown lease	10	"	1	13'	13'	Opencast	1,000	11,355	12,355	1	1
Diamond Lignite, Asher's Siding	Freehold	44	"	1	30'	30'	Opencast	3,360	53,372	56,732	3	3
Glacfield, Thornbury	"	24	"	1	17'	12'	"	1,392	1,393	2,985	2	2
Glenlea, Waikaka	Freehold	55	"	1	14' 6"	5' 6"	Bord and pillar	2,337	33,390	37,327		2
Hardmac, Ohai	Crown lease	7	"	2	6' to 12'	6' to 12'	Opencast	912	52,117	61,870	2	2
Hedgehope, Waimumu	Freehold	32	Brown	1	10' to 20'	10' to 20'	"	9,723	752	1,072	1	1
Liberty Opencast, Ohai	"	32	"	1	30' to 40'	30' to 40'	Bord and pillar	80,852	2,132,051	2,212,905	47	114
Linton, Ohai (No. 1)	"	17	"	1	6' to 40'	6' to 40'	Ditto	25,732	150,176	175,928	4	4
Mataura Paper-mills, Mataura	"	6	Lignite	1	15' to 23'	15'	Opencast	26,045	758,474	784,310	9	35
Mossburn, Ohai	Freehold	6	Brown	2	11'	8'	Bord and pillar	6,243	29,812	33,134	7	7
Newvale, Waimumu	"	14	Lignite	2	30' to 40'	9'	Opencast	1,064	4,327	4,327	4	4
Nightcaps, Nightcaps	"	2	"	1	20'	15'	"	51,666	33,714	85,380	14	14
Ohai Colliery, Ohai	Crown lease	66	Brown	1	10'	10'	"	1,740	37,713	39,453	1	1
Oru Creek, Wyncham	Freehold	8	Lignite	1	20'	20'	"	2,883	32,966	35,849	1	1
Rady, Gore	"	15	"	1	24'	24'	Bord and pillar	38,443	279,069	318,112	24	38
Star, Ohai	"	23	Brown	1	10'	10'	Opencast	3,968	6,177	10,145	3	3
Starlight, Gore	Crown lease	3	Lignite	1	4' to 6'	4' to 6'	"	54	245	290	1	1
Tanna, Orepuki	Freehold	5	"	1	17'	9'	Bord and pillar	1,842	20,549	22,391	1	1
Terrace, Balfour	"	3	"	1	17'	9'	"	2,111	40,322	42,433	1	3
Wainamea, Orepuki	Crown lease	18	Brown	1	22'	22'	Ditto	16,697	76,536	93,233	7	7
Waimumu, Waimumu	Freehold	32	Lignite	1	30'	30'	Opencast	67,230	927,927	995,157	28	70
Wairaki, Ohai	Crown lease and Freehold	32	Brown	1	7' to 22'	7' to 22'	Bord and pillar	11,633,050	11,633,050	11,633,050		
Output of collieries now abandoned or suspended												
Totals, Southern District, South Island												
Totals, West Coast District, South Island												
Totals, Northern District, North Island												
Output prior to 1800 not included in statistics												
Shale exported, 1914												
318 678 2,447												
771 1,075 2,447												
30,463,361 649 1,465 2,114												
11,738 3,819 5,557												
206,053												
21												
111,877,000												

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