1949

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, 1948.

MINERAL PRODUCTION

The following statement shows the quantity and value of the production of metalliferous mines, quarries, and coal-mines during 1948 and 1947 :—

Mineral.	1948.		1947.	
	Quantity.	Value.	Quantity.	Value.
		Fuels		
		£(N.Z.)		£(N.Z.)
Coal	2,775,886 tons	4,823,102*	2,751,725 tons	4,127,588
Petroleum (crude)	83,112 gals.	2,597	82,307 gals.	..
		Metals		
Gold	93,903 oz.	896,173	112,260 oz.	1,210,537
Silver	232,563 oz.	53,587	221,984 oz.	53,840
Antimony-ore	9 tons	248	..	..
Arsenic	8 tons	144	8 tons	143
Iron-ore	4,776 tons	10,062	6,226 tons	13,841
Copper-ore	..	..	580 tons	6,255
Tungsten-ore	25 tons	9,800	22 tons	10,500
Manganese-ore	525 tons	2,487	..	..
		Non-metallics		
Bentonite	624 tons	4,462	215 tons	1,049
Clay for bricks, tiles, &c.	159,129 tons	37,209	150,808 tons	33,893
Clay for pottery, fillers, &c.	17,402 tons	16,272	11,970 tons	9,970
Diatomite	103 tons	143	436 tons	709
Dolomite	6,912 tons	3,456	7,034 tons	3,517
Fuller's earth	68 tons	200	31 tons	120
Limestone, marl, &c., for cement	417,660 tons	68,454	399,335 tons	73,769
Limestone for agriculture	1,091,299 tons	473,709	1,020,810 tons	407,759
Limestone for industrial uses	69,068 tons	28,563	19,699 tons	7,129
Sand, gravel, &c., for roads and ballast	2,015,354 tons	608,140	1,617,953 tons	478,308
Sand, &c., for building aggregate	396,812 tons	141,504	375,435 tons	137,123
Dimension stone for building	22,319 tons	34,380	14,528 tons	11,143
Rock for harbour-work	63,059 tons	10,633	41,347 tons	6,451
Magnesite	540 tons	378	362 tons	253
Phosphate	..	..	200 tons	100
Pumice	6,863 tons	4,955	3,389 tons	2,635
Quartzite	26 tons	13	13 tons	33
Serpentine	38,637 tons	10,447	31,933 tons	11,803
Silica sand	16,536 tons	44,774	14,443 tons	30,358
Totals	..	7,285,892	..	6,638,826

* Value of coal assessed at 34s. 9d. per ton as per estimate in "Subsidy on Coal-production" section.

GOLD AND SILVER MINING

Production of bullion during the year 1948 amounted to 326,466 oz., valued at £949,760, a decrease in quantity of 7,778 oz. and a decrease in value of £314,617 as compared with the preceding year.

The gold content of the bullion is estimated at 93,903 oz., valued at £896,173, and the silver content at 232,563 oz., valued at £53,587.

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

Year.	Oz.	Year.	Oz.
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
1937	168,487	1947	112,260
1938	152,050	1948	93,903

Gold-production showed a decline in 1948 of 18,357 oz. compared with the previous year and fell below the 100,000 oz. mark for the first time since the year 1860.

Production from quartz-mines (37,135 oz.) shows a decrease of 361 oz., from dredges (54,644 oz.) a decrease of 16,887 oz., and from alluvial mines (2,124 oz.) a decrease of 1,109 oz.

During the past few years, dredging has been responsible for the greater proportion of the gold-production, and the over-all drop in output is due mainly to the decline from this form of gold-mining.

Eleven dredges were in operation during the year—nine on the West Coast and two in Otago. Before the end of the year three dredges on the West Coast abandoned operations, thus further reducing the number of working dredges. It is unfortunate that the largest producing dredge in New Zealand, the Arahura, recently suffered a serious accident which will put it out of commission for a considerable period. A small dredge in Southland is to resume operations on a new area, and on the West Coast the Premier Gold Dredge, previously known as the Nemona, has been re-erected on an area at Big River and will be in operation this year. The exhaustion of ground suitable for this form of mining, the higher cost of the construction, operation, and maintenance of dredges, and the stringent conditions applied where farm land is concerned have all combined to render new dredging propositions unattractive.

As a consequence there has been little activity in prospecting for new dredging areas and such work as has been carried out has mostly been directed towards the definition of those sections of the original claims which are still payable.

Production from quartz-mines was maintained during 1948 practically at the level attained in 1947, despite difficulties due to shortage of skilled labour. For some years there have been only two mines of any consequence, the Martha at Waihi and the Blackwater near Reefton, and the Martha has been responsible for over 70 per cent. of the output of gold from quartz-mines. Although the Martha ceased active development work many years ago and operations have been mainly of a reclamation nature, it has maintained its position as New Zealand's main gold-producer. The day when exhaustion of ore would compel the termination of mining operations has been in sight for some time, although the recent increased price of gold brought about by the devaluation of sterling may have the effect of prolonging the life of the mine.

Up till the end of 1948, bullion to the value of £24,147,563 9s. 3d. has been produced from the Martha Mine and dividends totalling £6,916,748 16s. 6d. have been paid, so that it must be accounted one of the great gold-mines of the world. In its day it has contributed much to the economy of New Zealand.

At the Blackwater Mine near Reefton development in depth has been suspended, at least for the time being, and if this policy is maintained the life of the mine must be prejudiced.

There has been no serious effort to prospect or develop new quartz-mines for many years.

The decrease in alluvial mining production has been marked during recent years. In 1934 no less than 43,541 oz. of gold were won by this form of mining, but since then output has persistently declined until 1948 when only 2,124 oz. were obtained. At the present time there is only one sluicing company of any consequence in active operation and the bulk of the production is now due to the work, frequently intermittent in nature, of small parties and individuals. This is, of course, due in great part to the continuous exploitation of alluvial deposits over a period of ninety years. Eventual exhaustion of such deposits is inevitable.

From 1st January, 1857, until 31st December, 1948, the quantity of gold exported from New Zealand has amounted to 26,578,231 oz., valued at £118,055,275, and this has been invaluable in the development of New Zealand.

During 1948, 232,563 oz. of silver, valued at £53,587, were produced, as compared with 221,984 oz., valued at £53,840, in 1947. Practically the whole of this amount was obtained from the Martha Mine.

The following Table shows the production of the principal quartz-mines, dredges, and alluvial mines for the year ended 31st December, 1948. It will be noted that over 94 per cent. of the total production of gold was obtained from two quartz-mines and seven high-capacity dredges.

——	Ore, in Tons.	Development, in Feet.	Men Employed.	Gold (Ounces).	Silver (Ounces).	£(N.Z.).
Quartz-mines						
Martha	95,804	5,761	449	26,975	231,753	328,317
Blackwater	24,328	1,117	111	9,977	..	96,023
Charlton's (Kuaotunu)	600	..	2	138	91	1,286
Callery Party, Macrae's Flat	100	..	1	25	..	250
Sundry	..	..	9	20	21	199
Totals	..	..	573	37,135	231,865	426,075

——	Yardage.	Acreage.	Average Depth, in Feet.	Men Employed.	Gold (Ounces).	Silver (Ounces).	£(N.Z.).
Dredges							
Grey River	3,495,647	73·536	29·5	27	7,323	72	65,670
Arahura	2,863,000	15·079	119·0	39	9,484	187	89,194
Rimu	1,408,780	27·489	31·8	39	4,229	145	31,759
Kanieri	2,670,000	22·024	58·9	38	7,503	..	68,963
Ngahere	1,994,796	15·9	78·0	25	5,850	12	52,958
Snowy River	950,000	41·4	16·0	13	3,639	..	35,213
Atarau	1,338,588	27·0	21·25	12	2,316	..	21,927
Marsden	563,086	10·3	34·0	12	536	..	5,445
Slab Hut	121,400	5·0	15·0	10	161	..	1,640
Austral New Zealand	3,154,000	43·5	50·0	50	7,974	282	77,948
Clutha	2,278,000	19·0	74·0	24	5,629	..	52,634
Totals	..	..	..	289	54,644	698	503,351
Alluvial							
Moonlight Goldfields, Ltd.	30,000	..	175·0	3	63	..	483
Golden Sands, Ltd.	..	..	40·0	2	39	..	366
Waitahu	61,216	..	15·0	3	144	..	1,248
Round Hill	..	..	..	6	453	..	4,291
Golden Arrow	..	..	..	6	29	..	309
Sundry	..	..	..	148	1,396	..	13,637
Totals	..	..	..	168	2,124	..	20,334
Grand totals	..	..	..	1,030	93,903	232,563	949,760

PETROLEUM OIL

Interest in prospecting for petroleum has remained at a low level since the overseas oil exploration companies ceased operations in 1944, and for some time there has been only one licence current under the Petroleum Act—namely, the petroleum mining licence held by New Zealand Oil Refineries, Ltd., over the Moturoa field near New Plymouth.

Drilling operations have been resumed in this field, and the Dobson No. 1 well, which was commenced on 2nd August, 1948, near the Taranaki Petroleum Co.'s No. 5 bore, was completed on 2nd March of this year at a depth of 2,236 ft., oil-bearing sands being passed through between 2,222 ft. and the bottom of the hole, with oil flowing under its own gas pressure at the rate of thirty barrels, or 1,200 gallons per day. The result of this drilling must be regarded as encouraging, and the company intends commencing a second hole at an early date.

From three wells on this area, New Zealand Oil Refineries, Ltd., produced 83,112 gallons of crude oil during 1948, bringing the Dominion's total production of crude petroleum up to 31st December, 1948, to 3,749,853 gallons.

With the increase in production obtained from the new well the existing refinery is not capable of dealing with the total yield of the field and at present crude oil has to be stored until such time as the capacity of the refinery has been increased.

Generally, progress in this area has been of interest, and although the field has not yet been established as a major producer, it is possible that a much greater annual production could be attained. The company is considering the advisability of obtaining a more mobile drilling rig from overseas and, if production can be increased sufficiently, installing a cracking plant and thus obviating the disposal of troublesome residues, which are difficult to market at present.

COAL-MINING

The total coal-production of the Dominion for the year 1948 amounted to 2,775,886 tons, which is 24,161 tons greater than production in 1947, which amounted to 2,751,725 tons.

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

Year.	Tons.	Year.	Tons.
1930	2,542,092	1940	2,516,099
1931	2,157,756	1941	2,639,507
1932	1,842,022	1942	2,680,041
1933	1,821,258	1943	2,787,868
1934	2,060,315	1944	2,805,970
1935	2,115,184	1945	2,833,576
1936	2,140,217	1946	2,793,870
1937	2,277,799	1947	2,751,725
1938	2,222,088	1948	2,775,886
1939	2,342,639		

It will be noted from the table above that production has been maintained at practically at even level of about 2,800,000 tons since 1943. Although production for 1948 shows an increase of 24,161 tons over the output recorded in 1947, it is a little disappointing that the increase was not greater, seeing that for the first six months of the year there was a substantial increase of 100,000 tons as compared with the corresponding period in 1947.

During 1948, 183 mines were in operation. Of these, 66 mines operated wholly or principally on freehold land and the remaining 117 wholly or predominantly on Crown land. Output from freehold land was 1,083,277 tons (39 per cent.) and output from Crown land 1,692,609 tons (61 per cent.).

Imports of coal in 1948 amounted to 54,211 tons, as against 93,411 tons in 1947 and 27,185 tons in 1946. Coal was imported from the United States of America, the United Kingdom, South Africa, and India, the greater proportion coming from the United Kingdom. All this coal was used by the railways. During the current year imports of coal have continued to be made from the United Kingdom and South Africa.

Exports of coal in 1948 amounted to 18,913 tons, as compared with 28,035 tons in 1947.

In 1948, 2,099,158 tons were produced from underground mines, compared with 2,107,033 tons in 1947, and from opencast mines 676,728 tons were produced in 1948, as against 644,692 tons in 1947.

The output per miner employed underground was 546 tons, a decrease of 18 tons as compared with 1947. The production per man on the pay-roll of underground mines—*i.e.*, both underground and surface workers—was 409 tons, a decrease of 12 tons on the previous year.

Production per man employed in opencast mines was 1,487 tons, a decrease of 5 tons as compared with 1947.

The over-all production per man employed in the industry—*i.e.*, combined underground and opencast mines—amounted to 497 tons, a decrease of 9 tons as compared with 1947.

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.
		Underground Mines			
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
1947	2,107,033	3,739	564	1,271	421
1948	2,099,158	3,842	546	1,285	409

Year.	Output.	Men Employed.	Tons per Man Employed.
Opencast Mines			
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
1947	644,692	432	1,492
1948	676,728	455	1,487
All Mines			
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
1947	2,751,725	5,442	506
1948	2,775,886	5,582	497

In order to maintain and increase present coal-production it is necessary to recruit men to the industry to replace wastage due to ageing miners, to lay out the development of a mine from the opening stages so that the mine can operate with maximum efficiency, and to equip the mines with mechanical equipment suitable to the conditions. During 1948 progress has been made in these directions.

There has been a small increase in the number of men employed both underground and on the surface, but the intake was necessarily confined to inexperienced men and some time must elapse before they have acquired the necessary skill to make any marked effect upon output. Any increase in the number of men employed in the industry is dependent upon the provision of suitable accommodation. As far as single men are concerned, the position is being adequately met by the provision of hostels by the Labour and Employment Department at various mining centres. During 1948 hostels were completed at Reefton, Granity, and Huntly, while during the present year hostels have recently been opened at Ohura and Ohai. At the moment additional huts,

auxiliary to the main hostels, are being provided at Ohai, Huntly, and Ohura, and hostels are projected for Granity, Denniston, Blackball and Renown. When the scheme is fully completed adequate accommodation with living-conditions of a high order will be available for single men at every important mining centre.

It is recognized that married men are more dependable than single men, and every effort is being made to provide additional houses for married men in mining districts. However, difficulties that are general to the whole building position of the country have not permitted as much progress in this direction as is desirable.

It has been disappointing that difficulties in securing equipment from overseas have made it impossible to carry out the experiments in mechanized mining on the full scale projected. At the Wilton State Coal-mine, where it was proposed to initiate this work, three coal-cutters—two of one type and one of another—and four electrically-driven drills have already been installed, and delivery is now awaited of three further coal-cutters. However, though portions of the scraper loader equipment have arrived. it has not been possible to complete the units and put them into commission.

There are, of course, obvious difficulties in introducing mechanized mining into old mines, whose original development plan made no allowance for the use of such equipment, and it is in the new mines that mechanization can be used to the greatest advantage.

Plans for the opening-up of new coal-mines by the State make provision for the installation of modern mechanical equipment suitable to the particular conditions of each area. It is worthy of mention that, as a result of the intensive survey and prospecting work carried out in the investigation of new fields, the conditions likely to be met in the development of new mines are known with reasonable accuracy and equipment can accordingly be ordered with confidence. Many mines in the past have been developed simply by following the coal from the outcrop, and, due to faulting and other complications for which there was little evidence, the result has been that access, haulage, and ventilation problems have become acute and mining operations inefficient. In new mines development work can be planned from the outset to meet the varying conditions that will be encountered, and the general efficiency of the mining operations should increase.

During the year drilling operations were completed at Morley in the Ohai Coalfield, at Rewanui in the Greymouth Field, and at the Plateau lease in the Denniston Coalfield, and active development at all three localities will commence as soon as men and equipment become available.

A limiting factor upon the production of coal in some fields in the past has been inadequate coal transport facilities. At Stockton preliminary work with the construction of the aerial ropeway has commenced and it is expected that the aerial will be in operation early in 1951. From then onwards increased production should be possible from this field.

A study of the coal transport problem in the Denniston Field has revealed that an improvement can be effected by the substitution of an aerial ropeway for the present endless-rope haulage system. As a first step in this programme a new stone haulage drive some 500 ft. long has been driven at the Steps entrance to the Whareatea Mine. The aerial ropeway that will serve this mine will also be used to transport coal from the mine to be developed on the Plateau area.

Continued attention is being given to the conservation of coal. Detailed plans have recently been prepared and are at present under consideration whereby sections of the Mangapehi State Coal-mine will be highly mechanized and the workings filled

by hydraulic stowage. It would be difficult, if not impossible, to use these methods of working in the older sections of the mine, and the introduction of hydraulic stowage is dependent upon sections being specially developed with this practice in view.

At the present time there is a loss of coal from some of our opencast mining operations where thin rider seams occur separated from the main seam by dirt bands. In order to make a higher percentage of recovery of coal from such seams, some form of coal washing is necessary, and arrangements have been made with the Mineral Dressing Laboratory of the Otago School of Mines to test samples from these mines by various washing methods.

A problem that is occasioning concern at the present time is the difficulty of pillar-extraction in thick seams due to mining operations being confined in many cases to a single shift. A high degree of extraction is not possible under this arrangement, as pillars are apt to crush as they take weight, the coal take fire, and the section of the mine affected must then be sealed off. The more rapidly the pillar can be extracted the greater will be the prooprtion of coal recovered. While confinement of operations to a single shift has much to commend it as a matter of general principle, it is desirable that pillar extraction, once it is commenced, be completed as quickly as possible. This fact is appreciated by the miners, and it does not seem impossible that recognition will be given by the unions concerned in agreeing to work at least double shift while on this class of work.

During the year the undertaking of Taupiri Coal-mines, Ltd., was purchased by the State. Six other smaller properties were also purchased, two for development by opencast methods and two for the protection and proper working of contiguous coal areas. The remaining two will be worked as State coal-mines and operations steadily expanded.

The most important development of the year as far as coal-mining is concerned was the passing of the Coal Act, 1948.

The Act vested all privately-owned coal, together with the rights or servitudes annexed to the coal, in the Crown as from 1st April, 1949.

As in England when by virtue of the Coal Act, 1938, the coal was acquired by the Crown, compensation to the owners is to be paid out of a "global" sum determined by reference to the average royalty and rent income. In this country the "global" sum is fixed by taking fifteen years' purchase of the average royalty and rent income obtained from the privately-owned coal and associated rights in respect of the calendar years 1941 to 1947.

The Coal Valuation Commission, which consists of —

Deputy Judge O. G. Stevens (Chairman),
Hon. T. O. Bishop, M.L.C.,
Mr. G. Duggan,
Mr. J. S. Jack, and
Mr. D. H. Steen,

is charged with the responsibility of assessing the value of the coal and servitudes which in terms of the Coal Act, 1948, have been vested in the Crown and of paying the various claimants out of the "global" sum.

The Coal Act also provides for the granting of coal-mining rights to owners and lessees who on the passing of the Act were carrying on coal-mining operations on the privately-owned lands. Section 42 of the Act cancelled the private leases and other contracts, but in their place authorized the granting, on notice to the Under-Secretary of Mines and on application to the Warden or the Commissioner of Crown Lands, of coal-mining rights under the provisions of Part I of the Coal-mines Act, 1925, on terms which were not more onerous or less advantageous than those previously held.

OPENCAST MINING

Steady progress continues to be made in the development of opencast mining, and production of coal from this form of mining amounted to 676,728 tons for the year 1948, as against 644,692 tons in 1947, an increase of 32,096 tons. Almost 25 per cent. of the total production of coal is now derived from this form of mining.

Since 1943, when attention was first directed to mechanized methods of opencast mining, production has increased from 62,037 tons to 676,728 tons, a tenfold increase, without exhausting the possibilities of considerable further expansion of output.

Stockton continued to hold pride of place in the production list with an output of 127,427 tons of good-grade bituminous coal. There was a falling off from the record output of 154,803 tons achieved in 1947, but this will be only temporary, and is due to the 5-yard shovel being out of action for a period and the difficulty experienced in maintaining the fleet of coal-hauling motor-vehicles in working-order. This latter difficulty will be overcome with the arrival of the three 21-yard bottom dump vehicles on order for coal transport.

Again while awaiting the arrival of additional equipment for the deeper ground to be worked it was decided to transfer operations from the main opencast area to a section known as W Block, which, though the coal seam only ranged from 6 ft. to 10 ft. in thickness, was considered amenable to opencast mining. In practice it was found that the coal roof was soft and the overburden broke up into large blocks, necessitating much secondary blasting, and the area was generally not suitable for opencast mining but that the coal could be more economically recovered by underground methods. Accordingly, the area was abandoned and work resumed at the main area. The situation while the 5-yard shovel was out of commission was retrieved by commencing operations with bulldozers and the smaller 1½-yard shovel at two contiguous areas known as Coal Island and Stable Pillar area, where coal had previously been worked by underground methods.

From Coal Island 20,000 tons were recovered, although extraction of coal by underground methods had been completed some twenty-seven years ago. This amount actually represents more than 50 per cent. of the coal originally in the area and would otherwise have been irrecoverable.

Operations at the Stable Pillar area were particularly interesting in that after completion of underground mining twenty-seven years ago a fire had broken out which continued to burn until twelve years ago. In this area, although the seam was 30 ft. thick, underground workings had been confined to the uppermost 10 ft., and it was found that, while the fire had destroyed all the coal above the level of the floor of the workings, the solid coal below had remained undamaged. In addition, the heat from the fire had, in fact, disintegrated the overburden and facilitated its removal by bulldozers. From this area, 35,000 tons of good-grade coal were obtained. The experience thus gained focuses attention on the fire area at Millerton, where it is possible that similar conditions prevail, and coal otherwise lost may yet be recovered by opencast mining.

During the year an area adjoining the main opencast area has been close bored in a grid pattern with 200 ft. centres and proved to contain 1,000,000 tons of coal of an average thickness of 30 ft. with an average overburden to coal ratio not exceeding 2 to 1. An extensive area in which similar conditions are expected to prevail adjoins this area, and close boring is continuing which will eventually greatly increase the proved tonnage of coal. To work this area a new 5-yard stripping-shovel, two blast-hole drillers, and four 18-yard muck-wagons have already arrived on the ground and will be shortly in commission, and this area to be worked to advantage and the maximum output obtained now only awaits the arrival of the coal-haulers and the construction of the aerial ropeway.

Huntly Field.—Kimihia No. 1 area continued in steady production throughout the year. In addition, work was commenced on Kimihia No. 5 area, which was surrounded by a stopbank and pumped out prior to stripping operations with the 5-yard shovel,

carryalls, and Athey wagons. It will take up to eighteen months of stripping before coal can be won from this area, but it is estimated that 527,000 tons of coal will eventually be obtained after 2,406,000 cubic yards of overburden have been removed.

A steady output from Kemp's Mine was maintained during the year, but the mine now approaches exhaustion, stripping operations having already been completed and only a few thousand tons of coal remaining to be extracted. As a replacement for Kemp's, work was commenced on Hillcrest Mine, in the vicinity of Wilton State Coal-mine, and an access road 85 chains long has been constructed and 15,000 tons of coal stripped ready for winning when Kemp's is finally exhausted.

At Rotowaro production from Alison's Pit ceased, but two new units, Thompson's and Barker's, have been opened up, the latter producing much needed coal over the Christmas holiday period. In addition, the Summit Mine, under private control, was opened up and produced coal during the latter part of the year.

Taranaki.—At Waitawhena operations were continued on the No. 2 area and for the first time it was found possible to advance stripping operations well ahead of coal-winning. Although no improvement in stripping conditions was experienced, a satisfactory output was maintained. Road access to No. 5 area was commenced from the No. 2 area towards the close of the year.

Reefton.—Opencast operations known as the South-east Opencast have recently been commenced on a portion of the vertical coal-seam at Garvey Creek estimated to contain 45,000 tons of coal requiring the stripping of 85,000 yards of overburden. Conditions are unusual for New Zealand, in that overburden has to be removed from both the floor and roof of the seam in a wedge-shaped excavation, the seam, which varies in width from 10 ft. to 40 ft., occupying the centre of the wedge.

Wangaloa.—Operations continued successfully during the year, but more difficult conditions must be faced in the future as the mining moves into the southern side of the excavation where overburden is thicker and the old workings of the Wangaloa Coal Co. are approached. By the acquisition of an adjoining area to the south, portion of which had already been worked by underground mining, the life of the mine has been considerably extended. While there is an appreciable tonnage of unworked coal available, it is hoped that a proportion of the coal abandoned in the underground workings may also be recovered.

Ohai.—The Black Diamond Mine was opened up further during the year, and while it was previously thought that stripping with tournapulls would have to be suspended during the winter months, in practice it was found possible to continue operations almost throughout the whole year.

A new opencast, McLean's Opencast, situated on the State Star Coal-mine area, was opened up in time to produce coal for the Christmas holiday period and has continued in successful operation. Further boring has been proceeding in areas adjacent to this mine.

Restoration.—The restoration of the surface of opencast mines on the completion of mining operations has continued to receive attention.

At Glen Afton the pines that were planted continue to grow well. At Kemp's, where more difficult conditions pertain owing to the high sulphur content of the spoil, the overburden has now stabilized and some trees have sprouted. At Thompson's the topsoil has been stockpiled and the area will eventually be restored to productivity while at McLean's topsoil has been treated in similar fashion.

In view of the considerable measure of success already met with in opencast mining, the effort is being made to expand production, and to this end considerable attention has been paid to the exploration of prospective opencast mines and close boring for the purpose has been carried out in the Huntly, Buller, and Ohai Coalfields.

The following table shows the output of coal from the various coalfields and the comparative increases and decreases for the years 1948 and 1947, together with the approximate total production to date :—

Coalfield.	Output.		Increase.	Decrease.	Approximate Total Output up to 31st December, 1948.
	1948.	1947.			
	Tons.	Tons.	Tons.	Tons.	Tons.
North Auckland	50,804	64,368	..	13,564	6,657,124
Waikato (including Taranaki) ..	964,384	915,652	48,732	..	25,783,627
Nelson	6,854	7,387	..	533	772,655
Buller	527,593	549,151	..	21,558	30,574,387
Reefton	119,104	130,759	..	11,655	2,070,555
Grey	490,328	468,282	22,046	..	22,979,303
Canterbury	32,030	34,780	..	2,750	1,440,041
Otago	205,931	203,889	2,042	..	15,747,241
Southland	378,858	377,457	1,401	..	11,379,678
Totals	2,775,886	2,751,725	74,221	50,060	117,404,611

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

Class of Coal.	Northern District (North Island).	West Coast District (South Island).	Southern District (South Island).	Total.	Total Output to 31st December, 1948.
Anthracite	..	..	1,745	1,745	18,677
Bituminous	..	950,901	..	950,901	62,338,375
Sub-bituminous	1,015,188	157,094	335,763	1,508,045	47,619,789
Lignite	..	35,884	279,311	315,195	7,427,770
Totals for 1948	1,015,188	1,143,879	616,819	2,775,886	117,404,611
Totals for 1947	980,020	1,155,579	616,126	2,751,725	114,628,725

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	..
1947	2,751,725	Dec. 42,145	93,411	66,226	..
1948	2,775,886	Inc. 24,161	54,211	..	39,200

TABLE SHOWING THE QUANTITY OF COAL EXPORTED FROM NEW ZEALAND FROM 1930 TO 1948

Year.	Tons.	Year.	Tons.
1930	126,118	1940	81,287
1931	48,334	1941	58,179
1932	35,866	1942	54,700
1933	34,131	1943	42,522
1934	40,361	1944	37,688
1935	46,146	1945	21,989
1936	44,872	1946	27,366
1937	113,116	1947	28,035
1938	55,711	1948	18,913
1939	43,990		

INVESTIGATION OF COAL RESOURCES

Intensive work on the investigation of coal resources was continued by three organizations working as in past years in close co-operation. These organizations are (1) the Coal Survey, whose activities are 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 percussion and core drilling.

Considerable progress was made by all these organizations and much detailed information concerning mines and fields has become available. The efforts of these organizations have, however, been mainly directed towards the detailed investigation of selected areas so that either underground or opencast mines in those areas can be opened up to the greatest advantage. Accordingly, sufficient information has not been forthcoming to materially affect the position of the coal resources of New Zealand, which have not been re-estimated, and remain as set out in the Mines Statement for the year 1945. It is, however, apparent from recent prospecting work that the Buller Field may contain greater reserves of coal than those previously estimated.

The time is approaching when adequate replacements will have been obtained for mines now approaching exhaustion and when work on the general question of the coal reserves of New Zealand will be intensified.

The most interesting features of the year's operations have been the considerable extension of the seams explored in the Morley area of the Ohai Coalfield to adjoining areas and the consistent results obtained by the close drilling of the main opencast mining area at Stockton. At both these localities uniform conditions of the coal-seams have been proved with consistent results over relatively large areas and large tonnages of coal are available in compact blocks, so that both areas promise to be major coal-producers in the coming years.

Particulars of the activities of the three organizations mentioned above are as under:—

COAL SURVEY

Coal Survey (Geological)

The geological work of the Coal Survey was confined to the South Island, and although staff shortages have now been largely overcome, it will be the middle of 1949 before work in the North Island fields is commenced, when the new members have received some training and experience.

During the year work in the various South Island fields was continued, Kaitangata area being the scene of detailed geological work, while drill log correlation and examination of detailed prospecting was carried out in the Ohai and Reefton Fields. The Murchison district was thoroughly examined in a search for likely coal areas and all the known coal occurrences examined in detail.

Late in the year the Coal Survey drill was finally completed and work was commenced in the Mataura Valley, Southland, on proving the Mataura lignite deposits. This work is viewed as a long-term job, as the entire Mataura Valley is to be examined.

Coal-sampling has been placed on a systematic basis, the southern and western districts being under the control of a sampler and assistants at Invercargill and Greymouth respectively. A similar sampling group will be stationed at Huntly for the northern mines.

Among the reports issued by the Coal Survey during the year, the following are concerned with geological work; Structure of proposed mining area at Ohai; Mataura lignite deposits; correlation of drill-holes, Kaitangata; limestone for stone-dusting; Island Block, Garvey Creek; progress report, Garvey Creek; and Heapy Coalfield.

Coal Survey (Laboratory)

The Coal Laboratory analysed 1,264 samples, compared with 523 in the previous year. Drill-hole samples account for 840 of this total, coal-dust inflammability investigations account for 143, and mine and outcrop samples for 167. The increase in number of mines' samples was the result of the introduction of a systematic sampling scheme under the control of the Coal Survey (Geological). The drill-hole samples were largely from Stockton and Ohai areas, and mine samples were confined largely to the South Island, where the sampling groups are operating.

Other investigations carried out by the Coal Survey Laboratory included the preparation and examination of special cokes; analysis of mine airs; an examination of limestones for their suitability for mine dusting; laboratory tests on the washability of Stockton and Wangaloa coals; inflammability of mine dusts taken from the various mines throughout New Zealand; the elimination of sulphur from gas; and generally the use of high- and medium-sulphur coals.

Mines Department Survey Parties

Survey parties were maintained by the Mines Department in each of the three fields, Garvey Creek, Stockton-Millerton, and Denniston, and particulars of the year's activities in each field follow .

Garvey Creek

Island Block.—Preliminary trenching, principally on the "A" seam, was completed on the full perimeter of this block, which contains an area of approximately 100 acres at a general elevation of 2,500 ft. north-east of the Garvey Creek vertical seam. The trenches were surveyed both topographically and from a geologic aspect and a series of contours at 10 ft. intervals were mapped. These contours will serve as a basis for structural topography and by means of cross-sections enable estimates to be prepared of those areas suitable for open-casting and also assist in the layout of underground mining. When labour becomes available it is proposed to commence drives in this block to obtain further information on the quality, thickness, and regularity of the seams. From present data it is estimated that the Island Block may contain 1,800,000 tons, with possibly 1,000,000 tons capable of extraction by opencast methods.

Centre Block.—Prospecting and surveying of coal trenches was continued in this block, which extends from the Island Block north-east on the Waitahu fall to the vicinity of Mount Albert Creek. The area is approximately two miles long by a half mile deep. On the portion of this area within the Inangahua fall, trenching and prospecting was continued in Wellman Creek, but extensive slips and some major faulting hindered the work of uncovering the coal outcrops and work was stopped in the meantime.

As with the Island Block, the final proving of this area will necessitate exploratory drives. The continuation of the proposed road to the Island Block will facilitate the transport of labour and stores to these areas for this purpose.

Webby Creek Block.—A large number of trenches were cut and surveyed in on this area. Preliminary sampling gave a high ash content, and geologic reports by officers of the Geological Survey were not entirely favourable in the indication of a good prospect for mining, either by underground or opencast methods.

Prospecting in these areas is hampered by a shortage of trained survey staff and prospectors, and work has, of necessity, been concentrated on those blocks likely to yield the largest and most suitable areas of workable coal. Particularly does this apply in the area in the Waitahu River basin, where, should sufficient coal be proved, it would be necessary to consider some alternative method of transport to Reefton Railway-station.

Stockton-Millerton

The activities of the survey group have tended to become more concerned with the development and exploitation of the coal deposits rather than with the straight prospecting and mapping of large coal-bearing areas. This is no disadvantage in itself as long as the amount of coal proved by prospecting is sufficient to offset the amount won from all operations. Instead of prospecting and mapping coal far removed from operational areas, the endeavour has been made to map just ahead of the mining operations and so prove sufficient coal to satisfy their needs for several years to come. Once each mine or opencast has sufficient information to enable it to lay out and exploit three to five years' supply of coal the prospecting will be extended behind these primary zones of investigation to enable extended development programmes and new schemes to be planned.

North-west and Rockies Areas.—Preliminary prospecting work has been done over these areas, with some plane tabling, trenching, and traversing. The North-west area will be an underground proposition, the coal running 4 ft to 8 ft thick and with only one continuous outcrop on the south-east side. A considerable amount of drilling will be required to prove this area. A reconnaissance over the Rockies area indicated that it will probably be opencastable, two seams being present, the top one running about 5 feet thick and the bottom or main seam about 20 feet. Development of this area is the only way to rapidly increase production from the Millerton Mine.

Block 2.—Sampling was carried out over this block in order to define more precisely the limits of a high-ash zone and to determine the sulphur content of the seam.

Block 3.—Trenching, plane tabling, and surveying has been done in the vicinity of Pegs Z10 and L41.

Bayne's Block.—Traversing, trenching, and surveying has been carried out over this block, two more outcrops still remaining to be trenched and surveyed. All of this block will probably be opencastable with coal up to 45 feet thick, only a strip of relatively thin coal along the edge of the barren zone on the eastern side being excepted.

Fly Creek Opencast.—A complete and detailed survey was run over this area. No report was drawn up, as it became obvious from the initial study of the survey data that any further opencast operations would result in flooding of the Fly Creek Mine by St. Pat's Stream. However, when Fly Creek Mine is worked out or nearly so there will be a considerable tonnage of opencastable coal available in this area.

North-east Section.—Results from the North-west area proved disappointing, so attention was focused on the North-east. The trenching and surveying of the outcrop is virtually completed and the entire area has been traversed. Plane tabling and boring remain to be done. Development of this block will enable the present rate of underground production to be maintained from the Millerton Colliery.

Opencast Surveying.—Surveys for coal tonnages, a close-boring programme, road surveys, dam sites, and diversion race have been done. The close-boring programme has consumed a fair amount of time, though with the completion of about eight more holes it is expected to have proved about 1,000,000 tons of coal, sufficient to occupy the opencast for several years.

Denniston

Plateau Lease.—The activities of the party have been in great part concentrated upon this area, some of the work having to be duplicated owing to loss of survey records in the Denniston office fire. Work on this area has now been completed, a topographical plan with surface contours at 25 ft. intervals and showing all creeks and watersheds having been prepared. All outcrops have been trenched and sampled and a geological map of the area completed. All boreholes have been located and a plan showing accurate structural contours prepared so that the mine may be opened up and developed to the best advantage.

Escarpment Area.—Topographical and geological mapping was commenced on an area near the escarpment at the rear of Whareatea Extended and sites for boreholes located. It has been found that previous boreholes had been abandoned in this area before the coal-seam had been reached, and recent drilling has proved persistence of a seam of workable thickness in this area. Portion of this area can be worked by opencast mining methods, and survey work preparatory to the opening up of this area has been carried out.

Birchall's Area.—Surveys have been carried out over a block between the Birchall and Old Waterloo Sections and boreholes located for the further prospecting of this area.

Area Between Old Cascade and Ironbridge Mines.—A preliminary reconnaissance has been carried out over this area, but results have been rather disappointing.

Cook's Lease.—A commencement has been made with survey work preparatory to the systematic investigation of this area.

Access-road surveys were carried out for the construction of access roads to the site of the entrance tunnel to the Plateau Mine and to the Escarpment opencast area.

Drilling Activities

Extensive drilling operations were again carried out during the year, with a considerable increase of footage drilled over the previous year.

Including 1,520 ft. of drilling for blast-hole purposes, the total number of feet drilled for the year was 23,418.

Not taking into account the number of bores for blast-holes, the total number of bores drilled for prospecting purposes during the year was 236.

A new mobile Failing Holemaster drill was purchased during the year and was put into operation at Burke's Creek Colliery, Reefton, and had by the end of the year drilled 310 ft. of a bore which will be completed this year.

Details of drilling in the three main districts—namely, Southern District (Ohai, Southland, and Otago), West Coast District (Grey and Buller Coalfields), and Northern District (Waikato Coalfield)—are as follows:—

Northern District

Kimihia Opencast.—During the year seventeen bores, with a total footage of 819 ft., were drilled to prove likely extensions to existing opencast mines and to test structure hardness on the area now pumped out and being stripped with the 120B shovel.

Devlin and Bell, Rotowaro.—Five bores, with a total footage of 222 ft., were drilled on this area, after an option to purchase had been given, to prove the quantity of coal on the area likely to be won by opencast methods. Further drilling will be done on this area during 1949.

Thompson and Party, Rotowaro.—Two bores, totalling 171 ft., were drilled, close by bores previously drilled by a contractor, to check the drilling already done. This area is now being stripped.

Wilton Opencast, Glen Massey.—Drilling on this area was completed during the year, and after a road is put in stripping will commence. Forty-five bores, with a total footage of 2,607 ft., proved an area of coal along a ridge very suitable for opencasting.

West Coast District

Harrison and Party, Ten-mile.—One bore, 76 ft. deep, was drilled for this party to prove the throw of a fault encountered in the mine workings.

Stuart and Party, Ten-mile.—Because the area being mined by this party is likely to be worked out in the near future, five bores, totalling 515 ft., were drilled adjacent to the present mine to prove whether the same coal-seam existed beyond the lease boundaries. Not very encouraging results were obtained.

Spark and Party, Rewanui.—Two bores, totalling 360 ft., were drilled by the State Coal-mines to prove a seam of coal below the present workings which is to be included with the new Rewanui Colliery. Both bores proved good coal below.

Strongman Colliery, Nine-mile.—Six bores, totalling 585 ft., were drilled inside this mine to prove fault throws and distances between seams. Because of the faulted nature of the seams in this mine an underground air drill could be kept employed full time on this class of work.

Dobson Colliery, Dobson.—One bore, 110 ft., was drilled underground in this mine to prove a fault encountered in the workings.

Mount Davy, Rewanui.—During the previous year aerial access to this area was completed under most trying conditions. Camping facilities were erected and during 1948 drilling was commenced. Bore 290 was drilled to 500 ft., but had to be abandoned because of the terrific quantity of water encountered. Fourteen gallons of water per second were coming from the bore and it became impossible to get drilling tools in the bore. A decision was made to drill the next bore from a high ridge so as to overcome some of the water pressure, and bore 318 was started after much difficulty with shifting plant in bad weather and then having to tie the plant and derrick down with steel ropes because of high winds. Bore 318 at the end of the year was down 110 ft. It appears that on this area on the slopes of Mount Davy the Dunollie beds overlying the Goldlight shales are saturated with water being held in cavities. The Dunollie beds are very broken.

Burke's Creek Colliery, Reefton.—A bore was commenced late in the year and had been drilled to 310 ft. by the end of December. This bore is proceeding.

Stockton Area, Buller.—For the year thirty-five bores, with a total of 4,078 ft., were drilled for prospecting the area to prove coal and overburden thicknesses for both underground and opencast operations. From the results obtained it may now be possible to extend the Webb Mine (Underground) farther north than was anticipated and at the same time considerably extend the area which could be worked opencast. During

December, 1,520 ft. of blast-hole drilling was done to assist with the shooting of overburden at the opencast. A new 56B blast-hole drill has been ordered for this class of work and should be in operation early in the next year.

Plateau Area, Denniston.—Seventeen bores, totalling 2,554 ft., were drilled on this area to try and define an area likely to contain low-sulphur coal. The drilling was most encouraging and this area will be opened up in the near future.

Southern District

Wangaloa.—During the previous year a deep bore was drilled to 834 ft., and was completed this year to 1,092 ft. The drilling on this area was most difficult because of the alternating hardness and looseness of the quartz material to be drilled through. The results from the bore were not encouraging and it was decided to abandon the work meantime.

Wangaloa Opencast.—Six bores, totalling 535 ft., were drilled near the present Wangaloa Opencast to prove the thickness of cover on a likely extension.

Wangaloa Coal Company.—To prove whether an area owned by the above company could be worked by opencast methods, the Mines Department drilled twenty-three bores, totalling 1,121 ft., during the year, and from the results of these bores a decision will be made early in the New Year as to the potential opencast value.

New Brighton, Ohai.—Five bores, totalling 251 ft., were drilled on a small area in this locality to see if suitable for a small party. The results were negative.

Star Opencast.—To prove the likely extent of coal which could be won opencast on this area, fifty-three bores, totalling 2,544 ft., were drilled. The area is now being stripped and some coal was won during the Christmas period.

Wairaki, Birchwood, and Star, Ohai.—Nine bores, totalling 4,172 ft., were drilled on these areas as part of the general deep-drilling programme in the Ohai district. Very encouraging results are being obtained in Ohai generally and large blocks of more or less undisturbed coal are being found.

Summary of Bores Drilled

		Ft.
Harrison and party	1	76
Stuart and party	5	515
Mount Davy	2	610
Spark and party	2	360
Strongman Colliery	6	585
Dobson Colliery	1	110
Wangaloa	1	258
Wangaloa Opencast	6	535
Wangaloa Coal Co.	23	1,121
New Brighton	5	4,170
Star Opencast	53	2,544
Star	3	1,496
Wairaki	1	77
Birchwood	5	2,599
Kimihia Opencast	17	819
Devlin and Bell	5	222
Thompson and party	2	171
Wilton Opencast	45	2,607
Stockton Area	35	4,078
Denniston Area	17	2,554
Burke's Creek, Reefton	1	310
	236	21,898
Blast-holes, Stockton Opencast	..	1,520
	..	23,418

SUBSIDY ON COAL-PRODUCTION

Payments administered by the Mines Department for the financial year ended 31st March, 1949, from the Stabilization Account were :—

	£	s.	d.
District tonnage subsidies	842,218	18	11
Subsidy on Saturday work	38,812	6	9
Subsidy on work on statutory holidays	29,429	19	10
Subsidy on shift bonuses	6,747	18	7
Subsidy on increased cost of tools	14,220	13	6
Special subsidies on uneconomic mines operated by the State	315,090	19	9
Guaranteed profits (Waikato mines)	287,490	7	0
Administration costs (Waikato mines)	958	19	10
Miscellaneous	310,120	7	11
Total	£1,845,090	12	1

Of this amount, £996,266 was in respect of State coal-mines and £848,825 in respect of privately-owned mines. The figures given are the actual payments by Treasury during the financial year. During the period, the State coal-mines earned subsidies to the amount of £1,203,966, as shown in the accounts (C–2A). The difference between this figure and the sum of £996,266 represents subsidies not verified and paid until after the end of the financial year.

The total amount paid by way of general subsidies from the inception of the scheme in May, 1940, to 31st March, 1949, is £7,249,611.

The total amount expended under the Waikato Coal-mines Control Emergency Regulations 1942 to 31st March, 1949, is £878,307, giving a grand total to date for all forms of subsidy of £8,127,918.

In December, 1939, the approximate average price (f.o.r.) of run-of-mine coal was £1 per ton, and at this level the price was stabilized until 1st October, 1947, when the average price was advanced by approximately 1s. 6d. per ton. However, during the year ended 31st March, 1949, subsidy payments on coal due for this period, together with the amount due under the guaranteed net-profits clause of the Waikato Coal-mines Control Emergency Regulations for the same period, would average approximately 13s. 3d. per ton of coal produced.

Accordingly it must be assumed that were it not for payments in respect of subsidy and guaranteed net profits the average price f.o.r. of run-of-mine coal would have advanced by 13s. 3d. per ton to 34s. 9d. per ton.

During the same period the statistical statements of the Ministry of Fuel and Power and the National Coal Board of Great Britain show that the average proceeds per ton of coal disposable commercially has increased from 17s. 6d. in December, 1939, to 47s. 8·4d. for the quarter ended 31st December, 1948.

CO-OPERATIVE MINING, STATE COAL RESERVE, GREYMOUTH

During the year 1948, eighteen co-operative coal-mining parties were operating on areas within the State Coal Reserve, Greymouth. The production for the year was 97,111 tons and the number of men employed was 133. In 1947, sixteen parties employing 130 men produced 84,925 tons.

Co-operative parties have produced to date 2,259,253 tons of coal and have paid royalties to the Crown amounting in the aggregate to £109,192.

WAIKATO COAL-MINES CONTROL

The control over the mines owned by Glen Afton Collieries, Ltd., Pukemiro Collieries, Ltd., Renown Collieries, Ltd., and Taupiri Coal Mines, Ltd., ceased on the 31st December last by virtue of the provisions of the Emergency Regulations Amendment Act, 1948.

The financial provisions under which the profits of the companies are guaranteed continue to operate, however, until the end of the financial year of each company following the date of revocation of the regulations.

In the case of Taupiri Coal Mines, Ltd., this is 31st March, 1949; Glen Afton Collieries, Ltd., 31st March, 1949; Renown Collieries, Ltd., 31st July, 1949; and Pukemiro Collieries, Ltd., 31st August, 1949.

During the year ended 31st March, 1949, the sum of £288,449 6s. 10d. was expended in respect of claims for guaranteed profits for companies' financial years ending in 1948 and in administration costs, making the total amount paid to date under the control scheme £878,307 8s. 4d.

The amount paid for the year ended 31st March, 1949, represents final settlement of all claims, with the exception of that from Glen Afton Collieries, Ltd., for the year ended 31st March, 1948.

In this case a progress payment of £50,000 has been made.

In addition, £42,905 was paid to Taupiri Coal Mines, Ltd., on account of the year ended 31st March, 1949.

CARBONIZING AND BRIQUETTING

The production of the low-temperature coal carbonizing and briquetting plant of Waikato Carbonization, Ltd., at Rotowaro during 1948 was:—

Raw coal carbonized	25,155	tons.
Carbonized coal produced	12,326	tons.
Average percentage of carbonized coal to raw coal	49	per cent.
Carbonettes manufactured	12,906	tons.
Tar and oil treated	181,115	gallons.
Pitch produced	364	tons.
Light and heavy oils produced	Nil	
Creosite produced	161,227	gallons.
"Char" sold for producer-gas plant	Nil	
"Char" sold for other purposes	621	tons.

No briquettes were produced by Smokeless Fuel and Briquettes (Canterbury), Ltd., during 1948, but 30,218 gallons of tar were obtained from their operations.

Negotiations are proceeding to acquire a site at Sockburn, near Christchurch, for the erection of a modern briquetting plant to handle various kinds of slack coal from South Island coal-mines. The plant will be designed by Mr. A. B. Jones, manager of Waikato Carbonization, Ltd., who recently investigated modern practice in briquetting overseas on behalf of the Government.

MINERALS OTHER THAN GOLD

There has been no development of consequence in the exploitation of these minerals during the year 1948. As in the immediately preceding years, production of non-metallic minerals has far exceeded that of metallic minerals, and it is of interest that, despite a decrease in value of the production of gold to the extent of £200,000, the value of the total mineral production, with the exception of coal, for 1948 remains practically unchanged from that of 1947 owing to the production of non-metallic minerals having increased in value by a similar amount.

Scheelite.—The equivalent of 25 tons of scheelite concentrates averaging 65 per cent. WO_3 were produced in 1948, 19 tons coming from the Glenorchy district and 6 tons from Macrae's Flat. This is in keeping with the production level of late years, 22 tons being produced in 1947, 27 tons in 1946, and 34 tons in 1945, but a marked decline from production during the wartime years, when a peak production of 145 tons was achieved in 1944. The low level of production is due mainly to exhaustion of ore and not to the price level, which has remained at a reasonably satisfactory rate. Actually over half of the Glenorchy production was due to the efforts of one party. It is, however, possible that with continued development other parties will locate good patches of ore and that production will be increased.

Manganese-ore.—A shipment of 489 tons of manganese-ore was made to Australia from Maning's Mine, Otau, Clevedon, and later in the year 36 tons of ore were sold locally, making the production for the year 525 tons in all. Arrangements have now been made whereby all the ore produced from this mine will be sold to local users and the difficulties in the past of securing shipping space will be obviated.

Iron-ore.—From deposits in North Auckland and at Onekaka a total of 4,776 tons of iron-ore were produced for use in gas-purification and in the manufacture of cement and stock-licks. Seeing that the gas industry has now to depend upon New Zealand coals with a higher sulphur content, the production of iron-ore for gas-purification is of considerable importance. A modern electric furnace is now being installed at Onekaka and large-scale experiments are to be made in the smelting of concentrates obtained from Taranaki ironsands by the use of spiral concentrators.

Antimony-ore.—After some years, the export of antimony-ore was resumed by the shipment of 9 tons of ore, valued at £268, from the Mount Stokes antimony-mine, in the Nenthorne Survey District. Prospecting operations for antimony-ore in the Bannockburn district have now been suspended owing to disappointing results.

Arsenic.—Eight tons of arsenic were recovered as a by-product from the roasting of gold-ores at the treatment plant of the Blackwater Gold-mine and were disposed of locally.

Copper-ore.—There was no further activity during 1948 at the copper-mine at North Auckland, but during the present year a small parcel of ore has been roasted to reduce sulphur content so that danger from heating while in transit can be overcome. A small parcel of this material has recently been shipped to the smelter in Australia, and it is possible that further shipments will be made.

Lead-ore.—The high price being obtained for lead has directed attention to lead-ores. A little preliminary work has been done at Te Aroha, but prospecting-work has had to be postponed until conditions under which such work is to be carried out could be framed to the satisfaction of the Health Department so that danger to the pollution of the local water-supply could be avoided. At the present time Sylvia Mines Consolidated, Ltd., are crushing ore obtained from the driving of No. 6 Level and concentrates are being obtained which will be shipped to Australia for treatment. The results of this test will give information as to the percentage of base metals contained in the ore that are recoverable by modern methods of concentration and indicate whether mining for base metals can be carried out on an economic basis.

Bentonite.—Of a value of £4,462, 624 tons of bentonite were produced during 1948, as against 215 tons, valued at £1,049, in 1947. All of this amount was produced from the Porangahau district, the major producer being New Zealand Bentonite (Porangahau), Ltd., the pioneer of bentonite in New Zealand. Another company has recently been formed to open up bentonite deposits in the Gisborne district. Although New Zealand bentonite is not strictly comparable with the best grade American type, a good market within its limitations exists overseas for New Zealand bentonite and production and export are capable of considerable expansion. It has in consequence been disturbing to find that inferior material has recently been marketed overseas as New Zealand

bentonite, and as a consequence overseas buyers have become prejudiced against all New Zealand bentonite. To obviate a recurrence of this situation it is now proposed that all bentonite for export must be sampled and tested by Government officers and that the material must attain the minimum grade of 90 per cent. by the Sadler test before export is permitted.

Serpentine.—There was increased production of serpentine during 1948, 38,637 tons being produced, as compared with 31,933 tons in 1947. Of the 1948 production, 5,362 tons came from North Auckland, 32,855 tons from Piopio, near Te Kuiti, and 420 tons from Mossburn, in Southland. All this serpentine has been used in the manufacture of serpentine-superphosphate, the quantity consumed to date amounting to 243,028 tons, and a continued demand for serpentine for this use appears assured.

Dolomite.—In 1948, 6,912 tons of dolomite were produced, as against 7,034 tons in 1947. Of this amount, 6,362 tons were sold in lump form and consumed in the manufacture of soluble-slag fertilizer, but 550 tons were finely ground for use as a fertilizer in the cultivation of tobacco.

Magnesite. From the magnesite-talc deposits of Upper Takaka 540 tons of impure magnesite were mined and finely ground for use as a fertilizer in the cultivation of tobacco. Recent research work at the Mineral Dressing Laboratory of the Otago University School of Mines has shown that the separation from this material of a high-grade magnesite is possible.

Limestone. The quarrying of limestone for various uses, the manufacture of cement, for agricultural purposes, and for industrial purposes is continually expanding and now constitutes one of the more important sections of the mining industry. In 1948 total production of limestone for various uses amounted to more than 1,500,000 tons. There was again a substantial increase in the production of limestone for use in agriculture, 1,091,299 tons being produced for this use in 1948, as against 1,020,810 tons in 1947. It is of interest that over 70 per cent. of this production came from the Southern Inspectorate District, comprising Canterbury, Otago, and Southland, where there are several large producing units that are highly mechanized and whose mining practice is modern in every way. It would appear that the production of limestone for agricultural purposes is still capable of considerable expansion before New Zealand's requirements are fully met. Production of limestone, marl, &c., for the manufacture of cement amounted to 417,660 tons in 1948, as compared with 399,335 tons in 1947. Of the 417,660 tons of material used in the manufacture of cement, 381,319 tons were limestone, 22,395 tons marl, and 13,946 tons silica sand.

Limestone produced for industrial uses amounted to 69,068 tons, of which the greater proportion was used for the manufacture of quicklime and slaked lime, 28,146 tons of these being produced. Other uses were in the manufacture of soluble slag and in sugar-refining. Included in this total are also 1,023 tons of chalk which were used for a variety of industrial purposes.

Pumice.—A total of 6,863 tons of pumice, of which 1,735 tons were exported, were produced in 1948, compared with 3,389 tons, of which 2,420 tons were exported, in 1947.

Clay for Bricks, Tiles, &c.—In 1948, 159,129 tons of clay for use in the manufacture of bricks, tiles, &c., were produced, as against 150,808 tons recorded in 1947.

Clay for Pottery, Fillers, &c.—Production of clays in this class amounted to 17,402 tons in 1948, as against 11,970 tons in 1947.

Silica Sand.—During 1948, 16,536 tons of silica sand were produced from deposits at Parengarenga, Hyde, Mount Somers, Pleasant Valley, and Parapara, compared with 14,143 tons obtained from the same deposits in 1947. As in past years, the deposit at Parengarenga operated by the New Zealand Glass Manufacturers Co. Pty., Ltd., contributed by far the greatest proportion, production from this source amounting to 14,113 tons.

Dimension Stone.—There was a considerable expansion in the production of stone for building and monumental work during 1948, 22,319 tons being produced, as against 14,528 tons during 1947. This increase is due entirely to the marked expansion in the production of Oamaru building-stone, of which 20,179 tons were produced, as compared with 2,932 tons in 1947. Small amounts of granite from Coromandel and Bluff, sandstone from Charteris Bay, Lyttelton, and marble from Hanmer of approximately the same order as in 1947 were produced during the year, but there was a marked decrease in the production of bluestone, which was practically confined to Christchurch quarries.

Salt.—Continued progress was made in the development of an area at Lake Grassmere, where salt is to be produced by the solar evaporation of sea-water. As yet there has been no production of salt in significant amount, but the Government, after consideration of a report by an overseas engineer experienced in the production of salt, has decided to take a substantial interest in the project.

General.—Small amounts of quartzite, fuller's earth, and diatomite were produced during 1948, while sand, gravel, rock, &c., for various uses, such as building aggregate, road-construction, &c., were produced in quantity and accounted for the major portion by volume of the production of quarries.

GEOLOGICAL SURVEY

The Geological Survey issued a revised geological map of New Zealand on the scale of 16 miles to an inch and an accompanying explanatory forty-eight-page booklet summarizing the main features in New Zealand geology.

The central volcanoes of the North Island were again the scene of activity, and on 8th February Ngauruhoe erupted and continued to 5th March; no damage was done.

Geologists are now working in four of our coalfields—Invercargill, Mataura, Balclutha, and Greymouth—and will soon be at work in three more—Huntly, Ohura, and Mokau. Recent geological field-work shows that no workable coal crops out in the coal-measures of West Southland along the south-east of Fiordland. To find how much lignite can be worked opencast in Southland, holes are being drilled at Mataura. In Kaitangata recent work indicates that workable coal does not extend beyond Tuakitoto in the west and Taratu in the north, but that the prospects in the east side of Kaitangata and near Benhar are bright.

Heaphy, Karamea, Collingwood, Murchison, and Garvey Creek Coalfields have been, and Reefton is being, examined. Limestones for dusting the coal-mines were examined in the West Coast.

Parts of North Auckland, Rotorua, East Coast, Canterbury, and Southland are being geologically examined and mapped.

At Wairakei and Tokaanu, wells were drilled for hot water.

Dam-sites were investigated along the Waikato and at Taupo and foundations at Murupara.

To investigate how to find and utilize underground steam, the director visited Larderello, and work is going ahead in Rotorua. A magnetometer survey has covered Tikitere and is being extended.

Pakotai copper was studied electrically, but the neighbouring areas showed no other similar deposits.

By testing the Canterbury Plains by electric restivity the ground water and seepage irrigation water were detected more efficiently than previously.

LABORATORY INVESTIGATIONS

The following is a summary of work carried out at the Dominion Laboratory during 1948 in connection with minerals and the mining industry :—

Further work was done on the possible use of greensand in phosphatic fertilizers. The use of a mixture of dolomite and greensand for this purpose was shown to be of value. The suggestion was made that slag prepared in this way might be used for the reversion of superphosphate.

The work on glass-sands was continued. Analyses and grading tests were made on samples from several localities. The possibility of improving the sands by washing, magnetic separation, and chemical treatment was investigated.

A great deal of further work is being done on the black sands for the Iron and Steel Department.

The investigation of New Zealand diatomites for filtration use was continued.

Analyses and tests were made of a large number of materials for possible use as pozzolanas in concrete. A chemical method of evaluation in which the conductivity of a solution is measured is being used.

As usual, many analyses and assays for gold and silver were made for prospectors and others.

Limestones for agricultural use were examined.

Bentonite deposits from various localities were surveyed by the Geological Survey and samples from each locality were tested and analysed by the Laboratory. The data will be published.

Many clays were analysed and tested for suitability for various purposes.

The survey of coal resources was continued, many analyses being made of core, outcrop, and mine samples of coal.

Analyses of mine airs and gases were made, and stone-dusts were tested.

SCHOOLS OF MINES

The expenditure on Schools of Mines for the year ended 31st March, 1949, was £4,069, as against £4,884 for the year ended 31st March, 1948.

Three candidates, two from Otago University School of Mines and one from Reefton School of Mines, sat the annual examination for Government Mining Scholarships. One of the candidates from Otago, who had already secured a partial pass, completed the examination, while the other two candidates obtained partial passes.

Few candidates of recent years have offered themselves for the examination for the Government Mining Scholarship, and of the scholarships awarded by far the greater portion have gone to students at Otago University School of Mines who have already completed two or even three years of their mining course. The scholarship has in consequence failed in its function as an entrance scholarship to the University and has no longer provided the means and encouragement for young men resident in mining districts to undertake a University course in mining engineering. This is, of course, due in great part to the decline of metal mining in New Zealand and the reluctance of students interested in coal-mining to proceed to the University.

To meet this position it has been decided to discontinue the award of Government Mining Scholarships and in their place institute entrance bursaries in coal-mining engineering to the Otago University School of Mines. This is an essential part of the policy of the Mines Department to pay increased attention to education in coal-mining

engineering in view of the increasing importance of this section of the mining industry and the necessity of maintaining an adequate supply of technically-trained officials in the industry.

Arrangements have been made with the authorities of the University of Otago whereby a chair devoted to coal-mining engineering will be created at the University, and a professor has already been appointed and will arrive in New Zealand at an early date. It is particularly fortunate that the first incumbent to the chair should be a gentleman with a most distinguished overseas record in scientific research problems connected with the coal-mining industry.

Regulations covering the award of coal-mining bursaries are as follows :—

(1) Commencing in the year 1950, not more than six coal-mining bursaries may be awarded annually to selected students who undertake the course leading to the Degree of B.E. (Mining) in the University of New Zealand. The first (Intermediate) year of this course may be taken at any of the constituent colleges of the University of New Zealand, providing the practical work done during the summer following the Intermediate Examination is approved by the Dean, Faculty of Mines and Metallurgy, University of Otago. The three succeeding years must be taken at the University of Otago.

(2) Each coal-mining bursary will be of the value of £75 per annum in the case of a student who is able to live at home during the academic year, and £150 in the case of a student who is obliged to live away from his home. In addition, the bursar's examination and tuition fees will be paid.

(3) Except in exceptional cases, each coal-mining bursary shall be tenable for a period not exceeding four years, renewal from year to year being subject in each case to satisfactory reports from the Dean of the Faculty of Mines, University of Otago, as to conduct, diligence, and proved suitability for work: Provided that in the case of a bursar who has undertaken the Intermediate year of his course at one of the other constituent colleges a satisfactory report as to the bursar's progress will be required from the college authorities concerned.

(4) The tenure of a bursary is also contingent upon satisfactory confidential reports being received by the Dean from the managers of mines and other approved works where the bursars spend their vacations gaining practical experience as required for the Degree of B.E. (Mining).

(5) A student who is awarded and accepts a bursary in any year shall forego for that year any bursary under the Educational Bursaries Regulations 1940, or any other grant or allowance by the Government, for the purpose of assisting him to pursue his studies at any college.

(6) Successful applicants will be required to give a guarantee that they will serve in the mining industry in work of a type approved by the Under-Secretary for Mines for a period of one year for each year in which the bursary is paid, together with a period of three months for each year or part of a year in which boarding-allowance is paid as part of the bursary. In the event of non-compliance with such an undertaking, they must provide sureties for the return of the total amount paid to the bursar in regard to each bursary or a due proportion to be determined by the Minister of Mines. If a bursar proves medically unfit to carry out his obligations, such bond shall be void.

Successful applicants will be required to follow the course for B.E. (Mining), and on completion of such course or when required by the Under-Secretary for Mines accept employment as hereinbefore described at such salary or emolument as may be prescribed by the Public Service Commission.

(7) Applications for the bursary shall be received by the Dean, Faculty of Mines, University of Otago, not later than 10th October in the year preceding that in which it is desired to take up the bursary. Forms of application may be obtained from the Registrar, University of Otago.

(8) Every applicant shall be required to furnish evidence that he has been accredited for or has passed the Entrance Examination of the University of New Zealand, or some equivalent examination approved of for the purpose by the Dean, Faculty of Mines, University of Otago. Preference will, however, be given to candidates who have shown special proficiency in mathematics and science subjects. The results gained by candidates in the University Entrance Examination, the University Entrance Scholarship Examination, and the Boarding Bursaries Examination will be used as a guide for the award of the bursaries. Candidates who are accredited for entrance to the University will be required to sit the Education Department's Special Bursaries Examination in order that their applications may be considered: Provided that in exceptional cases applications will be considered from candidates who have been accredited for or passed the Entrance Examination of the University of New Zealand and who have been employed at a coal-mine for at least twelve months prior to their application for a bursary.

(9) Each applicant will be interviewed by a Board consisting of—

(*a*) A representative of the Mines Department.
(*b*) The Superintendent of Staff Training, Public Service Commission, or his representative.
(*c*) A representative of the Education Department.
(*d*) A representative appointed by the Council of the University of Otago.
(*e*) A representative nominated by the New Zealand Institute of Coal-mining and approved by the Minister.

Bursars will be selected not necessarily on account of their merit in examination, but having regard also to their personality and general suitability.

In addition to the bursaries, it has been decided to institute travelling scholarships in coal-mining, and the conditions of appointment to these scholarships are as under:—

(1) There shall be two scholarships, called the Travelling Scholarships in coal-mining.

(2) The annual value of each scholarship shall be £500, but if the scholars undertake work for which they are paid the annual value shall be reduced by the amount thus received.

(3) In addition, actual and necessary travelling-expenses, not exceeding a total sum of £500, may be paid to scholars.

(4) Each scholarship is tenable for two years.

(5) The scholars shall be required to study some aspect or aspects of coal-mining technology in one or more countries abroad, and while doing so they shall be under the control of a centre of higher education approved by the Council of the University of Otago.

(6) The scholarships shall be awarded by the Council of the University of Otago after receiving from the Professional Board a report on the general merit of the candidates. Scholars shall be selected not necessarily on account of the order of merit in examination, but having regard also to their personality and general suitability as evidenced by the confidential reports received on the practical work done during the vacations.

(7) No candidate shall be entitled to take up a scholarship until he has presented a medical certificate of health satisfactory to the Council.

(8) A scholar must notify the University of Otago when he proceeds overseas, and at the end of each half-year the scholar must forward a statement of the work he has done during the period. The Director of the educational centre at which he is working shall be asked to report to the University of Otago on the nature and quality of the work done by the scholar.

(9) During the tenure of the scholarship, each scholar shall be required to devote the whole of his time to the courses of practical training and study approved by the Council.

(10) The scholarship stipends are payable half-yearly in advance, but £50 is reserved from the final payment until a satisfactory final report is received. Payments may be suspended if the statements and reports required under clauses (7) and (8) are not forthcoming or if any report is unfavourable. Scholars shall also forward with the reports required under clause (8) certified statements of emoluments received for any work done during the half-yearly period.

(11) Applications must be made in writing to the Registrar, University of Otago, by the 1st of November in the year prior to that in which it is desired to take up the scholarship. The applications must be accompanied by statements of the training and practical work the candidates propose to undertake if awarded a scholarship.

(12) Before they become entitled to any payment, scholars must enter into an agreement with the Mines Department defining their obligations and rights. The agreement will provide, *inter alia*, that, immediately after the termination of the scholarship, scholars shall accept employment with the New Zealand Mines Department, if called upon to do so, at a salary or emolument to be determined by the Public Service Commission. The period of employment shall not be less than two years, exclusive of any other obligation the scholar may have entered into—*e.g.*, obligation under a coal-mining bursary.

COAL-MINES COUNCIL

The work of the Coal-mines Council continued during the year and 103 separate decisions were issued, mainly in connection with the settlement of industrial disputes and the determination of working-conditions in the industry.

I take this opportunity of thanking the members of the Council for their valuable service during the year.

RESCUE STATIONS

Rescue stations at Dobson, Ohai, Rotowaro, and Granity were in full operation during the year and continued to render valuable service to the coal-mining industry.

Full details of the operations of these stations will be found in the annual report of the Superintendent which is published as an annexure to this Statement.

HOUSING

During the financial year 1948–49, housing loans were granted to twenty-eight employees to a total amount of £18,247. Eight loans were for the construction of new houses, seventeen for the purchase of existing houses, and three for repairs and renovations. The locations of the houses are: Runanga, 5; Dunollie, 3; Dobson, 1; Blackball, 3; Hector, 1; Waimangaroa, 1; Stockton, 3; Millerton, 1; Ohura, 1; Ngaruawahia, 7; Ohai, 2.

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.
		£		£		£		£
31/3/40 ..	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	8,860
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
31/3/48 ..	11	11,380	11	4,355	..	..	22	15,735
31/3/49 ..	8	10,670	17	6,907	3	670	28	18,247
Totals ..	83	73,128	82	38,148	21	5,486	186	116,753

COAL-MINERS' RELIEF FUND

Section 4 of the Coal-mines Amendment Act, 1947, increased the levy by which the fund is financed from ½d. to 1d. per ton, the rise being made necessary by the imminent exhaustion of the fund. Receipts for the year ended 31st March, 1949, were £11,373 3s. 9d. and expenditure for the year was £7,762 12s. 1d. Interest earned amounted to £56 1s. 10d. and the balance standing to the credit of the fund on 31st March, 1949, was £4,229 13s. 2d.

At the end of last year the figures were: receipts, £5,750; expenditure, £7,056; interest, £18; balance as at 31st March, 1949, £554. It will be noted that the financial position of the fund has considerably improved in response to the increased levy.

SOCIAL AMENITIES

During the financial year 1948–49 the sum of £5,575 was expended in providing social amenities for mining townships, as against £3,081 in the financial year 1947–48. Of this sum, £2,593 was supplied from the State Coal-mines Account and £2,982 from the "Mines" vote.

This expenditure covered a multitude of activities, the main ones being those of football clubs, cricket clubs, hall committees, bowling clubs, sports clubs, community centres, ambulance committees, playgrounds, fire brigades, tennis clubs, croquet clubs, swimming-baths, &c.

Shortage of both man-power and materials has handicapped the programme, but, as opportunity provides, conditions in the mining communities will be improved.

ASSISTANCE TO MINING

Subsidies and loans to the mining industry during the year ended 31st March, 1949, amounted to £4,873 15s. 1d. Details were:—

	£	s.	d.
Coal-mining	4,379	16	11
Scheelite-mining	224	0	0
Gold-mining	119	18	2
Erection bins, Cape Foulwind Limeworks	150	0	0
Total	£4,873	15	1

MINERS' BENEFITS

The provisions for payment of a miner's benefit are contained in the Social Security Act, 1938, which came into operation on the 1st April, 1939. One of the necessary qualifications is that the applicant should be seriously and permanently incapacitated by miners' 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 £117 per annum, increased in the case of a married beneficiary by £117 per annum for the wife. The widow of a miner who died while in receipt of a miner's benefit may be granted a benefit of £91 per annum during widowhood.

This scheme, which originated with the Miners' 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, 1949 :—

	£
Payments from 1st November, 1915, to 31st March, 1948 ..	1,878,548
Payments from 1st April, 1948, to 31st March, 1949	113,659
	£1,992,207

Number of new grants for the year 1948–49—	
Males	15
Females (widows of miners)	10
	25
Number of benefits in force at 31st March, 1949—	
Males	575
Females (widows of miners)	85
	660
Annual value of benefits in force at 31st March, 1949	£108,900
Dissection of benefits in force at 31st March, 1949—	
Single miners	262
Married miners	313
Widows	85
	660

MEN EMPLOYED IN MINING AND QUARRYING

The table shows the numbers of men employed in each inspection district during 1948 and 1947 :—

	Inspection District.			Totals.	
	Northern (North Island).	West Coast (South Island).	Southern (South Island).	1948.	1947.
Gold, silver, and scheelite ..	459	434	165	1,058	1,191
Coal	2,156	2,490	936	5,582	5,442
Bentonite	7	..	..	7	4
Clays	69	14	57	140	119
Diatomite	..	..	1	1	2
Dolomite	..	4	..	4	7
Fuller's earth	..	..	..	..	1
Iron-ore	13	3	..	16	17
Limestone	212	79	271	562	621
Magnesite	..	2	..	2	3
Pumice	11	..	..	11	10
Quartzite	..	4	..	4	3
Rock, sand, &c.	1,020	32	391	1,443	1,361
Serpentine	7	..	2	9	8
Silica sand	5	1	10	16	9
Totals	3,959	3,063	1,833	8,855	8,798

MINING AND QUARRY ACCIDENTS

Fatal and serious accidents in the mining industry during the year 1948 were :

	Men Killed.	Men Seriously Injured.	Men Ordinarily Employed.
Coal-mines	5	39	5,582
Metal mines	..	1	1,058
Quarries	..	2	2,215
Totals	5	42	8,855

MINING PRIVILEGES

The following table shows the numbers and descriptions of mining privileges granted through the Warden's Court during 1948, 1947, and 1946 :—

	1948.	1947.	1946.
Claims	33	30	23
Prospecting licences	134	62	83
Water rights	25	38	22
Residence sites	61	56	29
Mineral licences	12	7	8
Miscellaneous	7	13	10
Totals	272	206	175

LEGISLATION

The Coal Act, 1948, in addition to amending the Coal-mines Act, 1925, provides for the acquisition by the Crown of the property in all unworked coal. All privately-owned coal existing on or below the surface of any land is declared to be the property of the Crown. The Act makes provision for compensation to be paid for privately-owned coal and sets up a Coal Valuation Commission for this purpose.

In addition, Part III of the Act provides that certificates of title may be issued to His Majesty, that the Minister may generate and supply electrical energy, and that the Minister may acquire and dispose of shares or stock in companies.

The Mining Amendment Act, 1948, contains provisions fixing the royalty on mineral licences by weight or quantity, restricting the right of renewal of mining licences, determining hours of work underground not to exceed seven hours a day, and restricting employment of youths underground.

The Westport Coal Company Act, 1948, provides for the vesting in the Crown of the assets of the company and for the dissolution of the company.

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, 15th July, 1949.

Sir,—

I have the honour to present my report on metalliferous mines and quarries for the year ended 31st December, 1948.

QUARTZ-MINES

Martha Mine, Waihi.—The output of 95,804 tons, yielding 26,975 oz. of gold and 231,753 oz. of silver, valued at £328,316, was got from the Martha, Royal, Empire, Welcome, and Dreadnought Lodes. As in the previous year, the ore was obtained by the secondary working of arches and pillars of payable stone left for support during earlier mining operations. With a reduction of 32 in the men employed, ore produced showed a 13,000 ton fall compared with the 1947 output, and a decrease of 2,000 oz. in the gold yield. The total crushing time at the mill was 216 days.

Blackwater Mine, Waiuta.—Development for the year totalled 1,117 ft. with men employed 111, and consisted of some extension of No. 15 Level South and of No. 15 Intermediate Level North and South, but mainly of the extension north for 232 ft. of No. 16 Level and the southward extension of the same level for 135 ft., the greater part of this driving being on payable reef. A considerable footage of rising was completed on Nos. 15 and 16 Levels, and winze-sinking from Nos. 14 and 15 Levels, with generally good values. Ventilation of the southern end of the mine was considerably improved by this further connection of Nos. 15 and 16 Levels.

Completion of a shaft-repair job delayed starting after the Christmas holidays for a short time, but otherwise work was continuous, though much time was lost due to absenteeism and the result of a number of minor accidents. The available mine staff is much below the number required for efficient working, with the result that development shows a further decrease of 721 ft. below the 1947 figures. In spite of this, output shows an increase to 24,328 tons and 9,977 fine ounces, 1,809 oz. better than the 1947 yield.

For the proper development of the mine the sinking of the north shaft to open No. 17 Level is urgently necessary, but has been delayed by the lack of skilled men. No doubt owing to the reduction in the price of gold due to exchange adjustment in August, this proposal has now been postponed indefinitely.

Prospecting.—A small amount of prospecting for gold continued throughout the year in the Coromandel and Karangahake districts, but produced no results of consequence. Prospecting also was continued at Dynamo Flat and Copper Creek, in the Mount Aurum basin, Central Otago, by a small party who have now purchased and propose to erect a three-stamp battery to test further the Copper Creek prospect.

On the Tui property, near Te Aroha, some surface prospecting and the reopening of the old No. 3 Mine Level are reported to have shown encouraging results in the search for base metals.

A number of small parties employing some 27 men are still engaged in scheelite-mining in the Glenorchy and the Macrae's districts of Otago.

METALLIFEROUS MINES

Men Employed and Output

	Ore.	Development.	Men Employed.	Gold.	Silver.	Value.
Northern District—	Tons.	Ft.		Oz. dwt.	Oz. dwt.	£
Martha, Waihi	95,804	5,761	449	26,974 14	231,753 5	328,316
Lucy Amelia, Komata ..	..	..	..	3 11	18 1	42
Charlton's, Kuaotunu ..	Tailings	..	2	137 17	91 9	1,287
Jubilee, Coromandel ..	20	..	2	6 2	2 6	51
Sundry prospectors ..	..	..	5	..	..	..
Totals	..	..	458	27,122 4	231,865 1	329,696
West Coast District—						
Blackwater, Waiuta ..	24,328	..	111	9,976 7	..	96,023
Southern District—						
Callery Party, Macrae's Flat	100	..	1	24 16	..	250
Fraser Party, Macrae's Flat	24	..	1	4 18	..	48
Mount Arnum Syndicate, Skipper's Creek	15	..	1	6 9	..	58
Totals	139	..	3	36 3	..	356

ALLUVIAL MINING

Two of the three companies operating in the West Coast District, the Moonlight, Blackball, and the Golden Sands, Barrytown, suspended operations during the early part of the year due to the exhaustion of available payable ground.

In the Southern District the Golden Arrow Mining Co. worked during the early part of the year on the Arrow River. Operations were then suspended and the company went into voluntary liquidation.

A number of small parties are still working alluvial claims in these districts, but there have been no major developments.

Men Employed and Output

	Yardage.	Average Depth.	Men Employed.	Gold.	Value.
West Coast District—		Ft.		Oz. dwt. gr.	£
Golden Sands, Ltd., Barrytown	..	40	2	39 0 0	366
Waitahu Gold-mining Co., Ltd.	61,216	15	3	144 3 0	1,248
Moonlight Goldfields, Ltd. ..	30,000	175	3	62 15 11	483
Sundry alluvial claims ..	..	..	100	588 0 0	5,767
Totals	..	..	108	834 0 0	7,864
Southern District—					
Round Hill Mining Co., Ltd. ..	..	..	6	453 0 0	4,291
Golden Arrow Mining Co., Ltd.	..	..	2	29 0 0	309
Sundry alluvial claims ..	..	..	52	808 0 0	7,870
Totals	..	..	60	1,290 0 0	12,470

DREDGE MINING

In the Southern District the Clutha River dredge continued work throughout the year at Alexandra Flat, and the Austral-New Zealand dredge worked continuously in the Clutha River Flats upstream from the Lowburn Bridge. The Molyneux dredge has not worked during the year, while the Rainbow Dredging Syndicate's dredge, after being idle during most of 1948 due to exhaustion of the available dredging area, has now been shifted to the Charlton Valley dredging area near Gore, and will resume operations early in 1949.

In the West Coast District nine dredges worked throughout 1948. The reconstruction of the Premier Co.'s dredge is proceeding on the company's special dredging claim on Big River, adjoining the Blackwater section of the Grey River Dredging Co.'s claim. This dredge was formerly on the property of the Nemona Co., and was transferred during the year from New River.

The Maori gold dredge, Callaghan's, after an unsuccessful period of work in the previous year, did not resume in 1948.

Men Employed and Output

	Yardage.	Depth.	Men Employed.	Gold.	Silver.	Value.
West Coast District—	Cu. yds.	Ft.		Oz.	Oz.	£
Grey River, Ikamatua	3,495,647	29·5	27	7,323	72	65,669
Arahura, Arahura	2,863,000	119·0	39	9,484	187	89,194
Rimu, Rimu	1,408,780	31·8	39	4,229	..	31,759
Kaniere, Kaniere	2,670,000	58·9	38	7,502	145	68,964
Ngahere, Ngahere	1,994,796	78·0	25	5,850	12	52,958
Snowy River, Ikamatua ..	950,000	16·0	13	3,639	..	35,213
Atarau, Atarau	1,338,588	21·3	12	2,317	..	21,927
Marsden, Marsden	563,086	34·0	12	536	..	5,445
Slab Hut, Ikamatua	121,400	15·0	10	161	..	1,640
Totals	15,405,297	..	215	41,041	416	372,769
Southern District—						
Austral-New Zealand, Lowburn	3,154,000	48·0	50	7,974	282	77,948
Clutha, Alexandra	2,278,000	74·0	24	5,629	..	52,634
Totals	5,432,000	..	74	13,603	282	130,582

PRODUCTION OF METALS (OTHER THAN GOLD OR SILVER)

	Location.	Men Employed.	Quantity.	Ore Treated.	Value.
			Tons.	Tons.	£
Tungsten-ore	Glenorchy, Macrae's ..	23	24·3	458	9,800
Copper	None mined during year.				
Iron	Onekaka	7	317·0	..	238
	Okaihau	10	2,896·0	..	8,050
	Kamo	3	1,563·0	..	1,775
Arsenic	Blackwater Mine, Waiuta	..	8·0	..	144
Antimony	Nenthorne, Otago ..	2	8·5	..	248
Manganese	Otau, Clevedon	1	170·0	..	850

MINE ACCIDENTS

It is pleasing to note that during 1948 there were no fatalities and only one serious accident in or about metalliferous mines and dredges, at which 1,090 men were employed.

The serious accident occurred on a dredge in the West Coast District, a dredge hand receiving a fractured wrist while working a hand winch.

QUARRY ACCIDENTS

A satisfactory result is also shown for the year with regard to quarry accidents. There were no fatalities and only two serious accidents in quarries, though 2,127 men were employed.

In the Hauraki District a face worker while descending the face by means of a rope was struck on the elbow by a small piece of stone, lost his hold, and fell 10 ft., fracturing his thigh. He was wearing a safety-belt, which was detached for descent.

In the Northern District an employee at a quarry, while installing a crusher, was pinned by the frame when it slipped, and sustained a compound fracture of the leg, a fractured pelvis, and spinal injuries.

Cause of Accident.	Number of Accidents.		Number of Sufferers.	
	Fatal.	Serious.	Killed.	Seriously Injured.
Fall from face	..	1	..	1
Explosives	..	..	..	..
Falls of ground	..	..	..	..
Machinery	..	1	..	1
Haulage	..	..	..	..
Miscellaneous	..	..	..	..
Totals	..	2	..	2

QUARRY OUTPUTS

	Northern.		Hauraki.		West Coast.		Southern.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Tons.	£	Tons.	£	Tons.	£	Tons.	£
Bentonite	..	..	624	4,462	..	..	..	..
Clay for bricks, &c.	94,097	12,865	2,875	865	1,850	1,088	60,307	22,394
Clay for pottery, &c.	2,974	4,397	..	..	595	824	13,833	11,051
Diatomite	42	91	..	..	..	..	61	52
Dolomite	..	..	..	..	6,912	3,456	..	..
Fuller's earth	68	200	..	..	..	..	..	..
Limestone for cement	246,586	37,983	..	..	90,567	5,413	80,507	25,058
Limestone for agriculture	331,285	138,516	1,119	1,120	38,017	12,678	719,878	321,395
Limestone for industry	23,282	18,643	..	..	6,409	1,705	38,637	7,845
Magnesite	..	..	..	..	540	370	..	..
Phosphate	..	..	..	..	..	..	..	..
Pumice	6,863	4,955	..	..	..	..	..	..
Quartzite	..	..	..	..	26	26	..	..
Rock for harbour-works	..	..	250	75	..	..	62,809	10,558
Sand, gravel, &c., for roads and ballast	979,840	307,755	281,023	116,565	12,040	1,948	742,451	181,872
Sand, &c., for building aggregate	232,931	73,797	16,257	10,921	..	..	147,624	56,786
Serpentine	38,217	9,397	..	..	..	..	420	1,050
Silica sand	14,113	41,817	..	..	97	97	2,326	2,807
Dimension stone for building	..	..	50	225	..	..	22,269	34,155
Stonedust for mines	..	..	..	..	740	370	..	..
Totals	1,970,298	650,416	302,198	134,233	145,753	38,067	1,891,122	675,029

Number of men employed: Northern, 1,052; Hauraki, 233; West Coast, 111; Southern, 731.

STATE AID TO MINING

Subsidized Prospecting

Subsidies, loans, &c., advanced to the mining industry during the financial year 1948–49 totalled £4,874.

The Mines Department spent £39,746 in surveying, prospecting, and developing areas.

LEGISLATION

The Mining Amendment Act, 1948 (No. 26), was passed during the year making provision for—

(*a*) Royalty on mineral licences to be fixed by weight or quantity.

(*b*) Restriction of right of renewal of mining licences except residence or business site licences.

(*c*) Renewal of original priority in respect of water-race licences.

(*d*) Appointment of Wardens.

(*e*) Consent of Minister to be obtained to grant of metal mining privileges over land affected by coal-mining right.

(*f*) Hours of work underground not to exceed seven hours a day.

(*g*) Restricting employment of youths underground to those over nineteen years old, with certain exceptions.

GOVERNMENT DRILLS

All Mines Department drills were continuously employed throughout the year. Owing to the heavy programme of drilling undertaken by the Department in all the coalfields, no drilling was done for private operators.

SUBSIDIZED ROADS

Expenditure on subsidies for the maintenance and construction of roads in mining areas during the year 1948–49 was £6,880, the equivalent expenditure for the previous year being £3,476.

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 period amounted to 95,804 tons, which yielded 26,975 oz. of gold and 231,753 oz. of silver, worth £328,316 10s. 8d. In New Zealand currency the gold was valued at an average of £10 3s. 9d. per ounce and the silver at 4s. 7d. The heading value of the ore per ton was, gold 5 dwt., and silver, 2 oz. 11 dwt. 3 gr. The extraction was 93·7 per cent. of the former and 82·2 per cent. of the latter, representing 91·4 per cent. of the full value. The total crushing-time at the mill was 216 days. As in the past, the ore was got chiefly from the Martha, Royal, Empire, Welcome, and Dreadnought Lodes, and was raised through Nos. 4, 6, and the Grand Junction shafts and No. 7 Footwall Pass. Development work amounted to 5,249 ft. of driving and crosscutting and 512 ft. of winzing and rising, or a total of 5,761 ft. It was all of a secondary nature, consisting mainly of the reopening of former workings, and the driving of sub-levels for the removal of pillars and supporting arches under main levels. Apart from minor stoppages for maintenance work, the pumps were operated continuously (on night shift and at week-ends), raising to the surface 383,625,000 gallons of water from below No. 11 Level. The tonnage of ore treated and value returned show a reduction when compared with the corresponding figures for the previous year, and the number of men employed fell from 481 to 449. Dividends paid for the year amounted to £12,398.

Jubilee Claim, Coromandel (Horne and May).—Some 20 tons of ore produced from this property yielded 8 oz. 8 dwt. of bullion, which realized £51 5s. 7d. The stone was crushed at the State mill. The claim was formerly known as the "Success."

Charlton's Claim, Kuaotunu.—The treatment of 600 tons of tailings from the old Try Fluke area was carried out and gave a return of 137 oz. 17 dwt. of gold and 91 oz. 9 dwt. of silver, valued at £1,268 18s. 1d. and £17 2s. 11d. respectively. The gold averaged 0·625 fine. Two men were employed.

Prospecting

Karangahake.—R. Schulzki and mate did a limited amount of prospecting on their claim without appratent success. Gaghan and Thomson continued their work of reconditioning No. 11 Level, old Talisman Mine, but found nothing of importance, and towards the end of the year transferred to No. 8 Level, where they are hopeful of finding good stone. Haszard and Fallon barely got beyond the experimental stage in the treatment of their tailings at Mackaytown.

Te Aroha.—The Tui property was taken up and investigated for base metals by Messrs. Dunsheath and Bassett, of Auckland, during the year. A certain amount of surface prospecting was done by them, and this is reported to have been encouraging, as were also the results obtained from the reopening of No. 3 Level in the old mine. The area was unsuccessfully worked for gold as far back as 1884, and later passed through the hands of several concerns, which met with no better luck. The last crushings were put through in 1932–33, but these were poor, and the ground lay idle until taken up by the present holders.

Metallic Ores

Copper.—Cloudesley Mine, Pakotai: No ore was won during the year, but there is a possibility of work being resumed in the future.

Limonite.—Okaihau Quarries, Ltd., produced 2,896 tons, and W. Whitelaw, Kamo, 1,563 tons, with values of £8,050 and £1,775 2s. 6d. respectively. The limonite was used for various purposes but chiefly for top-dressing.

Manganese.—Maning's Mine, Otau, Clevedon: This property was previously owned by Mirandite Products, Ltd., but was taken over during the year by G. M. Maning, who formerly leased it from that company. A shipment of 488 tons 15 cwt. of ore was made to the Broken Hill Proprietary Steel-works, Newcastle, but 170 tons only of this was obtained during 1948, the balance having been held at Papatoetoe from the previous year, for want of transport by sea. The price, based on £5 per ton for 48-per-cent. manganese, and allowing for bonus and penalty adjustments, was £4 19s. 5d. per ton, making the return £2,264 7s. 11d. The dry weight of the ore was 455·3 tons and its average manganese content 49·06 per cent. Sales in New Zealand comprised 36 tons 2 cwt., worth £222 7s. 2d. and total receipts therefore amounted to £2,486 15s. 1d. The ore sold in New Zealand was used in the manufacture of fertilizer and for oxidation work in the melting of non-ferrous castings.

Miscellaneous Minerals (Non-metallics)

Bentonite.—Mr. H. F. Stoddart, Porangahau, produced 560 tons, which, apart from a few small processed parcels, was sold in a raw state for £7 per ton. The processed material realized from £10 to £30 per ton, and the sum received from all sales amounted to £4,057 18s. 5d. In addition, Clays and Minerals mined some 64 tons, valued at £404 7s. 9d. This was also got at Porangahau.

Clays (Brickmaking).—Some 1,500 tons of alumina, valued at £568 15s., and 2,875 tons of clay, worth £865 12s. 6d., were produced by Kamo Potteries, Ltd. The alumina is used in the manufacture of brick for furnace linings, and the clay for making ordinary bricks and for pottery work.

Diatomaceous Earth.—A small quantity only was produced, the suppliers being W. Brake, Ngongotaha, and the Clays and Minerals Syndicate, Ngakuru. The formers' output was 17½ tons, valued at £53 10s., and the latter's 25 tons, valued at £37 10s.

Fuller's Earth.—S. C. Crawford, Kamo, produced 68 tons, the value of which was £200.

Kaolin.—N.Z. Mercury Mines, Ltd., and J. J. Craig, Ltd., produced 287 tons and 1,034 tons, valued at £1,146 10s. and £2,528 19s. 10d. repsectively. The kaolin was got at Puhipuhi and Taurikura Bay, Whangarei, and was used by the pottery industry. The Ohio Kaolin Co., Thames, experimented for the whole year.

Pumice.—A total of 5,838 tons, valued at £4,670 16s. was obtained from the property of I. Lowe, Wanganui, by A. F. Nicholson. The pumice was used in the making of wallboard.

Serpentine.—Some 32,855 tons were produced from Kohua Road, Te Kuiti, and 5,362 tons from Kaukapakapa, North Auckland, or a total of 38,217 tons from both places. It was valued at £9,396 16s. 9d. Seven men were employed.

Silica.—Messrs. Gilberd and Son, Wanganui, got 320 tons, valued at £144 from their property at Aramoho. Five tons, worth £3 per ton, were obtained by A. C. Tucker from a nearby locality. Two men were employed.

Silica Sand.—The N.Z. Glass Manufacturers' Co., Pty., Ltd., Penrose, dug 14,113 tons, worth £41,870, from its deposit at Parengarenga. The average number of men employed was 5.

Lime.—The Gisborne Lime Co., Ltd., produced 1,119 tons, valued at £1,119 19s. 11d., from its works at Patutahi. It was all used as top-dressing in the locality.

Petroleum.—The N.Z. Oil Refineries, Ltd., Moturoa, New Plymouth, produced 83,112 gallons of crude oil, valued at £2,597 5s. Supplies were obtained from the following wells :—

	Gallons.
No. 1	4,920
No. 2	45,343
No. 4	32,849

The fractions stilled were :—

	Gallons.
Petrol	15,505
Distillate	4,020
Power kerosene	11,460
Heavy kerosene	11,920
Diesel oil	9,255
Residue oil	26,155
Total	78,315
Loss	4,565
Crude through still	82,880

In August the company started the sinking of a new well, the Dobson No. 1, near the old Taranaki Petroleum Co's. No. 5 bore, and at the end of December a depth of 2,174 ft. had been reached. Drilling was continued in the New Year and completed at 2,236 ft. in oil-bearing sands at the end of February. The well is now producing oil under its own pressure of gas at the rate of 1,200 gallons a day.

Quarries

The total production of stone, gravel, and sand for road and concrete work in this district, which comprises the Hauraki, Bay of Plenty, and Rotorua areas, and part of Hawkes Bay, was 297,580 tons, the amount used for concrete aggregate being 16,257 tons. Two quarries—namely, the Whitehall, Cambridge, and Mangatarata, Hauraki Plains County—were responsible for more than one-quarter of this output, the former accounting for 56,539 tons and the latter for 25,101 tons. The average number of men employed in all quarries was 233.

ACCIDENTS

There were no fatalities, but D. J. Hume, an employee at Henderson's Quarry, Ngongotaha, was unfortunate enough to fall and break his right thigh towards the end of the year. He had previously been trimming the face in order to make it safe, and while descending to the floor of the quarry with the aid of a rope was struck on one elbow with a falling stone. This caused him to let go his hold of the rope and fall about 10 ft. to the floor of the quarry, with the result stated. Mr. Hume is a fully experienced quarryman, and was wearing a safety-belt and equipment at the time.

PROSECUTIONS

Nil.

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

QUARTZ-MINING

Inangahua County

Blackwater Mine, Waiuta.—Excepting a short delay in resumption of development and stoping operations at the commencement of New Year due to completing shaft repairs commenced when the mine closed down for Christmas holidays, work was continuous with a labour quota equal to producing only half the mill capacity, and development fell off in a similar proportion.

Employing an average of 111 men, 9,977 fine oz. gold were recovered from 24,328 tons won from stopes and development between Nos. 14 and 16 Levels. Total development footage for the year amounting to 1,117 ft., a decrease of 721½ ft. when compared with the previous year, produced the following results: 821½ ft. development was on reef assaying 12·03 dwt. over a width of 28 in. Of this amount, 711 ft. was on payable reef assaying 13·57 dwt. over a width of 27 in., 110½ ft. on unpayable reef were exposed of a value of 3·79 dwt. over 33 in., and the total is made up of 295½ ft. driven off reef.

No. 15 Intermediate Drive North from Crosscut East was driven 8 ft. on reef averaging 23 in. in width and 15·32 dwt. in value and holed to stope.

No. 15 Intermediate Drive South was driven 39½ ft. on reef track.

No. 15 Level South, now, 1,631 ft. south of main shaft, was driven 24 ft., 6 ft. being on reef averaging 36 in. in width and 18·88 dwt. in value, 18 ft. being off reef. In addition, a branch drive in this level at 924 north of shaft was driven 24 ft all off reef.

No. 16 Drive North was extended 232 ft. on reef averaging 18 in. in width and 14·5 dwt. in value, 10 ft. being off reef. A branch drive in this level at 3,005 ft. north was advanced 8 ft. all off reef.

No. 16 Drive South was driven 135 ft., with 105 ft. on reef averaging 44 in. in width and 11·76 dwt. in value and 30 ft. on unpayable reef averaging 44 in. in width and 3·90 dwt. in value.

A branch drive in No. 16 South at 2,322 ft. north was driven 28 ft. off reef.

Out of a total of 508½ ft. of driving, 381 ft. was driven on reef assaying 13·06 dwt. over 28 in. Of this footage, 351 ft. was on payable reef averaging 26 in. over 14·34 dwt. and the total driven off reef was 127½ ft.

In addition to driving on Nos. 15 and 16 Levels North and South, 99½ ft. of crosscutting was completed and was complementary with general development work, connection of stopes, and making provision for adequate ventilation. Rising completed on Nos. 15 and 16 Levels totalled 373 ft. with 337½ ft. risen on reef, giving an average value of 12·08 dwt. over 27 in. Payable reef amounted to 311½ ft. assaying 12·9 dwt. over 28 in., while 26 ft of unpayable reef was disclosed assaying 4·12 dwt. over 18 in. in addition to 35 ft. risen off reef.

Winze-sinking from Nos. 14 and 15 Levels reached a footage of 136 ft. with 33 ft. off reef. The distance sunk on reef assayed 8·56 dwt. over 32 in. Of this amount, 48½ ft. of payable reef assayed 15·20 dwt. over 29 in. and unpayable reef accounted for 54½ ft., value 3·64 dwt. over 35 in.

The labour position did not improve during the year and operational difficulties were increased by absenteeism and increase in number of minor accidents.

The sinking of main North shaft to open No. 17 Level was to be an important item of the company's development policy for the year, but difficulty in securing the necessary skilled labour delayed commencement of work. When the decreased price of gold was brought about in August by alteration of exchange-rate it had the effect of compelling the company's directors and management to reconsider their policy, and postponement in the meantime of shaft-sinking was the first decision reached.

Dredge Mining

Inangahua County

Slab Hut Dredge, Mawheraiti.—This dredge, after working out all the ground at the upper end of claim, turned and crossed the river at the junction of Slab Hut and Little Grey Streams with the intention of dredging some virgin ground and working downstream towards Hinau if satisfactory arrangements could be made with Associated Gold Dredges to work a claim which that company had prospected with the intention of dredging a substantial area, but that plan never came into fulfilment on account of financial difficulties arising partly due to the outbreak of war. Following the dismissal of an employee for negligence and refusal of dredgemaster to reinstate him, the dredge was tied up and no further work was done and the services of 10 men were dispensed with. Several months later an agreement was reached with Associated Gold Dredges to work its ground, and plans were put in hand to make some substantial alterations to the dredge, but when the price of gold dropped the company's directors decided to go into liquidation. Before shutting down, the company dredged 121,400 cubic yards for a return of 161 oz. of fine gold, which realised £1,639 15s. 9d.

Snowy River Dredge, Ikamatua.—This dredge operated on east side of valley and worked upstream on a wide cut in ground varying from 10 ft. to 22 ft. in depth. In the shallow depth 3 ft. of bottom had to be lifted, but notwithstanding this disadvantage nearly 950,000 cubic yards of ground were dredged for a return of 3,639 oz. fine gold, which realized £35,213 12s. 1d. Dividends amounting to £6,805 4s. 11d. were paid, bringing the total amount distributed to shareholders since commencement of operations to £108,305 4s. 11d.

Grey River Dredge, Ikamatua.—During the year this electrically-operated dredge was in continuous operation, with results shown by the following figures :—

Working-days	312
Working-hours	7,488
Hours digging	6,146
Percentage time digging	82·1
Area dug, in acres	73·536
Average depth, in feet	29·5
Cubic yards handled	3,495,647
Cubic yards handled per day	11,204
Cubic yards handled per digging-hour	569
Ounces bullion produced (crude ounces)	7,588·49

Dredging operations were normal throughout the year. Considerable inconvenience was suffered on account of high cost and protracted deliveries of spare parts.

Premier Gold Dredge, Big River.—This dredge, previously known as the Nemona, has been dismantled and will be re-erected on the special dredging claim adjoining the licence held by Grey River Dredging Co. It is expected that the plant will be in operation by May or June, 1949.

Grey County

Atarau Dredge (Associated Gold Dredges, Ltd.), Moonlight Creek, Atarau.—In March the dredge turned downstream to take the last cut between the terrace and previous workings. On the terrace side of cut the ground was very shallow and it was necessary to take up 8 ft. of bottom to recover the overlying gravels. A 10-chain face was worked in order to take all the ground available, and while the shallow ground persisted on one side of the cut it averaged 25 ft. deep over the rest of the face. The digging of 1,338,588 cubic yards in 5,956 hours, being 81·7 per cent. of possible dredging-time, was carried out during the year from ground averaging 21 ft. 3 in. in depth, an area of 27 acres being dug. Grains recovered per cubic yard amounted to 0·701, and the total gold recovered was 2,317 fine oz., which realized £21,927 2s. 1d., at a cost of 4·313d. per cubic yard (excluding boring). Twelve men were employed.

Marsden Dredge (Associated Gold Dredges, Ltd.), New River, Marsden.—This dredge operated for the first four months of the year in ground of an average depth of 34 ft. Before closing down it had dug 563,086 cubic yards and recovered 536 fine oz. gold, which realized £5,444 19s. 5d. The recovery in grains per cubic yard was 0.485 and the cost of recovery was 3·271d. (excluding boring). Hours worked amounted to 2,262·55, being 79·1 per cent. of possible working-time. A proposition to work the dredge from the Marsden claim down the New River into the Bundi special dredging claim was given serious consideration by both parties concerned, but up to the end of the year no agreement had been reached regarding the conditions under which the Marsden dredge could operate on the Bundi lease ; consequently 12 employees were discharged.

Ngahere Dredge, Ngahere.—During the year this dredge worked 5,236½ hours, being a total of 71·63 per cent. of the possible working-time. Time lost during the year was due to extra repair work having to be carried out, including installation of a new top tumbler. In spite of the hard digging conditions, nearly 2,000,000 cubic yards were treated, and bullion produced amounted to 5,860·19ozs. The average recovery was 1·37 grains per cubic yard and the average number of men employed was 25, this complement being short of the required number to run a large dredge. Difficult dredging conditions are indicated by the bucket efficiency of 43·73 per cent., which gave a yield of 381 cubic yards per hour, a striking contrast with the output from the Grey River dredge, where digging condition are more favourable.

Westland County

Maori Gold Dredge, Callaghans.—After an unsuccessful period of operating in the previous year, this dredge did not resume work in 1948, and it was evidently considered by the proprietors that the equipping of the dredge with a new bucket line was not warranted when the future prospects of the claim had been summed up.

Rimu Dredge, Rimu.—This dredge dug throughout the year in low-grade gravels on the south side of the property and the operation of the dredge has been impaired more or less throughout by the difficulty of obtaining replacement parts. The following figures summarize the chief features of the year's operations:—

Working-days	305
Working-hours	7,320
Hours digging	6,077
Percentage time digging	83·0
Area dug, in acres	27·489
Average depth, in feet	31·8
Cubic yards handled	1,408,780
Cubic yards handled per day	4,619
Cubic yards handled per digging-hour	232
Ounces bullion produced (crude ounces	4,395·84
Value of product	£31,759
Value of product per day	£104
Value of product per cubic yard	5·41d.

Kaniere Dredge (Gold Mines (N.Z.), Ltd.), Kaniere.—For a yield of 784·45 crude oz. gold the company dredged 2,670,346 cubic yards ground, recovering 1·41 grains per cubic yard. A total of 22,024 acres was dug to an average depth of 58·9 ft., and 80 per cent. of running-time enabled 5,770 hours to be worked and continuous employment was given to 38 men. Apart from the collapse of the top tumbler shaft which entailed a stoppage until a spare tumbler could be obtained from the Ngahere dredge and placed in position, the year was uneventful until the reduced price for gold was announced.

Arahura Dredge (Gold Mines (N.Z.), Ltd.), Arahura.—This dredge continued operations in the deepest ground so far encountered in the claim, the average depth being 118·975 ft. Acres dredged amounted to 15·079 and the turnover was 2,863,684 cubic yards from which 9,839·25 oz. (bullion) were recovered for an average of 1·65 grains per cubic yard. Owing to a shortage of water in the early part of the year a considerable amount of time was lost. The total hours worked amounted to 5,569, equal to 75·92 per cent. of the possible dredging-time. During this interval a full staff of 39 men were kept continuously employed on the dredging claim.

ALLUVIAL MINING

Inangahua County

Waitahu Sluicing Claim, Waitahu, Reefton.—This claim was worked during the year by a party of 3 men who have leased the ground from the Waitahu Gold Mining Co. and 61,216 cubic yards of ground were treated for 144 fine oz. gold. The average depth of ground was 20 feet, and 43 cubic yards per hour were run through the sluice-boxes with four heads of water available delivered under fairly high pressure from the storage reservoir.

Grey County

Moonlight Sluicing Claim, Blackball.—On account of the tribute terminating at the end of 1947, work in the claim was resumed by the company, which operated for a short time with 3 men in employment and sluiced 30,000 cubic yards of gravel through the boxes for a return of 62 oz. 15 dwt. 11 gr. (fine ounces), which realized £482 16s. 10d., before finally closing down and going into liquidation.

Golden Sands Sluicing Claim, Barrytown.—After a few week's work in the early part of the year, the tributors recovered 39 fine oz. gold, which realized £365 17s. 2d., before operations were suspended, chiefly on account of all the available ground within the company's boundaries being worked out.

Marlborough County

Waikakaho Deep Lead, Deep Creek.—Following upon the installation of a Pomona pump and the draining of the workings, a crosscut through country rock was commenced to reach No. 1 Bore, situated at a computed distance of 80 ft. from the level. The objective was reached, but through either an underestimation of the difficulties when working wet and loose ground or incapacity of workers and management to deal with the problem, a run of ground took place immediately the wash was tapped and no further progress towards opening up the mine could be made. Expenditure on reopening the mine up to this period has been in excess of the estimated cost, consequently financial difficulties arose which the directors could not overcome, and the mine was shut down.

Minerals Other Than Gold and Silver

Iron-ore.—From the Onakaka deposit 317 tons were quarried, crushed, and sold as oxide of iron, valued at £237 15s. on the quarry floor. The increase in value per ton over the last year is due to the cost of access to the new site, coupled with higher cost of production.

Arsenic.—From the roasting-furnace used in conjunction with treatment of the Blackwater Gold Mining Co.'s sulphide concentrates, 7 tons 19 cwt. 8 lb. was recovered. This by-product realized £143 15s. 5d.

Talc and Quartz Magnesite.—From a Crown mineral licence at Upper Takaka, Lime and Marble, Ltd., quarried 540 tons, which was processed at Mapua, the product being used for agricultural purposes. The value of this product on the quarry floor was £378.

Dolomite.—A tonnage of 6,912, valued at £3,456 on quarry floor, was extracted from a quarry at Mount Burnett, in Collingwood district, and shipped from Onakaka in its raw state to fertilizer-manufacturers in the North Island.

Non-metallic Minerals

Clays.—From Polglaze's Clay-pit, Kaka, 416 tons feldspathic clay were mined and used for the manufacture of insulators at the Temuka Pottery-works. This product was valued at £644 16s. at the mine mouth.

Westport Brick and Pipe Co. produced 200 tons of clay for the production of earthenware pipes and fittings, and was valued at £82 10s. on quarry floor.

Greymouth Brick and Tile Works produced 1,000 tons of clay for brickmaking, valued at £875 on quarry floor.

Nelson Brick and Pipe Works produced from the pits at Nelson and Moutere 650 tons of clay for brickmaking and field tiles. This clay was valued at £130.

General Remarks

Dredging and alluvial mining during the year accounted for 15,500,000 cubic yards of gravels dug and sluiced from the known workable auriferous deposits in this inspection district, and prospect boring of sixty-seven holes aggregating 5,247½ ft. in depth was carried out. On an area adjacent to the company's claim, 781½ ft. were bored by Ngahere Gold Dredging Co., who put down thirteen holes in the Grey River Valley. This was the only boring carried out to prove a virgin area, the rest of the boring, as mentioned in the 1947 report, being for the purpose of eliminating yardage that did not measure up to increase of dredging-costs that have accumulated since the prospecting of areas was carried out prior to the erection of dredges and further reduced the acreage available for profitable exploitation.

The Ngahere Gold Dredging Co. holds prospecting licences over an area that has responded fairly satisfactorily to boring operations, but it is not yet known whether the values will warrant dredging operations.

Fatal Accidents

Nil.

Serious Non-fatal Accidents

Dredges

On 4th May, 1948, J. Mills, oiler, Arahura dredge, when operating a hand winch, was struck a blow on the wrist, which was fractured.

Metalliferous Mines

Nil.

Prosecutions Under the Mining Act, 1926

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 Maerewhenua Goldfields.

Waihemo County

The Callery Syndicate continued scheelite-mining operations on the western side of the Deep Dell Creek. They drove a distance of 400 ft., and blocked out those sections where the values warranted, for a return of 4 tons 15 cwt. of scheelite concentrates from 300 tons of ore and 24·809 oz. of fine gold from 100 tons of ore treated at the Deep Dell Battery. A prospecting party of 2 miners also operated in the Deep Dell area during a portion of the year.

Maniototo County

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

Tuapeka County

Mining operations have been continued steadily by the tribute party at the Sailors Gully Alluvial Mine, Waitahuna Gully.

Taieri County

The Mount Stokes Antimony-mine, in the Nenthorne Survey District, has been reopened. Two men have been employed and 8½ tons of antimony-ore have been sold.

Southland County

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

Wallace County

Sluicing operations have been carried out intermittently in the old township auriferous areas and also on the Orepuki Beach.

During the year the Round Hill Gold Mining Co., Ltd., operating on the flats between the Ourewera Stream and Lake George, have sluiced and elevated approximately 2½ acres to a depth of 50 ft. The ground worked during the year contained a large quantity of buried timber up to 12 ft. in thickness and the usual large masses of hard stiff clay which had to be drilled and blasted before it could be sluiced. The water-supply has been good during the year, but valuable sluicing-time was lost through breaks in the race and because of repairs needed at the gold-saving tables. During the year the manager, Mr. F. Hart, died. He had been manager for a very lengthy period and had an extensive knowledge of the Round Hill Goldfield.

Lake County

Paradise State Scheelite-mine.—Mining operations have been continued by the tributors, who have stripped the outcrop of the main reef and are now 50 ft. below the bottom level. Good use has been made of the water-supply, which has been larger than usual because of the very wet season experienced in the Lake County.

Glenorchy State Scheelite-mine.—Tributors have done a small amount of work above the Smithy Level. Two tribute parties have operated on section of the Kelly Lode to the north and south of the Kellys Bath Section, but nothing of importance has yet been located.

State Mine Treatment Plant.—This plant is being kept in order by the tributor and scheelite-bearing ore from the Paradise State Mine, the Bonne Jean Basin, Mount Judah, Mount McIntosh, and Rees Valley has been treated.

Heather Jock Syndicate (*Wylie Bros.*), (Western Slope of Mount Larkins).—The low level was extended to 180 ft. and an up rise driven to connect with the top level slope. The ore continued to live below the low or ventilation level, and another level is now being driven 25 ft. vertically below the ventilation level and scheelite-bearing ore has been located. Driving operations have been carried out in what is now the intermediate level and good ore is showing. Stoping has been carried out in the top level. The quartz and the footwall rock are very hard in this mine, and the tungsten carbide tipped drill bits are proving very satisfactory. The aerial ropeway continues to give good service, and improvements have been carried out at the Groves Battery, where all ore other than picked ore is treated.

Bonnie Jean Mine (*Elliot Bros. and Tripp*), (South-western Slope of Mount Larkins).—Stripping and mining operations have been carried out on the northern section of the reef, and advantage has been taken of the flush water for the stripping of the centre section of the reef.

Macalisters Reef Outcrop on North-western Slope of Mount Judah Above the Bucklerburn Bonnie Jean Aerial Ropeway Terminal: Sluicing operations were carried out and the lense of ore was extracted. This lense was small and did not come up to expectations and operations were suspended before the end of the year.

Eureka Reef Line, situated below the Bonnie Jean terminal of the Bucklerburn aerial ropeway: Prospecting operations failed to locate ore and operations ceased early in the year.

Hercules Mines (Geo. Ross and Party), (on the Lower Southern Slopes of Mount McIntosh).—Intermittent prospecting operations have failed to locate anything of importance.

Muddy Terrace Mine, Upper Rees Valley.—Active mining operations have been continued during the working season and good ore has been located in this slipped country. Prospecting operations have also been carried out in the Upper Bonnie Jean Gorge, but nothing of importance has yet been located.

The adjustment of the exchange-rate adversly affected the price of concentrates. The price of concentrates was high during the early part of the year, then the price dropped because of the sale of Bolivian concentrates. The price stiffened again during the latter part of the year, but the demand ceased and the chief buyers in New Zealand (Messrs. Dalgety and Co., Ltd.) finished the year with a considerable quantity of concentrates unsold.

Lake Wakatipu.—No work has been carried out at the Twelve-mile or Taos Creek Section.

Skippers, Dynamo Flat (Left-hand Branch, Skippers Creek).—The Mount Aurum Syndicate mining and treatment operations were carried out at Curries Reef during the summer and autumn months of 1948.

Copper Creek, Mount Aurum Basin.—Further prospecting operations were carried out, and the Copper Creek mining party then decided to purchase the three-stamp battery at Symes Reef, Fruitlands. This battery has been dismantled and conveyed by lorry to Skippers, where it will have to be packed up Skippers Creek and the Terrace Track to Copper Creek. The track is now being reconditioned and the plant will be packed in.

Crystal Reef, Near the Head of Sawyers Gully, Skippers—The heavy rainfall has caused extensive flooding in Sawyers Gully and the dam pipe-line and treatment plant have been damaged.

Flood Burn, Upper Shotover.—No work has been carried out in this area.

The Schieb-Sutherland Party.—The installation of the pipe-line was completed, but because of the failure of the dam the pipe-line had to be shifted and another dam built. Operations were then commenced in the bed of the Shotover River upstream from where the Deep Creek Mining Co. ceased mining operations, when a flood came down burying the elevator and washing away the sluice-boxes. A further attempt was made, but repeated floods caused a cessation of mining operations until such times as the river becomes normal.

The Atley Bros., who operate a river claim in the Shotover River Gorge between the Long Gully and Moke Creek junctions, have continued to operate when river conditions have been suitable.

Moonlight Creek.—Preparations are being made to open up an area on Darkeys Terrace on the western terrace between the Moke and the Moonlight Creek.

Arrow River.—The Golden Arrow Gold Mining Co. operated during the early part of the year on the western side of the Arrow River upstream from the Bush Creek junction. Operations were then suspended and the company went into voluntary liquidation.

Vincent County

Long Drive Syndicate, Gum-trees Downstream From Roaring Meg Junction, Kawarau Gorge.—Intermittent work has been carried on by the tributer.

Gees Flat, Kawarau Gorge.—The Homer party have continued the tail-race-reconditioning work. They have also transported a complete sluicing plant from the Sandhills, Upper Shotover, to this mine, and this plant is stored near the Cromwell Development Co. weir.

Nevis Valley.—Williamsons Mine, Stone Huts, Camerons Gully, Upper Nevis: This mine has been closed, the elevator, sluicing plant, and pipe-lines dismantled and removed.

I. McLean has installed a small sluicing plant in Camerons Gully and is now sluicing a shallow auriferous deposit.

Whittons Creek: All the plant and equipment have now been dismantled and transported via the Upper Nevis to Garston, and thence the major portion has been transported to the New Guinea Goldfields.

Mid-Nevis, Old Township Workings: The McLean party has been actively employed sluicing and elevating alongside the road at the northern end of the old workings during the working season.

D. Adie continues to ground sluice at the downstream end of the old workings during the working season.

During the year the old antimony workings on Antimony Saddle, situated on a spur between the right-hand branch of Pipeclay Gully and Long Gully and situated approximately six miles north of the Bannockburn Post-office, have been investigated, but no ore has been mined and investigations are suspended.

Dredging

Vincent County

Austral New Zealand Mining, Ltd.—This large electrically-operated dredge has continued to operate in the Clutha River flats upstream from the Lowburn Bridge. The average dredging depth was 48 ft. During the year, 43·5 acres of river channels, islands, and river flats have been dredged, yielding 3,154,000 cubic yards and a recovery of 8,256 oz. of bullion.

Clutha River Gold Dredging, Ltd.—This electrically-operated paddock dredge has continued dredging on the downstream or eastern cut in the high terrace on the Alexandra Flat and has dredged 19 acres with an average total depth of 74 ft. The dredge operated for 4,945 hours and treated 2,278,000 cubic yards for a recovery of 5,894 oz. of melted gold. This paddock dredge is working with a high face above water-level, and has a special stacker elevator and rubber conveyor belts in order to deposit the fines on top of the rough tailings.

Molyneaux Gold Dredging Co., Ltd.—This electrically-operated river dredge has been tied up during the whole of the year at Scotlands Point, Kawarau River, near the western end of the Cromwell Flats.

Southland

The Rainbow Dredging Syndicate.—This is a small Diesel-operated sluice-box dredge suitable for dredging shallow ground. The dredging area in the Maitland section of the Waikaka Valley became exhausted near the end of 1947 and the dredge was tied up during the major portion of 1948. An area in the Charlton Valley dredging area near Gore was prospected, and the dredge has been removed to this new area and will commence dredging operations early in 1949.

Accidents

There were no fatal or serious accidents during the year.

Quarries Accidents

There were no fatal or serious accidents during the year.

ANNEXURE B

QUARRIES

REPORT BY THE INSPECTOR OF QUARRIES FOR THE NORTH ISLAND (R. C. RUFFIN)

The following is my report for the year ended 31st December, 1948, for surface and underground work done under the provisions of the Quarries Act, 1944, and which comes within the North Island District under my inspection.

QUARRIES

A total of 269 quarries were worked during the year 1948, being a decrease of 1 compared with last year, while the number of men employed at quarrying for the same period was 1,052 showing a decrease of 57 under the number for 1947.

TOTAL OUTPUT OF QUARRIES

The total ouput of material quarried for the year 1948 is 1,902,323 tons, valued in the quarries at £598,684, compared with 1,908,698 tons, valued at £567,167, for 1947.

There is no marked difference in the quantities of the various materials won from quarries during the year under review, but I am inclined to believe that in the production of agricultural lime a much arger output would have been achieved if the operators had not been handicapped by difficulties beyond their control, such as loss of orders due to increased railway freights and shortage of railway wagons.

UNDERGROUND QUARRIES

Wellington City Council.—Karori Reservoir Tunnel: Main drive finished, lined size 6 ft. by 6 ft., length 1,180 ft.; storm-water drive finished, lined size 6 ft. by 4 ft. 6 in., length 323 ft.; adit finished, lined size 5 ft. 6 in. by 3 ft., length 70 ft.; Maldive Street Tunnel, Khandallah, size 6 ft. by 6 ft., length 1,100 ft.; tunnel at Pipitea Street, size 6 ft. 6 in. by 4 ft. 6 in., carried on three-piece timber sets and lathed, clay country throughout. Working conditions good and adequately supervised.

Auckland City Council.—Fanshawe Street: A party of men engaged in sinking and tunnelling.

Glendowie Drainage Scheme: Tunnelling from shaft chamber was perservered with.

Auckland City Council Waterworks Development.—Cossey's Creek Gorge to upper intake tunnel, size 6 ft. by 4 ft., length 300 ft.; investigation tunnel, size 6 ft. by 4 ft., length 300 ft.; diversion tunnel, size 6 ft. by 6 ft., length 900 ft.

Auckland City Council.—Parnell Road to Maunsell Street Tunnelling: Size 6 ft. by 4 ft.; underground work is completed.

Auckland City Council.—Customs to Fort Streets: Shaft sinking and tunnelling is now completed.

Auckland City Council: Ardmore Ridge Tunnel: Size finished 6 ft. 4 in. by 6 ft. 4 in., length 7,300 ft. Redmonds end under contract to J. Doolan and party.

In all these tunnels the working conditions and supervision are good.

ACCIDENTS

On 28th January, 1948, I accompanied Mr. N. I. Smith, solicitor, of King, McCaw, and Smith, of Hamilton, at his request, to inspect a quarry near Matamata where Mr. A. B. J. Price received back injuries on the 27th April, 1945.

Fatal Accident

Fatality: Albert William Ham. This accident occurred at Waimiha on the 18th December, 1947. The deceased was operating a slack drag-line and crusher. I inspected the scene of the accident on 25th February, 1948; I reported that it was not a quarry accident.

Serious Accident

Accident at Birkenhead Borough Council's Quarry at Takapuna to Sidney Trow on 3rd March, 1948. The injured person suffered a compound fracture of the left leg, a fractured pelvis, and a possible fracture of the spine. Accident caused when installing a primary jaw crusher, the frame slipped and pinned him against a wooden structure.

Minor Accidents

F. Hall while working at the Auckland City Council's Mount Eden quarry on 17th November, 1948, received slight injury to the face from an explosion of gelignite. Hall drilled into a crevice containing gelignite, which exploded, causing flying pieces of rock to strike his face.

On 25th November, 1948, at the Mata Lime-works, John Morunga was operating a mechanical loader when it capsized over a bank; in jumping clear Morunga fell heavily and sustained a broken wrist.

PROSECUTIONS UNDER THE QUARRIES ACT, 1944

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

On 12th January, 1948, at the Magistrate's Court, Whangarei, a quarry contractor was convicted and fined with costs in that he did have charge of blasting operations, contrary to section 9 (1) of the Quarries Act, 1944.

On 4th October, 1948, at the Magistrate's Court, Whangarei, a contracting firm was convicted and fined for storing explosive, contrary to section 16 (1) (*a*) (i), Quarries Act, 1944.

On 4th October, 1948, at the Magistrate's Court, Whangarei, a quarry foreman was convicted and fined for failing to keep a daily report book, contrary to Regulation 62 of the regulations dated 22nd March, 1948, made under the Quarries Act, 1944.

On 1st November, 1948, at the Magistrate's Court, Whangarei, a quarry occupier was proceeded against for storing detonators in a magazine with gelignite, contrary to secton 16 (1) (*a*) (iv) of the Quarries Act, 1944. The case was dismissed.

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, 9th July, 1949.

Sir,—

I have the honour to present my annual report on the coal-mining industry of New Zealand for the year ended 31st December, 1948.

OUTPUT

The total output for the year was 2,775,886 tons, an increase of 24,161 tons on production for the previous year.

This included opencast production, which for the three inspection districts was: Northern, 262,393 tons; West Coast, 218,680 tons; Southern, 195,655 tons; the underground coal mined being: Northern, 752,795 tons; West Coast, 925,199 tons; Southern, 421,164 tons.

The statement shows the tons of coal raised, men employed, and lives lost by accidents in and about collieries to 1948:—

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
1947	2,751,725	1,703	3,739	5,442	1·43	0·73	4
1948	2,775,886	1,740	3,842	5,582	1·80	0·90	5
Totals ..	117,404,611	..	..	..	..	..	575

ACCIDENTS

Serious and fatal accidents during 1948 were as follows:—

——	Fatal.		Serious.	
	Number of Accidents.	Deaths.	Number of Non-fatal Accidents.	Number of Persons Injured.
Carbon-monoxide poisoning	..	..	..	..
Other gases	..	..	..	..
Explosions, fire-damp, or coal-dust ..	..	..	..	..
Falls of ground or timber	3	3	6	6
Explosions	..	..	2	2
Haulage	1	1	19	19
Electrical	1	1	1	1
Miscellaneous—Underground	..	..	3	3
Surface	..	..	8	8
Totals	5	5	39	39

During the year five deaths resulted from accidents in New Zealand coal-mines, two being in the West Coast District and three in the Southern District.

In addition, thirty-nine accidents occurred involving fractures or other injuries of a more or less serious nature. Eight of these cases happened on the surface, three being at opencast coal-mines.

Of the fatalities in the West Coast District, one was an electrical and the other a haulage accident, while the three fatalities in the Southern District were due to falls of coal. Two of these occurred while working pillars in thick seams. This has been a fruitful source of fatal and serious accidents in the past, and the same methods are still being used. The death or permanent injury of many experienced miners has been caused by the working of the bord-and-pillar system in thick seams, and until this method is abandoned accidents from this cause will continue. Even with good inspection and the expert use of timber this class of accident cannot be avoided and the only remaining approach is to change the mining method.

Of the thirty-nine serious accidents the Northern District had eleven, the West Coast seventeen, and the Southern eleven. Falls of stone, coal, or timber caused two serious non-fatal accidents in the West Coast District and four in the Southern, besides the three fatalities due to this cause.

The Northern District, for the second year in succession maintained its record of no fatal accidents and no serious accidents due to falls. While there is no doubt some good fortune in this, and something is due to the nature of the mines, it is none the less an excellent result, and it is hoped that every one in the industry will work to provide a similar result in all districts.

In serious accidents during 1948 the emphasis is on haulage accidents. No less than twenty serious haulage accidents occurred, one causing a fatality.

Of the remainder the Northern District had seven, the West Coast ten, and the Southern two.

It is obvious on reading the accounts of the accidents that a large number could have been avoided by greater care. The attention of all concerned is directed to this, and to the need for good lighting, especially at control points on haulages, and of good equipment on self-acting inclines, with proper instruction and control of the men who work them.

IMPROVEMENTS IN MINE SAFETY

During the early part of the year, reports regarding the testing of coal-mine dusts by the Coal Survey Laboratory of the Department of Scientific and Industrial Research emphasized the fact that the standard for combustibles laid down by regulations was in many cases too high for safety, and it was decided to reduce the permissible amount of combustibles in the case of ten mines to 30 per cent.

In carrying out these tests the actual potential danger of the dust sample was demonstrated by explosion in an apparatus designed in England for that purpose.

Four of these appliances have been ordered and are now on the way to New Zealand. It is proposed to make use of them for immediate tests as required, and they will be installed for that purpose at central points in the coal-mining districts.

A better supply of a good grade of stone-dust has been arranged for the West Coast District, and stone-dusting of these mines is now on a better footing. At two mines in the West Coast District, Wallsend and Dobson, the stone-dusting of the main roads is being carried out by compressed-air ejector. This has been found to give more efficient results for coverage, saves time and labour, and is economical in stonedust, which is hard to get and expensive. It is hoped that many more mines will follow the example of the Wallsend Mine, where the method was started, by using similar methods of distribution.

In all districts it is satisfactory to note that there is an increasing use of water sprays at inbye control points to wet the top of coal on its way to the surface. The effect on reducing the distribution of fine dust in haulage roads is considerable and adds largely to safety. Water sprays at the faces are also now generally used and have a good effect when used on the chains of coal-cutters or to wet fallen coal before loading.

Four Watson konimeters have been issued to Inspectors of Coal-mines with a view to investigating air-borne dusts in coal-mines, to prevent conditions leading to diseases caused by mine dusts, and to minimize the ever-present risk of coal-dust explosions. These instruments can be used both for making counts of air-borne dusts and for the immediate demonstration of air conditions with respect to dust to miners at the working-faces.

A number of x-ray examinations of mine workers has been made to test the effect of working in mine atmospheres, and these tests are being continued.

To minimize shock in serious accident cases in coal-mines, an anti-shock injection treatment has been instituted and can be made use of in most of the larger mines within a few minutes of the accident.

All mine officials are to be required to undergo a refresher course in first aid every five years.

With a view to reducing shot-firing risks in gassy mines, a consignment of sheathed explosives is now on the way from England. Tests will be made with it on arrival.

The use of automatic stop-blocks of various types has been urged on mine-managers. Many jigs have been equipped with these devices, which should considerably increase safety.

DANGEROUS OCCUPATIONS

Thirty-six reports of dangerous happenings were made to Inspectors of Coal-mines, the Northern district having sixteen, the West Coast fifteen, and the Southern five. Thirty-one of these cases were heatings due to spontaneous combustion, and varied from active fires to reports of firestink from old workings.

These heatings are due to our method of working thick seams and are responsible for a heavy loss of coal every year, in addition to increasing the danger of mine work. They will never be eliminated until our method of mining is changed.

There were reports of three large accumulations of inflammable gas at the Liverpool, Wallsend, and Dobson Mines respectively. Two of these followed falls of roof, and the third was due to a heavy feeder of gas having been met in a level. Action was taken and the gas was cleared without risk in all cases.

An ignition of a small amount of inflammable gas in the Doel's Dip Section, Kamo State Mine, occurred on 13th May, a miner receiving burns. A further small amount of gas was later detected with the lamp in the same working-place. Safety-lamps were ordered for the section at once, it being impossible at the time to obtain lamps to equip the whole mine. These have now been obtained from overseas and the whole mine will be put on safety-lamps as soon as they are delivered.

A reported ignition in No. 6 Panel, Webb State Mine, Stockton, on 25th August, 1948, was investigated. No trace of inflammable gas could be detected in the working-place and samples submitted to the Dominion Laboratory were negative. No action was therefore taken in this case.

LEGISLATION

The Coal Act, 1948, was passed during the year making provision for the acquisition by the Crown of the property in all worked coal, and to amend the Coal-mines Act, 1925.

The Westport Coal Company Act, 1948, was also passed, making provision for the vesting in the Crown of the shares in the Westport Coal Co., Ltd., and to provide for the dissolution of the company.

PROSECUTIONS

Inspectors of Coal-mines found it necessary to take legal action in seven cases of breach of the Coal-mines Act, 1925, or regulations.

Five convictions were obtained, one information was withdrawn, and one was dismissed on a technicality connected with the wording of the charge.

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 (J. Adamson, Inspector of Coal-mines)

Summary of Operations of Each Colliery for the Year 1948

North Auckland District

Kamo State Colliery (J. Hadcroft (First Class), Mine-manager).—All coal from this mine during the year was produced on development from what is known as the Slant Dip and East Dip Sections. Two seams are being worked. The Slant Dip Section is in the top seam and the East Dip Section in the bottom seam. Doel's Dip Heading in the Slant Dip Section was advanced a distance of 28 chains from the Main Slant Dip haulage road. Development was changed from the dip to level course with the intention of forming a panel to the rise. Eight working-places were on production. A new section on level course was commenced during the year at a distance of 24 chains from the top of the Slant Dip and on the south side. Five places were developing in this area. The average thickness of coal in the top seam is 12 ft. In the East Dip Section solid work was completed approximately 13 chains from the Main Dip haulage. Bad roof and heaving floor made conditions extremely difficult. During the latter part of the year production was obtained by splitting and robbing pillars by 8 pairs of miners. Complete extraction was avoided so as not to interfere with the working of the top seam at a later date. No. 6 Stone Drive was completed, and intercepted the old workings, adjacent to the old west side drive, at a distance of 530 ft. from commencing-point at the surface. During the year alterations were made to the bathhouse and improvements were being made to the tip head arrangements. A double road was laid from the tip head down the main haulage dip and the haulage changed from the single- to double-drum system. The handling capacity was increased almost two-fold. One hundred and thirty-two men were employed underground and 25 on the surface.

Cunningham's Opencast, Hikurangi (C. E. Cunningham (Permit), Mine-manager).—Two men were employed recovering by opencast methods small pillars left in by previous underground mining. Prospects are not very encouraging.

Kiripaka Coal-mine (H. Pawson (Permit), Mine-manager).—Only a small output was obtained from this mine at the beginning of the year. The mine has now closed down.

Waikato District

Pukemiro Colliery (S. R. Eyeington (First Class), Mine-manager).—The output from this colliery was won from the North and South Mine areas. In the North Mine, pillar-extraction continued with 9 pairs of colliers. Production is now restricted to two small sections—namely, No. 1 Left and No. 2 Left respectively.

South Mine Area: Taupiri Section: Pillar-extraction was continued by 11 pairs of miners. Extraction was concentrated at the inbye portion of the section to effect speedier extraction and so avoid as much as possible the effects of flooding which occurs during the winter months. Good results have been obtained.

South Straight Section: Development work by 5 pairs of miners reached a distance of 19 chains from the main heading. Owing to faulty ground on the right side of the development heading it was only possible to open up a small second panel on this side. Development of a panel to the left has now been commenced into an area beyond the Taupiri Section old workings.

Middle Section: Pillar-extraction in the Nelson's Jig and Carlson's Jig Sections was completed during the year. Six pairs of miners are now engaged on pillar-extraction in two small areas on the inbye side. This extraction will eventually cut Horne's Dip Section off from No. 2 right haulage road. Alternative access to Horne's Dip from No. 1 right haulage road is well in hand.

Horne's Dip Section: Pillar-extraction by 3 pairs of miners was continued under very difficult conditions. Excessive crush on pillars has resulted in coal being lost in the goaf. Heavily fallen bords outbye the working-places were the sources of several heatings, which also added their quota of difficulties to the production of coal from this section.

No. 1 Right Section: Pillar-extraction by 12 pairs of miners was continued throughout the year with satisfactory output figures being achieved. The work of reopening an old stone drive giving access to an old section to the right of No. 1 right haulage road was pushed on whenever labour was available. Four chains of roadway have been recovered to date.

Two hundred and twenty-six men were employed underground and 67 on the surface.

Renown Collieries, Ltd. (T. Geddes (First Class), Mine-manager).—The output was won principally from No. 1 Drive mine area, production from the New Mine area being suspended for the greater part of the year.

In the No. 1 Drive area production from what is known as the Top Seam Section was stopped, the coal-seam deteriorating into a series of alternating bands of stone and coal. Similar conditions obtained also in the No. 1 North Section, where increased thickness of stone bands militated against successful operations, and the section was closed down during the first half of the year.

Development was completed in the No. 4 East Panel, which is bounded by a 30 ft. downthrow fault to the east and an area rendered barren by fire on the western side. Pillar-extraction has been pursued, since development was completed, with satisfactory results.

In the East Rope End Section pillar-extraction is nearing completion, but preparations are well in hand to transfer the miners to No. 3 West Section.

Very good results are being achieved in No. 2 West Section, which is on pillar-extraction. A rearrangement of the line of retreat overcame to some extent the difficulties previously created by the soft heaving floor.

Pillar-extraction in Thompson's pillar section was continued with satisfactory results. This section is bounded on the eastern side by a 30 ft. downthrow fault and a 10 ft. upthrow fault to the north.

In the Main West Heading Section, development was completed and pillar-extraction commenced. No. 5 North Section was reopened and development continued with the aid of coal-cutters and power drilling-machines. Very satisfactory progress was being made.

In the New Drive area, No. 1 East Panel was on development also with the aid of coal-cutters and power-drilling-machines. Preparations were also well in hand to pursue development across the 30 ft. downthrow fault encountered in the main heading. The average number of men employed during the year totalled 240, there being 63 employed on the surface and 177 underground.

Wilton State Collieries (J. Baird (First Class), Mine-manager).—The statement reviews operations from No. 2, No. 3, and No. 3 Extended workings.

In the No. 2 Mine, output was won solely from pillar-extraction. Very little coal remains in this area, the work being reduced to the extraction of pillars adjacent to the main level.

In the No. 3 Mine, output was won by 3 pairs of miners. An electric driven Siskol percussive-type coal-cutter with self-contained boring-machine was installed and has given satisfactory results.

The No. 3 Extended Mine comprises Nos. 2, 3, and 4 East and Nos. 2 and 4 West Sections. In the No. 2 East Section, output was obtained from pillar-extraction by 6 pairs of miners. Pillar lifts are driven with the aid of coal-cutters and electric boring-machines and the coal left on the goaf side brought back by hand methods. In the No. 3 East Section development was continued to the east and south-west by 8 pairs of miners. All places are machine cut. Development was completed in No. 4 East Section and pillar-extraction commenced by 5 pairs of miners. All coal won from No. 2 West Section was from pillar-extraction. In No. 4 West Section 4 pairs of miners completed development to the outcrop on the south side and pillar-extraction commenced. At the inbye end of No. 4 West Haulage a pair of headings were driven to the surface with a view to opening up an area of coal under the Te Puroa Road. One hundred and fifty-six men were employed underground and 58 on the surface.

Rotowaro No. 1 Mine (T. Glendenning (First Class), Mine-manager).—Production from this mine was limited and consisted of intermittent pillar-extraction by 3 pairs of colliers in the New Haulage and Hill 60 Sections.

Callaghan's Dip Mine: The main headings in this mine were stopped at 55 chains from the main haulage due to increasing thickness of stone bands in this direction. No. 6 Panel headings were advanced 11½ chains from the main headings and stopped against an upthrow fault whilst No. 6 Panel workings were in process of development to the right of the panel headings. The coal in this area is of good quality and approximately 15 ft. thick. No. 5 Panel headings were advanced 15½ chains from the main heading. Further development was stopped on account of increasing thickness of stone bands. Formation of pillars in No. 5A Panel was completed. Pillar extraction will not be attempted owing to the proximity of an overlying 18 ft. seam of coal suitable for opencast methods. Pillar-extraction proceeded in No. 5 Panel with satisfactory results. Several pillars and a barrier of coal must, however, be left for support to the overlying 18 ft. seam. Owing to a serious heating in No. 4 Panel, resulting in sealing of this section, very little work was done in the panel during the year. A stone drive commencing from a point adjacent to No. 4 Panel headings was driven a distance of 5 chains to intersect a lower seam. The coal at the point of intersection is 15 ft. thick and of average Waikato quality. The work of driving a second drift for a return airway to this seam is being continued. It is anticipated that these roadways when completed will provide access for some 300 acres of coal ranging up to 25 ft. in thickness. Development was continued in No. 3 Panel, while preparations have been made to develop an area of coal to the south. This area underlies swampy ground. Pillar-extraction is not anticipated.

Rotowaro No. 3 Mine: Practically all coal won is from pillar-extraction except for the New Dip Section, where two development headings were continued. Prospects of extensive development in this area are not good. In Wilkie's Dip Section, pillar-extraction was completed and this section is now closed. Pillar-extraction was continued throughout the year in Brown's Section. Development work in the Shaft Section was completed during the year and pillar-extraction commenced. In Moodie's Jig Section pillar-extraction was almost completed and arrangements were in hand to move the terminal of the main haulage system further outbye along Hagan's haulage road. One hundred and thirty-five men were employed underground and 54 on the surface.

Alison No. 1 Mine (W. Currie (First Class), Mine-manager).—Pillar-extraction was continued throughout the year in all sections. In the No. 1 Jig Section pillar-extraction was commenced at the perimeter of Barker's Road opencast project. The North Drive workings were abandoned owing to the heavy roof and heaving floor conditions. A sytem of boreholes has proved that this area is suitable for opencast work. A number of heatings occurred during the year but none were of a serious nature.

Alison No. 2 Mine (W. Currie (First Class), Mine-manager).—All coal produced from this mine, except for pillar-extraction in No. 1 Rise Panel, was from development work. No. 1 Rise Panel was exhausted and is now closed. The main dip headings were advanced 10 chains beyond the fault. Nos. 4 and 5 Rise Panels were further developed with coal-cutters and electric boring-machines. B Section headings were advanced 27 chains from the Main Dip haulage. Preparations are in hand for further development to the east of the Glen Afton – Huntly railway-line. B Section slope headings were advanced to a point 9½ chains from B Section headings with the aid of coal-cutting machinery.

Boreholes: One hundred and five rotary boreholes were put down from the surface by a Hamilton company, as follows:—

Rotowaro No. 2 Mine	17
Rotowaro No. 3 Mine	1
Alison No. 2 Mine	23
Opencast areas, Barker's	40
Road and Thompson's Farm, Smith's Farm area	24
	105

One 8-in.-diameter borehole was put down to Rotowaro No. 3 Mine for electric cables and one at Alison No. 2 Mine for pumping purposes.

An improved endless-rope haulage system was installed at Alison No. 2 Mine, eliminating the two temporary systems previously in use.

A new Thermotank torpedo fan, 95 in. diameter, two stage, for 150,000 cubic feet of air per minute against 4½ in. water-gauge, was installed at Alison No. 2 Mine. At present it is running at much below its rated capacity.

Mercury-arc rectifiers were installed and put into operation at the several mines to replace the old direct-current steam generating plant. One hundred and twenty-two men were employed underground and 74 on the surface.

Alison Opencast Mine (W. Currie (First Class), Mine-manager).—Mining operations continued throughout the year in the Barker's Road area to the north of Alison No. 1 workings. Towards the end of the year a further area was opened up for opencasting adjacent to the north drive workings, Alison No. 1 Mine. From this latter area an output of approximately 2,000 tons was produced over the Christmas period. All coal is transported by lorry to the company's private siding. The total output from this opencast for the year was some 38,000 tons.

Glen Afton No. 1 Colliery (W. C. Inglis (First Class), Mine-manager).—Coal-winning operations were continued throughout the year by 17½ pairs of miners employed in L, H, and E2 Sections.

In L Section 6 pairs of miners proceeded with pillar-extraction. The inbye portion of this section, lying between two faults, was exhausted, the main haulage was shortened, and pillar-extraction commenced on the outbye side of this area. Working conditions are good and clean extraction is being secured. In H Section 2½ pairs of miners proceeded with the development of a small area of solid coal between two faults. A new haulage road from E2 Section haulage to K Section haulage was completed, and work is proceeding in the driving of a return airway across the 40 ft. fault in this area. This new access to K Section haulage will provide an alternative route to pillars inbye J Hill on the main haulage road. In E2 Section 9 pairs of miners proceeded with pillar-extraction. A number of step faults in this area militated against good roof conditions, necessitating extreme care in the removal of pillars. The faulted area, however, is gradually being diminished and the workings extended into more stable ground. Owing to the structure of the coal being affected by the faulted conditions a good output has been procured. Ninety-three men were employed underground and 89 on the surface.

Glen Afton No. 2 (MacDonald Colliery) (H. Stirling (First Class), Mine-manager).—The output from this mine was won chiefly from pillar-extraction in H1 Left and H2 Right Panels, E Main and Tail Sections, and No. 4 Rope End and Jig Sections, while development work was continued in J and L headings and in the formation of pillars between the First Right and First Jig Sections in No. 4 Mine. The development of J heading was hampered to some extent by the presence of several small faults, but towards the end of the year conditions improved. Water spraying to counteract the production of coal-dust at the faces was being extended, the majority of places being now so equipped. The enlarging of the bathhouse was completed, resulting in greatly improved bathing facilities for the workmen. A concrete reservoir replacing the old clay dam was built, resulting in an improved water-supply both in quality and quantity. Two hundred and thirty-three men were employed underground and 28 on the surface.

Waikato Extended Opencast (Roose Shipping Co.), (E. Bond (Underviewer), Mine-manager).—The output was won from an area of opencast coal leased from the Taupiri Coal Co. Twelve men were employed.

Bell and Devlin's Victory Mine (H. Bell (Deputy), Mine-manager).—Six men were employed at this mine. The output was won during the formation of pillars on a small area of coal leased from the Taupiri Coal Co.

Huntly Brickworks.—No coal was produced during the year.

Te Pahu Colliery, Karamu.—No work was done at this mine during the year.

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

Whatawhata Campbell Colliery (A. Penman (First Class), Mine-manager).—A total of 12 men are employed at this mine. Output was won from 5 miners forming pillars on the western side of the Main Dip haulage road. Working-conditions were good with good-quality coal up to 12 ft. thick. The output from the mine is transported by endless rope to the screens, where the coal is bagged and loaded on to motor transport.

Rangitoto Opencast Coal-mine (Hamilton and Harvey), Otorohanga (K. L. Harvey (Quarry Certificate), Mine-manager).—A small output was won by 3 men from intermittent work during the year.

Kimihia State Opencast Mine (F. J. Handcock (Quarry Certificate), Mine-manager).—All coal for the year from this mine was won from what is known as No. 1 Area. At the end of the year sufficient coal was left for a further few months' production, after which this area will be exhausted. Some 175,000 yards of debris was excavated for an output of approximately 77,000 tons of coal. It is intended to open up a new area to the west where boring operations have revealed an approximate total quantity of 600,000 tons of coal which can be mined by opencast methods. Transportation of coal from the present mine to the screens is by means of an aerial drag-line system depositing the coal on to a vibrator screen arrangement. It is intended that this method of transportation will be superseded by a modern conveyor-belt system when production of coal will be commenced from the new area. Reclamation of the new area has been carried out as in the former areas by building a stopbank some distance out into the lake and the water from the area to be mined pumped out by a 12 in. Pulsometer pump driven by a 35 h.p. motor. Seven workmen's cottages have been established adjacent to the workings for the housing of the workmen engaged at the mine. An average of 28 men employed.

Kemp's State Opencast Mine (T. Bigwood (Quarry Certificate), Mine-manager).—Production from this mine was won from three thin seams, an output of approximately 66,300 tons being obtained. It is anticipated that this area will be exhausted in several months time, when extraction will commence on a new area to the west and adjacent to the Wilton Mine No. 2 workings. The formation and metalling of a new access road was well in hand and a fairly large area of coal stripped ready for extraction. An average of 50 men employed.

Heworth Coal-mining Syndicate, Glen Massey (J. Corness (Deputy), Mine-manager).—A small output was won by opencasting a 5 ft. seam of coal. Three men were employed.

Taranaki District

Mangapehi State Colliery (H. Quinn (First Class), Mine-manager).—During the year development of No. 2 East Level was continued and extended to a distance of 2,800 ft. from the Main Dip. The endless-rope system has been extended and now operates practically over the whole distance. The A Panel off this level has been extracted and sealed off. Entries for B, C, and D Panels have been commenced. Development of these panels has not yet, however, been attempted. The coal in the main level is of good quality and height and only a few minor disturbances have been encountered. The Slant Dip headings commencing at a point approximately 6 chains from the Main Dip along No. 2 East Level have been advanced to 950 ft. These headings have been in good coal for the full distance. Preparations are now being made to develop No. 3 Level headings to the east. Constant attention to return airways is necessary, due to excessive floor heave. This work presents a major problem to the management, but despite this aspect a considerable amount of work has been done towards maintaining satisfactory conditions in the return airways. A pump was installed to dewater the dip at the end of No. 1 East Level to enable extraction of the pillars in this area.

A new 300 kVA transformer was installed at the surface to replace the old one, which was inadequate. The mine is now equipped with portable electric cap lamps, principally to eliminate the danger of fires from naked lights. Safety-lamp conditions are now in force throughout the mine. Twelve workmen are now trained in mine rescue work. A local mines rescue station now has been built and stocked at the mine. One hundred and eight men are employed underground and 28 on the surface.

Tatu State Colliery (J. McLelland (First Class), Mine-manager).—At this colliery satisfactory working-conditions are rendered extremely difficult by virtue of soft heaving floor conditions. Practically continuous attention to repairs and enlarging of roadways is necessary. The cleaning-up and repairs to the lower 10 chains of the South Heading haulage road was completed effecting a marked improvement in haulage facilities. Development east and west of the main headings is handicapped by the presence of the Victory fault to the west and the Cunningham fault to the east. The main development has therefore proceeded to the dip in a south-easterly direction, whilst further development towards Cunningham fault was proceeded with in No. 3 Panel workings.

Pillar-extraction was completed in the Barrier Section and in No. 2 Rise Panel; however, extraction in this section was suspended temporarily following an accumulation of blackdamp in the goaf which tended to foul the workings on the return side. The section will be reopened following the rearrangement of the ventilation when the east side return airway is completed. In this connection approximately 90 ft. of stone driving remains to be done and a further 7 chains of roadway to be cleaned

up to provide a new main return airway for the mine. Pumping is also a difficult problem due to rapid " silting up " of the sumps. It is proposed to improve standage in No. 2 Dip Panel and to install a 6 in. Rees-Roturbo pump powered by a 60 h.p. motor. During the Christmas holiday period a new aerial rope approximately eight miles in length was installed on the aerial ropeway. Sixty-eight men were employed underground and 28 on the surface.

Moynihan's Lease, Mangakara, Ohura (D. Moynihan (Deputy), Mine-manager).—Coal-winning and stripping of overburden is carried out at this opencast by sluicing methods with very good results. The coal-seam dips gently towards the storage bin at the head of the access road, thus enabling the coal to gravitate easily to this bin with the aid of water and fluming. Operations are retarded somewhat during dry weather periods, but nevertheless a good production has been obtained by 3 men.

Sunnyside Mine, Waitewhena (J. Wilson (Deputy), Mine-manager).—This mine commenced operations during the year. It is an underground mining proposition to work a 13 ft. seam of coal. The area, which is a Crown lease of some 23 acres, is situate approximately two miles from the Waitewhena Opencast Mine. Since operations began early in the year a good output has been obtained by 6 men.

Aria Colliery (R. Gillespie (Permit), Mine-manager).—Three men were employed developing a 13 ft. seam of coal lying between what appears to be two faults. During the year a new dip haulage way was put into operation direct from the surface. Development to the dip was stopped at the end of the year after the dip heading had encountered faulty conditions.

Stockman Colliery (H. W. Jones (Deputy), Mine-manager).—A small output was obtained by 2 men during the year. The output is transported by launch down the Mokau River. Lack of sufficient rainfall, resulting in insufficient water in the river for safe navigation, has impeded production.

Fougere's Opencast, Ohura (E. Maslin (Quarry Certificate), Mine-manager).—Coal-production was obtained by 4 men opencasting on two small sections of this area. Thickness of coal ranges from 3 ft. to 4 ft.

Waitewhena State Opencast (S. T. Smith (Deputy), Mine-manager).—A daily output of 160 tons to 170 tons was maintained throughout the year from No. 2 Area. The coal is 11 ft. thick. Most of the output was crushed until 4th May, when the screening plant at Waitewhena railway siding was completed. Eight to ten Motor-trucks carrying an average load of 5½ tons were employed in transportation of coal from the face to the railway siding. On 3rd August a crusher was incorporated at the screening plant and arrangements made to divert all coal over 4 in. size to the crusher. This was necessary as the demand for slack exceeded the house-coal demand. On 26th November arrangements were made to provide for domestic coal when this class was required. Stripping operations were satisfactory, although difficulties in disposing of overburden were encountered. Earthwork plant for stripping consists of five caterpillar D8 tractors and blades and four 12-cubic-yard carryalls operated by the Ministry of Works. One ¾-cubic-yard power shovel and one T.D. 14 tractor and blade is operated by the coal cartage contractor. Blasting of overburden was carried out during the year. Coal stripped ready for extraction on 31st December, 1948, totalled 20,000 tons. The total number of men employed was 35.

Rotowaro Rescue-station

A total of 70 men were on the rescue-station register at the end of the year, these including 13 men at Benneydale. Seven new men were trained during the year. Ten applications for assistance were received from the mine-managers of the following mines: Six applications were from Pukemiro Colliery, one from Mangapehi State Mine, and three from the Macdonald Mine. Once again the activities of the rescue brigades bear witness to the value of such an organization in the Waikato District as far as dealing with underground fires is concerned. In several instances also the Station Superintendent has rendered valued assistance in exploring workings previously advanced or sealed off whenever it was desired to recommence mining in such areas. All rescue apparatus, interior, and surroundings of the rescue-station have been kept in good order and repair.

Huntly School of Mines

Instruction commenced at the beginning of the year with Mr. C. Hunter as Director, who assumed this position rendered vacant by the decease of Mr. Gomersall. An average number of 39 students availed themselves of the expert tuition afforded them. Classes were held in Huntly, Rotowaro, and Ngaruawahia. Classes of three hours' duration were held as follows—Huntly: Monday, Wednesday, Friday; Rotowaro: Tuesdays; Ngaruawahia: Thursdays.

At the annual examinations for underviewers and firemen deputies 2 students obtained passes in the underviewers' section and 2 obtained partial passes. In the firemen deputies' section 9 students secured passes and 1 partial pass.

Fatal Accidents

I am very pleased to record that no fatal accidents occurred during the year.

Serious Non-fatal Accidents

On the 26th February M. J. Sloper, miner, Pukemiro Colliery, sustained a compound fracture of the right leg. He was lowering a full truck down a slight grade when he was overtaken by another truck from behind, crushing him between the two trucks.

On 8th March R. Saunders, bushman, sustained a frature of the big toe, right foot, whilst employed cutting sleepers at the Mangapehi State Mine.

On 9th April Matthew Penman, screen worker employed at the Alison Mine, Rotowaro, whilst controlling a loaded railway wagon at the screens was overrun by a following waggon, resulting in Penman suffering amputation of both hands, lower portions of both arms, and portion of the left foot.

On the 6th May M. MacKenzie, coal-cutter operator employed at the MacDonald Mine, sustained bruises to the chest, hip, and ankle. McKenzie was accompanying a coal-cutter being hauled up an incline when a runaway truck crashed into the coal-cutter, striking McKenzie.

On the 17th June Stanley Charles Lord, trucker at Mangapehi State Mine, suffered a fracture of the terminal phalange, right hand, whilst in the act of spragging a truck.

On the 15th July D. Wallace, miner employed at Alison No. 2 Mine, Rotowaro, sustained fractured ribs and bruises to shoulder, chest, and hand through being crushed between empty trucks and the ribside.

On the 21st July Tai Hone, rope-road worker, Mangapehi State Mine, slipped and fell whilst clipping. He sustained a fractured bone in the hand.

On the 6th September John Emery, trucker at Mangapehi State Mine, sustained a fracture of the left forearm through being crushed between two trucks.

On the 20th September C. D. Young, winch operator employed at Kimihia State Opencast, was struck on the forearm by a clutch lever, sustaining a fracture of the forearm.

On the 4th November H. Fairless, while engaged on the screens, sustained a fracture of the small toe, right foot, when his foot was caught between a projection on the tippler and the decking on the gantry.

On the 7th December F. Purutanga, trucker at Mangapehi State Mine, sustained a compound fracture of the middle finger, left hand, whilst unclipping a truck on the endless-rope haulage.

Reports Regarding Dangerous Occurrences in Mines

On 15th February at MacDonald Mine a fire occurred at a stopping in E Dip Pillar Section. The fire was effectively sealed by the erection of four stoppings.

On the 21st March a shiftman noted smoke in the atmosphere in the vicinity of No. 1 South rope-end clipping-station. On investigation it was found that smoke was issuing from a piece of brattice cloth used in the construction of a seat. The incipient heating was quenched by throwing the brattice into water. It was considered that the ignition was caused by a lighted cigarette carelessly thrown away.

On the 3rd and 4th April a fire occurred at the Mangapehi State Mine. The fire was located over the timber sets at the inbye end of the main dip haulage and extinguished by the application of water.

On the 20th April a fire occurred in McIntyre's Dip, No. 1 Right Section, Pukemiro Mine. An attempt was being made to extract a pillar enclosed by a heavily fallen bord. However, the fallen material in this roadway ignited through spontaneous combustion. The pillar was abandoned and sealed off.

On the 28th April a heating occurred in the goaf of B Section, No. 3 mine, Rotowaro. Stoppings were erected and the affected area sealed off.

On the 13th May a miner was burnt in Doel's Dip Section, Kamo State Mine, when his naked light came into contact with a quantity of inflammable gas. All naked lights were withdrawn from this section and safety-lamps introduced.

On the 5th July an outbreak of fire was discovered in Morgan's Dip Section, Pukemiro Mine The affected area was sealed temporarily, and later reopened with the aid of rescue apparatus. A small fire was located and extinguished by water.

On the 20th July a fire occurred in the goaf in the New Haulage Section, No. 1 Rotowaro Mine. The fire was effectively sealed by the erection of two stoppings.

On the 15th August indications of heating were reported in No. 2 West Section, Renown Mine. Two stoppings were erected and the area sealed.

On the 19th August an outbreak of fire occurred in the New Dip Section, No. 3 Mine, Rotowaro. Several stoppings were erected and the area sealed off.

On the 12th September firestink was noticed issuing from the goaf in E2 Pillar Section, Glen Afton Mine. Stoppings were erected and the area sealed.

On the 25th September a heating was noted in the Mid Section, Pukemiro Colliery. The area was sealed by the erection of two stoppings.

On the 6th October a fire was discovered at a stopping at the second curve on Horne's Dip haulage in the Pukemiro Mine. The stopping was repaired and the fire controlled. A further series of permanent stoppings were commenced to seal off this section of the haulage road.

On the 11th October a heating occurred in No. 4 Section, MacDonald Mine. Two stoppings were erected and the heating goaf sealed off.

On the 29th November an area of goaf in the New Haulage Section, No. 1 Mine, Rotowaro, was sealed following an outbreak of fire.

On the 8th December a heating occurred in the goaf in Brown's Pillar Section, No. 3 Rotowaro Mine. The area was sealed off by a series of stoppings.

PROSECUTIONS

On the 3rd August Christopher Cowman was charged that he did travel on the main haulage road, Mangaphei State Mine, while the haulage was in motion, thereby committing a breach of section 113, Coal-mines Act, 1925. The Magistrate imposed a fine of £2 with 12s. 6d. Court costs.

On the 15th September John Green, Deputy, Rotowaro No. 1 Mine, was charged that he did fail to carry out the duties assigned to him by the manager, in contravention of Regulation 74, Coal-mines Regulations 1939/94. He was further charged that he did fail to make a full report of his inspection, contrary to the provisions of section 4 (2) of the Coal-mines Amendment Act, 1936. Both charges were dismissed on a technicality by the Magistrate.

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

GREYMOUTH DISTRICT

Liverpool State Colliery, Rewanui (L. F. O'Loughlin (First Class), Mine-manager).—Anderson Dip Section: Five pairs of miners were engaged on pillar-extraction. The level off Kennedy's Dip is stopped on a fault pending the retimbering and brushing of level. When this has been completed a start will be made to prove the fault and to develop coal which is known to be below Kimbell East Level.

Kimbell West Dip and Rise Sections: Three pairs of men are employed pillaring.

Morgan West Rise Sections: The Crosscut, Extended, and Dempster's Jig Sections were sealed off due to fire and can be considered as lost for all time. Prospecting work was continued in the Morgan West Level. Towards the end of the year it crossed a fault and advanced a distance of 25 ft. into the roof stone of the Morgan Seam. The strata is steep and the indications are that the Morgan Seam should be met with 60 ft. of driving.

Morgan West Dip: The dip face is still stopped in dirty coal. A pair of levels was driven off to the South-west a distance of approximately 12 chains. Four pairs of miners were engaged on development in this section.

Morgan East Level Section: This section was completely sealed off.

Morgan East Dip: Three pairs of miners were employed pillaring. In No. 1 Panel to east of dip 5 pairs of miners were engaged pillaring. In No. 2 Panel the main headings were driven to the boundary. A pair of levels was advanced in an easterly direction about 4 chains and met a fault. Six chains on the dip side of this pair of levels another pair of levels was advanced in an easterly direction for 5 chains when a fault was met. Prospecting of the seam will be carried out. Six pairs of miners were engaged on development work in this panel.

West Level off East Dip: Two pairs of miners were employed reopening the panel for pillar-extraction.

4A Section: Four pairs of miners were employed on development.

Seventy-one men were employed on the surface and 252 underground.

Strongman State Colliery, Nine-mile (G. K. Keown (First Class), Mine-manager).—No. 2 North Section: Early in the year an unexpected fault was met. Information is being obtained by driving on both sides of the fault. In No. 3 Panel development work continues in the top west corner, where the coal has thinned to 5 ft. in thickness. No. 4 Panel has been developed to within 2 chains of No. 1 Bore and the seam here is very dirty and only 3 ft. thick. A stone drive was advanced approximately 100 ft. to an upper seam. Ten pairs of miners were engaged in this section.

No. 3 North Section: Development work was continued in this section with 6 pairs of miners.

Main East Heading: Two places were continued through the fault and 3 pairs of miners were engaged on development in coal of good quality and thickness.

New South Dip: Five pairs of miners were developing in this section until thin dirty coal was met. Pillar-extraction is expected to commence early in 1949.

No. 1 South Dip: Three pairs of miners were engaged on pillar-extraction.

No. 1 North Dip: Two pairs of miners were splitting pillars.

Bottom Seam: Four pairs of miners were engaged on development in Rise Panel. In Slant Dip, 6 pairs of miners were engaged on development.

Main Return Airway: This airway was repaired and the falls cleared and the roof supported with steel girders and concrete legs.

Plant: Some compressed-air plants were replaced by electrical units.

Sixty-five men were employed on the surface and 187 underground.

Blackball State Colliery, Blackball (P.T. Peattie (First Class), Mine-manager).—Main Dip: This dip was extended for a further 9 chains. The seam is undulating and is of a very wet nature, making mining conditions difficult. The coal is hard and bright and 12 ft. to 15 ft. in thickness.

Sump Dip: The development of this dip was stopped at the beginning of the year and a large panel was formed which can be utilized as a major pumping-station at some future date.

Dunn's Dip: This dip was extended for 4 chains on a steep gradient in coal of fair quality. Twin levels were advanced in a northerly direction to connect with the endless-rope haulage. It is proposed that one of these levels will be used as a haulage road between Dunn's Dip and the endless-rope haulage. The coal in this area is of a friable nature and is 12 ft to 15 ft. in thickness.

Crow's Nest: A slant dip was driven 8 chains to give access to a block of coal proved by No. 1 Bore. The coal is of good quality and 12 ft to 15 ft. thick.

North Heading: A new north heading was extended for 6 chains from the main dip to win the coal up to the barrier of the old Blackball Mine workings. The coal in this area is of a hard bright nature and ranges from 12 ft. to 15 ft. in thickness.

Thirty-four men were employed on the surface and 155 men underground.

Blackball Creek Colliery (Balderstone and Party), Blackball (W. Balderstone (Underviewer), Mine-manager).—Operations continued in splitting and extracting pillars in the old Blackball co.'s workings in the top seam. One man was employed on the surface and 8 men underground.

Briandale Collieries, Ltd., Ten-mile Creek (T. Howard (First Class), Mine-manager).—Pillar-extraction continued in a small seam adjacent to the old Burnside Co-operative Mine. Two men were employed underground, 3 men were employed transporting coal by locomotive from six mines, and 1 man was employed on track maintenance.

Wallsend State Colliery, Brunnerton (J. Cunningham (First Class), Mine-manager).—No. 1 Section: Coal-production from this section was won from pillar-extraction only, the thickness of seam being approximately 10 ft.

Old No. 2 Section: This section is being dewatered to allow the fault in the dip heading to be prospected. No coal was won from this section during the year.

No. 1 Slant Dip Section: Coal-production in this section was won from pillar-extraction only, thickness of seam varying from 8 ft. to 12 ft. The system of haulage in this section was changed from endless-rope to direct haulage.

No. 2 Slant Dip Section: Pillar-extraction only was carried out in this section during the year. The seam varies from approximately 8 ft. to 12 ft. in thickness.

Extension Section and B Section: Pillar-extraction was also carried out in both these sections. The coal-seam over this area contains a band of stone which varies from 6 in. to 18 in. in thickness.

Thirty-two men were employed on the surface and 119 men underground.

Dobson State Colliery, Dobson (J. G. Quinn (First Class) Mine-manager).—During the year the output was maintained by development in the Main Dip and No. 5 West Sections with a small amount from the east side. No. 5 West Section was generally good, but the fault which was first encountered in No. 4 West Dip has gradually cut off all places down as far as the main level and this fault is now being proved by drilling, but no coal has yet been struck. The Main Dip area struck a fault in No. 2 Dip, and this was pierced with a 10 by 7 drive and coal struck at 60 ft. near No. 1 Borehole.

Preparations have been completed for the extension of the main endless ropeway by 18 chains to a point where the dip actually levels out. This will be the permanent terminus of the ropeway. The coal from the working-places will be transported to this point by auxiliary machines.

Paparoa State Colliery, Roa (J. J. Queen (First Class), Mine-manager).—The output from both the West and Aerial Sections was mainly from pillar-extraction. The only development work carried out was in the Aerial Rise Section, where two levels were driven some 18 chains to 20 chains beyond the Paparoa Coal Co.'s workings. These two levels were driven through faulted country and, in places, inferior coal, but the possibilities looked encouraging at the end of the year. It is intended to put through a new drive so as to improve the haulage from this section.

The old west fan which was situated at Waterfall Creek was dismantled and installed as a ventilating unit for the Aerial Mine and proved quite satisfactory.

Work was commenced on the erection of the high-tension power line from Middle Flat to Soldiers. It is expected this will be completed early in 1949.

Twenty-two men were employed on the surface and 57 underground.

Co-operative Mines in Grey District

Spark and Party's Mine, Rewanui (E. Cohen (Underviewer), Mine-manager).—All the output was obtained from pillar-extraction. Two men were employed on the surface and 7 men underground.

Old Runanga Mine (O'Brien and Party), Rewanui (E. W. Kennedy (Underviewer), Mine-manager).—The output was won from development work on the dip side of the seam. This seam is about 4 ft. thick with 1 ft. band of stone in the middle. Two men were employed on the surface and 8 men underground.

Moody Creek Mine (Wright and Party), Dunollie (R. K. McTaggart (Deputy), Mine-manager.—Development work was continued in 9 ft. of coal on the west side of the fault running parallel with the dip haulage road. The leading place was driven in a northerly direction to connect with the surface for a new return airway. One man was employed on the surface and 7 men underground.

Goldlight Mine (Williams and Party), Rewanui (A. Crawford (Underviewer), Mine-manager.—Development work was carried out in the early part of the year until thin stony coal was met within 3 chains of Coal Creek. This resulted in the pillars being extracted for the remainder of the year. One man was employed on the surface and 9 men underground.

New Point E. Party's Mine, Dunollie (J. H. Jackson (Underviewer), Mine-manager.)—All the output was won from pillar-extraction. One man was employed on the surface and 4 men underground.

Kiwi Mine (Previously Known as Hilltop Mine), Ten-mile (R. Scott (Underviewer), Mine-manager).—The output was obtained from pillar-extraction adjacent to a fault. One man was employed on the surface and 9 men underground.

Boote and Party's Mine (Kaye and Party), Ten-mile (R. E. Laing (Underviewer), Mine-manager).—Work consisted entirely of pillar-extraction throughout the year. Roof conditions were poor but a good percentage of extraction was obtained. One man was employed on the surface and 3 men underground.

Hunter and Party's Mine, Dunollie (N. Forsyth (First Class), Mine-manager).—In the early part of the year the workings passed through faulted country and finally reached thin stony coal within a few chains of Coal Creek. This development work was stopped and pillar-extraction commenced on the rise side of the seam. This was continued throughout the year. One man was employed on the surface and 9 men underground.

Schultz Creek Mine (Gould and Co., Ltd.), Twelve-mile (W. J. Beeby (Permit), Mine-manager).—All the output was won from pillar-extraction from a seam of coal 2 ft. to 3 ft. in thickness. A high percentage of extraction was obtained. One man was employed on the surface and 3 men underground.

Cliff Dale Mine (Stuart and Party), Ten-mile (W. Boyle (Deputy), Acting-Mine-manager).—Splitting and pillar-extraction continued throughout the year on the west side of the main dip. Roof conditions were good, giving a high percentage of extraction. Two men were employed on the surface and 6 men underground.

Bellvue Mine, Rapahoe (J. Allen (Underviewer), Mine-manager.)—The access road into this locality was completed and mining operations recommenced in the early part of the year. One pair of miners extracted pillars in the old mine, and a new mine was opened up on the east side of the old mine by 2 pairs of miners. The seam in the new mine is about 10 ft. thick with a good roof and a fairly uneven floor. One man was employed on the surface and 8 men underground.

Jubliee Mine (Tinning and Party), Rapahoe (J. Tinning (Deputy), Mine-manager).—The new access road was completed during the year and mining operations were recommenced with extraction of pillars on the rise side of the main level. Roof conditions were good, giving a high percentage of extraction. One man was employed on the surface and 7 men underground.

Coaldale Mine (Wafer and Party), Rapahoe (E. W. Broad (Deputy), Mine-manager).—All the output was gained from pillar-extraction, and mining operations finished at the end of the year. One man was employed on the surface and 2 men underground.

Cliffside Mine (Moore and Party), Nine-mile (R. McTaggart (Underviewer), Mine-manager.)—Throughout the year pillars were extracted in the south-east part of the mine, the average thickness of the seam being about 7 ft. Two men were employed on the surface and 7 men underground.

Brachead Mine (Boote and Party), Dunollie (G. H. Gaskell (Second Class), Mine-manager.)—The output was won solely from pillar-extraction on the east side of the main dip. The seam was about 12 ft. thick with a band of stone in the middle that varies from a few inches to 3 ft. in thickness. This means that a large amount of stone has to be handled. Pillars are being extracted in a sound manner. One man was employed on the surface and 7 men underground.

Harrison and Party's Mine, Ten-mile (R. Little (Deputy), Mine-manager).—This party were developing levels and inclines in a south-westerly direction. The thickness of the seam was reduced to 4 ft. and contained stone bands, making mining difficult and expensive. Bad roof conditions existed One man was employed on the surface and 5 men underground.

Exhibition Mine (Hassan and Party), Eight-mile (P. Hassan (First Class), Mine-manager).—This party is operating a seam of coal about 8 ft. thick, and friable in places, adjacent to the old James Mine workings. All the output was won from development work. Coal is transported from the coal face to a loading point in the mine by drag-line loader. Two men were employed on the surface and 5 men underground.

New Aerial Mine, Ten-mile Creek (P. A. Symons (Permit), Mine-manager).—A 15-chain aerial from the Ten-mile Gorge locomotive road to the mine was completed and mining operations were commenced. Outcrop coal was won by the opencast method. One man was employed on the surface and 2 men underground.

Harries and Party, Rewanui (J. Williams (Second Class), Mine-manager).—This is a new mine opened up on the dip side of Hunter and Party's workings. Two developing headings are being driven in a southerly direction in a seam about 3 ft. thick. One man was employed on the surface and 5 men underground.

REEFTON DISTRICT

Alborns' Mine (V. W. Alborn), Capleston (R. V. Alborn (First Class), Mine-manager).—Production was confined to development work in Nos. 2 and 4 vertical seams in Burke Creek, Boatmans. Coal was transported from the working-places to the bins by fluming. The seams varied in thickness and the coal was friable. One man was employed on the surface and 4 men underground.

Kleen Mine (Archer Bros.), Capleston (P. McCormick (Deputy), Mine-manager).—Pillar-extraction was continued in a vertical seam duing the early part of the year. When pillar-extraction was completed the party then extended a stone drive to meet the vertical seam at a lower level. The seam was met in the latter part of the year, and production is expected to commence in 1949. A new bin was built to suit the horse haulage road from these new workings. Five men were employed underground.

Coghlan's Freehold Mine (J. F. Coghlan), Capleston (J. J. Coghlan (Deputy), Mine-manager).—Pillar-extraction was continued throughout the year. One man was employed on the surface and 3 men underground.

New Imperial Mine (J. F. Coghlan's Leasehold) (Rollerson and Blom), Capleston (A. Thompson (Deputy), Mine-manager).—The output was obtained from development work in levels and rise inclines. This was claimed to be No. 4 Seam and is about 15 ft. in thickness of good-quality coal. Four men were employed underground.

Hillcrest Top Mine (E. Melbom), Waitahu (E. Melbom (Deputy), Mine-manager).—Due to the main level striking a gravel bed that is found in this locality, pillar-extraction was commenced and continued throughout the year. The seam is about 5 ft. thick with bad roof and very wet conditions. Two stoppings were erected to prevent a fire at the outcrop from advancing into the mine workings. A high percentage of extraction was obtained under bad mining conditions. Five men were employed underground.

Griggs and Party's Mine (Waitahu Colliery Party), Waitahu (S. Fairest (Deputy), Mine-manager).—Production was obtained from development work on Waitahu (N.Z.) Collieries lease No. 3432 in conjunction with the party's lease No. 9325. The latter lease was transferred to Murcott and party during the year, who have named the mine Waitahu Colliery Party. The seam is about 6 ft. thick of good-quality coal. One man was employed on the surface and 7 men underground.

Dauntless Mine (New Pyramid Coal Mining Co.), Waitahu (G. H. Millar (First Class), Mine-manager).—Previous to this mine being acquired by the State in August, production was obtained from levels and inclines on the north-east side of the main dip. Coal maintained excellent quality and averaged about 15 ft. in thickness. This mine was abandoned during the latter portion of the year.

New Pyramid Mine (Crown Lease), Waitahu.—No work has been done in this mine since it was flooded in 1946.

Burke's Creek State Mine, Reefton (C. D. Buist (First Class), Mine-manager).—Output was obtained from development to the north-east on the strike of the seam and from the extension of the main dip workings to the north-west on the full dip of the seam.

Development to the north-east from the bottom landing (144 ft. datum) was continued throughout the period in normal strata to a position 13 chains north-east of the main dip haulage. The two prospecting levels are now following the contour of a sharp syncline in highly inclined strata with dips between 45 degrees and vertical. Development to the dip is 25 chains from the portal. Sinking is continuing and levels for lateral development are being broken away. The dips in this section are normal and the coal of good quality.

A large sump was constructed at the bottom level (140 ft. datum), and alterations are in progress for a redistribution of the main pumping units for the purpose of dispensing with the pumping-station and sump at the horse level.

Drilling: A borehole from the surface, sited approximately 10 chains to the dip from the lowest north-west level, was commenced in December. Drilling is proceeding through the marine mudstones overlying the coal measures.

The main dip haulage extension was completed and coupled up for haulage at the end of the year.

The formation for the extension of the mine railway to the vicinity of the mine portal is completed and a commencement made with the erection of the structure for a new screening plant. This work when completed will eliminate the half mile of horse haulage between the mine and the existing screening plant.

Morrisvale Mines (W. J. Morris), Reefton.—Welcome Opencast (D. Wight (Underviewer), Mine-manager).—The output was won from an outcrop from No. 4 Seam, which is about 30 ft. thick. Six men were employed on opencasting.

Pyramid Section (G. H. Millar (First Class), Mine-manager).—This party is developing the dip of the No. 2 Seam that was at one time worked by Pyramid Coal Co. on this Morrisvale lease. The grade of the seam is about 1 in 3. Two men were employed underground.

Higrade Section: No work was done at this mine during the year.

Matchless Section (D. Wight (Underviewer), Mine-manager).—All the output was won from development work in No. 3 Seam and the coal maintained its thickness of 6 ft. Two men were employed on the surface and 7 men underground.

Ferndale Coal Syndicate's Mine (Lockington's Lease), Reiddale Valley, Reefton (J. Etheredge (Second Class), Mine-manager).—This mine was at one time worked by H. A. Lockington and later worked by J. Etheredge. The output was obtained from development work which eventually reached old workings, and pillar-extraction was commenced. One man was employed on the surface and 6 men underground.

Burnwell Mine (D. Hamill), Reefton (R. McDonald (Second Class), Mine-manager).—Production was maintained from development in a south-easterly and north-easterly direction. In places this development work reached a water-laden gravel bed, causing the places to be stopped. Two men were employed on the surface and 10 men underground.

Central Mine (Redpath and Sons, Ltd.), Reefton (W. A. Hansen (Deputy), Mine-manager).—Development was solely in the area recently granted to Redpath and Co. One man was employed on the surface and 7 men underground.

Terrace Mine (Terrace Coal Mine, Ltd.), Reefton (E. J. Richards (Second Class), Mine-manager).—Owing to a fire developing in the main level in No. 4 Seam, this section of the mine with the No. 2 Seam was conpletely sealed, and development was later confined in the No. 4 Seam to the dip of the main level. Two men were employed on the surface and 10 men underground.

Defiance Mine (R. F. Woodbury), Reefton (R. F. Woodbury (Deputy), Mine-manager).—After being idle for some time, mining operations were recommenced by Woodbury and party, who purchased the mine from McClatchie and Co., Ltd. The output was won solely from development work. Two men were employed underground.

Clele Mine (Alborn's), Merrijigs.—This mine remained idle during the year.

Nicholls Mine, Capleston (A. Cohen (Deputy), Mine-manager).—Production from this mine was obtained from working-places which reached the outcrops in Flowers Creek, and development work was stopped and pillar-extraction commenced on the rise side of the main level. The thickness of the outcrops was about 5 ft. The outcrops of two seams about 100 ft. apart were showing at Flowers Creek, and it is proposed to connect these with a stone drive from the No. 1 Seam in which the party is now working.

Banks Opencast Mine (Eklund and Party), Waitahu (A. E. Eklund (Underviewer), Mine-manager).—Good production was maintained from this mine until the boundary of the Morrisvale lease was reached. Production was suspended pending the reaching of agreement with Mr. W. J. Morris to extend operations into the Morrisvale lease. Nine men were employed on opencasting.

Royal Coal Syndicate, Rainy Creek (C. N. Curtis (Deputy), Mine-manager).—Production was maintained from splitting and extraction of pillars. Four men were employed underground.

Lewis and Party's Opencast Mine, Murray Creek (J. Lewis (Permit), Mine-manager).—Production was maintained by opencasting from an area which was previously worked by underground methods. Two men were employed on opencasting.

W. G. Chandler's Opencast Mine, Murray Creek (W. McCaffrey (Deputy), Mine-manager).—Production was obtained solely from the area previously worked by underground methods. Owing to thicker overburden being reached, great difficulty was found in disposing of the overburden. Eight men were employed opencasting.

Devil's Creek Mine (A. and W. J. McKenzie), Golden Point (W. J. McKenzie (Deputy), Mine-manager).—This mine is a few miles along the Merrijigs Road and was opened this year. Development work was carried out until a gravel bed was reached, and pillar-extraction was commenced. Two men were employed underground.

Garrey Creek State Mine, Reefton (J. Rarity (First Class), Mine-manager).—Development ceased in the south side at the end of the year. There are six levels on this side. No. 5 and 6 Levels go through to daylight, the latter level being approximately 3 chains long. Nos. 1 to 4 Levels have been cut off by a thinning of the seam. These will be prospected further when electrification replaces the compressed air. Preparations are in hand to opencast this side down to No. 4 Level, and the party is expected to take over at the end of January, 1949.

On the north side, Nos. 1 and 2 Levels have been driven 17 chains. No. 3 Level is in 20 chains, having had less trouble with stone bands. These levels were all in good coal during the last month of the year.

Work has commenced in opening up a fourth level at a point 7 chains in, as the lower levels are connected here by a coal-chute and timber-supply road.

The electric reticulation of the mine is completed. Only the transformer remains to be wired up. This is in position by the substation. The distribution panel is in place to connect up. A new compressor house is almost ready and an electric compressor will be installed early in the New Year.

Excavations are almost completed at the bins for the installation of a small bin, belt conveyor, and chain conveyor to deal with both opencast and underground coal.

Eight men were employed on the surface and 39 underground. Average daily output was 65 tons.

BULLER DISTRICT

Mitchell's Opencast Mine, Charleston (E. Rooney (Quarry Permit), Mine-manager).—The output from this lease was obtained during the latter half of the year by the Nile Hydro Coal Syndicate by opencast methods. Three men were employed on this area.

Warne's Mine, Charleston.—This mine was idle during the year.

Bowater and Bryan's Opencast Mines, Charleston.—The output was maintained by Rata Collieries (W. Powell (Permit), Mine-manager), Nile Hydro Syndicate (E. Rooney (Quarry Permit), Mine-manager), and T. N. Mouat (R. Holbrook (Permit), Mine-manager). The coal and overburden were removed by hydraulic means. Fifteen men were employed.

J. Powell's Lease, Charleston.—No coal was produced during the year.

Allen's Opencast Mine, Charleston (E. Rooney (Quarry Permit), Mine-manager).—This mine was operated in the latter portion of the year by the Nile Hydro Syndicate. Three men were employed.

Moynihan's Opencast Mine, Charleston. (E. Rooney (Quarry Permit), Mine-manager).—A small output was obtained by the Nile Hydro Syndicate during the early part of the year by opencasting. Three men were employed.

Rata Collieries Opencast Mine, Charleston (W. Powell (Permit), Mine-manager).—Output was obtained from this opencast mine during the first half of the year by hydraulic means. Three men were employed.

Sinclair's Opencast Mine, Charleston (E. Rooney (Quarry Permit), Mine-manager).—A small output was obtained from this mine by the Nile Hydro Syndicate during the early part of the year. Three men were employed.

Hillside Mine (Gemmell and Bennett), Charleston (R. Bennett (Deputy), Mine-manager).—The output was obtained from this lease by 3 men opencasting.

Brighton Mine (Hunter's), Brighton (W. Cairns (Deputy), Mine-manager).—The output was maintained from development work and coal was transported from the working-places to the bins by hydraulic means. One man was employed on the surface and 2 men underground.

Glencrag Mine (Glencrag Coal Co.), Buller Gorge (J. S. Blyth (Underviewer), Mine-manager).—The output was obtained solely from pillar-extraction. One man was employed on the surface and 9 men underground.

Glencrag Opencast Mine (Glencrag Coal Co.), Buller Gorge (R. Chester (Permit), Mine-manager).—Production was obtained from an area of coal adjoining the Glencrag underground mine. Overburden and coal were removed by hydraulic means. The seam is 12 ft. thick with an average thickness of overburden of 15 ft. Three men were employed.

Coal Creek Co-operative Party's Mine, Seddonville (R. Mulholland (Deputy), Mine-manager).—Coal was mainly obtained from pillar-extraction and cleaning up old roadways. One man was employed on the surface and 6 men underground.

Cardiff Coal Co., Ltd., Mokihinui (J. Simpson (Deputy), Mine-manager).—Production was won solely from pillar-extraction, the coal being mined by hydraulic means. Operations ceased during the latter part of the year. One man was employed on the surface and 2 underground.

Hydro Coal Mines Ltd., Seddonville (E. McKenney (Underviewer), Mine-manager).—The output was won from pillar-extraction, cleaning up roadways when opening up a sealed-off section. One man was employed on the surface and 8 men underground.

Charming Creek – Westport Coal Co., Ltd., Ngakawau (R. J. Wearn (First Class), Mine-manager).—Three pairs of miners were engaged throughout the year on pillar-extraction in No. 2 West Section. Seven pairs were engaged on development work in the main north-east headings. These workings were driven close to the northern boundary of the lease and the coal-seam decreased in thickness and contained near.y all dirt bands. Extraction then began in portions of this area, and at the end of the year 3 pairs were extracting and 5 pairs on solid work. Early in the year the transport road from Seddonville was completed and used for the transport of the men. A stone drive from the surface to open up about 40 acres of coal in the company's new lease area to the south of the present workings was driven approximately 7 chains. This work has since been stopped owing to an unfortunate accident to both men working in the drive. There are 3 chains to 4 chains of stone work to be done to complete the driving and it is hoped this work will be completed early in the New Year. Plant and machinery were maintained in good order, but no major additions or improvements were made during the year. A new bathhouse was completed. Twenty-one men were employed on the surface and 35 men underground.

Westport-Cascade Mine, Cascade Creek (W. Brown (First Class), Mine-manager).—Output was obtained from Durkin's South, Moynihan's, and Mill Creek Sections. Durkin's South Section was abandoned in July due to further outbreak of fire, necessitating erection of concrete stoppings near the mine mouth. Moynihan's Section was on pillar-extraction in good-quality coal. In Mill Creek Section, pillar-extraction was continued. Two miners were on pillar work and 5 on solid in good-quality coal. Owing to an industrial dispute, operations ceased as from 18th October. This seam is mined by hydraulic means. Seven men were employed on the surface and 10 men underground.

Denniston State Coal-mine, Denniston (W. Farnworth (First Class), Mine-manager).—Pillar-extraction was continued in the whole of Forsyth's Sections, which include the Third and Fourth South, 9 Box Jig, Fourth North, and Rope End. Pillar-extraction was continued in the Extension Section until April, when encroachment of fire necessitated sealing off this area. However, little coal was lost as there was only about one month's work for two pairs of hewers in this particular part and all material was recovered.

Pillar-extraction was also continued in Old Waterloo and Waterloo Dip Sections, and with reference to the last mentioned it is hoped to recover an area which was considered unobtainable. Between Forsyth's and Birchall's Sections an intrusion of stone causes the coal to become two separate seams, only the top part of which has been worked, so prospecting will be done in the bottom part, which is showing 7 ft. of good coal, the stone intrusion having thickened to 16 ft.

Pillar-extraction has recommenced in Birchall's Section, which has been standing for approximately fourteen years, and the same procedure is being adopted to prospect the extent of the "bottom seam," although the stone intrusion is not so thick as on Forsyth's Section side. Eighty men were employed on the surface and 199 men underground.

Aerial Ropeway to Cook's Lease.—Construction on this aerial was abandoned.

Millerton State Colliery, Granity (R. Marshall (First Class), Mine-manager).—Mine Creek Mine: In the early part of the year extraction of the Mangatini rope-road pillars was commenced with 3 pairs of miners and is still being continued with good results. This area was stopped in 1946.

In the North East Section, 2 pairs were engaged on prospecting work in virgin ground with satisfactory results. At the close of the year a fair amount of surface prospecting and trenching was carried out with a view to proving the continuation of the seam at lower levels than is at present being worked in this section. Extraction is still being carried on in Pollock's Level with 1 pair. Extraction was completed in Sixth West and Third West Sections during the year, and these are now sealed off.

Old Dip Mine: Four pairs were engaged in pillar-extraction in the Settlement Section in good high coal. Fire broke out in this section in the early part of the year, but as all the stoppings were in for the formation of an artificial panel it was quickly controlled. Further concrete dams were built during the year to isolate the area. In the Lower Area, 2 pairs were engaged extracting along a fault line. An endeavour is being made to reach a large block of unworked ground fairly close to the Old Dip Mine mouth, and to this end 1 pair of miners commenced work in the latter part of the year splitting through old pillars in an endeavour to reach this area.

A considerable amount of work was done on the bathhouse with a view to modernizing it. Forty-eight men were employed on the surface and 82 underground.

Stockton State Colliery, Ngakawau (G. Gilbert (First Class), Mine-manager).—Fly Creek Mine: Operations were confined mainly to pillar-extraction in the South Section under very wet difficult conditions. In the East, development continued along the escarpment from the new dip. A few thousand tons of excellent coal was won by opencasting. Development is now completed and no pillar-extraction is possible. Underground hydro bin and haulage way therefrom were completed. In the Old Mine, extraction was continued in No. 4 and 5 Sections. An excellent grade of coal was won under very wet conditions. The limit of safe extraction is now almost reached from the present haulage way. Arrangements are being made to penetrate the area from the escarpment at a much lower level, ensuring recovery of a large area of pillars below the level of the present haulage way.

Webb Mine: Development continued satisfactorily. The main headings were advanced 54 chains from the mine entrance. The seventh panel to the south was formed. In order to leave as much of the thick coal to the west as possible for opencast, the new line of development is to the north where the coal is thinner and the overburden of greater thickness. Headings in this direction, breaking off the main west heading at a point 44 chains from the mine entrance, were advanced 10 chains in very good coal. The seams dip to the north, having dipped 30 ft. in 10 chains, and will reach a point 70 ft. still lower about 28 chains from the present heading face. A new power line was erected over Webb Mine and the power conveyed by cable down a borehole near the working-places. Pump was installed and is in use in the North Dip.

Opencast Area.—Production during the last few months of the year was very unsatisfactory, largely due to the thicker overburden met with. This difficulty will be solved with the arrival of additional machines within a few months. A large area just ahead of the present opencast workings has been proved by bore to contain over 1,000,000 tons, average thickness 35 ft., overburden not exceeding 2 to 1. Analysis reveals that the coal is of exceptionally high quality with very low sulphur and ash content. Close boring at 200 ft. centres continues over an adjacent area of 250 acres where it is expected to prove 15,000,000 tons of excellent coal well within the opencast range.

During the year remarkable success was obtained in recovering coal from areas formerly worked underground and where all the coal that could be safely won underground had been extracted.

Area 1, Coal Island: Twenty thousand tons of coal were recovered twenty-seven years after underground extraction had been completed and actually more than 50 per cent. recovered by opencast.

Area 2, Stable Pillar Fire Area: In this area a fire broke out twenty-seven years ago and continued to burn until about twelve years ago. The coal was 30 ft. thick. The floor of the old workings was 20 ft. above the stone floor. The fire had destroyed all coal above the level of the floor

of the old workings but had not damaged the coal below. Thirty-five thousand tons of excellent bottom coal was recovered. The rock overburden, through the urgency of heat, had disintegrated, rendering comparatively easy its removal by bulldozers.

There are other areas formerly worked underground extending along the eastern escarpment of the Fly Creek Old Mine from which it is hoped to recover at least 500,000 tons of high-grade coal by opencast method.

Extensive repairs were effected on the power lines, loco road, substations, and tunnels and power plant. Locomotive inclines and bins were maintained in good working-order.

One hundred and ninety-eight men were employed on the surface and 169 underground.

Paine Bros. Mine, Buller Gorge (N. B. Paine (Under-viewer), Mine-manager).—Production was maintained by opencast methods by removing pillars formed by underground mining. Ten men were employed opencasting.

Rahui Mine (Buller Coal Mining Co.), Buller Gorge (J. H. Chandler (Deputy), Mine-manager).—Pillar-extraction was continued by hydraulic means in coal averaging 10 ft. in thickness. One man was employed on the surface and 2 men underground.

Heaphy's Opencast Mine, Buller Gorge (L. Heaphy (Permit), Mine-manager).—Output was won solely by opencasting. The coal is of good quality and ranges up to 25 ft. in thickness with very little overburden. This country is heavily bushed. Four men were employed opencasting.

Nelson District

Owen Colliery (Owen Collieries, Ltd.), Owen River (C. Taylor (Underviewer), Mine-manager).—The output was won from development work and pillar-extraction. Two main levels were driven in a westerly direction with the seam maintaining its thickness of 1 ft. 6 in. bottom coal, 1 ft. dirt, and 1 ft. top coal. Two inclines were advancing in a northerly direction from the main levels to reach the outcrop. It is expected this will bring about an improvement in the ventilation. One man was employed on the surface and 9 men underground.

Six-mile Mine (J. Gillespie), Murchison (T. Hill (Permit), Mine-manager).—The output was won from pillar-extraction, with 3 men working the vertical seam of irregular thickness. Coal was friable but of good quality.

Strathmore Mine (J. S. Dickson and W. S. Closs), Glengarry, Murchison (J. S. Dickson (Permit), Mine-manager).—The output is maintained from a 4 ft. seam of good-quality coal. Two men were employed underground.

Murchison Collieries (Downie Bros.), Murchison (L. B. Hawthorn (Deputy), Mine-manager).—This mine was newly opened and is operating in a vertical seam which is a continuation of the seam worked by the Six-mile Colliery. The seam varies in thickness from a few inches to 12 ft. of good-quality coal. The seam is being developed by levels and connecting rises. A propeller-blade type of fan was installed, which was successfully ventilating the mine. Three men were employed underground.

Westhaven Mine (G. and A. H. Wynn), Mangarakau, Collingwood (A. H. Wynn (Deputy), Mine-manager).—The output was won solely from development work on the right and left of the crosscut dip. On the right side a downthrow fault was met about 2 chains from the crosscut dip. This seam is 2 ft. bottom coal with 14 in. stone and 3 ft. top coal. Two men were employed on the surface and five men underground.

Whareriki Mine (D. R. and H. H. Trewavas), Puponga.—No coal was produced during the year.

Fatal Accidents

Two fatal accidents occurred during the year:—

On 10th January, 1948, Keith Cochrane, electrical apprentice, Blackball State Colliery, was killed instantaneously when he was electrocuted in the course of his duty of overhauling Dunn's Dip No. 2 State winch.

On 21st April, 1948, Thomas Wright Alexander Blyth, trucker, Liverpool State Mine, was struck by a runaway truck down the crosscut jig in Kimbell West Section. He received serious injuries to a leg, which bled freely, and he died in the Grey River Hospital that night.

Serious Non-fatal Accidents

Seventeen workmen were seriously injured during the year:—

On 7th January, 1948, Edward Davies, trucker, Stockton State Colliery, sustained a first-degree fracture of left fibula and iternal mallaolus when he was pinned by a full truck on the rib side of a jig.

On 30th January, 1948, A. Williamson, rope-road worker, Liverpool State Colliery, sustained a broken fibula when he was attempting to place the rope back on roller of endless rope, main haulage from mine.

On 5th February, 1948, W. McGinty, trucker and horse-driver, Denniston State Colliery, sustained a slight fracture of the vertebræ when timber was pulled out when the horse he was driving turned.

On 11th February, 1948, I. Gilmour, rope-road worker, Denniston State Colliery, sustained a fractured right wrist. He was engaged in pushing a box away from the weighbridge when another came behind him and crushed his arm between the boxes.

On 11th February, 1948, G. H. Filer, jun., trucker, Dobson State Colliery, sustained a fracture of the T12 vertebræ when he was caught between moving boxes and a prop whilst trucking in No. 2 Dip Section.

On 2nd March, 1948, A. Rubbo, shiftman Wallsend State Colliery, sustained a fracture of the head of the radius, left arm, when he slipped and in falling struck his left arm on a sleeper.

On 13th April, 1948, A. G. Cleghorn, trucker, Dobson State Colliery, sustained a fracture of right fibula when knocked off the trolly (through some foolish pranks of some of the workmen) which was conveying the men at knock-off.

On 29th April, 1948, T. Gallon, shiftman, Strongman State Colliery, was working at the bottom of No. 2 Dip. After signalling for a race of empty skips to be pulled away, he found that one of the skips was off the road, and while lifting the box on to the rails it ran back the length of the coupling. His left heel caught behind a sleeper and the buffers of the skip broke both bones of his left leg midway between the knee and the ankle.

On 19th May, 1948, Robert Blyth, jun., carpenter, Dobson State Colliery, was dressing some knotty timber slats in the power planer when the timber parted at a knot and his right thumb was caught in the planer head, resulting in the complete loss of the thumb.

On 21st June, 1948, Vernon Johnson, miner, Charming Creek Colliery, suffered serious facial and eye injuries when a shot exploded prematurely whilst he and his mate, William Crawford, were still at the face of the stone-drive. Crawford received minor injuries.

On 19th August, 1948, W. Reid, trucker, Liverpool State Colliery, sustained compound fracture of right leg and broken bone in knee of left leg and fracture of left forearm when struck by a runaway truck on Smith's Jig, Top Level, Main Dip 4A.

On 17th October, 1948, Robert Heslop, miner, Whareatea Mine, Denniston, was struck on the right leg and sustained fractured femur by a fall of coal from the rib side of his working-place.

On 29th October, 1948, William Currie, rope-road worker, Denniston State Colliery, suffered fractured radius when he caught his left wrist between two boxes whilst working on the weighbridge.

On 7th November, 1948, W. Middleton, tipper, Wallsend State Colliery, sustained a simple fracture of left arm when he slipped on a flat sheet.

On 11th November, 1948, William Allen, bratticeman, Blackball State Colliery, suffered from electric shock. The electric cable fell on to shaft of pump, making the pump alive whilst Allen was in contact with it.

On 24th November, 1948, James Mitchell, trucker, Burkes Creek State Mine, suffered fractured jaw when struck by a jig rope.

On 13th December, 1948, Herbert Satherly, trucker and rope-runner, Dobson State Colliery, sustained loss of finger, fractured collar-bone and ribs, and considerable bruising. He had apparently been riding on the front of the first box of a race of six boxes in No. 2 Dip and became caught by a low bar and was dragged over the top of the box.

Dangerous Occurrences in Coal-mines (Regulation 81, Coal-mines Regulations 1939)

Liverpool State Mine.—On 19th January, 1948, the examining deputy found an accumulation of gas in McNeil's place, No. 2 Bank, Morgan West Section. The cause was due to brattice being down on incline from which the place had been driven. The fall which caused the trouble was eventually cleared, brattice repaired, and place cleared on the backshift. On the following morning the deputy reported the place to be clear and in working-order.

Wallsend State Mine.—On 8th February, 1948, an accumulation of some thousands of cubic feet CH_4 was found at top of old west headings. This was caused by a fairly heavy fall of roof, the airway being blocked. Clearance was eventually made over the fall, allowing full circulation of air, and all traces of gas were removed.

Millerton State Mine.—On 11th February, 1948, an outbreak of fire occurred in Top Panel, Settlement Section (Old Dip Mine). The last recoverable pillar in this panel was being extracted by one pair of miners. Flames travelled rapidly due to pillar-extraction breaks to the surface, causing a natural draught, and it was necessary to employ all the men in the area to seal off with concrete blocks.

Liverpool State Mine.—On 16th February, 1948, a report of heating which had occurred in Kimbell West Dip Section was investigated, when it was found that the little dip area was being flooded with water. This area, as well as old workings to the rise on both sides of dip, were also sealed off, thus preventing any possible access of air. As a result of this the heating was effectively dealt with and work resumed normally.

Terrace Mine.—On 3rd March, 1948, a spontaneous heating which developed into a fire before being sealed off occurred in a rise heading. An inspection was made, and the heating was found to be coming from a fall on a jig. Stoppings were erected and the area sealed off.

Terrace Mine.—On 26th April, 1948, the mine-manager reported that a stopping in a small section of the mine that had been sealed off a month previously owing to falls showed signs of a haze and slight smell. The stoppings, which were of the brattice and cement-wash type, were immediately repainted and the sides packed again.

Whareatea Mine, Denniston.—On 3rd May, 1948, the assistant district manager reported on a fire that occurred on 23rd April due to a roof fall taking place in the vicinity of No. 10 Stopping. All precautions were taken and material recovered, and sealing off was completed by the erection of concrete stoppings.

Terrace Mine, Reefton.—On 7th June, 1948, the mine-manager reported that on the morning of 31st May when arriving at the mine considerable smoke was issuing from the return. After some time it was found that a large fall had taken place on the main roadway due to timber burning out and letting in the roof. The rescue brigade worked for two days and nights trying to extinguish the fire, and it was then decided to seal the area temporarily. Final seals were erected on 5th June, and on the following Monday there were no signs of leakage.

Liverpool State Mine.—On 11th June, 1948, the mine-manager reported that a heating had been discovered by the underviewer and himself on 8th June, 1948, on the outbye side of No. 2 Bank, Morgan East Section. All men were withdrawn from the mine, and then a start was made to seal off the area temporarily, and at a later date the area was sealed off with permanent concrete stoppings.

Hillcrest Mine.—On 18th June, 1948, the mine-manager reported by telephone that a fire had developed in the mine. Stoppings were erected.

Dobson State Mine.—On 29th June, 1948, the examining deputies reported at 8 a.m. that, due to a heavy gas feeder in Longley's Level, No. 5 West Section, 7,000 cubic feet of gas had accumulated in this level and the next heading. The places were fenced off and men withdrawn from the mine. The accumulation was eventually cleared.

Cascade Creek Mine.—On 6th July, 1948, a heating was reported in gob of Durkin's South Section. The fire area was successfully sealed by a brigade from the Buller Rescue Station.

Cliffside Mine.—On 9th July, 1948, the mine-manager discovered signs of heating in a heading. The workmen were directed to work night and day to dig out completely the heated area, which was trucked to the outcrop and disposed of down a gully.

Webb Mine, Stockton.—On 17th August, 1948, a small blower of CO_2 or nitrogen was met in Shepherd's and Jack's working-place, Sixth Panel. The gas was coming from a crack in the floor.

Webb Mine, Stockton.—On 25th August, 1948, a small ignition of gas was reported in Shepherd's place, No. 6 Panel. The miners had bored and fired a shot along the rib side and 1 ft. 6 in. from the floor. Whilst the miners were filling out the coal, Shepherd suspected a strange smell and put the flame of his carbide lamp near the back end of the shot-hole, causing an ignition. Samples of air were submitted to Dominion Laboratory, and the results showed the samples were free of inflammable and noxious gases. Apparently coal-dust dried through a shot being fired and was ignited.

Liverpool State Mine.—On 24th September, 1948, the mine-manager reported signs of heating in No. 2 Bank, Morgan West Section. The goaf was sealed temporarily whilst a permanent seal was prepared farther back in a more satisfactory position.

Prosecutions Under the Coal-mines Act, 1925

On 7th April, 1948, a mine-manager was charged under Regulation 226 (*h*) (i) of Coal-mines Regulations 1939 in relation to the proper and safe firing of shots in a coal-mine. He was convicted and fined £2 with 10s. Court costs.

On 7th April, 1948, a miner was charged under Regulation 226 (1), Coal-mines Regulations 1939, in that, not being an authorized person, he did fire a shot, in contravention of this regulation. He was convicted and fined £2 with 10s. costs.

On 5th July, 1948, a trucker was charged under section 144, Coal-mines Act, 1925, with negligently omitting to place properly in position a safety-block on the incline haulage line. The case was adjourned to a later date. In the meantime a charge against the trucker was laid by the police under the Crimes Act for manslaughter, but the case was dismissed. The charge under the Coal-mines Act was withdrawn.

SOUTHERN INSPECTION DISTRICT (G. Smith, Inspector of Coal-mines)

Canterbury District

With the exception of Klondyke Mine, all of the Canterbury district mines are operating in a small way, with from 2 to 8 men employed.

Acheron Mine No. 1 (Anthracite) (J. T. Todd (Deputy), Manager).—Development to the dip a further 80 ft. has given a pair of levels to the south in good coal varying from 6 ft. to 9 ft. in thickness.

The dip face is still in good coal, but further extension is questionable for, immediately to the north, levels met a split and intrusion of stony bands, and finally a dolerite face, and this is cutting across the dip face at an angle of 20 degrees.

All of the upper levels to the south at approximately 7 chains have struck barren ground, but as coal has been worked to the south of the present portal it is intended to prospect through this gravel band or barren area. Should this be unsuccessful, further dip development will have to be by stepping to the south, and by cross-cutting the rise pillars to furnish a suitable haulage road, for developing on the new bearing.

The new levels require an increase in the amount of timber previously used, and small gas (CH_4) feeders and accumulations are periodically met.

Acheron No. 2 (Anthracite) (J. W. Marsh (Deputy), Manager).—This mine is operating in a small way on a block of very limited area, with the seam 7 ft. in thickness.

Development has been by a dip 1 in 4 grade for 3 chains and a pair of levels to the south, which met trouble after advancing 100 ft. while the seam thinned rapidly. To the north, levels met dolerite towards the fringe of the terrace after 40 ft. of driving, proving the block to be limited to approximately 3,500 tons of good-quality anthracite, and further development is very doubtful.

The area, a low flat gravel terrace, adjacent to the stream has shallow cover, but the places 5 ft. wide and arched, by 6 ft. high, stand well and good extraction should be made.

Bonanza Mine (D. McQueen (Deputy), Manager).—Development in the new tunnel has been by a pair of levels 4 chains in length, the seam being struck after driving a well-timbered adit about a chain in length.

The seam is of good coal, 5 ft. in thickness at 24 degrees inclination, with a fairly good roof, and the mine is contiguous to the Sheffield–Coalgate Road.

The concern has not been worked to the extent one would expect for a new mine, and appears to be developed as a sales prospect rather than with the object of production, this aspect, with frequent changes of ownership, being too prevalent in the district, but the new Coal Act, 1948, will assure better control of such leases.

Victory Mine (V. L. Davies (Deputy), Manager).—The dip has been extended a further 80 ft. and another level opened out to the north-east and south-west of this haulage road.

The seam, 10 ft. in thickness, of good quality is highly inclined, 60–70 degrees.

New bins and a screening plant are being erected, with elevated tramway from the portal, and it is intended to install a coal-crusher to meet the demand for special grades of coal, also to replace the present steam traction-engine by a Diesel engine, with a compressor for underground pumping.

Malvern Mine (A. Taylor (Underviewer), Manager).—Following a short period of development in the two seams, 6 ft. and 4 ft. pillaring of the section to the rise of the new adit level commenced, and excellent extraction was obtained by special methods and using chutes in this highly inclined seam, 70 degrees.

It was decided to abandon the idea of recovery of the lower section of the dip roadway from the present adit, and to approach this by means of a new dip from the opposite side of the hill.

Simultaneous with this decision, development in the 6 ft. and 4 ft. seams ceased, and pillar work has been concentrated on while the new dip development commenced.

This dip, which struck the seam (6 ft.) after a half chain of driving from the surface, is being driven at a grade of 1 in 3 with firm sandstone for hanging and footwalls, and as it will be water-free until the level of the adit is reached, good progress is being made.

The coal is good hard quality with well-defined backs, and produces a high percentage of round coal.

By crosscutting at the desired point, the 4 ft. and also the 14 ft. seam, the latter so far untouched, can be developed through the new dip roadway, and the decision to adopt this development programme was a wise one.

Arrangements are in hand to install a D.C. Diesel-powered generator and motor-driven winch, as prospects of electric power being made avaiable are doubtful.

Manuka Point Mine (O. McQueen (Permit), Manager).—Two men are engaged developing a pair of levels in a block to the rise of the old Victory Mine.

The seam is 4 ft. 6 in. in thickness with good sandstone roof and lies at an inclination of 50–60 degrees.

The pair of levels, with separate portals which deliver to a chute and screen on the hillside, have now passed the fringe of the old mine workings, but the rise area to outcrop is limited to the projection of this pair of levels.

The old Victory workings are of small extent, and the proper development course to adopt would be from the Victory drive at road-level, which is well timbered and should be a simple matter to recondition, while a small elevator to give screening height would have been less costly than the chute and screen erected on the hillside slope.

Burnt Hill Mine (O. McQueen (Permit), Manager).—This small concern is operated by McRae Bros., and development is by a pair of levels, the seam being 5 ft. in thickness and lying at an inclination of 50–60 degrees.

The seam is generally of good coal, but at intervals the texture is somewhat shaken, but the roof of firm sandstone stands well.

Initially loading was by chute-screen, but a screen and staging are in the course of erection.

Klondyke Mine (A. Nimmo (Second Class), Manager).—Development has been to the south with the bottom and companion levels, but later the advancement of levels Nos. 3 and 4 recommenced in a southerly direction, to fit in with the proposed development programme, to furnish a new haulage raodway.

This new roadway will be established from the chosen point inbye on the lowest south level by a series of rise splits, and a surface approach to suit the banking layout, and is for the purpose of offsetting fault encroachment cutting diagonally across the north levels and in advance of the present dip-face.

All development to the south is in excellent coal with the seam inclination in the lower levels flattening to 38 degrees, compared with 78 degrees in the upper workings of the mine.

Pillaring has been continued in the two lower north levels adjacent to the cross-faulting previously mentioned, with a suitable system of chutes, ladderways, and goaf blockages giving very satisfactory results.

It is intended in the near future to introduce electric drilling-machines, which, for this class of coal and high inclination of the seam, should be a decided improvement.

Lucknow Clay-pit (W. G. Smith (Deputy), Manager).—Work of an intermittent nature has been undertaken, with operations confined to extracting the pillar to the rise of the trucking road, the amount of which is very limited.

Only a small output has been won, and it would appear that this special clay is mined to suit blending requirements at the pottery-works, which firm also works other clay deposits, with the workmen transferring as required.

Steventon Colliery (H. J. Robb (Underviewer), Manager).—Retreating from the dip, with a restricted width, has continued with satisfactory results and good extraction from the 6 ft. seam, while under favourable conditions reasonable recovery is also had from the 3 ft. seam which lies immediately above.

The coal is of excellent quality and commands a ready market.

The retreat has now reached the ninth level, and as the width of the pillars along the dip is narrow, excessive floor heave is experienced adjacent to the pillar places, and changes in the method of lifts and extraction are being tried to counter this to the best advantage.

Mount Somers Mine (R. R. Beckley (Deputy), Manager).—Development, combined with pillaring, continued during the major portion of the year, but towards the end of the term pillar work ceased.

Good extraction was obtained from pillar splits, lifts, and top coal, the latter usually about 10 ft. in thickness, to a good parting, and leaving a 1 ft. to 18 in. layer to hold the firm fireclay and sandy roof.

The places stand well, with the overburden closing the goaf immediately behind the line of retreat.

A coal-stone band flanking the former main road has been pierced and development continued in this direction in good coal, but the fault to the north-west limits the area available for the time being.

An upthrow fault 10 ft. to 12 ft. has been tested, with conditions looking promising, and new places are opening out in this direction.

Blackburn Nos. 1 and 2 Mines (W. L. Workman (Deputy), Manager).—In the No. 1 Mine, work is confined to pillar-extraction of the small area remaining to be worked adjacent to the haulage road.

Seasonal trade and absence of an employee has caused the mine to operate intermittently, for with the mines adjoining the men transfer as required.

No. 2 Mine: Development has continued in this small block with satisfactory results, but the main level should soon hole through to the opposite side of the knoll, and as the area to the rise is limited by a large fault, pillar-work will have to commence very soon.

The strike of the seam has been more regular of late, with the coal showing a lesser number of shaken quality, patches, and in the main being of good hard quality, with the places standing well.

Newburn Mine (T. Graham (Deputy), Manager).—Operations of a very minor nature were undertaken, and on my recent visit the rails and gear had been brought out of the tunnel.

The general appearance was that the area as a mining concern had been abandoned, although from the sand-pit adjacent to the portal a small output had been won.

Woodbank Mine (Albury) (J. H. Smillie (Deputy), Manager).—Early in the year heating caused the area to the west side of the dip to be sealed, and a new return air-course on the east side had to be formed, and a 24 in. Torpedo type of fan, electrically driven, installed.

Following the formation of the new air-course, extension of the dip commenced with the object of opening out a pair of levels to each side and forming a sump.

A shortage of experienced men has retarded this programme, but the required dip development should soon be completed and faces handy to the dip haulage available.

North Otago District

These mines are all small concerns employing from 2 to 6 men.

Willett's Mine (M. H. Wilson (Permit), Manager).—Operations are confined to pillar-extraction, which from splitting and lifts good extraction is obtained, with the soft sandstone overburden closely packing the goaf immediately behind the line of faces.

The seam at present is 7 ft. to 8 ft. in thickness in two distinct layers of good coal, the upper 3 ft. of darker colour and superior quality being overlain by a band of hard coal-stone, with well-defined partings at the top and bottom of this 3 ft. layer of coal.

The width of retreating face is narrow, but with the small output—1 pair of miners—the retreat is regular but slow.

Airedale Mine (R. A. Adcock (Deputy), Manager).—Pillaring from the dip continued during the early part of the year, with the width of face, one pillar to the left and two on the opposite side of the dip drive, and by splitting narrow and taking lifts, good extraction was obtained.

On Sunday, 6th June, smoke was observed coming from the fan shaft, and after locating the fire, which had travelled up the return some 5 chains, the mine was sealed at each entrance and the men accommodated in St. Andrews Mine, of similar ownership.

The recovery and isolation of the fire was undertaken at the end of the month under my supervision and with equipment from the Ohai Rescue Station, but as the fire had travelled some distance in the return air-course the imprisoned smoke and gases had created an ideal situation, and recovery was accomplished with safety and no inconvenience.

The location of the seat of the fire was found to be a pillar crack adjacent to a stopping of lower sealing, with the fire burning past the side of this stopping, but as all places were small—6 ft. by 6 ft.—the equipment (Blowman and smoke-masks) was only required for the temporary seal, and the three permanent seals were completed that evening.

An inspection the following day by me revealed all in order, and reconditioning work commenced, with production following.

Development to the north from the South Dip, where work ceased in 1937 owing to inferior coal, was started, the extent of poor outcrop coal, due to a surface depression, being small, and good coal was soon struck.

The programme is to extend this South Dip to intersect a pair of levels from the other dip, the position of which faces is in advance of the South Dip bearing, and to develop to the north and west.

St. Andrews Mine (J. H. Nimmo (Deputy), Manager).—Pillar work has continued with excellent extraction, by very narrow splits and lifts, with good roof control and a closely sand-packed goaf following withdrawal of the props, immediately behind the pillar lifts.

The area is small and retreat is now almost to the fan shaft, but suitable provision for future ventilation and protection of the shaft have been established, and goaf seals maintained.

Ngapara Mine (C. J. M. Nimmo (Permit), Manager).—Operations are solely pillar-extraction, which work commenced for the first time in this mine, towards the end of 1947 from the north-east corner on northern boundary, and as its history dates back some seventy years or more, pillaring will continue for many years.

From the seam, 24 ft. in thickness, by narrow splits and loose-end lifts, with extraction of top-coal simultaneously, good results are obtained, while the fine glauconitic sands overlying a thick bed of pipe-clay ensure a closely packed goaf a short distance behind the face.

This sand, which, following the first pillar roof-breaks, was wet and spilled freely into the workings, has now dried out, but the system of precautionary board barricades in roadways close seam to the faces is still maintained for safety.

Rockdale Mine (Herbert) (D. Gaudion (Deputy), Manager).—Development to the south with a pair of headings parallel with, but well in advance of, the main tunnel has continued, with the seam 12 ft. in thickness to a good coal-stone parting, which roof stands well.

The seam is of hard clean coal which commands a ready local sale, while the system of narrow development places 6 ft. by 8 ft. with 60 ft. pillars, is prudent.

Shag Point (A. K. McLean (Underviewer), Manager).—Early in the year, following the change of ownership, a more active policy was introduced with a view to recovering pillars left towards the foot of the dip and for further development work.

Simultaneously with surface rearrangements and extension of the road to the mine portal, reconditioning of the dip was commenced and good progress made for the first 4 chains, from which point difficulties were experienced, while advancement of the pump suction, owing to floor heave, also retarded progress. At a point 9 chains from the portal where the original dip drive had a slight bend to the north it was decided to deviate slightly to the south, and the face of the dip is now within this line of pillars, while by coupling the suction to the original pump column left *in situ* by the former owners water difficulties were overcome.

Recovery has been made for upwards of 11 chains, at which point the pillars to the south side are standing well, although the former dip drive, which has been well robbed, has collapsed in part.

A further 5 chains remains to be completed to reach the bottom of the old dip, where good coal of 8 ft. to 9 ft. in thickness was present when development ceased.

A new air-shaft, 60 ft., has been sunk and arranged as a second egress from a more suitable point.

The information obtained from the former owner and from the mine plan has not been in keeping with data furnished by the work of recovery, which has been a tedious, dirty, and difficult undertaking.

Central Otago District

Coal Creek (N. J. Harliwich (Permit), Manager); *Ourehua* (H. R. Upston (Permit), Manager); *Cambrian* (D. Jones (Permit), Manager); *Belmont* (G. W. Johnston (Permit), Manager); *Idaburn* (J. S. Murray (Permit), Manager).—Opencast operations, mainly to meet local requirements, have been continued on similar lines to those of previous years at the above pits, but a lessened demand for this class of fuel is being experienced, and activity over the last six months at Belmont Pit has been negligible.

East Roxburgh Mine (*Corcoran and Whites*) (F. J. Kemp (Permit), Manager).—Only a small amount of work has been done on the lease during the year, this being confined to driving a level in the seam from which a total output of 309 tons was mined, and the conditions of the lease are not being complied with.

The amount of plant is negligible, while the methods are of a very primitive nature, and as dip development will have to be undertaken, suitable plant is urgently required.

An area suitable for opencast mining is available, but this requires capital for drainage, stripping of overburden, and opening out a suitable face, and provision of this finance appears to be beyond the lessees.

Shepherd's Creek Mine (S. Hewison (Second Class), Manager).—This mine, which was within a few weeks of ceasing production following the death of the mine-manager, did not resume, and the pump and gear, which were back to within a chain of the portal, were withdrawn.

In December a party, with Mr. S. Hewison as manager, under an arrangement with the owners and using material available at the mine, commenced to unwater a mine about a quarter of a mile to the south of the abandoned mine.

This mine has not worked for some years, and I understand a run of wet sand was experienced.

Reasonable progress was made, using a rotary electrically-driven pump, 4 in. pipes, and by the end of January 3½ chains of dip headings (16 chains of roadways) had been unwatered, and arrangements were in trend to install a larger pump.

The total length of the dip is 800 ft. at a grade of 1 in 5 approximately, and the roadways unwatered and 2 chain arched stone adit are in excellent condition.

As the water recedes the daily progress made has gradually diminished, and this is no doubt due to the overlying sand-beds becoming saturated during the years the mine has been flooded.

The run of sand, previously referred to, will influence the inflow, while pillar-work in the recently abandoned mine, now full of water, may also be responsible.

The larger-stage turbo-pump, 15,000 to 20,000 G.P.H., recommended will soon prove whether the concern can be unwatered and economically worked.

Cairnmuir Mine (W. Hodson (Deputy), Manager).—This mine has continued to be operated by a co-operative party and the work has been confined to pillar-extraction to the south and development in this direction to intersect Gibson's old dip drive and workings, lying full of sand.

The seam is almost vertical, and from the system adopted good recovery is obtained, and the sand packs the goaf tightly immediately behind the face.

Dropping tops, or stoping to the rise along the rill of sand-spill, the pillars are breasted back in a safe manner to the extent predetermined, when the upper bridge is blasted and a further run of sand packs the open ground, and the cycle is resumed.

The programme was to project the dip at 1 in 2 grade for a further 120 ft. to furnish additional levels and a sump, but a sand run from the hanging-wall occurred, while an accident to the leader of the party also interfered with the proposed development.

Otago and South Otago Districts

Barclay's Mine (*Fairfield*) (F. Barclay (Second Class), Manager).—Operations continued in the old Walton Park area, mainly dropping top-coal and driving to the dip, but difficulty was experienced as these old places were closed or heaved, while the pillars were small.

As the water was lowered, and prospects looked good in June, excessive damp and a humid atmosphere caused the section to be sealed off, and an attempt to furnish a new access by crosscutting off the dip (Christies) was made.

Coal-stone bands present in the face of the old dip also cut across the line of the crosscut, and as the line of inferior coal follows this course the place was abandoned, and a decision made to prove this stony band with a minimum of driving by a prospecting drift off the opposite side of the dip, and extend through the Crown lease.

The single-phase pump proved inadequate, and three-phase equipment was installed at the mine with armoured cable underground and the surface winch converted to electric drive, but the centrifugal pump, 600 G.P.H., after a trial was replaced by a bulldozer pump of 2,000 G.P.H. capacity, which at a later period failed to make any advancement for about two months, but later the water commenced to be lowered.

Good progress was then made towards the old Prince of Wales shaft workings, when a large fall caused fully a chain of the dip drive at the face to be lost, for the sandy over-measures, due to the area being flooded for years, are waterlogged, while the floor heaves readily and the country is treacherous.

Driving parallel with and to the south of the fallen dip is now progressing satisfactorily in a seam 7 ft. in thickness, while a rise to the upper seam (approximately 7 ft. above) has been formed, and development commenced in this 5 ft. seam.

Victor Mine (*Brighton*) (L. Tikey (Deputy), Manager).—Development continued to the south-west, with the seam increasing to 5 ft. and in parts 6 ft. in thickness, but places driven to the south at 3 chains become stony with only 3 ft. of coal workable.

With development confined to a narrow area and the thin seam, the extension of the main roadway is rapid and transport will soon be a problem, for the measures are irregular.

The places are driven very narrow and to a coal-stone roof-parting some 6 in. off the soft sandstone main roof, which of late has not been as firm as that previously met.

Fernhill Mine (M. Hewitson (Deputy), Manager).—Pillar work, with excellent results, continued until January, 1949, in the No. 4 Mine, when the last pillar was extracted.

No. 3 Mine: Development resumed in this limited area following the abandonment of No. 4 Mine, and is confined to a narrow strip.

Four places are being developed in the top seam 6 ft. in thickness, this being the same seam as that worked in the No. 4 Mine adjacent, and the seam beneath has been worked some years ago.

The work will be confined to development and a system of splitting, as protection must be made for the City Council's water-race on the hillside above.

It is intended to pipe the water by a direct route, for which preliminary excavations have been completed, and when the deviation is arranged, orthodox extraction can be adopted.

Willowbank Mine No. 1 (E. Edmond (Deputy), Manager).—Pillar-work has continued along the level, and is now proceeding with satisfactory results adjacent to the lower portion of the main dip. The width of the area is narrow and floor heave is present, but the pillars stand well and good recovery is made.

In the No. 4 Mine (Wingatui), (R. D. Clark (Deputy), Manager) a short adit struck the coal within 2 chains, and a pair of headings is now being developed.

The seam of good hard quality with well-defined backs is 7 ft. to 8 ft. in thickness and the measures are at a low angle, but inclined to undulate.

Places are driven narrow with large pillars, and a good second egress has been formed.

Bins and screening plant have been erected, and a good road, 30 chains, formed to the mine portal from the county road. This company continued prospecting work at Saddle Hill adjacent to Bryce's and Dunnery's old workings, but during the latter part of the year the work has been intermittent only to suit seasonal trade at the other mines.

A pair of well-timbered dips (5 chains) have been driven and met old workings flushed with sand, and a prospecting drive projected 400 ft. at a bearing 45 to the west of that of the dip.

The measures, a low anticline, passed through are not promising, and it would appear that the edge of the field of Saddle Hill has been met, and boring in advance has been recommended.

Akatore Mine (*Milton*) (W. McDowell (Deputy), Manager).—Pillar-extraction has continued from a line where development ceased to the north and west owing to a thinning of the seam with stone bands present, and six pillars of this inferior class were left.

The retreat has now reached to within a chain of the jig-head, with the seam 9 ft. to a coal-stone parting, with sandstone immediately above.

A small opencast section was opened up, but this was not up to expectations, but as the overburden thickened and hardened a pair of headings was set away parallel with and to the dip of the former adit drive, and clean coal of 12 ft. in thickness has been met throughout.

Lovells Flat Opencast (T. Harris (Deputy), Manager).—Operations of a very limited scale have been undertaken at this opencast pit, with practically no output during the latter half of the year.

Good reserves have been stripped, but an improvement in supplies of coals of better quality has lessened the demand for lignite of this class.

Viewbank Mine (J. H. Lowrey (Deputy), Manager).—Formerly operated as an opencast pit, owing to increased overburden and difficulty in operating bulldozers on the irregular surface of the seam and grade, in August a change to underground mining was made, although part of the opencast face still operated. This face is 30 ft. to 35 ft. in thickness, but the stripping will rapidly increase onward.

These underground headings are being driven as levels from the lowest point reached with the opencast face, and are to the dip of a section of former workings which operated some years ago, and are intact and open to the upper fringe of the opencast pit.

Benhar Mine (J. Findlater (Underviewer), Manager).—Development in the bottom seam was concentrated on with a dip and companion and good progress made, operating double shift.

By August development had reached a point immediately beneath the extreme point of the workings in the top seam and the necessary sumpage established, and by a bore from this point the water, which had been allowed to accumulate in the upper workings following the sealing of a fire in that area in October, 1947, was drawn off under control.

A larger pump, 5,000 to 6,000 G.P.H., had been installed in readiness and an armoured cable fitted. Development is now being undertaken to the north side off the dip, with four levels advancing in a north-easterly direction, and six places, worked single shift, are available, from which a daily output of 50 tons is produced.

Taradale Mine (C. D. Nichol (Permit), Manager).—The section of the old Taratu Mine (McKenzie's) has been unwatered, and by splitting and driving through an area where the old workings had been driven in the upper part and middle of the seam a suitable haulage road has been established.

Development has commenced to the north immediately past the fringe of the old workings, where two places are operating in good coal, and conditions here and in the area on pillars look very favourable.

Kaituna Mine (*New*) (T. Harris (Deputy), Manager).—Following some prospecting on this area an adit was opened out and the coal-seam of excellent quality struck after 30 ft. of driving.

The old road to the former mine was reconditioned and extended 10 chains and metalled where necessary, and a small bin and screen erected.

After driving in good coal for upwards of 2 chains with a crosscut towards the outcrop, operations ceased, and I understand some arrangements have been entered into with the Department to delay further development until adjoining blocks have been tested as likely opencast areas.

The reconditioning of a tunnel on the opposite side of the gully is being undertaken with the intention of further driving to locate the seam. This tunnel was abandoned some years ago owing to lack of finance.

Sunnydale Mine (J. G. Barclay (Underviewer), Manager). The remaining pillars in the upper seam were extracted by the middle of the year, and from a small opencast face adjacent to the portal underground development in the bottom seam commenced.

A pair of headings has been driven 3 chains in a north-westerly direction, the coal being of good quality, with the seam thickness approximately 20 ft.

Wangaloa State Mine (Opencast) (G. Auld (Quarry Certificate), Manager). Operations have continued on a large scale with the stripping of the overburden, and with the multifarious earthwork machines in use good progress has been made and large reserves established, with a second face to the north-west now available.

An almost continuous boring programme has been in operation on this and adjoining areas and the field well proven.

A regular output (200 tons daily) has been won, and from the 25 ft. face clean coal, under ideal conditions and drainage, is being mined mechanically, while reserves for eighteen months are stripped of the overburden.

This is a good example of an opencast mine worked to advantage and well prospected in advance.

East Coast Coalmining Co. (Cross' Opencast) (R. Stanniford (Deputy), Manager). Operations on a more extensive scale have been introduced at this opencast pit, and while the seam is at present split, involving two operations to work it to advantage, boring operations and two old drives have proved good coal and a thick seam ahead and on the right flank. The present cut is on the low-lying ground and adjacent to the outcrop, but should improve as the face advances, while the second cut, on higher ground, will be under better conditions for removal of overburden and drainage.

A portable shaker-screen combination, with belt loader and small slack-bin, has been installed, and although the output is small the Diesel shovel and stripping-machine is capable of greatly increased production.

Kaitangata Mine (W. E. Hill (First Class), Manager).—The whole of the output from No. 2 Mine has been obtained from pillar-extraction, in the Electric Dip and Rogers' Heading Sections, the final stages in the latter having been reached and the section sealed.

All places are worked double shift, and with the seam 30 ft. thick and a good roof, from the three pillar places, approximately 8 chains down the Electric Dip, good extraction is obtained.

A pair of levels is being developed off this dip in a small block of coal about half-way down the dip and on the opposite side to the lower pillar places, and this should add to the life of the mine.

Development in a small seam near the north end of the main haulage tunnel was stopped, most of the levels meeting stony coal, but pillaring cannot be undertaken until the No. 2 Mine is completed owing to the risk of damaging the rope-road tunnel. The seal at the portal of No. 1 tunnel (closed in 1936) was removed, and later drilling at a point 600 ft. down the tunnel adjacent to the main seam intersection by this drive boring in the floor proved two seams of coal, 11 ft. of coal at 77 ft. and 9 ft. of coal at 149 ft. In conjunction with this boring prospecting, a dip drive has been undertaken in a small seam a few chains from the entrance to the tunnel, the coal being of good quality, but highly inclined.

Boring was continued by a No. 3 bore in Castle Hill property and proved various seams, the last being 17 ft. thick at a depth of 607 ft. Difficulty at various stages was experienced with the drilling of this hole.

Summer Hill Mine (W. E. Hill (First Class), Manager).—Development on an increasing scale has been undertaken, with the seam in places proved to be 40 ft. in thickness. The seam is, however, subject to lensing bands of clay and mudstone within it in sections, while it is also irregular in strike and dip, and although at an easy grade, the pillars are very irregular in shape.

The quality of this seam is inferior to the Kaitangata coal.

Improvements in surface arrangements have been made by the erection of a bin and extending the lorry road to within a few chains of the portal, the surface tram-line, operated by horse haulage, being eliminated.

Southland District

Costers, Raby, Starlight, Midway, Argyle, Ota Creek, Diamond Lignite, Waituna, and Tauanga Pits.—Opencast operations were continued with varying degrees of activity, based on local requirements at these small pits.

Terrace Road, Waimumu, Newvale, Hedgehope.—These comprise the larger opencast pits and are all in the Gore-Mataura district.

Terrace Road Pit (A. W. Coster (Permit), Manager).—Operated by the New Zealand Paper Mills, this pit ceased production in January, 1949, for, although the face was 25 ft., the rapidly thickening and harder overburden increased operating-costs.

The company has now transferred its machines to the Midway Pit, adjacent to the main highway and within a mile of the works.

From the Midway Pit, formerly operating by 1 man, a daily output of 120 tons is now being mined mechanically.

Waimumu Pit (S. I. Allison (Permit), Manager).—Operations were confined to working a high face, but later the bottom strip has been worked back from the far corner of the pit, but as the lower 3 ft. of the seam is of poor quality with muddy veins, this is being left and only a 6 ft. layer worked at present.

Although the face is hand operated and loaded, electric drilling-machines are installed, and a steam-shovel is to be converted to do the loading at the face.

A substantial bin and screening plant are in the course of erection adjacent to the pit, and a crusher may later be considered to meet trade requirements.

Newvale Pit (R. A. Adair (Permit), Manager).—A rapidly increasing face has been opened out, and although no machinery for drilling or operating at the face is in use, a large output is obtained from a face 15 ft. high. It is intended later to grade the road down and work the lower strip of the seam, which is up to 40 ft. in thickness, and then to back-fill the pit as future overburden is removed.

This pit is operating close to the Waimumu Co., some eight miles from the Gore–Mataura.

Hedgehope Pit (A. Maxwell (Permit), Manager).—The face, 16 ft. to 18 ft. in height, has been advanced as a strip alongside previous back-filling of the pit, but as further strips will involve increased overburden of a hard nature a new area of 40 acres has been bored showing 22 ft., and a shift to this will soon be made.

The face is totally hand-operated, but a steady good output is maintained.

Boghead Mine, Mataura (E. W. Moseby (Underviewer), Manager).—Development continued in levels to each side of the lower section of the dip, where the usual uniform conditions were present.

The matter of second work to the best advantage in this thick seam under good farming-land, with upper measures consisting of gravels, &c., was discussed, as it must soon be undertaken, and a system which should enable a good percentage of the seam to be recovered decided upon.

Terrace Mine, Balfour (W. McJ. Dixon (Permit), Manager).—Operations of a small intermittent nature have continued at this mine to meet local requirements. The general underground conditions are damp, and the coal is of good hard quality, with a well-defined parting forming the roof of the places, with a good thickness of top coal.

Glenlee Mine, Waikaka (E. McGregor (Permit), Manager).—Development with a small output continued to the west off the extreme end of the horse road, but early in December fumes from a dormant fire in old workings resulted in the area beyond this connection being sealed off.

Development will now be in a block of solid coal to the east of the horse road at a short distance from the portal, and as a shallow syncline follows the sourse of the haulage road, this will form a suitable barrier for the new development.

Waimeamea Mine, Orepuki (M. Fowler (Second Class), Manager).—Work in the first part of the year was confined to recovery and reconditioning of the old Orepuki Dip drive, unwatering of these workings, and establishing a suitable ventilation circuit.

In conjunction with this, opencast mining was applied to a small area adjacent to the Waimeamea Stream.

Following the reconditioning of the dip for 6 chains, two levels to the west were roaded and the extraction of small pillars left by the old company commenced inbye.

An area to the west of the portal and adjacent to the stream has been stripped of overburden, and from this strip, 4 chains by 1 chain with the seam 7 ft. to 8 ft. in thickness, which will be worked by the opencast method, the company hopes to maintain the output while the lower section of the old dip is dewatered and reconditioned.

This 3-chain section is subject to floor heave and the condition of the timber is badly crushed, the result of breaking the floor to regrade the dip.

On completion of this work it is intended to prove the fault crossing from the east. The seam is good hard quality of excellent appearance, and places 7 ft. high to a 4 in. bed of hard oil-shale which forms a good roof are worked, but a further 2 ft. of coal overlain by another oil-shale layer 9 in. thick exists, the main roof being of a treacherous nature.

Ohai-Nightcaps Opencast Mines.—Operations in the Hardmac and Liberty Pits terminated during the year when all coal that could be economically won was extracted.

Brazier's Pit.—This also ceased production for a period, but later the Kaireka Coal Co., following a boring programme and erection of a good bin and screening plant, with installation of electric power, commenced to mine coal from the area, but heating in old Nightcaps mine workings caused a halt, and operations were transferred to another area that had been stripped.

This area has proved very disappointing, and it appears that the large reserves stripped are not the true seam, and production for the time being has stopped, and this and borings are being investigated.

Black Diamond State Opencast (M. Dixon (Deputy), Manager).—Stripping operations on a large scale, with various machines engaged, have been carried out on this area and a good output won during periods of production.

With the completion of the present stripping programme it should be possible to maintain a regular output in future, with reserves ahead of requirements.

The coal is of excellent quality, and now that the full thickness of seam is available it can be worked to greater advantage. The installation of a larger pumping unit would also be an advantage from various aspects.

Ohai Coal Co.'s Opencast (J. W. McKenzie (Underviewer), Manager).—Opencast operations with a good output have continued on this area adjacent to a fault upthrust of a thick seam, and a large stripping programme has been undertaken.

Mossbank Mine (A. E. McMillan (First Class), Manager).—Operations have been confined to pillar-extraction in the lower part, south-west of the mine, and in the old No. 1 Rise Panel. A new haulage stone-tunnel has been driven, which will enable the coal under the old haulage roads to be extracted.

This tunnel was driven by rising from underground a total distance of 700 ft. at a grade of 1 in 3½, while the surface approach and winch chamber required a further 170 ft. of stone driving.

A 75 h.p. electric haulage (flameproof equipment) has been installed to furnish a reliable transport system.

Linton Nos. 1 and 3 Mines (A. Colligan (First Class), Manager).—In the No. 1 Mine, development has been in Sections Nos. 10 and 11.

In the former, levels are advancing in a south-west direction from the No. 1 panel, and a point 5 chains distance headings have been driven 2 chains from which a panel will be formed.

This area is on the rise side of the fault that was previously encountered in No. 10 Section and the coal is of excellent quality 40 ft. thick.

In No. 11 Section, headings are being projected to the south-west to develop the area along the Birchwood Mine boundary, with the distance driven approximately 4 chains, and the seam 40 ft. in thickness.

Pillaring has been undertaken in No. 8 Section—No. 3 Linton Mine.

The No. 6 Dip has been projected to the east some 16 chains from the main haulage road, and places developed 6 chains to the south and 3 chains to the north. The seam here is very thick, 40 ft. to 50 ft.

Pillaring to the west of the rope-road junction has continued with good results.

The main bathhouse has been extended 40 ft. with extra showers and a larger boiler installed, while at the bins and screens a bathhouse fitted with showers and electric heaters for the use of surface workers has been erected.

Further improvements have been the erection of a concrete, fully-equipped underground ambulance-room adjacent to the No. 10 Section, No. 1 Mine, and an ambulance-room in No. 3 Mine.

Wairaki Nos. 1 and 3 Mines (F. E. Lockington (First Class), Manager).—No. 1 Mine: An area of coal previously left on the east side of the dip a short distance from the portal has been blocked out, followed by pillar-extraction, from which good results were obtained, and the area has almost been worked out.

On the west side development continued in an irregular area formerly left, and later good coal was encountered, and development continued to within 2 chains of the No. 2 Mine workings, from which levels the area to the rise is being worked.

A new access has been formed by driving to the rise from a central position to connect with the main dip roadway about a chain from the portal, while a dip is also being advanced from the central position on the same bearing.

No. 3 Mine.—No. 6 Section: Development has reached a point about 19 chains from the main dip, where a split in the seam accompanied by minor faulting gave considerable trouble, and development has ceased for the time being.

No. 8 Section: Development has extended to 18 chains off the main dip, and the fault running along the bottom side between No. 9 and this section appears to have run out.

No. 9 Section: Development has advanced to 10 chains past the old No. 9 laybye. On the west side of this section the bottom part of the seam now contains bands of stone, and the places are driven above these bands.

No. 5 Section: Development in the main levels has reached a point 20 chains from the main dip and panels are being developed.

No. 1 Section, No. 5 Level: On the inside of these levels a dip is being driven to form a second dip panel, and rise panels are also being opened out. The main return airway is being enlarged and secured with heavy rail girders in place of timber, and a good job made.

Star Mine, Stafe (J. Lewis (First Class), Manager).—The work has been solely pillar-extraction in the middle and lower sections on the east side of the mine.

During the year two heatings occurred in the goaf, one in each section, and these were effectively sealed with log and clay stoppings.

The coal is of excellent quality and produces a large percentage of round coal.

A 10 h.p. three-stage electric pump was installed at the foot of the main dip.

Birchwood Mine (J. Lewis (First Class), Manager). The output has been obtained from development and pillar-work in the No. 1 West area.

In No. 1 Dip Section the seam thinned, and pillaring commenced in May, with good extraction from the low seam.

No. 2 Dip Section : The seam also thinned rapidly in the lower section of this dip, and pillar work on similar lines to No. 1 Dip commenced in January of this year, the seam at present being 6 ft. to 7 ft. in thickness, of good coal.

No. 3 Rise Section : Development work has been porceeded with and eighteen pillars now formed. A rise to No. 1 West top workings is being driven, and this will furnish a second return air-course and permit an ascensional ventilating system to be adopted.

Fatal Accidents

Three fatal accidents occurred during the year.

On 9th April about midday, John Hodson, married, and fifty-seven years of age, manager of Shepherds' Creek Mine at Bannockburn, was seriously injured by a piece of coal from roof and rib of a small drive. Hodson was in Cromwell Hospital until the 19th, when complications developed, when he was conveyed to Dunedin Hospital, where he succumbed to his injuries the following evening at 8 p.m. Hodson's injuries consisted of nine fractured ribs.

On Tuesday, 4th May, at approximately 3.30 p.m., John McInerney, a miner, single and twenty-eight years of age, was killed by a fall of coal in the Wairaki No. 1 Mine. Deceased was working single, within a chain of his brother, the place being a top-coal one of a total height of 11 ft., the lift of top coal being 4 ft., and while trimming the lip by pick from inside he was evidently knocked down, and was struck on the head by a lump of coal approximately 3 cwt. and killed instantly.

On Thursday, 30th September, at 10.30 a.m., John Johnstone, a single man twenty-two years of age, a miner, was killed by a fall of coal in the Star Mine. Deceased and mate had just returned to the place following "smoke-oh," and, as all coal had been filed away, intended to lift the short rails at the side of the jig prop, and had just stepped between the rails to lift them when a lump of coal approximately 10 cwt. fell from the lip and killed him instantly. The lump broke off immediately behind the jig prop and sprung the sprag-prop, which had been set to the lip. The place was only 6 ft. high with the top coal face 20 ft. to 25 ft. of very strong coal, and the fatality occurred just inside the low lip.

Serious Non-fatal Accidents

On 25th April William Hodson, manager of Cairnmuir Mine, Bannockburn, while installing a pump had his right leg fractured (simple) when a piece of coal he was pulling down fell back on him after striking the floor.

On 12th June at 11 a.m., Leslie Allan Cruickshanks, married, with three children, a miner employed at Boghead Mine, Mataura, received severe burns to the back of the hands and arms, in an attempt to protect his face, when sparks from a lamp lit a small quantity of loose powder. Blasting-powder in cartridges is used, and the injured man was knocking off for the day when the acetylene lamp on his head bumped the rib and sparks entered the powder canister which he was preparing to take out, igniting some loose grains of powder or a small cartridge.

On 28th June R. Moore, a miner employed in the Star Mine, while walking over a bench of coal, slipped and sustained a fracture of the left fibula.

On 2nd July a miner, G. McDonald, employed in the Kaitangata Mine was struck on the back by a small piece of coal while filling a box and x-ray later revealed a fracture of the transverse process of the third lumbar vertebra.

On 21st July Herbert Wilson, single, age thirty-five years, while filling coal into a lorry at Ota Creek Opencast Pit, Wyndham, was struck on the thigh by the end of a long lump of lignite which topped over, receiving a simple fracture of the femur just above the knee. Later complications developed and the leg had to be amputated owing to gangrene of the foot.

On 5th August M. D. Grant, while handling a carryall tire at the Wangaloa State Opencast, slipped and fell, striking his right ankle. An x-ray later revealed a fracture of a small bone in the ankle.

On 4th November at 2.30 p.m., Walter Wild, sixty years of age, a miner employed in the No. 1 Linton Mine, suffered a fracture of the pelvis. The accident occured on a narrow section of the main haulage road, and Wild was found lying at the side of the road. The accident is of a suspicious nature, as the injured man should have travelled by the customary travelling road, and the answers to my inquiries were evasive.

Dangerous Occurrences

Mossbank Mine.—Heatings were reported on 26th April in area to the east of Aylwards Dip, and also on the 24th September in the dip workings, No. 2 Section, and on 15th March of this year in Aylwards Dip, all of which have been successfully sealed off.

Star Mine.—Heatings were reported on two occasions and the goaf was effectively sealed off.

On 27th August a heating was reported in the goaf in the Middle Section, and on 27th November the manager reported a heating in the goaf, Magee's Dip Section.

Fernhill Mine.—On 2nd June the manager reported an active fire which had broken through to the surface and fouling the No. 4 mine workings. The area was sealed under my supervision and gave no further trouble.

Airedale Mine.—On 5th June smoke was observed coming from the fan shaft, Airedale Mine, and after an attempt to locate the fire, and as it was gaining hold, the two entrances were sealed. The mine was reopened a month later under my supervision and the seat of the fire sealed off and work resumed.

Glenlee Mine, Waikaka.—On 3rd December advice was received from the owner that fumes from old workings were entering the mine, and the area beyond this junction was sealed off and work commenced in a new area close to the portal.

Prosecutions

Two prosecutions for breaches of the regulations were laid and each was successful, these offences being in the Ohai district. A mine-manager was prosecuted for breach of Regulation 220 (1) and fined £3 and 12s. costs.

A shot-firer in an opencast mine was prosecuted for breach of Regulation 221 (4) and fined £3 and 12s. costs.

Ohai Rescue Station

The Officer in Charge and his men have rendered valuable service on several occasions during the year, details of which were :—

24th April, Mossbank Colliery ; Examining sealed area to find out how far the water seal had risen in the dip so that mining operations could be continued and adjusted.

17th July and 7th August, Birchwood Colliery : On these occasions the rescue team was standing by as a precautionary measure.

24th August, Mossbank Colliery : Sealing off a heated section.

27th August, Star Colliery : Sealing off spontaneous heating in the goaf.

18th September, Star Colliery : Recovery of a winch and other equipment left inside a stopping during the above sealing, which was a rush job, to complete the seal late at night.

24th September, Mossbank Colliery : Sealing off a heated area.

30th September, Mossbank Colliery : Examining a sealed area with view to reopening, to resume mining.

26th November, Star Colliery : Sealing off a heated area.

It is gratifying to see the managers calling on the brigade's services even for what may appear as trivial matters, and the presence of the trained men with equipment, even for small periods of assistance, may have prevented serious or dangerous conditions from developing.

Three new men were trained during the year, and 33 trainees attended for refresher courses.

The Officer in Charge has also assisted me with the preparation of equipment, examination of candidates for gas-testing certificates, and re-examination at five-year period.

ANNEXURE B

RESCUE STATIONS: ANNUAL REPORT FOR 1948 (F. DUFFY, SUPERINTENDENT, MINES RESCUE STATIONS)

During the past year the Officers in Charge of all the rescue stations again performed valuable service to the coal-mining industry. Trained rescue brigades rendered good service in making inspections of suspected heatings in the various mines and dealing with mine fires. At several of these fires the brigades were the means of saving a fairly large amount of coal and mine plant.

The rescue stations were kept in good order, both inside and outside, and the whole of the mine rescue equipment was well maintained.

The mine rescue vans were kept ready at all times in case of emergency calls.

DOBSON RESCUE STATION

Number of trained men on register	72
Number of men trained during year (included in above)	7
Total individual man practises during year	338
Number of team practises during year	58
Number of emergency calls during year	6

The following were the emergency calls received during the year:—

Liverpool Mine, Rewanui.—On 16th February, 1948, the mine-manager reported the occurrence of a heating in Kimbell West Section. No Proto apparatus was worn, but two trained rescue men were on duty until the heated area was sealed off.

Terrace Mine, Reefton.—On 3rd March, 1948, at the request of the mine-manager, a trained rescue brigade dealt with a fire which had broken out on the main jig. Six temporary stoppings were erected. The Proto breathing-apparatus was not used during the building of these stoppings. The seal proved effective.

Terrace Mine, Reefton.—On 31st May, 1948, at the request of the mine-manager, the services of trained rescue men were given to deal with a fire that had broken out in a pillar on the main road. The fire could not be dealt with owing to the roof collapsing. An attempt was made to fill the fallen roof away to get at the fire, but it was found this could not be done, and it was sealed off by erecting three stoppings. Proto apparatus had to be worn by seven trained men using the apparatus alternately. The seals proved effective.

Liverpool Mine, Rewanui.—On 11th June, 1948, the mine-manager reported that a heating had been discovered by himself and the underviewer on the outbye side of No. 2 Bank, Morgan East Section. Two trained rescue men were on duty until the sealing was completed.

Hillcrest Mine, Reefton.—On 18th June, 1948, the mine-manager reported by telephone that a fire had broken out in the mine. Stoppings were erected and the fire sealed off effectively. No apparatus had to be worn, but two trained rescue men were on duty.

Blackball Mine, Blackball.—On 22nd November, 1948, the acting-mine-manager reported that one of the fire stoppings in the goaf was leaking. This was in the Sump Section. The stopping was repaired and replastered by two trained rescue men wearing the Proto apparatus.

BULLER RESCUE STATION

Number of trained men on register	37
Number of men trained during year (included in above)	28
Number of refresher courses carried out	38

Refresher courses were carried out every two months by each brigade. The majority of these practises were carried out underground at all the principal mines in the Buller district.

Emergency calls were received from the following mines during the year, the number being seven:—

Millerton Mine, Granity.—On 11th February, 1948, an outbreak of fire occurred in the Old Dip Settlement Section. Three trained men wearing Proto apparatus made an inspection of the fire area and found that the area would have to be sealed off. The fire was effectively sealed with concrete blocks.

Hydro Mine, Seddonville.—On 14th February, 1948, at the request of the mine-manager, an inspection of the old fire area was carried out by a rescue team with a view to ascertaining how much coal could be won from the pillars. Six trained men wearing Proto apparatus carried out the inspection when large concentrations of blackdamp were encountered. This was considered good training for the rescue men.

Coal Creek Mine, Seddonville.—On 27th February, 1948, the mine-manager asked for an inspection o be made of some old workings with a view to recovering some pillars that had been sealed off owing to a fire occurring many years ago. An inspection was carried out by six trained men wearing Proto apparatus. It was not very successful, owing to the brigade encountering large falls of roof.

Denniston Mine, Denniston.—On 23rd April, 1948, the mine-manager requested the services of a trained rescue brigade owing to a fire occurring in the Extension Section. Six trained men wearing Proto apparatus made the inspection. It was found that three temporary stoppings were required to seal off the fire. The brigade had to erect these stoppings on account of a dangerous percentage of CO being present.

Hydro Mine, Seddonville.—On 28th April, 1948, at the request of the mine-manager, a further inspection of these old workings was carried out. Two trained teams wearing Proto apparatus carried out the inspection alternately.

Cascade Creek Mine, Burnett's Face.—On 7th July, 1948, the mine-manager requested the services of trained rescue men to deal with an outbreak of fire. Two trained teams of five men in each team were required to seal off the fire. These two trained teams wore the Proto apparatus until the three temporary stoppings were completed.

Cascade Creek Mine, Burnett's Face.—On 29th July, 1948, another outbreak of fire occurred. This required the services of a trained rescue brigade of five men wearing Proto apparatus to build two temporary stoppings in order to seal off the fire.

Ohai Rescue Station

Number of trained men on register	33
Number of men trained during year (included in above)	3
Number of individual team practises	113

Refresher courses by trained men were carried out at the rescue station and underground at the various mines in this district and were well attended.

The absence of any major trouble in the field was gratifying and all heatings were sealed off with the minimum trouble.

Nine requests were received for services of trained rescue brigades during the year :—

Birchwood Colliery, Ohai.—On 24th April, 1948, an examination of the fire area was carried out by one man wearing Proto apparatus for a distance of ½ chain in order to ascertain how far the water had risen to seal off the fire.

Birchwood Colliery, Ohai.—On 17th July, 1948, an opening had to be made in a stopping for the insertion of a ventilating-pipe. As a precautionary measure one man was on duty with Proto apparatus.

Star Colliery, Ohai.—On 24th August, 1948, the mine-manager advised that a heating had taken place in the mine. It was decided to seal the heated area off with two stoppings. Two trained men were on duty with Proto apparatus during sealing operations.

Star Mine, Ohai.—On 25th August, 1948, a request was made by the mine-manager to examine a fire stopping. It was found that this stopping was leaking, omitting firestink. The stopping was effectively sealed. One man was on duty with Proto apparatus.

Star Colliery, Ohai.—On 27th August, 1948, the mine-manager advised that he had decided to put in a new line of stoppings around the previous heating owing to the crushed nature of the coal. During the erection of the new stoppings two men were on duty with Proto breathing-apparatus.

Birchwood Colliery, Ohai.—On 18th September, 1948, the mine-manager requested the services of trained men to enter the heated area for the purpose of recovering a winch. This was recovered, with four men wearing Proto apparatus.

Mossbank Colliery, Ohai.—On 24th September, 1948, owing to heating being discovered, it was decided to seal the area off. Two trained men were on duty during sealing operations.

Mossbank Colliery, Ohai.—On 30th September, 1948, the mine-manager requested the services of trained rescue men for the purpose of making an inspection of a fire area which had been sealed off some time previously. The inspection was carried out by two trained rescue men and proved successful, it being found that several pillars of coal could be recovered.

Star Colliery, Ohai.—On 26th November, 1948, a heating was discovered, and the mine-manager decided to seal off the area. Two trained men were on duty during sealing operations.

Rotowaro Rescue Station

Number of trained men on register (including 13 at Benneydale)	70
Number of men trained during year—	
Benneydale	5
Rotowaro	7

The work carried out in this district has been of considerable importance to the management of the various mines in the Waikato and Benneydale districts.

Nine emergency calls were received :—

Mangapehi Mine, Mangapehi.—On 4th April, 1948, the mine-manager advised that a fire had broken out in the main dip and stoppings could not be erected on account of the state of the roof. The turbine pump, motor, pipes, cable, and other electrical equipment were recovered and the dip was allowed to be flooded. Five trained rescue men were on duty.

McDonald Mine, Rotowaro.—On 10th April, 1948, the mine-manager requested the services of a trained rescue team for the purpose of reopening a fire area in East Section. Five trained men fully equipped with Proto apparatus made the inspection and discovered an active fire between two temporary stoppings. The fire was dealt with by the application of water and stonedust. The heated coal was afterwards filled out. After a further inspection, conditions were found to be very satisfactory.

Pukemiro Mine, Pukemiro.—On 27th April, 1948, the mine-manager advised that a fire had broken out in the return airway, Horne's Drift. The fire was first sealed with a temporary stopping. Afterwards a permanent stopping was erected. Three trained rescue men were on duty during the sealing operations. No Proto equipment had to be worn.

Pukemiro Mine, Pukemiro.—On 1st May, 1948, the mine-manager requested the services of a trained rescue team owing to a fire having broken out at the top of Horne's Drift. Four stoppings had to be erected to seal off the fire. Six trained men were employed during the sealing process, which proved effective.

Pukemiro Mine, Pukemiro.—On 1st July, 1948, a call was received from the mine-manager asking for the services of trained rescue men to help seal off a fire in No. 1 Left area. The fire was successfully sealed. Three trained rescue men were employed.

Pukemiro Mine, Pukemiro.—On 2nd July, 1948, the mine-manager requested the services of trained men to make a further inspection of No. 1 Left area. During the inspection a large active fire was located. The fire was effectively sealed off by erecting new stoppings. Two trained men were on duty.

McDonald Mine, Rotowaro.—On 11th October, 1948, the mine-manager reported that a heating had been discovered in the Sullivan Section. Three trained rescue men wearing Proto apparatus made an inspection of the heated area. After the inspection it was decided to seal the area. Two stoppings were erected without having to use the breathing-apparatus.

McDonald Mine, Rotowaro.—On 25th October, 1948, the underviewer reported that a fire had broken out at the rope end, Sullivan Section, and requested the services of trained rescue men. Three trained men, accompanied by the Officer in Charge, made an inspection of the fire area and found an active fire at one of the stoppings. This fire was effectively dealt with by the application of stonedust. Two stoppings were then erected and the fire successfully dealt with.

Pukemiro Mine, Pukemiro.—On 7th December, 1948, at the request of the Inspector of Mines, Mr. J. Adamson, the Officer in Charge proceeded to the mine to assist in sealing a heating which had occurred in the South Mine, Right Section. Four trained rescue men were engaged in sealing off the heated area. Three stoppings were required. During the erection of the first two stoppings the Proto breathing-apparatus had to be worn by the trained men. The last stopping was erected without having to wear the apparatus.

STATISTICS OF WORKINGS IN COAL-MINES, 1948

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 1948.	Total Output to 31st December, 1947.	Total Output to 31st December, 1948.	Numbe. of Persons ordinarily employed.		
											Above.	Below.	Total.
NORTHERN INSPECTION DISTRICT													
								Tons.	Tons.	Tons.			
Waikato District													
Rotowaro, Rotowaro	Freehold ..	31	Brown ..	2	7′ to 27′ ..	Full ..	Bord and pillar	70,862	3,792,635	3,863,497	54	135	189
Alison, Rotowaro	,, ..	9	,, ..	1	6′ to 22′ ..	,, ..	Ditto ..	78,635	548,248	626,883	74	122	196
Alison (Opencast), Rotowaro ..	,, ..	1½	,, ..	..	.. ..	.. ..	Opencast	38,345	5,363	43,708	9	..	9
Pukemiro, Pukemiro	,, ..	33	,, ..	1	4′ to 18′ ..	Full ..	Bord and pillar	105,779	3,827,310	3,933,089	67	226	293
Wilton, Glen Massey (State) ..	,, ..	18	,, ..	1	6′ to 8′ ..	7′ 6″ ..	Ditto ..	91,911	1,405,475	1,497,386	58	149	207
Waikato Extended, Huntly West..	,, ..	4	,, ..	4	.. ..	16′ ..	Opencast	19,720	168,125	187,845	12	..	12
Glen Afton, Glen Afton ..	Crown lease and freehold	28	,, ..	1	4′ to 16′ ..	9′ ..	Bord and pillar	42,117	2,369,591	2,411,708	28	93	121
MacDonald, Waikokowai ..	Ditto ..	18	,, ..	1	6′ to 20′ ..	9′ to 14′ ..	Ditto ..	122,484	2,357,456	2,479,940	89	233	322
Kopuku (Opencast), Kopuku ..	Freehold ..	1	,, ..	1	40′ ..	.. ..	Opencast	12,436	..	12,436	8	..	8
Clifton Collieries, Kopuku ..	,, ..	½	,, ..	..	30′ ..	8′ ..	Bord and pillar	166	..	166	1	3	4
Whatawhata Campbell, Whatawhata	Crown lease ..	27	,, ..	1	10½′ ..	10′ ..	Ditto ..	9,062	138,251	147,313	8	5	13
Renown, Renown	Freehold ..	21	,, ..	2	15′ ..	7′ 6″ to 9′ ..	,, ..	93,320	2,119,241	2,212,561	62	194	256
Glen "A" Potteries, Glen Afton ..	,, ..	12½	,, ..	1	9′ ..	9′ ..	Opencast	92	3,336	3,428	1	..	1
Rangitoto (opencast), Otorohanga	Native lease ..	½	,, ..	1	7′ ..	7′ ..	,,	1,230	21,510	22,740	3	..	3
Victory, Rotowaro	Leased from Taupiri Co.	2	,, ..	1	14′ ..	8′ ..	Bord and pillar	7,180	4,381	11,561	1	6	7
Kinihia (State), (opencast) ..	Crown lease and University endowment	4½	,, ..	1	..	..	Opencast	77,762	173,170	250,932	28	..	28
Kemp's (State), (opencast) ..	Freehold ..	4½	,, ..	2	..	..	,,	66,318	142,912	209,230	50	..	50
Heworth Mining Party, Glen Massey	..	½	,, ..	1	6′ 9″ ..	..	Opencast and underground	505	..	505	..	3	3
Taranaki District													
Old Stockman, Mokau	Freehold ..	28	Brown ..	1	4′ 6″ ..	Full ..	Bord and pillar	689	17,749	18,438	..	2	2
Mangapehi (State), Mangapehi ..	Crown lease ..	14½	,, ..	1	8′ to 20′ ..	7′ to 8′ (top coal to 15′)	Ditto ..	38,069	414,060	452,129	28	108	136
Tatu, Ohura (State)	,, ..	11	,, ..	1	7′ ..	Full ..	,, ..	30,416	258,817	289,233	28	68	96
Aria, Aria	,, ..	5	Semi-bituminous	1	13′ to 14′	8′ to 10′ ..	,, ..	1,922	10,343	12,265	2	2	4
Waitewhena (State), (opencast) ..	Freehold ..	4½	Brown ..	1	11′ ..	11′ ..	Opencast	43,144	95,289	138,433	30	..	30
Mangakara Hydro Coal Syndicate, Ohura	Crown lease ..	2	,, ..	1	5′ ..	5′ ..	,,	6,662	6,329	12,991	2	..	2
Tonga, Ohura (opencast) ..	,, ..	3½	,, ..	1	3′ 6″ ..	3′ 6″ ..	,,	648	316	964	2	..	2
Paparata, Ohura (opencast) ..	,, ..	2½	,, ..	1	3′ 9″ ..	3′ 9″ ..	,,	209	1,855	2,064	2	..	2
E. Maslin, Ohura	,, ..	½	Sub-bituminous	1	3′ 6″ ..	3′ 6″ ..	,,	268	..	268	3	..	3
Sunnyside Mine, Waitewhena, Ohura	,, ..	..	Brown ..	1	12′ ..	7′ 6″ ..	Bord and pillar	4,433	..	4,433	..	6	6

Hikurangi District																
New Kamo, Kamo	Freehold ..	14½	Sub-bituminous	1	8′ to 16′ ..	8′ to 9′ ..	Bord and pillar	49,088	586,600	635,688	25	122	147
Opencast, Hikurangi	Crown lease ..	1¼	Brown ..	1	5′ ..	5′ ..	Opencast	1,666	206	1,872	2	..	2
Kiripaka, Kiripaka	Freehold ..	1½	Sub-bituminous	1	6′ ..	6′ ..	,,	50	380	430	2	..	2
Output of collieries now abandoned or suspended									12,956,635	12,956,635	..	..	..
WEST COAST INSPECTION DISTRICT													
Nelson District													
Westhaven, Collingwood ..	Freehold ..	10	Sub-bituminous	1	6′ ..	Full ..	Board and pillar	2,796	28,913	31,709	2	5	7
Owen, Owen River	Crown lease ..	19	Ditto ..	1	4′ 6″ ..	,, ..	Ditto ..	2,090	55,472	57,562	1	9	10
Strathmore, Ariki	,, ..	7½	,, ..	1	4′ 5″ ..	,, ..	,, ..	114	904	1,018	..	2	2
Six-mile, Murchison	,, ..	7½	,, ..	1	6′ ..	,, ..	,, ..	425	7,737	8,162	..	3	3
Murchison Collieries, Murchison ..	Crown lease and freehold	1	,, ..	1	12′ ..	,, ..	,, ..	1,429	..	1,429	..	3	3
Buller District													
Allan's (Nile-Hydro), Charleston ..	Crown lease ..	16	Lignite ..	1	25′ ..	15′ ..	Opencast	1,177	236	1,413	15	..	15
Mitchell's (Nile-Hydro), Charleston	,, ..	21	,, ..	1	15′ to 30′	15′ ..	,,	1,957	2,204	4,161			
Bowater and Bryan, Charleston ..	,, ..	18½	,, ..	1	4′ to 36′ ..	Full ..	,, ..	23,726	148,209	171,935			
Brighton, Fox River	,, ..	16	,, ..	1	12′ to 16′	8′ ..	Bord and pillar	2,863	11,360	14,223	1	2	3
Cascade, Cascade Creek	,, ..	22	Bituminous	1	20′ ..	10′ ..	Ditto ..	17,406	357,542	374,948	7	10	17
Charming Creek, Ngakawau ..	,, ..	21	,,	1	20′ ..	9′ ..	,, ..	34,828	473,834	508,662	21	35	56
Coal Creek, Seddonville	,, ..	31	,,	1	12′ ..	10′ ..	,, ..	4,821	132,716	137,537	1	6	7
Hydro, Seddonville	,, ..	13	,,	1	20′ ..	Full ..	,, ..	9,707	130,486	140,193	1	8	9
Rogers, Seddonville	,, ..	1	,,	1	7′ ..	,, ..	,, ..	4,735	..	4,735	..	4	4
Paine's Opencast, Buller Gorge ..	,, ..	46	Brown ..	1	14′ to 18′	,, ..	Opencast	8,400	50,169	58,569	10	..	10
Glencrag, Buller Gorge	,, ..	25	,, ..	1	10′ to 18′	,, ..	Bord and pillar	8,871	41,713	50,584	1	9	10
Glencrag Opencast, Buller Gorge ..	,, ..	1½	,, ..	1	12′ ..	,, ..	Opencast	16,751	4,774	21,525	3	..	3
Denniston, Denniston	,, ..	68	Bituminous	1	3′ to 20′ ..	,, ..	Bord and pillar	77,656	12,299,160	12,376,816	80	199	279
Millerton, Granity	,, ..	57	,,	1	4′ to 40′ ..	12′ ..	Ditto ..	57,717	9,343,559	9,401,276	48	74	122
Stockton, Ngakawau	,, ..	40	,,	..	4′ to 25′ ..	10 to 25′	,, ..	113,468	5,233,124	5,474,019	186	147	333
							Opencast	127,427					
Cardiff, Mokihinui	,, ..	12½	,,	1	10′ ..	Full ..	Bord and pillar	1,074	36,463	37,537	1	2	3
Cardiff No. 4 (Chester and Wilson), Seddonville	,, ..	½	,,	1	4′ ..	,, ..	Ditto ..	113	..	113	1	2	3
Buller Gorge, Rahui	,, ..	6½	Brown ..	1	10′ ..	9′ ..	,, ..	3,436	17,135	20,571	1	2	3
Heaphy's, Berlins	,, ..	2½	,, ..	1	25′ ..	Full ..	Opencast	5,299	2,426	7,725	4	.	4
Moynihan's (Nile-Hydro), Charleston	,, ..	3	Lignite ..	1	15′ to 30′	,, ..	,, ..	107	14,444	14,551	..	..	..
Gemmell and Bennett, Charleston	,, ..	3	,, ..	1	16′ ..	,, ..	,,	1,486	2,107	3,593	3	..	3
H. and R. Bennett, Charleston ..	,, ..	½	,, ..	1	16′ ..	,, ..	,,	935	..	935			
Rata, Charleston	,, ..	1	,, ..	1	16′ ..	,,	,,	2,090	1,013	3,103	..	..	..
Sinclair's (Nile-Hydro), Charleston	,, ..	1	,, ..	1	15′ to 30′	15′ ..	,,	1,543	335	1,878	..	..	..
Reefton District													
Alborn's, Boatmans	Crown lease ..	53	Brown ..	3	12′ to 20′	9′ ..	Bord and pillar	2,357	166,637	168,994	1	8	9
Archer Bros., Boatmans ..	,, ..	5	,, ..	2	12′ to 16′	Full ..	Ditto ..	3,335	4,188	7,523	16	56	72
Burke's Creek, Reefton	,, ..	47	,, ..	1	8′ to 15′ ..	9′ ..	,, ..	19,108	515,269	534,377			
Morrisvale, Reefton	,, ..	36	,, ..	3	6′ to 50′ ..	Full	,, ..	1,399	260,164	264,603	..	5	11
							Opencast	3,040			6	..	..
Coghlan's, Capleston	Freehold ..	51	,, ..	1	8′ to 12′ ..	,, ..	Bord and pillar	2,536	68,090	75,146	1	3	4
New Imperial (Coghlan's), Capleston	Crown lease ..	1½	,, ..	1	15′ ..	7′ ..	Ditto ..	4,520			..	4	4

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 1948.	Total Output to 31st December, 1947.	Total Output to 31st December, 1948.	Number of Persons ordinarily employed.		
											Above.	Below.	Total.
WEST COAST INSPECTION DISTRICT—*continued*													
Reefton District—continued								Tons.	Tons.	Tons.			
Defiance, Murray Creek	Crown lease	20	Brown	1	6′	Full	Bord and pillar	458	65,296	65,754	..	2	2
New Pyramid, Waitahu	,,	4	,,	1	12′ to 15′	8′	,,	6,133	18,537	24,670	2	15	17
Burnwell, Reefton	,,	20	,,	1	40′	9′	,,	9,630	53,411	63,041	2	10	12
Central, Reefton	,,	44/5	,,	1	12′	8′	,,	3,169	12,549	15,718	1	7	8
Waitahu (A. D. Williams), Reefton	,,	39	,,	1	6′ to 8′	Full	,,	8,951	104,134	113,085	2	11	13
Waitahu (Murcott's), Reefton	,,	31/2	,,	1	6′ to 8′	,,	,,	280	7,017	7,297			
Terrace, Reefton	,,	21	,,	1	30′ to 70′	61/2′	,,	8,281	70,406	78,687	2	10	12
Nicholls, Boatmans	,,	51/2	,,	1	6′	Full	,,	1,115	8,129	9,244	..	5	5
Banks, Waitahu	,,	5	,,	1	40′	,,	Opencast	13,831	75,716	89,547	9	..	9
Royal, Rainy Creek	,,	41/2	,,	1	6′	,,	Bord and pillar	2,674	5,884	8,558	..	4	4
Lewis and Party, Murray Creek	,,	4	,,	1	12′	,,	Opencast	990	5,411	6,401	2	..	2
Chandler's, Murray Creek	,,	4	,,	1	35′	,,	,,	9,460	20,371	29,831	8	..	8
Ferndale, Reddale Valley	,,	32	,,	1	5′ to 20′	5′ to 9′	Bord and pillar	5,035	30,868	35,903	1	6	7
Garvey Creek, Reefton	State reserve	2	Bituminous	1	15′ to 20′	10′	Ditto	11,621	4,538	16,159	5	29	34
Devils Creek, Golden Point	Crown lease	1	Brown	1	7′	Full	,,	1,181	..	1,181	..	3	3
Grey District													
Cliffdale, Ten-mile	State reserve	21	Bituminous	1	10′	Full	Bord and pillar	5,572	75,582	81,154	2	6	8
Bellvue, Rapahoe	,,	20	,,	1	11′	,,	Ditto	5,998	107,790	113,788	1	8	9
Blackball (State), Blackball	,,	57	,,	2	8′ to 17′	12′	,,	66,752	4,476,375	4,543,127	26	155	181
Blackball Creek, Blackball	,,	171/3	,,	1	44′	Full	,,	6,330	186,986	193,316	1	8	9
Harrison's, Ten-mile	,,	16	,,	1	41′	,,	,,	4,877	62,615	67,492	1	5	6
Brachead, Dunollie	,,	28	,,	1	6′ to 9′	,,	,,	6,655	182,251	188,906	1	7	8
Briandale, Ten-mile	Crown lease	22	,,	1	6′	,,	,,	1,944	104,170	106,114	4	2	6
Wallsend, Brunnerton	Crown lease and freehold	25	,,	1	18′	8′ to 10′	,,	52,008	1,185,754	1,237,762	32	119	151
Dobson, Dobson	Crown lease	26	,,	1	9′ to 16′	10′	,,	66,694	1,483,730	1,550,424	39	179	218
Goldlight, Rewanui	State reserve	21	,,	1	6′ to 8′	6′	,,	10,139	149,805	159,944	1	9	10
Kiwi (Hilltop), Ten-mile	,,	18	,,	1	18′	9′	,,	7,937	104,268	112,205	1	9	10
Kaye's, Ten-mile	,,	14	,,	1	11′	Full	,,	4,014	42,934	46,948	1	3	4
Hunter's, Rewanui	,,	28	,,	1	9′	,,	,,	9,190	164,667	173,857	1	9	10
Jubilee, Rapahoe	,,	21	,,	1	9′	,,	,,	6,498	86,391	92,889	1	7	8
Moody Creek, Dunollie	,,	26	,,	1	8′	,,	,,	6,167	127,399	133,566	1	7	8
Cliffside, Nine-mile	,,	131/2	,,	1	5′ to 15′	5′	,,	8,412	64,486	72,898	2	7	9
New Point Elizabeth, Dunollie	,,	22	,,	1	7′	Full	,,	1,714	155,067	156,781	1	4	5
Old Runaqa, Rewanui	,,	22	,,	1	21/2′ to 4′	21/2′ to 4′	,,	5,876	146,222	152,098	2	8	10
Paparoa, Roa	Crown lease	40	Super-bituminous	2	8′ to 12′ / 8′ to 16′	Full	,,	27,383	1,191,282	1,218,665	22	57	79
Schultz Creek, Twelve-mile	,,	24	Bituminous	1	3′	,,	,,	2,028	50,923	52,951	1	2	3
Strongman, Nine-mile	State reserve	10	,,	1	20′	9′	,,	84,342	780,761	865,103	65	187	252
Liverpool, Rewanui	,,	36	,,	2	8′ to 34′	8′	,,	85,736	4,315,609	4,401,345	71	242	313
Sparks, Rewanui	,,	26	,,	1	10′	Full	,,	6,296	92,852	99,148	2	7	9
Coaldale, Rapahoe	,,	21/2	,,	1	3′ to 5′	,,	,,	2,414	2,844	5,258	1	2	3
Exhibition, Eight-mile	,,	11/2	,,	1	8′	,,	,,	4,239	163	4,402	2	5	7

New Aerial, Ten-mile	Crown lease ..	1	„	1	10½′ ..	„ ..	Opencast	461	..	461	1	2	3
Harries, Rewanui	State reserve	½	„	1	3′ ..	„ ..	Bord and pillar	652	..	652	1	5	6
Output of collieries now abandoned or suspended									9,910,394	9,910,394	..	..	..

SOUTHERN INSPECTION DISTRICT

									Tons.	Tons.	Tons.			
Canterbury District														
Acheron No. 1	Freehold ..	7	Anthracite	1	8′ ..	8′ ..	Bord and pillar	1,745	9,210	10,955	4	4	8
Acheron No. 2	„ ..	1½	Lignite ..	1	8′ ..	7′ ..	Ditto ..	375	285	660	..	2	2
Blackburn	Crown lease ..	18	„ ..	1	8′ ..	7′ ..	„ ..	4,423	58,602	63,025	2	7	9
Bonanza	„ ..	2	„ ..	1	6′ ..	6′ ..	„ ..	236	246	482	..	2	2
Burnt Hill	„ ..	1	„ ..	1	5′ ..	5′ ..	„ ..	498	..	498	..	3	3
Klondyke	„ ..	20	„ ..	1	4′ to 26′ ..	8′ ..	„ ..	9,545	150,510	160,055	2	15	17
Malvern	„ ..	2	„ ..	2	4′ to 5′ ..	4′ to 5′ ..	„ ..	2,311	1,366	3,677	1	3	4
Manuka Point	„ ..	1	„ ..	1	5′ ..	4′ ..	„ ..	289	..	289	1	1	2
Newburn	„ ..	4	„ ..	1	4′ ..	4′ ..	„ ..	90	1,872	1,962	1	1	2
Steventon	Freehold ..	13½	„ ..	1	6′ ..	5′ to 6′ ..	„ ..	2,885	61,225	64,110	2	4	6
Tripps (Mount Somers)	„ ..	82	„ ..	1	10′ ..	8′ ..	„ ..	5,672	141,461	147,133	2	7	9
Victory	„ ..	8	„ ..	1	10′ ..	8′ ..	„ ..	1,756	5,624	7,280	1	3	4
Woodbank	Crown lease ..	23	„ ..	1	10′ ..	10′ ..	„ ..	2,205	29,424	31,629	1	3	4
North Otago District														
Airedale	Crown lease ..	22	Lignite ..	1	8′ ..	6′ ..	Bord and pillar	1,598	62,664	64,262	1	2	3
Ngapara	Freehold ..	71	„ ..	1	24′ ..	14′ ..	Ditto ..	2,289	68,983	71,272	1	3	4
Rockvale	„ ..	14	„ ..	1	8′ ..	6′ ..	„ ..	2,211	18,756	20,967	..	3	3
St. Andrews	„ ..	21	„ ..	1	8′ ..	6′ ..	„ ..	2,216	105,193	107,409	1	3	4
Shag Point	Crown lease ..	27	„ ..	1	6′ ..	6′ ..	„ ..	159	449,481	449,640	..	3	3
Willetts	„ ..	16	„ ..	1	7′ ..	7′ ..	„ ..	1,265	18,705	19,970	..	3	3
Central Otago District														
Belmont	Freehold ..	1½	Lignite ..	1	23′ ..	23′ ..	Opencast	145	54	199	1	..	1
Cairnmuir	Crown lease ..	8	„ ..	1	20′ ..	10′ ..	Bord and pillar	1,843	8,080	9,923	..	3	3
Cambrian	„ ..	3	„ ..	1	20′ ..	10′ ..	Opencast	322	446	768	1	..	1
Idaburn	..	31	„ ..	1	30′ ..	24′ ..	„	900	72,483	73,383	1	..	1
McPherson's	..	64½	„ ..	1	14′ ..	14′ ..	„	3,033	134,371	137,404	2	..	2
Oturehua	..	54	„ ..	1	12′ ..	12′ ..	„	657	10,815	11,472	1	..	1
Roxburgh East	..	1	„ ..	1	8′ ..	8′ ..	Bord and pillar	309	..	309	..	1	1
Shepherds Creek	Crown lease ..	70	„ ..	1	20′ ..	10′ ..	Ditto ..	287	156,131	156,418	1	2	3
Thompson's	Prospecting licence	..	„ ..	..	.. ..	..	..	21	..	21	..	..	..
South Otago District														
Akatore	Crown lease ..	3	Lignite ..	1	8′ ..	8′ ..	Bord and pillar	6,636	8,248	14,884	3	7	10
Barclay's	Crown lease and freehold	4	„ ..	1	5′ to 9′ ..	5′ to 6′ ..	Ditto ..	2,770	6,041	8,811	1	3	4
Benhar	Ditto ..	85	„ ..	1	35′ ..	35′ ..	„ ..	8,139	414,491	422,630	1	15	16
Elliotvale	Freehold ..	..	„ ..	1	8′ ..	8′ ..	„ ..	36	..	36	..	2	2
Kai Point	„ ..	1	„ ..	1	20′ ..	20′ ..	Opencast	1,551	..	1,551	1	..	1
Kaitangata	Crown lease and freehold	72½	Brown ..	2	8′ to 20′ ..	8′ to 20′ ..	Bord and pillar	47,243	6,826,348	6,873,591	52	86	138
Kaituna	Freehold ..	1	Lignite ..	1	..	..	Ditto ..	185	..	185	..	2	2
Lovells Flat	„ ..	2	„ ..	1	..	..	Opencast	119	876	995	1	..	1
New Fernhill No. 3	„ ..	3	„ ..	1	6′ to 7′ ..	6′ to 7′ ..	Bord and pillar	205	1,886	2,091	..	2	2
New Fernhill No. 4	„ ..	3	„ ..	1	6′ to 7′ ..	6′ to 7′ ..	Ditto ..	5,477	6,874	12,348	..	6	6
Summerhill	„ ..	2½	„ ..	1	30′ ..	30′ ..	„ ..	45,146	12,331	57,477	12	56	68

STATISTICS OF WORKINGS IN COAL-MINES, 1948—*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 1947.	Total Output to 31st December, 1946.	Total Output to 31st December, 1947.	Number of Persons ordinarily employed.		
											Above.	Below.	Total.
SOUTHERN INSPECTION DISTRICT—*continued*													
								Tons.	Tons.	Tons.			
South Otago District—continued													
Sunnyvale	Crown lease ..	3	Lignite ..	1	25′ ..	25′ ..	Board and pillar	3,900	3,913	7,813	..	3	3
Taradale	Freehold ..	4	,, ..	1	18′ ..	16′ ..	,, ..	2,787	7,314	10,101	1	4	5
Victory	Crown lease ..	4	,, ..	1	5′ to 6′ ..	5′ to 6′ ..	,, ..	2,703	6,088	8,791	1	3	4
Viewbank	Freehold ..	3	,, ..	1	30′ ..	30′ ..	Opencast	5,352	11,705	17,057	5	..	5
Wangaloa	Crown lease ..	27	,, ..	1	30′ ..	25′ ..	Bord and pillar	2,132	63,111	65,243	..	2	2
Wangaloa State	,, ..	3	,, ..	1	23′ ..	23′ ..	Opencast	47,618	72,816	120,434	20	..	20
Willowbank	Freehold ..	26	,, ..	2	15′ ..	6′ ..	Bord and pillar	6,677	133,383	140,060	2	4	6
Southland District													
Argyle	Crown lease ..	57	Lignite ..	1	10′ ..	10′ ..	Opencast	406	16,718	17,124	1	..	1
Birchwood	,, ..	24	Brown ..	1	5′ to 18′ ..	6′ ..	Bord and pillar	21,639	522,338	543,977	18	37	55
Black Diamond	Freehold ..	32	,, ..	1	20′ to 30′	20′ ..	Opencast	33,262	446,191	479,453	20	..	20
Black Lion	Crown lease ..	27	,, ..	1	28′ ..	28′ ..	,,	19,190	306,081	325,271	12	..	12
Boghead	Freehold ..	22	Lignite ..	1	23′ ..	10′ ..	Bord and pillar	7,645	198,950	206,595	3	5	8
Coster's	,, ..	12	,, ..	1	14′ ..	14′ ..	Opencast	752	13,291	14,043	1	..	1
Diamond Lignite	Crown lease ..	46	,, ..	1	36′ ..	36′ ..	,,	2,427	60,025	62,452	3	..	3
Glenlee	Freehold ..	57	,, ..	1	14′ ..	8′ ..	Bord and pillar	2,009	60,476	62,485	..	2	2
Hardmac	Crown lease ..	2	,, ..	1	6′ ..	6′ ..	Opencast	1,847	3,843	5,690	4	..	4
Hedgehope	Freehold ..	9	,, ..	1	16′ ..	16′ ..	,,	8,098	71,114	79,212	4	..	4
Liberty	Crown lease ..	3	Brown ..	1	12′ ..	12′ ..	,,	2,720	2,150	4,870	2	..	2
Linton	Crown lease and freehold	34	,, ..	3	30′ to 40′	30′ to 40′	Bord and pillar	80,057	2,291,979	2,372,036	33	125	158
Maclean's	Freehold ..	..	,, ..	1	8′ to 10′ ..	8′ to 10′ ..	Opencast	1,248	..	1,248	18	..	18
Mataura Paper-mills ..	,, ..	10	Lignite ..	1	20′ ..	20′ ..	,,	26,606	203,546	230,152	7	..	7
Midway	,, ..	2	,, ..	1	15′ ..	14′ ..	,,	1,504	825	2,329	1	..	1
Mossbank	Crown lease ..	8	Brown ..	1	17′ to 23′	8′ ..	Bord and pillar	26,104	810,579	836,683	11	36	47
Newholme	Freehold ..	1	Lignite ..	1	18′ to 33′	18′ to 33′	Opencast	940	..	940	1	..	1
Newvale	,, ..	2	,, ..	1	60′ ..	18′ ..	,,	11,365	38,717	50,082	3	..	3
Nightcaps	,, ..	34	,, ..	2	30′ ..	30′ ..	,,	3,917	8,644	12,561	3	..	3
Ota Creek	Crown lease ..	68	,, ..	1	10′ ..	10′ ..	,,	1,707	41,239	42,946	2	..	2
Raby	Freehold ..	10	,, ..	1	20′ ..	20′ ..	,,	3,354	38,909	42,263	1	..	1
Star	,, ..	17	Brown ..	1	20′ ..	20′ ..	Bord and pillar	35,570	358,593	394,163	14	45	59
Starlight	,, ..	4½	Lignite ..	1	4′ ..	4′ ..	Opencast	2,728	13,604	16,332	2	..	2
Taunoa	Crown lease ..	5	,, ..	1	3′ ..	3′ ..	,,	57	438	495	1	..	1
Terrace	Freehold ..	7	,, ..	1	17′ ..	9′ ..	Bord and pillar	1,146	24,070	25,216	1	1	2
Waimeamea	Crown lease ..	5	Brown ..	1	9′ ..	7′ ..	Ditto ..	5,324	48,185	53,509	1	5	6
Waimumu	Freehold ..	20	Lignite ..	1	30′ ..	30′ ..	Opencast	13,804	110,357	124,161	6	..	6

Wairaki	Crown lease and freehold	34	Brown ..	2	7′ to 25′ ..	7′ to 25′ ..	Bord and pillar	63,406	1,060,710	1,124,116	28	77	105
Waituna	Freehold ..	..	Lignite ..	1	10′ ..	10′ ..	Opencast	26	..	26	2	..	2
Output of collieries now abandoned or suspended ..			..	..	..	..	..	..	11,864,247	11,864,247	..	..	..
							Totals, Southern District, South Island ..	616,819	27,762,498	28,379,317	332	604	936
							Totals, West Coast District, South Island ..	1,143,879	55,143,970	56,287,849	729	1,761	2,490
							Totals, Northern District, North Island ..	1,015,188	31,425,583	32,440,771	679	1,477	2,156
								2,775,886	114,332,051	117,107,937	1,740	3,842	5,582
							Output prior to 1890 not included in statistics	..	..	296,653	..	..	..
							Shale exported, 1914	..	..	21	..	..	..
										117,404,611			

NOTE.—The totals of men employed have been adjusted as necessary to cover cases where men have transferred from one mine to another during the year by reason of suspension or cessation of operations at a mine.

APPENDIX C

REPORT OF BOARDS OF EXAMINERS

Mines Department,
Wellington, 23rd May, 1949.

The UNDER-SECRETARY, Mines Department, Wellington.

SIR,—

On behalf of the Boards of Examiners under the Mining and Coal-mine Acts, I have the honour to submit the following report on the work of the Boards during the past year.

Mining Act.—At the annual examinations, which were held on the 5th, 6th, and 7th October, 1948, two candidates sat for First-class Mine-manager's Certificate (one for the whole examination, and the other, who held a partial pass, to complete the examination), two candidates for Battery Superintendent's Certificate, and one candidate for Dredgemaster's Class B Certificate.

At the 1948 annual meeting the Board, after consideration of a report furnished by a sub-committee set up at the end of 1947 to revise the syllabus for the examinations for Mine-managers' Certificates, fully agreed with the expressed view of the sub-committee that such syllabus did not make adequate provision for the training of students in mining industrial law and business management. It was accordingly recommended to the Mines Department that the syllabus be amended by introducing a fresh subject, "Mining Economics," and by so enlarging the subject "Law" as to require a student to acquire a general knowledge of industrial conciliation and arbitration and workers' compensation. The Board also considered that candidates for Battery Superintendents' Certificates should have some knowledge of mining industrial law, and it was recommended to the Mines Department that the Mining Regulations be amended to that end.

Coal-mines Act.—The annual examinations for candidates for Mine-managers' Certificates were held at Huntly, Greymouth, Reefton, Westport, and Dunedin on 5th, 6th, and 7th October, 1948. In addition, examinations were held at Greymouth for Mine Surveyor's Certificates, and at Greymouth and Reefton for Electricians' Certificates.

The annual examinations for Underviewers' and Firemen-deputies' Certificates were held at Dunedin on 5th and 6th October; at Kamo on 19th October; at Huntly on 8th, 9th, 10th, 11th, and 12th November; at Westport on 9th, 10th, 11th, and 12th November; at Greymouth on 17th, 18th, and 19th November.

Three special examinations (affecting five candidates) for Firemen-deputies' Certificates were held during the year.

Application for examination by three candidates who were unable to prove the prescribed minimum underground experience were declined.

The total number of candidates sitting the various examinations under the Coal-mines Act was ninety-four, an increase of nineteen as compared with the previous year.

Sixty-nine Gas-testing Certificates were granted to candidates during 1948, while 129 holders of Gas-testing Certificates more than five years old passed a re-examination in gas-testing. Duplicates of five lost Gas-testing Certificates were issued.

Pursuant to subsection (5) of section 6, Coal-mines Amendment Act, 1937, the endorsement of four Underviewers' and thirteen Firemen-deputies' Certificates has been recorded in the Board's Register of Certificates.

The Board also recorded in the Register particulars of fifty-five certificates of proficiency in mine-rescue work issued to men who had undergone a course of instruction in the use of self-contained breathing-apparatus and in other related subjects and had passed a practical examination.

Two certified copies of lost or destroyed certificates were issued pursuant to section 55, Coal-mines Act, 1925.

The Board cancelled one partial pass for Fireman-deputy's Certificate, the holder having failed to complete the full examination within the period of years allowed.

Mr. J. W. Glendenning, who resigned from the Board on his appointment to a managerial position in Australia, was succeeded by Mr. P. M. Outhwaite, who was appointed for a term of three years as from the 1st April, 1948.

Mr. A. Curlew, whose appointment expired at the end of June, 1948, was reappointed for a term of three years as from the 1st July, 1948.

During the year it was found necessary to appoint examiners for Underviewers' and Firemen-deputies' Certificates as under:—

(*a*) For North Auckland district: Mr. J. Hadcroft, *vice* Mr. J. Makinson, resigned.
(*b*) For Westport district: Mr. A. Openshaw, *vice* Mr. J. W. Glendenning, resigned.

At the annual meeting held at the beginning of December, 1948, the Board considered certain amendments to the Mining Regulations, as proposed by the Board of Examiners under the Mining Act, to provide for the training of students in mining industrial law and business management, and were of the opinion that similar steps should be taken to raise the standard of the examinations for Mine-managers' Certificates under the Coal-mines Act. The Board recommended to the Mines Department that appropriate action be taken.

In my last report I mentioned that the Board had submitted to the Hon. Minister of Mines a report setting out the steps which the Board considered should be taken to improve the technical education of intending mine-managers. The Board's recommendations were briefly as follows:—

(1) That a Professor in Coal-mining be appointed to lecture at the Otago University School of Mines, and that a four-year course in coal-mining, leading to the degree of B.E. (Mining), be instituted at the School.

(2) That up to six bursaries, tenable for four years at the Otago School of Mines, be awarded annually to suitable applicants. It was suggested that a Board be appointed to make a selection from candidates having a University Entrance standard of education, with an age limit of twenty years, except in the case of students already taking terms in mining subjects at Otago or other New Zealand University colleges, whose time at the University in mining-course subjects might be added to the age limit.

(3) That on the completion of the course covered by the bursary the student to be employed at a State coal-mine as junior mining engineer on a salary, and there to receive training in mining and mine-management. At the end of the period of training he should be able to satisfy the Board as to his practical ability and to qualify for the First-class Colliery Manager's Certificate by examination.

(4) That two annual post-graduate scholarships of £500 plus travelling-expenses be awarded to selected trainees, who would be required to undergo practical training in modern coal-mining at overseas mines to be selected by the Mines Department and to give regular reports on their work. All trainees to enter into an agreement to remain in the service of the Mines Department of New Zealand or a New Zealand School of Mines for five years after the completion of their training.

The Board feels that candidates of the right type and trained on the above lines would develop into outstanding coal-mining engineers and that within a few years their work would prove of immense advantage to the coal-mining industry of the Dominion.

There would still be ample scope for men who wished to proceed to the First-class Colliery Manager's Certificate through the district Schools of Mines. Here again the effect of graduates of the above training scheme would be felt. These graduates would be in a position to give more modern and complete theoretical training by lecturing at Schools of Mines, and the practical effect of their work in coal-mines would also be of great benefit to students.

The Hon. Minister of Education has now agreed to the establishment of a Chair of Coal-mining at Otago, and, Cabinet having approved the Board's other proposals, there is every prospect of the new system of training coal-mining engineers being started in 1950.

A sub-committee of the Board is now giving attention to the training of mine surveyors, and will bring forward proposals during the present year.

General.—Pursuant to the provisions of the Petroleum Act, 1937, and the Petroleum Regulations 1939, one Service Permit was granted during the year.

The Boards also dealt with a number of matters arising out of applications for and the issue of certificates, none of which, however, calls for special mention.

The following is a summary of the various examinations held and the results obtained :—

Examination.	Number of Candidates.			Number of Certificates Issued.	
	Examined.	Passed.	Partial Pass.	By Examination.	By Recognized Credentials.
Coal-mines Act, 1925					
Mine-managers' Certificates—					
(*a*) First Class—					
Written examination	7	1	1	1	..
Oral examination	2				
(*b*) Second Class—					
Written examination	5	1	..	1	..
Oral examination	1				
Underviewer's Certificate	23	8	8	8	..
Fireman-deputy's Certificate	55	24	19	29*	..
Mine Surveyor's Certificate—					
Written examination	2	..	1	..	..
Oral and practical examination ..	1				
Electrician's Certificate—					
Written examination	2	2	..	2	..
Practical examination	2				
Mining Act, 1926					
Mine-manager's Certificate—					
(*a*) First Class—					
Written examination	2	2	..	2	..
Oral examination	2				
(*b*) Second Class—					
Written examination	..	..	..	..	..
Oral examination	..	..	..	..	..
Battery Superintendent's Certificate—					
Written examination	2	2	..	2	..
Oral examination	2				
Dredgemasters' Certificate—					
Class A—					
Written examination	..	..	..	..	..
Oral examination	..	..	..	..	..
Class B—					
Written examination	1	1	..	1	..
Oral examination	1				

* Includes five candidates who passed the 1947 examination but the issue of whose certificates was deferred pending production of First-aid Certificates.

A list of the certificates issued since my last report is appended :—

COAL-MINES ACT, 1925

FIRST-CLASS MINE-MANAGER'S CERTIFICATE

Issued After Examination.—Lundon, John William, Greymouth.

SECOND-CLASS MINE-MANAGER'S CERTIFICATE

Issued After Examination.—Brazil, Thomas Michael Verdun, Reefton.

ELECTRICIAN'S CERTIFICATE

Issued After Examination.—Lockington, Harry Anthony, Reefton; Reid, Charles Addison, Dobson.

UNDERVIEWER'S CERTIFICATE

Issued After Examination.—Andrews, R. A., Rotowaro; Bell, J., Dobson; Cruse, F., Dobson; Hannah, J., Dunedin; Honey, R. J., Reefton; McEwen, J., Huntly; Rattray, A. P., Denniston; Woods, N., Reefton.

FIREMAN-DEPUTY'S CERTIFICATE

Issued After Examination.—Andrews, R. A., Rotowaro; Blair, G. S., Blackball; Brown, W., Huntly; Clark, T., Dobson; Clarke, F., Benneydale; Cruse, F., Dobson; Davidson, W. H. K., Huntly; Dickson, T., Ngakawau; Duggan, E. H., Dobson; Dunn, J., Benneydale; Dyet, D. M., Benneydale; Finlayson, A. W., Westport, Fox, W., Millerton; Holm, J. E., Greymouth; Hunt, E. W., Ohai; James, E.; Westport; Kernohan, E. S., Huntly; Little, R. W., Runanga; McEwen, J., Huntly; McKenzie, R. B., Owen River; McNeish, W. C., Taylorville; Mann (Jnr.), W., Birchfield; Nelson, H. F., Denniston; Stirling, J., Huntly; Stone, J. W., Westport; Tackney, J. R., Dobson; Taylor, P., Millerton; Walsh, R., Granity; Wynn, A. H., Mangarakau.

MINING ACT, 1926

FIRST-CLASS MINE-MANAGER'S CERTIFICATE

Issued After Examination.—Andrews, Andrew, Ikamatua; Jones, Lloyd, Samuel Dunedin.

BATTERY SUPERINTENDENT'S CERTIFICATE

Issued After Examination.—Bacon, John Gerald, Waikino; Hutton, Gerald Percy, Waikino.

DREDGEMASTER'S CLASS B CERTIFICATE

Issued After Examination.—Hobarth, Frederick, Cromwell.

PETROLEUM ACT, 1937

SERVICE PERMIT

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Approximate Cost of Paper.—Preparation, not given; printing (1,089 copies), £225.

By Authority: R. E. OWEN, Government Printer, Wellington.—1949.

Price 1s. 9d.]