1946

NEW ZEALAND

MINES STATEMENT

BY THE HON. J. O'BRIEN, 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, 1945.

MINERAL PRODUCTION

The following statement shows the quantity and value of the production of metalliferous mines, quarries, and coal-mines during 1945 and 1944:—

Mineral.	1945.		1944.	
	Quantity.	Value.	Quantity.	Value.
		£		£
Gold and silver*	372,908 oz.	1,389,959	470,568 oz.	1,518,119
Platinum	..	..	..	..
Arsenic	17 tons	306	16 tons	284
Asbestos	31 cwt.	31	17 „	340
Bentonite	167 tons	800	360 „	1,640
Clays†	8,251 „	5,408	6,668 „	4,335
Coal	2,833,576 „	4,250,364	2,805,970 „	2,805,970
Diatomaceous earth	255 „	446	55 „	94
Dolomite	4,644 „	2,322	3,931 „	1,474
Fuller's earth	76 „	273	106 „	387
Iron-ore	6,067 „	14,648	6,036 „	11,550
Magnesite	111 „	100	103 „	93
Manganese-ore	..	..	..	..
Mica	882 lb.	882	292 lb.	292
Phosphate	7,956 tons	2,188	19,931 tons	20,551
Pumice	2,183 „	9,163	2,931 „	11,856
Quartzite	39 „	71	47 „	85
Serpentine	13,933 „	3,329	37,711 „	10,373
Silica sand	20,009 „	45,066	24,319 „	57,395
Stone	..	710,448	..	627,033
Talc	..	..	25 „	10
Tungsten-ore	34 „	10,360	145 „	67,081
Quicksilver	2,294 lb.	2,294	6,840 lb.	6,840
Totals	..	6,448,458	..	5,145,802

* The gold-silver bullion is generally exported unseparated. † Other than for brickmaking.

NOTE.—The values shown in the above and subsequent tables are expressed in New Zealand currency.

GOLD AND SILVER MINING

During the year 372,908 oz. of bullion, valued at £1,389,959, was produced, a decrease in quantity of 97,660 oz., and a decrease in value of £128,160, as compared with the previous year. The gold content of the bullion is estimated at 128,364 oz., valued at £1,353,207.

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

Year.	Oz.	Year.	Oz.
1930	120,931	1938	152,050
1931	129,851	1939	178,955
1932	166,354	1940	185,665
1933	161,755	1941	174,656
1934	160,248	1942	165,986
1935	165,277	1943	149,150
1936	164,575	1944	142,287
1937	168,487	1945	128,364

The decline in the production of gold which commenced in 1941 has not been arrested, and output shows a decrease of 13,923 oz. of gold compared with the previous year and is the lowest production since 1930.

This decline has not been confined to any particular section of mining. Production from alluvial mines (3,474 oz.) shows a decrease of 1,357 oz., dredges (82,086 oz.) a decrease of 5,188 oz., and quartz mines (42,804 oz.) a decrease of 7,378 oz. compared with the previous year.

Conditions brought about by the war, shortage of skilled labour and of equipment, together with increased working-costs, have been partly responsible for this decline in production, which recent output figures show is still decreasing. However, exhaustion of available deposits is also a factor, and this is particularly true of alluvial mining and of dredging operations on a small scale. Production from alluvial mines in the pre-war years was greatly stimulated by the operations of parties and individuals subsidized under the gold-mining scheme, and though individual outputs were small, in the aggregate they were appreciable.

There have been fewer gold-dredges in operation, although the production of gold by dredging has not decreased in similar proportion owing to maintenance of output by the modern high-capacity dredges. Sixteen dredges were operating during 1945, fourteen on the west coast and two in Otago, but three of the dredges on the west coast have since shut down.

The construction of dredges, which had to be deferred because of the war, is again receiving consideration, and it is expected that the number of high-capacity dredges, which have been so successful on the west coast, will be further increased, while it is possible that additional areas suitable for similar dredges may be located by further prospecting.

Any further expansion of gold production in the Dominion appears dependent on large-scale dredging operations carried out on the relatively low-grade ground, which has not been amenable to the older types of mining methods. Notwithstanding this fact, the policy set out in the Mines Statement of 1941, whereby dredging of land of good or potentially good farming value shall only be permitted provided conditions as to resurfacing and resoiling are strictly complied with, will be rigidly maintained, even if thereby it should render dredging operations uneconomic.

For practical purposes there are only two quartz mines at present producing gold, the Martha and the Blackwater, and shortage of skilled labour and increased working-costs have of late years created problems at both mines.

The reduction of the gold export duty, which, since 29th September, 1939, has amounted to 75 per cent. of the amount by which the New Zealand currency value of the London market price exceeds £9 5s. 8d., to 40 per cent. of the same amount has resulted in an additional 10s. 7d. New Zealand currency per fine ounce being made

available to gold-producers, while the announcement made in the Budget that the 40 per cent. will also be remitted has made available a further 11s. 7d. New Zealand currency, and this should to some degree offset the increased working-costs.

It is possible that certain quartz mines which have remained dormant during the war years may resume operations, but in the absence of new discoveries it is evident that the field for new quartz-mining ventures is very limited.

PETROLEUM OIL

There has been no activity in the search for petroleum in New Zealand during 1945.

During the preceding seven years investigations by three powerful overseas companies were intensive and comprehensive. Detailed geological and geophysical surveys were carried out over large areas and thousands of feet were core drilled for geological information, while thirteen deep wells, the deepest of which was 10,925 ft. deep and which totalled 73,565 ft. in depth, were drilled. All favourable structures were tested, the most modern drilling equipment used and large sums were expended, but all results were negative.

As a result of these activities, the Mines Department has obtained a great deal of important geological data which is being studied by Government geologists and which will be of value in the event of the search for oil being renewed in future years.

From the wells at Moturoa 91,212 gallons of crude petroleum oil was obtained during 1945 bringing the Dominion's total production of crude petroleum oil to 31st December, 1945, to 3,502,782 gallons. Certain proposals submitted by the owners of the Moturoa area for further drilling with financial assistance from the State did not prove acceptable to the Government.

COAL-MINING

There were 165 coal-mines operating in the Dominion in 1945. Fifty-seven of these mines are situated on freehold property and produced 1,280,072 tons, or 45 per cent. of the total output. The remaining 108 mines, situated on Crown land, produced 1,553,504 tons, or 55 per cent. of the total output of 2,833,576 tons.

The annual production of coal since 1939 has been as follows:—

Year.	Tons.	Year.	Tons.
1939 ..	2,342,639	1943 ..	2,787,868
1940 ..	2,516,099	1944 ..	2,805,970
1941 ..	2,639,507	1945 ..	2,833,576
1942 ..	2,680,041		

No coal was imported in 1945, none having been imported since 1943, when 37,454 tons were landed. Exports for 1945 were 21,989 tons, as against 37,688 tons in 1944. The output of 2,833,576 tons was a record for the Dominion and is an increase of 27,606 tons, or approximately 1 per cent. on the 1944 production.

Compared with 1939, when war broke out, the production for 1945 shows an increase of 490,937 tons. The output per miner employed underground during the year was 606 tons, a decrease of 53 tons as compared with 1944. The production per man on the pay-roll of underground mines—*i.e.*, both underground and surface workers—was 453 tons, a decrease of 36 tons on the previous year. Production per man employed in opencast mines was 1,363 tons, an increase of 551 tons as compared with 1944. The over-all production per man employed in the industry—*i.e.*, combined underground and opencast mines—amounted to 507 tons, an increase of 5 tons as compared with 1944.

In past years output-per-man figures have not shown any differentiation between opencast and underground mines as the output from opencast mines has not been of much consequence. Since 1944 the output from opencast mines has become significant and accordingly must be taken into account in calculating output figures.

To establish a basis of comparison, these figures have been calculated for the years 1936 onward, and the tabulation below shows the figures for these years. For the years prior to 1936 the figures published in the respective Mines Statements covering those years can be taken unchanged :—

ANNUAL OUTPUT PER MAN EMPLOYED IN COAL-MINES

Underground Mines

Year.	Production.	Men employed Underground.	Men employed on Surface.	Tons per Man Underground.	Tons per Man on Pay-roll.
	Tons.				
1936	2,108,238	3,154	1,040	668	503
1937	2,238,651	3,288	1,074	681	513
1938	2,180,122	3,368	1,142	647	483
1939	2,296,007	3,542	1,164	648	488
1940	2,465,336	3,769	1,241	654	492
1941	2,585,324	3,633	1,325	712	521
1942	2,624,267	3,659	1,291	717	530
1943	2,725,831	3,999	1,329	682	512
1944	2,609,516	3,958	1,395	659	489
1945	2,380,896	3,932	1,328	606	453

Opencast Mines

Year.	Production.	Men employed.	Tons per Man employed.
	Tons.		
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

Combined Underground and Opencast Mines

Year.	Production.	Men employed.	Tons per Man employed.
	Tons.		
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	587

It will be noted that in the case of underground mines, while the output per man increased during the years 1941 and 1942, there has been a progressive decline since then. This is due in great part to conditions brought about by the war. Increased production has been expedient in those years even if future production was thereby affected, and the effect has been cumulative with the years. Restriction of essential development work in the interests of immediate production, the shortage of skilled miners, and the increased average age of the coal-hewers owing to difficulties in replacements with younger men have all contributed to lessen the output-per-man figure.

Despite increased production of coal, the supply position has still remained difficult and unequal to demand, and it has been impossible to build up reserves to allow for stoppages in shipment occasioned by the vagaries of the bars at the west coast ports. It is, of course, the shortage of bituminous coal that is crucial to the position since the cessation of imports from Australia and the inability of bituminous mines in New Zealand to make up the leeway.

Although the shortage of coal is world-wide, efforts have been made to arrange imports of coal from other countries, but these have been unsuccessful till recently, when it has been possible to arrange a trial shipment of coal from Vancouver Island, in Canada. The prospect of importing further supplies from the west coast of the United States is being pursued.

However, permanent relief can come only from expansion of production in the Dominion. It is expected that there will be considerably increased production from Stockton when transport facilities have been improved by the construction of a high-capacity aerial ropeway, while it is hoped to bring the new coalfield at Garvey's Creek, in the Reefton district, which contains a bituminous coal of good grade, into early production. The intensive prospecting programme which was carried out on this field during 1945, and which is still continuing, has already proved that there is 1,000,000 tons of extractable coal with another 2,000,000 tons probable. Operations will commence upon a vertical seam, portion of which can be worked opencast and the remainder by underground methods with a high percentage of coal-extraction. In this field production does not have to wait upon extensive development work and production can commence as soon as an access road to the area is completed, so that some relief from this source can be expected at an early date.

As a result of an intensive drilling programme it has been shown that an area at Rewanui contains some 1,750,000 tons of recoverable coal of bituminous type contained in four seams, and plans are now being prepared to open up this area by driving two inclined stone drives. Production from this field necessarily lies some time ahead because of preparatory development work.

Again, the Westport Coal Co. is in the process of opening up a new colliery on what is termed Cook's Lease, and an access road is in course of construction and equipment for an aerial ropeway to transport the coal to Waimangaroa is on order from Great Britain. Production from this new coal-mine will compensate for decreased production from the company's Denniston mine.

As far as sub-bituminous coal is concerned, plans are being prepared for the opening-up of a large-scale colliery capable of producing 1,000 tons of coal per day at the Morley Block, in the Ohai Coalfield. This block was recently acquired by the State, and drilling by the State has confirmed the results obtained by the previous owners from their drilling programme and already 5,000,000 tons of coal are indicated.

Opencast Mining

While opencast coal-mining has been practised in New Zealand for many years, it has generally been on a small scale and intermittent in operation and confined in great part to the lignite deposits of Otago and Southland. With the exception of one mine in the Mataura field, operations have been carried out in primitive fashion without recourse to modern earth-moving equipment.

Since 1943 the Mines Department has paid increasing attention to this form of mining. For a commencement extensive geological and topographical surveys, followed by drilling, were required to locate suitable areas, define depth of overburden, and facilitate lay out of stripping operations. Shortage of earth-moving equipment was a severe handicap at the outset, but in 1945 the Mines Department was able to import two 5-cubic-yard Bucyrus-Erie electric drag-line shovels, and since these have been put into commission production has considerably increased.

Generally it has not been until 1945 that the full effect of the Department's opencast policy has been felt. In 1945 there were fifty-one opencast mines in active operation, which produced 452,680 tons of coal, a little over one-seventh of the total coal production. Production by opencast mines has increased progressively from 55,774 tons in 1942 to 62,037 tons in 1943, to 196,454 tons in 1944, to the record figure of 452,680 tons in 1945. The greatest proportion of this increase in opencast production has been due to the eight opencast mines operated by the State, none of which were in existence in 1942, but which contributed 257,467 tons, over one-half of the 1945 total. Of these the most important has been Stockton, which produced 104,455 tons of bituminous coal, the type of coal that has been in shortest supply. There are enormous tonnages of coal at Stockton that can be obtained by relatively shallow stripping, and disposal of overburden does not present problems. With the installation of the large-capacity drag-line shovel, capacity to produce has only been limited by transport facilities, and when the aerial ropeway for which tenders have already been called is installed and completed, greatly increased daily tonnages will be possible and a long and profitable life is assured with maximum possible extraction of coal.

While in the case of the larger opencast mines it has been possible either to make use of the screening plants of adjoining mines or provide separate plants and thereby eliminate much inferior material and provide a good grade of coal, this procedure cannot be extended to small-scale opencast mines. There the amount of coal to be won has not justified the provision of screening plants, and as a certain amount of contamination is unavoidable with this type of mining, the quality of the coal has not always been as good as is desirable.

Generally a long life cannot be expected of opencast mines because of their nature, but opencast mining will continue to make a valuable contribution to production during this and the next year, while investigation is still proceeding to allow of the opening-up of additional opencast mines as those now in operation become exhausted.

MINING PRACTICE

Continued attention has been given to means of improving underground mining practice, and to this end two officers of the Mines Department—the Superintendent of the State-controlled mines in the Waikato and the mine-manager of the Wilton State Coal-mine—have recently visited Australia to report on current mining practice there. In particular, attention was paid to methods of mechanization and to hydraulic and pneumatic stowage whereby the proportion of extractable coal can be considerably increased and danger of loss of coal by fire lessened. It is hoped that experiments both in mechanization and in hydraulic stowage will be made in one or other of the State mines at an early date, while the information obtained from this visit can also be turned to account in the layout of the new collieries which the State will open up shortly.

INVESTIGATION OF COAL RESOURCES OF NEW ZEALAND

Work has now been proceeding for some years on a comprehensive investigation of the coal resources of New Zealand. This in great part has been directed by the Coal Survey, whose activities are mainly geological and chemical. To supplement these activities a special organization has been set up by the Mines Department whose operations consist of detailed topographical surveys of selected areas, followed by shallow

prospecting by means of cuts, pits, and hand-drilling. The Mines Department has now also a well-equipped organization seeking additional information as to coal resources by deep-core drilling, and the activities of this organization are expanding. As a result of all these operations the coal resources of New Zealand have been reviewed.

COAL RESOURCES

Coal in New Zealand has for many years been mined in certain well-defined areas, beyond which no coal is known to exist in any significant quantities. The major coalfields, with the class of coal found in each, are :—

Bituminous Coal (Coking)—
Greymouth.
Westport (Buller Coalfield).

Sub-bituminous Coal (Non-coking)—
Waikato (including North Taranaki).
Southland (Ohai, &c.).
Reefton.

Lignite (Non-coking Low-grade)—
Southland (Mataura, &c.).

Minor coalfields from which coal is being mined, but which cannot be expected to provide an important contribution to our coal resources, are :—

Sub-bituminous Coal—
North Auckland (Hikurangi, Kamo).
Nelson (Puponga, Westhaven).
Otago (Kaitangata).

Lignite—
Canterbury (numerous small deposits).
Otago.
Charleston (Westport).

Close and systematic survey of the coal areas was interrupted by the war need to divert the limited staff of field geologists to investigate problems of immediate importance in the production of coal. However, a survey of the Greymouth Coalfield has now been completed by geologists of the Geological Survey staff, and figures published here regarding that coalfield have been obtained from their reports. Full details of the results of this survey will be published later as a bulletin of the New Zealand Geological Survey.

While it may be stated, in the light of present knowledge, that there is sufficient bituminous coal for requirements as at present for the next fifty years, it is not possible to give close estimates of coal resources in all the coal fields until the survey has been completed.

The table below gives an estimate of the coal resources of New Zealand.

"Proved" coal includes nothing beyond a proportion of coal actually in pillars in developed mines, plus a strip $1\frac{1}{2}$ chains wide beyond the limits of workings, except where such limits are known to be controlled by faults, thinning of the seam, or the incoming of dirty or unmarketable coal. The proportion of coal in pillars is arrived at by a consideration of various factors affecting the individual mines and limiting the quantity which could be extracted in the ordinary way of mining. The expression "proved" is therefore synonymous with "recoverable" or "measured" coal in this sense.

"Probably recoverable" coal relates to extensions of existing and still developing mines, undeveloped seams where fair evidence of a workable seam is available from outcrops or boreholes, and a number of small areas adjacent to abandoned large collieries

where workings on a co-operative basis would probably succeed. It will be evident that there must be constant changes in the estimates of quantities of "proved" and "probably recoverable" coal as mine workings advance and new areas or mines are opened up.

"Inferred" coal reserves consist of important blocks considered likely on geological grounds to contain coal, but which are unbored and too far away from known outcrops for reliable estimates to be made.

Class of Coal.	Proved recoverable.	Probably recoverable.	Inferred.
	Tons.	Tons.	Tons.
Anthracite	Very little	Very little	..
Bituminous (coking)	14,160,000	56,190,000	..
Sub-bituminous (non-coking) ..	139,094,000	103,992,000	321,000,000
Lignite (non-coking low-grade) ..	147,000,000	377,000,000	..
Totals	300,254,000	537,182,000	321,000,000

Reserves of bituminous coal have been shown by the recent survey to be considerably smaller in the Greymouth Coalfield than was anticipated, though it is possible, but not proved, that boring may disclose the existence of some further bituminous coal in the Mount Davy area.

Figures given for the Buller Coalfield are an estimate made by officers of the Mines Department, with the assistance of information supplied by the New Zealand Geological Survey and the Westport Coal Co., Ltd., and are as close as can be given at present on the available data :—

Bituminous Coal.	Proved recoverable.	Probably recoverable.
	Tons.	Tons.
Greymouth Coalfield (output, 1945, 497,982 tons) ..	8,060,000	24,000,000
Buller Coalfield (output, 1945, 464,226 tons) ..	5,100,000	30,190,000
Reefton Coalfield (Garvey's Creek)	1,000,000	2,000,000
Totals	14,160,000	56,190,000

With the completion of the survey of the Buller Coalfield, which has now been started, a much closer estimate of coal resources for this area will be available.

Recent bores in the Kawakawa district, North Auckland, have shown that there is little likelihood of further coal being available in that field, and with the practical exhaustion of the Hikurangi Coalfield only the Kamo Coalfield, which is of small extent, remains north of Auckland. Survey of the Waikato, Waitewhena, Reefton, and Ohai areas of sub-bituminous coal is proceeding. Estimates of this class of coal are based on various geological reports, combined with information obtained during the more recent working of the seams. The figures for lignite are estimates prepared in 1927 by P. G. Morgan, late Director of the Geological Survey, less outputs to date. While there is evidence of an extensive deposit of lignite in Southland and some thick seams are being mined, it will be necessary to obtain more accurate figures by fairly close boring.

The following is a table showing the output of coal from the various coalfields, and the comparative increase and decrease, for the years 1945 and 1944, together with the total approximate quantity of coal produced since the mines were opened :—

Name of Coalfield.	Output.		Increase.	Decrease.	Approximate Total Output up to 31st December, 1945.
	1945.	1944.			
	Tons.	Tons.	Tons.	Tons.	Tons.
North Auckland	89,525	85,390	4,135	..	6,464,179
Waikato (including Taranaki) ..	957,419	951,424	5,995	..	23,000,715
Nelson	7,805	8,146	..	341	751,523
Buller	540,782	463,874	76,908	..	28,962,469
Reefton	122,622	126,582	..	3,960	1,692,118
Grey	497,982	540,211	..	42,229	21,534,176
Canterbury	37,007	38,587	..	1,580	1,339,194
Otago	200,330	206,343	..	6,013	15,127,774
Southland	380,104	385,413	..	5,309	10,210,982
Totals	2,833,576	2,805,970	87,038	59,432	109,083,130

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

Class of Coal.	Output of Coal during 1945.				Total Output to the End of 1945.
	Northern District (North Island).	West Coast District (South Island).	Southern District (South Island).	Total.	
	Tons.	Tons.	Tons.	Tons.	Tons.
Anthracite	..	..	2,531	2,531	13,054
Bituminous	..	962,215	..	962,215	59,497,111
Sub-bituminous	1,046,944	148,163	428,229	1,623,336	43,037,782
Lignite	..	58,813	186,681	245,494	6,535,183
Totals for 1945	1,046,944	1,169,191	617,441	2,833,576	109,083,130
Totals for 1944	1,036,814	1,138,813	630,343	2,805,970	106,249,554

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

Year.	Coal and Shale raised in the Dominion.		Coal imported.		
	Tons.	Yearly Increase or Decrease.	Tons.	Increase over Preceding Year.	Decrease below Preceding Year.
Prior to 1940	92,820,069	..	13,920,438	..	..
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	..	..	..

TABLE SHOWING QUANTITY OF COAL EXPORTED ANNUALLY FROM NEW ZEALAND FROM 1940 TO 1945

Year.	Quantity. Tons.	Year.	Quantity. Tons.
1940	81,287	1943	42,522
1941	58,179	1944	37,688
1942	54,700	1945	21,989

SUBSIDY ON COAL PRODUCTION

For the financial year ended 31st March, 1946, the amount paid by way of subsidy on coal production was £1,148,002, made up as follows: tonnage subsidy (including provision for increases in mine stores), £748,294; subsidy in respect of the additional cost of work on back Saturdays £60,234, on statutory holidays £119,147, and on bonus payments, &c., to workmen not on contract £52,223; subsidy on increased cost of miners' tools, £4,675; subsidy by way of special payments to meet losses during the previous financial year made at uneconomic mines taken over by the State, £108,148; and subsidy on miscellaneous grounds, £5,281.

Of the £1,148,002 paid out during the year ended 31st March, 1946, the State Coal-mines received £489,010, while the privately owned mines received £658,992.

At 31st March, 1946, the total sum paid out for coal subsidies since the subsidy was first introduced early in May, 1940, amounted to £3,089,948.

In December, 1939, the approximate average price (f.o.r.) of run-of-mine coal was £1 per ton, and the price has been stabilized at that level until the present time. However, during the year ended 31st March, 1946, subsidy payments on coal were made which averaged approximately 9s. per ton, while, in addition, the amount paid under the guaranteed net profits clause of the Waikato Coal-mines Control Emergency Regulations, if distributed over the same tonnage, would average approximately 1s. per ton, and 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. or run-of-mine coal would have advanced by 10s. per ton to 30s. per ton. During the same period the statistical statements of the Ministry of Fuel and Power of Great Britain show that the average proceeds per ton of coal disposable commercially has increased from 17s. 6d. in December, 1939, to 39s. 6d. for the quarter ended 31st December, 1945.

CO-OPERATIVE MINING, STATE COAL RESERVE

During the year 1945 sixteen co-operative coal-mining parties were operating on parts of the State Coal Reserve, Greymouth. The production for the year was 81,373 tons and the number of men employed was 137. In 1944 eighteen parties produced 95,946 tons.

Co-operative parties have produced to date 1,988,508 tons of coal and have paid royalties amounting to £95,460 in the aggregate to the Crown.

STATE COAL-MINES

The gross output from the State coal-mines for the year ended 31st March, 1946, was 1,024,937 tons, an increase of 262,284 tons as compared with the year ended 31st March, 1945.

Mining conditions at Liverpool did not improve as anticipated, the output being maintained at approximately the previous year's figure.

Due to fewer days being worked, output at the Strongman Colliery decreased by 6,839 tons. With the exception of a small amount of fallen coal filled out from old bords, the output was obtained from solid places. Numerous faults are still hampering operations.

Output at the Blackball Colliery increased by 3,587 tons to 61,424 tons. During the year alterations were made to the pumping system at this mine, which is extremely wet, and these alterations will effect a saving in electric power as well as avoiding the possibility of flooding. Several new winches came to hand during the year, and these have eased the haulage problems.

Difficult mining conditions at Wallsend, particularly in No. 1 slant dip, where very bad roof conditions are being experienced, have largely contributed to the decrease of 9,515 tons in the output at this colliery.

Dobson suffered from a lack of experienced miners, a factor that has affected all mines to a greater or lesser degree, and output fell by 6,527 tons. All production was from solid workings.

At Stockton a new mine was opened during the year to replace the Fly Creek Mine, which is coming back on pillar-extraction. The Fly Creek Mine produced 57,110 tons, and the new mine (D Hill) 38,419 tons: while the E Hill Opencast produced 119,692 tons. The output from the opencast is very satisfactory, when it is considered that the rainfall in this area was in the vicinity of 250 in. for the year. Output from Fly Creek was obtained mainly from pillar-extraction, and from D Hill from development places.

Wairaki produced 68,425 tons and the coal was obtained mainly from pillars in the No. 1 Mine and solid workings in No. 3 Mine.

Work at Mossbank was continued in pillars in No. 2 panel and a section east of Aylwards Dip, while a small amount of coal was won from solid workings in the rise being driven for haulage purposes from Coppins Dip section. Production amounted to 24,128 tons.

Bar 20 Opencast produced 35,492 tons and operations continued normally.

In July, 1945, the Wangaloa Opencast was purchased by the State and developed by the Public Works Department. Production to 31st March, 1946, was 8,587 tons.

At Mangapehi heating in the mine on several occasions retarded the output of coal. Production fell by 2,748 tons to 58,112 tons.

Although excessive floor heave at the Tatu Colliery continues to prove troublesome, production increased by 1,163 tons to 32,573 tons.

Waitewhena Opencast produced 23,198 tons during the year. This opencast is situated in an area that is subject to a fairly heavy rainfall, and this, coupled with the steep nature of the ground being worked, caused several large slips, which interfered with production.

Wilton produced 88,653 tons, which was obtained from pillar-extraction in No. 3 Mine, development and extraction of pillars in No. 2 Mine, and the development of No. 3 Extended Mine.

At Kimihia the No. 2 and No. 4 sections closed down in June, 1945, as all recoverable coal was extracted. Production from Kimihia No. 1 (Kimihia Lake) commenced in the same month as the closing-down of Nos. 2 and 4, the total production from all areas for the year ended 31st March, 1946, being 32,398 tons. A 5-yard electric shovel has been installed on the No. 1 area, but owing to the unstable nature of the overburden being dealt with, difficulty has been experienced in stowing the overburden. The trouble experienced has reacted on production.

Glen Afton Opencast produced 14,394 tons for the year, an increase of 2,365 tons when compared with the previous year. Work at this pit has again been hampered by periodic floodings.

Kemp's Opencast produced 38,097 tons.

Full details in respect of the operations and financial results of the collieries appear in the annual report of the State Coal-mines. (C.–2A).

A comparative statement of outputs for the last two financial years is shown hereunder :—

Mine.	Output, 1945-46.		Output, 1944-45.		Percentage Increase in Gross Output.	Percentage Increase in Net Output.
	Gross.	Net.	Gross.	Net.		
	Tons.	Tons.	Tons.	Tons.		
Liverpool	122,108	117,430	121,728	116,670	+0·31	+0·65
Strongman	100,275	98,420	107,114	105,589	−6·38	−6·79
James (*a*)	39	39	7,057	7,057	..	..
Blackball	61,424	59,286	57,856	56,815	+6·20	+4·35
Mangapehi	58,112	56,014	60,930	59,040	−4·62	−5·12
Tatu	32,573	30,979	31,409	27,426	+3·71	+12·95
Wallsend	47,233	45,028	57,505	54,688	−17·86	−17·66
Dobson	54,580	53,047	61,461	60,373	−11·20	−12·13
Stockton (*b*)	215,221	208,460	108,953	103,591	..	..
Mossbank (*c*)	24,128	22,725	11,819	9,664	..	..
Wilton (*d*)	88,653	83,651	33,634	32,014	..	..
Wairaki (*e*)	68,425	63,343	12,836	11,385	..	..
Glen Afton Opencast ..	14,394	14,394	12,029	12,029	+19·66	+19·66
Kimihia Opencast	32,398	32,398	47,871	47,871	−32·32	−32·32
Beehive Opencast	..	..	4,009	4,009	..	..
Kemp's Opencast (*f*) ..	38,097	38,097	6,874	6,874	..	..
Ohai Opencast (*g*)	35,492	35,492	704	704	..	..
Waitewhena Opencast ..	23,198	23,198	18,884	18,884	22·84	22·84
Wangaloa Opencast ..	8,587	8,587	..	..	..	..
Totals	1,024,937	990,588	762,653	734,683	..	..

(*a*) James Colliery ceased operations on 23rd July, 1943. Slack raised from dump. (*b*) Stockton Mine purchased 1st July, 1944. (*c*) Mossbank Mine purchased 9th October, 1944. (*d*) Wilton Mine purchased 20th October, 1944. (*e*) Wairaki Mine purchased 27th January, 1945. (*f*) Kemp's commenced production 22nd December, 1944. (*g*) Ohai Opencast purchased 27th January, 1945.

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

The following table shows the total sale of State coal from the State mines as compared with the previous year and the average f.o.r. price realized by each mine exclusive of subsidy :—

Mine.	Total Sales, 1945-46.	Total Sales, 1944-45.	Percentage Variation.	Average Price f.o.r. realized.
	Tons.	Tons.		s. d.
Liverpool	115,487	114,675	+0·71	19 5·85
Strongman	99,663	106,071	−6·04	24 3·04
James	39	7,057	−99·44	7 10·08
Blackball	58,663	55,850	+5·04	17 3·55
Mangapehi	56,012	59,068	−5·17	20 1·22
Tatu	31,026	27,301	+13·64	22 3·16
Wallsend	46,756	52,879	−11·58	22 0·00
Dobson	52,943	59,343	−10·78	23 10·94
Stockton	210,623	98,567	..	20 9·52
Mossbank	22,713	9,655	..	20 6·28
Wilton	83,479	32,011	..	20 5·92
Wairaki	63,283	11,385	..	21 5·81
Glen Afton Opencast	14,394	12,029	+19·66	23 0·85
Kimihia Opencast	32,398	47,871	−32·32	24 8·47
Beehive Opencast	..	4,009	..	..
Kemp's Opencast	38,097	6,874	..	18 4·04
Ohai Opencast	35,492	704	..	24 11·44
Waitewhena Opencast	23,187	18,884	+22·79	28 3·11
Wangaloa Opencast	8,587	..	..	16 0·19
Totals	992,842	724,233	..	..

WAIKATO COAL-MINES CONTROL

The Waikato Coal-mines Control Board, established under the provisions of the Waikato Coal-mines Control Emergency Regulations 1942, and charged with the control of the mines owned by Glen Afton Collieries, Ltd., Pukemiro Collieries, Ltd., Renown Collieries, Ltd., and Taupiri Coal Mines, Ltd., met at regular intervals during the year and continued to exercise a superintendence over various matters affecting these mines.

The existence of a Board representative of both owners and miners to which an appeal could be made on any matter affecting the mines appears to have created a great measure of industrial security since, apart from the railway strike in January, 1945, there have been no prolonged stoppages of the mines in question.

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

Year ended 31st December.	Glen Afton.	Pukemiro.	Taupiri.	Renown.	Total.
	Tons.	Tons.	Tons.	Tons.	Tons.
1936	235,782	117,940	155,785	106,466	615,973
1937	223,301	112,036	158,288	114,893	608,519
1938	218,951	102,751	160,463	107,202	589,367
1939	211,768	110,987	176,020	121,164	619,939
1940	208,684	127,849	184,995	144,646	666,174
1941	222,333	134,242	203,298	128,297	688,172
1942	224,489	125,989	207,738	131,637	689,853
1943	241,709	138,530	219,643	141,974	741,856
1944	204,387	128,970	212,370	147,619	693,346
1945	189,707	116,696	195,205	130,037	631,645

The peak year of 741,856 tons occurred in the first complete year of control, but production has since receded, though it remains above the 1939 level.

The regulations provide for the guaranteeing by the State of the profits of the companies based on the average figure of three years prior to control. Some difficulties were experienced in settling the amounts that were to be paid, since the companies' claims were not entirely acceptable to the Government, but negotiations have been completed and full settlement made of all claims lodged to date.

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

The total amount paid in respect of claims under the Control Regulations to the end of the respective financial year ending in 1945 of each company has been £241,895.

CARBONIZING AND BRIQUETTING

The production of the low-temperature coal carbonizing and briquetting plant at Waikato Carbonization, Ltd., at Rotowaro, during the year 1945 was :—

Raw coal carbonized	24,548 tons.
Carbonized coal produced	12,029 tons.
Average percentage of carbonized coal to raw coal ..	49 per cent.
Carbonettes manufactured	9,784 tons.
Tar and oil treated	219,677 gallons.
Pitch produced	180 tons.
Creosote produced	160,998 gallons.
Char sold for producer-gas plants	3,449 tons.
Char sold for other purposes	38 tons.

During the year Smokeless Fuel and Briquettes (Canterbury), Ltd., produced 34,000 gallons of tar. No briquettes were made.

No decision has yet been taken on the proposal to establish a plant to briquette Strongman and Blackball slack.

MINERALS OTHER THAN GOLD

Production of these minerals has declined markedly and in many cases mining activities have ceased owing to slackening of demand and consequent recession of the price level. This trend has been accentuated by the exhaustion of ore reserves and the lack of encouragement under the present circumstances to undertake further development work.

It has become increasingly apparent, as the result of investigations and development work carried out during the war years, that New Zealand's resources of many of these minerals are negligible and that in the future greater importance will be given to the increased production of those less spectacular, but none the less valuable, non-metallic minerals, such as clays, limestones, and silica sands, that are demanded by industry.

Scheelite.—The contract with the Imperial Government, whereby tungsten-ores were purchased at 75s. sterling per unit, terminated on 30th June, 1945, owing to the accumulation of large supplies of tungsten-ore in Great Britain and the decision to confine further purchases to high-grade wolfram-ore. During this period the equivalent of 34 tons of concentrates assaying 65 per cent. WO_3 were produced and shipped, but, although production continued on a reduced scale during the year, no further shipments were made owing to difficulties in obtaining markets and procuring shipping space.

Production of scheelite concentrates calculated to the basis of 65 per cent. WO_3 per ton during the years in which purchase has come under Government control has been as under :—

	Tons.		Tons.
1940	79	1943..	116
1941	71	1944..	145
1942	71	1945..	34

The reduction in production during 1945 was due in great part to the uncertainty as to market conditions, but the exhaustion of deposits has also been a factor. It does not appear, however, that the collapse in the price of scheelite will be as severe as after the 1914–18 war owing to new and expanding uses for tungsten-ores. It is encouraging that recently some 12 tons of concentrates have been shipped on account of an English firm of ore-buyers at a price of 59s. sterling per unit,, and it is hoped that a satisfactory long-term contract can be made with this same firm.

A small-scale scheelite-mining industry maintained by small producers now seems assured at Glenorchy for some years, and to assist these producers the treatment plant purchased by the State in connection with its own operations is being retained in the district so that adequate treatment facilities will continue to be available. There was no mining activity by the State during 1945, operations being confined to cleaning up around the treatment plant, from which operations 1 ton of concentrates were produced. Most of the housing and much of the plant and equipment has now been disposed of.

As a result of State activities, some 100 tons of scheelite were produced during the war years, but the extensive development programme carried out showed that there was no basis for mining undertakings of any magnitude, particularly at the normal price level of peace conditions.

Mercury.—Mercury Mines, Ltd., produced 2,294 lb. of mercury from 343 tons of ore from their mine at Puhipuhi in the opening months of 1945, but, owing to the drastic slump in the price of mercury and the need for additional earth-moving equipment, operations terminated early in the year and since then the property has been on a care and maintenance basis.

Production of mercury during the war years has been as under :—

	lb.		lb.
1941	5,600	1944	6,840
1942	11,402	1945	2,294
1943	7,068		

It is to be regretted that the determination of this company to put mercury production on a sound basis in New Zealand and increase the supply of an essential war material has not met with a greater measure of success. Many difficulties have had to be faced; adverse weather conditions, the high ratio of overburden to ore, the general patchy nature of the ore-body, difficulites in securing earth-moving equipment, and, overriding all, the collapse in the price of mercury following resumption of marketing by the international mercury cartel. Despite the erection of a modern and efficient treatment plant and the introduction of both modern mining and metallurgical practice, it has been impossible under the circumstances to continue operations on an economic basis.

Manganese.—There was no production of manganese-ores during 1945, but a tributor at Mirandite Products, Ltd's, mine at Clevedon was engaged during the year mining and getting out a parcel of 500 tons of ore for shipment to Australia. Recently shipment has been made of 410 tons of this parcel and the balance is expected to follow at an early date. The ore, while of good grade, is limited in quantity and access and transport are difficult.

Copper.—A discovery of copper-ore was made some time ago at Pakotai, near Whangarei, in North Auckland, and during 1945 this ore-body has been opened up and a parcel of 500 tons of ore obtained. This parcel now awaits shipment to a smelter at Port Kembla, in Australia, and the result of the shipment will determine the average grade and the value of the ore. Both copper and gold are contained in this ore, but the extent of the deposit cannot be determined until further prospecting work is carried out, and this is in part dependent on the result of the shipment.

Iron-ore.—At North Auckland and at Onekaka, 6,067 tons of iron-ore were obtained from deposits, the majority coming from North Auckland. This iron-ore is used for gas purification, in the manufacture of stock-licks, and in the cement industry.

Uranium.—The search for uranium-ore in New Zealand has been proceeding for some considerable time by officers of the Department of Scientific and Industrial Research. Uranium occurs in New Zealand generally in minute concentration, the most important potential source of uranium being some of the sands and gravels of the west coast that are at present being dredged for their gold content.

The uranium content of these gravels is actually very low. In one dredging area it has been estimated that the bank material (*in situ*) contains 0·0005 per cent. monazite and 0·0003 per cent. hyacinth. The monazite at this locality has been analysed and proved to contain 1·15 per cent. U_3O_8 and 4·93 per cent. ThO_2, so that the overall content is minute in the extreme.

These uranium-bearing materials are concentrated to a certain extent incidental to the normal processes of gold recovery, and research work is being carried out to determine whether improved concentration can be effected on the dredge to such a stage that the material might be further treated and concentrated at a special treatment plant ashore. Research work into this latter aspect of the problem is now being carried out at the Thames School of Mines. Whether such work can be considered on the economic plane or not is at present indeterminate as it is impossible to assess the value of uranium under the system of control (of uranium-ores) exercised overseas.

The mining and treatment of uranium-ores in New Zealand is now controlled by the provisions of the Atomic Energy Act, 1945.

Mica.—Mining operations were continued by Radio Corporation of New Zealand, Ltd., at its mica-mine in South Westland and 882 lb. of dressed mica, valued at £882, were produced. The mica obtained has been invaluable in permitting the company to fulfil important war contracts when mica was unobtainable from overseas, but production costs have been high and the future of mica production in New Zealand under peacetime conditions is doubtful.

So far it has been impossible to complete the pack-track to the high-level deposits owing to the difficulties in obtaining a contract party.

Asbestos.—The comprehensive prospecting programme of driving and crosscutting commenced by the Hume Pipe Co. in 1944 upon its asbestos deposits in the Upper Takaka district was completed early in 1945, and since then the property has been on a care and maintenance basis.

During 1945, 31 cwt. of asbestos, of an estimated value of £31, were produced incidental to the prospecting programme.

Bentonite.—In 1945, 167 tons of bentonite, of a value of £800, were produced from Porangahau deposits, as against 360 tons, valued at £1,640, produced in 1944. It is expected, however, that the overseas demand for this material will increase during the coming years. During 1945 an investigation was carried out by the Geological Survey of bentonite deposits at Kekerangu, in Marlborough, but so far no deposit of commercial grade has been located.

Phosphate.—Operations at Clarendon during 1945 were confined to the low-grade phosphatic sandstone, of which 7,956 tons were produced, valued at £2,188. It is possible that attention will be paid to other sections of this deposit in the Clarendon area proved by the drilling programme. No work was done on the meduim-grade phosphate deposits, as reserves of this material were exhausted by the operations of the British Phosphate Commission during 1944.

Serpentine.—The production of serpentine again declined during 1945, only 13,933 tons being produced, as against 37,711 tons in 1944. This decline was due partly to the suspension of the regulations making its use compulsory in superphosphate fertilizers and partly owing to difficult transport conditions. Indications are that serpentine-superphosphate is now gaining favour and that production of this material, introduced as a war measure, will be maintained in after-years with increasing demand.

Production in 1945 came entirely from the North Auckland deposits, and, while operations will be continued from this locality by opening up fresh deposits, production has now commenced at a much larger deposit near Te Kuiti. The deposit at Mossburn, though inactive in 1945, is capable of satisfying all possible South Island requirements.

Limestone.—While limestone production, mainly owing to transport difficulties, declined from 903,808 tons in 1944 to 812,635 tons in 1945, notwithstanding this, production was at a much higher level than any of the preceding years other than 1944. There is now increased activity in the production of limestone for agricultural uses and, with attention now being paid to producing better-processed material, it would appear that the value of limestone production in our economy is being increasingly recognized.

Dolomite.—From the Mount Burnett deposits, near Collingwood, 4,644 tons of dolomite were produced, as against 3,931 tons in 1944.

Clays.—Clays other than for use in bricks were produced during 1945 to the amount of 8,251 tons, valued at £5,408. A drilling programme comprising fifteen holes and a total footage of 1,060 ft. was completed on the clay deposits at Kaka, in Nelson, and was successful in proving up additional reserves of clay suitable for the manufacture of insulators at Temuka. In the years to come increased attention must be given both to the prospecting of clay deposits and to research work in processing clays so that adequate reserves of uniform-grade material can be made available to the increased demands of industry.

Silica Sand.—During 1945, 20,009 tons of silica sand were produced, of a value of £45,066. Of this quantity, the most important contribution was that of 17,862 tons, valued at £42,870, which were obtained from North Auckland for use in the manufacture of glass.

Pumice.—During 1945, 2,183 tons of pumice, valued at £9,163, were produced for shipment overseas.

General.—Small amounts of arsenic, distomaceous earth, Fuller's earth, magnesite, and quartzite were also produced during 1945, but there was no development of note with regard to these minerals.

PERSONS EMPLOYED IN OR ABOUT MINES AND QUARRIES

The following table shows the number of persons employed in each inspection district during 1945 and 1944 :—

Classification.	Inspection District.			Totals.	
	Northern (North Island).	West Coast (of South Island).	Southern (Rest of South Island).	1945.	1944.
Gold, silver, and tungsten-ore	506	621	177	1,304	1,390
Coal	2,110	2,421	1,061	5,592	5,595
Quarries	1,091	116	511	1,718	1,531
Silica	7	..	4	11	13
Cinnabar	9	..	..	9	18
Iron-ore	17	5	..	22	20
Manganese	1	..	..	1	1
Fuller's earth	2	..	..	2	2
Diatomaceous earth ..	2	..	2	4	2
Bentonite	5	..	..	5	5
Serpentine	5	..	..	5	17
Asbestos	..	6	..	6	15
Dolomite	..	5	..	5	4
Clay*	3	4	9	16	12
Phosphate	..	..	3	3	14
Mica	..	5	..	5	6
Oil prospecting	..	..	..	..	..
Totals	3,758	3,183	1,767	8,708	8,645

* Other than for brickmaking.

MINING AND QUARRY ACCIDENTS

Fatal and serious accidents in the mining industry during the year 1945 were as follows :—

——	Number of Men killed.	Number of Men seriously injured.	Number of Men ordinarily employed.
Coal-mines	6	28	5,592
Metal-mines	2	3	1,304
Quarries	4	3	1,718
Totals	12	34	8,614

GEOLOGICAL SURVEY

During the year regional geology was carried on by only one party under Mr. Fleming in Wanganui, and under his direction Mr. Beck extended the mapping on the ironsands as far as Waitara.

Small areas in Southland were mapped by parties under Mr. Willett, and at Wairaki Mr. Rout located important new carboniferous fossiliferous beds.

Bentonite was examined at the Blue Slip, Kekerangu, and Clarence.

Coalfields were examined at Ohai, Morley, Kaitangata, Wangaloa, Mataura, Hokonui, Mount Davy, Garvey Creek, Buller, Tatu, Kamo, Kikurangi, Kawakawa, Mangatangi, and Huntly.

Clays were investigated at Wellington, Ashburton, McLeod's Bay, Tussock Creek, Taylor's Gorge, and throughout North Auckland.

Dam-sites were examined and, whenever necessary, re-examined at Karapiro, Maraetai, Clarence, Waitaki, and Molyneux.

Limestones were reported on at Clarendon, Balfour, throughout Southland, Ruatangata, View Hill, Cape Foulwind, and Te Kuiti.

Serpentine was examined at Harper's, Gordon's, and Maungaturoto.

Terrazzo materials were reported on by Mr. Macpherson.

Water-supply was investigated at Hawera, Otahuhu, Plimmerton, Foxton, Upokongaro, North Auckland localities generally, Blenheim, Picton, Ashburton, and Stewart Island.

Mr. Modriniak's geophysical investigations have been carried on at Karapiro, Maraetai, Chateau Tongariro, Maungaturoto, and Kakahi.

The Silvia Mine, gemstones, concrete aggregate, concentrates, railway ballast, and road metal have been investigated.

Two expeditions in the "New Golden Hind" examined Fiordland.

Mr. Healy, Vulcanologist, has take up his duties at Rorotua and will report on utilizing the hot water and steam.

Ruapehi volcano was kept under observation while in eruption, and in spite of many alarming reports no occasion arose for removing the people.

MINERALS EXAMINED BY DOMINION LABORATORY DURING YEAR ENDED 31ST DECEMBER, 1945

The number of scheelite samples analysed (45) was less than in 1944 because of the withdrawal of the Government control of marketing. Assays for gold and silver also declined somewhat in numbers.

On the other hand, there was a great increase in the number of complete analyses of minerals separated in the pure state by the Geological Survey. Minerals tested for the possible presence of uranium were thorite, chromite, garnet, monazite, ilmenite, sphene, and allanite.

Wanganui ironsands from both beach and dune deposits were analysed for the iron content of their magnetic and non-magnetic fractions.

Some 75 limestones from east coast districts were examined for lime content (for Native Department).

Serpentine from the newly opened quarry near Te Kuiti was tested for suitability for use in superphosphate.

In connection with the eruption of Ruapehu, the lava was analysed and the dust was examined for acidity and corrosion effects.

The examination of mine dusts for minerals injurious to health was continued.

Many other mineral samples were examined for identification.

A systematic examination was made of clay deposits from several districts.

Coal Survey.—The field staff appointed by the Geological Survey, working with officers of the Mines Department prospected coal-bearing areas in various parts of the Dominion, notably in the bituminous coalfields of the west coast of the South Island.

In all, 218 samples from bores, outcrops, or mines were analysed in the Dominion Laboratory. Samples of mine air were examined for methane carbon monoxide and carbon dioxide.

DRILLING OPERATIONS

All the diamond drills owned by the Department were in constant use during the year, and whenever possible, with the object of speeding up exploration, three shifts per day have been worked. The previous shortage of experienced drillers has been lessened by the employment of the older drillers as foremen, thereby assisting in training drillers and helpers as speedily as possible.

During the year there have been no serious or fatal accidents, although, because of the hazardous occupation, there have been some reportable slight accidents.

In all, forty-three holes, the total depth of which amounted to 12,282 ft., were drilled during 1945, details of which are as follows :—

Strongman Colliery.—An underground air drill has been in constant use during the year, prospecting through faults and determining seam levels as well as drilling directional holes for guidance in driving stone drives.

Dobson.—Drilling deep holes on the Dobson Flats, ahead of the Dobson Mine workings, to prove the extent of the coal in that direction was completed during the year. Four holes, with a total depth of 7,908 ft. were completed in this locality.

Of the four holes drilled, No. 252, situated 15 chains ahead of the workings, penetrated a seam of coal 10 ft. thick at a depth of 1,500 ft., and No. 254, approximately 55 chains ahead of the workings, disclosed a seam of coal 13 ft. 6 in. thick at a depth of 2,020 ft. from the surface, but No. 253, drilled to 2,201 ft. disclosed only narrow seams less than 2 ft. thick, and No. 251, drilled to 2,166 ft., disclosed only a seam of coal 1 ft. thick. These results indicated that there was not sufficient coal to justify opening up this area by deep vertical shafts as a separate colliery, but the area proved by holes Nos. 252 and 254 will be further explored by extending the Dobson dip, which had been discontinued during the drilling operations.

It is of interest that in three bores traces of crude petroleum oil with high wax content were obtained. The services of a petroleum engineer were obtained from the New Zealand Petroleum Co. and the bores were electrically logged with the object of determining the porosity, &c., of the sands containing the oil. These results have been kept for future reference.

Rewanui.—Drilling to the west of the Seven-mile Creek and below the old bins section has been in progress most of the year. The results have been encouraging, and with one or two more bores sufficient information will have been obtained to successfully determine the approach to the Kimbell, Morgan, and other similar seams in that locality.

Brunner.—In May of this year a bore was started at a site near the old Brunner Traffic Bridge to determine whether or not the Goldlight, Anderson, and Morgan seams were present below the Brunner series. This bore penetrated all the coal series and was drilled to basement at a depth of 2,023 ft. The results from this bore were such that another bore was started in Gage Creek about one mile north-west and outside the boundaries of the old Brunner workings. This hole was drilled to basement at a depth of 2,413 ft., but did not disclose any seam of coal. The area will, however, be further explored and an additional hole will be commenced at an early date.

Dunollie.—Two bores totalling 1,468 ft. were drilled on an area westward of the old Point Elizabeth Coal-mines to ascertain if coal was present between two parallel faults, one of which determined the westward boundary of the old workings. The boring proved that the coal had thinned and was very dirty, and further work has accordingly been abandoned.

Stuart and Party.—A bore was drilled to a depth of 230 ft. at the mine mouth to determine the interval between the seam being worked and the seam below. The coal was struck at a depth at which it would be too costly for the party to gain entry, therefore a further bore was drilled to a depth of 151 ft. from a position lower down-stream. Coal was struck at an economical depth, and the party started driving to the seam.

Fisher and Party.—Drilling has commenced on a lease west of the Seven-mile Creek, near Dunollie, to locate a seam of coal for a new co-operative party. Drilling is in progress.

Kawakawa.—A drill was despatched to Kawakawa, North Auckland, to drill at sites in Waiomio Basin recommended by the Geological Survey Department. Results have been disappointing, as no coal was disclosed, and drilling has been discontinued.

Portland.—During the year four bores of a total depth of 599 ft. were drilled by the Department for Wilson's (N.Z.) Portland Cement Co. at Portland to determine the extent of suitable limestone for the company's requirements.

Kaka.—Drilling of a most difficult nature was carried out at Kaka, in the Nelson district, for the Temuka Insulators, Ltd., to locate feldspathic clay. Fifteen bores were drilled having a total depth of 1,060 ft.

Stockton.—In the early part of the year drilling which had been proceeding for some months in the previous year was terminated.

A number of bores were drilled in the vicinity of D Hill for the purpose of establishing coal thicknesses and depths before opening up that section as an underground mine. Drilling will be recommenced at a later date when a new machine more suitable for the work comes to hand and when further mapping and geology is completed.

Ohai.—A percussion drill has been in operation near the Bar 20 Opencast for some months to determine the coal and overburden thicknesses near that mine.

It is found that close drilling is required in that locality and the machine will be in operation for some time.

A new diamond drill and equipment was despatched in August to Ohai to start an extensive drilling programme in the Ohai district generally. The first bore was drilled in the New Brighton area with not very encouraging results, but the machine has now been shifted to the Morley area and drilling is in progress.

Drilling already completed has confirmed the drilling results obtained by the former owners of this area, and it is estimated that some 5,000,000 tons of coal have already been proved in the section drilled. Drilling is continuing in this locality.

COAL-MINES COUNCIL

The Coal-mines Council was fully engaged throughout the year in hearing and deciding minor disputes at coal-mines. All the mining fields in the Dominion were visited, and it is pleasing to record that acceptable solutions to all difficulties were found and that time lost through strikes was reduced to a minimum.

SCHOOLS OF MINES

The expenditure on Schools of Mines for the year ended 31st March, 1946, was £4,190. For the previous year the amount was £3,989. Two candidates from the Otago School of Mines were awarded scholarships at the annual examination.

The decline of the metal-mining industry in recent years means that opportunities of employment in New Zealand for graduates of the Otago School of Mines now approach the vanishing point.

In the past very few of the graduates have been attracted to the coal-mining industry and the majority have preferred to seek positions overseas.

Both the Mines Department and the University staff consider this a highly undesirable state of affairs, and a survey is being undertaken with the object of organizing a scheme which will provide sufficient inducements to bring qualified men from the Otago University into the technical force of the coal-mining industry.

RESCUE STATIONS

The Dobson, Rotowaro, and Ohai Mines rescue stations rendered valuable service to the industry during the year.

New teams have been trained and refresher courses conducted for trained men. The teams have sucessfully controlled numerous cases of underground fires and heating.

The new station at Granity has been partially completed, but difficulty is being experienced in finishing the building owing to shortage of building-materials.

A substation has recently been built at Mangapehi, where the training of teams is carried out by the officer in charge of the Rotowaro district.

SOCIAL AMENITIES

During the financial year 1945–46 the sum of £1,973 was expended in the improvement of social amenities for mining communities.

During the war years it has been impossible to improve social amenities to the extent desirable, but it is intended from now onward to expand activities in this direction so that mining communities will have facilities for recreation comparable with those of the more accessible and favoured larger centres.

HOUSING

The critical shortage of building materials have prevented any large-scale building programme in mining centres, but it is hoped to build a limited number of new houses during the coming year, probably at Huntly, Reefton, and Ohai.

In addition, the provision of a large-scale hostel both at Huntly and Ohai is now under consideration, and it is hoped thereby to greatly improve accommodation for single men employed in the coal-mines in those districts.

COAL MINERS' RELIEF FUND

Receipts from the levy of ½d. per ton amounted to £5,706 for the year ended 31st March, 1946, and the total expenditure for the year was £9,219.

Interest earned amounted to £165, and the amount standing to the credit of the fund on 31st March, 1946, was £3,851.

At the close of the previous year the figures were: receipts, £5,566; expenditure, £10,059; interest, £301; balance as at 31st March, 1945, £7,199.

ASSISTANCE TO MINING

Financial assistance afforded the mining industry by subsidies and loans during the year ended 31st March, 1946, amounted to £11,173. Of this sum, £101 was for gold-mining, £14 for the production of manganese-ore, and the balance to the coal-mining industry.

MINERS' BENEFITS

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

The rate of benefit for a miner is £104 per annum, increased in the case of an applicant who is married by £104 per annum for his wife. There is now no provision for payment of any portion of miner's benefit in respect of a miner's child or children, as these, like the children of other beneficiaries, are covered by family benefit. The widow of a miner who died while in receipt of a miner's benefit has also received an increase of benefit from £52 to £78 per annum.

The new provisions referred to above were embodied in the Social Security Amendment Act, 1945.

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, 1946 :—

	£
Payments from 1st November, 1915, to 31st March, 1945 ..	1,574,667
Payments, 1945–46..	88,359
	1,663,026
Number of new grants for year 1945–46—	
Males	29
Females	9
	38
Number of benefits in force at 31st March, 1946 (including 2 emergency benefits)—	
Males	647
Females	91
	738
Annual value of benefits in force at 31st March, 1946	£101,338
Dissection of benefits in force at 31st March, 1946—	
Single miners	214
Married miners	433
Widows	91
	738

LEGISLATION

Under the Atomic Energy Act, 1945, provision was made for the control in New Zealand of the means of producing atomic energy, and for that purpose to provide for the control of the mining and treatment of the ores of uranium and other elements which may be used for the production of atomic energy and to provide for the vesting of such substances in the Crown

Under the Statutes Amendment Act, 1945, certain amendments were made to the Coal-mines Act, 1925. These are mostly of routine machinery nature and provide that additional matters shall be shown on coal-mine plans, that the Minister of Mines may acquire and hold shares in stock in companies, and that the Minister may sell or otherwise dispose of lands exempted from Part III of the principal Act. In addition, the Quarries Act, 1944, was also amended to provide that managers of certain specified quarries were not required to hold certificates if holding permits under the section.

Under section 15 of the Finance Act (No. 2), 1945, section 15 of the Customs Act Amendment Act, 1939, was amended by reducing the duty on gold from 75 per cent. of the amount by which the New Zealand currency value of London market price exceeds £9 5s. 8d. to 40 per cent. of the same amount.

Various amendments and additions to the regulations under the Mining Act, 1926, are contained in the Mining Regulations 1926, Amendment No. 10, which was issued during the year.

ALUMINIUM-DUST THERAPY FOR SILICOSIS

It is to be regretted that it has not been possible to make arrangements for Dr. W. D. Robson, Medical Director of McIntyre Research, Ltd., to visit New Zealand personally and advise the Government on the prophylactic treatment of silicosis. Unfortunately, there are so many demands upon Dr. Robson's time that a visit is impossible.

However, the Mines Department is following the development of this treatment with considerable interest, and it is hoped that it will be possible for an officer of the Health Department to visit Australia during Dr. Robson's visit there and confer with him, while the Australian Government has promised to furnish the New Zealand Government with reports on the treatment prepared by its medical officers.

POST-WAR DEVELOPMENT

The most important mineral resource of New Zealand is coal, and accordingly in the succeeding years it must command the greatest attention of the Mines Department, and a development programme has been prepared as follows:—

(1) State ownership of all coal rights and acquisition by State of principal collieries.

(2) Progressive development of new mines so that reliance can be placed on local production for national needs without recourse to importation.

(3) Conservation of coal resources by adoption of methods to obtain maximum extraction in mining. This entails briefly -

(*a*) Experiment in hydraulic and perhaps pneumatic stowage in pillar-extraction:

(*b*) Washing and processing to eliminate excessive ash and/or sulphur:

(*c*) Blending by briquetting of soft friable coals otherwise unsuitable for marketing.

(4) Study of latest technique in extraction of oil from coal by low-temperature and hydrogenation processes.

(5) Extension of mechanical means of boring, cutting, loading, and underground transport of coal where coal deposits and underground conditions are suitable.

(6) In furtherance of (2), opening up new mines: Garvey's Creek (under way), Morley (about ready to start), and Rewanui (surveys should be completed within few months).

(7) Acceleration of detailed survey of coal resources and drilling programmes.

(8) Programme of visits by suitable technicians overseas to study latest methods so as to keep up to date with modern trends.

(9) Continuance of encouragement to co-operative mining ventures where large-scale operations are impracticable.

(10) Continuance of improvement of housing and amenities in mining townships.

(11) Concentration of mining townships in desirable localities with better road and bus transport to the collieries.

(12) Further development of underground transport for workers in the larger pits.

(13) Appointment of fuel technologist to ensure use of coal to best advantage.

(14) Programme of training of mine officials and managers to be revised in association with Otago University, Schools of Mines, and representatives of industry.

(15) Maintenance of highest possible standards of safety and study of developments overseas.

(16) Continuance of developments in opencast mining.

STAFF

Early in 1946 the Chief Inspector of Coal-mines and Inspecting Engineer of Metalliferous Mines, Mr. George Duggan, retired on superannuation after long and valuable service with the Mines Department. During his term of office he was indefatigable in promoting safety conditions in coal-mines, and in particular he was instrumental in the creation of the mines rescue stations and in introducing safety-helmets into coal-mines.

His successor is Mr. R. H. Schoen, of the inspectorate staff.

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

SIR,— Wellington, 15th May, 1946.

I have the honour to present my report on metalliferous mines and quarries for the year ended 31st December, 1945.

ACCIDENTS

In 1945 two fatal and three serious non-fatal accidents occurred in or about metalliferous mines, at which 1,304 persons were ordinarily employed.

Cause.	Fatal Accidents.		Serious Non-fatal Accidents.	
	Number of Separate Accidents.	Number of Deaths.	Number of Separate Accidents.	Number of Persons injured.
Falls of ground	1	1	..	..
Explosives	..	..	1	1
Miscellaneous, on surface	..	..	2	2
Miscellaneous, underground	1	1	..	..
Totals	2	2	3	3

Of the fatalities, one man was killed by a fall of earth whilst prospecting at Glenorchy, and the other was killed by a falling wheel in the Martha Mine, Waihi.

Of the serious non-fatal accidents, one man was injured whilst blasting ore in the Martha Mine, one lost an eye from an electrical mishap on the Arahura Dredge, and one was injured by a mooring rope at the Waipuna Dredge.

GOLD-MINING

Production of gold showed a general decline in all branches. The Blackwater and Martha Mines continue to be the only substantial producers in the quartz-mining field, and the production from alluvial mining has shrunk to an almost negligible figure.

The number of dredges in operation for the year was seventeen, and these were responsible for over half of the total gold-production. Since the end of the year the Barrytown, Gillespie's Beach, and Waipuna Dredges have ceased operations.

MINERALS OTHER THAN GOLD

The production of minerals other than gold, which is shown elsewhere in the Statement, is substantially of the same order as last year.

QUARRY OUTPUTS

The following table shows the outputs of quarries under the Quarries Act, 1944, and also the numbers of men ordinarily employed during the year 1945 :—

District.	Number of Quarries.	Men employed.	Road Metal.	Stone for Harbour-works	Building or Monumental Stone.	Limestone for Agriculture.	Limestone or Marl for Cement.	Miscellaneous.	Value at Quarry.
			Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	£
Auckland	174	763	508,899	..	..	195,224	274,995	396,389	340,298
Hauraki Mining District	25	98	100,089	..	345	..	..	..	43,678
Hawke's Bay ..	28	93	37,987	..	..	44,500	..	..	27,079
Taranaki	24	72	23,138	..	..	..	..	..	6,441
Wellington	24	65	40,193	..	..	61,938	..	3,000	30,869
Nelson, Westland, Buller and Marlborough	40	116	13,553	2,142	..	26,290	87,710	3,251	14,157
Canterbury, Otago, and Southland	83	511	137,237	41,531	2,135	484,683	73,331	75,863	247,926
Totals, 1945 ..	398	1,718	861,096	43,673	2,480	812,635	436,036	478,503	710,448
Totals, 1944 ..	347	1,551	820,035	52,587	12,185	903,808	380,305	228,269	627,033

Quarry Accidents

The following is a summary of serious accidents during 1945 at quarries under the Quarries Act :—

Cause.	Number of Accidents.		Number of Sufferers.	
	Fatal.	Serious.	Killed.	Seriously injured.
Haulage	..	..	..	..
Machinery	..	2	..	2
Explosives	..	1	..	1
Falls of ground	4	..	4	..
Miscellaneous	..	..	..	..
Totals	4	3	4	3

STATE AID TO MINING

Subsidized Prospecting

A total amount of £11,173 was advanced during the year 1945–46 to mining concerns by way of subsidies, loans, and other forms of financial assistance.

The Department also expended a sum of £24,618 in surveys, prospecting, and developing of various areas.

Government Drills

Mines Department drills were hired to private concerns for testing two areas, one a limestone deposit and the other a clay deposit.

A total of nineteen holes were bored, having a footage of 1,659 ft.

Subsidized Roads

The expenditure on subsidies and grants for roads to mining areas was £4,603 for the 1945–46 financial year. The expenditure in the previous year was £5,752.

LEGISLATION

An amendment to the Quarries Act, 1944, was made by the Statutes Amendment Act, 1945, providing for the issue of a special form of permit to managers of quarries which use no explosives and have no underground workings.

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.—The quartz won and treated for the year amounted to 125,012 tons, which yielded 32,254 oz. of gold and 242,365 oz. of silver, valued at £341,489 and £36,475 respectively. The ore was separated into three products for cyaniding—namely, sulphide concentrate, 1·96 per cent.; slime, 87·13 per cent., and sand, 10·91 per cent.—while the heading value per ton was: gold, 4 dwt. 23 gr.; and silver, 2 oz. 6 dwt. As formerly, the Martha, Royal, and Empire lodes were the greatest producers. Development operations comprised 5,836 ft., made as follows: drives and crosscuts, 4,721 ft.; winzes and rises, 1,115 ft. The work was of a secondary character more than anything else, as it largely consisted of reopening blocks of ore previously unmined, and the construction of sub-levels for the extraction of supporting arches left under levels. Pumping was constantly carried out until the 27th October, when the rising main in No. 4 shaft was fractured by ground movement, after which no further pumping was done. The total quantity of water raised to the surface amounted to 175,067,500 gallons. The company paid out £24,795 in dividends during the year. An average of 480 men was employed.

Golden Dawn Gold-mines, Ltd., Owharoa.—The treatment of residues from the battery site was continuous for the year, but the concentrates recovered therefrom were not dealt with, though reported to contain profitable values.

Talisman Battery Site, Karangahake.—This is now held as the Grace claim by E. C. Roberts. Approximately 100 tons of material were treated for a return of bullion valued at £707.

Frevin's Extended Claim, Waitekauri.—Work suspended.

Golden Spur Mine, Maratoto.—Work consisted of driving west, then crosscutting south on No. 3 level with the object of intersecting a possible downward continuation of good ore which was stoped at a corresponding point on the level above. The crosscut was advanced for 100 ft. in unaltered andesite when operations were given up, as it was estimated that the stone looked for, if there, would have been met at 40 ft. No other work has since been done on the property.

Sylvia Mines Consolidated, Ltd., Thames.—Driving east on the main line of reef was continued to 437 ft. from the shaft crosscut, No. 6 level, where the stone split and disappeared in the face. Crosscutting and drilling north and south gave no results at this point, and further crosscutting north was then undertaken 20 ft. back from the face, when a reef measuring approximately 5 ft. in width, giving values of 17 dwt. of gold, was intersected at 10 ft. However, neither reef widths nor values were maintained, for development eastwards, which was carried forward to 60 ft., showed that the stone would be unprofitable to work. The discovery is probably a faulted portion of the Sylvia reef, missed on the upper levels, which could possibly be sought with advantage from the lowest water-free point. Development work on No. 6 level exposed about 6,000 tons of ore assaying 9 dwt. of gold. The payable stone exists in short separate shoots, while the non-payable is largely of a sugary character. The latter has been partly leached.

Miscellaneous

N.Z. Mercury Mines, Ltd., Puhipuhi.—A total of 343 tons of ore which were won and treated gave a return of 1 ton 1 qr. 26 lb. of mercury, valued at £2,294. Formerly the bulk of the production was sold in Australia, but the market collapsed there about September, and this, together with the difficulty of obtaining suitable gear, led to the closing-down of both mine and treatment plant. The ore is won by opencast methods and it will be necessary to provide a modern bulldozer and carryall to make a success of the venture with the prevailing prices for mercury. A caretaker staff only was maintained on the property for the last few months of the year.

Serpentine.—The whole of this was again got from Wayby and Kaukapakapa, North Auckland, and amounted to 13,933 tons altogether. The stone was produced by Bitumix Ltd. and Asbestos Mines, Ltd., in proportions of 12,107 tons and 1,826 tons, with values of £3,329 8s. 6d. and £368 5s., respectively.

Manganese.—G. Maning, operating Mirandite Products, Ltd.'s, area, Clevedon, under lease, produced a small quantity, but none was sold. When sufficient has been obtained for shipment, it will be disposed of to the Broken Hill Pty. Steel-works, New South Wales.

Silica.—A total production of 18,230 tons was recorded by two concerns—namely, the N.Z. Glass Manufacturers Co. Pty., Ltd., Penrose, and Messrs. J. B. Gilberd and Sons, Ltd., Wanganui. The former obtained 17,862 tons, worth £42,870 7s. 3d., from its deposit at Parengarenga, and the latter 368 tons, worth £165 12s., from a locality near Aramoho.

Fuller's Earth.—The total produced was 75 tons 13 cwt. 1 qr., valued at £273 2s. 8d. It was won by S. C. Crawford from his property at Kamo.

Diatomaceous Earth.—Production was as follows: S. C. Crawford, Kamo, 15 tons, worth £15; W. Brake, Ngongotaha, 63 tons 11 cwt., worth £170 4s. 9d.; Clays and Minerals, Ltd., Wellington, and Messrs. Forman and Son, Auckland, 31 tons 8 cwt. 3 qr., worth £78 10s. The last two named companies got their supplies from Mr. W. Matthewson, jun.'s property at Ngakuru, near Rotorua.

Bentonite.—The quantity won amounted to 166 tons 15 cwt., valued at £800, which shows a considerable drop when compared with the previous year's figures. Mr. H. F. Stoddart, of Porangahau, was the only producer.

Limonite.—The total obtained was 5,788 tons, of which Okaihau Quarries, Ltd., North Auckland, accounted for 3,270 tons, worth £10,198; W. Whitelaw, Kamo, 2,020 tons, worth £2,020; and J. W. D. Reyburn, Whangarei, 498 tons, worth £1,743. The ore produced by W. Whitelaw is practically all used as a reducing agent in the manufacture of cement, while the other supplies are processed and then sold for cattle licks and top-dressing.

Alumina.—The Kamo Potteries obtained and utilized 2,010 tons, worth £236, from its deposit near Kauri, Whangarei. The material was used for the manufacture of firebrick.

Sulphur.—None was mined or sold.

Moturoa Oilfields, Ltd., New Plymouth.—Production was as follows: No. 1 well, 5,195 gallons; No. 2 well, 49,999 gallons; and No. 4 well, 36,018 gallons: total, 91,212 gallons. The oil was disposed of to N.Z. Oil Refineries, Ltd., which got the undermentioned fractions therefrom:—

	Gallons.
Petrol	17,655
Distillate	6,335
Power kerosene	12,065
Heavy kerosene	12,125
Diesel oil	17,705
Residue oil	17,880
Total fractions	83,765
Loss	4,750
Crude in still	88,515

Accidents

There were two accidents, one fatal, and the other non-fatal. In the former case the victim, W. J. Henbest, was killed by a wheel which fell on him. There were no witnesses to the accident. W. Lane was the victim of the non-fatal accident. He was blasting a large stone in an ore chute and miscalculated, for on hearing a report from an adjoining place of work he returned to the ore chute only to receive the explosion of his own charge in his face. He suffered the loss of his left eye and minor injuries. Both men were employed underground by the Martha Gold-mining Co. (Waihi), Ltd.

Prosecutions

There were no prosecutions.

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

Quartz-mining

Marlborough County

Messrs. Straker and Cadigan abandoned the No. 3 level in Empire City Mine at Deep Creek and obtained a prospecting license over the Golden Bar Mine, which was formerly worked for gold and scheelite. They erected a light two-head stamp battery and from a dump crushed 66 tons which yielded 25 oz. gold and 8 oz. silver. It is the prospectors' intention to sink a winze on No. 2 level on a short chute of ore that they consider contains payable values.

Buller, Grey, Westland, and Murchison Counties

Gold mining and prospecting in the above counties is an almost extinct industry. None of the known reefing systems was given any attention, probably on account of more remunerative employment being obtainable in nearby townships.

Inangahua County

Blackwater Mine, Waiuta.—Development during the year fell short of the required footage owing to scarcity of miners. Labour disputes also retarded operations. The total footage advanced amounted to 1,233½ ft., of which 708 ft. was driven on the three lowest levels, exposing 339 ft. on reef averaging 13·64 dwt. over 32·5 in. with 369 ft. off reef. Winze-sinking amounted to 134½ ft., averaging 13·29 dwts. over 18·8 in. and 189 ft. rising, 126 ft. being on reef averaging 14·47 dwt. over 24·5 in. with 63 ft. off reef. Plat and crosscutting amounted to 77 ft. and the shaft was sunk 125 ft. from No. 15 to 16 level, making a total depth of 2,758 ft. from surface to bottom of 33 ft. sump.

Main development results were as follows:—

No. 14 North Level: 75 ft., all off reef.

No. 15 North Level: Total distance driven was 139 ft., 60 ft. being on reef averaging 7·81 dwt. over 34·6 in., and 79 ft. off reef.

No. 15 South Level: Total distance driven was 286 ft., 262 ft. being on reef averaging 14·52 dwt. over 32·1 in., and 24 ft. off reef.

No. 15 South Branch Drive at Co-ordinate 1790: 73 ft., all off reef.

No. 16 North Level: Total distance driven was 58 ft., 6 ft. being on reef averaging 20·61 dwt. over 25·5 in., and 52 ft. off reef.

No. 16 South Level: Total distance driven was 77 ft., 11 ft. being on reef averaging 18·99 dwt. over 27·4 in., and 66 ft. off reef.

The predominating footage off reef in No. 16 level was due to the necessity of leaving a substantial pillar to preserve the main shaft, which intersected the lode at the top of No. 16 plat, consequently driving north and south in country rock had to be carried out before reaching the lode.

Alexander and Big River Mines, Big River.—On account of the scarcity of skilled labour, no attempt was made to reopen these mines, which are both fully equipped with mining and treatment plants and in a position to employ a number of skilled miners and the necessary surface staff when available.

Dredge Mining

Inangahua County

Slab Hut Dredge, Mawheraiti.—Dredging operations on the claim were fairly continuous for the period under review and a total of 815,530 yards of ground was dredged for a satisfactory yield, despite the fact that a considerable amount of tailings was handled during the course of operations.

Snowy River Dredge, Ikamatua.—This dredge operated for a very high percentage of working-time on ground varying in depth from 12 ft. to 27 ft., and the gold recovered from a yardage that exceeded the million mark allowed the payment of the usual dividends.

Grey River Dredge, Ikamatua.—During the year this dredge worked 79·4 per cent. of the total digging-time of 310 working-days, equalling 5,910 digging-hours. Approximately 87 acres were dug of an average depth of 29·2 ft., and the ground treated was 4,112,179 cubic yards, the maximum output per digging-hour being 675 cubic yards. The value of the ground treated was 6·5d. per cubic yard and operating-costs, excluding export taxes and realization costs, amounted to 4·13d. per cubic yard, while the total cost of production equalled 5·27d. per cubic yard. The dredge operated under normal conditions during the year.

Grey County

Waipuna Dredge, Waipuna (Ahaura Survey District).—This dredge operated for nine months of the year and dug 200,638 cubic yards of low-grade ground before being dredged into a position where conditions were most favourable for dismantlement and removal.

Redjacks Dredge (Associated Gold Dredges, Ltd.), Redjacks Creek, Ngahere.—During the year this dredge dredged 17 acres of ground and treated 929,305 cubic yards. The average depth of ground worked was 26 ft. and the percentage of possible hours worked was 69·7 per cent. A recovery of 1·15 grains per cubic yard was effected, and total working-cost per cubic yard was 4·4d.

Atarau Dredge (Associated Gold Dredges, Ltd.), Moonlight Creek, Atarau.—During the year this dredge dug 48 acres averaging 16 ft. in depth for a yardage of 1,115,420 cubic yards. Seventy-seven per cent. of possible hours were worked, and working-costs totalled 5d. per cubic yard, to be expended from a return of 1·18 grains per cubic yard.

Marsden Dredge (Associated Gold Dredges, Ltd.), New River, Marsden.—This dredge worked 27 acres of ground and treated 1,104,585 cubic yards for a yield of 0·75 grains per cubic yard. The total cost of recovery was 4·23d. per cubic yard and the hours worked was 76·8 per cent. of the total possible time. The average depth of ground dredged was 22 ft.

Ngahere Dredge, Ngahere.—The area dredged during the year amounted to 11·74 acres of a maximum depth of 107 ft. and a minimum depth of 84 ft. The maximum depth below water-level was 77 ft. and the maximum height above water-level was 43½ ft. For a recovery of 1·84 grains per cubic yard, 1,864,733 cubic yards of ground were dredged. During June and July the original bucket band was discarded and a new one installed: a new stacker belt was also installed. During the stoppage numerous necessary repairs were effected, and since recommencing in August the dredge operated very efficiently, with a subsequent increase in output and gold return.

Blackball Creek Dredge, Blackball.—This dredge operated steadily throughout the year with the usual stoppages for overhaul and repairs, which are essential on a dredge of the age and type of the plant in use. In fairly tight ground varying from 35 ft. to 40 ft. deep sufficient gold was recovered to enable the company to maintain a satisfactory financial position.

Barrytown Dredge, Barrytown.—The following figures cover operations at this dredge up to 31st May, when dredging ceased. The area of ground dredged was 29·8 acres and the yardage of wash treated amounted to 798,000 cubic yards, not including the tailings, for a recovery of 1·04 grains per cubic yard. The dredge worked for 72·56 per cent. of the possible dredging-hours of 2,813 hours in ground of an average depth of 16·5 ft.

Westland County

Maori Gold Dredge, Callaghans.—This dredge was purchased by a syndicate, who intend to make extensive repairs to plant and pontoons and resume operations early in 1946. Prospecting by shafting disclosed values which, in the purchasers' opinion, warrant the exploitation of the remainder of the claim, which will provide for several years' work with an output of 12,000 cubic yards to 15,000 cubic yards per week.

Rimu Dredge, Rimu.—On account of this dredge having a higher percentage of working-time than the previous year, the turnover increased considerably, with a subsequent addition in the total amount of gold recovered. Out of a possible working period of 7,296 hours, the dredge worked 85·8 per cent. of digging-time. An area of 39·7 acres was dug of an average depth of 31·1 ft., and a total of 1,992,542 cubic yards of wash and overburden was treated. The yield per cubic yard averaged 11·7d., and operating-costs, excluding export taxes and realization costs, totalled 6·97d. per cubic yard. Total operating-costs, including the above-mentioned taxes, worked out at 8·9d. per cubic yard. Operation was normal throughout the year.

Kanieri Dredge (Gold Mines, N.Z., Ltd.), Kanieri.—A yardage of 2,744,000 cubic yards of solid ground was dredged and treated in addition to 6,996 cubic yards of tailings from 28·2 acres of ground in 5,869 hours, representing 81·38 per cent. of the total possible dredging-time. The depth of ground averaged 60 ft. and a recovery of 1·88 grains per cubic yard was effected.

Arahura Dredge (Gold Mines, N.Z., Ltd), Arahura.—A total of 3,290,000 cubic yards of ground was dredged from ground averaging 67 ft. in depth, the recovery being 1·99 grains per cubic yard. The total area dredged was 30·164 acres. Hours worked were 6,099, representing 84·57 per cent. of the possible working-time.

Gillespie's Beach Dredge, Weheka.—Despite labour shortages and scarcity of replacement parts, this dredge dug 593,338 cubic yards of ground of a average depth of 31 ft. This is a satisfactory performance, considering that lost time totalled nearly 33 per cent. of the available working-hours. The dredge is nearing the end of the payable ground, and unless the present prospecting operations disclose another lead that can be profitably worked, the dredge will cease operations in the near future.

ALLUVIAL MINING

Buller County

Addison's Flat Gold-mining Co., Ltd., Addison's Flat.—The year's operations resulted in the treatment of 150,000 cubic yards of ground derived from cemented gravels averaging 6 ft. in depth. Lack of suitable labour and high cost of pipes, &c., were the chief difficulties encountered by the company during the year, and consequently the margin of profit was reduced considerably.

Inangahua County

Neither Waitahu Sluicing Claim nor Mount David Sluicing Claim was operated during the year, but preparations are being made to commence work in both claims early in 1946.

Grey County

Moonlight Sluicing Claim, Blackball.—This claim was idle for about nine months before being taken over by Mutch and party on tribute in September. Different methods of working are to be introduced which will necessitate relaying of pipe-line and rearrangement of tail-races and stoning-plant. It is estimated that six months' preliminary work will be necessary before the producing stage is reached.

Golden Sands Claim, Barrytown.—This claim operated continuously during the year with what labour was available, and although values remained constant, which under normal conditions should be profitable, the restricted output for the year did not allow the payment of dividends.

MISCELLANEOUS MINERALS

Asbestos.—By September the Hume Pipe Co. (Aust.), Ltd., had completed an extensive prospecting and sampling campaign which consisted of driving a comparatively large footage of levels and crosscuts at varying elevations. The work was planned for the purpose of forming an estimate of the quantities of asbestos fibre available and its varying degrees of quality. Now that the data has been acquired it will be possible to proceed with the design of a treatment plant proportionate in size to the amount of rock available and type of fibre contained in the serpentine rock. The quarry and works were placed on a caretaking basis after the crew and managerial staff were transferred elsewhere. Production from prospecting equalled 31 cwt.

Mica.—Radio Corporation, Wellington, continued their mica-mining operations in the Matakitaki Range, South Westland, and during the period produced 882 lb. of mica from opencast workings. Owing to the cancellation of Government contracts, the company ceased operations shortly after the capitulation of Japan, and resumption of operations will eventually depend upon the demand for mica at a satisfactory price.

Pottery Clay.—The Kaka Clay-pit, in Waimea County, produced 1,294 tons, which realized £1,714 at the mine mouth. The original workings were closed down in June last on account of the remaining blocks of clay becoming too dangerous to extract. A road was constructed to another site where good-quality clay was outcropping, and a fairly extensive deposit had been proved by diamond drilling of Section 7, Block X, Tadmore Survey District, and mining commenced by the driving of a tunnel. Cobledick's quarry, in the same district, produced 100 tons clay from the opencast, and the clay is transported to Nelson and processed by a firm of brickmakers.

Iron-ore.—In the Onakaka district 279 tons of iron-ore were quarried and ground for disposal to gas companies. A sum of £687 was realized for the amount produced.

Talc and Magnesite.—The Takaka Lime and Marble Co. quarried 111 tons of talc and magnesite from the mineral license held by the company at Takaka.

Arsenic.—From the roasting-furnace at Blackwater Mine treatment plant, 17 tons 2 cwt. arsenic was obtained, which was disposed of at £18 per ton.

General Remarks: Mining and Prospecting

Although hostilities in Asia and Europe ceased during the period under review, the beneficial effects on the mining industry of peacetime conditions are not yet apparent, due to the lag between urgent war production and change over to peacetime needs. Labour shortage is still acute. Difficulties in replacing worn-out plant, &c., are not yet surmounted, but there is now prevalent an optimistic outlook for the future of gold-mining by shareholders in operating and idle mining ventures. Prospecting for quartz reefs or alluvial deposits dropped to the lowest point recorded in the past decade. Five companies bored forty-eight holes totalling a depth of 3,547 ft., but more vigorous efforts are anticipated in the coming year, and the diamond drill may play a prominent part in future operations.

Fatal Accidents

One fatal accident occurred during the year as follows:—

Kaka Clay-pit, Kaka.—On 18th July, 1945, Jack Wilfred Barker, miner, was seriously injured by a fall of roof clay in Polglaze's Clay-pit at Kaka, Nelson. The injuries later proved fatal.

Serious Non-fatal Accidents

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

Dredges.—On 16th May, 1945, David Cornelius Jellie, electrical superintendent, Arahura Dredge, suffered a severe injury to his right eye following an explosion of electrical power factor meter. The eye was later removed.

On 14th July, 1945, J. H. Werner, dredgemaster, Waipuna Dredge, while crossing a mooring-line which struck a small manuka stump, was caught by the rope and received compound fracture of left leg, broken right arm, fractured shoulder-blade, and severe shock.

Prosecutions under the Mining Act

Nil.

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

Quartz and Alluvial Mining

Waitaki County

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

Waihemo County

The major portion of the plant and buildings of the Golden Point Gold and Scheelite Mining Co. has been sold and removed from Deep Dell.

Callery Party, Deep Dell, Macrae's.—Prospecting and development work has been carried out on both sides of Round Hill. A considerable area has also been stoped, and 126 tons of ore has been treated at the Deep Dell Battery.

Maniototo County

The alluvial mines at Naseby, Kyeburn, St. Bathans, Cambrians, and Patearoa have operated steadily whenever water was available.

Tuapeka County

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

The Blue Spur and Gabriel's Gully party only operated for a short period at the beginning of the year.

Southland County

Sluicing operations have been carried out in the auriferous areas of Waikaia and Nokomai.

Wallace County

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

The Round Hill Gold-mining Co. has had to operate with one shift daily, the staff being reduced to eight men, with the result that operations have been again reduced. Three acres of ground have been stripped to a depth of 30 ft., and half an acre has been worked to a further depth of 30 ft. The 30 ft. of stripping contained about 20 ft. of buried timber and about 3 ft. of low-grade auriferous gravels. The lower 30 ft. has consisted mainly of hard lenses of clay which had to be drilled and blasted. Shortage of labour and difficult conditions have slowed up operations very considerably. The water-supply has been good.

Lake County

State Scheelite-mines at Glenorchy and Paradise.—All State mining operations ceased early in January at the Glenorchy Mine. Two tribute parties operated on Nos. 6 and 7 levels until the end of June, when the British Government ceased to purchase scheelite concentrates.

Tribute parties have also been testing sections of the Kelly lode, but nothing of importance was located.

At the Paradise Mine a tributer erected a small treatment plant for retreating the mine dump. Results were poor, and operations ceased. Two tributers then took up the surface extension of the reef, constructed a second holding-dam, installed a 500 ft. pipe-line, and opened up a few chains of the main reef by sluicing away the overburden. The reef is easily worked after being exposed, and scheelite-bearing ore has been obtained. Operations are being continued, and the wet season in the Lake County at the end of the year materially assisted this party.

The plant and equipment from the State mine is being transferred to other mines, chiefly State coal-mines. The major portion of the married and single men's quarters and four of the State mine houses have been dismantled and removed.

The State Mine Treatment Plant.—This plant has been kept in good order and has treated the balance of the ore from the State mines, also the ore from the tributers and the privately owned mines in the Bonnie Jean, Mount McIntosh, and Rees Valley reefing systems.

Heather Jock Scheelite Syndicate (Wylie Bros.), (Western Slopes of Mount Larkin).—Stoping operations have been continued in this mine, and the lense of scheelite-bearing ore still persists and has yielded 24 tons of concentrates. Operations are being continued, and the aerial ropeway is being shifted to a point near the mouth of the mine. The ore will then be transported from this point to the ore bin of the Groves Mine treatment plant, which has now been purchased by the Wylie Bros.

Bonnie Jean Mine (Elliot Bros. and Tripp), (South-western Slopes of Mount Larkin).—There has been a good supply of water during the later portion of the season and this has enabled the party to shift a large quantity of heavy overburden. During the early months of the year stoping operations were carried out in the underground southern section of the reef. Prospecting operations have also been carried out on the southern extension of this reef at the Shadows, near the Bonnie Jean Creek, by Messrs. Harris and Wetherston.

Groves Mine (on the Left-hand Terrace of the Bonnie Jean near the Bluffs).—The tributers (Northcote Bros.) continued the testing of the outcrop and the treatment of ore at the treatment plant until April, when W. S. Northcote was killed by a fall of earth. All mining operations ceased, and the Wylie Bros. purchased the treatment plant early in 1946.

The Valpy Bucklerburn Crossing River Mine has been in operation during the working season.

The Hercules Mine (G. Ross and Party), (on the Lower Slopes of Mount McIntosh).—Prospecting, stoping, and treatment operations have been actively carried on during the working seasons and good ore has been mined. No work has been done on Thompson's Reef.

Long Gully Reef Extension (B. Gollop and Partner).—Prospecting and ground-sluicing operations have been carried out steadily during the working season and some good ore has been obtained.

Long Gully Reef (M. Shaw and Partner), (in the Big Slip near the Head of Long Gully).—Prospecting and sluicing operations were carried out on this reef-line to the south of the fault and good ore was obtained. Operations ceased shortly after the cessation of Imperial purchase.

No mining has been carried out on the dark sides of Black Peak, Mount McIntosh, or the Upper Precipice Creek reefing systems.

Rees Valley Mine (Paulin Bros. and Scott), (Left-hand Terrace, Rees Valley).—Active prospecting, developing, and stoping operations were carried out at this mine until all the ore in sight between the fault and the surface was exhausted. Operations ceased, and the plant was removed in July.

On account of the drop in the value of scheelite concentrates and the uncertainty of the market, no work was done at the Muddy Terrace Mine, Upper Rees Valley.

Lower Bucklerburn Alluvial Mine (J. Sanders and Partner).—Ground sluicing for gold and scheelite on Long's Terrace, opposite Campbelltown, proved the area to be of low value. Mining operations were suspended early in the year. The water-race, dams, and pipe-line will be utilized for the generation of power for electric lighting.

Dynamo Flat (Left-hand Branch, Skippers Creek).—The Mount Aurum Syndicate has continued to operate Currie's Reef. Prospecting, stoping, and treatment operations have been carried on during the working season.

Floodburn, Upper Shotover.—The installation of the plant was completed, but mining operations have been hampered by the frequent floods. Operations are being continued.

Very little gold-mining has been carried on in the Lake County during the year on account of war conditions. There are indications that there will be increased activity, as returned men have taken over Short's Mine, downstream from Ballarat Creek, Upper Shotover, and also Sainsbury's Alluvial Mine, Pleasant Valley, Skippers; and the Attley Bros. are intending to resume operations at their River Mine between the Long Gully Creek and Moke Creek Junctions.

Scheelite-mining has received a set-back on account of the cessation of Imperial purchase and the uncertainty of the future market price.

Vincent County

Lower Cairnmuir (W. Thomas and Son).—On account of the urgency of essential work and the shortage of labour on account of war conditions, coupled with the need for adequate pumping plant, prospecting operations only have been carried out.

In the Nevis Valley, mining operations have been carried on actively during the working season.

Williamson Mine, Stone Huts, Upper Nevis.—Sluicing and elevating operations are being carried out on the northern end of the auriferous lead downstream from the Stone Huts.

Jones' Mine, Whitton's Creek.—Jones and Sutherland are sluicing and elevating in the Whitton's Creek area and are now opening up a new area to the south of the creek.

McLean Mine, Old Township Workings, Mid-Nevis.—Sluicing and elevating operations have been carried out, and a new area at the upstream end of the old township workings is to be opened up in 1946.

D. Adie is ground sluicing in the downstream section of the old township workings.

There has been very little alluvial mining in the Vincent and other counties on account of the prevailing labour conditions.

Dredging

Vincent County

Austral New Zealand Mining, Ltd.—This large electrically operated dredge has continued to dredge the river flats upstream from the Lowburn Hotel. At the end of the year dredging operations were being carried out in the island section between the channels of the Clutha River about one mile upstream from the Lowburn Bridge. During the year ending 31st December the area worked totalled 30·27 acres, yielding 2,301,000 cubic yards, for a recovery of 8,127 oz. of bullion. The average dredging depth was 49 ft. This dredge is now in good dredging trim, as the bucket-line has a full complement of buckets and other spares are also coming to hand. During the war period there was a shortage of spares and replacements and dredging companies had many difficulties to contend with.

The Clutha River Gold Dredging, Ltd.—This electrically operated paddock dredge continued to dredge the Alexandra Flat, continuing its first cut in a south-easterly direction along the south-western boundary of the Alexandra Flat area. During the year 11·5 acres were dredged for a yardage of 1,602,000 cubic yards, yielding 6,138 oz. of bullion. The average dredging depth was 30 ft. below water-level, with from 30 ft. to 50 ft. of gravels above water-level. The dredge ceased operations at the end of November for the purpose of undergoing alterations and improvements to the tailings stackers and for general repairs. When operating, the fines are deposited on top of the coarser material, and this is a great improvement on the old method of tailings disposal, but it increases the wear-and-tear on the stacker equipment.

The dredge of the Molyneux Gold Dredging Co., Ltd., has been tied up in the Kawarau River near Scotland's Point.

The Nevis Crossing dredge has been sold for dismantling.

The Bendigo Goldlight dredge has been dismantled.

Southland

The dredge operated by the Rainbow Dredging Co. at Maitland, Waikaka Valley, has been tied up during the year on account of the shortage of labour due to war conditions.

Accidents

I regret to report that one fatal accident occurred during the year, on the 10th April, 1945. One of the tributers at the Groves' Scheelite-mine in the Bonnie Jean Basin, Glenorchy, William Stafford Northcote, was killed by a heavy fall of earth when prospecting the surface outcrop of the reef.

Quarries Accidents

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

There were two accidents of a serious nature:—

At the Brown's Lime Quarry on the 31st January, 1945, John Silke, a quarry worker, was hit by the bucket of a power shovel when assisting to replace one of the caterpillar tracks. He suffered a triple fracture of the jaw.

At the Cave Quarry, operated by the Timaru Lime Co., on the 7th November L. McDonald, quarry worker, was hit in the small of the back by a piece of stone falling from the loaded bucket of the power shovel. He suffered fracture of five lumbar transverse processes.

ANNEXURE B

STONE-QUARRIES

REPORT BY INSPECTOR OF QUARRIES FOR THE NORTH ISLAND

(R. C. Ruffin)

Report for the year ended 31st December, 1945, for surface and underground work done in the North Island District under the Quarries Act, 1944.

Quarries

A total of 249 quarries were worked during the year 1945, being an increase of 6 compared with last year, while the number of men employed in the industry for the year 1945 was 977, showing an increase of 35 over the number for 1944.

Output of Stone

The output of hard stone used for roading, hydro-electric-dam construction, and concrete products is 977,589 tons, being an increase of 122,402 tons over 1944. This increase is partly due to the large volume of rock aggregate supplied for hydro-electric-dam construction.

During 1945, 301,662 tons of limestone for agricultural requirements was quarried, a decrease of 69,393 tons compared with last year, also 274,995 tons of limestone for the manufacture of cement, against 251,395 tons for last year.

The loss in production of agricultural lime to the extent of approximately 19 per cent. must be considered serious; there is no doubt as to the demand for this product, and the inability of the lime-works to supply is due to a combination of retarding factors.

Underground

A circular shaft 7½ ft. in diameter was sunk at the Dominion Breweries' property at Papatoetoe. The shaft is lined with concrete and is sunk 90 ft. It is proposed to sink to a depth of 120 ft. to intersect a pipi bed, where it is anticipated to tap a flow of water required for brewery manufacturing purposes.

A tunnel is being driven by the Wellington City Council at Walworth Street, Northland. The tunnel is being driven to divert storm-water.

Accidents (Fatal, 3; serious, 1)

Fatal Accidents

Fatal accident at Beros Bros.' quarry at Te Kuiti on the 3rd July, 1945. Percy Orr was killed by a piece of stone that fell on him from a place above him. He was changing poles at the time of the fatality.

Fatal accident at Wilson and Rothery's quarry at Ferndale Road, Ellerslie, on the 9th August, 1945. Jerko Didovich was killed through falling down the face of the quarry. He was barring a loose rock when he slipped and fell.

Fatal accident at Turiwiri Quarry, near Dargaville, on the 21st November, 1945. Ante Jericevich was killed when barring a slab of rock, when he slipped and the rock rolled on him.

Serious Accident

Jack Milina met with a serious accident at McCallum Bros.' quarry at Karamuramu Island on 27th February, 1945. Milina was firing a round of thirteen holes in a tunnel at the quarry. Milina was at the face when the blast started, and sustained general injuries and shock.

Prosecutions

Six informations were laid against quarrymen for breaches against the Quarries Act, 1944:—

27th February, 1945: A quarryman was prosecuted for firing more than six holes underground. The prosecution failed.

27th February, 1945: A quarryman was fined for acting in the capacity of manager of underground works, he not being certificated, as required by section 9 (3), Quarries Act, 1944.

27th February, 1945: A quarry occupier was fined for employing a quarryman in the capacity as manager who was not certificated, as required by section 9 (4) of the Quarries Act, 1944.

3rd July, 1945: A quarry foreman was prosecuted for failing to clean down loose rock material from the face after blasting, contrary to Regulation 50. The hearing has been adjourned from time to time by order of the presiding Magistrate.

23rd November, 1945: A quarry foreman was fined for failing to keep a daily report book, contrary to Regulation 51.

19th December, 1945: A quarry foreman was fined for failing to see that loose rock material was removed from the face of the quarry, contrary to Regulation 50.

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, 15th May, 1946.

Sir,—

I have the honour to present my annual report on the coal-mining industry of New Zealand for the year ended 31st December, 1945.

OUTPUT

The total output for the year was 2,833,576 tons, and increase of 27,606 tons on the 1944 production.

The Northern and West Coast Districts' outputs increased by 10,130 tons and 30,378 tons respectively, but the Southern District's output decreased by 12,902 tons.

The following statement shows the tons of coal raised, persons employed, lives lost by accidents in or about colleries, &c., to 1945 :—

Year.	Output, in Statute Tons.	Persons ordinarily employed.			Tons raised per each Person employed below Ground.	Lives lost by Accidents in or about Collieries.		
		Above Ground.	Below Ground.	Total.		Per Million Tons produced.	Per Thousand Persons employed.	Number of Lives lost.
Prior to 1941	95,336,168	..	..	..	..	..	..	526
1941 ..	2,639,507	1,358	3,633	4,991	726	1·51	0·80	4
1942 ..	2,680,041	1,338	3,659	4,997	732	2·24	1·20	6
1943 ..	2,787,868	1,375	3,999	5,374	697	2·87	1·50	8
1944 ..	2,805,970	1,637	3,958	5,595	709	4·28	2·14	12
1945 ..	2,833,576	1,660	3,932	5,592	721	2·12	1·07	6
Totals ..	109,083,130	..	..	..	..	..	..	562

For returns for previous years see page 53, Mines Statement, 1940.

ACCIDENTS

The following is a summary of accidents in and about coal-mines during 1945 with their causes :—

	Fatal Accidents.		Serious Non-fatal Accidents.	
	Number of Separate Fatal Accidents.	Number of Deaths	Number of Separate Non-fatal Accidents.	Number of Persons injured, including those injured by Accidents which proved Fatal to their Companions.
Carbon-monoxide poisoning ..	..	..	..	..
Explosions of fire-damp or coal-dust	..	..	..	..
Falls of ground	4	4	10	10
Explosives	..	..	1	1
Haulage	2	2	9	9
Miscellaneous—Underground ..	..	..	5	5
On surface ..	..	..	3	3
Totals	6	6	28	28

Four of the fatalities occurred in the West Coast District and two in the Northern District.

Twenty of the non-fatal accidents occurred in the West Coast District (six due to falls of ground), six in the Southern District (all due to falls of ground), and two in the Northern District.

DANGEROUS OCCURRENCES

Twenty-two dangerous occurrences were reported to Inspectors during 1945. Nineteen cases related to fire or heating in underground workings, one to explosives, one to an inflow of water, and one to a shaft cage.

PROSECUTIONS

Twelve informations were laid by Inspectors for breaches of the Act and regulations. Convictions were obtained in all cases.

LEGISLATION

A provision was included in the Statutes Amendment Act, 1945, requiring the levels of underground workings to be shown on all mine plans.

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 (R. H. SCHOEN, Inspector of Coal-mines)

SUMMARY OF OPERATIONS OF EACH COLLIERY FOR THE YEAR 1945

North Auckland District

Kamo Colliery.—No. 3 Mine: The No. 1 East dip heading is standing at 18 chains from the main haulage, but panel headings in the top seam have been extended 13 chains to the north-west in the direction of bore No. 3. In the No. 2 East Section the main headings are at 53 chains from the main haulage, and development is being continued both in these headings and in panel development north and south.

In the No. 2 West Section a pair of headings being driven south-west to the north of the British Standard old workings struck faulting, and development ceased in June.

In order to provide better ventilation for the No. 2 East headings, now the main development headings of the mine, it is intended shortly to construct a new ventilation drive from the surface at a point 15 chains south of the present loading bank. This will reach No. 1 West Section at a grade of 1 in 3 and will be equipped with a modern fan.

Waro Colliery, Hikurangi.—The splitting and extraction, where possible, of pillar coal has continued throughout the year, the face of work having progressed during 1945 from 3 chains south of No. 3 Slope Dip to a point on the main haulage 6 chains north of it. Some splitting and extraction of pillars has also been done in preparation outbye of this at two points east of the main laybye where the area previously developed widens. Output has improved slightly owing to the shorter haul, but pumping has given rather more trouble than usual during the year.

Avoca Opencast.—Early in the year stripping of portion of the 20 ft. seam was undertaken by the party, and the stripped area is now worked as an opencast, the coal being sold locally and in Dargaville. An output of 787 tons was produced during the year by the two men employed.

Wharcora Opencast.—During the year a small amount of coal was produced by stripping a small area of old workings of the Wharcora Mine, some nine miles from Whangarei. Much of the coal was found to be of poor quality, and the upper 3 ft. only was marketable. Two men were employed.

Campbell's Opencast, Hikurangi.—During the first three months of the year a small quantity of coal was obtained by stripping in the area covered by this lease near the Marua Road, Hikurangi. Owing to the seam thinning and becoming unworkable, work stopped in March.

Isherwood's Lease, Hikurangi.—A small area held under lease adjacent to Long's Road is being prospected by boring.

Waikato District

Pukemiro Colliery.—North Mine: On the south side of the main headings pillar-extraction has been completed to a point 19 chains from the mine entrance and is proceeding in Nos. 2 and 3 Sections.

On the north side, pillars in the inbye panel are being withdrawn in preparation for taking the rope-end pillars. Output from this mine has been steady in spite of difficult conditions, and fourteen pairs of miners have been regularly employed.

South Mine (Taupiri Section): In the shaft section, pillar-extraction has been continued, and pillaring has also started at the end of the Morgan's Dip headings, development of which ceased in June owing to thinning of the seam as it approached the outcrop. Some further development to the west of these headings has been carried out, but faulting has limited this.

The Horne's Dip workings have been extended to the boundary south-west of the dip, and development is till proceeding to the west. The coal, however, is thinning and is very friable, and the heavy cover of 600 ft. in this locality make conditions difficult.

Pillar-extraction in the Mid Section was completed in June, and is proceeding steadily in the Nelson's Jig - New Panel area, which are connected.

The No. 1 Right Section was cleared of water and reventilated. The coal near the end of the old drives was found to be 8 ft. to 9 ft. thick with some splinty bands. A small amount of development to the south-west has been carried out.

Renown Colliery.—The No. 2 Mine headings have been advanced to a distance of 77½ chains from the mine mouth, an extension of 1,200 ft. during 1945.

Development of Nos. 1 and 2 Panels East is nearly completed, No. 3 East is well forward, and Nos. 4 and 5 East have been started and development is proceeding rapidly. The advantage of the intelligent use of machines and power boring where conditions suit, combined with close attention to the haulage, has been well shown in the rapid development obtained in this mine.

In the No. 1 Mine the No. 1 North (top seam) pillars have now been extracted to a safe distance from the main haulage road and the area has been sealed off.

In spite of considerable floor movement, pillar-extraction of the No. 2 North pillars has proceeded steadily and a good extraction for the difficult conditions has been obtained. In the No. 4 South

headings pillars have been taken to a point 16 chains from the main haulage, while development of a small section to the west of the headings is proceeding. The coal here is 9 ft. thick, but is likely to thin to the west.

In the No. 3 South area pillaring is being continued from the rope end and also in No. 3 West Panel, while No. 2 West Panel is being developed. Here, too, the coal has been shown to thin to the west.

A new bathhouse designed for a shift of ninety men is being erected at the No. 2 Mine entrance. The building is in concrete and fibrolite, well lighted, and will be hot-air heated, the water also being electrically heated.

An Edison electric-lamp charger with metal rectifier to charge up to two hundred lamps has been installed.

Wilton Colliery.—No. 2 Mine: Pillar-extraction continued on both sides of the main headings and also in the Dawson's Dip area, development of which has been completed.

No. 3 Mine: In the East Section and B Panel pillars were extracted throughout the year, and at the southern end of B Panel the worked-out area has reached the roadside pillars of the main headings.

In the Extended Section three main headings have been extended 23½ chains from the mine entrance, and a fourth heading to the west of these is almost completed. The seam has maintained its thickness of 8 ft. to 11 ft. on the line of the headings, but thins to the west. In August a beginning was made in the development of four sections east and west of the main headings. These were started on the five-heading system with crosscuts at 45° in preparation for a system of complete mechanization by the use of shuttle boxes and scraper loading. Development of these sections has been steadily carried on, and heavy-gauge tracks and crossings to suit the proposed transport have been laid in all sections.

The No. 1 Mine fan was placed in position at the Extended Section in June, a concreted fan-drift having been prepared for it. A concrete entrance and penthouse have also been constructed at the main heading of this section.

Glen Afton No. 1.—Pillar-extraction continued throughout the year in E2 Section beyond the State boundary, while in H Section pillaring was carried out until late September. At this time preparations to resume work inbye of the J fault were concluded, and the men from H Section were placed in a small area of coal to the west of L haulage. Preparations for this included the strengthening and cooling of the stoppings in the J hill area, the retimbering of the main haulage in this locality, which is subject to heavy floor movement near the fault, and the construction of a new air crossing to restore the return.

Glen Afton No. 2 (McDonald Colliery).—Korfman Section: In H Section pillar-extraction continued in H4 left and H3 right panels. Development of H3 left headings was stopped in June owing to faulting.

K headings have been extended south-west 24 chains from the main Korfman haulage and are now 17½ chains inside the McKinnon lease. The coal has thinned considerably in this direction, but to the south-east of the development headings two pairs of headings have been driven for panel development. The upper pair has been driven some 87 chains and panels are being developed in coal 14 ft. thick. The second pair have been driven some 8 chains.

In E Section pillar-extraction has continued in thick coal in the inbye panel east of the headings. A serious heating here caused some difficulty in December, but was eventually controlled by a good close.

No. 4 Mine: Pillar-extraction continued throughout the year in the three rise and three dip sections.

Rotowaro Colliery.—No. 1 Colliery (Top Seam): Throughout the year pillar-extraction has continued in No. 1 and No. 4 Sections. The Hill 60 Section was again re-entered and worked for a short period, but a recurrence of the heating caused the section to be sealed off again.

Callaghan's Dip Section (Bottom Seam): The main headings have been extended to 52 chains from the No. 1 Haulage and are being continued, a bore-hole ahead showing that the seam is maintaining its thickness, though rising somewhat.

In the No. 4 Panel to the rise some pillar-extraction has been done, while No. 5 Panel development has been pushed on.

In the No. 3 Panel to the dip a small amount of development to the south-west was done early in the year and the extraction of top coal over the roads completed.

No. 3 Colliery (Bottom Seam): In A Section development in a small area of thick coal towards the western outcrop was continued throughout the year, while in B Section pillar-extraction proceeded.

Off C Section haulage pillars were taken in Brown's Section to the rise and also in the Wilkie's Dip area. In the New Dip area development is proceeding in a block of unworked coal to the west of the Wilkie's Dip workings and, according to bores, 10 ft. thick.

Alison No. 1 Colliery: Pillar-extraction was continued in all panels, and, in addition, the road pillars at the rope end and the barrier pillars between Nos. 1 and 1A Panels are being extracted.

Panel headings have been extended beyond 1A Panel, and another panel is being developed to the rise. Towards the end of the year work was resumed in the North Drive beyond the fault with the idea of reaching and providing an outlet for the coal lying to the north-east of No. 1 Jig.

Alison No. 2 Colliery: The main heading has been extended to a distance of 27½ chains from the surface, the 41 ft. downthrow fault having been pierced by a short stone drive. Bores ahead of the face indicate that the seam will shortly regain its full thickness after a slight local thinning at the fault.

B Section main heading has been extended to a point 14 chains from the main heading. Three development headings are being driven for this area. Development of B1 Panel has been pushed on rapidly by machine.

No further development has taken place in A Section, but a line of surface bores has been put down parallel to the main heading to test the swamp bed. These prove the existence of a thick bed of fireclay above the coal for the distance bored, 4 chains ahead of the face of A Section main heading.

Development of No. 1 Rise Panel was completed in June and pillar-extraction is now proceeding. Development of No. 2 and No. 3 Rise Panels is being continued.

A new fan-drift to the surface, concrete lined, has been completed in line with the main return and will be equipped with a modern fan designed for the mine, while a new haulage road is being driven to the surface in line with the main heading.

A straight cut across several bends of the Awaroa Stream below the dam which supplies the water for the bathhouses will improve the getaway of the water during wet weather and will also provide for better disposal of drainage from houses in Rotowaro Village.

Waikato Extended Opencast (Roose Shipping Co., Ltd.).—During the year a small output was maintained from opencast coal for shipping on the Waikato River and house coal. Nine men were employed and the total output was 5,325 tons.

Late in the year the screens, bin, and loading gear on the Waikato River bank were completed, and it is now intended to work an area of stripped coal to the west of the present opencast, using motor-trucks for transport to the landing.

Bell and Devlin's Mine.—A party of four are working this small mine, which commenced work in June in a small area of coal obtained on royalty from Taupiri Coal-mines, Ltd. The coal is of good quality and the output is taken by motor-truck to the railway at Huntly.

Glen Afton Potteries Opencast.—A small area of stripped coal 6 ft. thick has been worked intermittently as required, the output being used in the pottery-works.

Huntly Brickworks.—No coal was worked during the year. All clay required for brickmaking at the works was quarried at two faces. Late in the year construction of a large modern kiln of continuous-action type was commenced and is now well under way. This will ensure greater output with a better-quality product.

Te Pahu Colliery, Karamu.—Early in the year prospecting was started by a party of two men at a 6 ft. outcrop near the Karamu Caves, on Auckland University endowment property.

Prospects were encouraging, and underground mining commenced in June, and the drive has been put in 3 chains from the outcrop and an airshaft connected. The coal at the face is 4 ft. 6 in. and is of fair quality.

Dally's Mine, Hauturu.—Owing to its isolated situation and the difficulty of getting qualified men to work it, this small mine produced no coal during 1945.

Whatawhata Campbell Colliery.—The face of the main dip is now 9 chains from the surface, and it is intended shortly to continue its development to the south-west as the seam maintains its thickness of 10 ft. A 15 ft. upthrow fault has been struck to the south-east, but the seam has been shown to continue beyond this, and further proving and development will be done. The mine has maintained a steady output during the year in supplying the local market.

Rangitoto Opencast Coal-mine (Hamilton and Harvey), Otorohanga.—Production continued at this mine, which was operated for the owners by a contractor until July, and later by the owners themselves. Owing to the poor quality of coal produced, there was little demand for this coal after October, and only two men were employed from then on, producing a very small output from the 5 ft. of clean coal at the top of the seam. The output for the year was 11,226 tons.

Kimihia State Opencast (Johnson's Mine).—No. 4 Area: Production from this area continued in 1945, extraction of available coal being completed by 30th June. The total spoil shifted was 201,500 cubic yards, and the total coal won from the area 46,614 tons, including 14,764 tons during 1945.

The area has now been worked over and prepared for resowing, seed and manure being on hand for this purpose.

No. 2 Area: Work on this area started on 16th February and was finished by 16th June. A total of 39,300 cubic yards of spoil was removed for a total output of 9,096 tons of coal. This area has also been prepared for resowing, and seed and manure are on hand.

No. 1 Area: Total spoil used on the stop-bank was 94,960 cubic yards, including 71,000 cubic yards in 1944 and 23,960 cubic yards in 1945. Spoil handled in the whole area, both in stripping the seam and constructing the bank, totalled 301,200 cubic yards to 31st December, 1945. Coal produced to date totals 20,298 tons, and production of coal started on 18th June, 1945.

During the year bins and screens were completed at the opencast, the coal being brought to the bins by "flying fox" from the open cut.

Haulage of the coal by motor-truck to Huntly was found to be too costly and subject to interruption, and late in the year a full-gauge rail connection was provided from the main line south of the old Kimihia Station to the mine bins.

A 5-yard electrically driven Bucyrus-Erie dragline purchased in America was also delivered and assembled, and in the latter part of the year has speeded up the stripping of overburden.

Glen Afton State Opencast.—Spoil shifted in 1945 was 155,000 cubic yards, making a total to the end of the year of 326,000 cubic yards. Coal produced was 15,465 tons during 1945, making a total production of 27,302 tons for the opencast. Work is proceeding, but will probably be completed during 1946.

Kemp's State Opencast, Glen Massey.—Total spoil shifted to the end of 1945 was 643,790 cubic yards, including 501,790 cubic yards during 1945. Work on the top seam was abandoned owing to its thinning, but has been continued in the two lower seams, which have been somewhat disappointing owing to their varying thickness and quality. Output for the year was 32,177 tons of coal, giving a total output of 34,062 tons.

Taranaki Districts

Mangapehi State Colliery.—No. 1 East: The main headings have been driven 42 chains from the main haulage and are standing in good coal, though development to the rise has been stopped by the east fault, which here approaches the headings. The endless rope haulage has been extended nearly to the face.

No. 2 East: The main headings have been extended to 2¼ chains from the State boundary. In order to pass a series of rolls in the roof, a dip was driven in coal and has now reached the floor of the seam beyond the troubled area. Pillar-extraction of the eastern half of A Panel was started in March and has proceeded since, though a bad fire in the return airway from the section on 14th March caused considerable delay and loss of output.

No. 2 West: Pillar-extraction in this panel has proceeded throughout the year, though this work has been interrupted considerably during the period by heatings in the waste. Owing to bad conditions due to this cause and to wastage of pillar coal in sealing off, a heavy loss of both output and of developed coal has occurred in this and in the East pillars, in spite of all efforts of the management to deal with the difficulties arising through the thick seam, steep grade, and fiery nature of the coal. It is evident that a better method of extracting such seams should be adopted to avoid these losses, but owing to the general shortage of coal, enough men cannot be spared at this time to push experimental work ahead, and progress in this direction started during the year, has been discouragingly slow.

Development: A coal dip west of and parallel with the main drive had reached a point 2 chains ahead of the main dip and was in coal 6 ft. thick. There has been no further development here since July.

A slant dip is being driven in a north-east direction from near the bottom of the main dip to pass the troubled area met with in the bottom level. The face is 2½ chains from the main haulage and is partly coal.

The mine ventilation has been improved by the completion of an airshaft to the surface to serve the western side of the mine. A small Sirocco fan has been installed.

In August a bogey was put into service at the mine for the haulage of men.

Tatu State Colliery.—In the No. 1 north-west Pillar Section, pillar-extraction continued until July, when further work here was stopped owing to the difficulty of maintaining the haulage owing to heaving floor.

Development of the No. 2 north-west Section continued throughout the year, being limited to the north-west by a fault line proved by boring to be a 50 ft. upthrow. Pillar-extraction at the north end of the section commenced late in the year and is continuing. A pair of headings has been set away from the main haulage beyond No. 2 north-west headings in a west-north-west direction with the idea of crossing the 50 ft. fault at a better angle, but it seems likely that the coal-seam beyond the fault might be better reached and developed by fresh drives from the surface.

Coal Lease (T. Moynihan), Upper Mangakara Stream, Ohura.—No work has been done on the access road to this lease nor on the lease itself since it was granted in August, 1943.

Aria Colliery.—Another good year has been experienced at this small mine, and a steady output has been produced by the three men employed. A fair quantity of coal is now standing in rise pillars to the west of the main drive, and is is intended during 1946 to prospect the dip coal by another dip heading from the surface.

Stockman Colliery.—This small mine is situated twenty-five miles up the Mokau River, the coal being brought down by launch and distributed from Mokau. The seam is 4 ft. 6 in. of good-quality coal with sandstone roof and floor, and a regular output has been kept up from development by the three men employed.

Paparata Colliery (Libline and Williams).—Preparations are being made by this party to work a 4 ft. 8 in. seam of clean coal on a coal lease held by them near the Paparata Saddle, Tangarakau Gorge. No coal has yet been produced, but an access road, a bridge, and a bin have been constructed, and the mine should produce in 1946.

Fougere's Opencast, Tangarakau Gorge.—A seam of clean coal 3 ft. 6 in. thick is being worked by stripping. Owing to a very wet winter, little was done until late in the year, when a small amount of coal was won. This seam was formerly worked by the Tangarakau Coal Co.

Waitewhena State Opencast.—The output for 1945 was 28,756 tons, giving a total output to date of 38,269 tons. Production during 1945 was steady, but a particularly wet season and difficulties due to the steep country causing slips caused a drop both in quality and in quantity. The seam is 8 ft. to 11 ft. thick and contains some small stone bands which vary in thickness. Strip mining, particularly in the Waitewhena conditions, does not allow of the complete cleaning of the coal at the face, and processing is required to clean this coal thoroughly.

By October a large area, estimated to produce 30,000 tons, had been stripped to the west of the Lee Stream area, and will provide a large amount of the 1946 output.

Coromandel District

Yates' Lease, Coromandel.—Prospecting was done on a seam outcropping near the top of a ridge some seven miles from Coromandel on the Mercury Bay Road. Some coal had been struck here by a drive put in many years ago and appears to be of fair quality. It is intended to test the extent of the seam by boring.

ROTOWARO RESCUE-STATION

The number of fully trained men at the beginning of 1945 was eighty-five, all of whom were given refresher courses during the year. In addition eight new men completed training.

The brigade were called out on five occasions during the year to mine fires and the re-entering of fire areas, and the value of their services has been acknowledged by the managers of the mines concerned.

One of these occasions was a serious fire at the Mangapehi State Colliery, Benneydale, where the brigade by their prompt assistance were able to relieve the mine management, who had been in serious difficulty and danger in the earlier stages of a fire which might have done considerable damage to the mine.

HUNTLY SCHOOL OF MINES

Classes were continued at Huntly, Ngaruawahia, and Rotowaro throughout the year. The classes were well attended and good results were obtained at the annual examinations for coal-mining certificates. A number of candidates were also given instruction in the use of the safety-lamp for gas-testing certificates.

FATALITIES

On 2nd May at McDonald Colliery a miner, Matthew Robinson, received fatal head injuries due to a small fall of coal in a pillar place 19 ft. high. He was wearing a hard hat when the fall occurred.

On 31st May at Tatu State Colliery, John Cecil Coffin, a rope runner, received fatal injuries when a set of skips was derailed. The haulage road was low and the rope runner was riding between the two last skips and was unable to get clear.

SERIOUS NON-FATAL ACCIDENTS

At Mangapehi State Colliery on 2nd March, Ronald Henderson, a trucker, received a fracture of the skull, in addition to arm and shoulder injuries, when he was struck by a jig prop which pulled out at the foot due to floor movement having partly freed it.

On 2nd November at Renown Colliery, Nicholas Urlich, a trucker, received serious injuries to his left foot and lower leg which necessitated the amputation of the leg below the knee. He was lowering a set of empty skips with a winch when the rope crossed on the drum, and received the injury when trying to free it from the front of the drum.

REPORTS REGARDING DANGEROUS OCCURRENCES IN MINES

On 5th February at Mangapehi State Colliery a fire was located in a crack in coal floor at the No. 2 West air-crossing, main return. Put out by water and no recurrence.

On 13th March at Mangapehi State Colliery a serious fire in the main return at No. 2 East Section was caused by accidental lighting of brattice by an open light. It was controlled and finally sealed off by the manager and mine officials with the assistance of the Rotowaro Rescue Brigade, who came from Huntly. The area is now cool. At the same time two heatings developed in loose coal in the No. 2 West pillar section. These were sealed off.

On 31st March at the Alison No. 1 Colliery coal filling at a jig-head ignited. This was controlled by water and the coal filled out.

On 26th April at Waro Colliery a heating developed in the waste to the east of the main haulage. Pack stoppings were built to control this. On 25th June a similar heating occurred and was dealt with in the same way.

On 27th June at the Pukemiro North Colliery a brattice fire occurred, probably owing to a dropped cigarette butt, at a brattice stopping. The fire was put out and a notice put up pointing out the danger.

On 16th July at Pukemiro South Mine, the manager, while walking along a roadway which was being brushed, had a narrow escape from serious injury when a shot went off in the brushing above his head. The shot-firer was prosecuted for not covering all approaches to the shot.

On 10th September at Rope End Section, No. 1 Allison Colliery, a fire burnt round the side of a stopping sealing an old fire area. A partly built stopping outbye of this was completed and the area thus resealed.

On 11th October at Pukemiro North Colliery a fall occurred covering a miner's tools, with which was a tin of carbide. The manager is of the opinion that the fire which occurred was due to the gas generated from the spilt carbide. The fire was dug out and the area cooled.

At Hill 60 Section, No. 1 Rotowaro Colliery, a fire occurred on 1st November at a newly sealed off area due to a large fall going to the surface. Smoke formed was considerable and the men were withdrawn from the Callaghan's Dip Section inbye owing to the chance of smoke entering the section. The Hill 60 area was resealed.

On 19th November a small fire broke out in old workings in No. 4 Mine, Kamo Colliery, timber having caught from a gob fire. Three stoppings were built to seal the area.

On 10th December at Pukemiro South Colliery an active fire was found in the Nelson's Jig Section by the examining deputy. The fire had burnt round the edge of a concrete stopping. It was controlled with sand and clay and the stopping extended to reseal the area.

PROSECUTIONS

On 6th June at Huntly a miner was charged with causing an unprepared shot to be fired in his working-place, contrary to section 144, Coal-mines Act, 1925. Fined £1, costs 12s.

A fireman-deputy was charged with firing an unprepared shot, in breach of Regulation 226. Fined £1, costs 12s.

A miner was prosecuted for charging and connecting up an unprepared shot, contrary to section 144, Coal-mines Act, 1925. Fined £1, costs 12s.

His mate was charged with the same breach, but the case was withdrawn on his showing that he was trucking on that day and did not assist with the shot.

A fireman-deputy was charged with connecting up an unprepared shot ready to fire. Fined £1, costs 12s.

On 4th July at Huntly a trucker was charged with striking a youth, contrary to Regulation 65. Fined £1, costs 13s.

On 12th September at Huntly a fireman-deputy was charged with firing a shot without taking suitable steps to prevent persons approaching the locality. Fined £5, costs 10s.

WEST COAST INSPECTION DISTRICT (J. ADAMSON, R. T. H. DALE, and C. HUNTER, Inspectors of Coal-mines)

GREYMOUTH DISTRICT

Liverpool State Colliery, Rewanui.—Anderson Dip Section: Four to six pairs of miners have continued mainly with development work east and west of the main dip. Difficult conditions continued on the west side from the steeply inclined and friable coal. Pillar-extraction by two pairs of colliers was commenced during the year on the west side.

Kimbell West Dip Section: Six pairs of colliers were engaged, mainly on pillar-extraction.

Morgan East Dip Section: Development was continued to the rise and dip from the intersection of the stone dip drive and the Morgan seam. The development to the dip continues in good-quality coal, while the rise workings show a split in the seam. The top portion has shown a gradual decrease in thickness, with the coal interspersed by several stone bands. Work has now been commenced with the development of the lower portion, which appears to be the main seam in this direction. Quality of coal is good. A 70 h.p. electric hauler has been installed and is operating on the main dip drive.

Kimbell East Section: Three pairs of miners have been engaged, mainly on pillar-extraction, between Nos. 2 and 3 Bank Sections, which have been idle for some time.

Morgan East and West Sections: Operations have been confined mainly to pillar-extraction. Prospecting work was commenced through stone at the inbye end of the main Morgan West level, where it is considered that some workable coal exists adjacent to the main Morgan West fault. A dip section has been commenced from the Morgan West level.

Strongman State Colliery.—Pillar-extraction in No. 1 North ceased and the section was sealed on account of signs of spontaneous combustion. The remainder of the output was gained from development work. Development was continued in a northerly direction from the west side of No. 2 North heading, which has been stopped pending further exploration on a converging fault line from the west.

No. 2 South Section was stopped during the year: the development is to continue from a proposed stone drive into a lower seam.

Blackball State Colliery, Blackball.—No. 2 North Section: Development work has been continued with four pairs of colliers on friable coal. In the Sump Section six pairs of colliers on double shift were all in solid work in better-quality coal. A 35 h.p. electrically operated hauler has been installed for further development in the main dip heading.

The reopening and repairs to the water adit from the old mine were almost completed to the intersection with the old main haulage road. A considerable improvement was thus made with the drainage of excessive water from the old mine workings.

Blackball Creek Colliery (Balderstone and Party), Blackball.—The extraction of pillars in the top seam, left by the Blackball Coal Co., Ltd., has been continued throughout the year.

Briandale Collieries, Ltd., Ten-mile Creek.—Operations were confined to the prospecting of a coal-seam adjacent to the old Burnside Co-operative Mine. The average thickness of the seam was 6 ft. It is impossible to determine the extent of this seam owing to the disturbed nature of the ground being worked.

Wallsend State Colliery.—Operations have been confined mainly to the splitting of existing pillars. Adverse roof conditions in the Slant Dip and Extended Sections have made conditions difficult. Some driving was being done in No. 1 Dip Section to prove a small area of what is considered coal-bearing ground adjacent to the Dobson fault. Dewatering of the old No. 2 Dip Section was continued with an air-crossing, and several concrete block stoppings erected in preparation for the completion of a new return airway from No. 1 Slant Dip Section.

The installation of safety catches on the winding cages was commenced, one cage being so fitted up and working efficiently.

Dobson State Colliery.—Development work was commenced in a block of coal to the west and towards the Dobson fault, while splitting of pillars has been continued on the east side adjacent to the Mount Buckley disturbance.

Paparoa Colliery, Roa.—Aerial Section No. 1 Seam : Six pairs of miners were continuously employed on day shift. General maintenance, brushing of main roads, and retimbering was carried by shiftmen on back-shift, particularly in the No. 1 North level, where heavy timbering was erected.

No. 2 Seam, West Level Section : Three pairs of colliers were splitting pillars with a view to reopening of the old west side workings.

CO-OPERATIVE MINES IN THE GREY DISTRICT

Spark and Party's Mine, Rewanui.—The output was won from the development of the coal to the rise north-westerly of the main level, which is stopped against an upthrow fault. The coal is of good quality, 9 ft. to 10 ft. thick, rising at a grade of 1 in 3.

Old Runanga Mine (O'Brien and Party).—Pillar-extraction was continued on the rise side of the main level. To the west of the main level development work was continued in coal 3 ft. 6 in. thick for a distance of 4 chains, while a level drive was put through to the surface for ventilation and drainage purposes.

Moody Creek Mine (Wright and Party).—Development of the dip workings was continued throughout the year in good-quality coal of an average thickness of 12 ft. The grade at the lower end of the workings had increased to 1 in 3.

Goldlight Mine (Williams and Party), Rewanui.—Development work was continued to the dip in excellent-quality coal. A level at the lower end of the dip has been driven in a northerly direction towards the surface.

New Point Elizabeth Colliery (Guy and Party), Dunollie.—Pillar-extraction ceased on the rise side of the horse road, and a new dip from the surface was driven to open out a small area of coal on outbye side of the old mine. The dip had advanced 5 chains when trouble was encountered and further dip driving stopped. A small area to the north-west of the dip is now being opened up.

Hilltop Mine (Armstrong and Party), Ten-mile.—Development work was continued to the west of the main dip. This development was on level course several chains from the lower end of the dip workings in good coal of an average thickness of 20 ft.

Boote and Party, Ten-mile.—The output has been won principally from the extraction of pillars on the west side of the dip haulage road. Roof conditions were heavy, which has meant maintenance, constant care, and adequate timbering. The percentage of coal obtained from these pillar workings, however, has been satisfactory.

Hunter and Party's Mine, Dunollie.—Pillar-extraction, with good results, was continued on the rise side of the main level. Dip development was commenced in a westerly direction, the workings being driven in this direction for a distance of 4 chains in good coal. Thickness, 12 ft.

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

Cliffdale Mine (Stuart and Party), Ten-mile.—The output has been obtained from pillar-extraction in the main dip. A bore-hole was put down adjacent to the present mine mouth, subsequently proving a 13 ft. seam at a depth of 90 ft. Development of this coal is to be undertaken from a new dip drive through the intervening strata, commencing at a point some 10 chains to 12 chains west of the present mine mouth.

Bellvue Mine, Rapahoe.—Operations, which consisted of pillar-extraction adjacent to the goaf of the old James State Colliery, were suspended during the year owing to increasing difficulty with the surface haulage system. Improvements to the method of transporting the coal to the bins are considered necessary before this mine can be operated successfully.

Jubilee Mine (Tinning and Party), Rapahoe.—Pillar-extraction ceased in the dip section and development continued with a pair of headings to the rise off the main south level. These headings were stopped adjacent to a fault cutting across the headings in a north and south direction. Formation of pillars was commenced and pillar-extraction in the panel started towards the end of the year. A compressed air-driven scraper loader unit was installed and used for a short time, but was finally withdrawn on account of insufficient power.

Cliffside Mine (Moore and Party), Nine-mile.—The output was won chiefly from development work in good coal ranging from 10 ft. to 13 ft. thick. A fault running diagonally across the workings on the south side is restricting development of the present mine in a southerly direction, while a fault encountered on the eastern side has limited the workings in this direction also.

Smith and Party's Mine, Dunollie.—Extraction of several remaining pillars was effected during the year and the mine abandoned.

Brachead Mine, Dunollie.—The output was won solely from pillar-extraction east and west of the main dip. The coal is of good quality, 6 ft. to 7 ft. thick.

Halliday and Party's Mine, Dunollie.—This mine was abandoned by Currie and party and reopened by Halliday and party. The work consists of driving through existing pillars in very steep country to exploit some virgin ground at the inbye portion of the lease. Working conditions are difficult, owing to the grade, thin coal, and heavy roof conditions. A small section of coal in the western side at a lower level was prospected, so far with little success.

Harrison and Party's Mine, Ten-mile.—Pillar-extraction was continued by two to three pairs of colliers outbye from the main west fault. Regrading and straightening of the main dip haulage was done effecting a considerable improvement in haulage.

REEFTON DISTRICT

Doran's Mine, Boatmans.—Intermittent prospecting work was carried out during the year in a small seam of coal.

Alborn's Mine, Capleston.—Pillar-extraction was continued throughout the year in good-quality coal averaging 8 ft. thick.

Kleen Mine (Archer Bros.), Capleston.—The output was gained mainly from pillar, extraction in Nos. 1 and 2 levels. The seam is vertical, of good quality, and averages 12 ft. thick.

Coghlan's Freehold Mine, Capleston.—The output consisted solely of coal from pillar-extraction on the rise side of the main level.

Hillcrest Top Mine (previously Waitahu Mine; A. D. Williams), Waitahu.—The output was won from development easterly to the rise in coal of good quality averaging 5 ft. thick.

Griggs and Party's Mine (previously McKinlay's Mine), Waitahu.—Pillar-extraction on rise side of horse level was almost completed, while development of levels to the right of the lower end of the dip was continued. Roof conditions in these latter places was not good and required constant attention.

Dauntless Mine (previously Lewis and Party), Waitahu.—Two levels advanced in a north-easterly direction from the main dip and encountered the upthrow fault which limits the development on this side. Two levels south-west of the dip were advancing in very good coal 12 ft. thick. Seven chains of solid coal remained between these workings and the boundary of the mine with the New Pyramid Mine.

Pyramid Mine (Morriscale Lease), Reefton.—Extraction of pillars was completed during the year and the mine closed down, except for a small output intermittently obtained from a 3 ft. seam in an adjacent hill.

Pyramid New Mine (Crown Lease), Waitahu.—Developing to the dip was terminated at 10 chains and a pair of levels were driven 4 chains under the bed of the Waitahu River. These levels are to be used for the development of the field to the south. The coal is of good quality 12 ft. thick. Ventilation of the mine is by an electrically driven propeller-type fan. An electrically operated winch has been installed at the surface as the main haulage winch, while an electrically driven four-stage turbine pump is dealing with the pumping problem.

Burke's Creek Mine, Reefton.—Pillar-extraction ceased early in the year in the slant dip, due to a heating which was sealed off by stoppings. A new dip was driven 5 chains in an attempt to prove the coalfield further to the dip. Very little progress was made, chiefly due to lack of adequate pumping, hauling, and ventilating equipment. The main haulage dip was repaired and regraded early in the year, thus effecting an improvement in the haulage conditions on this road.

Morriscale Opencast Mine, Reefton.—Coal-production from No. 4 seam was continued intermittently throughout the year, difficulty being experienced in maintaining a steady output owing to weather conditions and old workings. Mechanical means are employed for the removal of the overburden and filling the coal.

Burnwell Mine (D. Hamill), Reefton.—Development has been continued on the level course in a north-easterly direction and to the rise in a south-easterly direction.

Central Mine (D. Hamill), Reefton.—The dip development to the north was continued and on level course towards the eastern boundary of the lease.

Terrace Mine, Reefton.—Development work was continued during the year in three main levels. A cross-measure drift to the north intersected No. 2 seam, but no work has been done beyond the point of intersection, due to lack of adequate ventilation.

Defiance Mine, Murray Creek.—A prospecting stone drive 130 ft. long was driven into the seam at a lower level to the old Defiance workings. The seam was proved to be 7 ft. thick and of good quality.

Butler's Section, Defiance Mine.—Four men were employed prospecting some solid coal in this section. The coal varied from 8 ft. to 15 ft. thick and was of fairly good quality.

Clele Mine, Merrijigs.—All the output was won from pillar-extraction in Nos. 1 and 2 Sections.

Nicholls' Mine, Capleston.—Development was continued by four men to the rise. The main heading holed to the surface, effecting an improvement in the natural ventilation. The quality of coal was good and thickness increased to 10 ft.

Banks' Opencast Mine (A. E. Eklund), Waitahu.—Coal-production from this opencast was maintained throughout the year. During the period the stripping of overburden by mechanical means was abandoned in favour of mining the coal hydraulically.

Star Mine (Lewis and Party), Murray Creek.—An intermittent output was obtained from opencasting a small block of old workings in the Cement Town area. Coal up to 15 ft. in thickness with 20 ft. of hard overburden was worked by a combination of mechanical and hydraulic stripping methods. Owing to the difficulty of handling the overburden, operations were abandoned at the end of the year.

Royal Coal Syndicate, Rainy Creek.—A small quantity of coal was won from a pair of development levels in a vertical seam 5 ft. thick.

Turner and Party's Opencast Mine, Murray Creek.—Coal-production from this mine was commenced early in the year from an area previously worked by underground mining and abandoned owing to fire. Coal of good quality, up to 10 ft. in thickness under an average of 10 ft. of overburden, is being successfully worked. The coal is hand filled and stripped by means of a bulldozer or dragline.

W. G. Chandler's Opencast Mine, Murray Creek.—The coal won from this mine is being won from an area worked previously by underground mining and abandoned owing to fire. Stripping is being done by a dulldozer and the filling by hand. Coal up to 12 ft. in thickness has been worked under 25 ft. of overburden.

Golden Point Mine (Blom and Rollerson), Reefton.—A prospecting dip was commenced during the latter portion of the year and driven for 2½ chains in a seam of poor quality. The grade is 1 in 1½, 2½ chains down. The thickness of the seam varies from 4 ft. 6 in. to 3 ft. The coal is friable and small strike faults were encountered. The thickness 2½ chains from the surface is 4 ft. 6 in.

Buller District

Mitchell's Mine, Charleston.—An output of 26 tons for the year was won from this mine.

Warne's Mine, Charleston.—This mine produced approximately 460 tons for the year. Both the removal of the overburden and the transport of the coal from the face to the loading-bin is done hydraulically.

Bowater and Bryan's Mine, Charleston.—Three separate mining parties—*i.e.*, Rata Collieries, Nile Hydro, and N. Mouat—are operating on this lease. The two former are hydraulically operated, while the latter is mechanically equipped. The combined output for the year from this lease was 53,370 tons.

Nile Hydro (J. Powell), Charleston.—The production from this mine was obtained from Powell's lease during the first portion of the year and from Bowater and Bryan's lease during the latter portion. Stripping overburden and the transport of coal to the screening plant are done hydraulically.

Allan's Mine, Charleston.—An output of 6 tons for the year was won from this mine.

Brighton Mine, Brighton.—A new storage bin and fluming have been completed adjacent to the main highway. Two men have been employed developing the lease, the coal averaging 16 ft. thick.

Glencrag Mine, Buller Gorge.—Development continues in a southerly direction in 11 ft. of coal of good quality. A wash-out to the west was crossed by two roadways, which are now in good coal. An air-shaft 80 ft. deep was driven, effecting a marked improvement in the ventilation.

Coal Creek Mine, Seddonville.—Attempts were made to extract a small area of coal on the property by opencasting. The venture was unsuccessful and finally abandoned. Underground operations consisted mainly of splitting and robbing existing pillars.

Cardiff Coal Co., Ltd., Mokihinui.—The output was won solely from pillar-extraction.

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

Charming Creek - Westport Coal Co., Ltd., Ngakawau.—Development was continued in the North Heading No. 3 East and No. 3 West Sections. Ten pairs of colliers were constantly employed on coal, varying from 11 ft. to 20 ft. in thickness, producing an average daily output of approximately 150 tons. A stone drive was completed on the locomotive road in the Ngakawau River Gorge, effecting a considerable improvement in the transport problem.

Westport-Cascade Mine, Cascade Creek.—Pillar-extraction proceeded in Moynihan's and Durkin's South Sections. Thickness of coal averaged 30 ft. of excellent-quality coal.

Mill Creek Section.—Development was continued by driving two headings towards the boundary in excellent-quality coal. It is not intended to form pillars in this section until these headings have reached the boundary, when pillar-extraction is to be commenced.

Westport Coal Co., Ltd., Denniston Mine.—Coalbrookdale Mine: The output was won partly from pillar-extraction and partly from development. The average number of colliers was seventy. In the old Waterloo Section two double-shift places were driving and prospecting virgin coal on the north side. Pillar-extraction proceeded in the third south and fourth north panels. Forsythe's Section and in the Rope End Section development was continued in a southerly direction, also in the fourth south headings.

A new endless rope hauler of 120 h.p. installed at Wooden Bridge junction eliminated the haulage plant at the Coalbrookdale Mine entrance. Access was regained into the Extended Section workings by driving a series of splits through pillars, thus forming a new haulage.

The salvage of materials from the abandoned Ironbridge Mine was completed early in the year.

Operations ceased in the Cascade Mine during March.

Westport Coal Co., Ltd., Millerton Mine.—Mangatina Area: Three pairs, later reduced to two pairs, continued with pillar-extraction.

Mine Creek Area: Six pairs of colliers, later increased to seven pairs, continued on pillar-extraction in the Sixth and Third West Sections and on the recovery of bottom coal left behind in the original workings of Pollock's level.

Old Dip Area: Five to six pairs of colliers were engaged on pillar-extraction. In the lower area of the Old Dip Mine development headings were driven in search of virgin coal to the west of the main haulage road. A thinning of the coal and stone intrusions were encountered, and this work was stopped and the colliers transferred to a block of coal west of the haulage road and 6 chains from the Old Dip Mine entrance.

Stockton State Colliery, Ngakawau.—Fly Creek Section: Operations were confined to pillar-extraction in the South Section and opencasting in the East. In the old mine, Nos. 2, 4, and 5 Sections, development was completed and pillar-extraction commenced.

The new mine on D Hill was opened to develop an area claimed to contain over 2,000,000 tons of good-quality coal. The main headings have advanced 12 chains, employing eighteen pairs of colliers. The output from the opencast operations on E Hill has been increased steadily, while arrangements are in train for the early employment of an electrically powered 5-yards mechanical shovel.

Harris' Mine, Karamea.—The mine remained idle during the year.

Comet Mine, Inangahua.—The output was won from pillar-extraction in the North Section and from prospecting work on the south side of the creek.

Paine Brothers' Mine, Buller Gorge.—The output was won from opencasting. The overburden was removed by bulldozers and the coal blasted and filled by hand methods.

Rahui Mine, Buller Gorge.—The output was obtained from development to the north and west. The coal is of good quality, but mining operations are hindered by stone intrusions in the seam.

Nelson District

Owen Colliery, Owen River.—The output for the year was secured from development of two levels in low coal 2 ft. thick.

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

Strathmore Mine (R. E. F. O'Rourke), Ariki, Murchison.—Development of the coal on level course in 4 ft. of good-quality coal continued intermittently throughout the year.

Westhaven Mine, Mangarakau, Collingwood.—Development work was continued on level course on left side of main dip heading. The seam averages 5 ft. of workable coal of good quality.

Victory Mine, Glenhope.—A very small output was obtained from a prospecting drive worked by one man.

Rescue-station

The number of fully trained men on the station register at the end of the year is seventy. During the year seventeen new men have been trained.

Three visits were made to the Reefton district to give refresher courses to the trained men employed in that district.

The Officer in Charge has continued his policy of making all rescue men familiar with the mines of the district by frequent visits to them, combined with the use of Proto equipment underground in actual mining conditions.

Fatal Accidents

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

On 18th January James William Patterson, working manager, Moody Creek Mine, was struck by a fall of stone at the face of No. 1 main dip and was killed instantaneously.

On 9th April at 11 a.m. Ray Hobbs, miner, Wallsend Colliery, was struck by a lump of coal weighing approximately 7 cwt. and was transferred to hospital, where he succumbed to his injuries at 3.45 p.m. in the afternoon.

On 22nd May William Upston, shiftman, Wallsend Colliery, was repairing a road on Tackney's jig, C panel, when he apparently got his head caught between the descending full box and the jig prop of the jig below and suffered a severe fracture of the skull. He was transferred to hospital, where he succumbed to his injuries at 5.20 p.m. that day.

On 15th October T. J. Uren, miner, Wallsend Colliery, was caught by a fall of stone in No. 1 Slant Dip Section and was transferred to hospital, where he succumbed to his injuries at noon on 18th instant.

Serious Non-fatal Accidents

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

On 27th February Thomas McDonald, horse-driver, Paparoa Colliery, was bringing out a full race of coal, when the first truck of the race came off the line and jammed McDonald's ankle against the buffer of the second truck. He sustained a simple fracture of a bone below the ankle.

On 2nd March Thomas Robertson, shiftman, Millerton Colliery, sustained a spiral fracture of the left humerus whilst packing tender overhead coal.

On 20th March Frank Archer, miner, Kleen Colliery, while filling a truck was partially buried by a fall of coal from the high side rib. He sustained a fracture of two ribs.

On 28th March Ronald Chandler, miner, Pyramid Colliery, was struck by coal falling from the waste, which struck him on his shoulder and ankle. He sustained a broken bone in the ankle.

On 18th April Thomas Cook, timber-cutter, Wallsend Colliery, was travelling along the level in the Extension Section when there was a runaway on a jig. In jumping to safety, Cook struck the back of his head against the overhead toy rope, and this caused him to bump his nose against a box, resulting in a compound fracture of the nose.

On 5th June C. P. Heaphy, who was constructing a road to Heaphy's coal lease, was using a monkey grubber for removing stumps. Heaphy was working the lever handle of the grubber and slipped on some wet clay, the handle striking him on the head, causing a fractured skull.

On 18th June G. Ladner, miner, Burke's Creek Colliery, received fractured ribs and internal injury when he was struck on the back by a piece of coal.

On 20th June T. Kilkelly, miner, Wallsend Colliery, struck his ribs against a box, fracturing some of them.

On 26th June F. J. Loubere, bins worker, Dobson Colliery, was jambed in the tumbler and sustained fractured ribs.

On 26th July A. Ross, shiftman, Wallsend Colliery, dropped a rail on his foot and broke one of the small bones.

On 1st August T. Y. Rutherford, shot-firer and deputy, Liverpool Colliery, received two broken ribs when a shot flew out and ricochetted on to him.

On 4th September Charles Schaefer, trucker, Blackball Colliery, lost four fingers of his right hand. He was at the back-end of a set of four boxes being lowered down first sump incline when the back empty box went off road and Schaefer went to side of set while still running. He slipped and fell and his right hand got caught between rails and wheels of box.

On 11th September G. Perrie, tipper, Wallsend Colliery, dropped a rail on his right toe, which was fractured.

On 20th September George Schafer, miner, Blackball Colliery, received a fractured left forearm, caused by the chain flying off a coal-cutter and striking his arm.

On 16th October W. Hobbs, miner, Wallsend Colliery, while erecting a prop fractured his right thumb when the prop fell on it.

On 23rd October Kenneth Fenemore, trucker, Wallsend Colliery, fractured the middle finger of the right hand. His hand was caught whilst placing a sprag on a full box of coal.

On 24th October A. Hinks, miner, Strongman Colliery, was struck in the right eye by a piece of flying coal whilst working at the coal face in the North Dip Section. His left eye was already almost blind, and, consequently, an injury to his right eye was very serious.

On 12th November J. Blance, trucker, Wallsend Colliery, sustained two fractured ribs on the right side when his empty trucks collided with three boxes.

On 19th November T. Morgan, carpenter, Wallsend Colliery, was cutting some timber on the circular saw when his hand slipped and his left thumb caught in the saw. An x-ray examination revealed a compound fracture of the thumb.

On 4th December W. Webster, rope-road worker, Denniston Colliery, whilst running from the bus to his work (a distance of 40 yards) tripped over a re-roader and fell heavily on the right hand. Subsequent medical examination revealed that the right forearm was fractured above the wrist.

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

Burke's Creek Colliery.—On 8th January it was reported by the mine-manager that spontaneous heating had occurred in the underground workings. The Officer in Charge, Mines Rescue-station, supervised sealing operations. Six temporary stoppings were erected.

Strongman Colliery.—On 25th January it was reported by the deputy that smoke was issuing from No. 1 north return airway. When an inspection was made by the mine-manager and underviewer it was found that the smoke was coming from an old level connecting No. 2 dip with the old east dip workings. Two temporary brattice stoppings were erected on the return side. Two-inch column of pipes was laid and water applied to the affected coal, which was finally cooled and filled away.

Liverpool Colliery.—On 8th March it was reported by the mine-manager that a fire had occurred in a log stopping in Kimbell East main level. A permanent concrete stopping, approximately 4 ft. from the original timber and clay stopping, effectively sealed the area.

Strongman Colliery.—On 13th May the check inspectors, Strongman Mine, requested an early morning inspection, as a heating had occurred in the site of the recent heating. After an inspection was made and it was found that the heating had been satisfactorily quenched, it was considered safe to work the mine.

Wallsend Colliery.—On 28th May and 4th June an empty box was allowed to run down the shaft. On the first occasion the box landed on the top of the cage and severely damaged it. The cage was straightened sufficiently to bring it to the surface and a spare cage was put on its place. On the second occasion the cage was removed in the wrong direction when signalled to lower the cage a few inches, resulting in the cage swinging the empty box in under itself and down the shaft. The box was removed and the shaft repaired that night.

Hydro Colliery.—On 26th June a small fire was reported in Cave Section and was located behind a board stopping. Immediate steps were taken, and after laying on water the fire was extinguished.

Millerton Colliery.—On 6th August, the mine-manager while making an inspection of the Old Dip Mine discovered indications that the "old dip fire" showed signs of burning through a barrier of coal. A temporary stopping of wood and brattice was erected approximately 6 yards from the "dead end" and then plastered with a mixture of cement and lime (stone dust). Steps were then taken to erect a permanent concrete stopping on the outbye side. No further developments took place.

Blackball Colliery.—On 13th August a slight heating occurred under a fall in the return airway from the bottom north level. Water was led on the fall to deal with the heating. Towards the end of the day all traces of heating had disappeared.

Prosecutions under the Coal-mines Act, 1925

Four informations were laid during the year and convictions obtained in all cases.

On the 17th April a mine-manager was charged, under section 60, clause 1 (*e*), of the Coal-mines Act, 1925, in that he did employ more than four men in or about the mine. He was convicted, with Court costs 10s. against him.

On the 17th April a mine-manager was charged, under Regulation 221, clause 1, under the Coal-mines Act, 1925, that he did take into the workings of the mine one packet of explosives—to wit, 5 lb. of Polar Thames—the said explosives not being in a secure case or cannister. He was convicted and fined £2 and costs.

On the 9th July a deputy was charged that, being a shot-firer, he did neglect to see that all persons in the vicinity had taken proper shelter when firing a shot. He was convicted and fined 5s. with 10s. Court costs.

On the 20th August a shot-firer and two miners were charged under Regulation 224, subsection (2), of the Coal-mines Act, 1925. The shot-firer was convicted and fined £2 and costs 10s., one miner was convicted and fined £1 and costs, and the other was convicted and fined £1 and 10s. costs.

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

North Otago District

St. Andrews Mine, Papakaio.—Pillar-extraction was continued throughout the year and no further development work was undertaken.

Ngapara Mine.—The whole of the operations at this mine have been confined to pillar-extraction.

Shag Point Mine.—During the year trouble has been experienced with roof control, and the result has been that a certain quantity of pillar coal has been lost. Pillar-extraction work only has been carried out.

Airedale Mine.—No further development work has taken place at this mine, the whole of the operations having been confined to pillar-extraction.

Rochrale Mine.—An additional small quantity of coal was developed during the year to the north-east of the main level, but this will be limited in quantity. Pillar-extraction continued in the balance of the mine.

Willett's Mine.—Development work was continued to the west; however, the seam deteriorated in this direction, and a commencement was made on pillar-extraction towards the end of the year.

Central Otago District

Cairnmuir Mine.—Development work has been continued during the year, chiefly to the south, by levels driven towards the old Cairnmuir Mine. The coal-seam has maintained its thickness and quality, but work to the dip is restricted as a result of the limited capacity of the plant.

Shepherd's Creek Mine.—Pillar-extraction has been continued throughout the year and there is now only a few months' work remaining.

Idaburn, Oturehua, and Coal Creek Pits.—Opencast operations have been continued throughout the year.

South Otago District

Benhar Mine.—Development work has been continued to the dip, and the lower north and south levels have been driven almost to their limit. A lower seam is stated to exist in the area already worked in the top seam, and it is proposed to commence the development of this lower seam, at the same time keeping the higher working free from water accumulation.

Wangaloa Mine.—No further development work has been undertaken and coal-production has been confined to pillar-extraction.

Wangaloa Opencast.—During the year the State acquired this coal-pit along with an area of freehold coal-bearing land. Boring operations adjacent to the opencast pit have proved a large quantity of coal available for opencast mining.

Fairfield Mine.—Spontaneous combustion brought about the abrupt termination of operations at this mine at the end of the year. Almost all the available coal had been won at the time of the outbreak, so it was decided to abandon the mine and withdraw all plant.

New Fernhill No. 1 Mine.—Pillar-extraction has been continued during the year.

New Fernhill No. 2 Mine.—Development work at this mine has been very disappointing, the coal-seam thinning in all directions. Work was done near old water-logged workings, with the result that the quantity of water to be handled became excessive. Present and future operations will probably be confined to recovering as much coal as possible from the area now opened up.

New Fernhill No. 3 Mine.—Prospecting driving was commenced in the coal-seam adjacent to the old Fernhill Mine and also near the present No. 1 Mine, but sufficient data is not so far available for comment.

Victory Mine, Brighton.—Development of this mine resulted in the interception of the old workings of Fry's Mine. The seam deteriorated in thickness, and a commencement has been made to extract the available pillars.

Willowbank No. 1 Mine.—Development work has been continued throughout the year. The main dip headings were advanced and development levels are being driven to the south-west; a faulting has been encountered in this direction, but indications are that this is of a minor nature. Some pillar-extraction work was also carried out.

Willowbank No. 2 Mine.—Following upon severe flooding and difficulty in maintaining the main return airway, mining operations were suspended at this mine during the year.

Kaitangata Mine.—Pillar-extraction operations have been responsible for the bulk of the year's output from this mine. In the main south dip section and the steep dip section in Samson's area the whole of the work was confined to pillar-extraction, and the quantity of coal remaining in these sections for winning is rapidly diminishing. In the north-east area, which was set out to develop a higher seam, pillar-extraction has also been commenced and the quantity of coal developed in this area proved to be very limited. Every effort was made to prove the lower strata from different points with a view to finding a seam below the present workings, but so far the result has been disappointing. The position at the present mine, so far as the quantity of coal available for mining is concerned, is not encouraging. The development of the area known as Summer Hill is proceeding. This area is distinct from the older Kaitangata mines and the coal-seam is probably in a higher series of strata and of slightly inferior quality.

Southland District

In the Gore-Mataura district, opencast operations have continued at various sites. At present coal production is taking place at the following coal-pits: Hedgehope, Coster's Waimumu, Raby, Argyle, Ota Creek, Asher's Siding, Newvale, Liberty, Mataura Paper-mills, Hakatere, Gladfield, Starlite, Taunga (Orepuki), Nightcaps, and Taradale (Taratu). The surface overburden is removed mechanically and the coal is mined by hand at all the coal-pits except the one worked by the Mataura Paper Mills Co., at which pit the whole of the operations are carried out mechanically and with efficiency.

Thorndale and Croydon Coal-pits ceased production during the year.

Boghead, Balfour, and Glenlee Mines.—Underground operations were continued along the usual lines followed during the last few years at these lignite mines.

Black Diamond Mine.—Development of the area known as the Mount Hilda Section has been continued throughout the year (this area was partially worked many years ago) and will result in a slightly extended life for this mine, but not to any material extent. Development of a lower seam has also taken place in this area, but the outlook for this seam is not very promising as it is separated from the main seam by only a few feet of friable stone and the ultimate recovery of coal must of necessity be very limited. Pillar-extraction has also continued throughout the year, accompanied by fairly frequent instances of spontaneous combustion.

Black Lion Mine.—Mining operations ceased at this mine during the year, all underground prospecting work having failed to prove any extention of coal available for mining. A small quantity of coal was worked opencast, but this work was not persevered with to any extent, and ultimately all plant was withdrawn and mining operations abandoned.

Star Mine.—Pillar-extraction work was carried out throughout the year in the No. 1 east level, fortunately without any signs of spontaneous combustion, which is somewhat unusual in this district. Development work was confined to the No. 2 and No. 3 east level sections and also to the south—*i.e.*, to the dip—from the No. 3 level. A fault was encountered in the main dip development work, and up to date the extent of this fault and its throw has not been proved. Bore-holes put down to the south of the fault having failed to locate the coal-seam, preparations are in hand to commence a dip stone drive to prove the southern portion of the lease. The thickness and quality of coal-seam as it abuts on the north side of the fault are such as to make it appear that the seam must exist to the south of the fault, if its location can only be fixed. The use of compressed air for underground haulage and pumping has resulted in a much more satisfactory temperature in the mine atmosphere.

Birchwood Mine.—Pillar-extraction has been again responsible for almost the whole of the output. It is obvious that development work of some description must be conducted in connection with the operations at this mine, and at a reasonably early date, or a bottleneck in production must be inevitable. The quantity of coal remaining available for pillar-extraction is rapidly diminishing.

Mossbank Mine.—Development work has been continued during the year at every point and in every direction which promised an extention of life for the mine. Development to the north-east proved a triangular block of good-quality coal but limited in area by faulting. Development to the south-west terminated in thin stony coal, and pillar-extraction was commenced. In the north-east, development work was persevered with and an additional small area of workable coal was made available; however, considerable faulting was encountered and the seam ultimately became unworkable and pillar-extraction was commenced. All attempts to develop the lease in an easterly direction were disappointing. Present appearances indicate that very little more development work will be possible at this mine and that pillar-extraction only will remain to be carried out.

Wairaki State Mines.—No. 1 Mine: Pillar-extraction was continued throughout the year and with satisfactory results; this work has now retreated to the No. 2 east level. All work at this mine will continue to be that of pillar-extraction.

No. 3 Mine: Development work was continued during the year. The main south dip headings were extended to a total distance of 40 chains, and at this point a fault, presumed to be an upthrow fault, was encountered. A commencement has been made to develop the east and west areas adjacent to the inbye end of the main dip, the policy being to concentrate on all inbye development work for preference. Speaking generally, it can be said that the results obtained from all development work has been satisfactory.

Linton No. 1 Mine.—In the Nos. 6 and 7 Sections pillar-extraction was carried out throughout the year and with satisfactory results; a very limited quantity of coal now remains for working in the former section. Development of the No. 8 Section was continued until the coal-seam became of

unmarketable quality, and pillar-extraction was commenced. The coal in portions of this section is of a friable nature and very liable to spontaneous combustion. The development of No. 9 Section was completed. Development of No. 10 Section was continued to the west and with highly satisfactory results. The coal-seam in this area is of great thickness and excellent quality, and present indications are that an extensive area of good-quality coal will be proven to exist in this direction and to the north—*i.e.*, to the dip—of the pillared area of the Birchwood Mine workings.

Linton No. 3 Mine.—Development of this mine has been retarded during the year as a result of faulting. The location and condition of the coal-seam to the north of the main fault has not been conclusively proved, despite the fact that additional boring operations have been conducted in the area from the surface. Pillar-extraction work on a reduced scale has been continued in the Nos. 3 and 4 dip heading sections, and development work has proceeded to the east and towards the Black Lion lease: however, faulting has been encountered in this direction also.

Canterbury District

Mount Somers' Mine.—The results obtained from development work carried out at this mine during the year have been much more satisfactory. Headings driven through a gravel intrusion in a northerly direction proved the coal-seam to be of reasonable thickness and of good quality. A ventilation fan was installed and an adit level constructed, and the future prospects of the mine are much improved.

Blackburn Mine.—Pillar-extraction has been continued throughout the year and the available pillar coal is now very limited. A commencement has been made to prospect and develop a coal-seam-found to exist adjacent to the present mine, but sufficient data is not so far available for comment.

Newburn Mine (Mount Somers).—Development work carried out at this mine has proved very unsatisfactory. A coal-seam was intercepted, but so far has proved to be of very little value.

Sunnydale Clay-mine.—Clay was mined intermittently during the year for use in the Timaru Potteries.

Woodbank Mine (Albury).—Development of this mine has continued throughout the year. The main south dip heading was extended sufficiently to allow of each and west levels being developed.

Meadowbank Mine (Waimate).—A further attempt has been made to win coal from the seam at Waihao Forks. Difficulty has again been experienced in disposing of this lignite, and the future prospects for this mine are not encouraging.

Acheron Mine (Anthracite).—Work at the old mine was suspended temporarily towards the end of the year; however, the development of a small area lying to the north of the old mine was commenced. A dip heading proceeding westerly has been driven a short distance and development work carried out per medium of levels proceeding north and south.

Clearview Mine, Glenroy.—The whole of the operations at this mine have again been confined to pillar-extraction.

Steventon Mine.—During the year the main dip heading was extended a short distance and development places driven north-east and south-west, and pillar-extraction was commenced along the north-east levels. Levels were driven south-west for a distance of 10 chains, and in this direction a stone band 18 in. in thickness exists in the centre of the coal-seam, which has a total thickness of approximately 6 ft.

Lucknow Clay-mine.—Pillar-extraction was continued in the south mine and a commencement made to develop a new area of fireclay to the north-east and a short distance from the old mine.

Victory Mine.—A very limited amount of development work was carried out at this mine during the year, the main dip heading being extended for a short distance and the north-east levels were driven 5 chains. This coal-seam appears to hold out good prospects, but the development of the seam is proceeding very slowly.

Klondyke Mine.—Development work was extended at this mine, chiefly in the direction of the main dip headings and to the north-east. The coal-seam eases in gradient and becomes thinner in the direction of the main dip and also to the north-east. Pillar-extraction was continued throughout the year in the Nos. 4, 5, and 6 north-east levels.

Fatal Accidents

It is pleasing to note that no fatal accident occurred in the mines in this district during the year and it is also satisfactory to note that serious accidents were of lesser proportions than has been the case for some time past.

Serious Accidents

On the 7th February Burt Haig, trucker at the Kaitangata Mine, sustained a slight fracture of the skull as a result of being struck on the head by a piece of coal.

On the 16th February James Hosking, trucker, at the Kaitangata Mine, sustained a slight fracture of one vertebra as a result of being struck by a falling piece of coal during the time he was sheltering from a shot which was being fired.

On the 14th May L. D. McGhie, trucker at Linton No. 1 Mine, sustained a slight fracture of the pelvis as the result of being struck by a piece of coal which fell from the roof adjacent to a jig prop whilst he was operating the jig.

On the 27th June Vernon Aylward, miner Mossbank Mine, sustained a compound fracture of the left leg just above the ankle as a result of being struck by a piece of stone from the roof which had been loosened by a previous shot at that point.

On the 16th October W. J. Dixon, miner, Mossbank Mine, sustained a dislocated right hip as a result of being struck by a piece of coal which fell from a point adjacent to the lip of a pillar place.

On the 5th November E. Greene, miner, Kaitangata Mine, sustained a slight fracture of the third vertebra as a result of being struck by a piece of coal which fell from the roof of his working-place, which, incidentally, was only 6 ft. 6 in. in height.

Dangerous Occurrences

Wairaki Mine.—A heating occurred in the No. 2 East Section of the No. 1 Mine on the 21st April, and also on the 5th September in an adjacent section. A heating occurred on the east side of the main dip on the 8th December. The above heated areas were promptly and satisfactorily sealed off.

Birchwood Mine.—A heating occurred in the No. 1 Pillar Section on the 1st May, and also in the No. 1 West Dip Section on the 10th August. These areas were promptly and satisfactorily sealed off.

Fernhill No. 1 Mine.—An inundation of surface flood waters occurred at this mine on the 19th May. A considerable volume of water entered the mine; however, the position was assisted by the presence of old workings which existed below the lower workings of this mine, and the condition of the mine was quickly brought back to normal.

Prosecutions

On the 26th September a trucker employed at the Kaitangata Mine was prosecuted for a breach of section 98 of the Coal-mines Act, 1925. Defendant was fined 10s. and costs.

On the 21st November an underviewer at the Mossbank State Mine was prosecuted for a breach of section 145 (3) of the Coal-mines Act, 1925. Defendant was convicted and fined £7 10s. and costs

STATISTICS OF WORKINGS IN COAL-MINES, 1945

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 1945.	Total Output to 31st December, 1944.	Total Output to 31st December, 1945.	Number of Persons ordinarily employed.		
											Above.	Below.	Total.
NORTHERN INSPECTION DISTRICT													
Waikato District													
Rotowaro, Rotowaro	Crown lease and freehold	28	Brown ..	2	7′ to 27′ ..	Full ..	Bord and pillar	195,205	3,825,757	4,020,962	106	268	374
Pukemiro, Pukemiro	Ditto ..	30	,, ..	1	4′ to 18′ ..	4′ to 18′ ..	Ditto ..	116,696	3,471,333	3,588,029	58	221	279
Wilton, Glen Massey (State) ..	,, ..	15	,, ..	1	6′ to 8′ ..	7′ 6″ ..	,, ..	83,081	1,171,369	1,254,450	52	130	182
Waikato Extended, Huntly West (opencast)	Freehold	..	,, ..	..	..	..	Opencast	5,363	133,870	139,233	8	..	8
Glen Afton No. 1, Glen Afton ..	Crown lease and freehold	25	,, ..	1	4′ to 16′..	9′ ..	Bord and pillar	51,947	2,221,463	2,273,410	30	101	131
MacDonald, Waikokowai ..	Ditto ..	15	,, ..	1	6′ to 20′..	9′ to 14′..	Ditto ..	137,760	1,946,336	2,084,096	90	227	317
Whatawhata Campbell, Whatawhata	University endowment	24	,, ..	1	10′ 6″ ..	10′ ..	,, ..	9,272	110,410	119,682	5	6	11
Renown, Renown	Freehold ..	18	,, ..	2	15′ ..	7′ 6″ to 9′	,, ..	130,037	1,795,856	1,925,893	63	197	260
Glen "A" Potteries, Glen Afton	,, ..	9½	,, ..	1	10′ ..	10′ ..	Opencast	257	2,782	3,039	1	..	1
Rangitoto, Otorohanga (opencast)	Native lease	1½	,, ..	1	.. ..	..	,,	13,994	1,797	15,791	2	..	2
Victory, Huntly West	Freehold ..	½	,, ..	1	6′ to 15′ ..	8′ ..	Bord and pillar	1,657	..	1,657	2	2	4
Kimihia (State), (opencast) ..	Crown lease and University endowment	1½	,, ..	1	..	..	Opencast	45,158	30,850	76,008	24	..	24
Glen Afton (State), (opencast) ..	Freehold ..	2	,, ..	1	..	..	,,	15,465	11,837	27,302	17	..	17
Kemp's (State), (opencast) ..	,, ..	1½	,, ..	2	..	..	,,	32,177	1,885	34,062	32	..	32
Beehive (State), (opencast) ..	,, ..	1	..	1	..	..	,,	1,803	2,206	4,009	3	..	3
Te Pahu, Karamu	University endowment	½	Semi-bituminous	1	5′ 6″ ..	3′ 6″ ..	..	126	..	126	2	..	2
Taranaki District													
Old Stockman, Mokau	Freehold ..	25	Brown ..	1	4′ 6″ ..	All ..	Bord and pillar	758	15,591	16,349	..	2	2
Mangapehi, Mangapehi (State) ..	Crown lease ..	11½	,, ..	1	8′ to 20′ ..	7′ to 8′ ..	Ditto ..	53,869	252,992	306,861	25	101	126
Tatu, Ohura (State)	,, ..	9	,, ..	1	7′ ..	Full ..	,, ..	32,004	161,414	193,418	40	63	103
Aria, Aria	,, ..	2	,, ..	1	12′ ..	8′ ..	Bord and pillar	1,996	1,632	3,628	4	3	7
Waitewhena (State), (opencast) ..	Freehold ..	11½	,, ..	..	.. ..	..	Opencast	28,756	9,513	38,269	6	..	6
Fougere's (opencast)	,, ..	½	..	1	3′ 3″ ..	..	,,	38	..	38	3	..	3
Hikurangi District													
Waro, Hikurangi	Freehold ..	11	Sub-bituminous	1	4′ to 6′ 6″	All ..	Bord and pillar	23,504	169,844	193,348	16	66	82
New Kamo, Kamo	Crown lease and freehold	11½	Ditto ..	1	8′ to 16′ ..	8′ to 9′ ..	Ditto ..	64,989	423,101	488,090	23	105	128
Avoca, Tangowahine	Freehold ..	2	Brown ..	1	16′ ..	16′ ..	Opencast	787	472	1,259	1	1	2
Whareora, Whareora	,, ..	¾	Sub-bituminous	1	3′ ..	3′ ..	,,	149	..	149	2	..	2
K. D. Campbell	Crown lease ..	½	Ditto ..	1	3′ 6″ ..	3′ 6″ ..	..	96	..	96	2	..	2
Output of collieries included in previous statements at which operations have been suspended or abandoned								12,655,660	12,655,660	..	..	..	

Nelson District															
Westhaven, Collingwood	Freehold	7	Sub-bituminous	1	6′	Full	Bord and pillar	3,823	18,310	22,133	2	6	8
Owen, Owen River	Crown lease	16	Ditto	1	4′ to 6′	,,	Ditto	2,162	49,446	51,608	1	7	8
Strathmore, Ariki	,,	4½	,,	1	3′ 6″ to 5′	3′ 9″	,,	125	562	687	..	2	2
Six-mile, Murchison	,,	4½	,,	1	8′	Full	,,	1,688	2,692	4,380	1	3	4
Victory, Glenhope	Freehold	4	Bituminous	1	2′ to 3′	3′	,,	7	185	192	..	1	1
Buller District													
Allan's, Charleston	Crown lease	13	Lignite	1	40′	8′	Opencast	6	96	102	1	..	1
Bowater and Bryan's, Charleston	,,	15½	,,	1	4′ to 36′	8′	,,	53,370	11,361	64,731	15	..	15
Brighton, Fox River	,,	13	,,	1	12′ to 16′	8′	Bord and pillar	1,530	4,960	6,490	1	3	4
Cascade, Cascade Creek	,,	19	Bituminous	1	25′ to 30′	7′	Ditto	21,427	295,924	317,351	8	11	19
Charming Creek, Ngakawau	,,	18	,,	1	9′ to 20′	9′	,,	35,132	371,364	406,496	24	32	56
Coal Creek, Seddonville	,,	28	,,	1	20′	8′	,,	2,565	124,575	127,140	1	4	5
Hydro, Seddonville	,,	10	,,	1	20′	Full	,,	13,791	94,037	107,828	3	7	10
Dove's, Seddonville	,,	15	,,	1	20′	,,	,,	9	119,702	119,711	..	1	1
Mitchell's, Charleston	,,	20	Lignite	1	40′	8′	Opencast	26	2,178	2,204	2	..	2
Warne's, Charleston	,,	20	,,	1	40′	9′	,,	458	966	1,424	6	..	6
Powell's, Charleston	,,	13	,,	1	30′	14′	,,	3,423	7,685	11,108	6	..	6
Paine's (Rocklands), Buller Gorge	,,	43	Brown	1	18′ to 20′	Full	Opencast and bord and pillar	8,052	26,599	34,651	8	..	8
Glenerag, Buller Gorge	,,	22	,,	1	12′	,,	Bord and pillar	6,770	16,827	23,597	4	6	10
Denniston (Denniston)	,,	65	Bituminous	3	3′ to 20″	,,	Ditto	109,842	12,024,847	12,131,689	70	222	292
Millerton, Granity	,,	54	,,	1	4′ to 40′	12′	,,	82,320	9,137,248	9,219,568	48	91	139
Stockton, Ngakawau	,,	37	,,	3	4′ to 25′	10′	Bord and pillar and opencast	196,125	4,537,489	4,733,614	152	140	292
Cardiff, Mokihinui	,,	9½	,,	1	10′	Full	Bord and pillar	3,015	29,165	32,180	1	3	4
Buller Gorge, Rahui	,,	3½	Brown	1	11′	7′	Ditto	2,921	8,125	11,046	3	3	6
Reefton District													
Doran's, Capleston	Crown lease	1½	Brown	1	4′ 6″	Full	Bord and pillar	362	196	558	..	1	1
Alborn's, Boatmans	Crown lease and freehold	50	,,	3	8′ to 12′	8′	Ditto	10,271	137,767	148,038	1	13	14
Kleen, Boatmans	Crown lease	2	,,	1	12′	Full	Opencast	1,714	679	2,393	3	..	3
Burke's Creek, Reefton	,,	44	,,	2	8′ to 20′	,,	Bord and pillar and opencast	15,040	466,019	481,059	22	35	57
Morrisvale, Reefton	,,	33	,,	2	8′ to 30′	,,	Ditto	10,838	227,343	246,825	4	11	15
Morrinsville (Pyramid), Reefton	,,		,,	1	10′ to 16′	10′	Bord and pillar	8,644					
Clele, Merrijigs	,,	59	,,	1	5′	Full	Ditto	1,730	110,770	112,500	..	2	2
Coghlan's, Capleston	Crown lease and freehold	48	,,	1	10′ to 12′	10′	,,	1,961	60,629	62,590	1	4	5
Defiance, Murray Creek	Crown lease	17	,,	1	6′	Full	,,	3,721	58,535	62,256	2	6	8
New Pyramid, Waitahu	,,	2	,,	1	12′	8′	,,	4,000	1,288	5,288	4	11	15
Burnwell, Reefton	,,	17	,,	1	40′	9′	,,	7,917	27,358	35,275	1	13	14
Central, Reefton	Crown lease and wayleave	1½	,,	1	8′ to 12′	8′	,,	3,366	918	4,284	3	11	14
Waitahu, Reefton	Crown lease	36	,,	1	6′ to 9′	Full	,,	10,908	70,287	81,195	4	13	17
Waitahu Syndicate, Reefton	,,	½	,,	1	6′	,,	,,	1,050	..	1,050	..	10	10

STATISTICS OF WORKINGS IN COAL-MINES, 1945—*continued*

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											Above.	Below.	Total.
WEST COAST INSPECTION DISTRICT—*continued*													
Reefton District—**continued**													
Terrace, Reefton	Crown lease and wayleave	18	Brown ..	2	50′ and 10′	9′ ..	Bord and pillar	10,224	37,028	47,252	1	13	14
Comet, Inangahua	Crown lease ..	4½	,, ..	1	10′ ..	Full ..	Ditto ..	4,199	12,047	16,246	..	5	5
Nicholls, Boatmans	,, ..	2½	,, ..	1	7′ ..	,, ..	,, ..	1,790	2,756	4,546	..	5	5
Banks, Waitahu	,, ..	2	,, ..	1	40′ ..	,, ..	Opencast	17,310	12,812	30,122	11	..	11
Star, Murray Creek	,, ..	2	,, ..	1	8′ ..	,, ..	,,	1,265	2,093	3,358	4	..	4
Royal, Rainy Creek	,, ..	1½	,, ..	1	6′ ..	,, ..	Bord and pillar	2,094	329	2,423	..	3	3
Turner's, Murray Creek	,, ..	1	,, ..	1	16′ ..	,, ..	Opencast	1,858	..	1,858	3	..	3
Chandler's, Murray Creek ..	,, ..	1	,, ..	..	.. ..	.. ..	,,	2,110	..	2,110	5	..	5
Golden Point, Reefton	,, ..	½	,, ..	1	5′ ..	Full ..	Bord and pillar	146	..	146	..	2	2
Heffernan's, Reefton	,, ..	½	,, ..	1	..	..	Opencast	104	..	104	2	..	2
Greymouth District													
Cliffdale, Ten-mile	State reserve	18	Bituminous	1	8′ ..	Full ..	Bord and pillar	3,556	59,720	63,276	1	7	8
Bellvue, Rapahoe	,,	19	,,	1	11′ ..	,, ..	Ditto ..	3,029	104,761	107,790	2	5	7
Blackball, Blackball	,,	54	,,	2	8′ to 17′ ..	8′ ..	,, ..	58,656	4,302,542	4,361,198	32	109	141
Blackball Creek, Blackball ..	,,	14½	,,	1	4′ 6″ ..	Full ..	,, ..	5,298	170,139	175,437	1	7	8
Harrison's, Ten-mile	,,	13	,,	1	8′ ..	,, ..	,, ..	6,172	43,540	49,712	1	8	9
Brachead, Dunollie	,,	25	,,	1	7′ to 9′ ..	,, ..	,, ..	5,431	165,040	170,471	1	7	8
Briandale, Ten-mile	Crown lease ..	19	,,	1	6′ ..	Full ..	,, ..	806	101,237	102,043	3	2	5
Wallsend, Brunnerton	Crown lease and freehold	22	,,	1	18′ ..	8′ 10″ ..	,, ..	50,266	1,040,956	1,091,222	32	121	153
Dobson, Dobson	Crown lease ..	23	,,	1	9′ to 16′ ..	9′ ..	,, ..	53,346	1,313,120	1,366,466	37	160	197
Goldlight, Rewanui	State reserve	18	,,	1	10′ ..	Full ..	,, ..	9,610	119,808	129,418	1	7	8
Hilltop, Ten-mile	,,	15	,,	1	22′ ..	10′ ..	,, ..	3,434	89,420	92,854	1	4	5
Kayes, Ten-mile	,,	11	,,	1	9′ ..	Full ..	,, ..	4,520	31,017	35,537	1	3	4
Hunter's, Rewanui	,,	25	,,	1	9′ ..	,, ..	,, ..	8,759	138,286	147,045	2	9	11
Jubilee, Rapahoe	,,	18	,,	1	9′ ..	,, ..	,, ..	9,737	58,893	68,630	2	15	17
Moody Creek, Dunollie	,,	23	,,	1	10′ ..	8′ ..	,, ..	4,460	113,006	117,466	2	6	8
Cliffside, Nine-mile	,,	10½	,,	1	11′ ..	9′ ..	,, ..	6,355	42,449	48,804	2	8	10
New Point Elizabeth, Dunollie ..	,,	19	,,	1	6′ ..	5′ ..	,, ..	4,365	144,002	148,367	2	7	9
Old Runanga, Rewanui	,,	19	,,	1	3′ to 5′ ..	Full ..	,, ..	6,071	126,265	132,336	2	8	10
Paparoa, Roa	Crown lease ..	37	Super-bituminous	2	8′ to 25′ ..	,, ..	,, ..	32,432	1,106,598	1,139,030	18	48	66
Schultz Creek, Twelve-mile ..	,, ..	21	Bituminous	1	3′ ..	,, ..	,, ..	1,635	45,777	47,412	1	5	6
Smith's, Dunollie	State reserve	25	,,	1	8′ ..	,, ..	,, ..	2,042	138,499	140,541	2	6	8
Halliday's, Dunollie	,,	15½	,,	1	4′ ..	,, ..	,, ..	742	70,785	71,527	1	5	6
Strongman, Nine-mile	,,	7	,,	1	20′ ..	9′ ..	,, ..	95,720	492,697	588,417	65	178	243
Liverpool, Rewanui	,,	33	,,	2	8′ to 34′ ..	8′ ..	,, ..	118,450	4,004,750	4,123,200	84	253	337
Spark's, Rewanui	,,	23	,,	1	9′ ..	Full ..	,, ..	3,090	80,236	83,326	2	7	9
Output at collieries included in previous statements at which operations have been abandoned or suspended									9,448,304	9,448,304	..	..	..

Canterbury District															
Acheron Anthracite, Coalgate ..	Freehold ..	5½	Altered lignite	3	14′ ..	8′ ..	Bord and pillar	1,619	4,621	6,240	3	4	7
Blackburn, Mount Somers ..	Crown lease ..	16	Lignite ..	2	8′ ..	7′ ..	Ditto ..	4,355	44,086	48,441	2	7	9
Brockley Anthracite, Whitecliff ..	Freehold ..	7	Altered lignite	1	3′ ..	3′ ..	,, ..	912	5,902	6,814	1	3	4
Clearview, Glenroy	,, ..	26	Lignite ..	1	10′ 6″ ..	8′ ..	,, ..	1,410	44,175	45,585	1	1	2
Klondyke, Coalgate	,, ..	17	,, ..	1	20′ ..	8′ ..	,, ..	12,786	115,206	127,992	2	18	20
Meadowbank, Waimate ..	Crown lease ..	1	,, ..	1	20′ ..	10′ ..	,, ..	1,259	..	1,259	2	3	5
Newburn, Mount Somers ..	,, ..	1	,, ..	1	20′ ..	10′ ..	,, ..	369	..	369	1	3	4
Steventon, Whitecliffs	Freehold ..	17½	,, ..	1	6′ to 7′ ..	5′ 6″ ..	,, ..	4,068	50,360	54,428	2	5	7
Tripps, Mount Somers	,, ..	79	,, ..	1	10′ ..	8′ ..	,, ..	4,525	125,883	130,408	1	7	8
Victory, Coalgate	,, ..	4	,, ..	1	14′ ..	9′ ..	,, ..	830	1,989	2,819	1	3	4
Woodbank, Albury	Crown lease ..	20	,, ..	1	11′ ..	10′ ..	,, ..	4,874	18,207	23,081	2	6	8
North Otago													
Airedale, Papakaio	Crown lease ..	19	Lignite ..	1	6′ 6″ ..	6′ ..	Bord and pillar	1,784	56,799	58,583	1	4	5
Ngapara, Ngapara	Freehold ..	67	,, ..	1	24′ ..	14′ ..	Ditto ..	2,559	60,676	63,235	1	4	5
Rockvale, Herbert	,, ..	11	,, ..	1	7′ ..	6′ ..	,, ..	2,267	12,297	14,564	..	3	3
Shag Point, Shag Point	Crown lease ..	31	Brown ..	1	5′ ..	5′ ..	,, ..	1,734	446,268	448,002	1	2	3
St. Andrew, Peebles	Freehold ..	66	Lignite ..	1	7′ ..	7′ ..	,, ..	3,190	97,651	100,841	1	5	6
Willett's, Airedale	Freehold and Crown lease	13	,, ..	1	10′ ..	6′ ..	,, ..	1,080	15,269	16,349	..	3	3
Central Otago													
Cairnmuir, Cromwell	Freehold and Crown lease	5	Lignite ..	1	20′ ..	8′ ..	Bord and pillar	1,509	4,067	5,576	1	4	5
Idaburn, Oturehua	Freehold ..	75	,, ..	1	30′ ..	30′ ..	Opencast	1,376	69,069	70,445	2	..	2
McPherson's, Coal Creek ..	Crown lease ..	75	,, ..	1	12′ ..	12′ ..	,,	4,150	123,587	127,737	2	..	2
Oturehua, Oturehua	,, ..	51	,, ..	1	20′ ..	15′ ..	,,	325	9,095	9,420	1	..	1
Shepherd's Creek, Bannockburn ..	,, ..	68	,, ..	1	6′ to 20′ ..	10′ ..	Bord and pillar	2,048	150,649	152,697	1	2	3
South Otago													
Akatore, Milton	Crown lease ..	2	Lignite ..	1	9′ ..	6′ ..	Bord and pillar	1,920	230	2,150	1	4	5
Barclay's, Fairfield	,, ..	1	,, ..	1	5′ to 8′ ..	6′ ..	Ditto ..	550	..	550	1	2	3
Benhar, Benhar	Freehold and Crown lease	82	,, ..	2	30′ ..	8′ ..	,, ..	9,827	385,376	395,203	1	11	12
Fairfield, Fairfield	Freehold ..	13	,, ..	1	6′ ..	..	,, ..	4,154	38,363	42,517	1	3	4
Kaitangata, Kaitangata	Freehold and Crown lease	69	Brown ..	2	8′ to 20′ ..	8′ to 20′ ..	,, ..	127,025	6,511,421	6,638,446	54	230	284
New Fernhill No. 1, Abbotsford ..	Freehold ..	13	Lignite ..	1	6′ to 14′ ..	10′ ..	,, ..	6,936	55,954	62,890	2	6	8
New Fernhill No. 2, Green Island	,, ..	4	,, ..	1	10′ ..	8′ ..	,, ..	3,563	2,981	6,544	2	5	7
Riverside, Milton	,, ..	1	,, ..	1	6′ to 8′ ..	6′ to 8′ ..	Opencast	466	..	466	3	..	3
Taradale, Kaitangata	,, ..	1	Brown ..	1	30′ ..	20′ ..	,,	1,286	..	1,286	1	..	1
Victory, Brighton	Crown lease ..	2	Lignite ..	1	5′ ..	5′ ..	Bord and pillar	1,984	48	2,032	1	3	4
Viewbank, Crichton	Freehold ..	1	,, ..	..	.. ..	..	Opencast	455	..	455	3	..	3
Wangaloa, Kaitangata	Crown lease ..	23	,, ..	1	25′ ..	20′ ..	Bord and pillar	8,087	37,664	45,751	3	7	10
Wangaloa (State), Kaitangata ..	Freehold ..	1	,, ..	..	.. ..	..	Opencast	5,106	..	5,106	17	..	17
Willowbank No. 1, East Taieri ..	,, ..	23	,, ..	1	15′ ..	6′ ..	Bord and pillar	5,037	114,261	119,298	2	6	8
Willowbank No. 2, East Taieri ..	,, ..	26	,, ..	1	10′ ..	8′ ..	Ditto ..	1,912	65,033	66,945	2	5	7

STATISTICS OF WORKINGS IN COAL-MINES, 1945—*continued*

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											Above.	Below.	Total.
SOUTHERN INSPECTION DISTRICT—*continued*													
Southland District													
Argyle, Waikaia	Crown lease	54	Lignite	1	10′	10′	Opencast	479	15,473	15,952	1	..	1
Birchwood, Ohai	,,	22	Brown	1	9′ to 25′	6′ to 8′	Bord and pillar	33,705	429,885	463,590	14	45	59
Black Diamond, Nightcaps	,,	30	,,	2	40′ and 12′	40′ and 12′	Ditto	16,964	393,085	410,049	6	22	28
Black Lion, Ohai	,,	24	,,	1	8′	8′	,,	3,327	287,197	290,524	4	16	20
Boghead, Mataura	Freehold	40	Lignite	1	23′	10′	,,	11,019	170,316	181,335	3	7	10
Costers, Edendale	,,	9	,,	1	14′	14′	Opencast	1,274	10,141	11,355	1	..	1
Diamond Lignite, Asher's Siding	Crown lease	43	,,	..	36′	36′	,,	2,107	51,265	53,372	2	..	2
Gladfield, Thornbury	Freehold	2	,,	1	20′	14′	,,	1,335	258	1,593	2	..	2
Glenlee, Waikaka	,,	52	,,	1	14′ 6″	8′ 6″	Bord and pillar	2,621	52,769	55,390	..	2	2
Hardings, Ohai	Crown lease	1	,,	1	5′	5′	Opencast	43	..	43	3	..	3
Hedgehope, Waimumu	Freehold	7	,,	1	10′ to 20′	10′ to 20′	,,	11,128	41,019	52,147	7	..	7
Liberty, Ohai	,,	1	,,	1	6′	6′	,,	752	..	752	2	..	2
Linton, Ohai	Freehold and Crown lease	30	Brown	1	30′ to 40′	30′ to 40′	Bord and pillar	86,524	2,045,527	2,132,051	47	121	168
Mataura Paper-mills, Mataura	Freehold	7	Lignite	1	14′ to 25′	20′	Opencast	21,373	128,803	150,176	5	..	5
Mossbank (State), Ohai	Crown lease	5	Brown	1	16′ to 23′	8′	Bord and pillar	24,462	734,012	758,474	11	34	45
New Hakatere, Gore	Freehold	2	Lignite	1	16′	16′	Opencast	526	1,346	1,872	3	..	3
Newvale, Waimumu	,,	5	,,	1	25′	7′	,,	9,289	20,523	29,812	9	..	9
Nightcaps, Nightcaps	,,	1	,,	1	5′	5′	,,	1,064	..	1,064	4	..	4
Ohai Colliery, Ohai	Crown lease	2	Brown	1	20′	15′	,,	24,547	9,167	33,714	10	..	10
Ota Creek, Wyndham	,,	65	Lignite	1	9′	9′	,,	622	37,091	37,713	1	..	1
Raby, Gore	Freehold	12	,,	1	20′	20′	,,	2,745	30,221	32,966	1	..	1
Star, Ohai	,,	14	Brown	1	20′	20′	Bord and pillar	38,674	240,995	279,669	15	46	61
Starlight, Gore	,,	2	Lignite	1	10′	10′	Opencast	4,508	1,669	6,177	3	..	3
Taunga, Orepuki	,,	2	,,	1	15′	5′	,,	179	66	245	2	..	2
Terrace, Balfour	,,	5	,,	1	17′	8′ 6″	Bord and pillar	1,395	19,154	20,549	2	..	2
Thorndale, McNab	,,	1	,,	1	4′	4′	Opencast	364	..	364	1	..	1
Waimeamea, Orepuki	Crown lease	40	Brown	1	22′	9′	Bord and pillar	698	39,624	40,322	1	2	3
Waimumu, Waimumu	Freehold	17	Lignite	1	30′	30′	Opencast	9,157	67,379	76,536	3	..	3
Wairaki, Ohai	Freehold and Crown lease	32	Brown	1	14′ to 27′	5′	Bord and pillar	69,283	858,644	927,927	31	80	111
Output of collieries included in previous statements at which operations are abandoned or suspended								..	11,473,153	11,473,153	..	..	..
Totals, Southern District, South Island								617,441	25,872,866	26,490,307	317	744	1,061
Totals, West Coast District, South Island								1,769,191	51,662,044	52,831,235	726	1,695	2,421
Totals, Northern District, North Island								1,046,944	28,417,970	29,464,914	617	1,493	2,130
								2,833,576	105,952,880	108,786,456	1,660	3,932	5,592
Output of collieries prior to 1890, not included in above statement								..	..	296,653	..	..	..
Shale exported, 1914								..	..	21	..	..	..
										109,083,130			

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