1950

NEW ZEALAND

MINES STATEMENT

BY THE HON. W. SULLIVAN, 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, 1949.

MINERAL-PRODUCTION

The following statement shows the quantity and value of the production of metalliferous mines, quarries, and coal-mines during 1949 and 1948 :—

Mineral.	1949.		1948.	
	Quantity.	Value.	Quantity.	Value.
		Fuels		
		£(N.Z.)		£(N.Z.)
Coal	2,813,275 tons	5,907,878*	2,775,886 tons	4,823,102
Petroleum (crude)	236,463 gals.	7,389	83,112 gals.	2,597
		Metals		
Gold	84,874 oz.	836,001	93,903 oz.	896,173
Silver	232,599 oz.	54,587	232,563 oz.	53,587
Antimony-ore	5 tons	209	9 tons	248
Arsenic	19 tons	344	8 tons	144
Iron-ore	4,352 tons	9,727	4,776 tons	10,062
Copper-ore	13 tons	28	..	..
Tungsten-ore	25 tons	7,882	25 tons	9,800
Manganese-ore	305 tons	1,879	525 tons	2,487
		Non-metallics		
Bentonite	456 tons	3,341	624 tons	4,462
Clay for bricks, tiles, &c.	157,910 tons	36,109	159,129 tons	37,209
Clay for pottery, fillers, &c.	14,672 tons	7,934	17,402 tons	16,272
Diatomite	94 tons	59	103 tons	143
Dolomite	4,210 tons	2,105	6,912 tons	3,456
Fuller's earth	..	..	68 tons	200
Limestone, marl, &c., for cement	465,026 tons	89,208	417,660 tons	68,454
Limestone for agriculture	1,100,126 tons	554,468	1,091,299 tons	473,709
Limestone for industrial uses	43,901 tons	22,747	69,068 tons	28,563
Sand, gravel, &c., for roads and ballast	2,509,576 tons	822,177	2,015,354 tons	608,140
Sand, &c., for building aggregate	449,697 tons	150,315	396,812 tons	141,504
Dimension stone for building	5,482 tons	6,698	22,319 tons	34,380
Rock for harbour-work	66,269 tons	12,594	63,059 tons	10,633
Magnesite	559 tons	391	540 tons	378
Pumice	13,124 tons	6,845	6,863 tons	4,955
Quartzite	19 tons	19	26 tons	13
Serpentine	54,453 tons	17,057	38,637 tons	10,447
Silica sand	20,401 tons	59,032	16,536 tons	44,774
Totals	..	8,617,023	..	7,285,892

* Value of coal assessed at 42s. per ton as per estimate in "Subsidy on Coal-production" section.

GOLD AND SILVER MINING

Production of bullion during the year 1949 amounted to 317,473 oz., valued at £890,588, a decrease in quantity of 8,993 oz. and a decrease in value of £59,172 as compared with the preceding year.

The gold content of the bullion is estimated at 84,874 oz., valued at £836,001, and the silver content at 232,599 oz., valued at £54,587.

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

Year.	Oz.	Year.	Oz.
1930	120,931	1940	185,665
1931	129,861	1941	174,656
1932	166,354	1942	165,986
1933	161,755	1943	149,150
1934	160,248	1944	142,287
1935	165,277	1945	128,364
1936	164,575	1946	119,271
1937	168,487	1947	112,260
1938	152,050	1948	93,903
1939	178,955	1949	84,874

Gold-production showed a decline in 1949 of 9,029 oz. Of the total production, quartz-mines accounted for 36,432 oz., a decrease of 703 oz., dredges for 47,000 oz., a decrease of 7,644 oz., and alluvial mines for 1,442 oz., a decrease of 682 oz.

The increased price of gold brought about by the devaluation of sterling and the remission of taxation upon production have materially bettered the position of gold-producers. Otherwise it is likely that the decline in gold-production for 1949 may have been greater, while the future of the whole industry could only be regarded as bleak.

In particular is this true of quartz-mining. For many years there have been only two mines of any consequence, the Martha at Waihi and the Blackwater near Reefton, and the lives of both mines must have been prolonged by the altered circumstances. In fact, the Martha was upon the point of suspending all mining operations, and the respite afforded this company by the increased price of gold has been very welcome. In the case of the Blackwater, the incentive to resume development in depth has been restored, and provided additional labour can be recruited to provide an adequate force, the mine should continue in production for many years to come. As in past years, there has been no serious move to develop new quartz-mines or to reopen old and abandoned mines, so that generally the future of quartz-mining in New Zealand must be regarded as limited.

For many years gold recovered by dredges has been the mainstay of production, and the decline in the total output of gold is in great part due to the reduction from this form of mining. This reduction, in turn, can be accounted for by the foundering of the Arahura Dredge, which resulted in the dredge being out of commission for the last ten months of the year, and for the reduction in running-time of the Ngahere dredge through water escaping from the dredge pond when old underground workings were encountered. Had both these dredges been in commission for the full year, production of gold from this form of mining would have been maintained at the level reached in 1948. Nine dredges were active for some part or other of the year, six on the West Coast and three in Otago and Southland, the third dredge in the latter district being a small dredge which resumed operations after being out of commission for some time. By the end of the year, construction work on the new Premier Gold-dredge was complete and early in this year active dredging operations were commenced on an area at Big River in the Reefton district. It has now been decided to refloat and recondition the Arahura Dredge so that it can resume active operations, and when this is accomplished the fleet of dredges will

consist of seven on the West Coast and three in the Otago-Southland area. The continuance of gold-production from dredging at the level of the 1949 output seems reasonably assured for some years as most dredges have relatively long lives, which have been prolonged in some cases by the acquisition of adjoining areas. Prospecting for new ventures has been at a standstill for some years, and the field is now limited after the comprehensive boring programmes of the "thirties," and accordingly it is difficult to see any very great expansion of dredging activity.

Production from alluvial mines dropped to an all-time low figure, and it appears inevitable that it must progressively diminish.

Despite the decline in production of recent years, gold-mining still plays an important part in the economy of New Zealand in providing a modicum of foreign exchange. It is accordingly a matter of some concern that in particular the dredging industry has been subjected to such continuous and hostile criticism, and it is apparent that many objectors would be satisfied with nothing less than its extinction. It is true that, particularly in the early years, some land of fair productive capacity was destroyed by mining operations, but even so it is questionable, in view of the great contribution that gold-mining has made to the early economic development of New Zealand, whether there was not a fair measure of justification for the policy adopted at the time. There is no doubt that the land despoiled by mining is a mere fraction of the total area destroyed directly and indirectly by other pursuits, and there is need for balanced judgment in dealing with the matter. However, be that as it may, there is no justification now for the destruction of land that has potential value for farming activity, and it has been the concern of the Mines Department these many years to ensure that this does not occur. The policy which was clearly stated in the Mines Statement for the year 1941 has been rigidly maintained, and since that date no significant area of land of agricultural value has been taken up for dredging purposes. It has been, of course, impossible to make this policy retrospective. Among other things, it would involve interference with existing title rights and would certainly lead to substantial compensation claims against the Government. Again, the jurisdiction of the Mines Department extends only to land where the mineral rights are reserved to the Crown. In the case of land owned in fee-simple without mineral reservation, the Mines Department has no jurisdiction and the owner or operating company is at liberty to carry out dredging operations without reference to the Department, other than comply with the safety provisions of the Mining Act and the regulations thereunder.

During 1949, 232,599 oz. of silver, valued at £54,587, were produced, as compared with 232,563 oz., valued at £53,587, in 1948. Practically the whole of this amount was obtained from the Martha Mine. The following table shows the production of the principal quartz-mines, dredges, and alluvial mines for the year ended 31st December, 1949. It will be noted that two quartz-mines and seven of the larger dredges were responsible for over 91 per cent. of the total production of gold.

	Ore, in Tons.	Development, in Feet.	Men Employed.	Gold (Ounces).	Silver (Ounces).	£(N.Z.).
Quartz-mines						
Martha	81,388	3,502	394	26,604	232,449	307,181
Blackwater	22,115	445	118	9,541	..	92,006
Callery Party, Macrae's Flat ..	380	..	3	106	..	921
Sundry	..	..	16	181	150	1,687
Totals	..	..	531	36,432	232,599	401,795

—	Yardage.	Acreage.	Average Depth, in Feet.	Men Employed.	Gold (Ounces).	Silver (Ounces).	£(N.Z.).
Dredges							
Grey River	3,337,000	68·5	30	25	5,667	..	64,146
Arahura	441,253	2·0	131	39	1,832	..	22,389
Rimu	1,565,000	23·0	42	41	4,849	..	49,613
Kaniere	2,789,372	15·8	113	42	11,300	..	123,628
Ngahere	1,498,351	13·3	78	27	4,971	..	46,784
Snowy River	1,000,000	..	20	13	4,735	..	37,564
Austral New Zealand ..	2,990,000	42·3	47	47	7,090	..	67,835
Clutha	2,521,000	20·0	78	25	6,400	..	62,021
Rainbow	150,000	..	6	2	156	..	1,407
Totals	..	..	..	261	47,000	..	475,387
Alluvial							
Waitahu	..	..	12	2	93	..	1,116
Round Hill	..	..	..	6	327	..	2,888
Sundry	..	..	..	92	1,022	..	9,402
Totals	..	..	..	100	1,442	..	13,406
Grand totals ..	..	..	..	892	84,874	232,599	890,588

PETROLEUM OIL

Activity in the petroleum mining industry was again confined to the operations of New Zealand Oil Refineries, Ltd., which in addition to maintaining production from the old wells in the Moturoa field near New Plymouth, completed a new well, the Dobson No. 1. Although this well was not completed until March, 1949, production from it alone amounted to 180,970 gallons of crude oil as compared with 55,493 gallons from the three old wells. This result has encouraged the company to commence a new well, the Dobson No. 2, and despite some misfortune at the commencement of operations, satisfactory progress has been made in sinking the bore hole.

Production from the Moturoa field for the year 1949 amounted to 236,463 gallons, as against 83,112 gallons in 1948, 82,307 gallons in 1947, and 81,625 gallons in 1946.

The total production of crude petroleum in New Zealand up to 31st December, 1949, now amounts to 3,986,316 gallons.

COAL-MINING

The total coal-production of the Dominion for the year 1949 amounted to 2,813,275 tons, which is 37,389 tons greater than production in 1948, which amounted to 2,775,886 tons.

The annual production of coal since 1930 is as follows :—

Year.	Tons.	Year.	Tons.
1930	2,542,092	1940	2,516,099
1931	2,157,756	1941	2,639,507
1932	1,842,022	1942	2,680,041
1933	1,821,258	1943	2,787,868
1934	2,060,315	1944	2,805,970
1935	2,115,184	1945	2,833,576
1936	2,140,217	1946	2,793,870
1937	2,277,799	1947	2,751,725
1938	2,222,088	1948	2,775,886
1939	2,342,639	1949	2,813,275

It will be noted from the table above that in only one previous year has the production for 1949 been exceeded—namely, in the year 1945, when the record production of 2,833,576 tons was achieved. Actually since 1943 production of coal has been maintained at an even level of some 2,800,000 tons, and indications are that production may be continued at this level during the current year.

During 1949, 175 mines were in operation. Of these, 56 mines operated wholly or principally on freehold land and the remaining 119 wholly or predominantly on Crown land. Output from freehold land was 1,134,536 tons (40 per cent.) and output from Crown land 1,678,739 tons (60 per cent.), these proportions being similar to those recorded in the previous year.

Imports of coal in 1949 amounted to 78,485 tons, as against 54,211 tons in 1948 and 93,411 tons in 1947. Coal was imported from the United Kingdom and South Africa, the greater proportion coming from South Africa. All this coal was used by the railways. During the current year imports of coal have continued to be made from South Africa.

Exports of coal in 1949 amounted to 21,575 tons, as compared with 18,913 tons in 1948.

In 1949, 2,071,288 tons were produced from underground mines, compared with 2,099,158 tons in 1948, and from opencast mines 741,987 tons were produced in 1949, as against 676,728 tons in 1948.

The output per miner employed underground was 517 tons, a decrease of 29 tons as compared with 1948. The production per man on the pay-roll of underground mines—*i.e.*, both underground and surface workers—was 385 tons, a decrease of 24 tons on the previous year.

Production per man employed in opencast mines was 1,484 tons, a decrease of 3 tons as compared with 1948.

The over-all production per man employed in the industry—*i.e.*, combined underground and opencast mines—amounted to 479 tons, a decrease of 18 tons as compared with 1948.

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

Year.	Output.	Men Employed Underground.	Tons per Man Underground.	Men Employed on Surface.	Tons per Man on Pay-roll.
		Underground Mines			
1930	2,530,661	4,430	571	1,409	433
1931	2,143,023	4,331	495	1,375	376
1932	1,826,110	3,379	540	1,214	398
1933	1,797,869	3,194	563	1,134	415
1934	2,042,228	3,249	629	1,172	462
1935	2,098,904	3,104	676	1,083	501
1936	2,108,238	3,154	668	1,040	503
1937	2,238,651	3,288	681	1,074	513
1938	2,180,122	3,368	647	1,142	483
1939	2,296,007	3,542	648	1,164	488
1940	2,465,336	3,769	654	1,241	492
1941	2,585,324	3,633	712	1,325	521
1942	2,624,267	3,659	717	1,291	530
1943	2,725,831	3,999	682	1,329	512
1944	2,609,516	3,958	659	1,395	489
1945	2,380,896	3,932	606	1,328	453
1946	2,265,170	3,819	593	1,313	441
1947	2,107,033	3,739	564	1,271	421
1948	2,099,158	3,842	546	1,285	409
1949	2,071,288	4,009	517	1,368	385

Year.	Output.	Men Employed.	Tons per Man Employed.
Opencast Mines			
1930	11,431	28	520
1931	14,733	39	378
1932	15,912	43	370
1933	23,389	58	403
1934	18,087	57	317
1935	16,280	44	370
1936	31,979	63	508
1937	39,148	55	712
1938	41,966	53	792
1939	46,632	56	833
1940	50,763	36	1,410
1941	54,183	33	1,642
1942	55,774	47	1,187
1943	62,037	46	1,349
1944	196,454	242	812
1945	452,680	332	1,363
1946	528,700	425	1,244
1947	644,692	432	1,492
1948	676,728	455	1,487
1949	741,987	500	1,484
All Mines			
1930	2,542,092	5,867	433
1931	2,157,756	5,745	376
1932	1,842,022	4,636	397
1933	1,821,258	4,386	415
1934	2,060,315	4,478	460
1935	2,115,184	4,231	500
1936	2,140,217	4,257	503
1937	2,277,799	4,417	516
1938	2,222,088	4,563	487
1939	2,342,639	4,762	492
1940	2,516,099	5,046	499
1941	2,639,507	4,991	529
1942	2,680,041	4,997	536
1943	2,787,868	5,374	519
1944	2,805,970	5,595	502
1945	2,833,576	5,592	507
1946	2,793,870	5,557	503
1947	2,751,725	5,442	506
1948	2,775,886	5,582	497
1949	2,813,275	5,877	479

It will be noted that there has been a substantial increase in the number of men employed in coal-mines, and it is gratifying that men are being attracted to the industry and, in particular, to underground work. No doubt the improvement of living conditions at coal-mining townships is in part responsible for the increase, and a major contribution to this has been the provision of hostels for single men by the Labour and Employment Department. During 1949, hostels were completed at Ohura and Ohai, so that hostels are now available at five mining centres: Huntly, Reefton, Granity, Ohura, and Ohai. During this present year it is intended to adapt a large house at Blackball for use as a hostel, the hostel at Renown is to be improved and extended, and minor extensions are to be made at Ohura. On the completion of this programme, it is felt that adequate accommodation for single men will be available in every important coal-mining centre. The position has so far improved that the hostel projected for Denniston and the additional

hostel for Granity have been abandoned, as it was felt that the money and building-materials available for this purpose could be put to better use in providing additional houses for married men, thereby encouraging men to make permanent homes in mining villages.

It is disappointing to have to report a decrease in tons produced per man underground and in tons produced per man on the pay-roll of underground mines. The introduction of the seven-hour day is, of course, responsible for a part of this decrease, but other contributory factors have been the shortage of experienced men and the more difficult mining conditions and longer haulages that have been encountered in the older mines.

It is of interest that of late years the output per hewer shift has remained remarkably constant, and the inference is strong that the over-all decrease is due to the greater number of men required in maintaining services and in transporting coal from the face to the surface.

While it is realized that New Zealand mines do not lend themselves to mechanization in as complete a degree as in overseas practice, still progress in partial mechanization has not proceeded to the degree expected. It was hoped that a programme of partial mechanization to be carried out at the Wilton State Coal-mine would provide a useful working test on the basis of which mechanization in other mines could be more confidently planned. So far four chain-type coal-cutters, three electrically driven coal-cutters, and nine electrically driven drills have been put into operation at this mine, but delivery of the scraper-loader equipment was delayed so long that development work in the section of the mine where experimental work on their use was contemplated had been completed and the experiment had to be abandoned. The use of power-driven coal-drills, either driven by electricity or by compressed air, is expanding, and the use of coal-cutters is also increasing. During 1949, power drills were introduced at both Burke's Creek State Coal-mine and Blackball State Coal-mine, and two coal-cutters were put into operation at the latter mine. An experiment of interest is to be made in the Ohai Coalfield during the present year in the use of a duck-bill coal-loader on pillar work.

Another trend in coal-mining practice in New Zealand will be the use of belt conveyor systems in place of the older methods of transport. Conveyors are at present being installed in the Webb State Coal-mine; they are projected for the Kamo State Coal-mine; they form an integral part of the mechanization scheme contemplated for the Mangapehi State Coal-mine, and will be extensively used in the new State mine at Denniston on the Plateau lease. It is at this last mine that mechanization under local conditions should be tested under the most favourable conditions, as the mine has been planned and will be developed from the outset to facilitate the use of mechanized mining equipment, and the necessity to adapt working methods to unfavourable conditions resulting from previous mining operations will not arise.

To maintain coal-production at the present level and meet the gradually increasing demand that must be expected, it is essential that new mines be opened up to replace mines approaching exhaustion. To this end, three main development programmes have been planned for this present year. At Denniston work will be continued on the opening-up of the Plateau lease. Already much preparatory work has been carried out. An access road has been constructed, a winch and compressors installed and housed, an electric-power transmission line provided, a temporary substation built, and the portals of the stone drives prepared, by use of a scraper loader, for driving operations. Everything is now in readiness for the commencement of driving the stone tunnels which will give access to the coal-seam. It has now been decided to open up a small underground

mine at Stockton as an extension to the Webb Mine in a block which proved unsuitable for opencast mining but which should lend itself to a high degree of extraction by underground mining.

In order to prolong the life of the Wallsend State Coal-mine, the neighbouring Tyneside Mine, which was abandoned many years ago after flooding, is to be unwatered and reopened. Not only will this allow of the recovery of the coal remaining in the mine, but will also permit the mining of a coal barrier that has been left in the adjoining Wallsend Mine for safety reasons. It is anticipated that the life of the Wallsend Mine will be increased by these operations.

On the other hand, with altered circumstances, it has been decided not to proceed with the development of two areas—namely, the extension of the Liverpool State Coal-mine and the Morley area in the Ohai Coalfield. In the case of the Liverpool Mine, it has been decided that the available labour could be concentrated to greater advantage on the extraction of coal in pillars as rapidly as possible and thus recover the maximum amount of coal possible. Accordingly, it has been decided to defer opening up this new area until such time as the exhaustion of the present Liverpool Mine is imminent.

A careful survey of the productive capacities of the southern sub-bituminous coal-fields has revealed the existence of possible large opencast mines which could only be worked economically by large-scale operations. Accordingly, it has been decided to defer the development of the new Morley Colliery until these opencast possibilities have been fully considered, and it is possible that the opening-up of the new Morley underground mine may be deferred for some years.

At the moment there would appear to be ample productive capacity to meet the market demands for coal, and the only mines approaching exhaustion are those of Wilton, in the Waikato, and Millerton. In the locality of the latter mine, boring operations are now being carried out to locate a new area for underground development.

It has become increasingly apparent that the only mining method by which a high rate of extraction from our thick coal-seams is possible is one involving some form of stowing. Plans have now been completed whereby experiments in hydraulic stowage are to be made at the Mangapehi State Coal-mine. A good source of stowing material occurs in the ignimbrite formation that overlies the coal measures at this mine, and it is proposed to introduce this material in crushed form to the underground workings through bore-holes. Hydraulic stowage is to form an integral part of a highly mechanized mining method for which the necessary equipment is being ordered. Experimental work at this mine will be valuable in giving reliable information upon which the economics of this process can be assessed under New Zealand conditions, and it can be determined whether it is applicable to other mines with similar conditions.

During the year a commencement was made with the construction of the aerial ropeway at Stockton, and while considerable progress has been made, delivery of steel has been slower than expected and the ropeway will not be in operation as soon as expected. This ropeway should not only allow of a considerable expansion of coal-production from the Stockton Plateau, but also permit of a substantial reduction in transport costs. Preliminary work has been carried out on the Denniston area, where an aerial ropeway is to be substituted for the present endless-rope haulage system, thus effecting a diminution in the labour required for transport and consequent reduced costs.

Further purchases of private coal-mines by the State have been made. In the Ohai field the last surviving privately-owned mine, the Linton, was purchased by the Crown, and participation in the Waikato field by the State has been increased by the purchase of the Renown Coal-mine. As a consequence of these purchases, only five coal-mines of any size are left in New Zealand under private control. A small mine, the Burnwell, in the Reefton district was also purchased.

Shortly after attaining office, the Government, on representations made by the owners of coal-mining rights, considered in detail provisions of the Coal Act, 1948, whereby all privately owned coal was vested in the Crown. As an immediate step, the operations of the Coal Valuation Commission, appointed to determine and allot compensation payable to holders of coal-mining rights, were suspended.

On examination it was found that the advantages of securing control of the coal resources of New Zealand did not appear commensurate with the cost of compensation for their acquisition acceptable to the owners, and, further, that the State already, by possession of Crown lands and by purchase and lease of freehold coal-mining rights, controlled sufficient coal to meet the needs of the industry for many years. Accordingly, the Government has decided to repeal the Coal Act. All coal and servitudes in private ownership before the passing of the Act will now revert to their previous owners and their position will be identical to that enjoyed previously. At the same time, it is proposed to amend the Coal-mines Act to ensure a greater measure of control in the interests of conservation and efficient working of coal. To this end it will be made obligatory on the owner of any mine on or under private land to carry out the requirements of the Inspector of Coal-mines in regard to the working of the mine in the most efficient manner so as to extract the maximum possible quantity of coal from the land and without causing unnecessary loss of coal. In future the Minister will be able, on the request of any owner working coal on or under any land, to take as a public work land and/or coal for the purpose of creating a new mine or extending the workings of an existing mine. The Minister will also be enabled to take as a public work a coal-mine.

Provision will also be taken to enable the Inspector of Coal-mines to compel the working of barrier coal and the adjustment of barriers between adjoining owners or lessees on Crown and private lands so as to avoid unnecessary loss of coal.

It is considered that by these measures sufficient control will be exercised to promote conservation of coal without resorting to measures which will entail unnecessary expense by way of compensation.

OPENCAST MINING

A record production was again obtained from opencast mines, 741,987 tons being produced in 1949, as against 676,728 tons in 1948, an increase of 65,259 tons. Since 1943 each succeeding year has shown a substantial increase over the preceding one in the production of coal by opencast mining and each year this production has constituted a higher proportion of the total output. Over 26 per cent. of the total production was obtained from opencast workings in 1949, a proportion that must be considered high even in countries overseas where opencast mining has been highly developed. Every effort will be made to increase production of coal by this method. The high percentage of coal recovered and the elasticity afforded to coal-production by this method are only two of the many favourable aspects of this form of mining. New opencast mines are either in the process of development or under consideration at Denniston, Garvey Creek, Ohai, and Huntly, and the search for new areas amenable to this form of mining is being continued.

Steady progress has been made in the Stockton field, where operations have been commenced on a new section termed "F" Block. This block has been surveyed in considerable detail and has been close bored on a grid pattern with holes spaced at 200 ft. centres. This has allowed of the amount of coal recoverable (1,189,000 tons) and the amount of overburden to be shifted (2,588,000 cubic yards) to be estimated with accuracy. Both the topography of the area and the structure of the coal-seam have been mapped in detail so that the layout of future operations can be planned with confidence. To

work this area an additional 5-yard stripping shovel with 46 ft. boom, four 18-yard muck wagons, two blast-hole drillers, and three 21-yard bottom dump coal vehicles have been placed in commission, and the mine has now been equipped on a mechanized scale that will bear comparison with anything overseas.

The construction of the Stockton aerial ropeway will complete the equipment of the area, and when this is put in commission a considerable expansion in production will be possible. Drilling operations beyond "F" Block, both the systematic close boring on the "G" Block adjoining this section and the scout boring of the further afield Bayne area, have already indicated that several millions of tons of coal can be won by opencast mining with a ratio of coal to overburden well within economic limits.

In the Waikato, mining operations have been completed at Kimihia No. 1 area, 1,045,200 cubic yards of overburden having been removed for the recovery of 250,586 tons of coal. Attention has now been directed towards Kimihia No. 5 area, where stripping operations have been carried out by use of the 5-yard shovel, carryalls, and Athey wagons. Good progress has been made, 555,800 cubic yards of overburden having been removed, and production of coal has now commenced.

Operations terminated at Kemp's Opencast Mine, Glen Massey, after 2,313,149 cubic yards of overburden had been removed for the recovery of 239,314 tons of coal, the ratio of 9·7 cubic yards of overburden to 1 ton of coal being the highest as yet recorded in New Zealand. Neither the coal recovered at this mine nor that from the Kimihia No. 1 area could have been obtained by underground mining methods. As a replacement to Kemp's, a new opencast, the Hillcrest Opencast Mine, was commenced at Glen Massey, and by May of this year operations were completed, 380,000 cubic yards having been stripped for a recovery of 54,282 tons of coal.

At Rotowaro, Thompson's and Barker's Opencast Mines continued in satisfactory operation, though coal-production at the latter mine was seriously affected by the shortage of railway wagon transport.

A commencement was made with stripping operations at the Victory Mine (Devlin's) during the year and has been continued during the present year to the production stage.

Other large producing opencast mines in the Waikato district, which, in contrast to those cited above, are privately operated, were the Kopuku Opencast at Kopuku and the Summit Opencast at Rotowaro.

Boring operations in the Waikato to locate further large-scale opencast mines have been continued. Very satisfactory results have been obtained at Weaver's Crossing where some 4,000,000 tons of coal have been proved, but development work has been disappointing in the Callaghan's Dip area.

In Taranaki operations were continued at Waitewhena, and the No. 2 area has now been abandoned after producing 146,564 tons of coal, which entailed the stripping of 660,076 cubic yards of overburden. Work is now concentrated on the No. 5 area while preparations are being made to open up the No. 5 Extended area.

At Garvey Creek, in the Reefton Coalfield, work continued on the South-east Opencast. Many difficulties have had to be met as the conditions are unusual in that the opencast is situated on the crest of a steep ridge through which runs a vertical coal-seam. So far a block of 3,000 tons of coal has been stripped but there has been no production. Work will shortly commence on two additional blocks in the Garvey Creek field, one to be known as the Morris Creek Opencast and the other as the North-west Opencast.

At Wangaloa operations have continued satisfactorily during the year and recent work has shown that opencast operations can be extended to the north farther than was originally expected. The use of tournapulls has been adopted at this mine during the year with a considerable measure of success.

In the Ohai field, both the Black Diamond Opencast and McLean's Opencast, situated in the State Star Coal-mine area, continued to make satisfactory progress. During the present year the original No. 1 area at McLean's has become exhausted, and attention has now been directed towards an adjoining section No. 5, and production will shortly be forthcoming from this latter section. An intensive search for potential opencast areas has been made and is continuing to be made in the Ohai field, and so far seven areas are in some process of investigation. There are indications that one of these may be a large tonnage proposition with a considerable thickness of overburden in places, and consequently detailed prospecting is required to determine whether opencast mining would be economic or otherwise. As a greater degree of geological knowledge becomes available and the structure of the field can be more accurately interpreted, it is becoming apparent that there are considerable possibilities in the Ohai field for opencast mining, and as time and opportunity permit, these will all be investigated.

The following table shows the output of coal from the various coalfields and the comparative increases and decreases for the years 1949 and 1948, together with approximate total production to date:—

Coalfield.	Output.		Increase.	Decrease.	Approximate Total Output up to 31st December, 1949.
	1949.	1948.			
	Tons.	Tons.	Tons.	Tons.	Tons.
North Auckland	56,485	50,804	5,681	..	6,713,609
Waikato (including Taranaki) ..	1,016,573	964,384	52,189	..	26,800,200
Nelson	7,123	6,854	269	..	779,778
Buller	466,452	527,593	..	61,141	31,040,839
Reefton	104,524	119,104	..	14,580	2,175,079
Grey	530,427	490,328	40,099	..	23,509,730
Canterbury	31,441	32,030	..	589	1,471,482
Otago	199,549	205,931	..	6,382	15,946,790
Southland	400,701	378,858	21,843	..	11,780,379
Totals	2,813,275	2,775,886	114,981	82,692	120,217,886

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

Class of Coal.	Northern District (North Island).	West Coast District (South Island).	Southern District (South Island).	Total.	Total Output to 31st December, 1949.
	Tons.	Tons.	Tons.	Tons.	Tons.
Anthracite	..	..	1,885	1,885	20,562
Bituminous	..	934,802	..	934,802	63,273,177
Sub-bituminous	1,073,058	138,632	366,218	1,577,908	49,197,697
Lignite	..	35,092	263,588	298,680	7,726,450
Totals for 1949	1,073,058	1,108,526	631,691	2,813,275	120,217,886
Totals for 1948	1,015,188	1,143,879	616,819	2,775,886	117,404,611

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

Year.	Coal Produced.		Coal Imported.		
	Tons.	Yearly Increase or Decrease.	Tons.	Increase Over Preceding Year.	Decrease Below Preceding Year.
Prior to 1930	71,298,699	..	12,734,199	..	..
1930	2,542,092	Inc. 6,288	157,943	..	57,713
1931	2,157,756	Dec. 384,336	179,060	21,117	..
1932	1,842,022	Dec. 315,734	103,531	..	75,529
1933	1,821,258	Dec. 20,764	99,272	..	4,259
1934	2,060,315	Inc. 239,057	100,715	1,443	..
1935	2,115,184	Inc. 54,869	97,398	..	3,317
1936	2,140,217	Inc. 25,033	111,078	13,680	..
1937	2,277,799	Inc. 137,582	116,499	5,421	..
1938	2,222,088	Dec. 55,711	109,206	..	7,293
1939	2,342,639	Inc. 120,551	111,537	2,331	..
1940	2,516,099	Inc. 173,460	64,860	..	46,677
1941	2,639,507	Inc. 123,408	78,171	13,311	..
1942	2,680,041	Inc. 40,534	90,865	12,694	..
1943	2,787,868	Inc. 107,827	37,454	..	53,411
1944	2,805,970	Inc. 18,102	..	..	37,454
1945	2,833,576	Inc. 27,606	..	..	..
1946	2,793,870	Dec. 39,706	27,185	27,185	..
1947	2,751,725	Dec. 42,145	93,411	66,226	..
1948	2,775,886	Inc. 24,161	54,211	..	39,200
1949	2,813,275	Inc. 37,389	78,485	24,274	..

TABLE SHOWING THE QUANTITY OF COAL EXPORTED FROM NEW ZEALAND FROM 1930 TO 1949

Year.	Tons.	Year.	Tons.
1930	126,118	1940	81,287
1931	48,334	1941	58,179
1932	35,866	1942	54,700
1933	34,131	1943	42,522
1934	40,361	1944	37,688
1935	46,146	1945	21,989
1936	44,872	1946	27,366
1937	113,116	1947	28,035
1938	55,711	1948	18,913
1939	43,990	1949	21,575

INVESTIGATION OF COAL RESOURCES

The three organizations which are concerned in the investigation of coal resources as usual worked in the closest co-operation and considerable progress was made towards establishing a more realistic basis of knowledge of our coal resources. The three organizations responsible for this progress are (1) the Coal Survey, whose activities are mainly geological and chemical; (2) an organization set up by the Mines Department to follow up the Coal Survey with detailed topographical surveys and shallow prospecting by means of cuts, pits, and hand drilling; (3) the Drilling Section of the Mines Department carrying out investigations by percussion and rotary drilling.

As a result of the intensive work of these organizations during the past four years, considerably more information is now available than was the case in 1946 when the last estimate of the coal resources of New Zealand which appeared in the Mines Statement for the year 1945 was made. This matter has lately been considered jointly by officers

of the Geological Survey and Mines Department, and a new estimate has been prepared based on information obtained from the Mines Department as to reserves of operating coal-mines and of closely drilled areas and from the Coal Survey as to reserves of the districts surveyed. The classification accepted—" measured," " indicated," and " inferred "—is that used by the United States Bureau of Mines and the Commonwealth Mineral Resources Survey. These terms are simply defined as follows :—

(1) " Measured coal " is coal for which tonnage is computed from dimensions revealed in outcrops, trenches, workings, and drill holes and for which the grade is computed from the results of detailed sampling. The sites for inspection, sampling, and measurements are so closely spaced and the geologic character is defined so well that the size, shape, and content are well established. The computed tonnage and grade are judged to be accurate within limits, and no such limit is judged to differ from the computed tonnage or grade by more than 20 per cent.

(2) " Indicated coal " is coal for which tonnage and grade are computed partly from specific measurements, samples, or production data and partly from projection for a reasonable distance on geologic evidence. The sites available for inspection, measurement, and sampling are too widely or otherwise inappropriately spaced to outline the coal completely or to establish its grade throughout.

(3) " Inferred coal " is coal for which quantitative estimates are based largely on broad knowledge of the geological character of the deposit and for which there are few, if any, samples or measurements. The estimates are based on an assumed continuity or repetition for which there is geologic evidence ; this evidence may include comparison with deposits of similar type. Bodies that are completely concealed may be included if there is specific geologic evidence of their presence.

Although these terms are fairly close to the original terms—" proved," " probable," and " inferred "—it was considered better to use the clearly and specifically defined terms as above that now have wide international acceptance.

The figures in all cases represent recoverable coal and not coal in ground.

The following are the total coal resources of the Dominion based on all available information at date (1950) :—

——	Measured.	Indicated.	Inferred.
	Tons.	Tons.	Tons.
Bituminous	28,000,000	21,000,000	58,000,000
Sub-bituminous	52,000,000	45,000,000	502,000,000
Lignite	13,000,000	27,000,000	366,000,000
Totals	93,000,000	93,000,000	926,000,000

It will be noticed, when compared with 1946 figures, that measured bituminous has increased, largely as a result of close drilling on the Buller field, and that a figure for inferred bituminous is presented. In both sub-bituminous and lignite the previous large quantities of proved coal have been considerably reduced simply because there was no evidence to support such figures as measured coal according to the definition of this term. In both cases, inferred resources have been shown, which in 1946 were confined to sub-bituminous. The over-all total of 1,112,000,000 tons is fairly close to the previous 1946 estimate (1,158,436,000 tons).

From time to time concern has been expressed that reserves of measured, or, to use the old terminology, proved, recoverable coal are of so low an order in New Zealand. It must, however, be recognized that to establish reserves of this type it is necessary either to block them out by underground development or to define them by close boring, and sound mining practice demands that such reserves should bear some relationship to the scale of the industry and the annual production required. Actually, measured reserves of coal in each class, bituminous, sub-bituminous, and lignite, are sufficient to maintain the present rate of production for a term of years far in excess of those demanded by recognized mining practice, and it is accordingly questionable whether, from some aspects, reserves are accordingly too high rather than too low and there is no justification for the concern expressed.

The rise in inferred lignite and sub-bituminous is the result of work in the Ohai and Kaitangata fields. It is considered that these figures represent a more realistic picture than did those of 1946.

The following table shows the quantitative groupings in the various coalfields of New Zealand, set out under the three rank divisions :—

—	Measured.	Indicated.	Inferred.
Bituminous			
Buller	14,000,000	6,500,000	24,300,000
Murchison	..	..	1,500,000
Garvey Creek	1,000,000	2,300,000	2,200,000
Greymouth	13,000,000	13,000,000	30,000,000
Totals	28,000,000	21,800,000	58,000,000
Sub-bituminous			
Northland	1,300,000	1,700,000	3,000,000
Huntly	32,000,000	18,000,000	65,000,000
Maramarua	5,000,000	15,000,000	20,000,000
Mangapehi	1,500,000	500,000	1,000,000
Tatu	300,000	400,000	..
Waitewhena	400,000	..	12,000,000
Mokau	..	..	60,000,000
Nelson	200,000	..	2,000,000
Buller Gorge	..	..	1,000,000
Reefton	1,000,000	2,700,000	5,000,000
Fletcher Creek	..	..	3,000,000
Punakaiki	..	..	2,000,000
Kaitangata	..	6,000,000	227,000,000
Ohai	11,000,000	1,000,000	100,000,000
Orepuki	..	..	1,000,000
Totals	52,700,000	45,300,000	502,000,000
Lignite			
Charleston	6,000,000	2,000,000	8,000,000
Canterbury	250,000	..	20,000,000
North Otago	250,000	..	2,000,000
Central Otago	250,000	..	15,000,000
Green Island	250,000	..	3,000,000
Kaitangata	1,000,000	5,000,000	156,000,000
Pomahaka	..	..	10,000,000
Mataura Valley	5,000,000	20,000,000	152,000,000
Totals	13,000,000	27,000,000	366,000,000

Officers of the Coal Survey are now at work on a bulletin on New Zealand coal resources that will give the geological picture of the various fields, with recent analyses to form a background for the statistical and quantitative information.

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

Coal Research Committee

The work of the Coal Research Committee is reviewed in the Committee's annual report (Coal Report No. 250). The main sections of the report are summarized as follows :—

Coal Survey (Geological)

Coal Survey field-work has made steady progress during the year with the strengthening of district offices, personnel, and the establishment of a district office at Ngaruawahia as the headquarters of the work in the Waikato field. Good progress has been made with the mapping of the Kaitangata Coalfield, which major work is now well in hand, and the publication of sheets is proceeding steadily. At Ohai, work has been largely confined to the correlation of a large amount of drill-hole data for both the overall coalfield picture and the close prospecting of opencast projects. At Mataura, drilling was continued on the Southland lignites confined to Crown lands. Activity on the West Coast has been confined to Reefton, Garvey Creek, Fletcher Creek, and Punakaiki Coalfields. Exploratory drilling on West Coast fields has been closely studied for correlation purposes. The North Island activity has been concentrated on the Waikato Coalfield following the establishment of a district office at Ngaruawahia in September, 1949. In addition, regular sampling has been carried out by two groups in all the mines of the South Island, the southern group sampling Southland, Otago, and Canterbury, and the western group sampling Westland and Nelson.

Coal reports continue to be issued steadily, and during 1949 twenty-six reports prepared by field officers were issued. An additional step has been the publication as coal reports of reports prepared by Mines Department officers ; this will permit the placing on record of many valuable reports on prospecting operations.

Coal Reports Nos. 217–243 were published during the year.

Safety in Mines

Safety-in-mines work has been concerned mainly with mine dusts, explosives, and accident-prevention. Professor J. Ivon Graham has taken up the Chair of Coal-mining at the University of Otago and has commenced investigation of mining problems closely associated with the safe working of the mines.

Coal Utilization

The main activities in coal utilization have been connected with the supply of special fuels for iron and steel trials in the electric furnace at Onekaka and the setting-up of laboratory equipment for the investigation of the forms of sulphur in coal-gas. The extraction of hydrogen sulphide from coal-gas is still under consideration, and a pilot plant has been set up to operate on the principle of the Thylox system.

Coal Research Laboratory

This laboratory carries out all analyses connected with the survey, utilization, and safety-in-mines programmes. In all, 1,427 samples were analysed. Seventy-one per cent. were from drill-holes, 17 per cent. were face and run-of-mine samples taken in accordance with the Coal Survey's systematic sampling scheme, and the remaining 12 per cent. covered mine airs, mine dusts, outcrops, industrial samples, &c.

Mines Department Survey Parties

Survey parties were maintained by the Mines Department in each of the three fields, Garvey Creek, Stockton-Millerton, and Denniston. Particulars of the year's activities in each field are as follows:—

Garvey Creek

General trenching and survey work was carried out at Centre Block, Montgomerie Block, and Waitahu Block, and some detailed work was done on an opencast area in the Webby Creek Block. As a result of this work and that carried out in previous years, it is now considered that sufficient information concerning the Garvey Creek area is available for all immediate purposes and that detailed work may well await the completion of the Island Block access road, which will not only facilitate transport of labour and stores but will have definite prospecting value as well in view of the exposures of the seams that will be made incidental to its construction.

Centre Block.—This, the largest area—namely, 550 acres—in the Garvey Creek Coalfield, has been prospected on three sides, the western, eastern, and northern, the extent to which the block may extend to the south being at present unknown. Prospecting work has merely outlined the structure and indicated areas where the structure is relatively simple that warrant further detailed information. No estimate of quantities can be made at this stage. The "A" seam in this block occurs as discontinuous lenticular blocks rather than as a regular continuous seam. To determine the structure and thickness and quality of coal in "A" seam, further work by drilling or prospecting drives is necessary when road access is provided to the Island Block.

Waitahu Block.—This block is situated on the main ridge about one mile and a half north of the junction of the Waitahu and Montgomerie Rivers approximately 1,500 ft. to 2,300 ft. above the Waitahu Valley. It has an area of approximately 160 acres, and is roughly triangular in outline, its greatest length being 50 chains and width 35 chains. One seam was traced along the southern extremity and thirty trenches were dug, but nowhere was more than 10 ft. of coal exposed. Only in the south-east corner was the seam found workable, where it averaged 6 ft. to 8 ft. thick for 10 to 15 chains.

Two factors, (*a*) its inaccessibility and (*b*) the nature and thinning of the seam, preclude the possibility of the Waitahu Block offering any mining prospects in the immediate future.

Montgomerie Block.—This block is situated north-east of the junction of the Montgomerie and Waitahu Rivers on the Montgomerie side of the divide. "A" seam outcrops were traced for 60 to 70 chains and twelve trenches were dug to prove the seam. It exhibits the marked irregularities typical of the field, and in view of its isolation further detailed investigation cannot be justified at the moment.

Webby Creek Block.—An opencast area of approximately 3½ acres situated in Webby Creek Block about one mile and a quarter from the Garvey Creek Road on the proposed route to the Island Block has been closely trenched, several new trenches having been dug, and existing ones extended to the full width of the seam. As a result of this work it has been estimated that the area contains 125,000 tons of coal from which 270,000 cubic yards of overburden would have to be stripped, while a further 30,000 to 35,000 tons of coal is possible with a similar overburden to coal ratio. This area will be further investigated when the road to Island Block is constructed to the site of this opencast.

STOCKTON-MILLERTON AREA

Work on this area was concentrated upon three sections: the North-east area, Millerton; Block 2, Stockton, which has been further subdivided into Blocks F and G; and Baynes Block. Particulars of the work done in each of these sections is as follows:—

North-east Area.—The trenching, surveying, plane tabling and sampling of this area have been completed and the drill is now in the area ready to bore ten scout holes. The seam here has medium-ash - high-sulphur content and runs from 4 ft. to 15 ft. thick. The relatively thin coal and presence of a structural dome in the western end of this block will introduce unusual mining problems.

Block 2.—The surveying, close drilling, and sampling of F Block has now been completed. Maps showing surface topography at a 5 ft. contour interval, structural contours at a 10 ft. interval, quantities of coal and overburden, and cross-sections 200 ft. apart have been prepared. This block has been computed to contain 1,189,000 tons of proved recoverable, low-ash, medium-sulphur coal overlain by 2,588,000 cubic yards of overburden.

During the year the greater portion of G Block was close bored, and this boring has disclosed 2,672,000 tons of proved coal and a further 790,000 tons of probable coal. It is expected that about 300,000 tons of the total will be high in ash as the south-west corner of the block extends into a probable high-ash zone.

The close boring on these two blocks for the year has entailed the setting-out on the grid and shooting in of seventy-two holes, and the collection, recording, and despatch of 187 samples from thirty-eight of these holes. Further face samples have been taken on F Block to determine whether low-sulphur coal suitable for gasmaking might be produced by selective mining methods.

Baynes Block.—Continued trenching in heavy bush-clad gullys, plane-table surveying, traversing, shooting in coal-trenches, and setting out and fixing thirteen scout bores on an extended grid pattern constitutes the work done on this block. The trenching and boring of the eastern half of the block has shown that this portion contains 2,907,000 tons of probable coal whose quality will be ascertained from the analyses of the 240 samples collected from the drill-holes. This work proves that the edge of the barren belt lies about 500 ft. farther east of the position defined by Bayne in his report. Scout holes to determine the coal in the western half of the block have been sited in the field, and the drilling of these holes has commenced.

Denniston

Prospecting work has been confined to three sections, the Escarpment area, Birchall's area, and Cook's lease.

Escarpment Area.—This area is situated at the rear of Whareatea Extended and near the escarpment. The area has been topographically and geologically mapped and systematically drilled and has now been estimated to contain, including the opencast area and Birchall's area, 2,408,400 tons of clean coal and 417,600 tons of dirty coal the ash content of which could be reduced to marketable limits by means of a cleaning plant. In addition, 873,700 tons of coal are indicated in this area. It has now been found that previous boreholes had been abandoned in this area before the coal-seam had been reached, and the recent prospecting programme has accordingly increased the coal reserves of the Denniston field. A detailed survey was made of portion of this area and it was proved that it could be worked by opencast methods. Work on an access road to this area has been started.

Birchall's Area.—Detailed topographical and geological surveys were carried out on an area which lies to the west of Birchall's south heading in the Whareatea Mine. This area had been abandoned when the coal thinned down to 4 ft. in the workings. After a geological survey of the area, a drilling programme was commenced which proved

the existence of a coal-bearing area some 35 acres in extent containing 600,000 tons of coal. The seam averages 12 ft. in thickness and the coal is of good grade. A short stone drive to open up this area has since been completed.

Cook's Lease.—As opportunity provided, trenching and survey work was carried out in Cook's lease, attention being directed to possible opencast areas. At the end of the access road an area has been located where an average thickness of 18 ft. of coal occurs underlying a maximum cover of 60 ft. of overburden, and detailed work will be carried out in this locality during the present year.

Drilling Activities

Extensive operations were carried out by the Drilling Section of the Department during the year ended 31st December, 1949, with a considerable increase of footage drilled over that of previous years.

For the year ended 31st December, 1948, the total number of feet drilled, including 1,520 ft. of blast-hole drilling for opencast purposes, was 23,418, whereas for the year now under review a total of 49,198 ft. was drilled extending over most of the coalfields in New Zealand.

During the year there were no serious accidents and very few non-serious accidents. A competent staff has been maintained, and plant has been kept in good mechanical order.

One drill was dismantled, reconditioned, and converted from steam to petrol drive, it now being a machine with modern equipment which will be most useful for depths up to 1,000 ft.

Southern District

During the year most of the drilling was done in the Ohai district, where large quantities of coal have been proved both for underground working and opencast. Some work was also done at Wangaloa and Ashers Siding, in both cases for opencast purposes.

Wangaloa.—Three bores with a total depth of 103 ft. were drilled, completing a programme, started in the previous year, to prove whether sufficient coal for opencast purposes existed on an area offered to the Department by the Wangaloa Coal Co.

Ashers Siding.—At the beginning of the year drilling operations on this area ceased because of unfavourable results. Eight holes with a total depth of 313 ft. were drilled by hand and fourteen holes with a total depth of 820 ft. were drilled with an alluvial drill.

Ohai.—Two rotary drills—one alluvial drill and one hand drill—have been in operation all the year and one other alluvial drill most of the year in this district, and 142 bores with a total depth of 16,459 ft. have been drilled for prospecting purposes, while two bores with a total of 67 ft. were drilled to test screening-plant foundations. Also two bores, Nos. 196 and 197, totalling 428 ft. were drilled on the line of the proposed Morley drives to determine the grading of the drives.

The 142 bores mentioned above were drilled to prove (1) blocks of coal suitable for opencasting, (2) continuity of deeper coal suitable for underground work.

The drilling in the Ohai district is well advanced and large quantities of coal have been proved.

West Coast District

Stockton.—During the year 4,390 ft. of drilling was done with one of the prospecting drills at the Stockton Opencast for shot-holes in connection with coal-winning and seventy-eight bores with a total depth of 9,209 ft. were drilled on the grid pattern ahead of the opencast to determine coal and overburden quantities and coal-floor grades with the two drills.

Prospecting still further ahead of the proposed opencast on the block known as Baynes is now being done, and in general the work is well ahead of schedule.

Denniston.—Work on the Escarpment area has been carried out with two drills. Twenty holes were drilled with a total of 3,525 ft.

Access on this area is very difficult and considerable track making has been necessary, obviously slowing up progress.

One hole (bore 549) was drilled to a depth of 114 ft., and is to be used for lowering electric cable into the present underground mine.

Burke's Creek State Colliery, Reefton.—Bore R. 101, which was 310 ft. deep at the close of the previous year, was completed at 1,244 ft. R. 102 was completed at 1,090 ft., and R. 103 was completed at 1,010 ft.

Bore R. 104 was started during the year and was abandoned at 61 ft. because of extraordinary large boulders, and R. 104A was commenced. This bore ran into an uncomformity and it was necessary to case off the loose sand with coupled casing, but so many difficulties were encountered that the hole had to be abandoned also.

The total feet drilled for the year was 3,501 ft.

Liverpool Colliery.—A bore (No. 336) was drilled down from the Morgan Seam in the above colliery and struck the sub Morgan Seam. Further bores are now necessary to determine the extent of this seam. Bore 336 was completed at 165 ft.

Dobson Colliery.—Drilling started in the previous year was carried further by the completion of four bores, Nos. 321, 322, 323, 324, to a total depth of 750 ft. Bore 321 was standing at a depth of 110 ft. at the commencement, thus 640 ft. were drilled during the year. These bores were to determine the throw of a fault met in the mine.

Strongman Colliery.—Eleven bores totalling 987 ft. were drilled during the year to determine fault throws. This work is continuously necessary in this mine.

Tyneside.—Bore 337 was commenced near the end of the year and is now standing at 170 ft. It is anticipated that this bore will be drilled to 550 ft. to ascertain the thickness of coal near a natural boundary to which the old Tyneside Mine could be worked when dewatered. This project affects the life of the Wallsend Mine.

Mount Davy.—This most important drilling on the slopes of Mount Davy, near Rewanui, has been carried a year further with almost the completion of a bore record in depth for the district, and in which very encouraging results were obtained. The bore at the end of the year under review stands at a depth of 2,482 ft., and it is expected that basement could be reached with very little more drilling.

Although the Morgan Seam, the main one in the Rewanui measures, was not as good as was expected, the sub Morgan was 15 ft. thick.

Because of climatic conditions on the slopes of the mountain and at the camp-site, fast drilling is almost impossible. Some days the men are not able to reach the drill because of flooded creeks, and on other occasions the intense coldness is uncomfortable in the extreme. Every endeavour has been made to work the drill two shifts a day when possible with the object of speeding up the work. All the shifting of stores and equipment is done by aerial systems installed by the drill crews.

Daily radio communication is maintained with the base camp, and if at all possible when the drill is shifted to the next site living quarters will be installed right at the drill-site and they too will be connected to the office by radio.

There have been remarkably few accidents on this job, considering the conditions. Every precaution is being taken to minimize the accident possibility.

Northern District

Kimihia.—In January four bores totalling 211 ft. were drilled on the Kimihia Extended area to determine the hardness of the fireclay and its ability to carry the large 5-cubic-yard shovel.

Devlin and Party's Area, Rotowaro.—This area was under option to the Department, and it was deemed necessary to close drill to determine coal and overburden quantities for opencast purposes. Thirty-two bores totalling 1,319 ft. were drilled, and in the process it was found that because of the irregularity of the coal the spacing of the bores was important. This area has now been thoroughly drilled and will be worked opencast.

Callaghan's Dip Area, Rotowaro.—Thirty-one bores totalling 4,201 ft. have to date been drilled on the area, and drilling is proceeding. It is too early yet to give any indication of quantities of coal.

Foundations, Rotowaro Workshops.—Six bores totalling 94 ft. were drilled for foundation testing at the proposed site of the new workshops for Taupiri Coal-mines. This was done with hand equipment.

Summary of Bores Drilled

Area.	Bores.	Footage.
Wangaloa	3	103
Ashers Siding	22	1,133
Ohai	146	16,954
Stockton	78	9,209
	Shot-holes	4,390
Denniston	20	3,525
	Cable-holes	114
Reefton	4	3,501
Liverpool Mine	1	165
Strongman Mine	11	987
Tyneside	1	170
Dobson	4	640
Mount Davy	1	2,482
Devlin and party area	32	1,319
Kimihia	4	211
Callaghan's Dip	31	4,201
Foundations, Rotowaro	6	94
Total	..	49,198

SUBSIDY ON COAL-PRODUCTION

Payments administered by the Mines Department for the financial year ended 31st March, 1950, from vote "Stabilization" were :—

	£
District tonnage subsidies	2,148,395
Special subsidies on uneconomic mines operated by the State	430,451
Guaranteed profits (Waikato mines)	308,716
Administration costs (Waikato mines)	2,205
	£2,889,767

Of this amount, £1,751,028 was in respect of State coal-mines and £1,138,739 in respect of privately owned mines. These figures are the actual payments by Treasury in the financial year. During the period the State coal-mines earned subsidies to the amount of £1,357,922, as shown in the accounts (C–2A). The difference between this figure and the sum of £1,751,028 is accounted for by the amounts owing but not paid at the end of each financial year—*e.g.*, the special subsidy of £430,451 paid in the 1949–50 financial year was in respect of the 1948–49 financial year.

The total amount paid by way of general subsidies from the inception of the scheme in May, 1940, to 31st March, 1950, is £9,828,457. The total amount expended under the Waikato Coal Mines Control Emergency Regulations 1942 to 31st March, 1950, is £1,189,228, giving a grand total for all forms of subsidy up to 31st March, 1950, of £11,017,685.

In December, 1939, the approximate average price f.o.r. of run-of-mine coal was £1 per ton, and at this level the price was stabilized until 1st October, 1947, when the average price was advanced by approximately 1s. 6d. per ton. However, during the year ended 31st March, 1950, subsidy payments on coal paid during this period, together with the amount paid under the guaranteed net-profits clause of the Waikato Coal-mines Control Emergency Regulations for the same period, would average approximately 20s. 6d. per ton of coal produced.

Accordingly it must be assumed that were it not for payments in respect of subsidy and guaranteed net profits, the average price f.o.r. of run-of-mine coal would have advanced by 20s. 6d. per ton to 42s. per ton.

During the same period the statistical statements of the Ministry of Fuel and Power and the National Coal Board of Great Britain show that the average proceeds per ton of coal disposable commercially has increased from 17s. 6d. in December, 1939, to 48s. 4·8d. for the quarter ended 31st December, 1949.

Since 8th May, 1950, as part of Government policy, payment of all subsidies in respect of coal-production has been withdrawn, a procedure which has inevitably increased the price of coal. A new price structure has been instituted whereby opportunity has been taken to revise prices of certain classes of coal such as slack coal so that they are more in keeping with present conditions. It is felt that the abolition of subsidy has placed the operations of the mines on a realistic basis and given some incentive to both management and men to achieve lower costs. The whole coal industry must benefit thereby, and eventually the consumer will reap the reward of lower prices for coal.

CO-OPERATIVE MINING, STATE COAL RESERVE, GREYMOUTH

During the year 1949 eighteen co-operative coal-mining parties were operating on areas within the State Coal Reserve, Greymouth. The production for the year was 103,958 tons and the number of men employed was 133. In 1948 eighteen parties employing 133 men produced 97,111 tons. Co-operative parties have produced to date 2,363,211 tons of coal and have paid royalties to the Crown amounting in the aggregate to £114,389.

CARBONIZING AND BRIQUETTING

The production of the low-temperature coal carbonizing and briquetting plant of Waikato Carbonization, Ltd., at Rotowaro during 1949 was :—

Raw coal carbonized	25,857 tons.
Carbonized coal produced	12,670 tons.
Average percentage of carbonized coal to raw coal	49 per cent.
Carbonettes manufactured	13,715 tons.
Tar and oil treated	249,338 gallons.
Pitch produced	361 tons.
Light and heavy oils produced	Nil.
Creosote produced	163,550 gallons.
" Char " sold for producer-gas plant	Nil.
" Char " sold for other purposes	829 tons.

During 1949, 33,634 gallons of tar was produced by Smokeless Fuel Co., Ltd.

MINERALS OTHER THAN GOLD

There has been continued interest in the development of base-metal minerals, but so far this interest has not been translated into practical mining activity, and the production of these ores has again been of little significance. On the other hand, production of non-metallic minerals, in particular limestone, has been substantial, and development of these minerals becomes yearly of increased importance.

Scheelite.—Twenty-five tons of scheelite concentrates averaging 65 per cent. WO_3 content were produced during 1949, as compared with 25 tons in 1948, 22 tons in 1947, 27 tons in 1946, and 34 tons in 1945, and it would appear that production will be maintained at this level in the future. Of the amount produced last year, the Glenorchy field contributed all but 1 ton which was obtained from the Macrae's Flat area, and two parties between them were responsible for two-thirds of the Glenorchy output. A contributory factor to low production during 1949 has been the stagnant state of the overseas market for tungsten minerals and the difficulty in making sales of the concentrates produced.

Manganese-ore.—From the deposit at Otau, Clevedon, 305 tons of manganese-ore valued at £1,879 were produced during the year. All of this tonnage was disposed of in New Zealand, in great part for use in the manufacture of fertilizers.

Antimony-ore.—Prospecting and development work was continued intermittently at the Mount Stoker antimony-mine in the Nenthorne Survey District and 5 tons of ore were sold valued at £209. This compares with a production of 9 tons of ore valued at £268 from the same mine during the year 1948.

Arsenic.—In 1949, 19 tons of arsenic were recovered as a by-product from the roasting of gold-ores at the treatment plant of the Blackwater Gold-mine, as against 8 tons valued at £144 in 1948.

Iron-ore.—From deposits in North Auckland and at Onekaka a total of 4,352 tons of iron-ore valued at £9,727 was produced for use in gas purification and in the manufacture of cement and stock-licks. Of this total, 2,441 tons were obtained from deposits at Okaihau, 1,503 from Kamo, and 408 from Onekaka. The recent tests of smelting concentrates obtained from Taranaki ironsands in a modern electric furnace and using char from Waikato coal which were carried out at Onekaka under the supervision of overseas experts definitely showed that pig iron of a type satisfactory for conversion to steel could be produced from these sands.

Copper-ore.—Mining operations were resumed at the Pakotai Copper-mine in North Auckland, and a parcel of 611 tons was obtained which was shipped to the smelter in Australia early in the present year. The results were very satisfactory, the ore, which averaged 12·38 per cent. copper, 3½ dwt. of gold per ton, and 1 oz. 15 dwt. of silver per ton, being similar in grade to that of the first shipment made some two years ago.

Lead-ore.—Towards the end of the year the Auckland Smelting Co., Ltd., commenced the formation of a road to their claim at Te Aroha where it was proposed to drive a tunnel to crosscut the lode system at depth. During the present year the road has been completed and the tunnel commenced. Sylvia Mines Consolidated, Ltd., shipped some concentrates obtained from the treatment of test parcels of ore from the Sylvia Mine to Australia for treatment and sale. The concentrates contained copper, gold, silver, lead, and zinc, but in the form they were marketed no allowance was made for the lead and zinc content.

At the present time the Sylvia Co. are reopening the workings of the old Monowai Mine near Thames, where it is known that the big lode contains copper, lead, and zinc, in order to sample the lode and determine whether its base-metal content in conjunction with the gold and silver it also contains is high enough to make exploitation profitable.

Bentonite.—The stipulation that bentonite must attain the minimum grade of 90 per cent. by the Sadler test before export is permitted has already brought results and the Australian market has already been partly recovered. During 1949, 456 tons of bentonite valued at £3,341 were produced, as compared with 624 tons valued at £4,462 in 1948.

Serpentine.—There was again a substantial increase in the production of serpentine, 54,453 tons being produced, as against 38,637 tons in 1948. Of the 1949 production, 52,053 tons came from Piopio, near Te Kuiti, and 2,400 tons from Mossburn, in Southland. The use of serpentine-superphosphate as a fertilizer now seems established. Since 1941 to date, 297,481 tons of serpentine have been produced for this purpose.

Dolomite.—Production of dolomite amounted to 4,210 tons in 1949, as against 6,912 in 1948. Of this amount, 622 tons were finely ground for use as a fertilizer in the cultivation of tobacco, the balance being sold in lump form for the manufacture of soluble-slag fertilizer. Since production commenced in 1936 at the deposit at Mount Burnett in the Collingwood district, 44,453 tons have been marketed.

Magnesite.—From the magnesite-talc deposits of Upper Takaka, 559 tons of impure magnesite were obtained as compared with 540 tons in 1948. The magnesite was marketed in finely ground form for use as a fertilizer in the tobacco plantations of Nelson.

Limestone.—Production of limestone for various uses has been continually expanding until in bulk it ranks second to coal and in value third to gold and coal, and the total production of limestone for the year 1949 again exceeded 1,500,000 tons. Of this total, limestone for use in agriculture was the greatest contributor, 1,100,126 tons being produced for this use in 1949, as against 1,091,299 tons in 1948. As in past years, the Southern Inspectorate District comprising Canterbury, Otago, and Southland was responsible for over two-thirds of this production, the balance coming from the North Island, except for a small tonnage from the Nelson - West Coast District. In the cement industry, 418,487 tons of limestone were used together with 30,879 tons of shale and 15,660 tons of silica sand to produce 250,026 tons of cement. There must be considerable increase in the production of materials for the manufacture of cement when the enlargement of cement-works is completed.

Production of limestone for industrial uses amounted to 43,901 tons, of which the greater proportion was used for the manufacture of quicklime and slaked lime, 23,545 tons of these being produced. Other uses were the manufacture of soluble slag, the refining of sugar, and the dusting of coal-mines. Included in this total are 1,621 tons of chalk which were used for a variety of industrial uses.

Pumice.—A total of 13,124 tons of pumice, of which 1,419 tons were exported, was produced in 1949. Corresponding figures for 1948 were 6,833 tons of which 1,735 tons were exported.

Clay for Bricks, Tiles, &c.—Production of clays for the manufacture of bricks, tiles, &c., amounted to 157,910 tons in 1949, as compared with 159,129 tons in 1948.

Clays for Pottery, Fillers, &c.—In 1949, 14,672 tons of clay were produced for use in pottery and as fillers, &c. The corresponding figure for 1948 was 17,402 tons.

Silica Sand.—During 1949, 20,401 tons of silica sand were obtained from deposits at Parengarenga, Hyde, Mount Somers, Geraldine, and Parapara, compared with 16,536 tons produced from the same deposits in 1948. The most important contributor to this total was the deposit at Parengarenga, from which 18,363 tons were obtained for use in glass-manufacture.

Dimension Stone.—The production of stone for building and monumental work during 1949 amounted to 5,482 tons, as against 14,528 tons during 1948. This decrease is due entirely to reduction in the mining of Oamaru stone, only 1,241 tons of this stone being produced in 1949, as compared with 20,179 in 1948. Other types of stone produced included granite from Bluff, marble from Hanmer, sandstone from Charteris Bay, Canterbury, and bluestone from quarries in Otago and Canterbury.

Salt.—Further progress was made in the development of the project whereby salt is to be produced by solar evaporation of sea-water at Lake Grassmere, but there was no production of any significance during the year 1949, though this is confidently expected to be reached during the present year.

General.—Small amounts of quartzite and diatomite were produced during 1949, while sand, gravel, rock, &c., for various uses such as building aggregate, road-construction, &c., were produced in increased amounts and accounted for the major portion of the production of quarries.

GEOLOGICAL SURVEY

Regional surveys of the Motatau Subdivision, in North Auckland, and Hauroko Subdivision, Southland, have been completed, and the bulletins are in course of preparation.

Bulletins descriptive of the geology of the Dannevirke and Wanganui Subdivisions and of the Heaphy, Karamea, and Geraldine provisional one-mile sheets, as well as one of the coastal area between Bruce Bay and Haast River, await publication. Other sheets descriptive of West Coast geology are in course of preparation. A palæontological bulletin on the Tertiary and Recent Ostracoda of New Zealand also awaits publication.

Regional surveys in Southland, Hawke's Bay, and North Auckland are proceeding.

A district office at Ngaruawahia was established in September as headquarters for the detailed survey of the Waikato Coalfield. The survey of the Kaitangata Coalfield has advanced considerably and the supplementary survey of Ohai field is practically complete. Activity on the West Coast has been confined to Reefton, Garvey Creek, Fletcher Creek, and Punakaiki Coalfields. Several cyclostyled reports on the survey of the coalfields were issued during the year.

Systematic observation of wells and springs in the Rotorua-Taupo area was continued throughout the year, and a concentrated effort is under way, in co-operation with the Ministry of Works, to test the Wairakei areas as a possible source of steam for generation of electricity.

Water-supply problems for local and public bodies as well as for Government Departments and industrial and private supplies have been reported on throughout New Zealand. A paper on the "Conservation and Protection of Underground Water in New Zealand" was prepared for the International Water-supply Association.

The preliminary gravimetric survey of the North Island is completed, and indicates that the newly acquired gravimeter will prove an invaluable instrument for interpreting geologic structure.

Seismic and magnetic methods were employed to investigate dam-sites for the State Hydro-electric Department in both Islands and electric logging of drill-holes undertaken.

Additional investigations carried out during the year included limestones at many localities throughout the country for agricultural lime and cement manufacture; greywacke and basalt for aggregate in the Waikato; sands for glassmaking and moulding in Canterbury and Otago; serpentine for the fertilizer industry at Wairere; clay for ceramics at North Auckland and Orepuke; bentonite for general purposes at Waimarama and Masterton district; greywacke for coastal and river protection at Kaikoura; clay and decomposed greywacke for bricks at Tawa Flat; tuffs for pozzolanas at Oamaru and Te Kuiti; antimony at Alexandra and Bannockburn; copper sulphide at Waitahuna; diatomite at Middlemarch; ironsands at Cape Foulwind; suitability of rocks as aggregate with high and low alkali cement and with bituminous mixes.

MINERALS EXAMINED BY DOMINION LABORATORY

Cement Industry Investigations.—In view of possible expansion of cement-production, a survey of raw materials was put in hand by Geological Survey. Particular attention was given to the Huntly – Te Kuiti, Canterbury, Cape Foulwind, and Oamaru districts. The completion of the analyses of the many samples collected will provide the data necessary for deciding upon the most suitable location for a new works.

Blacksand Investigations.—In connection with the experimental trials at Onekaka for the production of iron from Taranaki ironsand by an electric furnace process, the preparation of a large quantity of ironsand concentrate became necessary. Analyses were made of these concentrates and also of raw materials proposed as fluxes, including limestones, sands, quartzites, and dolomites, while during the trials numerous analyses of sinters, slags, and irons had to be made. The Dominion Laboratory fitted out a chemical laboratory at Onekaka to enable urgent analyses to be done on the spot.

Preliminary surveys were also made of the ilmenite-bearing sands of the West Coast of the South Island, which are of interest as a possible source of titanium dioxide for white pigment production.

A reconnaissance survey of blacksands of the North Island from Taranaki northwards was also carried out. Analyses of blacksand from several other sources, including Stewart Island and George Sound, were also made.

Glass-sand.—The possibility of obtaining from Parengarenga sand, by high-intensity magnetic separation, a grade of sand suitable for the manufacture of optical glass was investigated. Sands from Whitecliffs and Sheffield (North Canterbury) were also tested. The latter may be of value as a moulding sand.

Pozzolanas.—The addition of finely ground siliceous materials of a suitable type to cement for the production of pozzolanic cement, is becoming common practice, particularly for dam-construction in the United States. The investigation of certain local volcanic tuffs for suitability for this purpose has reached the stage where the more promising materials have been sorted out for practical strength trials. Volcanic tuffs from Oamaru, Gisborne, and Waikato (ignimbrite) are now being specially studied.

Clays.—Examination of a number of clays, including fireclays associated with coal-seams, was made during the year. An information circular on North Auckland refractory clays was prepared.

Miscellaneous.—Among the many samples examined, mention may be made of diatomite, limonite for gas-purification, bentonite for export, limestones for agricultural use, and minerals for identification. A number of assays for gold and silver were made. Ores from Te Aroha were examined for lead, zinc, and silver content, and an ore from Reefton for antimony. A preliminary study of the use of greensand as a flux in the preparation of a phosphatic fertilizer by a fusion process was made, and experiments on a larger scale are being put in hand.

Coal.—The Coal Research Section of the Dominion Laboratory has analysed 1,427 samples, consisting mainly of drill cores, run-of-mine, and face samples. This work is detailed under the report of the Coal Research Committee.

SCHOOLS OF MINES

The expenditure on Schools of Mines for the year ended 31st March, 1950, was £13,708, as against £4,069 for the year ended 31st March, 1949. The marked increase in expenditure is entirely due to a grant of £9,893 made to the Otago University School of Mines for the purchase of equipment for the metallurgical and mineral dressing laboratories which came to charge during the period.

Two candidates, both from Otago University School of Mines, sat the annual examination for Government mining scholarships. Both candidates were successful, one having already secured a partial pass in the previous year. However, only one scholarship was awarded, seeing that the other candidate had previously been awarded

a University Entrance bursary in coal-mining and thereby became ineligible. This is the last occasion upon which examinations will be held for the award of these scholarships. Of late years they have not fulfilled their function as entrance scholarships to the University School of Mines, and it has been decided to suspend their award and substitute entrance bursaries in coal-mining, the regulations governing the award of which were detailed at length in the Mines Statement for the year 1949.

Early in the present year a Selection Board was convened in Christchurch to interview applicants, and as a consequence six bursaries, the maximum number possible, were awarded. The progress of these, the initial bursars both at University and later at the mines, will be followed with interest.

The first travelling scholarship in coal-mining, open to graduates of the Otago University School of Mines, was awarded by the Council of the University during 1949, and the first holder is now overseas studying opencast coal-mining technique. Arrangements have recently been made whereby holders of these travelling scholarships may pursue a course of training and study specially planned for graduates by the National Coal Board of Great Britain. This will give scholarship-holders an excellent opportunity to become familiar with up-to-date practice in Great Britain, and the whole industry in New Zealand must eventually benefit.

For some time it has been the desire of the Director of the Otago School of Mines and Metallurgy to arrange a mining conference in Dunedin so that members of the industry might meet not only to discuss mining problems, but also to become familiar with the new equipment and facilities now available at the school. The Mines Department willingly supported this proposal, and it was finally decided to hold the conference in May of this year. Although the last conference in 1926 had dealt with mining generally, it was decided in this case to confine discussion to coal-mining, in view of its major importance. The conference proved a great success, for which credit is due in great part to the Faculty of the Otago School of Mines, who made all the preliminary arrangements and organized the conference throughout its various sessions. One very pleasing feature was the attendance of two visitors from Australia who occupy leading positions in the coal-mining industry there. Their contributions to the discussions were particularly helpful in view of their extensive overseas experience. At the conclusion of the conference a conducted tour of the southern coalfields was arranged in which many members participated. Generally it was felt that much was achieved by the conference and that the frank discussion of many controversial problems was of considerable value. It is to be hoped that it may be possible to arrange similar conferences at closer intervals than formerly.

COAL-MINES COUNCIL

The Coal-mines Council continued to work during the year and issued 90 decisions dealing with 294 separate matters, mainly in connection with the settlement of industrial disputes and the determination of working conditions in the industry.

RESCUE STATIONS

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

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

HOUSING

During the financial year 1948–49, housing loans were granted to forty-two employees to a total amount of £27,547. Fifteen loans were for the construction of new houses, twenty-five for the purchase of existing houses, and two for repairs and renovations. The locations of the houses are: Runanga, 12; Dunollie, 1; Dobson, 5; Blackball, 3; Hector, 1; Waimangaroa, 1; Stockton, 1; Ohura, 3; Ohai, 1; Granity, 1; Paparoa, 1; Ngakawau, 2; Rapahoe, 2; Denniston, 1; Ngahere, 1; Birchfield, 2; Reefton, 1; Rotowaro, 3.

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

Year Ended	Erection of New Houses.		Purchase of Existing Houses.		Repairs and Renovations.		Total.	
	Number.	Amount.	Number.	Amount.	Number.	Amount.	Number.	Amount.
		£		£		£		£
Prior to 31/3/40	45	17,555	15	3,301	5	1,428	65	22,284
31/3/41 ..	16	10,221	..	..	3	909	19	11,130
31/3/42 ..	14	9,088	..	..	1	120	15	9,208
31/3/43 ..	6	5,500	11	6,230	1	495	18	12,225
31/3/44 ..	10	10,335	15	6,788	3	1,025	28	18,148
31/3/45 ..	4	4,549	7	3,925	1	395	12	8,869
31/3/46 ..	2	2,000	7	2,748	2	560	11	5,308
31/3/47 ..	3	4,160	14	7,195	6	1,062	23	12,417
31/3/48 ..	11	11,380	11	4,355	..	..	22	15,735
31/3/49 ..	8	10,670	17	6,907	3	670	28	18,247
31/3/50 ..	15	4,575	25	12,182	2	790	42	27,547
Totals ..	134	100,033	122	53,631	27	7,454	283	161,118

COAL-MINERS' RELIEF FUND

Receipts from the levy of 1d. per ton amounted to £10,882 for the year ended 31st March, 1950, and the total expenditure for the year was £7,146.

Interest earned amounted to £176 and the amount standing to the credit of the fund on 31st March, 1950, was £8,123.

At the close of the previous year the figures were: receipts, £11,373; expenditure, £7,763; interest, £56; balance as at 31st March, 1949, £4,221. It will be noted that the financial position of the fund continues to improve in response to the increased levy.

SOCIAL AMENITIES

During the financial year 1949–50 the sum of £6,530 was expended in providing social amenities for mining townships, as against £5,575 in the financial year 1948–49. Of this sum, £3,185 was supplied from the State Coal-mines Account and £3,345 from vote "Mines."

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

It is becoming apparent that in future the Government will be asked to meet calls for social amenities involving the expenditure of sums beyond the capacity of the State Coal-mines Account and the "Mines" vote. To meet this position the Government

has decided to strike a levy of 3d. per ton on all coal produced in New Zealand and thus create a fund to be invested by the Public Trustee and administered by an Amenities Council from which financial assistance can be obtained for the provision of social amenities in mining townships.

ASSISTANCE TO MINING

Subsidies and loans to the mining industry during the year ended 31st March, 1950, amounted to £3,225 3s. 6d. Details are :—

	£	s.	d.
Coal-mining	2,821	1	0
Scheelite-mining	128	0	0
Gold-mining	276	2	6
Total	£3,225	3	6

Expenditure on subsidies for the maintenance and construction of roads in mining areas for the year ended 31st March, 1950, was £2,416 12s. 1d., of which £2,274 18s. 9d. was in respect of coal-mining areas and £141 13s. 4d. in respect of metal-mining areas.

MINERS' BENEFITS

Miners' pensions originated in the Miners' Phthisis Act, 1915, and since 1st April, 1939, have been administered by the Social Security Commission in terms of the provisions of the Social Security Act, 1938.

One of the necessary qualifications is that applicants 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 £130 per annum, increased by £130 for a wife. The widow of a miner who died while in receipt of a miner's benefit may be granted a benefit of £104 per annum during widowhood.

The following is a summary of the operations for the year ended the 31st March, 1950 :

	£	
Payments from 1st November, 1915, to 31st March, 1949 ..	1,992,207	
Payments from 1st April, 1949, to 31st March, 1950 ..	120,061	
	£2,112,268	
Number of new grants for the year ended 31st March, 1950—		
Males	16	
Females	7	(widows of miners).
	23	
Number of benefits in force at 31st March, 1950—		
Married miners	307	
Single, widowed &c., miners	244	
Widows	85	
	636	

MEN EMPLOYED IN MINING AND QUARRYING

The table shows the numbers of men employed in each inspection district during 1949 and 1948 :—

——	Inspection District.			Totals.	
	Northern (North Island).	West Coast (South Island).	Southern (South Island).	1949.	1948.
Gold, silver, and scheelite ..	408	358	143	909	1,058
Coal	2,189	2,731	957	5,877	5,582
Bentonite	6	..	..	6	7
Clays	54	13	44	111	140
Diatomite	..	..	..	..	1
Dolomite	..	3	..	3	4
Iron-ore	8	2	..	10	16
Limestone	239	72	241	552	562
Magnesite	..	2	..	2	2
Pumice	10	..	..	10	11
Quartzite	..	2	..	2	4
Rock, sand, &c.	1,076	19	479	1,574	1,443
Serpentine	6	..	2	8	9
Silica sand	5	..	..	5	16
Manganese	1	..	..	1	..
Totals	4,002	3,202	1,866	9,070	8,855

MINING AND QUARRY ACCIDENTS

Fatal and serious accidents in the mining industry during the year 1949 were :—

——	Men Killed.	Men Seriously Injured.	Men Ordinarily Employed.
Coal-mines	3	25	5,877
Metal-mines	4	2	923
Quarries	1	3	2,270
Totals	8	30	9,070

MINING PRIVILEGES

The following table shows the numbers and descriptions of mining privileges granted through the Warden's Court during 1949, 1948, and 1947 :—

	1949.	1948.	1947.
Claims	25	33	30
Prospecting licences	82	134	62
Water rights	27	25	38
Residence sites	41	61	56
Mineral licences	8	12	7
Miscellaneous	10	7	13
Totals	193	272	206

LEGISLATION

The Coal-mines Amendment Act, 1949, in Part I amends the Coal Act, 1948, in minor respects relating to financial arrangements, manner of making applications, and definitions.

Part II requires first-aid certificates of officials to be renewed each five years, makes additional inspection rules for opencast mines, and empowers the Minister of Mines to engage in the processing of coal.

APPENDICES TO THE MINES STATEMENT

APPENDIX A

REPORTS RELATING TO METALLIFEROUS MINES AND QUARRIES

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

Wellington, 19th June, 1950.

Sir,

I have the honour to present my report on metalliferous mines and quarries for the year ended 31st December, 1949.

QUARTZ-MINES

Martha Mine, Waihi.—The final shut-down of the mine in May was averted due to the increase in the gold price, and output for the remainder of the year was obtained from the reopening of old workings and the extraction of ore from pillars and arches. The ore was won chiefly from the Martha, Royal, Welcome, and Empire Lodes. The output of 80,803 tons, plus 585 tons of residues from the company's old Union Mill, made a total production of 81,388 tons, which was treated to yield 26,604 oz. of gold and 232,450 oz. of silver, valued at £307,180.

As was to be expected, output was lower by 14,416 tons than the previous year. The average number of men employed was 394, 55 fewer than in 1948. The mill crushed on 187 days.

Blackwater Mine, Waiuta.—The collapse of a section of the South Shaft some 45 ft. from the surface occurred early in the year, and repairs over a depth of 280 ft. were found necessary, the shaft being out of use for some months.

This caused difficulties by affecting the maintenance of the main ventilating return of the mine, but the aircourses were completely restored and improved before the end of the year.

As in the case of Waihi, the increase in the price of gold due to the devaluation of sterling gave a new lease of life to this mine, and preparations for the sinking of the North Shaft to No. 17 Level were put in train before the end of the year.

Development on the reef north and south at this level will overcome the lack of stope room which developed when a closing-down of the mine seemed inevitable early in the year.

Driving on No. 16 Level South and Intermediate, winze sinking from 14, 15, and 16 Levels, and rising from 15 and 16 Levels accounted for the total development of 444½ ft., most of it being on payable reef.

The men employed averaged 118, and the output for the year was 22,115 tons, yielding 9,540 oz. of gold, valued at £92,006.

PROSPECTING AND REWORKING

A small amount of prospecting for gold was done in the Karangahake, Thames, and Coromandel districts, but no finds of importance have been made.

The higher price of gold has allowed of the treatment of small parcels of ore from several mines in the Thames district with good results, and what is thought to be a payable block of stone has been reported from the old Talisman Mine, Karangahake.

In Central Otago the Copper Creek Party have continued prospecting a small reef in the Mount Aurum basin, Skippers, and crushing of some of the stone won from an outcrop was started in December.

BASE METALS

Prospecting was continued at the Tui Mine, Te Aroha, which is now operated by the Auckland Smelting Co. An access road is being constructed as a preliminary to driving an estimated 1,200 feet of tunnel to cross the lines of the Champion and Ruakaka Reefs and prospect them at low levels.

The Cloudesley Mine, Pakotai, has produced, since work recommenced in November, a further consignment of 1,000 tons of copper-ore for shipment to Australia.

Manings Otau manganese-mine produced only a small output during 1949, owing to the access road being closed to traffic for six months. The product was sold in New Zealand.

Limonite amounting to some 4,000 tons was quarried at Okaihau and Kamo, North Auckland, and was used as top-dressing for pasture and in the cement industry.

At the Mount Stoker antimony-mine, Otago, 5 tons of concentrates were produced and sold during 1949, while 17 men engaged in scheelite-mining at Macrae's Flat and Glenorchy produced 25 tons of saleable concentrates, valued at £7,882.

METALLIFEROUS MINES

MEN EMPLOYED AND OUTPUT

——	Ore.	Development.	Men Employed.	Gold.		Silver.		Value.
Northern District—	Tons.	Ft.		Oz.	dwt.	Oz.	dwt.	£
Martha, Waihi ..	81,388	3,502	394	26,603	19	232,449	10	307,181
Sylvia, Thames	80	..	1	8	0	24	19	95
	Old concentrates	..	..	3	7	10	11	40
Monowai, Thames ..	Old concentrates	..	..	1	17	5	15	22
Progress, Thames ..	2	..	2	15	4	7	7	160
Golden Spur, Thames ..	5	..	2	7	13	6	1	96
Charltons, Kuaotunu ..	Tailings ..	..	2	68	0	50	2	576
Sundry prospectors ..	..	..	7	71	17	44	14	649
Totals	81,475	..	408	26,779	17	232,598	19	308,819
West Coast District—								
Blackwater, Waiuta ..	22,115	445	118	9,540	10	..		92,006
Southern District—								
Macrae's Flat, County	380	..	3	106	8	..		921
Copper Creek Syndicate, Skippers, Lake County	4	..	2	4	7	..		48
Totals	384	..	5	110	15	..		969

ALLUVIAL MINING

The only claim now being worked for alluvial gold in the West Coast District is the Waitahu Gold Mining Co.'s claim near Reefton. This ground, it was thought, would be worked out by the end of 1949, but the increase in the gold price has improved prospects and has added an estimated eighteen months to the life of the claim.

In the Southern District the Round Hill Mining Co., Ltd., worked throughout the year and was the largest plant in production.

A number of small river, beach, and sluicing claims are also being worked throughout Otago and Southland, but no large increase of output is anticipated.

MEN EMPLOYED AND OUTPUT

	Yardage.	Average Depth.	Men Employed.	Gold.	Value.
		Ft.		Oz. dwt.	£
West Coast District—					
Waitahu Gold-mining Co., Ltd.	..	12	2	93 0	1,116
Sundry alluvial claims ..	..	..	51	467 0	4,352
Totals	..	..	53	560 0	5,468
Southern District—					
Round Hill Gold-mining Co., Ltd.	..	..	6	327 0	2,888
Sundry alluvial claims ..	..	..	41	555 0	5,050
Totals	..	..	47	882 0	7,938

DREDGE MINING

During 1949 in the West Coast District four dredges continued to work throughout the year with good results, though delays were caused at times owing to short supplies of spares and replacements.

Two other dredges, Ngahere and Arahura, were idle due to accident for part of the year, Ngahere being grounded from July to August when the pond was emptied through dredging into an old tunnel, and again from September onwards from a similar cause. On the second occasion serious damage to the digging ladder required repairs which stopped dredging until the end of the year. Only 50 per cent. of possible time during the year was devoted to dredging, compared with 72 per cent. in 1948. Dredging was resumed early in 1950.

From causes still unknown, the Arahura Dredge capsized and sank on 5th March at the change of shifts at 4 p.m., one of the employees on the incoming shift being drowned. Up to the end of the year no decision had been made regarding salvage, but the insurance claim has now been paid and it is understood that the salvage of the plant will be proceeded with.

The Premier Dredge, transferred from Nemona Creek, has now been rebuilt on Caribou Creek, Big River, and a trial run has been made. Dredging will proceed in 1950.

The Atarau and Marsden Dredges, belonging to Associated Gold Dredges, Ltd., have not worked during 1949, but remain fully equipped and are being kept in working-order.

In the Southern District the Austral-N.Z. Co.'s dredge at Lowburn Bridge and the Clutha River Co.'s dredge at Alexandra Flat ran continuously with good results, but the Molyneux Gold Dredging Co.'s dredge remained tied up throughout the year.

A small Diesel-driven dredge belonging to the Rainbow Syndicate has been working at Charlton Valley since the begining of the year on shallow ground.

MEN EMPLOYED AND OUTPUT

—	Yardage.	Depth.	Men Employed.	Gold.	Value.
	Cu. yds.	Ft.		Oz.	£
West Coast District—					
Grey River, Ikamatua	3,337,000	30·2	25	5,667	64,146
Arahura, Arahura	441,253	131·0	39	1,832	22,390
Rimu, Rimu	1,565,000	42·0	41	4,849	49,613
Kaniere, Kaniere	2,789,372	113·0	42	11,300	123,627
Ngahere, Ngahere	1,498,351	78·0	27	4,971	46,784
Snowy River, Ikamatua	1,000,000	20·0	13	4,735	37,564
Totals	..	..	187	33,354	344,124
Southern District—					
Austral-N.Z., Lowburn	2,990,000	47·0	47	7,090	67,835
Clutha, Alexandra	2,521,000	78·0	25	6,400	62,021
Rainbow, Gore	150,000	6·0	2	156	1,407
Totals	..	..	..	13,646	131,263

BASE-METAL MINING

PRODUCTION OF METALS (OTHER THAN GOLD OR SILVER)

—	Location.	Men Employed.	Quantity.	Ore Treated.	Value.
			Tons.	Tons.	£
Arsenic	Blackwater Mine, Waiutu	By-product only	19·0	..	343
Antimony	Taieri	..	5·0	..	209
Copper	Sylvia and Monowai Mines, Thames	By-product only	13·0	..	28
Iron (limonite)	Onekaka	5	408·0	..	408
Iron (limonite)	Okaihau Quarries, Okaihau	5	2,441·0	..	7,628
Iron (limonite)	Whitelaws, Kamo	3	1,503·0	..	1,691
Manganese	Manings, Clevedon	1	305·0	..	1,879
Tungsten	Glenorchy and Macrae's	17	25·2	390	7,882
Totals	..	..	..	..	20,068

MINE ACCIDENTS

Two fatal accidents were reported from metal mines during 1949. A chamberman in a shaft met his death by falling out of a cage while travelling between levels, and a prospector was killed by a fall of earth while making an open cut to start tunnelling.

Two serious non-fatal accidents were reported from metal mines, a miner being struck by a fall from the back of a stope and sustaining a broken arm, and a surface worker losing his thumb and forefinger while using a circular saw.

Two fatal accidents and one serious non-fatal accident occurred at dredges. Both fatalities were due to drowning, one man being drowned when the Arahura Dredge capsized, while the other fell from a boat while working outboard on the Rimu Dredge. To counter this latter form of accident, steps were taken to amend the regulations, and men working from boats or outboards on dredges are now required to wear life-jackets.

The serious non-fatal accident was caused by a man being jammed by a heavy steel bar while trying to prevent it from sliding overboard. He sustained a fracture of the left leg.

ACCIDENTS: METAL MINES

	Fatal.		Serious.	
	Number of Accidents.	Deaths.	Number of Non-fatal Accidents.	Number of Persons Injured.
Falls of ground or timber	1	1	1	1
Explosives	..	..	..	..
Electrical	..	..	..	..
Haulage	..	..	..	..
Fires	..	..	..	..
Gases	..	..	..	..
Shafts	1	1	..	..
Miscellaneous	..	..	1	1
Totals	2	2	2	2

ACCIDENTS: DREDGES

	Fatal.		Serious.	
	Number of Accidents.	Deaths.	Number of Non-fatal Accidents.	Number of Persons Injured.
Drowning	2	2	..	..
Electrical	..	..	..	..
Struck by falling material	..	..	..	..
Miscellaneous	..	..	1	1
Totals	2	2	1	1

QUARRY ACCIDENTS

One fatality occurred in quarries under the Quarries Act during 1949, a face worker in a Southland quarry being struck by a fall of rock. He was not wearing a hard hat, and while it is not suggested that the hard hat in this case would have saved his life, because the fall was a large one, this equipment gives good protection against casual small falls, which are frequent in most quarries. The men in this particular quarry are now wearing hard hats, and it would be a wise precaution for all quarry face workers to adopt this safeguard.

Two serious accidents occurred in the Northern District and one in the Southern District.

A feeder at a jaw crusher received chest injuries when a piece of rock was thrown from the jaw and struck him on the chest.

A face worker lost two fingers and the thumb of his left hand while crimping a detonator to a fuse, using crimping pliers. A driller lost his right eye when the jack-hammer drill he was using came in contact with some explosive substance. The hole he was drilling was on an old face where no work had been done for two years.

The two explosive accidents indicate the extreme care that is required in using dangerous materials and in drilling near old shotholes.

Regulations are framed for the protection of all, but safety is largely in the hands of the worker himself, and can only be assured by his use of safe methods at all times.

ACCIDENTS: QUARRIES

Cause of Accident.	Number of Accidents.		Number of Sufferers.	
	Fatal.	Serious.	Killed.	Seriously Injured.
Fall from face	..	..	..	..
Explosions	..	2	..	2
Falls of ground	1	..	1	..
Machinery	..	1	..	1
Haulage	..	..	..	..
Miscellaneous	..	..	..	..
Totals	1	3	1	3

QUARRY OUTPUTS

	Northern.		Hauraki.		West Coast.		Southern.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Tons.	£	Tons.	£	Tons.	£	Tons.	£
Bentonite	..	..	456	3,341	..	..	..	..
Chalk	..	..	..	..	..	..	1,621	811
Clay for bricks, &c.	66,012	10,278	3,155	1,201	..	..	40,856	11,855
Clay for pottery, &c.	30,741	5,831	68	193	..	..	22,692	9,580
Clay (other uses)	..	..	..	..	..	..	39	15
Diatomite	..	..	..	..	..	..	94	59
Dolomite	..	..	..	..	4,210	2,105	..	..
Limestone (cement)	268,772	42,960	..	..	88,467	8,870*	61,248	24,499
Limestone (agriculture)	362,175	174,443	2,378	2,531	39,375	13,271	696,198	364,223
Limestone (industry)	6,976	4,669	..	..	..	..	1,839	4,058
Marl (cement)	..	..	..	..	9,244	..	21,635	1,422
Marble (industry)	..	..	..	..	3,248	1,299	..	..
Magnesite	..	..	..	..	559	391	..	..
Pumice	5,868	817	6,908	5,872	..	..	..	..
Rock (harbour-works)	..	..	..	..	..	..	66,269	12,594
Sand, gravel, &c., for roads and ballast	1,319,116	453,712	273,019	120,765	8,934	1,351	908,507	246,359
Sand (industry)	..	..	..	..	..	..	859	428
Sand, &c., for building aggregate	226,089	67,859	16,149	10,712	..	..	197,609	71,319
Serpentine	..	..	52,635	11,057	..	..	2,400	6,000
Silica sand	..	..	18,711	56,932	15,734	1,531	1,955	2,189
Stone (dimension) for building	..	..	..	..	..	..	5,482	6,698
Stonedust (mines)	..	..	..	..	698	986	..	..
Totals	2,285,749	760,569	372,879	212,604	170,469	29,804	2,029,363	762,199

* Includes value of marl (cement) below.

Number of men employed: Northern, 1,146; Hauraki, 250; West Coast, 108; Southern, 766.

STATE AID TO MINING

During the financial year 1949–50 the metal-mining industry received State assistance in the form of subsidies and loans as follows:—

	£
Scheelite-mining	128
Gold-mining	276

There was no expenditure during this period on surveying, prospecting, or development by the Mines Department.

MAINTENANCE AND CONSTRUCTION OF ROADS

Assistance in maintenance of roads and tracks granted during the year amounted to £141 13s. 4d.

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. (A. E. Waite, Manager).—The ore won for the period amounted to 81,388 tons, which yielded 26,603 oz. 19 dwt. of gold and 232,449 oz. 10 dwt. of silver, worth £307,180 16s. 7d. In New Zealand currency, the gold was valued at £9 9s. 10d. an ounce and the silver at 4s. 8·326d. The heading value of the ore per ton was, gold 6 dwt. 5 gr., silver 3 oz. 1 dwt. 7 gr. The extraction per ton was 94·1 per cent. of the former and 81·4 per cent. of the latter, representing 91·2 per cent. of the value. The mill crushed for 187 days. The ore was got chiefly from the Martha, Royal, Welcome, and Empire Lodes, and was raised through Nos. 4, 6, and the Grand Junction shafts and No. 7 Footwall pass. Development operations comprised 3,097 ft. of driving and crosscutting and 405 ft. of rising and winzing, or a total of 3,502 ft. Generally, this consisted of reopening old workings and driving sub-levels and gangways for the extraction of ore from pillars and supporting arches. The pumps were operated on night shift and occasional Saturdays up to the 6th May, when they were stopped in view of the impending shut-down of the mine. This not eventuating owing to an increase in the price of gold, they were later started up and kept running as hitherto. The total quantity of water raised to the surface for the year amounted to 103,142,000 gallons. The amount of ore given—namely 81,388 tons—contains 585 tons of residues from the company's old Union mill. The average number of men employed was 394, and dividends paid amounted to £8,265 2s. 4d.

Old Talisman Mine, Karangahake.—Gaghan and Thomson report having found a payable block of stone, 3 ft. wide, on No. 8 level. They are now busy taking out a trial parcel of the ore for treatment at the School of Mines battery, Thames.

Tui Mine, Te Aroha Mountain (J. B. McAra, Manager).—This property was transferred from Mr. Dunsheath to the Auckland Smelting Co. during the year, and the new owners are now engaged at bulldozing a road to the site of a proposed tunnel, which is situated at an elevation of 1,650 ft. When constructed the tunnel should intersect the Champion and Ruakaka lines of reef, and be approximately 1,200 ft in length. Provided prospecting work on the reefs is successful, plant will be erected by the company and the ore treated for gold, silver, and base metals.

Sylvia Mine, Thames.—Sylvia Mines Consolidated, Ltd., crushed and treated 80 tons of ore from a stock-pile. Ten tons of concentrates were obtained as a result, and these, together with 1½ tons got from the retreating of some other old concentrates, were sent to the Port Kembla Electrolytic Refining and Smelting Co., Australia, for further treatment. Gold and silver to the value of £135 9s. 5d. and copper worth £26 3s. were recovered therefrom. In addition, the same company shipped 1½ tons of concentrates from the old Monowai battery site, and these returned values of £22 0s. 10d. for gold and silver and £1 18s. for copper. The amount of copper obtained from all concentrates was about 4 cwt. There was also an estimated lead and zinc content of 1½ tons, worth £120, but these were treated as penalties and nothing was received by the company for them.

Golden Spur Mine, Thames.—Five tons of ore were crushed for a return of 13 oz. 14 dwt. of bullion, worth £96 4s. 1d.

Progress Mine, Thames.—Bullion amounting to 22 oz. 11 dwt., worth £160, was recovered from the treatment of 2 tons of ore and 50 lbs. of specimens.

Charlton's Claim, Kuaotunu.—Some 950 tons of residues from the old Try Fluke battery were treated and gave a return of 118 oz. of bullion, worth £576. Mr. Charlton gave up operations towards the end of the year.

PROSPECTING

Continued work of this description was undertaken at Karangahake, Thames, and Coromandel without anything of importance being found.

METALLIC ORES

Copper.—Cloudesley Mine, Pakotai: Work was resumed about November, and a shipment of 1,000 tons should be ready for export to Australia early in 1950.

Limonite.—Okaihau Quarries, Ltd., won 2,441 tons, valued at £7,628 2s. 6d. A mechanical loader was installed during the year, and this has proved a thorough success. The limonite (crushed to a fine state) is used for top-dressing, chiefly for its cobalt content. W. Whitelaw, Kamo, produce 1,503 tons, valued at £1,690 17s. 6d. It was used in the cement industry.

Manganese.—G. M. Maning's Mine, Otau, Clevedon: The output amounted to 305 tons 6 cwt. valued at £1,879 2s. All of this, with the exception of 1 ton 3 cwt. utilized in the making of non-ferrous castings, was sold and used in New Zealand in the manufacture of fertilizers. The road was closed to traffic from May to October on account of bad weather, and this affected production.

Bentonite.—Mr. H. F. Stoddart, Porangahau, quarried 351 tons, and of this amount 262½ tons were processed and 88½ tons disposed of in a raw state. The former realized £10 per ton and the latter £6 10s., the total value being £2,839. Clays and minerals produced 105 tons for export to Australia from a deposit at Porangahau. The sum realized was £501 7s. 6d.

Clays (Brickmaking).—The Amalgamated Brick and Pipe Co., Ltd., Kamo, quarried 1,423 tons of alumina at Kauri and 1,732 tons of clay from other nearby places. The material was chiefly used in the manufacture of different types of bricks and was valued at £1,201.

Kaolin.—N.Z. Mercury Mines won 17 tons from its property at Puhipuhi, North Auckland. The value received was £68. J. J. Craig, Auckland, obtained 51 tons, worth £125, from Taurikura, Whangarei Heads. The Ohio Kaolin Co. (N.Z.), Ltd., was reformed during the year with the object of raising further capital. It is now known as Ohio Kaolin Products (N.Z.), Ltd.

Pumice.—The quantity dug amounted to 6,908 tons, valued at £5,872. It was obtained from I. Lowe's property, Aramoho, Wanganui, by A. F. Nicholson.

Silica.—Messrs. Gilberd and Son, Wanganui, obtained 348 tons, worth £156 12s., from Georgetti's property, Upper Aramoho.

Serpentine.—L. A. Boswell, Te Kuiti, quarried 52,035 tons, valued at £11,057 8s. 9d., on Kohua Road, Piopio for Asbestos Mines (N.Z.), Ltd., Wellington.

Silica Sand.—N.Z. Glass Manufacturers Co. Pty., Ltd., Penrose, obtained 18,363 tons from its property at Parengarenga, North Auckland. The sand was valued at £56,775 8s. 8d.

Lime.—The Gisborne Lime Co. produced 2,378 tons worth £2,530 16s. 9d., from its quarry at Patutahi.

Petroleum.—N.Z. Oil Refineries, Ltd., Moturoa, New Plymouth, won 236,462 gallons, valued at £7,389 9s. 4d. Supplies were obtained as follows:—

	Gallons.
No. 1 well	3,737
No. 2 well	32,266
No. 3 well	19,490
No. 1D well	180,970

The fractions recovered were:—

	Gallons.
Petrol	46,040
Distillate	9,070
Power kerosene	10,600
Heavy kerosene	33,635
Diesel oil	43,690
Residue oil	82,690

The yield from No. 1D well has proved so satisfactory that the company intends putting down a second one, to be known as No. 2D. Head gear and plant have been erected, though drilling has not yet commenced.

Quarries

The total production of stone, gravel, and sand for road and concrete work in this district, which comprises the Hauraki, Bay of Plenty, and Rotorua areas, and part of Hawke's Bay, was 289,168 tons, the amount used for concrete aggregate being 16,149 tons. The largest producers were the Whitehall Quarry, Cambridge, with 40,433 tons, and the Mangatarata Quarry, Hauraki Plains, with 20,386 tons. No stone was produced for monumental or building purposes. The average number of men employed was 219.

Accidents

There was one fatal accident, the victim being W. J. Gardiner, chamberman, who met his death through falling out of a cage in the Martha Co.'s No. 4 shaft on the 10th March. There were no witnesses of the occurrence, and he fell a distance of 500 ft. At the inquest held later the Coroner returned a verdict of accidental death. On the 19th January, W. Bidois, also employed by the Martha Co., sustained a broken arm and severe bruising from a fall of stone while drilling. The ground had previously been tested, but no flaw was found, and it could therefore only be assumed that there was an undected line of weakness in the vicinity, and that vibration from the drilling-machine affected same, with the result stated.

Prosecutions

Nil.

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

QUARTZ MINING

Inangahua County

Blackwater Mine, Waiuta.—The everyday troubles of operating a mine that could not be profitably worked despite all efforts to cut costs were added to early in the year when a section of South shaft collapsed at a point 45 ft. below the collar and necessitated repairs over a depth of 280 ft. Four shifts were concentrated on repair work, and production was suspended for one month on account of the mine ventilation being affected by closure of the upcast shaft. Several months elapsed before the South shaft could be utilized for winding material from No. 12 Level, which is the main return airway for the greater part of workings, consequently, the air-course could not be maintained up to its usual high standard and ventilation was one of the difficult problems confronting the management.

The air-courses were completely restored and additional duplicate ventilating rises put through in South end of mine before the year ended and complete restoration of satisfactory ventilation was accomplished, much of it at the cost of reduced tonnage to mill and limitation of development.

Despite the fact that the mine was responding well to the limited development due to lack of suitable labour, the outlook was depressing and the closing-down of a well-equipped mine seemed inevitable, but the devaluation of New Zealand currency completely altered the situation.

Employing an average number of 118 men, 22,115 tons were mined and treated from stopes and development faces on Nos. 14, 15, and 16 Levels, yielding 9,540 oz. 10 dwt., which realized £92,005 18s. 1d. Total development footage for the year amounted to 444½ ft., operations in No. 16 South accounting for the greatest part of work accomplished for the period under review.

No. 16 Level South main drive and intermediates were driven 152 ft. all on payable reef over an average width of 43 in. and value 17·32 dwt.

Winze-sinking in Nos. 14, 15, and 16 Levels accounted for 111 ft., of which 108½ ft. was on payable reef, width 40 in., value 16·7 dwt.

Rising from Nos. 15 and 16 Levels amounted to 119½ ft. on payable reef 40 in. in width, 15·2 dwt. in value, with 62 ft. unpayable reef averaging 18 in. in width and 7·11 dwt. in value.

During the Christmas vacation, preparations for sinking of main North shaft were completed with the exception of installation of winch in No. 16 Chamber. When a team of competent sinkers is available the opening-up of No. 17 Level North and South will relieve the present tension regarding diminishment of working stopes.

DREDGE MINING

Inangahua County

Snowy River Dredge, Ikamatua.—During the year the dredge worked in a cut taken through the centre of the valley and downstream. An average depth of 20 ft. was dredged and approximately 1,000,000 cubic yards dug, yielding 4,734 oz. 10 dwt., which realized £37,563 18s. 6d. Dividends amounting to £5,638 2s. 8d. for the year were paid, bringing the total amount distributed to shareholders since the commencement of operations to £113,943 7s. 7d.

At the end of the year the worked ground at north-west end of claim was reached and the dredge turned to work upstream on what will be the last section on the central portion of claim. There is a considerable area of ground in the south end of claim to be worked after the central section is dredged and a number of years of profitable work is ahead of the plant.

Grey River Dredge, Ikamatua.—This dredge was in continuous operation during the year and analysis of the following figures will disclose the result of operations:—

Working-days	310
Working-hours	7,440
Hours digging	5,435
Percentage time digging	73·1
Area dug, in acres	68·461
Average depth, in feet	30·2
Cubic yards handled	3,337,000
Cubic yards handled per day	10,765
Cubic yards handled per digging-hour	614
Ounces bullion produced (crude ounces)	5,872·3

Considerable inconvenience was suffered during the year on account of high cost and protracted delivery of spare parts.

Premier Gold Dredge, Caribou Creek, Big River.—During the early part of the year dismantlement and transport of the dredge from Nemona Creek was completed, and by the end of the period re-erection had reached a stage that allowed of a trial run being made. Production on three shifts will commence early in 1950 and it is anticipated that some very high returns will be recovered.

Grey County

Associated Gold Dredges, Ltd.—This company did not attempt to start up Atarau and Marsden Dredges and both are lying fully equipped and maintained on a caretaking basis.

Ngahere Dredge, Ngahere.—The following figures are submitted relative to operations during 1949, and it will be noted therefrom that the percentage of running-time dropped from 71·63 per cent. during the previous year to 50·47 per cent. during the year under review (this was due entirely to two very serious accidents which occurred during the year):—

Possible dredging-time (hours)	7,264
Actual dredging-time (hours)	3,665·03
Time lost (hours)	3,598·97
Percentage running time	50·47
Area dredged (acres)	13·314
Yardage treated (cubic yards)	1,498,351
Yardage per hour	408·8
Bucket efficiency (per cent.)	46·92
Gold produced (ounces)	4,971·58
Average recovery (grains per cubic yard)	1·59
Average number of men employed	27

The first accident occurred in July, when the buckets penetrated an old prospecting tunnel 1,200 ft. long running form Aynsley's old sluicing claim to the dredge paddock. The company was aware of the existance of this tunnel and thought it was efficiently sealed near the outlet. However, on 12th July the sealing broke away and the water ran from the dredge paddock. Fortunately there was time to turn the dredge parallel to the digging face and it settled on to bottom without any damage. The break into the tunnel was sealed by bulldozing material into it after blocking with timber. The dredge was then turned and sand and gravel dredged over the sealing. Digging recommenced on 4th August, and the starboard side of dredge cut was altered so that the dredge did not break surface within 30 ft. from the supposed line of tunnel. In addition to this precaution a toe was left on this side of cut which brought the total distance from where the dredge was bottomed to the supposed position of the tunnel to just on 80 ft. On 15th September the water again burst into the tunnel some 30ft. below the top of the dredge face. On this occasion the water drained away in twenty-seven minutes, making it impossible to turn the dredge, and it settled on bow and stern, breaking the digging ladder forward of the bow gantry. A pump capable of delivering 5,000 gallons per minute had to be installed to control the water-level in paddock before repairs to ladder could be undertaken. By the end of the year the dredge was restored to first-class working condition, but it was not until some weeks later that the dredge resumed operations owing to difficulties encountered in raising the water-level to suitable height in dredge paddock, the outflow from tunnel being almost as great as drainage into dredge pond, but an improvement in this direction was gradually effected.

Westland County

Rimu Dredge, Rimu.—For the second year in succession the dredge dug through the low-grade gravels on the south side of the property, this procedure being necessary in order that the dredge may dig the deeper high-grade gravel uphill and thereby attain greater depth below water-level. The following figures summarize the chief features of the year's operations:—

Working days	303
Working hours	7,272
Hours digging	5,306
Percentage time digging	73
Area dug, in acres	23·119
Average depth, in feet	42
Cubic yards handled	1,565,000
Cubic yards handled per day	5,200
Cubic yards handled per digging-hour	295
Ounces bullion produced (crude ounces)	5,061·98

The operation of the dredge has been impaired more or less throughout the year by the difficulty in obtaining replacement parts and the long deliveries required.

Kaniere Dredge (Gold Mines (N.Z.), Ltd.) Kaniere.—This dredge operated continuously during the year in ground of higher grade than that worked during the previous year, and with a higher volume of gravels dredged the gold returns were substantially increased, and analysis of the following figures in comparision with 1948 returns will reveal a satisfactory improvement in all respects:—

Area of ground dredged (acres)	15·813
Possible dredging-hours	7,264
Actual dredging-time (hours)	5,860
Percentage running-time	79·79
Yardage treated	2,789,372
Bullion recovered (ounces)	11,805·6
Recovery (grains per cubic yard)	2·03
Average depth (feet)	113

Arahura Dredge (Gold Mines (N.Z.), Ltd.), Arahura.—The following figures relative to Arahura dredging operations for the first two months of the year indicate the loss to the mining industry through the mishap of the dredge on 5th March. Instead of nearly 10,000 oz. gold as produced during the previous year, the yield did not reach 2,000 oz. during 1949:—

Area of ground dredged (acres)	2·047
Possible dredging-hours	1,288
Actual dredging-time (hours)	842
Percentage running-time	65·37
Yardage treated	441,253
Bullion recovered (ounces)	1,841·8
Recovery (grains per cubic yard)	2·00
Average depth (feet)	131

It is not yet known what caused the wreck of the dredge and the loss of an employees' life, and probably the mystery will not be solved until the dredge is completely dismantled. At the end of the year no decision had been reached by the insurance company as to what action would be taken either to settle the claim or undertake the salvaging of the dredge.

Alluvial Mining

Inangahua County

Waitahu Sluicing Claim, Waitahu, Reefton.—This claim was operated during the year by a working party, who anticipated that they would have exhausted all the payable ground before the end of the year. A considerable amount of the operators' time was spent in shifting the pipe-lines in order to work the best parts of the claim, whose faces are now advanced within a few chains of the end of the gully. Devaluation of the New Zealand pound gave a fresh lease of life to the claim, and there appears to be now enough ground left to keep the plant operating for from twelve to eighteen months. From an unstated yardage 93 oz. gold were won. The Waitahu races and pipe-lines were kept in first-class order, and the operators are men who have had wide experience in sluicing claims of varying types.

With the foregoing exception there were no other sluicing claims operating in the West Coast Inspection District during 1949. The Golden Sands, Barrytown, and Addisons Flat Claim, Westport, are worked out, and in the case of the Moonlight Sluicing Claim, Blackball, although the ground is not exhausted, the company has gone into liquidation. In Marlborough and Collingwood Counties the only producers are a few individuals who win a few ounces of gold from old diggings.

Minerals Other Than Gold and Silver

Iron-ore.—At Onekaka 408 tons, valued at £408, were quarried and ground and the product sold chiefly to gas companies for refining purposes.

Arsenic.—From roasting concentrates the Blackwater Gold Mining Co.'s treatment plant recovered 19 tons 2 cwt. 1 qr. 6 lb., which realized £343 10s. 5d.

Talc and Quartz Magnesite.—Lime and Marble, Ltd., quarried 559 tons from the mineral lease situated at Upper Takaka, and the product was valued at £391 6s. before treatment. After being processed at the company's works at Mapua the product is chiefly used for agricultural purposes.

Dolomite.—From the Mount Burnett Dolomite-quarry near Collingwood 4,210 tons of rock were recovered, valued at £2,105 on the quarry floor. The demand for dolomite by fertilizer-manufacturers in the North Island was greater in the past year than the supply.

Non-metallic Minerals

Clays.—K. A. Polglaze won from his clay-pit situated at Kaka 515 tons of feldspathic clay, valued at £836 17s. 6d. at the pit mouth. The clay was used by pottery-works chiefly for the manufacture of insulators.

Westport Brick and Pipe Co. produced 200 tons of clay for the production of earthenware pipes and fittings. This was valued at £46 13s. 4d. on the quarry floor.

Greymouth Brick and Tile Works produced 1,120 tons of clay for brickmaking, valued at £980 on the quarry floor.

Nelson Brick and Pipe Works produced from the clay-pits at Nelson and Moutere 620 tons of clay, valued at £124 on the quarry floor. It is used for the manufacture of bricks and pipes.

General Remarks

The output of gold from dredges and sluicing claims receded to a low level, and up to the time when New Zealand currency was depreciated the outlook for continuation of gold-production appeared to be hopeless. With a nearly 50 per cent. increase in price in the concluding months of 1949 a more optimistic outlook prevailed, and if normal conditions prevail the 1950 yield will show a considerable increase over the preceding year.

The total loss of Arahura Dredge after two months of production, and for nearly five months the Ngahere Dredge was a non-producer, accounted for a large drop in the total yield.

The Ngahere Gold Dredging Co. continued prospecting operations in the Grey Valley and bored forty-two holes, aggregating 2,521 ft. in depth. A special dredging claim has been applied for, and if the application is successful the dredge will be worked from its present position to the new claim, probably in 1950.

Rimu Gold Dredging Co. bored seven holes, aggregating 548 ft. in depth, during the period of low gold price, chiefly for the purpose of eliminating ground that would be unprofitable to dredge before devaluation of the pound took place.

Two hydraulic sluicing claims will enter the producing stage next year, and it is possible that utilization of modern earth-moving machinery will play a prominent part in future winning of gold from alluvial mines where deposits are too limited in yardage for dredging.

There has been no actual recovery in quartz-mining, and if conditions existing prior to September had continued, this branch of mining would have become defunct, but plans for reopening mines are being discussed and the chief obstacle to their resumption is scarcity of suitable labour.

Fatal Accidents

Two fatal accidents occurred on dredges during 1949 :—

On 14th February, 1949, Alexander Jones, greaser, Rimu Dredge, accidentally fell into the dredge pond and was drowned. It is believed that he had been standing on the platform of the boat prior to casting off the mooring lines with the intention of greasing the pennant sheaves and that a disturbance of the boat caused him to lose his balance and fall overboard.

On 5th March, 1949, Frederick Tohuru, employee, Arahura Dredge, was drowned when the dredge suddenly capsized.

Serious Non-fatal Accidents

Dredges

Nil.

Metalliferous Mines

On 18th June, 1949, John Robertson, boilermaker-fitter, Blackwater Mine, sustained the loss of the thumb and index finger of left hand when his hand was caught in a motor-driven circular saw.

Prosecutions Under the Mining Act, 1926

Nil.

SOUTHERN INSPECTION DISTRICT (T. McMillan and H. T. Gordon, Inspectors of Mines)

Quartz and Alluvial Mining

Waitaki County

Sluicing operations have been carried out in the auriferous gravels of the Maerewhenua Goldfield.

Waihemo County

The Callery Syndicate continued to operate in the Deep Dell area for scheelite-bearing ore during the first three months of the year, then as the markets for tungsten became unsettled the party transferred their operations to the Round Hill Mine, where development work and stoping operations have been carried out in the upper level and on a surface outcrop for gold-bearing ore.

Maniototo County

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

Tuapeka County

On account of the sale of the mining plant of the Sailors Gully Sluicing Co., Waitahuna Gully, the tribute party ceased operations on the 31st December, 1948, and mining operations, which have been carried on continuously since the "sixties" have ceased. A monument to the memory of the old pioneer miners has been erected at the upper end of the main gully.

Taieri County

Prospecting and development work has been continued intermittently at the Mount Stoker antimony-mine. A total of 260 ft. of the Bottom Level has been retimbered. Five tons of ore have been sold for £209.

Southland County

Sluicing operations have been carried out in the Waikaia auriferous areas at Happy Valley and Chinaman's or Welshman's Gully. Some prospecting work has been carried out in the Piano Flat auriferous area.

Wallace County

Beach mining operations have been carried out intermittently on the Orepuki Beach.

During the year the Round Hill Gold Mining Co., Ltd., operating on the flats between the Ourawera Stream and Lake George have sluiced and elevated 1¼ acres to a depth of from 40 ft. to 45 ft. The ground worked during the year contained a large quantity of buried timber and hard lenses of clay.

The timber has to be hauled out and stacked, and the clay has to be blasted in order to speed up the operations. The length of the main pipe-line from the dam to the mine is three miles. Fifteen cusecs of water are used and the main elevator is 73 ft. in height. Length of Riffle Race is 105 ft., with a large spread of tables covered with matting, riffles, and plates, in order to save a high percentage of the fine gold.

Mr. J. H. Sorensen, of Orepuki, who has had a lengthy experience in alluvial mining and saving of fine gold, has been appointed manager. Seven men have been employed.

Lake County

Paradise State Scheelite-mine.—The tributers have continued to operate during the year; they have worked on the outcrop of the reef. The reef line was followed and exposed by sluicing methods to the north until it became very narrow and faulted; the sluicing plant was then removed, and the reef has been driven on and stoped on the outcrop from the Bottom Level up to the old Top Level. Operations are being continued at the Intermediate Level, where scheelite-bearing ore was first located on the Paradise Reef.

Glenorchy State Scheelite-mine.—Tributers have carried out prospecting work in the No. 8 Prospect Level by driving and rising, but nothing of importance has so far been located. Another tribute party has operated on one of the upper levels and some good ore has been won. Some tribute work was carried out on the Kelly Lode during the early part of the year, but nothing of importance was located.

State Mine Treatment Plant.—This plant is kept in order, and has been used to treat ore from the Bonnie Jean Basin, Mount Judah, Rees Valley, and Paradise Mines. E. Gaskill, who was operating the plant on tribute, succumbed to a serious illness on the 24th September, and A. T. Elliot is now operating the plant.

Heather Jock Syndicate (Wylie Bros.).—Prospecting and mining operations have been continued at this mine, which is situated 4,700 ft. above sea-level, on the western slope of Mount Larkins, during the working season. Step faulting has been encountered in the Intermediate, or ventilation, Level. Driving and raising operations have been carried out on this level and operations are still in progress. The Bottom Level has been extended for a short distance, but on account of the excessive water seepage from the roof, driving operations were suspended early in the year. All the ore from this mine is transported to the treatment plant at Groves on the south side of the Bonnie Jean Creek, and all timber and stores are transported from the battery to the mine by means of an aerial ropeway. The treatment plant is kept in good order, and improvements which will effect a saving in water-consumption will be carried out early in 1950.

Bonnie Jean Mine (Elliot Bros.).—(South-western Slope of Mount Larkins).—Stripping operations have been carried out at this mine whenever flush-water periods make this possible, and mining operations have been carried out during the slack-water periods in the centre section of the reef. Some good ore has been located. During the winter season the water-race fluming in the Upper Bonnie Jean gorge was badly damaged by snow and wind. This fluming had to be reconditioned in the early spring-time in order to obtain a water-supply for sluicing operations. The water-supply is used to the best advantage. The reef is stripped by sluicing methods, then the quartz is lifted, and the ore is hand picked, bagged and transported to the opposite side of the Bonnie Jean Gorge by aerial ropeway. The ore is then sledged to the Bluffs, and thence by lorry to the State Mine Treatment Plant.

Eureka Reef Mine (situated below the Bonnie Jean Terminal of the Bucklerburn Aerial Ropeway).—No work has been carried out on this reef line.

Hercules Mine (on the Lower Southern Slopes of Mount McIntosh *(Geo. Ross and party)*).—No work has been carried out at this mine during the year, but the owner has been prospecting on other section of the Glenorchy mining field, so far without locating anything of value.

Muddy Terrace Mine (Upper Rees Valley).—Mining operations were carried out in this disturbed area during the early months of the year, then operations were suspended.

Lower Rees Valley Precipice Mine.—Prospecting operations were resumed at this mine, and a low level is being driven.

The market for tungsten-ores has been unsettled during the year; the price has fallen, and the demand for concentrates has been generally poor.

ALLUVIAL AND QUARTZ GOLD-MINING

Lake Wakatipu

No work has been carried out at the Twelve-mile alluvial mine.

Skippers

The alluvial mine between the Shotover River and Stoney Creek is operated during the working season by Mr. Egbert Sainsbury.

Dynamo Flat (Left-hand Branch, Skippers Creek), Curries Reef.—No work has been carried out during this year.

Copper Creek (Mount Aurum Basin).—The Copper Creek mining party had to recondition the track from Skippers to Dynamo Flat, as this had been damaged in several places by the heavy floods in the first quarter of 1949. The track from Dynamo Flat to Copper Creek had to be widened in places,

then the three-stamp battery was transported from Skippers Point and reassembled downstream from the reef. Treatment was commenced in December, and quartz is being won from the outcrop section of the reef.

Crystal Reef (near the Head of Sawyers Gulley, Skippers).—Some repair and prospecting work has been carried out at this mine.

The Schieb-Robertson Party (Shotover River, Downstream from the Boomerang Section).—During the lengthy high river period this party has been engaged in dam-construction and water-race reconditioning. Plant has also been transported to the mine from the Mountain Terrace and Ballarat Creek Mines, ready for a resumption of river mining when conditions become suitable.

The Athy Bros. River Mine (in the Shotover River, Two Miles Downstream from the Long Gully Junction).—On account of the lengthy period of high river, very little work has been done.

Moonlight Creek (Darkeys Terrace, Between the Moke and Moonlight Creek).—Sluicing plant has been installed and intermittent mining operations have been carried out.

Vincent County

Long Drive Syndicate (Near the Gum Trees, Downstream from the Roaring Meg Junction, Kawarau Gorge).—Intermittent work has been carried out on this deep lead by the tributer.

Gees Flat, Kawarau Gorge (The Homer Party).—The sluicing and elevating plant has been transported across the river to the mine. The main pipe-line has been relaid with larger pipes, and the mine is now ready for the commencement of sluicing operations.

Nevis Valley (Camerons Gully, Stone Huts, Upper Nevis).—J. McLean has continued to sluice in Camerons Gully during the working season.

Baileys Hill.—Upstream from Whittons Creek junction, Sutherland and party endeavoured to relocate a deep lead in this area, but Prospector Sutherland was killed by a fall of gravel early in January, and operations were then suspended.

Mid-Nevis Old Township Workings.—The McLean party continue to Sluice and elevate alongside the Upper Nevis Road at the northern or upstream end of the old workings.

DREDGES

Vincent County

Austral-New Zealand Mining, Ltd.—This large electrically-operated dredge has continued to operate in the Clutha River flats upstream from the Lowburn Bridge. The average dredging depth was 47 ft., and 42·3 acres of river channels, islands, and river flats have been dredged during the year, yielding 2,990,000 cubic yards, with a recovery of 7,547 oz. of bullion. An average of 47 men was employed.

Clutha River Gold Dredging, Ltd.—This electrically-operated dredge has continued dredging operations on the Alexandra Flat, and has dredged an area of 20 acres with an average depth of 78 ft. The dredge operated for 5,819 hours and treated 2,521,000 cubic yards of material for a recovery of 6,802 oz. of melted gold. An average of 25 men has been employed. During the year the dredge was turned to the west again, and is now dredging on an upstream cut; it is now operating on the high terrace flats with a high gravel face above water-level, and is equipped with a special stacker elevator and rubber belt conveyors for the purpose of depositing the fines on top of the rough tailings.

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

SOUTHLAND

The Rainbow Dredging Syndicate.—This is a small Diesel-operated sluice-box dredge suitable for dredging shallow ground. Dredging operations were commenced in the Charlton Valley, Part Lot 7 and 8, D.P. 83, of Section 4A, Waimumu Survey District, at the beginning of the year, and 150,000 cubic yards have been dug with an average depth of 6 ft.

ACCIDENTS

Mines

There was one fatal accident on 16th January. A prospector, A. Sutherland, was killed by a fall of earth from the side of an opencut when commencing a drive at Baileys Hill, Upper Nevis.

There was one serious non-fatal accident. On 8th December, G. H. Carey, dredgeman, Clutha River Dredging, Ltd., Alexandra, suffered a fracture of the tibia and fibula of left leg when endeavouring to prevent a steel bar from sliding overboard. The bar jammed his leg against the side of a chute.

Quarries

There was one fatal accident on 6th December. George Hawkins, shot-firer, was killed by a fall of rock in the quarry operated by the Awarua Lime Co. at Kings, near Winton.

There was one serious non-fatal accident on 21st July at the Opihi Quarry, Totara Valley. Robert Graham, a quarryman employed by the McHaffie Bros., suffered an injury to his right eye, which has had to be removed, when the jackhammer drill he was using came into contact with some explosive substance.

ANNEXURE B

QUARRIES

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

The following is my report for the year ended 31st December, 1949, covering surface and underground work done under the provisions of the Quarries Act, 1944, within the North Island District under my inspection.

QUARRIES

A total of 320 (surface) quarries were worked during the year 1949, being an increase of 51 compared with last year, and the number of men employed at quarrying for the same period was 1,143, showing an increase of 91 over that for 1948.

TOTAL OUTPUT OF QUARRIES

The total output of material quarried for the year 1949 is 2,287,693 tons, valued in the quarries at £763,382, compared with 1,902,323 tons, valued at £598,684, for 1948.

Throughout the year I found a healthy activity prevailing in the industry, and this is reflected in an increased output, which apparently is on the up-grade.

It is pleasing to note that there is an increase in the tonnage of agricultural lime produced, but the large limeworks are not working to anything near their capacity to produce.

UNDERGROUND QUARRIES

Auckland City Council Waterworks Development.—Cossey's Creek Gorge Tunnel: Inlet end, 624 ft. driven, size 6 ft. 6 in. by 4 ft. 6 in.; outlet end, 600 ft., timbered where necessary. There is still 2,150 ft. to complete. Walsh's Tunnel: 7 ft. 4 in. circular, arch timbered, 914 ft. completed. Ardmore Ridge Tunnel: Main south end, 1,650 ft. driven; north end, 190 ft. driven; 5,525 ft. to finish. Butterworth's Tunnel: Dimensions, 7 ft. 4 in. circular; 923 ft. completed. Reid's Tunnel No. 1: Dimensions, 7 ft. 4 in. circular; 725 ft. completed. Redoubt Road Tunnel; South end, 9 ft. 6 in. circular, 360 ft. driven; 1,890 ft. to complete. Redoubt Tunnel: North end, 9 ft. 6 in. circular, 250 ft. driven; 1,530 ft. to complete. The working conditions and supervision of these tunnels are good.

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

Wellington City Council.—Wadestown–Ngaio Access, Blackbridge Road Tunnel: During my last inspection the tunnel had been produced 200 ft.: the estimated completed length is 420 ft. Tunnel dimensions, 7 ft. by 6 ft. and timbered where necessary. Pipitea – Hill Street Tunnel: 1,500 ft. driven. The finished concrete size is 5 ft. 6 in. by 3 ft. North of the shaft, 500 ft. of tunnel is on timber ready to be concrete lined.

FATAL ACCIDENTS

Fatality: John Birch received fatal injuries when attempting to clear a belt from a driving-pulley in a crushing plant at the Hukerenui Quarry, north of Whangarei, on 17th January, 1949. The belt caught his legs and hauled him between a revolving shaft and the ground floor. This accident does not come within the provisions of the Quarries Act, 1944.

Fatality: Charles William Mills. Mills was killed on 3rd March, 1949, at the Kaigoose Limeworks, near Maungatapere, when feeding the pulverizer with limestone. I reported this accident, but, similarly to the above, it does not come within the provisions of the Quarries Act, 1944.

It should be noted that, although the sites of the foregoing accidents were inspected, the crushing plants concerned are registered as factories and therefore do not properly come within the jurisdiction of an Inspector under the Quarries Act.

SERIOUS ACCIDENTS

On the 5th January, 1949, at the Waipa Quarries, Ngaruawahia, L. J. Hyde received injury to his left breast when feeding a swing-jaw crusher. A piece of rock was ejected from the jaw, striking him on the breast.

At the Hendon Avenue Quarry, Mount Albert, on the 7th March, 1949, Nick Unkovich sustained the loss of a thumb and two fingers of his left hand caused by a premature explosion when he was crimping a detonator to a safety-fuse.

MINOR ACCIDENTS

Injury to E. Booth when working at the Whangarei Borough Council's quarry on the 9th June, 1949. Booth received injury to his right eye when changing a drill steel.

PROSECUTIONS UNDER THE QUARRIES ACT, 1944

Nil.

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, 10th August, 1950.

Sir,—

I have the honour to present my annual report on the coal-mining industry of New Zealand for the year ended 31st December, 1949.

OUTPUT

During 1949 production from all coal-mines was increased by 37,389 tons to a total of 2,813,275 tons. Opencast production showed an increase over 1948 of 65,259 tons to an output of 741,987 tons, 26 per cent. of the total production, while mined coal fell by 27,870 tons to 2,071,288 tons.

Table I gives details of coal raised, explosives used, shots fired, and men employed from the year 1941 onwards. "Explosives Used" figures for 1949 only are shown in this table.

ACCIDENTS

It is encouraging to note that deaths due to accident at coal-mines during 1949, both surface and underground, have been held to the low figure of three. This is the best result since 1935, and is creditable to the efforts of all in the industry to adopt safe methods. What is not so encouraging is the fact that all three deaths were due to falls of coal or stone, one of them a fall of stone at the face, the others falls of stone and coal while repairing and shotfiring respectively back from the face. One of the fatalities occurred in the Northern District, the other two on the West Coast.

Of the twenty-five serious accidents—that is, accidents which must be notified under section 145 of the Coal-mines Act, 1925—nine were due to falls of coal or stone at the face and one was due to a fall of stone on a roadway away from the face. There were seven haulage accidents.

Though the total number of serious accidents is the lowest since 1942, it is capable of considerable improvement, and the attention of every one employed underground is drawn to the need for concentration on safe methods, good lighting, and constant care at the face and on haulage roads to effect this.

Table II deals with the incidence of fatal accidents on the basis of tonnage raised and men employed over the period 1941 to 1949.

Table III gives the causes of fatal and serious accidents respectively during the same period.

REPORTS ON ACCIDENTS

In an attempt to institute a month by month report on the causes of mine accidents in the different inspection districts, Inspectors of Coal-mines were asked to obtain and forward early in each month accident reports from their districts.

Table IV gives total accidents involving three days' absence or more from work for the year ended 31st March, 1950, but it is intended in future years to publish annually total accidents for each calendar year.

It is hoped that mine-managers will assist, both by seeing that prompt and accurate monthly records are returned and by graphing the monthly accidents for their own mines under the different causes, so that quick investigation and action may reduce any type of accident that tends to increase or to have a high incidence.

IMPROVEMENTS IN MINE SAFETY

Mine Lighting.—Tests of 40-watt fluorescent units ordered in 1948 have now been made possible by delivery of the lamps. They have been installed at the shaft bottom in the Wallsend Mine and at a control point in the Mangapehi Mine. At such points comparison with filament lamps for lighting effect is all in favour of the fluorescents, but the present cost is high and will tend to limit their general use.

Pneumatic electric lamps of this type have also been tried, and on test give extremely good lighting. For face work on the bord-and-pillar system of mining as used in New Zealand the cost of these lamps would be prohibitive, though a limited use may be found for them in the lighting of junctions nearer the face than could be allowed under the present regulations governing mains lighting.

Sheathed Explosives.—Tests of sheathed explosives imported from Great Britain were made at the Strongman Mine, West Coast, and the Wairaki Mine, Southland. The tests were fairly successful, the main difficulty being in the length of the plugs, which prevented the charge being concentrated at the back of the hole as when using the unsheathed explosive. This explosive is not made in Australia, and the source of supply would be Great Britain. The high cost due to this will make it impossible to use. Unibel, an explosive in which the flame-reducing agent is incorporated in the explosive itself instead of being used as a sheath, is taking the place of sheathed explosive in Great Britain, and an order has been placed for a quantity of this explosive for trial in New Zealand coal-mines.

PRECAUTIONS AGAINST COAL-DUST EXPLOSIONS

During the year stone-dust supplies were satisfactory and, generally speaking, mine sampling revealed a percentage of combustibles which complied with the regulations. It must be recognized, though, that sampling by the method in general use does not give complete assurance as to the safety of mine roads for many reasons, one being that the standard of incombustibles accepted by the regulations is too low, and is difficult in practice to raise because of shortage of stone-dust and the difficulty of applying it.

The inflammability testers now coming into use are valuable here as giving a quick and practical test of inflammability of any coal-mine dust, and it is disappointing that so much time has elapsed in getting delivery. They have now been landed, and will be put into use without delay.

Mine-managers will be well advised to make full use of this equipment, which will be placed centrally at rescue stations, as testing by this means will give them good evidence as to the state of their roads.

Distribution of Stone-dust.—Hand distribution is costly and slow. Various mines have tried mechanical and pneumatic methods of distribution, but managers are by no means convinced that these methods have given them efficient results. It is suggested that further experiment is justified, as it is unusual to get good results at the first attempt by any new method, that pneumatic blowers might be increased in diameter, as the object is to deposit the stone-dust and not to blow the dust off the ribs, and that, in view of the fact that the most dangerous dust is the air-borne dust which is deposited on top of the stone-dust, the rule " little and often " is just as good for applying stone-dust as for firing a boiler.

Water Sprays.—More use could be made of sprays at laybyes, and control points inbye and as close to the faces as possible. Sprays where used at the faces could in most cases be used more efficiently in wetting frequently fallen coal while it is being loaded. The wetting of the face itself is useless as a means of preventing air-borne coal-dust.

Dr. F. V. Tideswell in a recent paper published by the Institution of Mining Engineers makes this comment: "One direction which we hope to pursue ourselves is the possibility of development of a water spray barrage fed from the water-mains and triggered by the explosion itself: the potential efficiency of water as a suppressor of explosions is well established."

The New Zealand system of mining in panels would lend itself readily to this method.

First Aid.—The use of anti-shock injections in serious mine accidents has proved very successful where it has been necessary to apply it. Treatment is in the hands of experienced first-aid men. An Army type of non-refillable hypodermic is used, and reports indicate that this early treatment reduces pain, and by reducing shock it should also assist recovery.

On the advice of the Occupational Hygiene Branch, Health Department, mine-managers have been advised that sulphanilamide powder can now be obtained and used as a dry dressing to reduce sepsis following mine injuries. No use of this treatment has yet been reported, but it should have a good effect in the many cases of cuts and abrasions in mines, where sepsis often follows owing to the conditions of the work.

Shot-firing.—During 1949 in New Zealand underground coal-mining, 99,522 more pounds of explosive were used and 44,370 more shots were fired to produce 514,036 less tons of coal than in 1941.

Furthermore, while in 1941 the time worked at the coal face would average more than six hours per shift, in 1949 it would average less than five hours per shift.

On a shorter-term comparison underground output decreased by 35,745 tons between 1947 and 1949, while pounds of explosive used in underground mining increased by 106,757 lb. and shots fired increased by 108,896.

The increase in dependence on blasting is indicative of the reduction in skill of the miner and is also a measure of the decreased control by mine officials concerned with the firing of shots. It unfortunately also indicates a lack of preparation of shots in hand-worked mines—the time factor is sufficient proof of this.

Danger of mine explosions is increased by the extra coal-dust produced at the faces by the increased amount of shot-firing, and by its increased concentration due to a diminishing work shift.

It is obvious that, in addition to the risk of an explosion due to ignition at the coal face, the general danger of an explosion being carried through the mines by deposited coal-dust is being largely increased, and it is to every mine worker's advantage therefore to limit shot-firing to a minimum.

All officials can contribute to safety here in a very practical way by strict control of the preparation of shots and strict limitation of the number fired.

Stop-blocks.—There has been an increase in the use of automatic stop-blocks at jig heads in all districts, an indication that managers recognize the value of these. However, there is still plenty of room for improvement in this respect, and when all possible jigs are fitted with these blocks, and jig brakes are controlled from a point where there is good vision, the number of jig accidents, which are often serious, should decrease sharply.

Cases have been noted where automatic blocks, though provided, have not been well maintained, and mine officials should see that prompt repairs are made when needed.

NOTIFICATION OF POSSIBLE CAUSES OF DANGER

Inspectors were advised by mine-managers, as required by the Coal-mines Act, of thirty-four cases where possible danger might be caused to mine workers.

Of these, twenty-nine consisted of heatings in the goaves in old workings or at fire stoppings. Immediate action was taken in all cases, and proper sealing carried out. Trained mine rescue men were present in most of these cases, with equipment available in case of emergency, and where necessary trained rescue teams explored the heated area, erected temporary stoppings, and stood by until safe conditions were restored.

A heavy blower of firedamp at the Liverpool State Mine in February cause a small area of the Morgan East Dip Section to be sealed off, and three pairs of miners to be withdrawn.

At the Star and the Pukemiro North Mines, CO_2 was released from old workings due to a barrier and a stopping respectively having been damaged by falls of coal. Ventilation was restored and the old workings resealed.

An outcrop fire at the Pukemiro North Mine showed a tendency to encroach on underground workings. By local reversal of the ventilation and erection of stoppings, the area was sealed off.

Reports of firedamp in the main heading of B Section, Alison No. 2 Mine, in December caused the mine to be put on safety-lamps.

PROSECUTIONS

Twelve prosecutions were taken by Inspectors of Coal-mines during 1949 for breaches of the Coal-mines Act and regulations. In nine cases defendants were convicted and fined, in one case a conviction was recorded, and two charges were dismissed.

LEGISLATION

The Coal-mines Amendment Act, 1949, was passed during the year, amending certain sections of the Coal Act, 1948.

Sections 9–12 also extend and amend parts of the Coal-mines Act, 1925, and amendments relating to first-aid certificates, management of opencast coal-mines, reports on inspections of mines by examining officials, and the right of the Minister to purchase, sell, store, and process coal.

I have, &c.,

R. H. Schoen,

Inspecting Engineer and Chief Inspector of Coal-mines.

Table I

Year.	Coal Raised (Tons).			Explosive Used.				Men Employed.		
				Pounds.		Shots.				
	Mined.	Opencast.	Total.	Underground.	Opencast*.	Underground.	Opencast*.	Underground.	Surface.	Total.
1941 ..	2,585,324	54,183	2,639,507	644,860	..	799,810	..	3,633	1,358	4,991
1942 ..	2,624,267	55,774	2,680,041	718,037	..	881,770	..	3,659	1,338	4,997
1943 ..	2,725,831	62,037	2,787,868	805,633	..	956,602	..	3,999	1,375	5,374
1944 ..	2,609,516	196,454	2,805,970	854,069	..	865,315	..	3,958	1,637	5,595
1945 ..	2,380,896	452,680	2,833,576	707,866	..	833,012	..	3,932	1,660	5,592
1946 ..	2,625,170	528,700	2,793,870	686,069	..	794,693	..	3,819	1,738	5,557
1947 ..	2,107,033	644,692	2,751,725	637,625	..	740,284	..	3,739	1,703	5,442
1948 ..	2,099,158	676,728	2,775,886	694,038	..	815,187	..	3,482	1,740	5,582
1949 ..	2,071,288	741,987	2,813,275	744,382	176,631	849,180	53,767	4,009	1,868	5,877

* Opencast figures, 1941 to 1948, not available.

Table II

Year.	Output (Tons).	Persons Ordinarily Employed.			Lives Lost.		
		Surface.	Underground.	Total.	Per Million Tons Produced.	Per Thousand Persons Employed.	Lives Lost.
Prior to 1941 ..	95,336,168	..	..	..	..	..	526
1941	2,639,507	1,358	3,633	4,991	1·51	0·80	4
1942	2,680,041	1,338	3,659	4,997	2·24	1·20	6
1943	2,787,868	1,375	3,999	5,374	2·87	1·50	8
1944	2,805,970	1,637	3,958	5,595	4·28	2·14	12
1945	2,833,576	1,660	3,932	5,592	2·12	1·07	6
1946	2,793,870	1,738	3,819	5,557	1·43	0·72	4
1947	2,751,725	1,703	3,739	5,442	1·43	0·73	4
1948	2,775,886	1,740	3,842	5,582	1·80	0·90	5
1949	2,813,275	1,868	4,009	5,877	1·07	0·51	3
Totals ..	120,217,886	..	..	..	..	..	578

TABLE III

Year.	Underground.											Surface.	Grand Total.
	Falls of Ground.			Haulage.	Electrical	Explosions or Fires.	Shaft.	Gases.	Explosives.	Other Causes.	Total Underground.		
	At Face.	On Roads.	Total.										
Number of Men Killed at All Mines Under the Coal-mines Act, 1925													
1941	2	..	2	1	..	..	..	..	..	..	3	1	4
1942	4	..	4	..	..	..	..	..	..	1	5	1	6
1943	6	..	6	2	..	..	..	..	..	..	8	..	8
1944	8	..	8	1	..	..	..	..	..	3	12	..	12
1945	4	..	4	2	..	..	..	..	..	..	6	..	6
1946	4	..	4	..	..	..	..	..	..	..	4	..	4
1947	2	..	2	..	1	..	..	1	..	..	4	..	4
1948	3	..	3	1	1	..	..	..	..	..	5	..	5
1949	1	2	3	..	..	..	..	..	..	..	3	..	3
Number of Men Seriously Injured at All Mines Under the Coal-mines Act, 1925													
1941	10	..	10	7	..	..	..	..	..	1	18	2	20
1942	10	..	10	8	..	..	..	..	2	2	22	3	25
1943	8	..	8	16	..	..	..	..	..	4	28	2	30
1944	16	..	16	14	..	2	..	..	..	3	35	1	36
1945	10	..	10	9	..	..	..	..	1	5	25	3	28
1946	14	..	14	13	..	1	..	..	1	10	39	4	43
1947	12	..	12	14	..	..	..	1	1	5	33	8	41
1948	6	..	6	19	1	..	..	..	2	3	31	8	39
1949	9	1	10	7	..	..	..	..	..	5	22	3	25

Table IV—Summary of Accidents in Coal-mines, Year Ended 31st March, 1950

(Involving three days' absence from work or more—taken from accident report forms C. & S. I.A. 2)

District.	Underground.										
	Fall of Roof or Side.	Gas Explosions.	Haulage.					Electricity.	Explosives.	Other Causes.	Total Underground.
			Endless Rope.	Jig.	Winch.	Trucking.	Miscellaneous.				
Northern	60	..	96	3	5	317	113*	..	..	502	1,096
Percentage of total accidents	4·75	..	7·60	0·24	0·40	25·10	8·94	..	..	39·75	86·78
West Coast	94	..	42	18	15	226	141*	..	..	321	857
Percentage of total accidents	9·16	..	4·10	1·75	1·46	22·03	13·74	..	..	31·29	83·53
Southern	19	..	1	..	3	51	20*	..	..	57	151
Percentage of total accidents	10·92	..	0·57	..	1·72	29·31	11·50	..	..	32·76	86·78
Grand total	173	..	139	21	23	594	274	..	..	880	2,104
Percentage of total accidents	7·02	..	5·64	0·85	0·93	24·12	11·13	..	..	35·73	85·42

District.	Surface.									
	Electricity.	Machinery.	Railway Trucks, &c.	Haulage.		Other Causes.	Total Surface.	Shaft.	Grand Total.	Fatal
				Trucking.	Miscellaneous.					
Northern	1	17	16	36	..	97	167	..	1,263	1
Percentage of total accidents	0·08	1·35	1·26	2·85	..	7·68	13·22	..	100·00	0·08
West Coast	1	1	2	27	35	102	168	1	1,026	2
Percentage of total accidents	0·10	0·10	0·19	2·63	3·41	9·94	16·37	0·10	100·00	0·19
Southern	..	2	3	1	..	17	23	..	174	..
Percentage of total accidents	..	1·15	1·72	0·57	..	9·78	13·22	..	100·00	..
Grand total	2	20	21	64	35	216	358	1	2,463	3
Percentage of total accidents	0·08	0·81	0·85	2·60	1·42	8·78	14·54	0·04	100·00	1·21

* Includes some accidents not broken up into various classifications under haulage.

Note.—All fatal accidents have occurred from falls of roof or sides.

ANNEXURE A

SUMMARY OF REPORTS BY INSPECTORS OF COAL-MINES

NORTHERN INSPECTION DISTRICT (J. Adamson, Inspector of Coal-mines)

Summary of Operations of Each Colliery for the Year 1949

North Auckland District

Kamo State Colliery (J. Hadcroft (First Class), Mine-manager).—All coal from this mine was won from solid work in the East Dip and Slant Dip Sections. The workings in the East Dip Section, until February, were in the bottom seam, where a section had been opened up between the main dip haulage road and a fault some 13 chains to the north-west. Splitting of some pillars was carried out, but owing to soft floor and bad roof producing excessive floor heave it was found necessary to abandon this work. Eleven chains from the top of the East Dip haulage a stone drive was driven on line with the dip haulage into the top seam and the dip development continued in this seam for a further 14 chains in 9 ft. of good-quality coal. In the Slant Dip area (bottom seam) development was advanced to 42 chains from the head of Doel's Dip Heading. The coal averaged 9 ft. in thickness except for the last few chains, where a series of small faults were encountered. A section was also opened up midway along the Slant Dip haulage road and advanced some 20 chains on level course. This development has been temporarily stopped in faulty ground. On the surface, improvements have been effected to the tip-head, and the bathhouse capacity increased by building a 15 ft. extension to this building.

Trial operations were carried out with an electric-driven Siskol coal-cutter with reasonably satisfactory results.

One hundred and twenty-nine men were employed underground and 24 on the surface.

Cunningham's Opencast, Hikurangi (C. G. Cunningham (Permit), Mine-manager).—Two men were employed recovering, by opencast methods, small pillars of coal left behind by a previous underground venture.

Waikato District

Pukemiro Colliery (S. R. Eyeington (First Class), Mine-manager).—Production was continued throughout the year from the North and South Mine areas. In the North Mine 8 pairs of miners continued with pillar-extraction. Considerable difficulty was experienced in this mine through an outbreak of fire at the outcrop encroaching on the workings. It is pleasing to record, however, that the outbreak has been kept under control.

In the South Mine output was won from five districts known as Taupiri Section, South Straight, Middle Section, Horne's Dip, and No. 1 Right Section. In the Taupiri Section pillar-extraction was continued by 11 pairs of miners. During the latter portion of the year operations were completed in the Morgan's Dip area. A centrifugal pump with 5 in. delivery was installed, thus improving pumping facilities in this area. In the South Straight Section the main heading struck the main fault early in the year, with the result that development work was confined to an area to the left. Four pairs of miners were employed, with 2 pairs of miners on pillar-extraction to the right of the main heading. Pillar-extraction was continued by 6 pairs of miners in the Middle Section with good results. To allow for the extraction of roadside pillars on the No. 2 Right main haulage road a new intake haulage and return airway was established for Horne's Section by way of No. 1 Right haulage. In the Horne's Dip Section heavy roof and heaving floor continued to prevent efficient and adequate pillar-extraction, which was continued by 3 pairs of colliers. An improvement in working conditions cannot be expected until a line is reached on the outbye side of the old Rope End Section. A further 12 pairs of miners continued with pillar-extraction in the No. 1 Right Section.

During the year a new endless-rope haulage was installed to cope with the increased output brought about by the new haulage connection with Horne's Dip Section. On the surface a 400 kw. mercury arc rectifier was installed in the power-house, which in due course will replace the existing steam generating plant.

Two hundred and twenty-one men were employed underground and 69 on the surface.

Renown Collieries, Ltd. (T. Geddes (First Class), Mine-manager).—During the year development work was continued in the New Mine area adjacent to the boundary of the company's property with the MacDonald Mine workings. Five pairs of miners were employed in No. 1 East Panel, where the seam averages 15 ft. in thickness. Varying gradients militated against the successful operation of coal-cutting machines, with the result that development was not up to the usual standard.

The No. 1 Mine area is divided into the following sections—East Rope End, No. 2 West, No. 2 East, Thompson's Pillars, and the Main West Heading Sections. The East Rope End Section was exhausted late in the year and the section sealed off. Thirty-one pairs of miners were all engaged on pillar-extraction in this mine, with the exception of No. 2 East Section, where solid work is being pursued with the aid of coal-cutting machines. Pillar-extraction in Thompson's Pillars and in the Main West Heading Section is nearing completion. In the latter section the rate of extraction has been adversely affected by considerable heaving of the soft floor. No work was done in No. 5 North Section for some considerable time on account of a shortage of suitable labour.

The thickness of coal in this mine ranges from 7 ft. to 16 ft.

On the surface all buildings were maintained in good order, while extensive repairs were carried out on the bridge adjacent to the mine fitting-shops.

One hundred and seventy-eight men were employed underground and 62 on the surface.

Wilton State Collieries (J. Baird (First Class), Mine-manager).—The greater portion of the output from this mine was won from No. 3 and No. 3 Extended Mines. No. 2 Mine was closed on 7th July, 1949, all available coal having been extracted. Three pairs of miners were employed on pillar-extraction in 6 ft. of coal. These men were transferred to No. 3 Extended Mine. The limit of extraction in No. 3 Mine has also been reached, a number of pillars being left intact for support to the main haulage road from No. 3 Extended Mine. Three pairs of miners previously employed have been transferred also to No. 3 Extended. In the No. 2 East Section of this mine development was completed and pillar-extraction commenced with 9 pairs of miners. Output was maintained at a high level with the aid of coal-cutters and power drilling-machines. In the No. 3 East Section development of the main headings was continued to a distance of 29 chains east from the main haulage road. Further development was abandoned on account of the seam being split by increasing dirt bands, coupled with bad roof conditions. Development to the north and south was also abandoned for similar reasons. A small area of coal still remains to be developed adjacent to the outcrop. This work is being continued. The greater portion of the output, however, was obtained from pillar-extraction. Twelve pairs of miners were employed in this section. Two coal-cutters and two power drilling units were operated in the section. Pillar-extraction was continued in Nos. 2, 3, and 4 West Sections and in No. 4 East Section, with 10 pairs of miners engaged in this work. In the No. 1 West Section, 2 pairs of miners continued with development, aided by an electric-driven Siskol coal-cutter and drill. Development was continued in the No. 4 West Extended area, where 6 pairs of miners were employed. Development was impeded through the workings encountering several faults accompanied by heavy roof conditions. All coal was won with the aid of coal-cutting machines and power drills. During the evening of 6th September, 1949, a disastrous fire occurred at the surface workshops, resulting in their total destruction, with serious damage to the plant. One hundred and seventy-six men were employed underground and 36 on the surface.

Rotowaro No. 1 Mine (T. Glendenning (First Class), Mine-Manager).—Production from this mine was limited and consisted of intermittent pillar-extraction by 4 pairs of miners.

Callaghan's Dip Mine: Development work was continued in the No. 2 Dip Panel with 2 pairs of miners. During the later portion of the year three reinforced-concrete dams 27 in. in thickness were erected in three entries to the old No. 3 Dip Panel. These dams were erected as a precaution should there be an entry of water from an overlying swamp. Pillar-extraction was continued in Nos. 3 and 5 Panels with good results, 6 pairs of miners being employed in these districts. Development in No. 6 Panel was completed and splitting of pillars commenced by 3 pairs of miners. Complete extraction will not be attempted owing to the swampy nature of the ground on the surface. In the No. 4 Dip Section, lower seam, a return airway was completed and development of two headings in 15 ft. of coal was continued by 2 pairs of miners, assisted by a Sullivan coal-cutter and power drilling-machines.

Rotowaro No. 3 Mine: Practically all coal won from pillar-extraction, except for 3 pairs of miners advancing two headings in the new Dip Section. Prospects for continued development in this area, however, are not good. A number of heatings in Brown's Section have interfered with continued production. In Moodie's Section approximately three months' work remains for 2 pairs of miners on pillar-extraction. Pillar-extraction was continued intermittently in the Shaft Section. C Section was reopened for pillar-extraction by 2 pairs of miners after being sealed for some considerable time. Further heating in the goaf was again experienced and the section resealed. In D Section some development work was carried out by 3 pairs of miners towards the old stone drive workings. At the end of the year the timber supports to the girders at the mine entrance were replaced by the erection of concrete walls.

The number of men employed underground totalled 133, with 54 on the surface.

Alison No. 1 Mine (W. N. Currie (First Class), Mine-manager).—Pillar-extraction was continued in No. 1 Jig, No. 4 Jig, and No. 2 Dip Sections with 9 pairs of miners.

Alison No. 2 Mine (W. N. Currie (First Class), Mine-manager).—Production was maintained throughout the year entirely from development work. In B Section Slant Panel 5 pairs of miners have continued with the aid of a Samson crawler-type coal-cutter and power drills. B Section headings were advanced a further 10 chains south of the Huntly–Glen Afton railway-line. Five pairs of miners were engaged in this section. Development was continued in No. 4 Rise Panel also with 4 pairs of miners assisted by a Samson crawler-type coal-cutter and power drills. It is interesting to record that this type of coal-cutter has been used in this section to cut places on grades up to 1 in 5. Some development work was also carried out by 2 pairs of miners in C Section. The main development heading was continued by a stone drive through an anticlinal fold in the seam. This drive, at a grade rising 1 in 16 tapped the seam at a distance of approximately 8 chains. Preparations are now in hand for a return airway and further development. Some 1¼ chains of the main return airway were concreted where this airway had been driven through heavy and faulted ground. Surface boring operations on the company's property were continued throughout the year, an additional 223 holes being bored.

A total of 140 workmen were employed underground in No. 1 and No. 2 Mines, with 70 on the surface.

Alison Opencast Mine (W. N. Currie (First Class), Mine-manager).—Opencast operations were continued intermittently during the first half of the year, when 4,000 tons of coal were produced by 12 men. This opencast was situated on the eastern boundary of the present Alison No. 1 Mine. It is intended to resume operations at a later date from the Barker's Road area.

Thompson's Opencast Area: Sixteen men were engaged on opencast operations in 15 ft. to 20 ft. of coal. This project is situate some 20 to 30 chains to the north-west of Alison No. 1 Mine. Thirty-nine thousand six hundred and fifty-two tons were produced from April to the 31st December.

Barkers Opencast Mine (T. Bigwood (Quarry Certificate), Mine-manager).—Eight men were engaged on opencast operations adjacent to Alison No. 1 Mine. The coal varied in thickness from 10 ft. to 23 ft. An output of 22,495 tons was produced during the year.

Summit Coal-mining Party (A. Harlock (Deputy), Mine-manager).—Opencast operations were continued throughout the year for approximately 32,000 tons by 6 men. The ratio of overburden to coal averaged 3 to 1. Stripping was done by bulldozer and the coal loaded into motor-trucks by a ¼-yard petrol-driven digger. This mine is situated some 20 chains west of the present Rotowaro No. 1 Mine entrance and is an area on lease from the Taupiri Coal Mines.

Glen Afton No. 1 Colliery (W. C. Inglis (First Class), Mine-manager).—Output from this mine was won almost entirely from pillar-extraction by 17½ pairs of miners in E2 and L Sections. Excessive roof pressure and floor heave in E2 Section did not permit of maximum extraction of pillars in this section and necessitated constant attention to repairs of timbering on roadways adjacent to the working faces. Despite these disadvantages it is pleasing to record that there were no signs or reports of spontaneous combustion for the year. Ninety-four men were employed underground and 91 on the surface.

Glen Afton No. 2 (MacDonald Colliery), (H. Stirling (First Class), Mine-manager).—Coal winning in this mine was chiefly from pillar-extraction in H1 Left and H2 Right Panels, K Section, E Panel, and No. 4 Mine Rope End and Jig Sections, while some development work was continued in J, L, and C Sections. Development in C Section was continued towards K Section old workings, Glen Afton Mine, with a view to the extraction of several acres of coal in this area and with a view to providing an additional haulage road for the output from K Section. It was intended to effect some improvement to the ventilation by the erection of an air-crossing in the return airway 2 chains from the main fan. The present return airway from E Sections will then become an intake airway with a separate fan installed at the surface to ventilate these sections. Two hundred and thirty-five men were employed underground and 32 on the surface.

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

Victory Mine (Devlin and Bell), Rotowaro. (H. Bell (Deputy), Mine-manager).—Output was won from development work by 6 men until April, when operations ceased, the mine being purchased by the Government.

Kopuku Opencast Mine (Glen Afton Colleries, Ltd.), (M. Ralph (Underviewer), Mine-manager).—Eight men were employed opencasting 45 ft. to 50 ft. of coal. Overburden is stripped by bulldozers and carryalls and dumped to form a stop-bank against the water from the adjacent swamp and lake. After the removal of overburden the coal is mined in a series of lifts 15 ft. to 20 ft. high, depending on the nature and thickness of the seam. The coal is loaded by Diesel-driven digger of ¾-yard capacity on to a chain conveyor and thence on to the main belt conveyor, rising at a gradient of approximately 1 in 4 to the bins at the roadside. From the mine the coal is transported a distance of some 16 miles to the railway at Pokeno.

Clifton Collieries Ltd., Kopuku (G. E. Cunningham (Underviewer), Mine-manager).—Four men were employed underground and 1 on the surface. The output was won from development. The main dip heading encountered a downthrow fault approximately 4 chains from the surface. Lack of skilled miners considerably delayed the continuation of this heading through the faulted ground. Coal thickness in this mine reaches 30 ft. in two seams separated by 4 ft. to 8 ft. of soft clay.

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

Glen Afton Potteries Opencast (E. Anderton (Permit), Mine-manager).—Six men continued with opencast operations. Some 3,700 tons of coal were produced during the year from a seam 10 ft. thick.

Te Pahu Colliery, Karamu.—Operations have ceased and the mine closed down.

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

Whatawhata Campbell Coal Co. (E. Kerry (Second Class), Mine-manager).—A small output was maintained by 5 miners in solid work to the west of the main dip haulage road. Working conditions were satisfactory in coal up to 12 ft. thick. All production from this mine is sold on the local market. Eight men were employed underground and 4 on the surface.

Rangitoto Opencast Coal-mine (Hamilton and Harvey), Otorohanga (K. L. Harvey (Quarry Certificate), Mine-manager).—A small output was won by 2 men at the beginning of the year, but the lease was surrendered in March and operations ceased.

Kimihia State Opencast Mine (J. Roberts (Quarry Certificate), Mine-manager).—All coal from this mine was won from No. 1 Area, which is now practically exhausted. Several hundred tons of coal remain in a small area bordering the railway siding at the screens. Stripping operations on No. 6

Area have been continued throughout the year with the aid of the 120 R.B. Bucyrus Erie electric shovel, with bulldozers, Athey wagons, and Tournapulls used for transportation of the overburden to the stop-bank at the lake edge. It is estimated that some 600,000 tons of coal are available for mining in this area, the coal attaining a thickness of 28 ft. An average of 28 men was engaged on this project.

Kemp's State Opencast Mine (T. Bigwood (Quarry Certificate), Mine-manager).—Production from this mine was continued intermittently until November, when all available coal was extracted and the mine abandoned.

Hillcrest State Opencast Mine (T. Bigwood (Quarry Certificate), Mine-manager).—Seven men were employed with bulldozers and carryalls on stripping operations, with a further 10 men engaged on winning a 6 ft. seam. The ratio of overburden to coal thickness averaged 5 to 1. Very little coal was left for extraction at the end of the year.

Heworth Coal-mining Syndicate, Glen Massey (J. Corness (Deputy), Mine-manager).—A small output was obtained from a 5 ft. seam by 3 men. All workable coal was exhausted in March and the mine closed down.

Taranaki District

Mangapehi State Colliery (H. Quinn (First Class), Mine-manager).—Output from this mine for the year was obtained solely from development work, with the majority of working faces on double shift. The main No. 2 East Level headings reached a distance of 3,500 ft. from the main dip and were at the end of the year in faulty ground. This disturbance, however, was considered to be of local extent and not extensive. Five panel entries have been formed to the rise ready for further development when required. No. 3 East Level headings have been driven 800 ft. to the east of the slant dip and are continuing in good coal. Westerly development from the lower end of the slant dip has reached 300 ft. from this point with a view to eventual connection with the Main Dip Extension. A further 1,100 ft. require to be driven to reach this objective. Dewatering of the dip section in No. 1 East Level has been completed, but no attempt as yet has been made to extract the pillars in this section. A substantial concrete air-crossing was erected at the head of the No. 3 East Section, and this section is now ventilated on a separate split. Several units of fluorescent lighting have been installed in the main laybye at the entrance to No. 2 East Level, effecting a marked improvement in the standard of lighting at this junction. There was a marked improvement in the condition and size of the return airways, with the result that an appreciable improvement in the standard of ventilation at the faces was noted. Considerable improvements were made in the main east return at the approach to the fan drift. The airway was cleaned out, and rebuilt in a semi-circular form with the use of specially-shaped concrete blocks. One hundred men were employed underground and 30 on the surface.

Tatu State Colliery (J. McLelland (First Class), Mine-manager).—During the year pillar-extraction was continued with excellent results in No. 3 Rise Panel. The main south headings were extended a further 5 chains. Further development was suspended owing to haulage difficulties. Four headings, two of which were entries for the proposed No. 4 Rise Panel, were commenced, but a downthrow fault retarded progress. This fault was found to be running almost parallel with the south headings and 2 chains to the east. A propecting drive, 4 chains outbye from the south heading faces, was set away in an easterly direction to prove the extent of the Victory Fault. This drive proved the fault to be approximately 12 ft. displacement. The coal beyond the fault was found to be 8 ft. thick. Development of this coal is to be commenced as soon as satisfactory haulage arrangements can be made. The stone drive for a new east side return airway was completed and 1,000 ft. of airway cleaned out where this airway had become blocked by falls and heaving floor. This latter work was greatly assisted by the use of a Gardner-Denver shovel loader. An improvement in the general ventilation of the mine was thus achieved. Floor heave, however, will continue to adversely affect the condition of airways in this mine. These difficulties will increase as the workings extend. Considerable repairs were effected to the aerial ropeway to Mangaparo, a number of breakdowns resulting in a depletion of buckets in service. Sixty men were employed underground and 35 on the surface.

Moynihan's Lease, Mangakara, Ohura (D. Moynihan (Deputy), Mine-manager).—This is an opencast project where 5 ft. of coal is won by hydraulic means with the overburden stripped by bulldozer. Dry weather periods retard coal-winning operations in the summer, but nevertheless a good average output is obtained by 3 men.

Sunnyside Mine, Waitewhena (J. Wilson (Deputy), Mine-manager).—Six men are employed working 13 ft. of coal by underground methods. The mine is situate approximately 2 miles north of the Waitewhena State Opencast Mine. Towards the end of the year approximately 5,000 tons of coal were stripped along the northern outcrop ready for opencasting.

Aria Coal-mine (R. Gillespie (Permit), Mine-manager).—Three men were employed underground mining a 13 ft. seam of coal dipping at an average gradient of 1 in 3. Output was obtained principally from development on level course to the south.

Stockman Colliery (H. W. Jones (Deputy), Mine-manager).—A small output was obtained by 2 men developing a 4 ft. 6 in. seam of coal situated 27 miles from the mouth of the Mokau River. The output is transported from the mine down the river to the township of Mokau.

Fougere's Opencast, Ohura (Tonga and Paparata), (E. Maslin (Quarry Certificate), Mine-manager).—A small output was obtained by 4 men opencasting two sections on this area. The coal averages 3 ft. 6 in. to 4 ft. in thickness.

Waitewhena State Opencast (S. T. Smith (Deputy), Mine-manager).—An output of 44,177 tons was obtained from No. 2 Area. The seam averaged 11 ft. in thickness. Approximately 9,000 tons remain on this area, with the overburden attaining a ratio of 5 to 1. In April stripping operations commenced on No. 5 Area, while the formation of a new access road to this latter area was pushed on as machines and labour became available. Some 5 chains of this formation remained to be done at the end of the year. All stripping at the mine is done by the Ministry of Works, employing five caterpillar tractors and blades and two 12-cubic yards carryalls. One three-quarter-yard shovel excavator and two T.D. 14 tractors are used on coal-winning. The output is transported 13 miles by road transport to the screening and sizing plant at the railway siding. The total number of men engaged was 35.

Rotowaro Rescue Station

At the end of the year the total number of trained men on the register was 57, including 13 men at Benneydale. Individual practices totalled 391 and team practices 95. Eight emergency calls were made to several district mines, as follows: One to MacDonald Mine, four to Pukemiro Mine, one to Wilton Mine, and two to Mangapehi State Mine, Benneydale. Valuable assistance was thus rendered at the various mines in dealing with underground fires. All rescue apparatus, together with the interior and surroundings of the rescue station, were kept in very good order. At the beginning of the year Mr. Lennox resigned from the position of Officer in Charge, Mr. E. C. Carter accepting the position in a temporary capacity until a permanent appointment was made. Mr. Carter carried out his various responsibilities in an able and efficient manner for several months until the present officer, Mr. N. Croad, was appointed.

Huntly School of Mines

Instruction was continued throughout the year under the able direction of Mr. C. Hunter. The average number of students attending was 32 for the first and second quarters and 33 for the last quarter. Classes were of three hours' duration, as follows—Huntly: Mondays, Wednesdays, and Fridays; Rotowaro: Tuesdays and Thursdays. As no students were available from Ngaruawahia, no class was held there, the extra night—namely, Thursday—being allocated to Rotowaro.

At the annual examinations for underviewers and firemen deputies 3 students obtained passes in the underviewers' section and 1 failed. In the firemen deputies' section 5 obtained passes and 1 failed.

Fatal Accidents

I regret to report that one fatal accident occurred during the year. Thomas J. Purnell, Pukemiro Colliery, married, with three children, was fatally injured by a fall of stone and coal on 8th September, 1949. The accident occurred while Purnell was engaged in repairs to timbering in the McIntyre's Dip Section, Pukemiro South Mine.

Serious Non-fatal Accidents

On the 20th January at Wilton State Colliery, R. E. Lumsden suffered a fracture of the fibula. He was employed on the surface. The accident was caused through Lumsden slipping on a sleeper and falling down a bank.

On the 29th January Donald Pearson suffered a fracture of the metacarpus bones of the right hand whilst employed at the face of Roose's Opencast Mine at Huntly West.

On 31st January H. Wallace sustained a fracture, fourth toe of the right foot, caused by a tub falling on to his foot at Pukemiro Mine.

On the 10th February Kenneth Baldwin, miner, Pukemiro Colliery, received a fractured right leg. He fell whilst attempting to avoid a small fall of coal in his working-place.

On the 11th February A. Bates suffered a fractured left wrist after being struck from behind by a full truck at the screens, Glen Afton Colliery.

On the 16th February Douglas R. Jolly, trucker, Wilton State Colliery, sustained a fracture of a small bone in the wrist. The injury was caused through Jollys' hand being jammed between the buffers of two trucks.

On 16th March William Archibald, trucker, Mangapehi State Mine, sustained a dislocation of the left wrist when his hand was jammed between a low portion of roof and the top of a truck.

On the 27th April S. Graham, screen hand, Glen Afton Colliery, sustained a fracture of the right hand when he fell from the iron step of a railway wagon.

On the 20th May J. Tapara, Trucker, Rotowaro No. 3 Mine, suffered the loss of the first joint of the little finger and lacerations to middle and ring fingers when his hand was jammed between a low portion of roof and the top of a full truck.

On 14th June William Hay, road worker, Pukemiro Mine, sustained severe lacerations of the palm and fracture of the metacarpal bones, right hand, when he slipped and fell, a rake of trucks passing over his hand.

On the 27th June Ronald Makin, miner, of Wilton State Colliery, suffered a laceration of the right eye. The pick which Makin was using deflected off the side of the cut and the pick point entered the eye.

On the 6th July T. Taituha, trucker, Mangapehi State Mine, sustained a fractured rib when he slipped and fell on to the buffer of a truck.

On the 27th July A. Cameron, miner, of Mangapehi State Mine, when walking down a jig slipped and fell heavily, sustaining a fracture of the left wrist.

On the 8th August Robert Clark, miner, Glen Afton No. 1 Mine, suffered a fracture of the left leg. The accident was caused by a prop rolling off a truck on the tip-up and striking Clark on the leg.

On the 25th August D. Morwood, miner, of Wilton State Colliery, was struck by a fall of coal at the face. He suffered a fractured pelvis.

On the 31st August C. Cross, miner, of Mangapehi State Mine, suffered a fracture of the big toe, right foot. A truck ran off the rails at the face, a wheel striking Cross on the foot.

On the 21st September D. Black, trucker, of Pukemiro Colliery, suffered a fracture of the left leg when a truck was derailed at the stopblock on a jighead.

On the 26th October J. Lawrence, miner, of Mangapehi State Mine, suffered a fracture of the right wrist when he fell heavily on an incline on his way into his working-place.

On the 7th November B. Main, trucker, Tatu State Mine, sustained a fracture of the right leg when a truck was derailed at a stopblock on a jighead.

On the 5th December R. Pengelly, deputy, of Mangapehi State Mine, suffered a fracture of the right leg when he slipped and fell heavily on a rail at the mine entrance.

On the 7th December W. Martin, machineman, Wilton State Mine, suffered a fracture of the right leg when he slipped and fell on a rail crossing as he was walking out of the mine.

Reports Regarding Dangerous Occurrences in Mines

On the 14th March firestink was discovered in the last working-place on the return side, Main West Heading Section of the Renown Mine. The heating was effectively sealed by the erection of two permanent stoppings.

On the 7th April fire was seen issuing from breaks in the strata at the surface and immediately above Brown's Section, No. 3 Mine, Rotowaro. The stoppings sealing the area underground were not affected. The outbreak was effectively controlled by closing the fissures at the surface by the use of a bulldozer.

On the 7th April a heating in the goaf, A Section, No. 3 Mine, Rotowaro, was reported. The section was sealed off.

On the 9th June an outcrop fire at the Pukemiro North Mine was found to be encroaching on working-places underground. The occurrence was controlled by the erection of three stoppings and reversal of the ventilation in the section.

On the 26th June the fire reported on the 9th June in the Pukemiro North Mine burnt through one of the seals. The outbreak was extinguished by water and the stopping repaired. A further stopping was burnt out by this fire again on the 28th June. This occurrence was controlled by the erection of a further stopping on the outbye side of the one destroyed.

On the 27th June several stoppings in the No. 1 Left Section, Pukemiro Colliery, were damaged by a fall of coal in the goaf, resulting in several places being fouled by blackdamp. The affected places were rendered idle for the day until the stoppings were repaired.

On the 6th July a heating occurred in the Rope End Section, Alison No. 1 Mine. Two stoppings were erected and the occurrence brought under control.

On the 12th July evidence of heating was noted in the No. 4 East Section, Renown Mine. Several stoppings were erected and the affected area sealed off.

On the 23rd August the bottom of a stopping was burnt out in McIntyre's Dip Section. The burning material was cooled with water and filled out and the stopping repaired.

On the 11th September two stoppings were damaged by fire at the Pukemiro Mine, one in the North Mine and one in Cauchi's Dip Section, South Mine. A new stopping was erected in the first case, while in the latter the heated material was filled out and the damaged stopping repaired.

On the 29th October a heating occurred in the goaf in C Section, Rotowaro No. 3 Mine. The affected area was effectively sealed by the erection of a number of stoppings.

On the 29th November the night-shift deputy found a burning stopping in the Middle Section, Pukemiro South Mine. The burning material was extinguished by water and stonedust and the stopping re-erected.

On the 8th December the examining deputy in B Section, Alison No. 2 Mine, reported finding the presence of firedamp in a cavity in the roof of the main heading place. As a result of this occurrence electric safety-lamps were enforced throughout the mine.

PROSECUTIONS

On the 28th February John Marlowe, shot-firer, Kamo State Mine, was charged with a breach of Regulation 226 (*g*) (i), Coal-mines Regulation 1939. He was convicted, with 10s. Court costs.

On the same day Richard Cunningham, underviewer, was charged with a breach of Regulation 87, Coal-mines Regulations 1939. A fine of 10s. with 13s. Court costs was imposed.

On the 7th June M. Haack, miner, of Wilton State Mine, was charged with a breach of Regulation 65, Coal-mines Regulations 1939, The information was dismissed.

On the 15th June Lloyd Henry Brewer, miner, of MacDonald Mine, was charged with a breach of Regulation 65, Coal-mines Regulations 1939. The Magistrate dismissed the charge on a technicality.

On the 18th June Arthur Douglas Robinson, deputy, of Pukemiro Mine was charged with a breach of Regulation 65, Coal-mines Regulations 1939. Robinson was convicted and discharged.

On the 5th August Frank Hale and John Gair, miners, of Wilton State Mine, were both charged with a breach of Regulation 221 (4), Coal-mines Regulations 1939. The defendants were each fined £5 with 12s. Court costs.

On the 7th December Frederick Connew, deputy, of Pukemiro Mine, was charged with a breach of section 128 (1), Coal-mines Act, 1925. The Magistrate imposed a fine of £5 with 10s. Court costs.

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

GREYMOUTH DISTRICT

Liverpool State Colliery, Rewanui (L. F. O'Loughlin (First Class), Mine-manager).—Anderson Dip Section: The reopening of old roadways and extraction of pillars was continued during the year by 5 pairs of miners. It is proposed to prospect a fault in Kennedy's Dip from the Morgan Seam.

Kimbell East Section: One pair of miners was engaged in opening No. 1 Bank in preparation for pillar-extraction. It is expected that prospecting may prove a block of coal between this section and Top Mine.

Kimbell West Section: Four pairs of miners extracted pillars in reopened fire area.

Morgan West Rise: Two pairs were engaged extracting pillars in No. 3 Bank, 3 pairs in No. 2½ Bank, and 1 pair in No. 1 Bank.

Morgan West Level: A stone drive was still being continued to prospect the fault known to exist. When the faulted area is passed through it is proposed to bore for the seam.

Morgan West Dip: Four pairs of miners were developing in East and West Levels, the seam being 14 ft. thick in West Level. The thickness of coal in East Level was 7 ft. near roof, 1 ft. stone, and 12 ft. on floor. The prospecting dip off East Level is now stopped in 10 ft. coal whilst a return airway is driven.

Morgan East Dip: Top Panel was finished and sealed. In No. 1 Panel 2 pairs of miners were extracting pillars, and in No. 2 Panel 3 pairs were extracting pillars. The fault was met on the east side in No. 2 Panel. Two prospecting bores were put down. One struck a 5 ft. seam and the other a 4ft. seam at approximately the same depth of 134 ft. The coal appears to be dirty. Two further holes will be put down to the north and south of the present ones.

West Level, Morgan East Dip: Six pairs of miners were developing in a seam 25 ft. thick.

Cust's Dip 4A Section: Three pairs of miners were developing a seam 20 ft. thick.

East Level Main Dip 4A: One pair of miners had developed a level for 12 chains. The seam at the face was 3 ft. dirty coal near roof, 2 ft. stone, 3 ft. 10 in. coal on floor.

West Level 4A Main Dip: Two pairs of miners were developing a seam 20ft. thick.

Main Dip 4A: This dip was extended 4 chains on a grade of 1 in 2, the seam being 20 ft. thick.

Seventy men were employed on the surface and 252 underground at this colliery.

Strongman State Colliery, Nine-mile (G. K. Keown (First Class), Mine-manager).—No. 2 North Section: Early in the year development of No. 3 Panel was completed. Development in No. 4 Panel was continued to within 2 chains of No. 1 Bore when the area had to be abandoned owing to thin, dirty coal. Seven pairs of miners continued development work in the Heading Section. The seam is badly broken by faults. The main intake stone drive reached the upper E seam. The return stone drive was put in and development work was continued in a seam 10 ft. thick with hard roof.

No. 3 North Section: Development work was continued with 5 pairs of miners.

East Heading: Development work was continued by 5 pair of miners. It is expected that more miners can be placed in this section when the endless-rope haulage is reorganized.

New South Dip: Development work was completed and pillar-extraction commenced early in the year with 4 pairs of miners.

No. 1 South Dip: Pillar-extraction was continued with 3 pairs of miners. A weak roof is making pillar-extraction difficult.

Bottom C Seam, Rise Panel: Development work was continued within 3 chains of underground bore No. 279, which shows no coal at this horizon. The seam thinned suddenly and was badly split by stone bands. Very little work is left to be done in this section.

Slant Dip: Eight pairs of miners were developing a thick seam of good-quality coal.

South Level: The reopening of this level is to be continued when a scraper loader is available.

Plant: In No. 1 North Level a compressed-air pump was replaced by an electrical unit.

Sixty-eight men were employed on the surface and 204 men underground at this colliery.

Blackball State Colliery, Blackball (P. T. Peattie (First Class), Mine-Manager).—Slant Dip: Four pairs of miners on double shift continued to work in a seam 12 ft. to 15 ft. thick in good-quality coal.

Dunn's Dip and No. 2 South Sections: Two levels to connect these sections were extended for 14 chains. Eight chains of the driving was in coal 3 ft. to 6 ft. thick. When these two sections are connected, one of these levels will be used to transport coal from Dunn's Dip to No. 2 South endless haulage.

Perrin's Dip: This dip was dewatered and extended for 3 chains. Owing to extensive floor heave and very wet conditions, this dip was abandoned. A panel is being developed to the north of the dip. The seam is undulating, 12 ft. thick, and the coal is of good quality.

Main Dip: This dip has been extended for 10 chains, the coal at the face being hard and bright. Three headings off the main dip were driven in a southerly direction for 5 chains. The grade of the seam was 1 in 4 and the coal was hard.

Main Intake Airway: This airway is being enlarged and the timber supports replaced by concrete legs and steel bars.

Crow's Nest Section: Working places in this section are being connected with the abandoned No. 1 South Section. It is proposed to continue one of the working-places to connect with the under-cast, which passes under the main intake airway. Later this can be used as a return airway for this side of the mine.

Plant: Rotary coal-boring equipment was installed throughout the mine.

Twenty-eight men were employed on the surface and 164 men underground at this colliery.

Blackball Creek Colliery (Balderstone and Party), Blackball (W. Balderstone (Underviewer), Mine-manager).—Pillar splitting and extraction was continued. One man was employed on the surface and 8 men underground.

Briandale Collieries, Ltd., Ten-mile Creek (T. Howard (First Class), Mine-manager).—One pair of miners continued development work in a seam containing stone bands.

Four men were employed on the surface and 2 men underground.

Wallsend State Colliery, Brunnerton (J. Cunningham (First Class), Mine-manager).—No. 1 Section: Pillar-extraction was continued in this section, which was nearing completion near the end of the year.

No. 1A Section: This is an abandoned section which was reopened during the year with a view to extracting pillars.

Rise Workings Between Shaft and Tyneside: This abandoned section was reopened for the purpose of surveying to determine the exact position of Wallsend workings in relation to Tyneside workings.

Old No. 2 Section: Dewatering was continued.

No. 1 Slant Dip: Pillar-extraction was continued. This section is nearing completion.

No. 2 Slant Dip: Pillar-extraction was continued. Pillar extraction in Extension Section and B Section was completed, and extraction is now confined to haulage roadside pillars.

Six Box Section: This section is being reopened with a view to pillar-extraction.

A storage bin at the surface was repaired and new plant installed to deal with the output.

Thirty-two men were employed on the surface and 133 men underground.

Dobson State Colliery, Dobson (C. D. Buist (First Class), Mine-manager).—Fifth West Section: Development work was continued in a seam 12 ft. thick. Extension of this section to the west is limited by a fault. Underground drilling has so far failed to prove the seam beyond this fault.

No. 2 Dip Section: Development work was continued to the dip and the rise. The grade of the seam was uniform and the coal of good quality.

No. 1 Dip Section: This section was developed by two crosscut dips in a very steep seam of irregular grade. The faces of two crosscuts are now at 1,700 ft. below sea-level and 80 chains away from bore No. 254, which has reported 13 ft. coal.

Viaduct East Section: Three pairs of miners were developing a very disturbed seam with steep grades. Development work to the south-west is proving an excellent seam, whilst development to the south-east shows the seam to be more steeply inclined and irregular.

A new deputies' change house and official's office was erected near the mine mouth. Renewals and renovations were carried out to the main bathhouse.

Forty-two men were employed on the surface and 193 men underground.

Paparoa State Colliery, Roa (D. Mackay (First Class), Mine-manager).—Aerial Section: Work throughout the year mainly consisted of reopening old roadways and pillar-extraction. A stone drive from the mouth of the Aerial Mine was extended towards Waterfall Creek Section. This is later to be used as a haulage road from Waterfall Creek Section. It is proposed to use a battery locomotive along this haulage road. The fan was removed to a new site, producing an increased volume of air in the mine.

West Section: Work throughout the year was mainly on reopening old roadways and pillar-extraction. The high-tension line from Middle Flat to Soldier's was completed and the power connected to the West Section fan.

Twenty-four men were employed on the surface and 60 men underground at this colliery.

CO-OPERATIVE MINES IN GREY DISTRICT

Spark and Party's Mine, Rewanui (E. Cowan (Underviewer), Mine-manager).—All the output was obtained from pillar-extraction.

Two men were employed on the surface and 8 men underground.

Old Runanga Mine (O'Brien and Party), Rewanui (E. W. Kennedy (Underviewer), Mine-manager).—The output was won from pillar-extraction on the rise side of the main haulage level. The face of this level was stopped within 2 chains of a bore in which is reported 5 ft. coal.

Two men were employed on the surface and 7 men underground.

Moody Creek Mine (Wright and Party), Dunollie (R. K. McTaggart (Underviewer), Mine-manger).—The output was won from pillar splitting and extraction. A new return airway was connected to the surface and a fan installed. One man was employed on the surface and 8 men underground.

Goldlight Mine (Williams and Party), Rewanui (A. Crawford (Underviewer), Mine-manager).—Pillar-extraction was continued throughout the year and a high extraction under good roof conditions was obtained. One man was employed on the surface and 9 men underground.

New Point E. Party's Mine, Dunollie (J. H. Jackson (Underviewer), Mine-manager).—The output was won from pillar-extraction. It is expected that this mine will be abandoned in 1950. One man was employed on the surface and 5 men underground.

Kiwi Mine, Ten-mile (R. Scott (First Class), Mine-manager).—This party was engaged mainly on development work throughout the year. One man was employed on the surface and eight men underground.

Boote and Party's Mine (Kaye and Party), Ten mile (R. E. Laing (Underviewer), Mine-manager).—Pillar-extraction was continued throughout the year. It is expected that this mine will be abandoned in 1950. One man was employed on the surface and 2 men underground.

Hunter and Party's Mine, Dunollie (N. Forsythe (First Class), Mine-manager.)—All the output was won from pillar-extraction on the rise side of the haulage road, a high extraction being obtained. One man was employed on the surface and 9 men underground.

Schultz Creek Mine (H. Gould and Co. Ltd.), Twelve-mile (W. J. Beeby (Permit), Mine-manager).—Pillar extraction was continued in a seam 3 ft. thick, a high extraction being obtained. One man was employed on the surface and 2 men underground.

Cliffdale Mine (Stuart and Party), Ten-mile (W. Boyle (Deputy), Mine-manager).—Pillar-extraction was continued throughout the year. An excessive amount of water was entering the mine, making pumping costs high. It is expected that this mine will be abandoned in 1950. Two men were employed on the surface and 5 men underground.

Bellvue Mine, Rapahoe (J. Allen (Underviewer), Mine-manager).—One pair of miners continued extracting pillars in the West Mine. Part of the seam had to be sealed off owing to fire. Very little coal was lost. In the East Mine the output was obtained from development work in a seam 10 ft. thick. This party is working the James seam. The floor of the seam is undulating and the coal hard. One man was employed on the surface and 9 men underground.

Jubilee Mine (Tinning and Party), Rapahoe (J. Tinning (Deputy), Mine-manager).—Pillar-extraction was continued on the rise side of the horse haulage road. The hard roof allowed a high percentage of extraction. One man was employed on the surface and 7 men underground.

Coaldale Mine, Rapahoe (E. W. Broad (Deputy), Mine-manager).—Mining operations at the old mine were abandoned during the year. A new mine is being opened up adjacent to the Bellvue lease. A drive has been put into the seam for about 2 chains. Two men were employed on the surface and 2 men underground.

Cliffside Mine (Moore and Party), Nine-mile (R. McTaggart (Underviewer), Mine-manager).—Pillar-extraction was continued in a seam about 10 ft. thick. Two men were employed on the surface and 6 men underground.

Braehead Mine (Boote and Party), Dunollie (G. H. Gaskell (Second Class), Mine-manager).—Pillar-extraction was continued on both sides of the main dip. The seam is now free of stone bands and the percentage of coal recovered was increased. A new drive from the horse haulage road was being driven in a southerly direction to strike the seam approximately 50 ft. above the one now being worked. One man was employed on the surface and seven men underground.

Harrison and Party's Mine, Ten-mile (J. Cowan (Second Class), Mine-manager).—Development work was abandoned in a thin seam with stone bands. Pillar-extraction was commenced and continued throughout the year. Bad roof conditions made pillar-extraction difficult. One man was employed on the surface and 6 men underground.

Exhibition Mine (Hassan and Party), Eight-mile (P. Hassan (First Class), Mine-manager).—All the output was won from development work in a seam adjacent to the old James Mine workings. Owing to unfavourable mining conditions the drag-line loader is not now being used. One man was employed on the surface and 6 men underground.

New Aerial Mine, Ten-mile Creek (L. Jones (Permit), Mine-manager).—The output for the year was obtained by development work in an 8 ft. seam which is on the north side of Ten-mile Creek. The coal is lowered on aerial ropeway to Briandale locomotive road. Two men employed on the surface and 2 men underground.

Harries and Party, Rewanui (J. M. Williams (Second Class), Mine-manager).—Development work was continued in two levels and crosscuts on the dip side of Hunter and party's workings. Towards the end of the year indications were that the levels were approaching the thicker seam in Hunter's Mine. One man was employed on the surface and 5 men underground.

REEFTON DISTRICT

Alborn's Mine (V. W. Alborn), Capleston (N. R. Alborn (Deputy), Mine-manager).—During the year mining operations were restarted and the main dip extended for 3 chains. The seam is about 12 ft. thick of hard coal. One man on the surface and two men employed underground.

Alborn's Mine (Creek Section), Capleston (R. V. Alborn (First Class), Mine-manager).—Production was confined to pillar-extraction in No. 4 vertical seam in Burke Creek, Boatmans. This coal is transported from the working-places to the bins by fluming. The seam varies in thickness and the coal is friable. One man was employed on the surface and 3 men underground.

Kleen Mine (Archer Bros.), Capleston (P. McCormack (Deputy), Mine-manager).—Development work was continued in two parallel levels and a connecting rise to the north and south of the stone drive. This is a vertical seam about 16 ft. thick. Five men were employed underground.

Coghlan's Freehold Mine, Capleston (J. J. Coghlan (Deputy), Mine-manager).—Pillar-extraction was continued throughout the year. Owing to a gob fire a section of the seam was sealed off. One man was employed on the surface and 3 men underground.

New Imperial Mine (Coghlan's Lease), Capleston (A. Thompson (Deputy), Mine-manager).—All the output was won from pillar-extraction. One man was employed on the surface and 3 men underground.

Hillcrest Top Mine (Melbom and Party), Waitahu (E. P. Melbom (Deputy), Mine-manager).—pillar-extraction was continued throughout the year. Roof conditions were good and a high extraction was obtained. Two stoppings that were erected are still holding the outcrop fire from advancing into the mine workings. Five men were employed underground.

Waitahu Colliery Party (Murcott and Party), Waitahu (S. W. Fairest (Deputy), Mine-manager).—Production was obtained mainly from development work. As the workings advance the seam becomes thinner, so that it is now 5ft. thick at the face of the main level. Bad roof and heavy crush made timbering costs high. Some coal was also produced by the reopening of an abandoned mine at a higher level. One man was employed on the surface and 7 men underground.

Burke's Creek State Mine, Reefton (J. Rarity (First Class), Mine-manager).—The output was obtained from development to the north-east of the main dip. This work had advanced, and stopped on the boundary of the Bayne area. The rise side of the main level was being developed. The main dip was extended 24 chains from the surface and stopped in good coal. The levels driven off this dip are now being used for water-sumps. On the north-west side of the dip a pair of levels was being extended. Excessive crush was experienced on this side of the mine. The main return airway was continued being enlarged. Bores were put down ahead of the main dip to test the continuation of the seam. A belt conveyor and vibratory screen were installed during the year. Work is being continued on the new bins and extension of the railway. Twenty-two men were employed on the surface and 71 men underground.

Morrisvale Mines (W. J. Morris), Reefton.—Pyramid Mine (G. H. Millar (First Class), Mine-manager).—Production was obtained from development work in levels and inclines on the north and south sides of the main dip. The seam was about 10 ft. thick of hard coal. The north side workings were very wet. One man was employed on the surface and 2 men underground.

Matchless Mine (D. Wight (Underviewer), Mine-manager).—Development work was continued in No. 3 seam, the coal maintaining its thickness of 6 ft. Six men were employed underground.

Welcome Opencast (W. McKenzie (Deputy), Mine-manager).—Production was maintained from the outcrop of No. 4 seam. Four men were employed opencasting.

Perfection No. 3 Mine (W. McKenzie (Deputy), Mine-manager).—A level drive was put in the seam for 3 chains. The seam is very steep and about 5 ft. thick. Development work is temporarily abandoned. Two men were employed underground.

Great Barrier Opencast (A. E. Eklund (Underviewer), Mine-manager).—During the year the boundary of the Morrisvale lease was reached by Banks and party. An agreement was drawn up between W. J. Morris and Banks and party to form the Great Barrier Syndicate, which is now operating on the Morrisvale lease. Work during the year mainly consisted of opencasting No. 4 seam. This seam is up to 40 ft. thick. Seven men were employed opencasting.

Ferndale Coal Syndicate's Mine, Reddale Valley, Reefton.—(C. Roughan (Deputy), Mine-manager).—The output was obtained from reopening old workings and extracting pillars. One man was employed on the surface and 6 men underground.

Burnwell State Mine, Reefton (R. McDonald (Second Class), Mine-manager).—In the early part of the year operations were confined to repairing the main intake airway. Later pillar-extraction commenced and continued throughout the year, gravel overburden making extraction difficult. This mine was taken over by the State on 1st May, 1949. A part of the workings was sealed off owing to fire. Previous to the State taking over, the output was obtained from development work. Seventeen men were employed underground.

Central State Mine, Reefton (T. Brazil (Second Class), Mine-manager).—This mine was taken over by the State on 19th March, 1949. During the year the main dip was repaired, the main return airway was enlarged, and the rise workings are now advancing towards the surface to obtain new outlets for intake and return airways. The output was obtained from this development work. Two levels were advanced south of the main dip. Three men were employed on the surface and 17 men underground.

Terrace Mine, Reefton (E. J. Richards (Second Class), Mine-manager).—Development work was confined to No. 4 seam to the dip of the main level. To counteract the bad effect of crush, the level roads are driven on coal floor. One man was employed on the surface and 10 men underground.

Defiance Mine (R. F. Woodbury), Reefton (R. F. Woodbury (Deputy), Mine-manager).—The output was obtained from development work. Towards the latter end of the year pillar-extraction was commenced. Four men were employed underground.

Clele Mine (Alborn's), Merrijigs (R. Bennett (Deputy), Mine-manager).—During the year operations were recommenced and the output was obtained solely from pillar-extraction. One man was employed on the surface and 2 men underground.

Nicholl's Mine, Capleston (A. Cohen (Deputy), Mine-manager).—Pillar-extraction was continued in No. 1 seam. A level stone drive was put in from this seam to find the No. 2 seam. After being driven approximately 60 ft. the stone drive was stopped and prospecting of the No. 2 seam was commenced from the surface and on the dip side of the present workings. Four men were employed underground.

Banks Opencast Mine (Eklund and Party), Waitahu (A. E. Eklund (Underviewer), Mine-manager).—Coal-production by this party on their Crown lease was completed during the year and the party is now absorbed in the Great Barrier Coal Syndicate, which is operating on the adjoining Morrisvale lease. Seven men were employed opencasting at this mine during the year.

Royal Coal Syndicate, Rainy Creek (C. N. Curtis (Deputy), Mine-manager).—Production was maintained from splitting and extraction of pillars. A jig and tram-line were put in to develop the seam at a higher level. Three men were employed underground.

Lewis and Party's Opencast Mine, Murray Creek (J. Lewis (Permit), Mine-manager).—Production was maintained by opencasting from an area which was previously worked by underground methods. This mine was closed down near the end of the year. One man was employed opencasting.

Murray Creek Opencast (Chandler's), Murray Creek (W. McCaffrey (Deputy), Mine-manager).—Production was maintained from opencasting an area previously worked by underground methods. The area for disposal of overburden is very limited. Nine men were employed opencasting.

Devil's Creek Mine (A. and W. J. McKenzie), Golden Point (W. J. McKenzie (Deputy), Mine-manager).—Pillar-extraction was continued, and the mine closed down during the latter half of the year. Three men were employed underground during the first half of the year.

Garvey Creek State Mine, Reefton (J. Lundon (First Class), Mine-manager).—Development work has reached within 30 chains from the surface. No. 4 Level was slightly below creek-level and was stopped 1 chain from the outcrop. The three levels below this were expected to pass under Morris Creek. A chain retarder conveyor was installed up the hill to deal with the coal from the proposed opencast.

South Side: No underground mining was done on this side. Blair and party were stripping the overburden on the high side of the seam preparatory to opencasting. Six men were employed on the surface and 36 men underground.

Buller District

Mitchell's Opencast Mine (Nile-Hydro Coal Syndicate), Charleston (E. Rooney (Quarry Permit), Mine-manager).—The output from this lease was obtained by opencast methods. Three men were employed opencasting.

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

Bowater and Bryan's Opencast Mines, Charleston.—The output was maintained by Rata Collieries (W. Powell, (Permit), Mine-manager), Nile-Hydro Syndicate (E. Rooney, (Quarry Permit), Mine-manager), and Glenmouat (W. Hampton (Permit), Mine-manager). The coal and overburden were removed by hydraulic means. Sixteen men were employed opencasting.

Powell's Mine, Charleston.—This opencast mine remained idle during the year.

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

Moynihan's Opencast Mine (Nile-Hydro Syndicate), Charleston.—No coal was produced from this area during the year.

Rata Collieries Opencast Mine, Charleston (W. Powell (Permit), Mine-manager).—The output continued to be obtained by hydraulic means, three men being employed.

Sinclair's Opencast Mine (Nile-Hydro Syndicate), Charleston.—No coal was produced from this area during the year.

Hillside Mine (Bennett Bros.), Charleston (R. Bennett (Deputy), Mine-manager).—A small output was obtained in the early part of the year and the mine was abandoned.

Brighton Mine (Hunter's), Brighton (W. Cairns (Deputy), Mine-manager).—The output was maintained from development work. One man was employed on the surface and 2 men underground.

Redjacket Mine (L. E. and S. T. Powell), Brighton (L. E. Powell (Permit), Mine-manager).—The output was obtained from opencast workings by hydraulic means. One man was employed.

Glencrag Mine, Buller George (J. S. Blyth (Underviewer), Mine-manager).—Pillar-extraction was continued throughout the year, 7 men being employed.

Glencrag Opencast Mine, Buller Gorge (R. Chester (Deputy), Mine-manager).—Production was maintained by opencast work, four men being employed.

Coal Creek Mine, Seddonville (R. Mulholland (Deputy), Mine-manager).—In the early part of the year the output was obtained from pillar-extraction in underground workings. This method of work was changed to the opencast system, 8 men being employed.

Hydro Coal Mines, Ltd., Seddonville (E. McKenney (Underviewer), Mine-manager).—The sealed Cave Section was reopened and the output was obtained from the reopening of old roadways and splitting pillars. Two men were employed on the surface and 6 men underground.

Roger's Mine, Seddonville (R. Hollingsworth (Deputy), Mine-manager).—Output was maintained from development work in a seam 7 ft. thick with hard roof. A hydraulic sluicing system was installed. One man was employed on the surface and 4 men underground.

Charming Creek-Westport Coal Co. Ltd., Ngakawau (R. J. Wearn (First Class), Mine-manager).—Three pairs of miners were continuously employed on pillar-extraction in No. 2 West Section. Four pairs were on pillar-extraction for several months in the east side of north heading and were then removed to development work. Twenty-six men were employed on the surface and 34 men underground.

Westport-Cascade Mine, Cascade Creek—(W. Brown (First Class), Mine-manager).—The output was partly obtained from pillar-extraction in Moynihan's Section and development work in Mill Creek Section. This seam is mined by hydraulic means. Eight men were employed on the surface and 10 men underground.

Denniston State Mine, Denniston (W. Farnworth (First Class), Mine-manager).—Wharcatea Colliery—Rope End Section: Pillar-extraction was solely worked and was nearly completed.

9 Box Jig Section: Production was mainly from pillar-extration and splitting of barrier pillars.

Scottie's Section: The output was obtained from pillar-extraction and from development work in an area of 5 acres to the dip of the seam.

Kitchin's Landing: Development in the bottom seam was continued in good-quality coal 6 ft. thick, the seam dipping slightly in the direction of Forsyth's Section. A rotary drill machine was installed.

Waterloo Dip: The output was obtained from splitting and pillar-extraction. Shiftmen are prospecting the fault in the direction of a bore that shows 19 ft. 6 in. coal.

Birchall's Section: Prospecting in the bottom seam is proceeding and is showing satisfactory results in the direction of Forsyth's Section. In the top seam production was mainly from splitting and pillar-extraction.

Old Waterloo Section: Production was confined mainly to splitting and robbing of pillars. Stumps of coal were left to support surface creeks.

Extension Section: An artificial barrier was formed by a ring of concrete stoppings with a view to extracting pillars inside the panel.

Birchall's Opencast Area: An access road is being formed into this area.

Plateau Area: Surface buildings were erected preparatory to driving the stone drifts into the seam.

Cook's Lease: Prospecting work continued on this area.

Eighty-seven men were employed on the surface and 212 underground at this colliery.

Millerton State Colliery, Granity (R. Marshall (First Class), Mine-manager).—Mine Creek: Extraction of rope-road pillars was continued in the Mangatini Section with 3 pairs of miners under fairly difficult mining conditions. Floor heave was fairly prevalent and accompanied at times by heavy surface water creating difficult extracting conditions. Development was carried on in the North-east Section with 2 pairs, but towards the end of the year the seam showed a tendency to thin, being as low as 4 ft. 6 in. in places. Good results were obtained in Pollock's Level by 1 pair extracting in good high coal.

Old Dip: Four pairs were engaged in the Settlement Section extracting in high coal and 3 pairs in the Lower Old Dip, also extracting. During the year trouble was experienced in the Lower Old Dip area by a fire which has been burning for many years eating its way over a line of concrete stoppings. Another line was started, and towards the close of the year was nearing completion.

Surface: The scheme of improvements for the modernizing of the bathhouse was finalized and is working to satisfaction.

A new 6 in. water-line was installed from a dam situated below Millerton Township to the screening plant and work-shops, all of which are operated by water power.

One new cottage was built in Granity by the mine carpenters, to be used by a surveyor.

Fifty men were employed on the surface and 79 men underground at this colliery.

Stockton State Colliery, Ngakawau (G. Gilbert (First Class), Mine-manager).—Fly Creek Mine: Operations were confined solely to pillar-extractions in the South area, in very wet conditions. In the old East the remainder of the outcrop coal was lifted and preparations completed for the coal-bin for the hydro scheme. On the surface a short tunnel was completed and pipes laid to convey water from the Plover Creek Dam, a distance of 670 yards, to the old fire area.

In the old mine a prospecting drive was driven from the outcrop into the old No. 4 area, skirting the old pillared ground, to ascertain the quantity of coal which could be recovered and flumed to the outcrop.

Webb Mine: Development continued satisfactorily. Three main headings have penetrated a distance of 61 chains from the mine entrance in excellent coal. No. 1 North Dip heading was abandoned in inferior coal at a point 14 chains from the main heading. In the old mine 3 pairs are extracting pillars.

Webb Mine Extended: Lorry road and bin-site about completed. Preparations under way to start the stone drive to the seam.

Opencast: Production during the year was fairly satisfactory. A large face has now been opened up on the main area. With the new equipment (now being assembled) in use, a large regular output should be easily maintained.

Boring has been continued at 200 ft. centres over a very large adjacent block, proving well over 4,000,000 tons of excellent coal within opencast range.

Paine Bros.' Mine, Buller Gorge (N. B. Paine (Underviewer), Mine-manager).—Production was maintained by opencast methods and from one underground drive. The ratio of overburden to coal has increased. Nine men were employed opencasting.

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

Heaphy's Opencast Mine, Buller Gorge (L. Heaphy (Permit), Mine-manager).—The output was maintained solely by opencasting. Four men were employed opencasting.

Nelson District

Owen Colliery (Seymour), Owen River (C. Taylor (Underviewer), Mine-manager).—The output was obtained from pillar-extraction in a panel on the rise side of the main horse level. The seam maintained its thickness of 1 ft. 6 in. bottom coal, 1 ft. dirt, and 1 ft. top coal. One man was employed on the surface and 9 men underground.

Six-Mile Mine (J. Gillespie, Murchison) (T. Hill (Permit), Mine-manager).—The output was won from pillar-extraction. Mining operations ceased during the latter half of the year. One man was employed on the surface and 2 men underground.

Strathmore Mine (Dickson and Closs), Glengarry, Murchison (J. S Dickson (Permit), Mine-manager).—The output was obtained solely from pillar-extraction. Two men were employed underground.

Murchison Collieries (Downie Bros.), Murchison (L. B. Hawthorn (Deputy), Mine-manager).—The output was obtained solely from development of the vertical seam. The seam continues to vary in thickness from a few inches to 7 ft. 6 ins. A new compressor and compressed air boring-drills were installed. One man was employed on the surface and 3 men underground.

Westhaven Mine (G. and A. H. Wynn), Mangarakau, Collingwood (A. H. Wynn (Deputy), Mine-manager).—The output was maintained from development work on the left side of the crosscut. Two men were employed on the surface and 4 men underground.

Whaririki Mine (D. R. and H. H. Trewavas), Puponga (W. Hansen (Deputy), Mine-manager).—The output was obtained by developing the dip in an easterly direction and levels to the north and south of the dip. The dip was down about 4 chains from the surface. The seam was 4 ft. bottom coal, 9 in. stone, 1 ft. top coal. One man was employed on the surface and 2 men underground.

Fatal Accidents

Two fatal accidents occurred during the year:—

On 27th April, 1949, John McLaren, deputy, Liverpool State Mine, whilst firing a shot in H. Pattinson's place, No. 2 Bank, met with an accident which later proved fatal. The vibration from the shot fired in the top coal caused approximately one box of coal to fall from a height of 8 ft. off back coal on the high side on to the position the shot was fired from, slightly injuring H. Pattinson and gravely injuring J. McLaren, who later succumbed to his injuries.

On 5th July, 1949, Ernest Albert Smith, miner, Jubliee Co-operative Mine, was fatally injured when buried by a fall of stone in his working place.

Serious Non-fatal Accidents

Nine workmen were seriously injured during the year:—

On 7th February, 1949, C. Donnell, trucker, Strongman State Mine, sustained severe injuries to his right leg, which was later amputated at the hospital. He was struck by a fall of roof stone in No. 2 North Section.

On 20th April, 1949, P. Halkett, hewer, Glenmouat Opencast Mine, received a broken left leg near the ankle. He was engaged barring down a piece of coal 13 ft. from floor-level in a seam 26 ft. thick having 12 ft. overburden above a large stone resting on loose coal approximately 20 ft. from floor-level. The stone came away and split in two pieces, one of which caught Halkett.

On 17th May, 1949, Charles Pinn, miner, Moody Creek Mine, whilst working in a level which had just struck the fault, was picking at the face when a piece of coal weighing approximately 3 cwt. came away from the top side rib near the fault, and in trying to dodge the coal he slipped and was struck on the side. His injuries consisted of fractured right pelvic bone, right ankle, right elbow, and dislocation of right wrist.

On 17th May, 1949, R. J. Wallace, trucker, Wallsend State Colliery, slipped and fell whilst greasing rollers on the extension rope and sustained a simple fracture of left wrist.

On 4th July, 1949, H. Raich, miner, Blackball State Colliery, sustained a fractured right leg below knee and slight bruises to the side when a piece of stone fell from the roof and rolled towards him when clearing a place to set a prop.

On 4th October, 1949, M. Buckley, shiftman, Strongman State Colliery, after assisting the ropeboys to send coal away on top of the hill at Rapahoe, was walking back when he stepped on a loose sprag lying between the two roads and fell heavily, sustaining a fracture of both bones of the left leg just above the ankle. It seems that, as he fell, his left leg swung out and struck the buffer of a passing full skip. This blow may have caused the actual fracture.

On 6th October, 1949, Cliff Bishop, miner, Burnwell State Mine, whilst raising a bar by means of a screw jack, suffered a crushed and compound fracture of right foot, necessitating amputation of middle toe. The accident was caused through the screw of the jack being screwed right out of the nut. The spring of the timber being jacked up projected the detached piece of the jack on to Bishop's foot.

On 17th November, 1949, A. Picken, trucker, Strongman State Colliery, fractured a small bone in the back when a lump of coal slipped down between the laths of two sets and struck him on the back.

On 9th December, 1949, W. Long, trucker and winch driver, Dobson State Colliery, was operating a small Holman air winch (about 5 h.p.) when, it is assumed, he took hold of the rope to make it book better while in motion. In the process his arm became caught and was taken round the drum of the winch. His injuries consisted of fractured forearm (radius and ulna bones) and loss of the tip of the middle finger, right arm, and lacerated wound above elbow.

DANGEROUS OCCURRENCES IN COAL-MINES (REGULATION 81, COAL-MINES REGULATIONS 1939)

Kiwi Mine, Ten-mile.—On 3rd February, 1949, the manager reported that a heating had developed in the goaf adjacent to where pillars were being extracted. The affected area was sealed off by board and brattice stoppings plastered with a mixture of cement and stonedust.

Blackball Mine, Blackball.—On 5th February, 1949, a heating was located in the gob where pillars are being extracted in the Sump Dip district. The area was sealed off.

Liverpool State Mine, Rewanui.—On 23rd February, 1949, an outburst of gas due to a blower occurred in a developing level off the inside panel bank, Morgan East Dip. Three pairs of miners were withdrawn and the area was sealed off.

Liverpool State Colliery, Rewanui.—On 12th May, 1949, a slight heating was discovered in the top panel, Morgan East Dip, and it was found necessary to isolate the heating by permanently sealing the panel. Approximately 1,500 tons of coal were lost and one working-place.

New Imperial Mine, Reefton.—On 16th August, 1949, the mine-manager reported having discovered a heating over a small area in Grigg's worked-out section. There was no danger to the New Imperial workings.

Burnwell State Mine, Reefton.—On 17th August, 1949, the District Manager, State Coal-mines, Reefton, advised that a heating had been detected in a level adjacent to the foot of the main jig. The smell was strong and carbon monoxide was detected at the top of the fall. Sealing was carried out.

Central State Mine, Reefton.—On 2nd September, 1949, warmth was noticed in an old fall on what is known as Clark's Level, the heating being very deep-seated in this fall. A temporary board and brattice stopping was erected which was later replaced by a permanent stopping.

Millerton State Mine, Granity.—On 13th September, 1949, it was found that coal over a fire stopping in the Old Dip Mine was very hot. The stopping itself was in good condition. Another preparatory stopping had been built about 5 yards away. As it was not practicable to do anything further to the fire stopping, it was decided to seal off at the doorway of the preparatory stopping. Work will be continued in this area to build two further stoppings or dams 3 ft. thick and to add another 2 ft. to the preparatory stopping, thus making it into a dam that will hold a small head of water. As these stoppings are all to the dip of the rope road, it is the intention of the management to flood these with water when the dams are completed.

Burnwell State Mine, Reefton.—On 7th October, 1949, a leakage, including carbon monoxide, was detected at a recently erected stopping adjacent to main jig bottom. This stopping was fastened up next day.

On 10th October, 1949, heating was detected in a fall in rise workings, which were sealed off by the following day by two board stoppings. A further heating occurred on 12th October, 1949, when smoke was detected coming from the fallen area at the inbye end of the main level. As a precautionary measure this area had been enclosed by stoppings, and on smoke being detected the intake and return stoppings were closed up. On 18th October, 1949, the District Manager advised of an incipient heating inbye from the previous ones in a roadway on the low side of main level, and it was proposed to load out this fall.

Central State Mine, Reefton.—On 18th October, 1949, it was reported that an incipient heating was suspected in a fall in main return level. As no alternative airway was available, a road was being laid into it from the return side.

PROSECUTIONS UNDER COAL-MINES ACT, 1925

On 20th January, 1949, a mine-manager was charged with breaches of shot-firing regulations. The charges were laid under Regulation 225 (4), 226 (*b*), and 226 (*c*) of the Coal-mines Regulations 1939. The charges under Regulations 225 (4) and 226 (*c*) were withdrawn and the charge under Regulation 226 (*b*) was proceeded with, the charge being that he did employ unqualified persons as shot-firers in the stone drive of his colliery. A plea of guilty was entered, and a conviction and fine of £1 with costs 10s. recorded.

On 20th January, 1949, two workmen were charged with breaches of shot-firing regulations. The charges were laid under Regulations 225 (4) and 226 (*c*), Coal-mines Regulations 1939. The charges under Regulation 226 (*c*) were withdrawn in each case and the hearing proceeded with under Regulation 225 (4), the charge in each case being that an unauthorized person did fire shots electrically in the colliery. Conviction and fine of £1 with 10s. costs were recorded in each case.

On 16th March, 1949, a trucker was charged under section 144, Coal-mines Act, 1925, that being a person employed in the mine as a jig operator did negligently omit to take reasonable precautions to see that the jig was clear and allowed a full box to go over the jig. A conviction and fine of £1 and 10s. costs were recorded.

On 14th June, 1949, a colliery proprietor was charged with breaches of sections 145 (1) (*b*) and 59 (4), Coal-mines Act, 1925. The defendant was fined £2 on each of the charges.

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

CANTERBURY DISTRICT

All mines in this district, with the exception of Klondyke, are operating with 8 men or less, and the managers of all but three of the mines are the holders of deputies' certificates or permits.

Acheron No. 1 Mine (Anthracite), (T. J. Todd (Deputy) Manager).—Development has been to the dip with levels to the south; a dolerite zone encroaching from the north requiring the dip roadway to be deflected some 40 degrees to the south.

The seam in the lowest level is 9 ft. in thickness of good-quality anthracite, but a section of barren ground to the south limits development in these levels to 7 chains.

Prospecting to the south, by driving and boring from the face of Level No. 4, proved fruitless and dip extension cannot go much farther owing to the igneous intrusion to the north. With the wash-out to the south gradually narrowing the area, extraction of the pillars must soon commence.

Acheron No. 2 Mine (Anthracite), (J. W. Marsh (Deputy), Manager).—This small block, with a seam 7 ft. in thickness of good-quality anthracite, was fully developed early in the year. Pillaring has commenced and has given good results, but the life of the present mine is very limited.

Bonanza Mine (D. McQueen (Deputy), Manager).—Development of an intermittent nature continued with a pair of levels, the seam being 6 ft. in thickness and at an inclination of 25 degrees, with roof fairly good and the coal of excellent quality.

The area to the rise of the adit is small and this drive has reached outcrop after being projected through the knoll. Pillaring from this point recently commenced.

As the road boundary is adjacent to and parallel with the adit, the area to the dip is limited to a strip 4 chains wide and the life of the mine, even with its small output, is short.

Victor Mine (V. L. Davies) (Deputy), Manager).—Dip development and the opening-out of a further two levels has been undertaken.

To the south-west the upper level at some 6 chains from the dip roadway encountered a split in the seam with 6 in. to 12 in. of very hard stone, and further development will be confined to the upper 6 ft. of the seam.

Further dip extension should give adequate cover for the north-east levels to pass safely beneath the gully, and this will offset the stone intrusion encroaching from the south.

The seam of approximately 10 ft. in thickness is highly inclined—60 to 70 degrees—with the coal generally of good quality, but the split referred to makes the coal beneath the stone band unprofitable to work, as the quality of this layer is poor.

Malvern Mine (A. Taylor (Underviewer), Manager).—Development by extension of the new dip at a grade of 1 in 3 continued on double shift until the lowest level of the old mine was struck.

Meanwhile pillar-extraction with excellent results continued in the old mine in a section to the rise of the adit, the seam being almost vertical, 6 ft. in thickness and of hard quality, producing a high percentage of screened coal.

During the year a 30 h.p. Diesel-driven, direct-current generator, 230 volts, and an electrically-driven winch and fan have been installed; while armoured cable and electric pump underground provide for drainage, the amount of water now that the old workings have been unwatered is small.

This mine is being well developed and equipped, and within a few months should be able to increase its output considerably.

Manuka Point Mine.—This small concern, employing 2 men, ceased operations in July, after about three months' work in the first part of the year. The area available from the present adit is very limited, while the highly inclined seam, 4 ft. to 5 ft. in thickness, is of shaken coal adjacent to the outcrop, and the future of the mine is doubtful.

Burnt Hill Mine (R. Rae (Permit), Manager).—A small concern of the Bush Gully class, it is unfortunate that the area is limited to a pair of levels 9 chains in length piercing a spur and restricted area to the rise, where the highly-inclined seam, 5 ft. in thickness, outcrops.

While the area contains the larger seam worked in adjacent mines, the sub-lease granted to Rae Bros., the party operating the mine, restricts development to this small seam, and it is unlikely that they will consider costly dip development for a seam of this nature.

Following the projection of the pair of levels through the hill, pillar-extraction commenced in November, and under a perfect example of systematic timbering and straight-line extraction, almost complete recovery is being obtained.

Klondyke Mine (A. Nimmo (Second Class), Manager).—Pillar work to the north has been continued and the lower levels in this direction encountered faulting crossing diagonally in front of the main dip. From the system of narrow splits, lifts, and top-coal recovery, in conjunction with passes and loading-chutes, excellent results are obtained.

Development with levels Nos. 9 and 10 to the south has continued satisfactorily. No. 10, the bottom level, has been driven 10 chains from the main dip, while No. 9 Level has advanced to a point some 18 chains from the dip.

By rising from No. 9 Level adjacent to the face and from two intermediate levels to connect with the surface at a suitable point chosen for the new screening plant, the manager has commenced to establish the future main haulage roadway, which will offset faulting crossing diagonally in front of the original dip.

During the year additional electric equipment has been installed to introduce power-drilling at the faces and auxiliary fan face ventilation, which has been operating for some months.

Lucknow Clay-pit (W. G. Smith (Deputy), Manager).—The last pillars were extracted from the old mine on the north side of the gully early in the year, and the men transferred to an open cut, where two seams of fireclay were worked for some time.

Meanwhile a cross-measure adit was commenced a short distance farther to the south, a road extension was formed, and bins erected.

A pair of levels is now being driven to the seams of clay which are 5 ft. in thickness and at an inclination sufficient to enable passes to be used from the companion level and rises to the surface to be driven.

Steventon Mine (H. J. Robb (Underviewer), Manager).—Operations have been solely pillar-extraction, retreating from the dip on a narrow width, the main seam, 6 ft. in thickness, being worked by a system of splitting and lifts. A 3 ft. fireclay-sandstone layer is dropped and the 3 ft. top seam is mined as top coal immediately behind the retreating face in the lower seam.

By this system and by using steel chutes or boxes on a grade just sufficient for the lumpy coal to slide when assisted slightly, ideal face transport to the trucking road immediately below is provided, and excellent recovery made.

The retreating pillar line has now reached No. 7 Level, at which point the width of face increases and the goaf is filling with water closely behind, with floor heave very prominent.

Mount Somers Mine (R. R. Beckley (Deputy), Manager).—In the early part of the year pillar work ceased for a period, and development continued in a narrow strip between two parallel faults. This area looked promising, but later the quality deteriorated with increased dross, while the fault swung to cross the heading.

The stony band to the east of the horse-road was pierced and development continued in good coal, but the distance to the boundary, 7 chains, limits the area available, as faulting crosses to the north.

An application has been made for the adjoining area, and extension of the present workings to win this coal is the logical course, as low-level drainage through the present mine is assured. Otherwise a new dip drive involving pumping during the life of the mine would be necessary, and the area does not warrant this expenditure.

Pillar-extraction was resumed later in part of the mine adjacent to a fault, with good results.

Early in May the manager reported heating in the goaf of the previously pillared section. This was effectively sealed with five concrete stoppings and has given no further trouble.

Blackburn Mine No. 1 (L. Workman (Deputy), Manager).—Work ceased in this mine towards the end of March, and the small section of pillars to be extracted is held as a reserve, the section in the meantime being sealed, and the men accommodated in No. 2 Mine adjoining.

No. 2 Mine: Development continued satisfactorily in a northern direction, and following the piercing of the knoll by the main heading a small area at the extreme end was stripped by bulldozer, but owing to difficulty in keeping the coal clean, opencast operations were abandoned.

Development in this isolated block is nearing completion, and pillar work recently commenced adjacent to the face where opencast work was tried.

The seam averages 11 ft. in thickness of good clean coal, and mining conditions are ideal with the exception of frequent variation in the strike bearing; the inclination is, however, a very moderate one.

Woodbank Mine (Albury), (J. H. Smillie (Deputy), Manager).—Extension of the main dip a further 100 ft. to give another pair of levels to each side has been undertaken, and in these places development has been pushed on under satisfactory conditions and on an approved system, with a barrier maintained against the sealed area to the rise.

Places are being worked to a parting 6 ft. from the floor, leaving 3 ft. of top coal.

NORTH OTAGO DISTRICT

Willett's Mine (M. H. Wilson (Permit), Manager).—Operations are solely pillar work, good extraction being obtained from splitting and lifts, with the goaf closing fairly tightly behind the retreating faces.

The seam is from 8 ft. to 10 ft. in thickness, of good hard coal in two well-defined layers with a mid-parting, and the upper and lower parts of the face of different texture.

Airedale Mine (J. H. Nimmo (Deputy), Manager).—Development has been to the south-east, where the faces, after passing through a zone of soft coal below a surface depression, entered an area of good coal.

Places are driven narrow with the roof arched, a thin lens of fireclay taking the place of the usual good parting, approximately 6 ft. from the floor of the seam.

To simplify haulage, a new roadway from a point adjacent to the faces is being driven diagonally to connect with the South Dip road near the brow.

St. Andrew's Mine.—Early in the year the men were transferred to Airedale Mine—under similar ownership—to advance development more rapidly, and the remaining small section of pillars is being kept as a standby to meet trade and mining irregularities, the goaf being sealed in the meantime.

Ngapara Mine (C. J. M. Nimmo (Permit), Manager).—The work has been confined to pillar-extraction, from which, by a safe system of narrow splits and lifts, simultaneously with recovery of top coal from this 24 ft. seam, good results are obtained. A close sand-packed goaf closely follows the retreating faces.

Rockdale Mine (Herbert), (D. Gaudion (Deputy), Manager).—Development has continued with a pair of narrow headings to the south after deflecting to the west of Marshall's old workings.

The seam is 12 ft. in thickness, but the upper part is patchy with stone present, and the height of working-places is approximately 8 ft., with regular 60 ft. pillars formed.

Shag Point Mine (A. K. McLean (Underviewer), Manager).—The recovery of the old dip roadway was persevered with, and in September the mine had been completely unwatered.

Where development ceased by the former owner in 1940, the lower workings were found to be in fairly good condition with the seam 8 ft. in thickness and a hard sandstone roof.

An inspection of the lower levels revealed conditions and thickness of seam to coincide with information given by the previous owner. This was unfortunately the only part of the mine that did so, or conformed with the plans, with the result that the recovery job was an arduous and difficult one. I doubt whether it would have been undertaken had the true position been known.

Following the dewatering and inspection, the company had to consider the matter of a new stone drive, 400 ft., at a grade of 1 in 3½, as the circuitous exploration dip was only suitable for its purpose and as a return air-course, should the new dip be decided on.

Before this expenditure could be considered, boring was recommended, and following this drilling the driving of the stone tunnel commenced, while further holes are to be bored.

All credit is due to this company, not familiar with mining, and to the manager and men for the spirit shown with this undertaking against difficulties and uncertainties.

The mine has been well equipped with electric power for pumping, haulage, and ventilation, while an electrically-driven compressor furnishes power for pneumatic drilling requirements.

The coal is of excellent hard quality and should command a ready sale for railway and household use.

Allandale Mine (T. Graham (Deputy), Manager.)—Following prospecting for some months by W. and G. Brooke, and cleaning up of a small section of old workings, upwards of sixty years of age, in Beadle's Gully, arrangements were made to equip and develop the mine, where a clean seam of excellent coal 5 ft. in thickness with sandstone conglomerate roof was proved.

The old Allandale Township road was regraded and extended to the mine and metalled to give a reliable access, and an electric power-line erected.

The mine has been equipped with armoured cable, electric winch, pump, and lighting, while a good bin fitted with a vibrator screen completes a well-housed and serviceable plant.

Development by a dip heading is proceeding satisfactorily and three levels have been set off, with prospects looking very good.

CENTRAL OTAGO DISTRICT

Opencast operations, mainly to meet local requirements, have been continued on similar lines to those of previous years at the following pits: *Coal Creek, Roxburgh* (N. J. Harliwich (Permit), Manager); *Oturehua* (H. R. Upston (Permit), Manager); *Cambrian* (D. Jones (Permit), Manager); and *Idaburn* (J. S. Murray (Permit), Manager).

Belmont Opencast Pit ceased operations after a brief term and small output.

East Roxburgh (F. Kemp (Permit), Manager).—This mine has been at a standstill throughout the year, and no effort has been made to equip and develop the mine, either as an opencast pit or by continuation of the small amount of underground work so far undertaken.

Shepherd's Creek Mine (Bannockburn), (S. Hewison (Second Class), Manager).—In January unwatering commenced of a partly developed area to the south of the Shepherd's Creek Mine where, in April of last year, operations ceased on the completion of the last pillars. Owing to irregular power-supply and other pumping difficulties it was June before the water had been lowered sufficiently to permit of roadways being relaid and reconditioning work to be undertaken.

In July a larger pump was installed to deal with increased inflow from the saturated sand overburden. The mine had been flooded for some years, while a sand run in the lower dip had been experienced.

Following the installation of 1,000 ft. of armoured cable and a 4 in. Monoglide turbo-pump, taking 20 h.p., a steam boiler and winch had to be installed as a haulage unit, for the power available was only sufficient for pumping requirements.

Development to the south off the bottom of the dip recently commenced, and as the workings, with the exception of lower dip and level filled with sand, are in excellent condition, increased production should soon be had.

The coal is of good appearance and of a hard nature with well-defined backs and should yield a high percentage of screened coal.

Cairnmuir Mine (W. Hodson (Deputy), Manager).—A co-operative party of 3 continue to operate this mine, the seam being almost vertical and the coal of good hard quality.

Operations are now solely pillar-extraction, the area to the south adjacent to Gibson's old dip having been fully developed. On account of the treacherous nature of the measures and runs of wet sand from the hanging-wall, further development to the dip was forbidden.

By a safe system of stoping to the rise on a grade suitable to the loose sand-rill, and then retreating with a lift of top coal after leaving a bridge of coal at the upper end, good recovery is obtained.

The coal is mainly lumpy and rolls to the level below, where it is filled under a safe lip. When completed the upper bridge is blasted out to create another sand-slide to pack the goaf, and the cycle is repeated.

Otago and South Otago Districts

Barclay's Mine (Fairfield), (F. Barclay (Second Class), Manager).—A party of 3 continue to operate this mine, mainly old workings of Prince of Wales and Walton Park Mines, some of which are upwards of sixty years of age. Although the conditions of the workings look good, revealing craftmanship of the miners of bygone days, the pillars are very narrow and spontaneous heating soon follows the unwatering operations or removal of the blackdamp.

Owing to shallow overburden, difficulty has been experienced in isolating these heatings, and after further attempts to enter the Walton Park area it had to be resealed. It is doubtful if the party will persevere further with it.

To the dip towards Prince of Wales shaft the party experienced water troubles and for a time little progress could be made, but later development was continued in what was considered to be virgin country in the top seam, 6 ft. in thickness, with fireclay floor.

The intervening measures here are only 3 ft., although proved to be 10 ft. to 12 ft. in other sections, and a programme to develop the top seam with suitable barriers, and also the bottom seam off the former dip road, was decided upon, and everything looked promising.

Seepage, and water proved by boring later, revealed irregularity in the old mine plans, and after a full investigation further development was forbidden, and the party will now retreat with a system of pillaring to meet the surface conditions.

Victory Mine (Brighton), (L. Tikey (Deputy), Manager).—Development to the west encountered thinning of the seam, with gradually increasing stone bands which soon rendered the area uneconomical to work and pillaring of the section commenced with favourable results.

The seam generally is 5 ft. in thickness with variations above and below this figure, and with the system of narrow places the soft sandstone roof stands fairly well.

Development is now confined to a pair of headings advancing in a northerly direction with places to the west connecting with former development. These, on account of the measures dipping to the east, had to be stopped.

Fernhill Mine (M. Hewitson (Deputy), Manager).—Development in No. 3 Mine continued in this area of very limited extent, where the topseam, 6 ft. in thickness, is being worked by a system of narrow drives, the lower seam having been extracted many years ago, with the result that drainage by seepage is provided.

Provision has been made for protection of the road and the City Corporation water-race by suitable barriers, and pillar work is now being undertaken by a system of narrow splits and lifts from which a high percentage extraction is obtained. The life of the mine is limited to about one year.

The company has proved by boring a thick seam at Ocean View, Brighton district, on the lower eastern slopes of Saddle Hill, and development of this area will soon be put in hand.

Willowbank Mines.—No. 1 Mine (E. Edmond (Deputy), Manager).—In the early part of the year operations were mainly pillar work, with part solid to the north-east of the main dip, and retreating up the dip roadway.

Later development in the upper seam commenced off the main dip, and by means of a level drive, in the intervening soft sandstone conglomerate the main haulage now operates direct from the section, with development satisfactory.

The strike of the measures is variable and soft patches of coal are met from time to time, and on account of the thin intervening measures, development of this upper seam will have to conform with the workings of the lower one.

No. 4 Mine (R. D. Clark (Deputy), Manager).—The projection of a pair of narrow headings continued but the seam, formerly 7 ft. to 8 ft. in thickness, gradually thinned to half this amount, while development to the north-west encountered stony coal and thinning, and towards the end of the year operations were suspended. The men were transferred to the other mines to undertake more important work and to remove material from Dunnery's area, Saddle Hill, where prospecting has proved very discouraging.

Akatore Mine (Milton), (W. McDowell (Deputy), and later J. McCoy (Permit), Managers).—Pillaring continued in the old mine to the jig-head with satisfactory results, although stony coal caused the retreat to be more rapid than anticipated.

A small section was worked opencast, and off this a pair of headings has been advanced in good clean coal, the seam being upwards of 12 ft. in thickness.

Viewbank Mine (J. H. Lowrey (Deputy), Manager).—Development by a pair of headings continued off the lower part of the opencast face simultaneously with part opencast work.

Later permission was given to extract pillars from an old section to the rise of the new development subject to certain conditions. The preparation for this work was commenced, to furnish ventilation and suitable roadways, and following some solid work pillar-extraction started.

Elliotvale Mine (F. Harris (Deputy), Manager).—In January, following prospecting operations at a site 30 chains to the south-west of the old Elliotvale Mine portal, an adit was started. After driving 6 chains in excellent coal 16 ft. in thickness, it was decided to develop to the dip as the topographical features limited development on a level course to a pair of levels. The absence of power was the deciding factor for the first programme of development. A decision was made later to link up with the adit development, and a stage has now been reached where a pair of levels to each side are being worked.

The haulage road is to the full dip 1 in 7. The small amount of water made is siphoned, while an internal-combustion engine furnishes haulage. Further dip extension will require power to be installed.

The seam contains at least 16 ft. of excellent coal, and a well-defined parting at 7 ft. from the floor provides a perfect roof for the development places.

A road, ¾ mile long, has been formed and suitable gantry and loading facilities provided, and it is intended to erect screens and slack-bin.

Benhar Mine (J. Findlater (Underviewer), Manager).—Development has been to the north in the bottom seam off the end of the main dip, where uniform conditions have been present, enabling a regular and good output to be won, and with extra places established the mine reverted to single-shift coal-production.

During the year a Vale's axial-flow fan was installed to replace the former inefficient open-running type, and this, at the present speed, produces 39,000 cubic feet per minute with a W.G. of 1¼ in. and is capable of much higher quantities.

The installation of a concrete-brick overcast has enabled a two-split ventilating system to be established, which speedily clears fumes from blasting operations.

The tough nature of the coal requires a greater number of shots per miner than in working seams of a more free nature, and it is pleasing to report that the company, following a discussion on this matter, decided to install electric coal-cutting machines and drilling equipment at the faces. This plant will arrive very shortly.

The return airway has been enlarged and retimbered in part, and this mine, an example in all respects, has been maintained in its usual excellent condition.

Taradale Mine (C. D. Nicol (Permit), Manager).—Development continued towards the perimeter of old workings driven in the upper part and middle of the seam by the Taratu Co., while pillar-extraction and top-coal recovery adjacent to old workings was also undertaken.

The work at present is pillar-extraction from an area (McKenzie's) developed by the old company, from which good recovery should be possible, but the circuitous haulage road is a retarding factor, the improvement of which is well worth consideration.

Sunnydale Mine (J. G. Barclay (Underviewer), Manager).—This co-operative party carried on development in the bottom seam by a pair of headings commencing from the outcrop adjacent to the former mine, which was in the upper seam.

The area was purchased by the State for extension of the Wangaloa opencast pit, and the party ceased operations in December, arrangements having been made for them to transfer to an area unsuitable for opencast working.

Wangaloa State Opencast (G. Auld (Quarry Certificate), Manager).—Stripping operations on a large scale continued throughout the year, and the second cut has almost bared the coal-seam, while the removal of overburden from another area to the north is well advanced.

The present coal face is 22 ft. in height, of good clean coal, while the second cut stripped will give a further thickness of 10 ft., of which fully 50 per cent. is recoverable as clean coal, the remainder being interspersed with dirt bands.

The mine continued to produce an output of upwards of 250 tons daily to supply winter demands but the improved fuel situation resulted in a reduced output during the summer months.

Adequate reserves have been established for the 1950 output, and the plan of operations has been well arranged and executed.

East Coast Coal-mining Co.—Kai Point Opencast Pit (R. Stanniford (Deputy), Manager).—An output of 25 tons to 30 tons daily is being won, with the coal loaded by Diesel shovel into a portable screen and belt-loader with slack-bin attached.

The present face is 10 ft. in height, but the seam thins, with dirty coal at the extreme point of the first cut, 8 chains from the starting point.

Stripping of the second cut flanking the first, and on higher ground, has advanced sufficiently to permit of coal-production, and this should prove superior to the first.

Kaitangata Mine (W. E. Hill (First Class), Manager).—No. 2 Mine: The output has been obtained from pillar work mainly in the Electric Dip, where good extraction was obtained from the thick seam with favourable roof, with the width of face restricted to from two to three pillars.

In December the retreat reached the brow of the dip, and the area below this point was sealed.

The present work is confined to extraction around the head of the dip and a small area on the south side beyond the bottom of the stone haulage tunnel.

The seam in this latter area is about 12 ft. in thickness, with the coal of good quality. The life of this mine is limited to about six months.

No. 1 Mine: A stone drift off No. 1 tunnel has been driven to intersect the coal-seam proved by boring to lie beneath the tunnel, the result of faulting of the measures, while from the surface on the hillside a stone dip at a grade of 1 in 1 has established connection.

Development in this seam so far is not as good as expected at the outset, the coal being friable, while the thickness is irregular, roof conditions are poor, and the measures not uniform.

While driving the return in stone, a 10 ft. seam of good coal was passed through, and after driving in the seam a level stone drift from the surface has now holed and a short surface tramline on the hillside has been installed.

The seam at the intersection by the return drive was almost horizontal, which does not conform with the adjacent measures cut by the No. 1 tunnel, so its extent is very doubtful.

Summer Hill Mine (W. E. Hill (First Class), Manager).—Development has opened up a large area, the coal being generally good hard quality of this class of coal, while the thickness of seam is upwards of 40 ft.

Lensing, with a gradually thickening band of fireclay-mudstone, is present in one section, while the undulating nature of the measures restricts adherence to a plan.

Drilling Operations: No 5 Bore is being drilled alongside the coast road on the east side of the saddle, with the nature of the measures very hard conglomerate, and at the end of the year the depth reached was 440 ft.

Southland District

Opencast operations were continued with varying degrees of activity, based mainly on local requirements, at the following pits: *Costers*, now *Browndale* (G. Butel (permit)); *Raby* (D. McGregor (Permit)); *Starlight* (J. Hoffman (Permit)); *Argyle* (A. J. Hamer (Permit)); *Ota Creek* (H. G. Genge (Permit)); *Diamond Lignite* (W. H. Monk (Permit)); and *Waituna* (E. H. Chalmers (Permit)).

At *Waimumu* (S. I. Allison (Permit)), *Newvale* (R. A. Adair (Permit)), *Hedgehope* (A. Maxwell (Permit)), pits in the Waimumu district, and *Midway* (A. W. Coster (Permit)), situated at Mataura, opencast operations on a larger scale were undertaken, the latter now being worked by New Zealand Paper Mills, which company has systematically bored the area and installed heavy earthwork machinery for stripping the overburden and loading the coal at the face, but so far the installation of power drilling for blasting has not been considered.

With the exception of Hedgehope, where a transfer has been made to the new area proved by boring and situated about half a mile from the old pit, operations and conditions at the faces remain unchanged.

Boghead Mine (Mataura), (E. W. Moseby (Underviewer), Manager).—On the completion of development to the northern boundary, pillar-splitting on an approved system commenced in this area simultaneously with development in the lower south levels.

Splitting of the 45 ft. pillars is by a cross-split with places 13 ft. wide and 11 ft. high to the Pretty—a district term for a well-defined band and parting—and leaving 10 ft. to 12 ft. of top coal, with stumps 16 ft. square.

The places are arched, and in this tough lignite they do not require support, and to December three rows of pillars each way had been split with conditions perfect.

Terrace Mine (Balfour).—Operations ceased during the year and the material was withdrawn, and the workings, a small area, are flooded.

Glenlee Mine (Waikaka), (E. McGregor (Permit), Manager).—Development has been to the north-east of the former haulage road a short distance from the portal, where the first places to the east encountered outcrop coal.

Owing to a syncline these places are bearing away from the course of the previous main road, and pumping may be necessary to recover the coal in the depression.

Waimeamea Mine (Orepuki), (M. Fowler (Second Class), Manager).—In the early part of the year, operations were confined to extraction of stumps or small pillars formed by the old company to the west of the dip roadway, the seam being of hard coal 9 ft. in thickness, with a 4 in. band of oil-shale 7 ft. from the floor of the seam, which forms an excellent roof-parting.

Overlying this band of shale is a 2 ft. layer of similar quality coal with a further 9 in. strong band of oil-shale above, but the measures beyond are treacherous.

Operations during the latter half of the year have been opencast work to the west of the portal, where a strip 4 chains long by 1 chain wide skirting the Waimeamea Stream had been stripped of shallow alluvial overburden.

The reconditioning of the lower part of the dip has been postponed in the meantime, and the goaf to the west of the main dip permanently sealed.

Ohai-Nightcaps Opencast Pits.—Kaireka Coal Co. (Brazier's), (W. J. Bell (Quarry Certificate), Manager).—During the early months of the year a small output was obtained by working the upper 3 ft. layer of the seam, where extensive stripping operations had been done, but the lower part of the seam is unsaleable, and it is evident that an irregularity exists between this area and that formerly worked by Braziers, less than 20 chains distant, where a 24 ft. seam with a 2 ft. coal-stone band in the middle was present.

Black Diamond State Opencast (M. Dixon (Deputy), Manager).—A good and regular output has been won from this opencast pit, where an extensive stripping programme has been continuously operating.

The second large cut has bared the coal-seam 30 ft. to 35 ft. in thickness at the front of the cut to furnish adequate reserves, and when completed this cut, 2 chains wide by 10 chains long, will provide 100,000 tons reserve.

The over-measures immediately above the coal-seam to the rear of this second cut are soft sandstone, which requires blasting, and a rotary drilling plant is engaged systematically boring this layer.

The stripping of the third cut commenced towards the end of the year, an extensive job, as the overburden is 150 ft. in thickness in parts, but good and adequate earthwork plant is provided, and coal reserves are well in advance of requirements.

Ohai Coal Co's Opencast (J. W. McKenzie (Underviewer), Manager).—For the first half of the year operations were continued in the main face with good results, while the stripping of an area adjacent to the old Black Lion Mine beyond the ridge was undertaken.

Following the commencement of coal-production from this new area an extensive stripping programme, with two tournapulls, three bulldozers, and a carryall was instituted at the main face, on the second cut flanking that previously worked along the fault upthrust.

By the end of the year the coal-seam had been bared at the front of the cut to furnish adequate reserves for production to resume when the new area has been worked out, a matter of three months time.

In the main area the seam is 30 ft. and upwards of clean coal, and where worked by the first cut along the outcrop is at a grade of 1 in 1.

Star Opencast Section (State Mine).—From this opencast section, on the flat adjacent to the Star Mine, a good and regular output has been maintained, the seam at present being 8 ft. in thickness, of excellent quality.

Beyond a small upthrust flanking the present face, a second area, 5 chains by 4 chains, is stripped in readiness, with the seam here 14 ft. in thickness, and arrangements are being made to shift the Star Mine auxiliary surface haulage, to permit of the extension of the present cut at the opposite end.

Mossbank Mine (A. E. McMillan (First Class), Manager).—No development work has been done, operations being confined solely to pillar-extraction from the dip, with the line of face maintained immediately in advance of water which is flooding the goaf, this being mainly surface water controlled to suit the desired submerging level.

Linton Nos. 1 and 3 Mines (A. Colligan (First Class), Manager).—In Sections 7 and 8, No. 1 Mine, pillar work has continued throughout the year.

No. 10 Section; Development continued to the south-west, with the main levels, for a distance of 10 chains. Headings and gallery have advanced 6 chains to the south, and the formation of a panel to the south-west commenced.

No. 11 Section: Headings and gallery headings have advanced 6 chains to the south, and from these headings a pair of levels has been driven 2 chains to the west in the formation of a panel.

Splitting of the seam and other faulting encountered has interfered with planned development, and indications point to the faulting to the north-west being of some extent.

Adjacent to the portal of No. 1 Mine in November stripping operations commenced to work an area where heating has given trouble on two occasions from the old horse-level area, and it is intended to work this block, 2 chains of the main tunnel to a fault which crosses this roadway, from which 25,000 tons will be won, by opencast methods, and security of the mine entrance will be assured.

Linton No. 3 Mine: No. 6 Dip has been projected 12 chains to the east into Black Lion area and development continued, with faulting met to the north and south at approximately 9 chains apart.

In No. 5 Dip, pillar-extraction continued, but this later ceased in anticipation of this and No. 6 areas being considered as opencast propositions.

Wairaki State Mine Nos. 1 and 3 (F. E. Lockington (First Class), Manager).—No. 1 Mine: The slant dip to the west in an area between No. 1 workings and No. 2 Mine has been extended to a point 18½ chains from its connection with the former dip roadway, and this block between parallel faults is being developed to each side, while pillaring is ready to commence in the lower part.

The development of this block, left by the previous owners, has extended the life of this mine for two or three years.

No. 3 Mine: The level in the top seam has been extended to a point 10 chains from the main dip, in order to drive a pair of headings to the surface for future haulage and ventilation requirements. The bottom part of the section has been sealed off with concrete stoppings.

No. 5 Section: The bottom level has been extended to a point 23 chains from the main dip in good-quality coal, and No. 2 rise panel when driven approximately 6 chains to the rise in the bottom split of the seam had to be stopped owing to difficulty in keeping the coal clean from stone mixing with it.

No. 8 Section: This has extended to a point 23 chains from the main dip, the coal being of excellent quality.

No. 9 Section: The main roadway to the west side has been extended some 12 chains from the dip roadway in coal of excellent quality.

The coal in parts of this mine is of a very proud nature, with bursting at the faces and roof-guttering very prominent.

The mine development is well planned ahead, and is much in advance of present requirements.

Star State Mine (J. Lewis (First Class), Manager).—The output has been obtained solely from pillar work, with three sections operating, the coal in the lower section being of a friable nature and prone to heating, but that in the mid and upper sections is of hard, bright quality.

During the year heatings on two occasions were permanently sealed, while on three occasions minor heatings were dealt with successfully.

An electric pump installed at the foot of the main dip was a decided improvement on the former compressed-air unit.

Birchwood State Mine (J. Lewis (First Class), Manager).—Development in No. 3 Section continued on the eastern side, where the seam is 17 ft. in thickness, but faulting to the rise has been met, and stone drift has been driven to improve haulage and ventilation.

Pillar-extraction has been undertaken in No. 3 Section, with the height of coal 20 ft., and heating, which was effectively sealed in August, gave only slight interruption to this work.

A new Becander electric winch was installed to haul from No. 1 West Dip, and pneumatic drilling at the faces was introduced during the year.

Development in No. 1 Section is being constantly hampered by stone bands irregularly crossing the coal-seam in all directions.

Accidents

It is pleasing to report that there were no fatal accidents during the year.

Serious Non-fatal Accidents

On 13th January Norman Smith, a miner, forty-two years of age, married, with four children, received a simple fracture of the left tibia and fibula. Smith was engaged in forming a needle-hole preparatory to erecting a set of timber in a place 6 ft. wide by 4 ft. 8 in. in height, and while in a kneeling position a piece of damp friable sandstone the size of a loaf of bread fell on the back of the calf of his leg, causing the injury.

On 28th January Boyd Bennie, a shiftman, aged sixty-three, employed in the Kaitangata Mine, at 4 p.m. received a simple fracture of the left leg adjacent to the ankle. Bennie and mate were engaged in floor-brushing the lay-bye immediately off the dip when a box, 8 cwt., which had been spragged in each set of wheels and with a short rail-stay against the buffers, ran back about 12 ft. on a grade of 1 in 5, forcing the injured man's leg against the 9 in. step of bottoms. The 12 ft. pair of rails which were being lowered were not dogged at either end, but unfortunately the upper free end was in alignment with the fixed roadway, and the workmen evidently jarred the joint-sleeper, causing the rail back-stay to become dislodged.

On 31st January, at 2.15 p.m., Mark Lancaster, thirty-two years of age, married, with one child, while engaged in removing a drilling plant from No. 1 Tunnel, Kaitangata Mine, had his skull fractured. The plant, approximately 30 cwt., had been loaded on a flat-top trolly, and as the winch was moving away slowly on the temporary rails the trolly went off at the joint and toppled over, jamming the injured man's head against a set of timber. Lancaster had his hand against the trolly and was in a crouching position watching, while one of his mates was giving signals to start slowly, and the trolly had moved only a few feet. The grade was 1 in 5, the main road of rails 40 lb. to the yard, and the section of roadway 8 ft. high by 9 ft. wide and fitted with heavy sets. This is an instance where the use of a hard hat prevented a fatality, for the spur-wheel of the drilling plant dented the rim of the protective helmet, which was caught between the wheel and the heavy leg of the timber, the injured man's head being firmly held by the distorted hat, with the result that the skull was only slightly cracked, the well-splayed leg of the set assisting as the weight from the wheel gradually tightened.

On 7th March E. B. Andrews, a trucker, thirty-eight years of age, married, with one child, employed in the Electric Dip No. 2, Kaitangata Mine, was injured due to a large lump of coal rolling down the heap of top coal and striking the face-box. The miners had been shooting down top coal for about a week, and completed trimming the roof and commenced filling coal, the heap being approximately

30 ft. high, when a slide of loose coal occurred and a large lump came through between the timber, striking the box and turning it over on its side. The injured man had a cut on the side of the head and ear—this was later revealed as a slight crack of the skull—abrasions to shoulder, forearm, and back of hand, with a fracture of a small bone at the base of third finger.

On 4th May in No. 10 Section of the Linton No. 1 Mine, George Bryant, a miner, received a compound fracture of the lower left leg when struck by the shackle of a face jig-rope. Bryant was preparing to jig the box, had cleaned the end of the rails for the ascending tub to land, and had removed the safety chain, when the full box ran down the jig. The place was 12 ft. wife by 8 ft. high and the grade 1 in 6 to 1 in 3½ approaching the face. At the bottom of the jig, 80 ft. in length, a lay-bye with points and crossings at the out-bye end required the empty box to be shunted after the removal of the full box, and it was at this time that the full box descended. Bryant, when he observed the box depart, was concerned for the safety of the trucker, and, failing to observe his own danger, was struck by the loose end of the rope as it swung round the jig wheel, for he had ample room and time to get clear.

On 21st June J. English, a trucker, twenty-two years of age, single, and employed in Wairaki No. 3 Mine, while moving full tubs in No. 5 lay-bye, was struck by four full boxes brought out by the trucker from the inside places and knocked down, causing a fracture of one of the small bones below the right ankle.

Dangerous Occurrences

Star Mine.—The Manager advised that on 27th January a pillar fall in the top section made contact with an old place that had apparently been driven across the barrier from the worked-out section and used as a former spoil dump for a stone tunnel. A considerable volume of CO_2 was met, and after an examination of this place, not shown on the mine plans, the area was sealed off.

Mossbank State Mine.—A heating occurred in the Aylward Dip section on the 15th March, and three temporary stoppings were erected, followed immediately by permanent ones.

Barclay's Mine, Fairfield.—On 4th May the manager reported that while making his morning examination a fire stopping was found to be burned out, requiring a further six stoppings to isolate this old Walton Park section. The pillars in this area are very narrow, although the workings are in good condition, but difficulty is experienced in preventing air drawing through crevices.

Mount Somers Mine.—On 9th May the manager reported that heating occurred in the goaf adjacent to the pillar section to the west of the main heading. Temporary stoppings were erected, and on the 25th May further advice was received that five reinforced-concrete stoppings had been put in and everything was satisfactory.

Birchwood State Mine.—The manager reported that owing to a heating in the gob of the rise pillar section the area was sealed on 29th August by completing the three preparatory stoppings and erecting a further two, the mine being idle during the following day.

Mossbank State Mine.—The manager reported a local heating in No. 2 Section on 25th September. Following the application of water under pressure, conditions became normal, and no further trouble was experienced.

Blackburn Mine, Mount Somers.—The manager reported that while making his inspection on the morning of 1st November he found evidence of heating in old workings adjacent to the main cuddy-road in No. 1 Mine. The material was withdrawn and the small area yet to be extracted was sealed.

Linton Mine.—On 18th November, owing to a haze in the goaf, No. 7 Section, No. 1 Mine, the area was sealed. On 2nd December the manager reported that evidence of heating in the goaf of No. 8 Section, No. 1 Dip, No. 1 Mine, resulted in the sealing of the area on Friday, and a further report advised that the deputy while making his inspection on Sunday, 4th December, observed a slight trace of smoke leaking from the return stopping No. 8 Dip Section and the erection of concrete stoppings was started immediately.

Ohai Rescue Station

The Superintendent and teams have rendered valuable service on several occasions, and it is pleasing to report that the managers, particularly in the Ohai district State mines, make use of the rescue brigade or men on any doubtful occurrences requiring investigation.

A record of calls and services is as follows :—

14th January : Examination of fire area, Mossbank Mine, with a view to reopening this area.
19th January : Examination of a surface well, after ignition of CH_4. This was work of a private nature, and not in connection with any of the mines.
27th January : Sealing of fire area, Star Colliery, as a precautionary measure.
5th February : Establishing ventilation circuit in reopened area.
7th February : Sealing fire area, Star Colliery, as a precautionary measure.
14th March : Sealing fire area, Mossbank Colliery, as a precautionary measure.
15th March : Examining sealed area as a precautionary measure.
19th March : Erecting stoppings behind a crushed stopping to facilitate permanent sealing.
25th June : Examining fire area, Mossbank Colliery, to obtain information.
30th July : Sealing collars of two shafts in sealed area, to facilitate reventilation.
29th August : Sealing fire area, Birchwood Colliery.
6th December : Sealing fire area, Star Colliery, as a precautionary measure.

ANNEXURE B

RESCUE STATIONS: ANNUAL REPORT FOR 1949 (F. DUFFY, SUPERINTENDENT, MINES RESCUE STATIONS)

Once again I have to report that the Officers in Charge of the four main rescue stations carried out their duties in a very creditable manner, rendering valuable service to the coal-mining industry. Trained rescue brigades also rendered good service in making inspections of suspected heatings in various mines and dealing with mine fires. Due to their efforts, a fairly large amount of coal and mine plant have been saved.

The four rescue stations were kept in good order, both inside and outside. The Rotowaro and Ohai Stations were renovated during the year.

The whole of the Proto apparatus and other mine rescue equipment were well maintained.

Five complete sets of Protos, inhalator, oxygen pump, and the necessary spares were installed at the Reefton School of Mines and are kept in readiness for any emergency that may arise in that district.

All mine rescue apparatus at Liverpool Colliery is ready for any emergency.

The mine rescue vans were kept ready at all times in case of emergency calls.

DOBSON RESCUE STATION

Number of trained men on register	65
Number of team practices	65
Number of individual man practices	389
Resignations	7
Number of emergency calls	3

The following were the emergency calls received during the year:—

Central Mine, Reefton.—On 2nd June, 1949, a telephone message was received from the mine-manager requesting that an inspection be made of an area that had been sealed off due to heating. Three trained men wearing Proto apparatus made the inspection. It was discovered that some of the stoppings were leaking. These were attended to and made airtight.

Central Mine, Reefton.—On 11th June, 1949, the three rescue teams in the Reefton district made a further inspection of the fire area. After the inspection it was decided to remove one of the fire stoppings that was giving trouble and erect a new one further inbye. This was done, and by so doing it allowed a better inspection to be made of all the fire stoppings. All three teams wore the apparatus alternately until the new stopping was completed. Each team wore the apparatus for one and a half hours.

Bellvue Mine, Eight-mile.—On 7th October, 1949, the mine-manager reported that smoke was discovered in the return airway, and he requested the services of trained rescue men to make an inspection of the mine. Two trained men wearing Proto apparatus made the inspection and located the smoke coming from old workings. Three stoppings were erected and the area was successfully sealed off.

BULLER RESCUE STATION

Number of trained men on register	35
Number of men trained during the year	3
Number of resignations during year	5
Number of man practices during year	243
Call outs	Nil.

Practices and refresher courses were carried out at the rescue station and at all the large mines in the district, especially around the fire stoppings at Millerton, Denniston, and Fly Creek Mine, Stockton.

Refresher courses in first aid were also held in the rescue station in the evenings and were attended mostly by members of the rescue brigades.

OHAI RESCUE STATION

Number of trained men on register	31
Number of new trainees	Nil
Number of individual man practices	145

Emergency Calls

Star Colliery.—27th January, 1949: Sealing off fire area. Proto apparatus (precautionary).

Star Colliery.—5th February, 1949: Erection of brattice to ventilate reopened area. Proto apparatus used. Two men.

Star Colliery.—7th February, 1949: Sealing off heating. Two men with Proto apparatus (precautionary).

Mossbank Colliery.—14th March, 1949: Sealing off heating. Two men with Proto apparatus (precautionary).

Mossbank Colliery.—19th March, 1949: Erection of stopping inside fire area due to outside stopping being in crushed position. Proto apparatus used with six men.

Mossbank Colliery.—26th June, 1949: Examination of fire area to ascertain height of water used to flood area. Two men using Proto apparatus.

Wairaki No. 3 Colliery.—30th July, 1949: Sealing off ventilation shafts inside sealed area to facilitate reventilation of top workings in area No. 1 Section. Six men used Proto apparatus.

Birchwood Colliery.—29th August, 1949: Sealing off heating. Two men with Proto apparatus (precautionary).

Star Colliery.—6th December, 1949: Sealing heating. Two men with Proto apparatus (precautionary).

ROTOWARO RESCUE STATION

Number of trained men on register	57
Number of individual practices	391
Number of team practices	95
Number of emergency calls	7

The following were the emergency calls during the year:—

MacDonald Mine.—On 10th April, 1949, the mine-manager advised that a fall of coal had dislodged a stopping and smoke was coming from the inbye side of the stopping. Two stoppings were erected and effectively sealed off the fire. Five brigade men were on the job.

Pukemiro South Mine.—On 3rd May, 1949, the mine-manager requested assistance to repair a stopping in the Borehole Section. A fall of coal had broken a stopping, liberating noxious gases. Apparatus was used for two hours while a stopping was erected which effectively sealed off the area. Five members of the rescue team were on the job.

Pukemiro South Mine.—On 14th July, 1949, a call from the underviewer to complete a stopping was received. Three members of rescue team were on the job. The Proto apparatus was used for one and a half hours to complete the stopping (blackdamp being present).

Pukemiro South Mine.—On 15th July, 1949, the underviewer called for use of Proto apparatus to examine old working in a sealed-off area where falls had occurred, with the idea of ventilating the area to work it. Apparatus was used for one hour by three brigade members.

Pukemiro South Mine.—On 21st November, 1949, the mine-manager called for assistance of a rescue team to deal with an active fire that had broken out due to a fall having occurred and breaking a stopping. The fire was effectively dealt with by the application of water and stonedust. A stopping was then erected and the area sealed off. Four men from the rescue brigade were employed. Proto apparatus was not required.

Wilton State Mine.—On 21st December, 1949, at the request of the Inspector of Coal-mines, a rescue team of five men was taken to this mine to deal with a gob fire. Conditions were good, due to the temporary stoppings that had been erected. Two board stoppings were erected over the two gobs where firestink was coming out and two brattice stoppings were erected over two other gobs where it was possible the fire may have been drawing air. Proto apparatus was not used.

Mangapehi State Colliery.—The District Manager advised that Proto sets have been used at this colliery in order to ascertain the level of the water in No. 1 East Dip Section. Particulars of their use are as follows: 3rd September, 1949, two brigade men used sets for one hour; and 8th September, 1949, three brigade men used sets for one and a half hours.

STATISTICS OF WORKINGS IN COAL-MINES, 1949

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 1949.	Total Output to 31st December, 1948.	Total Output to 31st December, 1949.	Number of Persons ordinarily employed.		
											Above.	Below.	Total.
NORTHERN INSPECTION DISTRICT													
Waikato District								Tons.	Tons.	Tons.			
Rotowaro, Rotowaro	Freehold	32	Brown	2	7′ to 27′	Full	Bord and pillar	69,947	3,863,497	3,924,444	63	130	193
Alison, Rotowaro	,,	10	,,	1	6′ to 22′	,,	Ditto	79,089	626,883	705,972	67	135	202
Alison Opencast, Rotowaro	,,	1¾	,,	..	..	..	Opencast	4,039	43,708	47,747	8	..	8
Barker's Opencast, Rotowaro	,,	1	,,	..	..	..	,,	33,530	..	33,530	18	..	18
Thompson's Opencast, Rotowaro	,,	1	,,	..	..	..	,,	39,652	..	39,652	18	..	18
Summit Opencast, Rotowaro	Leased from Taupiri Co.	1	,,	..	..	..	,,	31,396	4,576	35,972	6	..	6
Pukemiro, Pukemiro	Freehold	34	,,	1	4′ to 18′	Full	Bord and pillar	103,619	3,933,089	4,036,708	69	221	290
Wilton (State), Glen Massey	,,	19	,,	1	6′ to 8′	7′ 6′	Ditto	85,248	1,497,386	1,582,634	36	176	212
Waikato Extended	,,	5	,,	..	..	16′	Opencast	16,598	187,845	204,443	11	..	11
Glen Afton, Glen Afton	,,	29	,,	1	4′ to 16′	9′	Bord and pillar	43,571	2,411,708	2,455,279	41	94	135
MacDonald, Waikokowai	Crown lease	19	,,	1	6′ to 20′	9′ to 14′	Ditto	122,571	2,479,940	2,602,511	82	235	317
Kopuku Opencast, Kopuku	Freehold	2	,,	..	40′	..	Opencast	36,533	12,436	48,969	8	..	8
Clifton Collieries, Kopuku	,,	1½	,,	1	30′	8′	Bord and pillar	4,274	166	4,440	1	3	4
Whatawhata Campbell, Whatawhata	Crown lease	28	,,	1	10′ 6″	10′	Ditto	8,893	147,313	156,206	8	5	13
Renown, Renown	Freehold	22	,,	2	15′	7′ 6″ to 9′	,,	83,710	2,212,561	2,296,271	62	178	240
Glen "A" Potteries, Glen Afton	,,	13½	,,	1	9′	9′	Opencast	3,755	3,428	7,183	6	..	6
Kimihia (State), opencast	Crown lease and University endowment	5¾	,,	1	..	..	,,	55,290	250,932	306,222	25	..	25
Hillcrest (State), opencast	Freehold	1	,,	..	..	..	,,	35,345	..	35,345	42	..	42
Kemp's (State), opencast	,,	6	,,	..	..	..	,,	30,110	209,230	239,340			
Victory Mine, Rotowaro	Leased from Taupiri Co.	2¼	,,	1	14′	8′	Bord and pillar	1,180	11,561	12,741	1	6	7
Taranaki District													
Old Stockman, Mokau	Freehold	20	Brown	1	4′ 6′	Full	Bord and pillar	683	18,438	19,121	..	2	2
Mangapehi (State), Mangapehi	Crown lease	15½	,,	1	8′ to 20′	7′ to 8′ (top coal to 15′)	Ditto	39,220	452,129	491,349	30	100	130
Tatu, Ohura (State)	,,	12	,,	1	7′	Full	,,	36,253	289,233	325,486	35	60	95
Aria, Aria	,,	6	Semi-bituminous	1	13′ to 14′	8′ to 10′	,,	2,472	12,265	14,737	1	2	3
Waitewhena (State), opencast	Freehold	5½	Brown	1	11′	11′	Opencast	44,192	138,433	182,625	35	..	35
Mangakara Hydro Coal Syndicate, Ohura	Crown lease	3	,,	1	5′	5′	,,	6,384	12,991	19,375	3	..	3
Tonga, Ohura (opencast)	,,	4½	,,	1	3′ 6″	3′ 6″	,,	213	964	1,177	2	..	2

Paparata, Ohura (opencast)	..	..	3½	,,	..	1	3′ 9″	..	3′ 9″	..	,,	1,069	2,064	3,133	3	..	3
Sunnyside Mine, Waitewhena, Ohura	..	..	1½	,,	..	1	12′	..	7′ 6″	..	Bord and pillar	6,737	4,433	11,170	..	6	6
Hikurangi District																	
New Kamo, Kamo	..	..	Freehold	..	15½	Sub-bituminous	1	8′ to 16′	..	8′ to 9′	..	Bord and pillar	55,107	635,688	690,795	24	129	153
Opencast, Hikurangi	..	..	Crown lease	..	2½	Brown	..	1	5′	..	5′	..	Opencast	1,378	1,872	3,250	2	..	2
Output of collieries now abandoned or suspended				..		..		..		..		..	..	12,956,635	12,956,635	..	..	..
WEST COAST INSPECTION DISTRICT																	
Nelson District																	
Westhaven, Collingwood	..		Freehold	..	11	Sub-bituminous	1	6′	..	Full	..	Bord and pillar	1,652	31,709	33,361	2	4	6
Owen, Owen River	..	..	Crown lease	..	20	Ditto	..	1	4′ to 6′	..	,,	..	Ditto	2,225	57,562	59,787	1	9	10
Strathmore, Ariki	..	..	,,	..	8½	,,	..	1	4′	..	,,	..	,, ..	443	1,018	1,461	..	2	2
Six-mile, Murchison	..	..	,,	..	8½	,,	..	1	4′ 6″	..	,,	..	,, ..	811	8,162	8,973	1	2	3
Murchison Collieries, Murchison	..		Crown lease and freehold		2	,,	..	1	7′ 6″	..	,,	..	,, ..	1,651	1,429	3,080	1	3	4
Whararíki (Trewavas), Puponga	..		Crown lease	..	1	,,	..	1	6′	..	,,	..	,, ..	341	55	396	1	2	3
Buller District																	
Allan's (Nile-Hydro), Charleston	..		Crown lease	..	17	Lignite	..	1	30′ to 35′	..	20′	..	Opencast	4,612	1,413	6,025	16	..	16
Mitchell's (Nile-Hydro), Charleston			,,	..	22	,,	..	1	40′	..	20′	..	,,	5,008	4,161	9,169			
Bowater and Bryan, Charleston	..		,,	..	191	,,	..	1	4′ to 36′	..	Full	..	,,	20,785	171,935	192,720			
Brighton, Fox River	..	..	,,	..	17	,,	..	1	12′ to 18′	..	10′	..	Bord and pillar	2,744	14,223	16,967	1	2	3
Cascade, Cascade Creek	..		,,	..	23	Bituminous		1	20′	..	8′	..	Ditto	16,914	374,948	391,862	8	10	18
Charming Creek, Ngakawau	..		,,	..	22	,,	..	1	15′ to 20′	..	9′	..	,, ..	31,962	508,662	540,624	26	34	60
Coal Creek, Seddonville	..		,,	..	32	,,	..	1	12′	..	10′	..	,, ..	2,460	137,537	143,040	2	6	8
													Opencast	3,043					
Hydro, Seddonville	..	..	,,	..	14	,,	..	1	20′	..	Full	..	Bord and pillar	6,137	140,193	146,330	2	6	8
Rogers, Seddonville	..	..	,,	..	2	,,		1	3′ to 5′	..	Full	..	Ditto	3,180	4,735	7,915	1	4	5
Paine's, Buller Gorge	..	..	,,	..	47	Brown	..	1	4′ to 12′	..	Full	..	Opencast	5,411	58,569	63,980	9	..	9
Glenerag, Buller Gorge	..	..	,,	..	26	,,	..	1	12′	..	Full	..	Bord and pillar	8,039	50,584	58,623	..	7	7
Glenerag Opencast, Buller Gorge	..		,,	..	2½	,,	..	1	10′ to 18′	..	Full	..	Opencast	18,446	21,525	39,971	4	..	4
Denniston, Denniston	..	..	,,	..	69	Bituminous		1	3′ to 20′	..	Full	..	Bord and pillar	72,071	12,376,816	12,448,887	87	212	299
Millerton, Granity	..	..	,,	..	58	,,		1	4′ to 40′	..	12′	..	Ditto	52,677	9,401,276	9,453,953	50	79	129
Stockton, Ngakawau	..	..	,,	..	41	,,	..	..	4′ to 25′	..	10′ to 25′	..	,, ..	103,759	5,474,019	5,673,951	245	173	418
													Opencast	96,173					
Cardiff No. 4, Seddonville	..		,,	..	1½	,,		1	12′	..	8′	..	Bord and pillar	1,357	113	1,470	..	3	3
Buller Gorge, Rahui	..	..	,,	..	7½	Brown	..	1	12′	..	9′	..	Ditto	2,978	20,571	23,549	1	2	3
Heaphy's, Berlins	..	..	,,	..	3½	,,	..	1	20′	..	Full	..	Opencast	6,753	7,725	14,478	4	..	4
H. and R. Bennett, Charleston	..		,,	..	1½	Lignite	..	1	16′	..	Full	..	,,	231	935	1,166	3	..	3
Rata, Charleston	..	..	,,	..	2	,,	..	1	14′	..	Full	..	,,	1,212	3,103	4,315	..	..	*
Redjacket (Powell's), Charleston	..		,,	..	1	,,	..	1	10′	..	Full	..	,,	485	..	485	1	..	1
Harris, Karamea	..	..	Freehold	..	9	,,	..	1	12′	..	8′	..	Bord and pillar	15	63	78	..	1	1

* Number of men employed included in Bowater and Bryan's area.

STATISTICS OF WORKINGS IN COAL-MINES, 1949—*continued*

Name of Mine and Locality.	Title held (Crown Lease or otherwise).	Number of Years Worked.	Classification of Coal.	Number of Seams Worked.	Thickness of Coal-seams.	Thickness Worked.	System of Working.	Total Output for 1949.	Total Output to 31st December, 1948.	Total Output to 31st December, 1949.	Number of Persons ordinarily employed.		
											Above.	Below.	Total.
WEST COAST INSPECTION DISTRICT—*continued*													
								Tons.	Tons.	Tons.			
Reefton District													
Alborn's, Boatmans	Crown lease	54	Brown	3	6′ to 12′	Full	Bord and pillar	4,023	168,994	173,017	2	10	12
Archer Bros., Boatmans	,,	6	,,	2	6′ and 12′	,,	Ditto	1,465	7,523	8,988			
Burke's Creek, Reefton	,,	48	,,	1	8′ to 15′	9′	,,	20,545	534,377	554,922	22	71	93
Morrisvale, Reefton	,,	37	,,	3	6′ to 60′	Full	,,	3,873	264,603	272,563	1	10	11
							Opencast	4,087			11		11
Clele, Merrijigs	,,	62	,,	1	5′	,,	Bord and pillar	640	113,746	114,386	1	2	3
Coghlans, Capleston	Freehold	52	,,	1	12′	,,	Ditto	1,925	75,146	81,383	1	3	4
New Imperial (Coghlans), Capleston	Crown lease	2½	,,	1	12′	,,	,,	4,312			1	3	4
Defiance, Murray Creek	,,	21	,,	1	4′	,,	,,	2,659	65,754	68,413		4	4
Burnwell, Reefton	,,	21	,,	1	40′	9′	,,	3,467	63,041	66,508		17	17
Central, Reefton	,,	5½	,,	1	10′ to 16′	9′	,,	3,587	15,718	19,305	3	17	20
Waitahu Collieries (Murcott and Melboms)	,,	40	,,	1	6′	Full	,,	7,218	120,382	127,600	1	12	13
Terrace, Reefton	,,	22	,,	1	30′ to 70′	7′	,,	7,051	78,687	85,738	1	10	11
Nicholls, Boatmans	,,	6½	,,	1	6′	Full	,,	2,254	9,244	11,498		4	4
Banks, Waitahu	,,	6	,,	1	40′	,,	Opencast	7,719	89,547	97,266	7		7
Royal, Rainy Creek	,,	5½	,,	1	6′	,,	Bord and pillar	1,855	8,558	10,413		3	3
Lewis and party, Murray Creek	,,	5	,,	1	12′	,,	Opencast	691	6,401	7,092	1		1
Chandler's, Murray Creek	,,	5	,,	1	35′	,,	,,	7,833	29,831	37,664	9		9
Ferndale, Reddale Valley	,,	33	,,	1	10′	5′	Bord and pillar	3,682	35,903	39,585	1	6	7
Garvey Creek, Reefton	State reserve	3	Bituminous	1	15′ to 50′	10′	Ditto	14,642	16,159	30,801	6	36	42
Devils Creek, Golden Point	Crown lease	2	Brown	1	7′	Full	,,	996	1,181	2,177		3	3
Grey District													
Cliffdale, Ten-mile	State reserve	22	Bituminous	1	12′	Full	Bord and pillar	6,377	81,154	87,531	2	5	7
Bellvue, Rapahoe	,,	21	,,	1	11′	,,	Ditto	11,439	113,788	125,227	1	9	10
Blackball (State), Blackball	,,	58	,,	2	8′ to 17′	12′	,,	68,364	4,543,127	4,611,491	28	164	192
Blackball Creek, Blackball	,,	18½	,,	1	4½	Full	,,	6,037	193,316	199,353	1	8	9
Harrison's, Ten-mile	,,	17	,,	1	5′	,,	,,	5,437	67,492	72,929	1	6	7
Braehead, Dunollie	,,	29	,,	1	6′ to 9′	,,	,,	5,971	188,906	194,877	1	7	8
Briandale, Ten-mile	Crown lease	23	,,	1	6′	,,	,,	2,126	106,114	108,240	4	2	6
Wallsend, Brunnerton	Crown lease and freehold	26	,,	1	18′	8′ to 10′	,,	55,514	1,237,762	1,293,276	32	133	165
Dobson, Dobson	Crown lease	27	,,	1	9′ to 16′	10′	,,	70,373	1,550,424	1,620,797	42	193	235
Goldlight, Rewanui	State reserve	22	,,	1	7′	Full	,,	10,170	159,944	170,114	1	9	10
Kiwi, Ten-mile	,,	19	,,	1	11′	,,	,,	7,160	112,205	119,365	1	8	9
Kaye's, Ten-mile	,,	15	,,	1	11′	,,	,,	3,777	46,948	50,725	1	2	3
Hunter's, Rewanui	,,	29	,,	1	9′	,,	,,	9,647	172,857	183,504	1	9	10
Jubilee, Eight-mile	,,	22	,,	1	9′	,,	,,	6,833	92,889	99,722	1	7	8

Moody Creek, Dunollie	,,	27	,	1	9′	,	,,	6,301	133,566	139,867	1	8	9
Cliffside, Nine-mile	,,	14½	,,	1	12′	,,	,,	8,543	72,898	81,441	2	6	8
New Point Elizabeth, Dunollie	,,	23	,,	1	7′	,,	,,	2,951	156,781	159,732	1	5	6
Old Runanga, Rewanui	,,	23	,,	1	3½′ to 5′	,,	,,	5,978	152,098	158,076	2	7	9
Paparoa, Roa	Crown lease	41	Super-bituminous	2	8′ to 12′ 8′ to 16′	,,	,,	29,063	1,218,665	1,247,728	24	60	84
Schultz Creek, Twelve-mile	,,	25	Bituminous	1	3′	,,	,,	1,177	52,951	54,128	1	2	3
Strongman, Nine-mile	State reserve	11	,,	1	20′	9′	,,	92,778	865,103	957,881	68	204	272
Liverpool, Rewanui	,,	37	,,	2	8′ to 34′	8′	,,	100,127	4,401,345	4,501,472	70	252	322
Spark's, Rewanui	,,	27	,,	1	9′	8′	,,	4,984	99,148	104,132	2	8	10
Coaldale (Wafer and party), Rapahoe	,,	3	,,	1	3′ to 5′	3′	,,	28	5,258	5,286	..	2	2
Coaldale (Broad and party), Rapahoe	,,	½	,,	1	8′	Full	,,	90	..	90	2	2	4
Exhibition, Eight-mile	,,	2½	,,	1	9′	,,	,,	5,022	4,402	9,424	1	6	7
New Aerial, Ten-mile	Crown lease	2	,,	1	9′	7½′	,,	910	461	1,371	2	2	4
Harries, Rewanui	State reserve	1½	,,	1	3′	Full	,,	3,250	652	3,902	1	5	6
Output of collieries now abandoned or suspended	..	..	..	..	..	..	..	..	9,878,759	9,878,759	..	..	..

SOUTHERN INSPECTION DISTRICT

									Tons.	Tons.	Tons.			
Canterbury District														
Acheron No. 1	Crown lease	8	Anthracite	8	8′	8′	Bord and pillar		1,885	10,955	12,840	4	4	8
Acheron No. 2	,,	2½	Lignite	1	8′	7′	Ditto		628	660	1,288	1	2	3
Blackburn	,,	19	,,	1	8′	7′	,,		4,645	63,025	67,670	2	7	9
Bonanza	,,	3	,,	1	6′	6′	,,		327	482	809	..	2	2
Burnt Hill	,,	2	,,	2	5′	5′	,,		975	498	1,473	..	3	3
Klondyke	,,	21	,,	1	4′ to 26′	8′	,,		8,118	160,055	168,173	2	15	17
Malvern	,,	3	,,	2	5′	4′	,,		1,704	3,677	5,381	1	3	4
Manuka Point	,,	2	,,	1	5′	5′	,,		198	289	487	1	1	2
Newburn	,,	5	,,	1	4′	4′	,,		16	1,962	1,978	1	1	2
Mount Somers (Tripp's)	Freehold	83	,,	1	10′	8′	,,		5,053	147,133	152,186	1	7	8
Steventon	,,	14½	,,	1	6′	5′	,,		2,590	64,110	66,700	2	3	5
Victory	,,	6	,,	1	10′	8′	,,		2,540	7,280	9,820	1	4	5
Woodbank	Crown lease	24	,,	1	10′	10′	,,		2,762	31,629	34,391	1	3	4
North Otago District														
Alredale	Crown lease	23	Lignite	1	8′	6′	Bord and pillar		2,659	64,262	66,921	1	4	5
Allandale	Freehold	1	,,	1	5′	5′	Ditto		428	..	428	1	2	3
Ngapara	,,	72	,,	1	24′	14′	,,		2,204	71,272	73,476	1	4	5
Rockvale	,,	15	,,	1	8′	6′	,,		2,509	20,967	23,476	..	3	3
St. Andrews	,,	22	,,	1	8′	6′	,,		806	107,409	108,215	1	3	4
Shag Point	Crown lease	28	,,	1	6′	6′	,,		429	449,640	450,069	1	3	4
Willetts	,,	17	,,	1	7′	7′	,,		1,371	19,970	21,341	..	3	3
Central Otago District														
Cairnmuir	Crown lease	9	Lignite	1	20′	10′	Bord and pillar		2,012	9,923	11,935	..	2	2
Cambrian	,,	4	,,	1	20′	10′	Opencast		230	768	998	2	..	2
East Roxburgh	,,	2	,,	1	8′	8′	Bord and pillar		58	309	367	..	1	1
Idaburn	,,	32	,,	1	30′	20′	Opencast		660	73,383	74,043	1	..	1
McPherson's	,,	65½	,,	1	14′	14′	,,		3,174	137,404	140,578	2	..	2
Oturehua	,,	55	,,	1	20′	15′	,,		704	11,472	12,176	1	..	1
Shepherd's Creek	,,	71	,,	1	20′	10′	Bord and pillar		644	156,418	157,062	..	3	3

STATISTICS OF WORKINGS IN COAL-MINES, 1949—*continued*

Name of Mine and Locality.	Title held (Crown Lease or otherwise).	Number of Years Worked.	Classification of Coal.	Number of Seams Worked.	Thickness of Coal-seams.	Thickness Worked.	System of Working.	Total Output for 1949.	Total Output to 31st December, 1948.	Total Output to 31st December, 1949.	Number of Persons ordinarily employed.		
											Above.	Below.	Total.
SOUTHERN INSPECTION DISTRICT—*continued*													
								Tons.	Tons.	Tons.			
South Otago District													
Akatore	Crown lease ..	4	Lignite ..	1	8′ ..	8′ ..	Bord and pillar	4,469	14,884	19,353	1	3	4
Barclay's	,, ..	5	,, ..	1	9′ ..	6′ ..	Ditto ..	2,769	8,811	11,580	1	3	4
Benhar	,, ..	86	,, ..	1	35′ ..	35′ ..	,, ..	8,327	422,630	430,957	3	14	17
Elliotvale	Freehold ..	1	,, ..	¼	8′ ..	8′ ..	,, ..	2,187	36	2,223	..	6	6
Kai Point	,, ..	2	,, ..	1	22′ ..	22′ ..	Opencast	3,686	1,551	5,237	2	..	2
Kaitangata	Crown lease ..	73½	Brown ..	2	8′ to 20′ ..	8′ to 20′ ..	Bord and pillar	46,775	6,873,591	6,920,366	56	102	158
New Fernhill No. 4	Freehold ..	4	Lignite ..	1	7′ ..	7′ ..	Ditto ..	4,629	12,348	16,977	2	6	8
Summerhill	,, ..	3½	,, ..	1	30′ ..	30′ ..	,, ..	46,307	57,477	103,784	9	40	49
Sunnyvale	Crown lease ..	4	,, ..	1	25′ ..	25′ ..	,, ..	2,293	7,813	10,106	..	2	2
Taradale	Freehold ..	5	,, ..	1	18′ ..	16′ ..	,, ..	2,606	10,101	12,707	1	4	5
Victory	Crown lease ..	5	,, ..	1	6′ ..	5′ ..	,, ..	2,349	8,791	11,140	1	4	5
Viewbank	Freehold ..	4	,, ..	1	30′ ..	30′ ..	,, ..	5,215	17,057	22,272	2	2	4
Wangaloa State	Crown lease ..	4	,, ..	1	23′ ..	23′ ..	Opencast	42,481	120,434	162,915	22	..	22
Willowbank No. 1	Freehold ..	27	,, ..	1	6′ ..	6′ ..	Bord and pillar	5,865	140,060	145,925	2	4	6
Willowbank No. 4	,, ..	1	,, ..	1	10′ ..	6′ ..	Ditto ..	1,703	..	1,703	1	2	3
Southland District													
Argyle	Crown lease ..	58	Lignite ..	1	10′ ..	10′ ..	Opencast	20	17,124	17,144	1	..	1
Birchwood	,, ..	25	Brown ..	1	5′ to 18′ ..	6′ ..	Bord and pillar	22,468	543,977	566,445	16	41	57
Black Diamond	Freehold ..	33	,, ..	33	20′ ..	20′ ..	Opencast	39,446	479,453	518,899	20	..	20
Black Lion (McKenzie's) ..	Crown lease ..	28	,, ..	1	28′ ..	28′ ..	,,	17,668	325,271	342,939	11	..	11
Boghead	Freehold ..	23	Lignite ..	1	23′ ..	10′ ..	Bord and pillar	7,264	206,595	213,859	3	6	9
Browndale (Coster's)	,, ..	13	,, ..	1	14′ ..	14′ ..	Opencast	649	14,043	14,692	2	..	2
Coalvale	Crown lease ..	¾	,, ..	1	..	..	,,	560	..	560			
Diamond Lignite	,, ..	47	,, ..	1	36′ ..	36′ ..	,,	2,620	62,452	65,072	3	..	3
Glenlee	Freehold ..	58	,, ..	1	14′ ..	8′ ..	Bord and pillar	1,706	62,485	64,191	..	2	2
Hedgehope	,, ..	10	,, ..	1	16′ ..	16′ ..	Opencast	7,221	79,212	86,433	6	..	6
Linton	Crown lease ..	35	Brown ..	3	30′ to 40′ ..	30′ to 40′ ..	Bord and pillar	69,217	2,372,036	2,441,253	33	125	158

Maclean's	Freehold	1	,,	1	10′	10′	Opencast	39,677	1,248	40,925	18	..	18
Mataura Paper-mills	,,	11	Lignite	1	20′	20′	,,	1,790	230,152	231,942	5	..	5
Midway	,,	3	,,	1	15′	15′	,,	23,764	2,329	26,093			
Mossbank	Crown lease	9	Brown	1	17′ to 23′	8′	Bord and pillar	26,135	836,683	862,818	8	33	41
Newholme	Freehold	2	Lignite	1	30′	30′	Opencast	1,359	940	2,299	1	..	1
Newvale	,,	3	,,	1	60′	18′	,,	11,404	50,082	61,486	4	..	4
Nightcaps (Kaireka)	,,	4½	,,	1	30′	30′	,,	1,334	12,561	13,895	4	..	4
Ota Creek	Crown lease	69	,,	1	10′	10′	,,	1,877	42,946	44,823	2	..	2
Raby	Freehold	11	,,	1	20′	20′	,,	3,159	42,263	45,422	2	..	2
Star	,,	18	Brown	1	20′	20′	Bord and pillar	37,569	394,163	431,732	17	45	62
Starlight	,,	5½	Lignite	1	5′	5′	Opencast	1,919	16,332	18,251	2	..	2
Waimeamea	Crown lease	6	Brown	1	9′	7′	Bord and pillar	4,850	53,509	58,359	1	5	6
Waimumu	Freehold	21	Lignite	1	30′	30′	Opencast	14,520	124,161	138,681	6	..	6
Wairaki	Crown lease	35	Brown	2	7′ to 25′	7′ to 25′	Bord and pillar	62,413	1,124,116	1,186,529	36	92	128
Waituna	Freehold	1	Lignite	1	10′	10′	Opencast	92	26	118	1	..	1
Output of collieries now abandoned or suspended								..	11,898,298	11,898,298	..	..	..
Totals, Southern District, South Island								631,691	28,379,317	29,011,008	333	624	957
Totals, West Coast District, South Island								1,108,526	56,287,849	57,396,375	828	1,903	2,731
Totals, Northern District, North Island								1,073,058	32,440,771	33,513,829	707	1,482	2,189
								2,813,275	117,107,937	119,921,212	1,868	4,009	5,877
Output prior to 1890 not included in statistics								..	..	296,653	..	..	..
Shale exported 1914								..	..	21	..	..	..
										120,217,886			

APPENDIX C

REPORT OF BOARDS OF EXAMINERS

Mines Department,
Wellington, 20th April, 1950.

The UNDER-SECRETARY, Mines Department, Wellington.

SIR,—

On behalf of the Boards of Examiners under the Mining Act, 1926, and Coal-mines Act, 1925, I have the honour to submit the following report on the work of the Boards during the past year.

Mining Act.—At the annual examinations, which were held on the 4th October, 1949, two candidates sat for Dredgemaster's Class A Certificate and one candidate for Dredgemaster's Class B Certificate. There were no candidates for Mine Managers' or Battery Superintendents' Certificates.

It is recorded, with deep regret, that Thomas Bernard Gillooly, who had been a valued member of the Board since the 1st September, 1941, and A. J. McEwin, recently appointed an examiner for purposes of the battery superintendents' examinations, both passed away during the year.

Mr. T. R. Hogg, whose term as a member expired during 1949, was reappointed for a further term of three years.

One certified copy of a Dredgemaster's Certificate which had been lost or destroyed as the result of the Japanese invasion of Puket Island, West Siam, was issued.

The following examiners were appointed during the year: Mr. A. B. Hogg, Waiuta, as an examiner for battery superintendents' examinations. Messrs. D. A. Mitchell, Dunedin, and W. B. Hepburn, Alexandra, as examiners for 1949 oral examination at Dunedin for Dredgemaster's Class A Certificate.

It was suggested to the Board at the 1949 annual meeting that Class A Dredgemaster's Certificate should be abolished, for the reasons (*a*) the exploitation of swift-flowing rivers for the recovery of gold could now be considered as having ended; (*b*) the disparity in size, horse-power, and digging capacity of dredges suggested a more logical and sensible classification than at present existed. The Board decided that, before dealing finally with the matter, the suggestion should be submitted to gold-dredging companies, dredgemasters, and Inspectors of Mines for an expression of opinion.

Coal-mines Act.—The annual examinations for candidates for Mine-manager's Certificates were held at Huntly, Greymouth, Reefton, and Dunedin on the 4th, 5th, and 6th October, 1949. In addition, examinations were held at Greymouth, Westport, and Dunedin for Mine Surveyors' Certificates, and at Huntly and Reefton for Electrician's Certificates.

The annual examinations for Underviewers' and Firemen-deputies' Certificates were held at Dunedin on 4th and 5th October; at Huntly on 7th, 8th, 9th, and 10th November; at Westport on 15th, 16th, and 17th November; and at Greymouth on 22nd, 23rd, 24th and 25th November.

Two special examinations (affecting a total of two candidates) for Underviewers' Certificate and Fireman-deputy's Certificate respectively were held during the year.

Applications for examination by four candidates who were unable to prove the prescribed minimum period of underground experience were declined, as was also a fifth application, the applicant being under the minimum age prescribed by the regulations.

An application for a Fireman-deputy's Certificate (by exchange) was received from an applicant who held a Certificate of Qualification of Fireman, Examiner, or Deputy issued under the British Coal-mines Act, 1911. As the examination which the applicant was required to sit for the certificate he produced was not equivalent to that prescribed for a New Zealand Fireman-deputy's Certificate, the Board declined the application.

The Board cancelled two partial passes for Fireman-deputy's Certificate, the holders having failed to complete the full examination within the period allowed.

The total number of candidates sitting the 1949 examinations under the Coal-mines Act was ninety-five, an increase of one as compared with the previous year.

During the year, 65 Gas-testing Certificates were granted to candidates who had passed the prescribed examination, while the holders of 106 Gas-testing Certificates which were more than five years' old passed a re-examination in gas-testing. Duplicates of three lost Gas-testing Certificates were issued.

A certified copy of a lost certificate was issued pursuant to section 55, Coal-mines Act, 1925.

Pursuant to subsection (5) of section 6, Coal-mines Amendment Act, 1937, the endorsement of fifteen Underviewers' and forty-two Firemen-deputies' Certificates has been recorded in the Board's Register of Certificates granted.

The Board also recorded in its Register particulars of three certificates of proficiency in mine-rescue work issued to men who had undergone a course of instruction in the use of self-contained breathing-apparatus and in other related subjects and had passed a practical examination.

Since the 1948 annual meeting, the following legislation affecting the Board has been passed :—

Section 8, Coal-mines Amendment Act, 1949, provides that every certificate of competency as a mine-manager, underviewer, or fireman-deputy shall be suspended unless from time to time endorsed by an Inspector of Coal-mines with a certificate to the effect that the holder of the certificate is a holder of a recognized first-aid certificate granted not more than five years before the date of endorsement.

Clauses 4 to 9 of Amendment No. 4, Coal-mines Regulations, 1939, provide for—

(*a*) The deletion of " First Aid to the Injured " as a subject in any of the Board's examinations, and the requirement of every applicant to forward with his application a first-aid certificate acceptable to the Board.
(*b*) The enlargement of the syllabus for mine-managers' examinations.
(*c*) More varied experience to be obtained and proved by an applicant for examination for Underviewer's or Fireman-deputy's Certificate.

These amendments to Act and regulations followed recommendations from the Board made at the 1947 and 1948 annual meetings.

Proposals by the sub-committee set up to inquire into and report on the training and examination of candidates for Mine Surveyor's Certificate were examined by the Board at its last meeting, but no resolution was passed pending a further report from the sub-committee on an investigation of the present methods of maintaining and keeping up-to-date mine plans and records.

General.—Both Boards also dealt with a number of matters arising out of applications for and the issue of certificates, none of which, however, calls for special mention.

The following is a summary of the various examinations held and the results obtained :—

Examination.	Number of Candidates.			Number of Certificates Issued.	
	Examined.	Passed.	Partial Pass.	By Examination.	By Recognized Credentials.
Coal-mines Act, 1925					
Mine-managers' Certificates—					
(*a*) First Class—					
Written examination	8	2	2	2	..
Oral examination	5				
(*b*) Second Class—					
Written examination	7	2	..	2	..
Oral examination	2				
Underviewer's Certificate	25	9	7	9	..
Fireman-deputy's Certificate	50	29	15	29	..
Mine Surveyor's Certificate—					
Written examination	3	..	..	..	..
Oral examination	..				
Electrician's Certificate—					
Written examination	2	1	1	1	..
Practical examination	2				
Mining Act, 1926					
Mine-managers' Certificates—					
(*a*) First Class—					
Written examination	..	..	..	..	..
Oral examination	..	..	..	..	..
(*b*) Second Class—					
Written examination	..	..	..	..	..
Oral examination	..	..	..	..	..
Battery Superintendent's Certificate—					
Written examination	..	..	..	..	..
Oral examination	..	..	..	..	..
Dredgemasters' Certificates—					
Class A—					
Written examination	2	1	..	1	..
Oral examination	1				
Class B—					
Written examination	1	..	..	..	..
Oral examination	..				

A list of the certificates issued since my last report is appended :—

COAL-MINES ACT, 1925

FIRST-CLASS MINE-MANAGER'S CERTIFICATE

Issued After Examination.—Marshall, Frank William, Reefton; Scott, Ronald Walter, Greymouth.

SECOND-CLASS MINE-MANAGER'S CERTIFICATE

Issued After Examination.—Holm, Joseph Eric, Greymouth; Lennox, Gordon Murray, Taylorville.

ELECTRICIAN'S CERTIFICATE

Issued After Examination.—McKenzie, Alexander, Reefton.

UNDERVIEWER'S CERTIFICATE

Issued After Examination.—Boyd, A. R., Glen Afton; Crook, H. W., Rotowaro; Fitzsimmons, H. N., Stockton Mine; Kernohan, E. S., Huntly; Lawrence, J. R., Benneydale; McMillan, D., jun., Millerton; McTaggart, R. K., Runanga; Walsh, R., Birchfield; Woodhouse, A. W. G., Ohai.

FIREMAN-DEPUTY'S CERTIFICATE

Issued After Examination.—Blair, R. McK., Glentunnel; Boyd, A. R., Glen Afton; Boyd, T. M., Blackball; Boyd, W., Westport; Buchan, W. J., Glentunnel; Chester, J. T., Seddonville; Crackett, G. S., Stockton Mine; Cross, C., Benneydale; Cumming, G. F., jun., Denniston; Edmondson, J. R., Ngaruawahia; Farnworth, F., Huntly; Gear, D. H. E., Seddonville; Hollingworth, R., Seddonville; Harrison, W. J., Glentunnel; Humphries, A. A., Ngakawau; King, C. C., Ohai; Mason, O. J., Huntly; Montford, J., Ngaruawahia; Park, T., Kaitangata; Philp, R., Seddonville; Quinn, G. R., Seddonville; Rhodes, A., Glentunnel; Russell, A. R. C., Ohai; Tukere, E., Ngaruawahia; Walker, W., Renown; Ward, L. H., Denniston; Wells, A. W. B., Bennydale; White, N., Huntly; Whorskey, J. G., Huntly.

MINING ACT, 1926

DREDGEMASTER'S CLASS A CERTIFICATE

Issued After Examination.—Forrest, J. J., Alexandra.

I have, &c.,

R. H. SCHOEN,

Chairman of Boards.

Approximate Cost of Paper.—Preparation, not given; printing (1,128 copies), £270.

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