

1910.
NEW ZEALAND.

INSPECTION OF COAL-MINES REPORT.

(THE COAL-MINES ACT, 1908.)

Presented to both Houses of the General Assembly by Command of His Excellency.

Mr. FRANK REED, M.Inst.M.M., Inspecting Engineer, to the UNDER-SECRETARY, Mines Department.

SIR,—

Mines Department, Wellington, 24th May, 1910.

I have the honour to present the annual reports of inspection, together with statistical information in regard to the coal-mines of the Dominion for the year ended 31st December, 1909.

The reports are divided into the following sections :—

- I. Output of Mineral.
- II. Persons employed.
- III. Accidents.
- IV. General Remarks.

Annexures—

- (a.) Inspectors' Reports.
- (b.) Mine Officials' Examinations, and List of Certificate-holders.
- (c.) Statistics of Working-colleries.

SECTION I.—OUTPUT OF MINERAL.

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

Class of Coal, &c.	Northern District.	West Coast District.	Southern District.	Total.
	Tons.	Tons.	Tons.	Tons.
Bituminous and semi-bituminous coal ...	134,957	1,122,276	...	1,257,233
Pitch-coal	...	...	5,473	5,473
Brown coal... ..	212,962	366	346,181	559,509
Lignite	451	...	38,581	89,032
Totals...	348,370	1,122,642	440,235	1,911,247

The annual output of coal in this Dominion has doubled during the past decade. Prior to 1878 the total quantity of coal produced was only 709,931 tons.

The following statement shows the production, &c., of the principal collieries :—

Name of Colliery.	Locality.	Class of Coal.	Output for 1909.	Total Output to 31st December, 1909.	Total Number of Persons ordinarily employed.
<i>Northern District.</i>					
Hikurangi Coal Company (Limited)...	Hikurangi...	Semi-bituminous	Tons. 58,359	Tons. 639,952	84
Taupiri Coal-mines (Limited) ...	Huntly ...	Brown ...	192,827	2,093,280	460
Northern Collieries Company (Limited)	Hikurangi...	Semi-bituminous	39,301	323,547	73
<i>West Coast District.</i>					
Westport Coal Company (Limited) (Coalbrookdale Collieries)	Millerton ...	Bituminous	212,474	2,863,535	452
Westport-Stockton Coal Company (Limited)	Denniston	"	348,335	5,374,712	604
	Mangatini	"	89,675	92,942	200
New Zealand State Coal-mines	Seddonville	"	67,935	277,345	110
	Point Elizabeth	"	216,225	1,011,683	411
Blackball Coal Company (Limited) ...	Blackball...	"	120,065	1,146,620	190
<i>Southern District.</i>					
New Zealand Coal and Oil Company (Limited)	Kaitangata	Brown ...	127,732	2,440,412	327
Nightcaps Coal Company (Limited) ...	Nightcaps...	" ...	50,052	666,315	90
Other collieries, in all districts ...	...	Various ...	388,267	12,103,843	1,190
Totals ...	...	...	1,911,247	29,034,186	4,191

The predominant feature of the year in the coal-mining industry has been the increased demand for the best classes of coal : resulting in greater outputs from the principal collieries ; a decline, however, in the production of lignite from the southern mines has occurred, which may be attributed to the stoppage of many of the gold-dredges which usually burn that class of fuel.

SECTION II.—PERSONS EMPLOYED.

Inspection District.						Average Number of Persons employed during 1909.		
						Above Ground.	Below Ground.	Total.
Northern	...	...	...	...	...	155	627	782
West Coast	...	...	...	...	...	727	1,670	2,397
Southern	...	...	...	...	...	277	735	1,012
Totals, 1909	...	...	...	...	...	1,159	3,032	4,191
Totals, 1908	...	...	...	...	...	992	2,902	3,894

In conformity with the output the number of persons engaged at our collieries has practically doubled within the past decade.

SECTION III.—ACCIDENTS.

In 1909 seven fatal accidents occurred in and about the coal-mines of the Dominion, causing the loss of seven lives. The proportion of lives lost was 1.79 per thousand persons employed, which proportion, although lower than prevails in some countries, including North America and South Africa, exceeds the general European average.

By far the greatest number of accidents may be attributed to the carelessness of the sufferers or to misadventure.

The following is a summary of fatal and non-fatal accidents classified, and cause, in this Dominion during 1909.

	Fatal Accidents.		Non-fatal Accidents.	
	Number of Separate Fatal Accidents.	Number of Deaths.	Number of Separate Non-fatal Accidents.	Number of Persons injured, including those injured by Accidents which proved Fatal to their Companions.
Explosions of firedamp ...	...	...	2	4
Falls in mine ...	4	4	6	10
Shaft accidents ...	...	...	...	...
Miscellaneous—Underground...	2	2	6	6
On surface ...	1	1	3	3
Totals ...	7	7	17	23

With the introduction this year of the new regulations under the Coal-mines Act, making it compulsory that all underviewers and firemen and deputies (in addition to mine-managers, as heretofore enacted) shall be the holders of certificates of competency or service, it may be hoped that greater safety will be obtained in our coal-mines.

The following statement shows the tons of mineral raised (coal and shale), persons employed, lives lost, &c., from 1878 to 1909 :—

Year.	Output of Mineral.	Persons employed.			Tons of Mineral raised per each Person employed Underground.	Tons of Mineral raised per Life lost.	Persons employed per each Life lost.	Lives lost per Thousand Persons employed.	Number of Deaths.
		Above.	Below.	Total.					
Prior ...	709,931	...	...	...	...	...	...	...	...
1878 ...	162,218	147	366	513	443	4,771	15	66.27	34†
1879 ...	231,218	...	...	802	...	115,609	401	2.49	2
1880 ...	299,923	...	...	1,038	...	149,961	519	1.92	2
1881 ...	337,262	...	...	963	...	337,262	963	1.04	1
1882 ...	378,272	...	...	1,043	...	189,136	521	1.91	2
1883 ...	421,764	361	888	1,249	475	210,882	624	1.60	2
1884 ...	480,831	393	890	1,283	540	160,277	421	2.34	3
1885 ...	511,063	338	1,145	1,483	456	170,354	494	2.01	3
1886 ...	534,353	392	1,213	1,605	440	*	*	*	0
1887 ...	558,620	388	1,111	1,499	503	139,655	375	2.66	4
1888 ...	613,895	414	1,275	1,689	481	153,474	422	2.36	4
1889 ...	586,445	466	1,251	1,717	261	146,611	313	2.37	4
1890 ...	637,397	512	1,334	1,846	477	79,674	231	4.33	8
1891 ...	668,794	416	1,277	1,693	523	167,198	423	2.36	4
1892 ...	673,315	485	1,196	1,681	563	673,315	1,681	0.66	1
1893 ...	691,548	590	1,298	1,888	533	138,305	377	2.64	5
1894 ...	719,546	506	1,393	1,899	516	119,924	316	3.16	6
1895 ...	726,654	525	1,274	1,799	618	145,331	360	3.33	5
1896 ...	792,851	590	1,347	1,937	588	12,013	29	34.07	66‡
1897 ...	840,713	531	1,381	1,912	609	210,178	478	2.09	4
1898 ...	907,033	556	1,447	2,003	627	907,033	2,003	0.49	1
1899 ...	975,234	554	1,599	2,153	609	325,078	717	1.39	3
1900 ...	1,093,990	617	1,843	2,460	593	273,497	615	1.62	4
1901 ...	1,239,686	688	2,066	2,754	600	413,228	918	1.09	3
1902 ...	1,365,040	803	2,082	2,885	655	682,520	1,443	0.69	2
1903 ...	1,420,229	717	2,135	2,852	665	355,057	713	1.40	4
1904 ...	1,537,838	763	2,525	3,288	609	384,459	822	1.21	4
1905 ...	1,585,756	833	2,436	3,269	651	264,293	546	1.83	6
1906 ...	1,729,536	1,174	2,518	3,692	687	288,256	615	1.62	6
1907 ...	1,831,009	1,143	2,767	3,910	662	152,584	326	3.07	12
1908 ...	1,860,975	992	2,902	3,894	641	372,195	778	1.28	5
1909 ...	1,911,247	1,159	3,032	4,191	633	273,035	599	1.79	7
Totals ...	29,034,186	...	...	...	...	...	...	...	217

* No life lost.

† Year of Kaitangata explosion.

‡ Year of Brunner explosion.

SECTION IV.—GENERAL REMARKS.

MINING OPERATIONS.

Coal-mining operations on the fields north of Auckland have during the year been unimportant, and a small decline in the output of coal therefrom has occurred. Underground developments on some of those small coalfields have proved the coal-measures to be both fragmentary and considerably faulted, which is unfortunate, as the coal therefrom—of semi-bituminous class—is the best steam coal in the North Island.

Further discoveries of coal-outcrops have been made in the country between the Northern Wairoa River and Hokianga, which appear to indicate that an extensive area of coal-measures exists in that locality.

On the Waikato Coalfield (a map of which accompanies this report) the Taupiri Colliery has increased its annual output to 192,827 tons, and the satisfactory developments at this mine, together with the demand for Taupiri coal, are favourable evidence that the increase in the annual output will be continued.

A new company, the Waipa Railway and Collieries (Limited), with a capital of £80,000, is being formed for the purpose of working an extensive area on the southern portion of the Waikato Coalfield, near the Akatea Settlement, where formerly a small mine was opened upon the land of Mr. T. Runciman. The seam of coal to be worked is exposed by outcrops at altitudes varying between 390 ft. and 630 ft. above sea-level, evidently a continuation of the seam worked at the Taupiri Colliery, which consists of a high-class brown coal. As the coal-measures on this field rise generally to the southward, this new company will have the advantage over its northern neighbour, as the drainage, haulage, and ventilation of the mine may be effected from adits, thereby reducing working-costs; the coal-pillars likewise may be extracted without fear of inundation by surface-waters. A branch railway of about six miles in length will be required to connect this mine with the Auckland-Wellington Main Trunk line at Ngaruawahia, distant sixty-eight miles from the former city.

Towards the end of 1909 a discovery of coal of lignitious class was made upon Crown lands in the country adjoining the Main Trunk Railway, about three miles to the westward of Waimarino Station. A reconnaissance survey of the locality has since been carried out by Dr. J. M. Bell, M.A., F.R.G.S., Director of the Geological Survey of New Zealand, who reports that a somewhat extensive coalfield exists in that locality upon country which physiographically may be considered to form part of the Wanganui coastal plain. The confines of the coalfield are not yet known, but it is believed to be an extension of the Mokau coal-bearing series. Several outcrops of coal have been located, varying from 3 ft. to 8 ft. in thickness, in rocks of Tertiary age, dipping to the south or eastward. Dr. Bell pronounces the coal to be of fair quality, suitable for household use, though not of value for steaming purposes. The following is an average analysis of five samples of the outcrop and consequently weathered coal made by the Dominion Analyst, Dr. J. S. MacLaurin, F.C.S.: Fixed carbon, 38.49 per cent.; volatile hydrocarbons, 40.71 per cent.; water, 11.87 per cent.; ash, 5.99 per cent.; sulphur, 2.94 per cent.; practical evaporative power (60 per cent. efficiency), 6.35 lbs.

The Inspector of Mines at the Thames, Mr. Bennie, reports improved ventilation and safety precautions on the North Island coalfields, and no fatal accident occurred thereon during 1909, although 782 persons were employed.

On the West Coast coalfields considerable activity prevails. The principal collieries have maintained their output, and two new mines—viz., the Westport-Stockton and Paparoa Collieries, both equipped on a scale of magnitude—have been added to the list of producing mines.

Extensive plants and surface arrangements are being laid down by the North Brunner Coal-mining Company, near Stillwater, and by the Government at the Seven-mile Creek, Point Elizabeth, both on the Grey Coalfield.

On the Buller Coalfield an important discovery of a 20 ft. seam of high-class bituminous coal has been made on the State Coal-mines Reserve covering the Charming Creek Valley, extending from the Ngakawau River to the Seddonville State Colliery. Systematic boring operations by means of a diamond drill are now being carried out to prove the extent of this favourably situated discovery.

On the coalfields of Canterbury, Otago, and Southland, which embrace the southern inspection district, the year's work has been somewhat uninteresting, the demand for the brown coals and lignite obtained on those coalfields having slightly declined.

The Inspector of Mines at Dunedin, Mr. E. R. Green, reports favourably upon the improved ventilation and general efficiency obtained in the southern district; and the fact that only one fatal accident has occurred during two years in this extensive district, where over a thousand persons are ordinarily employed at the coal-mines, is extremely creditable both to the inspection and the management.

EXPORTS OF COAL.

The quantity of coal exported during 1909 amounted to 201,790 tons, the greater part of which consisted of West Coast bituminous coal for use on ocean-going steamers. In addition to the above, a considerable quantity of Coalbrookdale (Westport) coal was used by the Admiralty, for consumption by the Australian Squadron.

UNDERTAKERS' AND FIREMEN AND DEPUTIES' CERTIFICATES.

Regulations under the Coal-mines Act, 1908, and its amendments, have been made providing for the qualification by service or examination of all colliery undertakers and firemen and deputies, which I believe to be an innovation in coal-mining legislation in the British Empire. The results of this legislation will therefore be watched with interest, and if the proportion of mining accidents is reduced

— MINES DEPARTMENT. — NEW ZEALAND. —

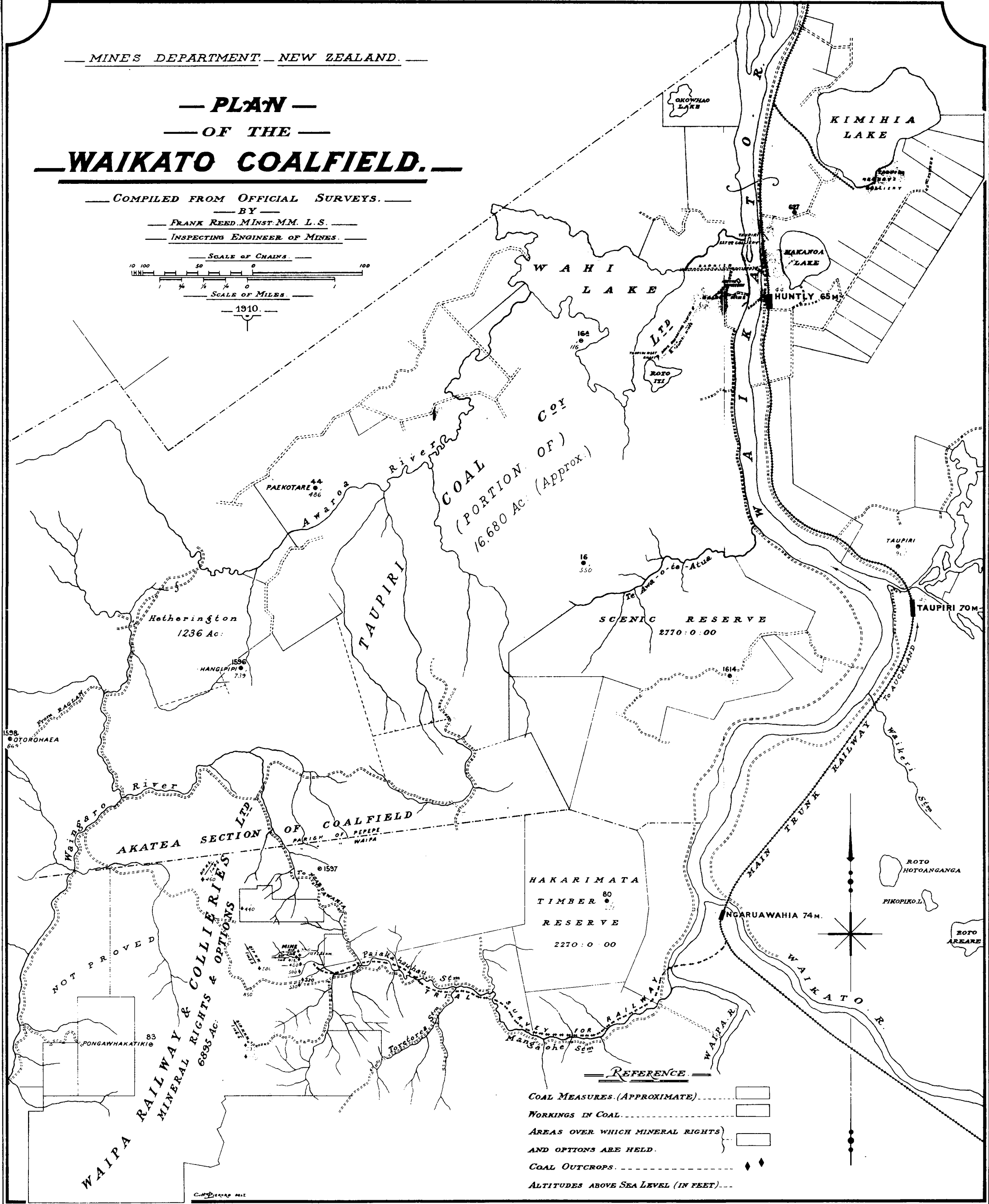
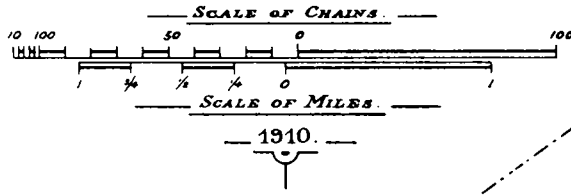
— PLAN —
— OF THE —
— WAIKATO COALFIELD. —

— COMPILED FROM OFFICIAL SURVEYS. —

— BY —

— FRANK REED MINST. MM. L.S. —

— INSPECTING ENGINEER OF MINES. —



— REFERENCE —

- COAL MEASURES. (APPROXIMATE) —
- WORKINGS IN COAL —
- AREAS OVER WHICH MINERAL RIGHTS AND OPTIONS ARE HELD —
- COAL OUTCROPS —
- ALTITUDES ABOVE SEA LEVEL (IN FEET) —

thereby it will be very gratifying. It is provided that certificates of service shall be issued to all persons who produce satisfactory evidence as to sobriety, experience, and good conduct who have held during the whole of 1909 the position for which a certificate is desired.

Other candidates not thus qualified by service are required to produce satisfactory evidence as to experience, sobriety, and good conduct, and shall pass an examination in the following subjects:—

- (a.) Working coal and timbering underground.
- (b.) Mine-gases, spontaneous combustion, and ventilation.
- (c.) Dealing with old workings and other sources of danger.
- (d.) Arithmetic and a knowledge of the Coal-mines Act and regulations.
- (e.) First aid to the injured.

The examinations are conducted by the same Board of Examiners who examine candidates for mine-managers' certificates, assisted by the Inspectors of Mines.

There are two grades of certificates—viz., underviewers' certificates and firemen and deputies' certificates.

The law therefore provides for the qualification by certificate of every official (and engine-driver), except the electricians, in all New Zealand collieries employing more than eight persons. Where less than eight persons are employed the manager need not hold a certificate, but must hold a permit from the Inspector of Mines. Other officials must be qualified as at the larger mines.

COAL-SHIPPING PORTS.

Westport.

A further improvement in the volume of shipping and in the depths of water on the Buller bar has taken place.

The output from the local collieries using this harbour amounted to 718,419 tons during 1909, being an increase of 49,970 tons on the output for the previous year. The returns show that the output has practically doubled within the past decade.

The Chairman of the Harbour Board, Mr. George Griffiths, reports that the volume of inward and outward shipping for the year was as follows:—

					Steamers.	Sailers.	Registered Tonnage.
Inwards	..	..	..	..	1,151	21	623,664
Outwards	..	..	..	..	1,152	20	622,566
Total	..	..	..	..			1,246,230

being an increase of 63,150 tons over that of the previous year.

The port and its railway equipment are now capable of dealing with 30,000 tons of coal per week.

The Engineer to the Harbour Board, Mr. R. A. Young, M.Inst.C.E., reports that there has been an improvement in the depths of water on the bar at high water, inasmuch as the depths are more regular, being limited to from 20 ft. to 26 ft. at H.W.S.T.

The Board have recently imported a new suction dredge, the "Eileen Ward," of 1,000 tons capacity, which will supplement the powerful dredger "Rubi Seddon," which during the year lifted and carried out to sea 378,950 tons of material, at a cost of 3-6d. per ton.

The "Erskine" bucket dredger likewise lifted 155,700 tons, at a net cost of 7-5d. per ton.

Greymouth.

The following are the official returns of the Port of Greymouth, from whence is shipped the product of the Grey Coalfield. A small decrease in the registered tonnage of the vessels entering the port as compared with the previous year is recorded.

Average depth of water on the bar at high water, 21 ft.; average depth of water in river at high water, 19 ft. 7 in.

Number of days bar was navigable, 321.

Tonnage of vessels entering the port: 680 steamers, 337,167 tons register; 31 sailing-vessels, 4,552 tons register: total, 341,719 tons register.

Imports.—General, 54,621 tons.

Exports.—Timber, 31,181,000 sup. ft.; coal, 335,151 tons; bricks, 633 tons; coke, 2,596 tons; flax, 913 bales; wool, 1,464 bales; gold, 83,974 ozs.; general, 2,761 tons.

Berthage accommodation, 2,770 ft. A tidal dock in Kororo Lagoon, giving additional berthage accommodation of 2,000 ft., is now being constructed, 700 ft. having been completed.

I have, &c.,

FRANK REED,

Inspecting Engineer and Inspector of Mines.

ANNEXURE A.

REPORTS OF INSPECTORS OF MINES.

Mr. BOYD BENNIE, Inspector of Mines, Northern Inspection District, to the UNDER-SECRETARY,
Mines Department, Wellington.

SIR,—

Inspector of Mines Office, Thames, 14th February, 1910.

In compliance with section 78 of the Coal-mines Act, 1908, I have the honour to report on the coal-mines in the Northern District for the year ended 31st December, 1909.

Kawakawa Colliery (Samuel Neill, mine-manager).—Operations are still confined to the extraction of pillars, and considerable expense has been incurred in reopening the old drives, &c. The output of coal from the mine for the year was 580 tons, and three men were employed. The mine, when inspected, was in good order.

Ruatangata Colliery (William Wallace, mine-manager).—The owners have located a seam of coal 7 ft. thick about 40 ft. below the seam worked by the old company. The newly discovered seam is reported to be of first-class quality. The expenditure required for the opening of the mine will be comparatively light, as it is situated near to the Government railway. The mine was inspected during the year, and found to be in good order. Three men were employed prospecting.

Hikurangi Coal Company (Limited) (W. R. Dunn, mine-manager).—The company has vigorously worked the three sections of its property during the past twelve months. In the eastern section the pillars, of which there are a large number remaining, are being drawn with very little loss. The quality of the coal has scarcely deteriorated to any appreciable extent during long and constant exposure to the atmosphere. In the western section men are employed working on the bord-and-pillar system. The seam varies from 4 ft. to 7 ft. in thickness; in the Crown lease section it is only from 3 ft. to 5 ft. thick, hitherto very few men have worked there. The other sections of the company situated south-west of the Hikurangi Township have been prospected by boring, and I understand that the results are satisfactory. The mines were examined several times during the year, and everything gave satisfaction except the ventilation, which is induced by natural means, and is consequently very erratic. The output for the year was 58,359 tons of coal, or 2,712 tons below the return of the previous year; the dividends amounted to £5,062 10s.

Northern Coal Company (Limited) (William Morgan, mine-manager).—A dip heading has been driven in a north-easterly direction to the dip of the old mine, thus opening up and draining a large area of coal, and improving the ventilation. This section is opening out well, the coal-seam being 12 ft. thick in places. A drive has been carried through some pillars in the old Mino section where a creep had taken place, and towards the end of the year pillars were being drawn close to the boundary. Most of these pillars may safely be drawn if care is exercised. In the early part of the year the ventilation was defective, necessitating the sinking of a shaft to connect with the workings, also the connecting of the north-east dip with the old workings. Although this has resulted in a material improvement in the natural ventilation, it is inadequate. The output of coal for the year was 39,301 tons, showing a decrease of 10,275 tons. Seventy-three men were employed.

Kiripaka Mine (Northern Coal Company, owners; E. W. Tattley, mine-manager).—Early in the year operations were confined to the north side of the main dip, where some pillars were extracted. Subsequently a creep occurred in No. 2 south level, but it has now settled, enabling the company to extract the pillars in this affected area. A new dip heading has been driven through the thin coal on the south of the main dip for a distance of 400 ft., and coal 5 ft. in thickness has been proved. To facilitate this undertaking a new air-compressor was installed on the surface, and a 5 in. single-cylinder haulage-engine underground. The haulage-engine and pumps are now driven by compressed air. A diamond drill for prospecting-work has been continuously used during the year, with satisfactory results. The mine was found to be in good order. Adequate ventilation is maintained by a fan. A complete first-aid equipment has been jointly purchased by the company and the Miners' Union. The output for the year—a record one—was 36,542 tons of coal and 1,500 tons of fireclay. Eighty-five men were employed.

Taipiri Coal-mines (Limited).—This company continues to occupy the premier position in this Island as a coal-producer. A disagreement between the company and the workmen regarding a vital clause in the Workers' Compensation Act, 1908, caused a short delay in resuming work after the Christmas holidays; but upon this being satisfactorily arranged the men returned to work. Mining operations were pushed ahead, with the result that the coal output from the three sections of the company constitutes a record, exceeding the output of the previous year by 17,050 tons.

Ralph's section (E. S. Wight, mine-manager).—The principal development work for the year consisted of driving a connection with the Taipiri West shaft. Three shifts of men have been constantly employed on this work at both ends, and it is anticipated that the connection will be made by the end of July, 1910. There remained only 530 yards to be driven on the 14th February. Various improvements have been carried out in the last few months. The drainage has been improved by putting down a borehole 62 chains west of the shaft connecting the mine-workings at a depth of 380 ft. A

new Cameron pump, 14 in. by 6 in. by 18 in. stroke, has been installed for the purpose of forcing the water direct to the surface through the borehole; and a new two-stage air-compressor, Ingersoll Rand type, has been erected to supply the additional power required. Ventilation is induced by a Waddell fan. A special visit for the purpose of testing the ventilation was made on the 18th December, and the following measurements were taken: Main intake—Quantity of air entering the mine, 42,630 cubic feet per minute, or 311.16 cubic feet of air per man per minute; temperature, 76.5° Fahr. The distribution of the air through the workings was satisfactory. Mine-sanitation is properly attended to, and there is a good supply of mining-timber on hand. The pillar area under the Waikato River is gradually being filled in with *débris*. This section does not appear to have suffered any damage during the year. The ladderways in the second escape and return air-shaft have been substantially protected; strong wire netting is fitted to the ladders so as to form a half-cylindrical tube. The danger of serious accidents occurring by persons falling off the ladders is thus greatly minimised. The shafts, cages, ropes, chains, and automatic gear connected therewith were carefully examined from time to time. The engine, boiler, and fan machinery are in good order. Telephone communication is now established in the mine. The output of coal for the year was 85,149 tons, a decrease of 6,626 tons as compared with the previous year. Two hundred and ten men were employed.

Extended section (William Wood, mine-manager): The main haulage has been extended into the west heading for a distance of 14 chains, and improvements have been effected at the pit-bottom, thereby facilitating the work of loading coal. During the year the downthrow fault referred to in last year's report was driven through, and the seam was found. The connecting drive for ventilation purposes has been made, also arrangements undertaken in connection with haulage and drainage. The north-west heading has been extended to within 5 chains of the western bank of the Waikato River. A new Lancashire boiler is employed at the mine, and a start has been made to erect a pair of 20 in. cylinder haulage-engines. Ventilation is produced by a fan of Sirocco type. The mine was last visited on the 20th December, when the following measurements were taken: North section: the quantity of air entering the mine was 29,145 cubic feet per minute, being 331.2 cubic feet of air per man per minute (the air is well distributed through all the working-places); mine-temperature, 78° Fahr. Sanitary conditions are satisfactory; drives and other places well timbered, and ladders and timber are provided for each working-place. Travelling-roads are in good order. In the second escape and return air-shaft the ladders are being protected in the same manner as those at Ralph's. The shafts, cages, ropes, and chains, with the detaching-hooks and safety catches, were carefully tested from time to time by the engineers, and the results of such tests were recorded in the report-book. Special and general rules posted, and reports entered to date. The output of coal for the year was 101,180 tons, being an increase of 23,618 tons over the previous year. Two hundred and twenty-three men were employed.

Taupiri Reserve (William Wood, manager): Nothing of special note has been done during the year. Ventilation is by natural means, assisted by a jet of steam. The quantity of air per man per minute entering the mine at the time of the examination was 173.3 cubic feet. The mine is in good order, and the rules and regulations are well observed. The output of coal for the year was 6,502 tons.

Taupiri South Colliery (William Leather, mine-manager).—Mining operations have been seriously hindered by mine-fires, and although the manager attempted to block up the area in which the fires existed, his efforts proved fruitless, and he has been compelled to build stoppings, and close up the mine with a view to choking the fire. Five men were employed during the year.

Union Collieries (F. J. Tattley, mine-manager).—The mine has been worked continuously throughout the year, but no development-work of any importance has been undertaken. A connection was made with the old Miranda Company's shaft, thus making provision for a second outlet. The ventilation was tested early in December, and the following measurements were taken: Main intake—1,421 cubic feet of air per minute, or 79 cubic feet of air per man. Main return—3,350 cubic feet of air per minute, or 186 cubic feet of air per man. The discrepancy in the quantities of air is due to the fact that the velocity of the air-currents is variable, also in a measure to leakage. These defects were pointed out to the manager, and he was requested to remedy them at once. The manager is inclined to be lax and somewhat indifferent concerning the supervision of the mine, and I have had to warn him about several matters which should have been quite unnecessary for me to comment on had he been both observant and mindful of the provisions of the Coal-mines Act. Special and general rules posted, report-book kept, and reports entered to date. The coal-output for the year was 13,720 tons, and thirty-one men were employed.

Waipa Colliery (no manager).—This mine has been idle throughout the year. A new company is being formed, with a capital of £80,000, to develop and work the property, situated some six miles north-west of Ngauwawhia Railway-station. The mine will be connected with the Main Trunk and Waikato lines by branch railway, and this work will be undertaken as soon as the surveys, &c., are completed. The development of the mine will be carried out simultaneously with railway-construction.

Drury Colliery (James Holden, mine-manager).—The principal product of the mine is fireclay, which occurs in a bed of considerable thickness and contains a very faulted coal-seam of inferior quality. Owing to the thickness of the clay and rock *débris* which cover the clay and coal-seams ordinary mining methods are adopted. The natural ventilation is inadequate. The mine was inspected on several occasions during the year and found otherwise to be in good order. Special and general rules were posted, and there was a plentiful supply of mining-timber on hand. Report-book kept, and reports entered to date. The output for the year was 451 tons of coal and 875 tons of fireclay. Four men were employed.

Mangapapa Colliery (William Lennox, mine-manager).—Operations have been carried out only on a small scale, as in former years. The installation of a Hayes fan, single inlet, 4 ft. 6 in. diameter, driven by a portable engine, has materially improved the ventilation, previously defective. The

following measurements were registered by the anemometer: Main intake—13,432 cubic feet of air per minute, or 1,425 cubic feet of air per man per minute. The mine is well opened out, and the size of the pillars is adequate. The mine-workings are safe, and a good supply of mining-timber is on hand. Special and general rules are posted, and reports entered daily. Alterations have also been carried out in connection with the wharf and coal-storage bin. The output of coal for the year was 6,415 tons. Sixteen men were employed.

I have, &c.,

B. BENNIE,

Inspector of Mines.

Mr. A. G. MARSHALL, Inspector of Mines, West Coast Inspection District, to the UNDER-SECRETARY, Mines Department, Wellington.

SIR,—

Inspector of Mines' Office, Westport, 21st March, 1910.

I have the honour, in compliance with section 78 of the Coal-mines Act, 1908, to report as follows on the West Coast coal-mines for the year ended 31st December, 1909:—

Enner Glynn Coal-mine, Nelson (James Carroll, permit).—(9/11/09): This mine has lately been reopened, after being shut down for ten years, it having been found necessary at that time to flood the mine owing to an outbreak of fire in the old workings. On withdrawal of the water from the shaft, the timber was found in comparatively good condition, whilst the main levels were found completely blocked, the water having caused the ground (which is of a soft nature) to swell and crush through the timber. In preference to opening out the old levels, the manager decided to set out a new drive to intersect the winze, which, when holed, should materially assist the ventilation of the mine. On the surface new pulley-frames have been erected over the shaft, a steam-engine and boiler have been placed in position for winding the coal and to drive the ventilating-fan.

Morrison's Freehold, Gordon Downs (Benjamin Millan, permit).—(8/11/09): Prospecting has been energetically conducted on this property since June. No. 1 prospecting tunnel has been driven a distance of 130 ft., but is now abandoned, whilst No. 2 tunnel has been driven a total distance of 220 ft.: but coal has not yet been proved.

Smythe's Coal Lease, Mataura, Collingwood (A. Walker, permit).—(5/11/09): A considerable amount of prospecting has been done on this property, several outcrops having been exposed showing coal of good quality, whilst a pack-track has been completed to within about one mile of the proposed site of the mine.

Seaford Colliery, Pakawau (owner, E. G. Pileher, of Wellington; P. McCaffrey, mine-manager).—(4/11/09): Owing to the unsatisfactory shipping facilities at the old wharf, this mine closed down on the 4th July, 1908, pending the erection of a new wharf some two miles further south, which was completed in August, and is of a very substantial character. The total length is 726 ft., and width 18 ft. Berthage is obtained for several small vessels, and the depth of water will enable vessels of a much greater draught than formerly to load. The company has built a sawmill, where all timber such as is used for sleepers and truck-building will be cut. All work is now at a standstill until such time as authority can be obtained to construct a mile and a quarter of tram-line, when it is the intention of the management to instal the main and tail rope system of haulage to convey the coal from the mine to the wharf.

Taupata Estates (R. G. Filluil, owner; W. Lewis, second-class mine-manager).—(4/11/09): Prospecting on this estate has been carried on during the latter part of the year by the lessees (Messrs. Lewis Bros. and Forbes), but so far with very little success. In No. 1 prospecting tunnel a seam of coal 16 in. in thickness was cut, dipping to the westward at an angle of 60°. On driving, the seam showed no improvement in thickness, and the work here was therefore abandoned on the 4th September. A new tunnel was then started 6 chains west of No. 1, but at 40 ft. lower level, the face now standing in hard sandstone.

Puponga Colliery (C. Y. Fell, attorney, Nelson; R. McEwan, mine-manager).—(4/11/09): In "A" mine the main dip has only been extended 307 ft. during the year, making the total distance from tunnel-mouth to face of heading 2372 links. The coal at the face is of a very good quality. In order to maintain the output from this mine it is obvious that a more vigorous system of development should be carried out, and the dip extended northward, to prove the field in this direction, before the extraction of the pillars lying to the east and rise of the main dip workings can take place. B mine: Mining operations were suspended here owing to the gradual thinning of the coal. However, to prove the field, a borehole was put down to a depth of 104 ft., passing through a small seam 1 ft. 10 in. thick at a depth of 96 ft., and it is now intended to continue this borehole to a greater depth. The Radialaxe coal-cutting machines installed during last year continue to give every satisfaction, and are found to be very effective in holing in clay or stone bands. This enables a much larger percentage of large coal to be won from the mine than was formerly the case when hand mining was employed. All machinery in and about the mine is kept in good order. New storage-bins have been erected at the mine, and the tramway and wharf greatly improved, at considerable expense.

Seddonville State Colliery (James Fletcher, mine-manager).—(12/10/09): With the exception of winning some top coal from the Bridge section, work has been practically confined to the development of the Cave area, where a holing was effected on the above date from the West section, materially improving the ventilation, the air-courses being much shorter and more direct to the ventilating-fan, which is of the single-inlet Sirocco type, 50 in. diameter, belt-driven, and capable of producing 35,000 cubic feet of air per minute at a water-gauge of $\frac{1}{2}$ in. West section, where five pairs of miners are employed, is separately ventilated by a 9 ft. diameter Broome fan, producing 18,500 cubic feet of air

per minute. So far the Cave area has proved to be the best section of the mine, both in extent and quality of coal. It is anticipated that a new heading recently started eastward off the main winning heading will eventually tap the coal that is known to lie under and to the east of the present rope road, and which has been proved by borehole to be 16 ft. in thickness. Throughout the whole of the mine the timbering is done in a very creditable manner, whilst the ventilation is efficient. An increase of 12,704 tons has to be recorded in the output, which constitutes a record for the mine. Towards the latter part of the year a new section of the Buller Coalfield was discovered in the Charming Creek district, between the Ngakawau River and Seddonville Mine. Upon this area boring operations are being carried out to ascertain the continuity and thickness of the coal. So far one borehole has been completed, proving coal of good quality 20 ft. in thickness. This field may justify the development of a new mine, and give a new lease of life to State mining at Westport if the boring operations are successful.

Westport-Stockton Colliery (George H. Broome, general mining manager; H. McAvoy, mine-manager).—(18/12/09): This colliery has now been in constant operation for the past fifteen months, during which time mining operations have been carried on by double shift. The work has been confined to B tunnel section, where 92,942 tons of good quality coal has been obtained. The mine is worked on the bord-and-pillar system, the bords being driven as near as possible to the level course of the seam to facilitate trucking, whilst stentons are driven from level to level, thus cutting the area worked into pillars. Bords and stentons are driven 6 yards wide, whilst both hand and machine labour is employed. The Sullivan bord-and-pillar machines are used, capable of holing a face 6 yards wide to a depth of 6 ft. in twenty minutes. These electrically driven machines are giving every satisfaction. Ventilation throughout the mine is good. A Waddell fan 7 ft. in diameter is used, giving 80,000 cubic feet of air per minute at a $1\frac{1}{2}$ in. water-gauge. The fan is driven by a 30-horse-power three-phase induction motor. The company have two of these fans, but only one is at present in use. The natural drainage of the mine is very good, and the small Worthington pump used has a very small duty imposed on it. The small locomotives that do all the shunting in the mine weigh 1,300 lb., with a draw-bar pull of 2,500 lb. on the level, at a speed of 7.4 miles per hour. They are provided with a cable-reel, driven at a properly regulated speed by chain gearing, which enables them to have a working-radius of 300 yards from the nearest trolley-wire. The coal is brought from the lay-by inside B tunnel to the top of No. 2 incline by electrical locomotives which weigh 40,000 lb. each, and are equipped with the Sprague general type M control, which enables them to be worked singly or coupled as desired. They have a draw-bar pull of 7,500 lb. on the level at a speed of 8.2 miles per hour. Each of the main locomotives is equipped with a powerful Fell brake, which has been improved in various ways, and is now working very satisfactorily. Each locomotive when engaged in lowering coal is assisted by a brake-car, which also carries a Fell-brake equipment. On the down trip it runs behind the locomotive in front of the load, and on the up trip is hauled on the rear of the train for safety, in case of the breaking of a coupling. The brake-car is in charge of a second man, who acts as conductor, and attends to the switches at the various passing-places. At present there is only one car equipped with two brakes, but it is intended to replace with double brakes all single-brake cars. At the bins all coal is handled by three automatic side-tippers in charge of one man, and is then distributed by means of plate-band conveyors, belt-driven by D.C. motors. Bunker-doors are worked by hydraulic pressure, and do excellent work. The whole plant is working very efficiently, and for some considerable time has dealt with an output of 700 tons per day. Extension works: At the present, development work is being pushed on to enable further deposits of coal to be tapped. The Mangatini Bridge is nearing completion, and other formation contracts are well under way.

Millerton Colliery (owners, Westport Coal Company (Limited); William Dunn, local manager; William McCormack, mine-manager).—(28/10/09): During the year the tonnage raised and forwarded for shipment was 212,474 tons, which is a decrease of 104,127 tons on the preceding year. This large decrease was due to the breaking-out of an underground fire in the Mine Creek lay-by on the 28th February which necessitated the sealing-down and flooding of the mine, operations not being resumed until the 24th May.

Mine Creek area: A general improvement in the hardness and quality of the coal worked in this area is noticeable. Owing to the heaving of the bottom in No. 10 east level, caused by the flooding of the mine at the time of the fire, practically a new dip haulage road had to be driven from No. 11 east, in order to extract the pillars in this section.

Mangatini section: This area is being rapidly opened out, and so far shows coal of good quality and thickness. The coal at present is being lowered by a temporary system of jigs and main rope haulage, but a powerful lowering brake has been erected and the permanent roads laid for endless rope to a point of junction with the main haulage in the south heading of Mine Creek area.

New Tunnel district: The only work in this district has been the driving of the new tunnel 46 chains in length, to connect into Mine Creek area, and junction with the main south heading, thereby forming a new haulage-road at a grade of 1 in 10, and thus doing away with the extremely heavy Mine Creek Jig route, now in use, with a maximum grade of 1 in 2. This contract was carried on from both ends through very hard granite country, and a holeing effected in November last, both ends meeting with complete accuracy. The tunnel, which is driven 11 ft. by 7 ft. in the clear, will make a very fine haulage route, and will deliver the whole output from the Mangatini and Mine Creek sections. It is anticipated that a material increase will be effected in the output as a result of these improved conditions of haulage.

Denniston Collieries (owners, Westport Coal Company (Limited); J. C. Brown, local manager).—During the year the tonnage lowered down the inclines for shipment was 348,335 tons, which is a record output, and was won from the mines working single shift. The development work in connection with both mines is kept well in advance of requirements, and has proved very satisfactory, whilst pillar extraction has also given good results.

Coalbrookdale Mine (Charles W. Dixon, mine-manager) (16/12/09): The development of the dip area in this mine is showing excellent results, the seam opening up extensively in coal of an exceptionally good quality as the workings advance in a north-easterly direction. The coal lying to the dip and east of Munsie's section will be won by these workings as they extend. Munsie's section: Owing to the seam dipping at a somewhat acute angle, all solid workings in this section were stopped some time ago, the faces standing in good coal. All available pillars are now being extracted, and the remainder of the coal will be more advantageously won from the Cascade dip, which is at a lower level. The extension of the Cascade dip workings will also allow of the extraction of the pillars now standing practically intact in the East or old Left Hand section. The Wareatea section is being opened by a 10 ft. by 7 ft. drive, easily graded through the coal-measures for a distance of some 24 chains, which it is intended to equip for endless-rope haulage. The workings in Bradley's section are meanwhile suspended, pending the completion of this shorter line of haulage. When this section of roadway is in working-order the drive will be extended a further 25 chains, principally in coal, which will allow the thorough development of the Wareatea area. Work is in progress for the lighting of all main roads, lay-byes, jig-heads, &c., by electricity.

Ironbridge Mine (Thomas Thomson, mine-manager) (14/12/09): During the year, mining operations in the various sections of this mine have proved very satisfactory, and the quality and thickness of the seam have been well maintained. The lower seam intersected in Dundee dip proved of excellent quality, having a thickness of fully 15 ft. According to present indications, this seam extends over a considerable area, and will prolong the life of the mine. **Kiwi section**: The whole of the output from this area is derived from the pillars, which are gradually being extracted homewards. **Old Shaft section** (15/12/09): The development of this area has proved satisfactory, a fair output being maintained from solid and pillar workings. **Deep Creek**: Work in connection with the opening-up of this section has been pushed forward with all possible speed. The permanent roads for endless-rope haulage have been laid to the outcrops, and the coal is now being lowered by temporary jigs and appliances, until the extension of the headings to a point suitable for a permanent lowering-brake site.

To further increase the efficiency of the ventilation of this colliery a new Schiele fan was erected during the year, and is giving very satisfactory results. It is also intended to instal electric light on all main roads, &c.

Rocklands Coal-mine, Buller Road (Geo. Walker, lessee; James Burley, permit).—(9/12/09): After being closed for two years, this mine was recently reopened, when the whole of the underground workings were found in good order, with the appearance of having been worked with some system. The coal won from the mine is used exclusively for dredging purposes.

Whitecliffs Coal-mine, Buller Road (Job Lines, lessee; John Burley, permit).—(9/12/09): In this mine the main levels have been driven too wide, and have the appearance of being worked on the long-wall advancing system. The owner has been requested to reduce the width of same, as timber would be ineffective to prevent the mine from eventually being lost if this practice is continued. The coal is of excellent quality for either steam or household purposes.

Burke's Creek Coal-mine (Harris and Gibson, owners; J. Harris, permit).—(23/11/09): Since the purchase of this property by the present owners a considerable amount of work has been done, nearly every department of the mine needing overhaul and repairs. The old timber tram-line has now been relaid with steel rails for a distance of a mile and a half, and it is the intention of the owners to continue this line to connect with the Government railway near Reefton Station, where it is proposed to erect proper coal-screening plant.

Lockington's Leasehold, Burke's Creek (E. Lockington, permit).—(23/11/09): The greater portion of the coal won from this mine during the year has been mined from the eastern section. A large amount of pyritical stone continues to show in the several faces. On the whole, the mine has the appearance of being very much neglected, and lack of energy in the working of same is very apparent.

Archer's Freehold, Caplestone (F. W. Archer, permit).—(23/11/09): Owing to the faulting of No. 1 main south level, top seam, work here has been temporarily suspended, the development of the bottom seam now being carried out. In the levels in this seam the coal is about 12 ft. in thickness, and of good quality. A new engine plane has been constructed, having a total length of 11 chains, and a mean gradient of about 1 in 5 against the load. The coal is hauled by a small steam-winch.

Coghlan's Freehold, Caplestone (J. Coghlan, permit).—(23/11/09): During the latter part of the year it was found necessary, owing to the faulty nature of the coal in the bottom level, to abandon it, and a new mine was opened out a quarter of a mile further east. For the development of this mine a self-acting incline, 6 chains in length, with a mean gradient of 1 in 4, was constructed. New storage-bins of 20 and 40 tons capacity have been erected at the top and bottom of the incline.

Waitahu Coal-mine, Reefton (J. O'Donnell, permit).—(23/11/09): No. 2 tunnel has been driven 60 ft. to prove the fault encountered in this and No. 1 tunnel, but up to this point coal has not been intersected. The most economical way to conduct further prospecting is by boring. In the lower level, driven immediately above flood-water level, a washout occurs 40 feet in width, the roof and floor maintaining their continuity. The intervening space was filled with gravel and river-silt, clearly showing that at one time this had been the course of the Waitahu River.

Reefton Coal-mine (J. Billett, owner; J. H. Howell, permit).—(24/11/09): Owing to the unsatisfactory state of the timbering in this mine, due in a great measure to side weight or pressure, it was found necessary in September last to withdraw the workmen until the renewal of the timber and the more efficient ventilation of the mine. On the above date there still remained about 100 ft. of the main level to be retimbered.

Phoenix and Venus Coal-mine, Murray Creek (J. Knight, permit).—(24/11/09): In the development of this mine a new crosscut has been driven to intersect the bottom seam, 20 ft. in thickness, but not so hard as the top seam. Nevertheless, it is an excellent steaming coal, but as the sale of this

class of coal is limited, very little development has so far been carried out. Over 90 per cent. of the coal won from this mine during the year was obtained from the top seam. Although a considerable amount of new and larger fluming has been erected to convey the water from Victoria Creek on the western side of the lease, and from the source of the Murray Creek on the eastern side, the fire in the old Phoenix Mine still continues to burn fiercely in one or two places.

Watson and Moyle's Coal-mine, Murray Creek (W. Watson, permit).—(24/11/09): After being closed down for upwards of twenty years, this mine was reopened by the present owners in September. Owing to the faulted nature of the country, the coal is soft and only fit for steam-producing purposes; it is used by the Keep It Dark Glod-mining Company at their reduction-works.

Lankey's Creek Coal-mine (D. Turnbull, permit).—(24/11/09): Since the Progress Gold-mining Company took over this property, in August, the mine has been thoroughly renovated. All the old workings and levels have been retimbered, and several faces have been reopened which were abandoned in the early working. The outside improvements consist of the construction of a new self-acting incline, 1,000 ft. in length, with bins at top and bottom. The former have a storage-capacity of 125 tons, and the latter 100 tons. It is intended to improve the present system of haulage from the bottom of incline to the battery, by the substitution of a traction-engine for the horse-haulage hitherto employed, when it is anticipated a load of from 8 to 10 tons will be hauled.

Merrijigs Coal-mine (McGee and Osborne, owners; J. Osborne, permit).—(25/11/09): In order to develop this coal area, a rock tunnel, 6 ft. by 5 ft., was driven for a distance of 145 ft. to intersect the coal, which, on being cut, was found to be standing almost vertical, and on being driven on to the east, a gradual thinning took place, the coal becoming unprofitable to work. Mining is now entirely confined to the western side of the area, where the coal is 2 ft. 5 in. thick, and of fair quality. Throughout the mine the timbering is done in a very workmanlike manner.

Loughnan's Coal-mine (J. Billett, owner, permit).—(25/11/09): A fault of considerable displacement having cut the coal in the main north level, preparations are now in progress to start a new heading at a much lower level. The coal in this mine is of excellent quality, and is used principally by the Progress Gold-mining Company in connection with their winding plant on the Globe Hill.

Blackball Colliery (owners, Blackball Coal Company (Limited); Walter Leitch, mining manager; William Clark, mine-manager).—(3/12/09): During the year a fair amount of development work was completed, but, unfortunately, a large fault was intersected by the main levels. After considerable prospecting, it is now intended to cut through this fault and open out to the line of outcrops about 60 chains ahead. Nos. 17 and 18 headings, at right angles to the main levels, have been pushed forward to prove the coal to the rise, and at a driven distance of 15 chains show good coal throughout, and, although not yet extended their full distance, open up a fairly large field of coal. Heating continues to give as much trouble as formerly, but the panel system of working prevents any large outbursts, this having proved efficient for coal of this class. The general workings of the mine are adequately ventilated by a belt-driven Capell fan, but the ventilation of Nos. 17 and 18 headings during their extension was at times poor. Until the end of last November all coal was carried to Ngahere by aerial tramway, but, owing to the expense and delay caused by breakdowns, the Government agreed to convey the coal over their partly completed Ngahere-Blackball Railway, with the result that a decided increase in the output of the mine has taken place. During the past year a record output of 120,065 tons was made. In connection with the Government railway, storage-bins of 3,000 tons capacity were constructed at this mine; and to further facilitate the economical handling of the coal modern machinery and labour-saving appliances have been installed. The main endless-rope system of haulage has been extended about 300 ft. at the surface end to convey the coal direct to the bins.

Paparoa Colliery (owners, Paparoa Coal-mining Company, Limited; J. T. Watson, mine-manager).—(4/12/09): All preparatory work in connection with the development of this colliery is now practically completed. The branch line to connect with the Government railway at Blackball is two miles in length, with a uniform gradient of 1 in 25, and is fitted throughout with a centre-brake rail. At Roa, where the bins are situated, about one mile of railway sidings have been laid down to provide storage-accommodation for full and empty wagons. The bins have a storage-capacity of 4,500 tons. The superstructure, which is built of local red-pine and steel girders, supported on ferro-concrete piers and foundations, has complete screening plant, distributing conveyors, cross and picking belts, slack-elevator, power-driven tippler, &c. This plant is actuated by Pelton wheels, driven by a 200 ft. head of water, taken from Ford's and Tunnel Creeks and other sources. It is estimated that the quantity of water available under ordinary conditions is from two and a half to three Government heads. This power is to be supplemented by steam for use in dry seasons. Mining operations have been carried on in No. 1 seam, from which a daily output of from 200 to 250 tons is lowered. The development of No. 2 seam is now being vigorously prosecuted, when the output from the mine should be materially increased. A considerable amount of work has also been done on No. 3 seam, from which coal should be produced in a few months. Among the works contemplated are the erection of a few coke-ovens for dealing with the very small coal.

North Brunner Colliery (owners, North Brunner Coal-mining Company, Limited; Arthur P. Harper, attorney; George Smith, mine-manager).—(19/11/09): In connection with the development of this company's property, contracts were let in the early part of the year for the formation of 57 chains of incline, having a mean gradient of 1 in 12 in favour of the load. At the same time tenders were called for building a bridge to span the Grey River. This bridge, which is built entirely of Australian hardwood, is 660 ft. long and 10 ft. wide (which allows for two lines of rails to be carried across, leaving ample room between the two for footway). To open out for temporary purposes a small area of coal covering 5½ acres, lying from 400 ft. to 500 ft. above sea-level, a tunnel has been driven for 8 chains to the coal, which was found to be standing almost vertical, and of poor quality. Work was therefore abandoned, and preparations made for the extension of the incline a further 20 chains, the coal there

being of a much harder nature and of better quality; this necessitated the driving of a tunnel on the line of rope road, $6\frac{1}{2}$ chains in length, rising 1 in 2.75. The erection of coal-bins at Stillwater, 76 chains distant, having a storage-capacity of 1,000 tons, is nearing completion. The bins are to be equipped with mechanical appliances, such as elevators, jiggling-screens, &c., capable of dealing with an output of 1,500 tons per day. Commodious carpenters', fitters', and smithy shops have been erected, which are fitted throughout with up-to-date machinery for the necessary repairs usual about a colliery. The whole of the workshop machinery, as well as that of the blacksmith's shop, is actuated by a horizontal steam-engine with $6\frac{1}{2}$ in. cylinder and 9 in. stroke, supplied by steam at 140 lb. pressure from a multi-tubular boiler.

Brunner Mine (owners, Point Elizabeth Railway and Coal Company (Limited); R. Alison, mining manager; James Armstrong, mine-manager).—(18/11/09): The workings in the St. Kilda section of this company's mine have been extended during the year, and, owing to the limited number of working-faces, three shifts of workmen were employed. In the main heading riseward a reverse or overlap fault was encountered, apparently covering a considerable area, which can now be worked in the form of a second or top seam, above portion of the already worked-out seam, thus adding new lease of life to the mine. The winning headings have still some distance to be driven before the boundary is reached. As the coal in the two prospecting drives near the river-bank showed no improvement on being driven on, work there has practically been abandoned. The water-power installed during the year 1908 for driving the ventilating-fan proved to be inadequate, and a 20-horse-power Campbell oil-engine has been since erected for this work, materially improving the ventilation throughout the mine. A vibrating screen, two picking-belts each respectively 40 ft. and 70 ft. long, and one set of bucket elevators for raising the small coal, have been installed. The construction of an unscreened-coal bin of 200 tons capacity, with necessary adjuncts of tippler and travelling belt, is almost completed.

No. 1 Point Elizabeth State Colliery (James Bishop, general mining manager).—The gross tonnage from this colliery for the year 1909 (216,225 tons) shows a decrease of 18,025 tons as compared with the previous year. This decrease is in a large measure due to the cessation of work for three weeks in the latter end of the year, pending the arranging of a new agreement.

No. 1 section (J. Coulthard, mine-manager) (6/12/09): Nos. 2, 3, and 4 west levels are still working in the solid, and show coal of very good quality. *Extended Dip*: As the working-places on the eastern side of this section were cut off by a large fault all mining is practically confined to the west side, where the faces are still in the solid. Locked safety-lamps are used throughout this part of the mine. *East section*: All solid work has been completed in Nos. 3 and 4 levels, the whole of the pillars standing intact. No. 2 level is driving forward on the strike of the seam, the main fault which has cut off Nos. 3 and 4 not yet having been met. The system of working in No. 1 level was partly longwall, and from Nos. 7 to 4 banks, off No. 1 level, all coal is being won by extraction of pillars. 47,000 cubic feet of air circulating in main return.

No. 2 section (J. Herd, mine-manager) (5/12/09): All workings on the west side of main dip are in solid coal, which is of good quality. The double shifting of the *Extended Dip* section has been found necessary, in order that the coal both from solid and pillar workings might be won as rapidly as possible, when the dip will form a sump for the storage of water, and thus enable the extraction of a large area of pillars standing to the rise. All solid workings have now been completed, and the coal won from this area is derived entirely from the extraction of pillars. In Nos. 2, 3, and 4 levels, east of main dip, all solid workings are completed, these levels now standing against the fault. The coal shows evidence of thinning in No. 1 east level, top seam, as the workings extend riseward, whilst it is the intention of the management at an early date to work No. 1 east, bottom seam, on the longwall advancing system. Total quantity of air circulated, 49,000 cubic feet.

In the immediate future, all output from the dip-workings of both Nos. 1 and 2 sections of this colliery must be obtained from the extraction of pillars. Danger from accident and interruption from water will be reduced the more rapidly the withdrawal of these pillars can be effected.

No. 2 Point Elizabeth State Colliery (James Bishop, mine-manager).—(6/12/09): This new colliery is being developed entirely independent from the No. 1 State Colliery, about five miles nearer Grey-mouth, and involves the construction of three miles of railway over very rough country, necessitating the bridging of the Seven-mile Gorge, together with the formation of extensive bin-sites and railway-sidings. To connect the mine with the screens and storage-bins about two miles of rope-haulage road is being constructed, including about 6,000 ft. of tunnelling in four sections. This endless-rope road will be self-acting, the load being controlled by powerful hydraulic brakes. Good progress is being made at the tunnels, of which the first two sections have been started. The coal-mine in connection with these development-works, where two men are employed winning coal for the air-compressors actuating the rock-drills, continues in good order, and is well timbered and ventilated. Other works in progress comprise the clearing for starting the mine-tunnel in coal, cuttings, and trestle-work required for completion of rope-road, and a sawmill has been erected for the supply of timber for all purposes. The storage-bins, having a capacity of 4,000 tons, will shortly be started. The plant is being designed to handle an output of 2,000 tons daily.

ACCIDENTS.

Of the number of accidents reported as coming within section 62 of the Coal-mines Act, 1908, six were fatal and eleven non-fatal. Of the persons killed, three were underground at the working-face, two were run over by trucks in the mine, and the other was killed on railway surface-works by premature explosion. In one accident (fall of roof), one miner was killed, two seriously injured, and three others slightly injured. Two men were slightly burned by explosion of firedamp in Paparoa Colliery.

Fatal.

Point Elizabeth State Collieries.—(25/1/09) : John McIntyre, trucker, killed by runaway empty truck on main dip haulage road.

Millerton Colliery.—(2/2/09) : Charles Forrest, miner, killed by fall of coal in the face.

Point Elizabeth State Collieries.—(17/4/09) : Albert John Davis, trucker, run over and killed by truck on main dip haulage-road.

Blackball Colliery.—(7/7/09) : James Meehan, labourer, killed by premature explosion whilst charging shot-hole at Blackball Coal Company's railway-works.

Ironbridge Mine, Denniston Collieries.—(26/7/09) : George Miller, miner, killed by fall of coal in the face through timber being knocked out.

Point Elizabeth State Collieries.—(12/10/09) : Frederick Fletcher, roadsman, killed by fall of stone from roof, through timber being knocked out by truck.

Non-fatal.

Millerton Colliery.—(9/1/09) : Joseph Pfeffer, miner, sustained fracture of left thigh and four ribs on right side, through fall of roof coal and stone.

Paparoa Colliery.—(4/5/09) : Thomas Wilcock and Robert Dall, miners, sustained slight burns about face and neck, through explosion of firedamp.

Point Elizabeth Collieries.—(27/7/09) : John Tyson, trucker, sustained severe crush in the region of the pelvis, through being struck by runaway truck.

Westport-Stockton Colliery.—(3/9/09) : J. W. Marshall, outside foreman, sustained fracture of skull and broken ribs, by falling from staging on bins.

Point Elizabeth State Collieries.—(12/10/09) : John Birch, miner, sustained fracture of three ribs, and Philip Rodgers, miner, fracture of hip-girdle, through fall of stone from the roof through timber being knocked out by truck. Frederick Fletcher was killed, and three others—Chris Rodgers, miner ; Emil Clouston, miner ; and John Harrison, fireman—sustained slight injuries by the same fall.

Westport-Stockton Colliery.—(17/12/09) : Emil Hartwig, foreman platelayer, sustained internal crushing and fracture of left leg above the knee in two places, through being crushed between brake-car on electric train and side of cutting.

I have, &c.,

A. G. MARSHALL,

Inspector of Mines.

MR. E. R. GREEN, Inspector of Mines, Southern Inspection District, to the UNDER-SECRETARY,
Mines Department, Wellington.

SIR,—

Inspector of Mines' Office, Dunedin, 21st March, 1910.

In compliance with section 78 of the Coal-mines Act, 1908, I have the honour to present my annual report for the year ended 31st December, 1909.

CANTERBURY.

Springfield Colliery, Springfield (Christchurch Brick Company, owners ; T. N. Horsley, secretary ; James Taylor, permit, mine-manager).—(28/9/09) : New second outlet air-shaft satisfactorily completed, having proper ladderway and platforms. Ventilation good. Work now being conducted in the second seam. Coal thin, from 18 in. to 2 ft. ; fireclay, 5 ft., the latter being used at the owners' clay and pottery works, Christchurch. Working-places well secured with timber. Report-book kept and rules posted. During the year 1,477 tons of fireclay was mined.

Springfield Fireclay Mine, Springfield (Christchurch Gas, Coal, and Coke Company, owners ; R. English, general manager ; W. Wilson, permit, mine-manager).—(28/9/09) : Fireclay-seam, about 10 ft., being worked for clay for manufacture of sanitary ware and gas-burner fireplaces at the Christchurch factory. Working-places timbered to the faces. Communication is made with upcast shaft, but ladderway not quite completed. The creep anticipated by the mine-manager has apparently settled, also the sweating in the waste formerly noticeable has almost disappeared. Rules posted, report-books to date. During the year 1,235 tons of fireclay was mined.

Austin's Fireclay-mine, Sheffield (Charles Austin, owner ; Edwin Smith, permit, in charge).—Fireclay-pit only ; not visited. The owner reports that 1,043 tons of fireclay was mined during the year.

Homebush Colliery, Glentunnel (Dean's trustees, owners ; J. C. Campbell, mine-manager).—(16/12/09) : No. 1 Mine, pillaring section : The balance of pillars nearing a finish. These have been successfully extracted, a high percentage, estimated at 90 per cent., of the coal-seam having been won practically without accident, notwithstanding the false roof, which was treacherous, but on that account perhaps extra care was taken by workmen. Timber being systematically used, and kept close up to working-faces. Seam, 7 ft.

No. 1 Mine, dip section : No. 2 heading district now pillared out and abandoned. No. 1 heading, north side : Remaining pillars are crushed badly, and consequently lost by reason of the smallness of the coal. Ventilation very fair on this occasion, which may be attributed to a considerable length of air-course having been cut off by abandonment of north side, and the ventilating-furnace is thereby enabled to overtake its duty.

Engine seam : Coal thinned to 5 ft., and continuation of heading suspended. Present intentions are to withdraw this coal from the market, and utilise it for own consumption at pottery-works on the

premises. Extraction of rise pillars is begun. As the life of the mine is becoming restricted, boring operations have been conducted with some measure of success. At 100 ft. depth, two seams, each 3 ft., having a band of clay about 12 in. between, are expected to be workable, and a mine dipping 1 in 5 is being driven to the coal.

Fireclay and pipeclay—3,065 tons were mined during the year—are obtained on the property, and utilised for brick and pipe making at the pottery-works on the premises, where a considerable proportion of coal-output is also consumed. Powder-magazine approved. Requirements of the Act generally well observed.

St. Helens Colliery, Whitecliffs (Levick and Thin, owners: W. Thin, permit, mine-manager).—(2/6/09): Advancing levels to southward being practically up to the boundary of good coal area, now preparing to draw pillars homeward. Extraction of the double seam to northward of dip has thrown a weight on the timber, which requires frequent renewal. Bottom also heaving to an extent, and consequent contraction of roads and airways. Some sweating in gob on north side indicates heating, but no further appearance as yet of approaching gob fire. Ventilation good. Rules posted; report-book kept. Seam, 5 ft., all being worked on the pillar, stope, and wall system.

Mount Somers Colliery, Mount Somers (Mount Somers Coal Company, owners; George Nell, secretary; J. S. Hamilton, mine-mangaer).—(1/10/09): No. 1, or Woolshed Creek Mine—freehold: Freehold old mine-entrance closed and workings abandoned. A new prospecting drive is in about half a chain on the creek-bank in coal as yet too near the outcrop to be of value, although apparently improving. The drive is timbered to the face.

No. 2 Mine—Crown lease: The mountain tramway and jig which was formerly in use is now discontinued, as the new self-acting jig to Woolshed Creek tramway is in full working-order. Length, 25½ chains, and grade of new jig, 1 in 3½. The mine-mouth is situated on the company's freehold, but underground workings are extended within the boundary of the Crown coal lease, whence output is being drawn. Headings are driven to the "washout" and bords broken off in the usual way. Ventilation adequate. Rules posted; plan and report-books kept. Blasting-powder apparently properly handled in the mine, the main supply being stored in an approved magazine on the surface.

Albury Coal-mine, Albury (C. E. Riddle, permit, lessee and mine-manager).—(26/5/09): Crown lease: Robbing of pillar and head coal to rise continuing. Some warmth and smell detectable on the edge of the waste; the person in charge, however, asserted that symptoms of gob fire were not worse than at any time during the previous three months. Arrangements were being made for draining water in the old dip workings, and the work is to be prosecuted in that direction. Second outlet air-shaft in good order; ladder provided. Rules posted; plan kept; report-book to date.

Stoney Creek (late Waihao) Coal-mine, Waihao Forks (Stoney Creek Coal Company, Waimate, owners; D. L. Watson, permit, lessee and mine-manager).—(22/9/09): A small prospecting drive put in on the face of the terrace. Coal-seam found, but thin, and troubled with running sand. The lessee proposes to shift to a place further up the valley, where he says coal is known to occur in workable thickness, and of fair quality.

NORTH OTAGO.

St. Andrew's Colliery, Papakaio (Thomas Nimmo, permit, owner and manager).—(25/5/09): Rules posted; report-book and plan to date. The new mine is opening up fairly well, although seam disturbed by several small faults met with. Bords driven medium width, and strong pillars are being left. Workings in good order. Ventilation good. The new air-shaft projected, being to the rise of all the workings, should afford more than ample ventilation for this mine.

Prince Alfred Colliery (on Mining Reserve) Papakaio (Abel Beardsmore, permit, lessee and manager).—(25/5/09): This colliery is now under new ownership, Mrs. Willetts and family, who worked it for so many years, having transferred their interest to Mr. Beardsmore, who is working the new mine opened to southward of the old workings. A downthrow fault struck on the main level is interfering with development, but a water-lodgment is being constructed, after which the workings are to be opened to the best advantage. Old rules posted to be replaced; plan to be provided, also copy of Act; report-book to be obtained.

Ngapara Colliery, Ngapara (William Nimmo, permit, owner and manager).—(22/5/09): Rules posted; plan and report-book kept. Mine and workings in good order. Ventilation adequate.

Shag Point Colliery, Shag Point (William Hunt, permit).—(21/9/09): This small mine is closed, and may be considered as abandoned, the lessee having extracted the pillars of this thin seam (2 ft.) almost to mine-mouth.

Shag Point Coal-mining Company, Shag Point (J. O. Gilmour, secretary, Shag Point; C. Clausen, permit).—(21/4/09): Driving prospecting dip, which, at 150 ft., tapped a 3 ft. seam of coal, which is being won longwall. Ventilation good, and workings well laid off from commencement.

Broadleaf Coal-mine, Shag Point (George W. Brooke, permit, lessee and manager).—(21/9/09): After considerable prospecting a dip drive from seaward at 150 ft. struck a 2 ft. seam of coal, rather stoney but suitable for some local purposes. Air good, having met with an old level driven from sea-beach several years ago.

Allandale Colliery, Shag Point (Allan McIntosh, lessee and manager).—(21/9/09): The new dip workings are pillar-robbd and finally abandoned, as, owing to the faulted ground and bad roof, coal-getting here became unprofitable. Chief working consists of splitting pillars to rise of main-haulage level. Recent proposals are to work out the easily available coal, then draw the plant, and afterwards win the pillars left in old mine-workings. Coal-output shows a considerable reduction of that on former years.

SOUTH OTAGO.

Fernhill Colliery, Abbotsford (James Gray, owner and manager).—(31/8/09) : Rules posted ; plan kept ; report-book to date. Only head-coal places are being worked, and the limited area of the mine which is standing open is in fairly good working-order.

Freeman's Colliery, Abbotsford (Freeman's Coal Company, owners ; R. Green, general manager ; A. S. Gillanders, mine-manager).—(28/10/09) : No. 1 Mine : Coal-getting now discontinued, and the main level is used as second outlet and travelling-way for workmen. Furnace-ventilation is employed, intake air being led direct to working-faces in No. 8 dip, and thence around the workings to furnace-shaft. Method of work consists of advancing northerly in solid for development, with extraction of pillar and head coal following. Coal being proud and roof bad, places are driven narrow at first working. At near No. 5 dip pillar workings the waste was heating, and the temperature above normal, which usually occurs in final extraction preparatory to stoppings going in. These were prepared and ready for insertion at short notice in brick or wood as considered advisable. Rules posted ; plan kept ; report-books to date. Other requirements of the Act reasonably well observed. Proposed mechanical ventilation by fan is being considered.

Green Island Minerals Company, Green Island (J. Loudon, managing director ; T. Barclay, jun., mine-manager).—(26/10/09) : Several faults encountered have interfered with adequate development. Dip-extension discontinued meanwhile, and levels are driven north and south in coal of a proud nature ; therefore, drives are taken narrow, to provide for maintenance of roof. An area is laid off for present working having safety barrier between these and old workings, which were discontinued in the year 1893, and of which the plan deposited in this office at that time appears to have been fairly well kept. Rules posted ; report-book and plan to date.

Jubilee Colliery, Saddle Hill (Jubilee Coal Company ; A. P. Bremner, general manager ; T. Barclay, mine-manager).—(27/10/09) : Prospecting places in dip still continued. Seam thin, and roof bad. The greater proportion of output is got from pillar and head coal extraction. A feature at the breast of work is absence of black damp and fire stink, due mainly to the method of work adopted of driving to boundaries and coming homeward on pillar and head coal. The 10 ft. seam of sand overlying the coal-seam in falling proved an effectual natural stopping on the fringe of waste. Ventilation generally adequate, and well conducted by brattice to working-faces. Rules posted ; plan and report-books kept ; and requirements of the Act fairly well attended to.

Burnwell Colliery, Saddle Hill (Adam Harris, owner and manager).—(26/10/09) : Pillars and head coal to dip are fairly well extracted. Floor having heaved is now met with roof, thus forming a safeguard for balance of coal-extraction and a minimising factor of spontaneous fires. The south-westerly line of fault is being prospected for a payable seam of coal in that part of the field.

Saddle Hill No. 1 Colliery, Saddle Hill (Christie Bros., owners ; W. W. Ogilvie, mine-manager).—(30/12/09) : Extraction of pillars and head coal continues in the usual safe manner. Considerable trouble has been experienced with the waste, owing to spontaneous heating. Single and double stoppings are in against the gob, and with a good current of air travelling workmen are subjected to a minimum of inconvenience. Brick stoppings are being built against the wooden ones where heating occurred, as a precaution against possible outbreak of spontaneous fires. Ventilating-furnace recently enlarged, with good results. Requirements of the Act generally well observed.

Saddle Hill No. 2 Colliery, Saddle Hill (Christie Bros., owners ; Robert Hill, mine-manager).—(2/11/09) : By the use of a fan the satisfactory ventilation of this mine presents no difficulties. With the fan running at two-fifths speed the workings and the mine generally are kept clear, and the mine-air is highly satisfactory. Coal proud and pillars crushing in the southerly part of the mine, where approaching fault line, near the old workings. Rules posted ; plan and report-book kept. Approved magazine for storage of explosives.

Lauriston Colliery, Brighton Road (James Walker, owner and manager, permit).—(29/10/09) : The mine and workings are in good order. Second outlet provided. Ventilation excellent.

Brighton Colliery, Brighton Road (D. L. McColl, owner ; A. McColl, permit, manager).—(29/10/09) : A new adit is to be put in to replace the old level, which is in a ragged state, owing to pressure on the timbers, which last only a brief length of time. Second outlet shaft 30 ft. in depth by 4 ft. square. Mine-workings in good order.

Waronui Colliery, Milton (Bruce Railway and Coal Company, owners ; J. R. Wilson, general manager ; James Carruthers, mine-manager).—(7/12/09) : New loading-bank and surface arrangements in connection with branch railway-line are almost completed. The pillars in No. 1 section are exhausted, and fire-stoppings are in on the fringe of waste. Pillar-extraction continues in the main or middle lift workings, where the atmosphere was above normal temperature, owing to the tendency to spontaneous ignition which develops in the waste or gob, and is held in check by special stoppings according to circumstances. The new stone drive, 12 chains, is being utilised for output from south side workings, where prospecting levels are being driven, and eventually the whole output will be diverted to this point. The mine was in fair working-order, but the ventilation could not be considered adequate, and fan-ventilation is being provided at earliest opportunity. Rules posted ; report-books and plan kept.

Lakeside Coal-pit, Lovell's Flat (G. E. Royds, owner).—(24/6/09) : A drive on the hillside in surface seam of Taratu quality. Seam apparently interrupted by faults where being worked. A prospecting drive in the valley is stated to have proved a payable seam of coal at shallow depth. Coal produced for private and local requirements.

Taratu Colliery, Taratu (Taratu Coal and Railway Company, owners ; G. R. Cheeseman, general manager ; Thomas Shore, mine-manager).—(23/12/09) : Ventilation good throughout the mine, and brattices kept well up to the working-faces. A number of miss-fire shots reported had been attributed to insufficient care when attaching fuses to charges in wet holes. Although situated in the Kaitangata

Coalfield, firedamp has not yet been seen or reported ; but its presence is none the less carefully searched for. Being a non-gaseous pit, workmen charge and ignite their own shots, and work is also conducted with naked lights. On the western boundary coal-winning places are worked up to the line of fault, having a north and south trend in accordance with the known faults of this coalfield. Strict attention paid to the requirements of the Coal-mines Act.

Port Arthur Coal-pit, Kaitangata (Morrison Bros., owners ; Robert Penman, permit, lessee).—(24/6/09) : The patch of coal worked is evidently in the Vs of a fault, troubled coal having made all around. A drive to the seam at lower level is in coal of workable thickness ; but, meanwhile, not much enterprise appears to be displayed in the working of this mine, which is worked irregularly to suit local requirements. Flax-milling being decreased has affected this and many other small coal-mines in this district.

Hawthorn Den Coal-pit, Kaitangata (—Smaill, owner ; John Espie, permit, lessee).—(23/6/09) : The mine is said to have been originally operated by the late Dr. Sewell about twenty years ago. Present lessee has driven to the rise, and also claims that he has exposed a 9 ft. seam of coal with only 2 ft. 6 in. of cover, and which it is intended to work opencast.

Longridge Coal-pit, Kaitangata (Nesbit Mackie, permit, lessee).—(6/12/19) : A small mine opened on the outcrop of upper seams of Kaitangata coal series. Drive in about 100 ft. in coal of fair quality, but evidently troubled by faulting of measures. This is the property upon which Mackie and McAllister Bros. had developed small outputs and abandoned after short periods of working.

Kaitangata Colliery, Kaitangata (New Zealand Coal and Oil Company (Limited), owners ; O. G. Lockhart, secretary, Dunedin ; W. Carson, mine-manager).—(9/12/09) : Work proceeded steadily throughout the year. Extensive development of the north side section proved a large area of coal to be somewhat crushed and troubled, in marked contrast to the south and easterly advanced workings, which have opened up a seam of superior quality and thickness. By limiting the areas of coal sections opened, together with rapid extraction, it has been found that a larger percentage of coal is won, with decreased expense to owners and less discomfort to workmen, although it has to be said that this method is facilitated by the comparative flatness of the coal-seam locally. As the workings extended it was found that the ventilating-fan in use became inadequate for satisfactory ventilation, and a new fan, having 50 per cent. increased efficiency, is being constructed. Endless-rope haulage has been installed, and is giving every satisfaction, so that the day-shift provides the bulk of the output, instead of having two equal shifts, as was formerly the case. Bickford's patent safety-fuse lighters are in use for shot-firing. Safety-lamps only are in use throughout the mine, some 340 lamps being in daily use. There has been comparative freedom from what might be termed serious accident throughout the year, although a number of minor accidents occurred, with more or less serious consequences to the persons sustaining them. On the 2nd March Samuel Newburn, deputy, and William Oliver, miner, sustained slight burns by an ignition of gas while shot-firing. Newburn, being the accredited shot-firer, reported that he had previously made examination, and failed to find any trace of firedamp in the place. On the 12th August David Dallas, pitheadman, was attacked with hæmoptysis while pushing a truck, and subsequently died from tuberculosis. It is not yet decided whether the occurrence was an accident or whether the work at which he was engaged was responsible for the state of his health. The upcast air-shaft and second outlet continues to be carefully maintained, with a caretaker constantly on the premises. Mine-manager's, underviewer's, and deputy's report-books are systematically attended to, and reports duly entered. Plans kept to date, and all requirements of the Coal-mines Act particularly well observed and carefully attended to.

Castle Hill Colliery, Kaitangata (New Zealand Coal and Oil Company (Limited), owners ; W. Carson, mine-manager).—(16/11/09) : Underviewer's and deputy's report-books show that the workings are practically clear of firedamp. Traversed Jordan's seam workings, which with No. 7 dip north, Green's seam, through the roll, are the working districts. Old carriage heading and crosscut, Green's seam, are stopped off. Jordan's seam : 11 ft. on the average, but to north is thinning, being somewhat troubled and faulted. Pillar workings in Jordan's seam south in fairly good order. Ventilation will become improved as the workings retreat. The area of coal-seam across the roll is larger than had been expected ; consequently, there still remains another year's working in sight. Main return airway to ventilating-furnace in good order, as is the furnace itself, which is standing well, having been rebuilt and surrounded by boiler-plate tubes reinforced with railway-metals bent and shaped to suit. On the whole, ventilation of the working-places is hardly what it should be, owing chiefly to the ventilating-furnace proving incapable of adequately overcoming increasing drag in the long air-courses. In discussing this with the mine-manager, that official mentioned that it was proposed to obtain a new fan for Kaitangata Mine, and transfer the present Kaitangata fan to Castle Hill air-shaft. The water-balance for men-hoist at second outlet is reported as being used on trial from time to time. One hundred and fifty safety-lamps in use daily.

Benhar Colliery, Stirling (P. McSkimming and Son, owners ; Colin Murdoch, permit, manager).—(8/12/09) : Workings continue easterly in the direction of main fault. The recent survey shows that the advancing workings are now within the area marked on plan as old workings, but unsurveyed. The old workings were lost through fire, and it is suspected that they may now contain water. Owing to shallowness of seam from surface, impending danger, if any, from water-accumulation is greatly minimised, but borehole kept forward, and the person in charge is fully alive to the danger. The staple pit in air-course was rendered unsafe by proximity of a large fall. The person in charge subsequently wrote me that a new airway had been made. Use of blasting-powder appears to be carefully provided for by the management ; one of the workmen, however, sustained slight burns by thoughtlessly holding a pellet of powder in his hand while lighting a fuse.

Mount Wallace Colliery, Stirling (F. Park, lessee, and permit-holder).—(8/12/09) : Heating and indications of spontaneous fire having arisen in the fallen workings, the mine is closed, and prospecting

is being conducted on another part of the property. I had previously warned the persons connected with this mine that the workings were taken too wide and high for permanence, and full advantage was ever taken of this generous seam of coal, although worked in a manner free from accident. The pit is on private land, and worked in a small way for local use.

Mainholm Colliery, Conical Hills, Waipahi (William Lischner, permit, owner and manager).—Opencast pit; seam, 20 ft.; usually worked in a safe manner.

CENTRAL OTAGO.

Coal Creek Collieries, Coal Creek Flat, Roxburgh (Barber and Shaw, lessees; J. Barber, mine-manager).—(18/11/09): This mine continues to be kept in good condition and safe-working order. Ventilation good. A prospecting drive on the freehold resulted in failure, only crushed and burnt coal seam being obtained. Rules posted; plan and report-book kept.

McPherson's Coal-pit, Coal Creek Flat, Roxburgh (McPherson Bros., lessees; A. J. McPherson, permit, manager).—(18/11/09): Crown lease. Underground mining now being conducted in northern coal-face. Seam estimated at over 80 ft. in thickness. Mine in good order, and well ventilated. Rules posted.

Craig's Perseverance Coal-mine, Coal Creek Flat, Roxburgh (James Craig, lessee; S. E. F. Vernon, permit, manager).—(18/11/09): Crown lease. Ventilation at working-faces becoming weak by reason of length of air-courses under natural ventilation. A new air-shaft is now to be provided at near the level-face. Stoppings in against heated area are quite cool, and receive daily attention. Rules posted; plan and report-book kept.

Alexandra Coal-mine, Alexandra South (Messrs. Mathias Bros. and Co., lessees; A. E. Barnes, mine-manager).—(1/12/09): Crown lease. Owing to softness of floor and bad roof in the faulted area, workings to dip are again discontinued. Pillars are being brought homeward, and roof and floor gradually meet in the waste. I drew the mine-owners' attention to the necessity for preserving support in that part of the mine underlying the Alexandra Borough Water-race. Rules posted; plan and report-books kept.

New Alexandra Coal Company, Alexandra South (J. Pollock, mine-manager).—(1/12/09): Crown lease. This colliery is now under new ownership, having been acquired from the Alexandra Coal Company by a small private syndicate. Work going on much as usual; partial extraction of pillars in north-western section yielding the larger proportion of output. The pillars are split and resplit in accordance with the manner in which the work was originally laid out. As the stumps of pillars left gradually sink the floor rises until roof is met, thus preserving the measures and affording a safeguard against sudden inburst of water from the strata overlying coal-seam. Ventilation good around the mine. Old workings in good order, as are both shafts and ladderways for second outlet. Rules posted; plan and report-books kept; and requirements of the Act generally well observed. Pumping-time averages ninety-six hours per week, pumping—on week-days only—at the rate of 12,000 gallons per hour.

Welshman's Gully Coal-pit, Cambrian (Sarah McGuckin, lessee; J. McGuckin, permit, manager).—(12/4/09): Crown lands. Opencast. Output decreased owing to the difficulties of working the pit by reason of heavy stripping and pumping water.

Jones's Coal-pit, Cambrian (Robert Jones, lessee).—Crown lands. This pit is being worked steadily on a small scale.

St. Bathans' Coal-pit, St. Bathans (James Enright, lessee).—(13/4/09): Crown lands. Opencast pit. Stripping being imperfectly attended to, in consequence of which it was apparent that the lessee and his son were at times working under an overhanging face. I again drew the lessee's attention to the dangerous nature of his method of working, and rewarned him of the risk of serious accident which he was undertaking.

Rough Ridge Coal-pit, Idaburn (Mrs. M. Beck, lessee; W. Beck, permit, manager).—(12/4/09): Crown lands. Opencast pit in good working-order. Rules posted; copy of Act and report-book kept.

Idaburn Coal-pit, Idaburn (J. White, permit, lessee).—(12/4/09): Crown lands. Opencast pit worked up to adjoining boundary. Owner's intention is to open a new pit on the northern side of old workings. Rules posted.

Oturehua (late Border) Coal-pit, Oturehua (Richard Thomas, permit, lessee).—(13/4/09).—Crown lands. Opencast pit. Face of lignite being opened up in a workmanlike manner.

Donaldson's Coal-pit, Mount Highlay (W. and G. Donaldson, licensees).—(15/7/09): Lignite license. Opencast pit, seam 10 ft., stripping 8 ft. to 10 ft. in thickness, worked mainly for supply of fuel to the owners' quartz-crushing battery.

Clyde Collieries, Clyde (Vincent and Dairy Creek Mines), (G. F. Turner, mine-manager).—(1/12/09): Crown lease. Now under new ownership, the company having gone into liquidation, and the mine taken over by Mr. Jonathon Rhodes, a mortgagee. Workings in good order, and ventilation fair. The stoppings in on the pillared area where heating and discharge of black damp where observed are cool and tight, and there are no present indications of further trouble in that direction. Rules posted; plan and report-book kept in the office at the mine.

Cardrona Colliery, Cardrona (R. McDougall, permit, lessee).—(13/1/09): Crown lands. Working to southward on strike of seam and driving in lower measures for prospecting purposes. As has been usual, blocks of hard coal alternate with soft bands, of which latter the one at present being worked is proving to be more extensive than heretofore. The lessee subsequently reported that a good seam had been found at the northern end of the old workings.

Gibbston Coal-mine, Gibbston Saddle (J. Duncan, lessee and mine-manager).—(12/7/09): Crown lease. Rules posted; report-book kept; and plan to be brought to date. Main level driven 15 chains on strike of coal-seam, which at 350 ft. in is 15 ft. in thickness, widening out in the middle block to

40 ft., but at near face a downthrow fault is met with which apparently thins the seam to 15 ft. as at first. Dip of seam 1 in 3 west. Three parallel levels are driven and stentons through for air. Coal-seam tender and drives narrow, for which Mr. Duncan is to be commended, as by greedy first working the mine might have easily ere this become ruined, which would have been a loss to the district as well as to the public revenue. From indications, the workable coal-bearing area is less restricted than had been thought to be the case.

Cromwell and Bannockburn Collieries Company, Bannockburn (T. K. Harty, managing director, Dunedin; W. R. Parcell, mine-manager).—(2/12/09): Crown lease. Kawarau or Shepherds Creek Mine: Retreating steadily with the balance of pillars, bottom rising fast in lower places. A new mine is being driven to southward, where the coal-seam is outcropping conveniently. Rules posted; plan kept; report-books to date.

Excelsior Mine: This mine is now practically abandoned, pump drawn, rails lifted, and maintenance ceased, as also weekly examination. The water, it is expected, will rise in dip-workings until it overflows by way of Wilson's old mine-entrance. The practical closing of this mine, the company claims, is due to lack of trade and the opening of new mines in the district.

Cairnmuir Coal Company, Bannockburn (James Lewis, mine-manager).—(2/12/09): Some heating had occurred at fault in the lower level south. Stoppings were put in, and the warm area deluged with sand and water. Pillars are being drawn in the first workings with every indication of success. Rules posted; report-books and plan kept.

Scott's (late Ryder's) Coal-pit, Nevis (Charles Scott, permit, lessee).—(5/11/09): Crown lands. Seam semi-vertical. Opencast now discontinued, and shaft being sunk for winning coal by underground driving. Rules posted; report-book kept.

Nevis Crossing Coal-pit, Lower Nevis (Robert Ritchie, permit, lessee).—(7/11/09): Crown lands. The overburden is sluiced away and the coal won by opencast working. Rules posted; report-book kept.

SOUTHLAND.

Pukerau Coal-pit, Pukerau (Hamilton, Sheddan, and Gill, lessees; James Hamilton, permit, manager).—(28/7/09): Crown lands. The new owners are working bord and pillar on similar lines to those of the late Mr. O'Hagan. Seam, 16 ft. of strong lignite. Ventilation good. Rules posted.

Nelson's Coal-pit, Pukerau (J. H. Nelson, permit, lessee).—(28/7/09): Crown lands. Rules posted, report-book to be obtained. Working-places in fair order; safely worked.

Riverview Coal-pit, Gore (J. and J. Nicol).—A small quantity of coal raised for private and local requirements.

Hefferman's Coal-mine, East Gore (W. C. Burgess, permit, and lessee).—(12/6/09): Rules posted; report-book kept; plan to date. Driving in solid to get around area where pillars drawn by former lessee. Instructed permit-holder that care would require to be exercised by timbering to roof where joints and partings occur in the seam.

Green's Coal-mine, Gore (Thomas Green, owner; James Mason, mine-manager).—(5/11/09): Owing to the extent of the workings underground, the air-courses are becoming too lengthy to admit of the working-faces being adequately cleared of powder-smoke by natural ventilation, consequently a small ventilating-fan installation is receiving serious consideration. Rules posted; plan kept; report-book to date. Edward Henry Matthews was found dead under a fall of coal which he had evidently been trying to bring down after shot-firing on the 18th November, 1909. At the inquest the jury brought in a verdict of accidentally killed.

Smyth's Coal-mine, Gore (Broome Bros. and Brown, owners; James Broome, jun., permit).—(5/11/09): A considerable proportion of this shallow mine is fallen to surface, where pillars and head coal had been worked; in fact, the method adopted is to win the bulk of these at first working, and ground falls in behind, a safe system in the hands of practical men in such a strong seam. Seam, 16 ft., three-fourths of which is being won. Ventilation good. Report-book kept; rules posted.

Bushy Park Coal-mine, Croydon (James R. Tait and Company, owners; W. Dickson, permit).—(5/11/09): A spontaneous fire having originated in the waste of pillared area, underground working is discontinued. The coal-face at outcrop is being robbed as much as convenient with safety. A new opencast pit is being opened in the vicinity. Shortly after the aforementioned fire broke out the examiner and those with him observed an ignition of gas having a dark blue flame which travelled along the roof a short distance and became extinguished. There was no explosion, neither was any damage done of any kind. The liability to spontaneous ignition may be attributed to the presence of a seam of shale in the clays overlying the coal-seam, which on falling, as usual, quickly become heated in the waste or gob.

Burnwell Coal-mine, East Chatton (Cameron and Johnston, lessees; D. Cameron, permit).—(23/11/09): The old mine area is closed down, and now engaged extending the dip and breaking levels away in the strong seam of over 20 ft. in thickness. Air-shafts are being made. Rules posted; report-book kept; and explosives apparently carefully handled.

Pacey's Freehold Coal-pit, East Chatton (T. H. Maslin, lessee; Jos. Buchols, permit).—(23/11/09): Powder-smoke hanging, therefore required lessee to provide a ventilating-shaft near working-faces for adequate ventilation. Rules posted; report-book kept. Powder-magazine on surface approved, but to be shifted back further from the roadway for greater safety.

Chatton Coal-pit, East Chatton (Ramsay Bros., lessees; P. Ramsay, permit).—(23/11/09): Present workings in upper level toward outcrop. New air-shaft being made will further improve ventilation, which is conducted by brattice to working-faces. The drain for unwatering the dip-workings is being brought up at 10 ft. lower level, which will enable an area to dip being worked water-free. Rules posted; report-book kept; and plan to date.

Springfield Coal-pit, Waikaka Valley (Mutch and McIntyre, lessees; E. Charles, mine-manager).—(21/10/09): Opencast working discontinued meantime, and underground driving is being conducted on a small scale. Seam, 15 ft. New loading-bank completed and small steam-pump installed for drainage purposes.

Willowbank Coal-pit, Waikaka Valley (William Jones, permit, owner).—(21/10/09): That part of the mine affected by the "crush" in July last is standing just as it was after the fall had settled, and does not affect the working-parts of the mine. Dip drive being extended having a small fan, driven off the pump steam-pipe column, for ventilation, and powder-smoke slowly dispersed thereby. Approved magazine for storage of explosives, and proper powder-canisters provided. Rules posted; report-book and plan kept. Seam, 15 ft., of which 10 ft. being worked.

McDonald's Coal-pit, Waikaka Valley (A. A. Edge, lessee; W. McIvor, permit, and G. Mitchell, sublessees).—(22/11/09): School Commissioners' lease. Seam, 16 ft., 12 ft. worked. Dip drive and level being extended to eastward in coal of average quality. Ventilation fair, and rendered regular owing to plumps to surface in worked ground. Powder-magazine approved, and rules regarding explosive (compressed blasting-powder) observed. Pit drained by siphon. Report-book kept; plan to recent date; rules posted.

Anderson's Coal-pit, Wendon (James Anderson, owner; Samuel Yeomans, lessee).—(14/6/09): Rules posted. No one about. The mine evidently temporarily closed as usual during winter months, local requirements having been supplied during the autumn. The drive is in 100 ft. to the vertical seam, on which levels are driven east and west. Drive fairly well secured with timber, and the coal-workings are taken high, but apparently safe, mainly owing to the long spell of dry weather experienced.

Landship Coal-mine, Landship, Waikaia (William Kyle, permit, and lessee).—(24/11/09): School Commissioners' lease. Under the new owner withdrawal of pillars has been continued, and the mine is now practically exhausted. A new mine to southward is in sandstone through the fault, and the coal-seam being struck, the life of the colliery is expected to be renewed. Rules and regulations attended to.

Waikaia Coal-mine, Landship, Waikaia (Alexander Cain, permit, lessee).—(24/11/09): School Commissioners' lease. New air-shaft enables south side workings to be fairly well ventilated, but pillar place in north side has not been receiving necessary attention in regard to air. The air-shaft also requires to be enlarged and timbered up for security. I instructed Cain in these matters; also that report-book and plan of mine should be kept at the office at the mine, instead of at the dwelling at Waikaia where he resides. Cain promised to attend to these matters, and write and let me know when they had been completed.

Rossvale Coal-mine, Landship, Waikaia (Bond Bros., lessees; J. Bond, permit).—(24/11/09): School Commissioners' lease. Rules posted; report-book kept; plan and copy of the Act kept at the mine. Seam, 10 ft., 8 ft. worked on the bord-and-pillar system. Hitherto development consisted of driving a water-free level, off which headings were taken to the rise until outcrop reached. Stentons having been put through at regular intervals, the area worked is standing on rectangular pillars. The band of stone at 3 ft. from the floor gradually made until coal from advanced places became unsaleable and forward work was stopped. Work now consists of extracting pillars to rise, commencing at furthest in and leaving the level and the place above intact for future requirements. For further development attention is being paid to dip working, for which pumping will be necessary. Compressed blasting-powder used, and taken in to workings in calico bag in small quantity, sufficient for the day's requirements, and served out by Bond, the owner and person in charge. I instructed Bond, and subsequently wrote him, to provide proper canisters for taking blasting-powder into the workings. Powder-magazine approved.

Muddy Terrace Coal and Shale Pit, Waikaia (Knuckey and Junker, lessees; J. McLelland, mine-manager).—(24/11/09): School Commissioners' lease. Rise workings are driven to outcrop and pillared homeward. Downthrow fault on south level, and main dip apparently cuts off the seam. Amount of throw not yet determined, but indications are not favourable, unless it be that the disturbance is merely a wash-out, which may be probable. The proprietors propose sinking prospecting-shafts in summer time to further prove the ground. Rules posted and requirements of the Act attended to.

Argyle Coal-pit, Upper Waikaia (C. Hutton, permit).—Opencast pit, seam 20 ft., being worked in benches. Stripping kept sluiced away well in advance of working-face and pit in a safe-working condition.

Waimea Coal-pit, Kingston Crossing (J. Johnstone, permit, and W. Shore, lessees).—(16/6/09): An opencast pit on A. Small's property. Work recently resumed, and some 400 tons output to date. A deep drain has been dug to unwater the old mine, which will be worked, and a practical miner placed in charge.

Mataura Coal-mine, Mataura (Mataura Collieries (Limited); James A. Yule, managing director; W. C. Johnson, permit, mine-manager).—(11/12/09): Coal now produced by underground mining, and, as is usual in these mines devoid of mechanical means of ventilation, powder-smoke hangs in the working-places an undue length of time. Fan-ventilation is now said to be receiving the attention of the owners. Coal requires to be taken narrow in working to avoid fracture of roof on account of the strata of water-bearing gravel overlying the coal-seam. Mr. James A. Yule, managing director, was prosecuted for failure to make returns of coal-output and payments to the Coal-miners' Relief Fund for quarter ending 30th June. He pleaded "Guilty" through oversight, and the Magistrate imposed fines to the amount of £4, and costs, £1 3s.

Mataura Lignite-pit, Mataura (Beattie, Coster, and Co. (Limited), owners; W. Coster, permit, mine-manager).—(11/12/09): Seam, 16 ft., stripping 8 ft. to 10 ft. of gravel. Opencast pit worked in the usual safe manner. Rules posted. Powder-magazine approved.

Boghead Coal-pit, Mataura (C. P. Sleeman and Co., owners; C. P. Sleeman, jun., permit).—(11/12/09): Pit in good working-order; stripping kept well ahead. Powder-magazine approved. Rules posted; report-book kept.

Waimumu Coal-pit, Waimumu (George W. Williams, owner; J. Wallace, permit).—(5/11/09): Pillar-extraction is almost completed, and preparations are in hand for new mine to westward of the area worked for several years past. So far operations have been safely conducted, no accidents having been recorded. Rules posted; report-book kept.

Clarke's Coal-pit, Wyndham (Samuel Clarke, owner).—(4/11/09): An opencast pit in good working-order; stripping kept well in advance of working-face. Seam, about 12 ft. in thickness, all worked by being benched out in lifts or layers by the aid of blasting-powder. A special visit was paid on account of accident to William Nolan on the 2nd November—injuries to face, eyes, and right hand—caused by a charge of blasting-powder exploding while Nolan was apparently engaged tamping a shot. Nolan, who was working alone, subsequently declared that he was unable to account for the explosion.

Robin Hood Coal-pit, Pine Bush (Jessie Couser, owner; William Couser, permit).—(10/9/09): An opencast lignite-pit, not being worked at present, but is in an unworkmanlike condition, and apparently insufficient attention had been paid to stripping in advance prior to cessation of work last season. Seam, 14 ft.; stripping, about 8 ft.

Te Anau Coal-pit, Upukarora, Te Anau Downs (Tourist and Health Resorts Department, owner; Captain Dore, agent, Manapouri).—During the year 188 tons of coal was obtained for use by the Tourist Department.

Beer's Coal-pit, The Key (Mrs. T. Beer, lessee; A. E. J. Beer, manager).—During the year 113 tons of coal was obtained for local requirements.

Nightcaps Colliery, Nightcaps (Nightcaps Coal Company (Limited), owners; William Handyside, managing director, Invercargill; W. Barclay, mine-manager).—(10/12/09): No. 1 district: Work continues as heretofore, consisting mainly of extraction of pillars and head coal, with roadways and airways constructed to suit. Stoppings in against the waste are substantial and carefully attended to daily. This day the workmen were withdrawn on account of an inrush of water from the fault, which, however, rapidly ceased, and work was resumed. Adequate ventilation usually maintained. It was found, however, on several occasions that smoke from blasting hung in the pillar places, necessitating increased speed of fan and attention to air-stoppings. No. 2 district: Ventilation good. Pillars being drawn and head coal robbed to advantage. Opencast workings in good order and a large area is kept stripped in advance of working-face. Generally work has been safely conducted, there having been freedom from serious accident. Plant and appliances are maintained in good working-order, and an abundant supply of mining-timber is kept on the premises for use as required. A new air-compressing plant is about to be installed to replace steam for haulage and pumping, which, when completed, should have the effect of lowering the temperature of the workings in No. 1 district by several degrees. Rules posted; plan kept; and all report-books to date.

Wairaki (late Hit or Miss) Coal-mine, Nightcaps (John Lloyd, lessee and manager).—(20/10/09): A new entrance has been made into the leasehold, also new loading-bank erected. Work continuing in development to boundary and preparing for extraction of pillars homeward. Ventilation good, and mine safely worked. Seam, 6 ft., all worked on bord-and-pillar system. Some prospecting by shaft-sinking resulted in the discovery of a good seam of coal at a depth of 40 ft. Rules posted; report-book and plan kept.

H. B. Coal-mine, Nightcaps (G. R. Spence, permit, lessee).—(20/10/09): Withdrawing the remainder of pillars, which are expected to be exhausted towards the end of the year. Stripping is being conducted on another part of the property, the intention being to work the balance of seam toward outcrop by the opencast system.

New Brighton Coal-mine, Wairio, Nightcaps (D. McKenzie and Co., owners; D. McKenzie, permit, manager).—(25/8/09): Crown lands. Eight men employed. Seam, 20 ft., worked partly opencast and partly underground. Workings kept in a safe and workmanlike manner. Powder-magazine approved for storage of six cases (each 25 lb.) of blasting-powder. Report-book kept; rules posted.

Beaumont Coal-mine, Nightcaps (Moss Bros., lessees; W. Moss, permit).—(25/8/09): Crown lands. Opencast pit. Three men. Seam, 20 ft., and stripping 6 ft. to 8 ft. The overburden is not being kept as well ahead as consistent with safety to workmen, of which I warned the permit-holder; also, 6 ft. of coal is being left to waste on the pit-bottom. Powder-magazine approved for storage of one case (25 lb.) of blasting-powder. Report-book kept.

Bush Siding Coal-pit, Seaward Bush (F. R. Bowden, permit, manager).—(11/8/09): Opencast pit. Lifting bottoms. Seam 32 ft., stripping 10 ft. to 12 ft. of gravel. Pit in fair working-order. The bush-fire which passed through the Seaward Bush last summer set fire to the coal in pit, which had to be flooded to extinguish the burning seam. Coal conveyed to Asher's Siding by iron-rail tramway three-quarters of a mile in length.

COAL-MINERS' RELIEF FUND.

The contributions by coal-owners to the Coal-miners' Relief Fund amounted to £435 11s. 6d., while payments from the fund to the amount of £312 6s. 9d. have been recommended on account of accidents which have occurred in and about coal-mines in the district during the year.

OTHER MINERALS.

					Tons.
Fireclay and pipeclay (Canterbury and Otago)	..	..	..	..	8,820
Sand (Green Island Coalfield)	..	..	..	..	21,702
Marl (Burnside)	..	..	..	..	7,750
Lime (Milburn and Dunback)	..	..	..	..	17,485
Phosphate (Clarendon, Otago)	..	..	..	..	10,000

ACCIDENTS.

Fatal.

18th November, 1909.—Edward Henry Matthews, Green's Coal-mine, Gore : Instantaneously killed by a fall of coal at the face, which he was evidently attempting to bring down after having fired a shot therein.

Non-fatal (Serious).

27th January, 1909.—Charles King, miner, Kaitangata Mine : Fracture of left arm, by fall of head coal.

27th April, 1909.—J. C. Campbell, jun., miner, Homebush Mine : Hernia, sustained while trucking.

28th May, 1909.—Thomas Dixon, miner, Kaitangata Mine : Wound and subsequent loss of right eye, by flying coal from working-face.

2nd November, 1909.—William Nolan, miner, Clarke's Coal-pit : Loss of right eye and compound fracture of nose, by explosion of blasting-powder while charging a shot.

8th December, 1909.—John Heard, miner, Kaitangata Mine : Fracture of arm and loss of fore-finger and little finger, by fall of coal from roof and sides.

2nd March, 1909.—Samuel Newburn, deputy, and William Oliver, miner, Kaitangata Mine : Burns of face and arms, by slight explosion of firedamp while shot-firing.

I have, &c.,

E. R. Green,

Inspector of Mines.

ANNEXURE B.

QUESTIONS ASKED AT THE 1910 MINE-MANAGERS' EXAMINATIONS FOR FIRST-CLASS CERTIFICATES OF COMPETENCY.

SUBJECT 1.—*Prospecting, Boring, Shaft-sinking, and Opening out a Colliery.*

1. If you were prospecting a district previously unexplored from a mining point of view, how would you proceed to ascertain the existence of coal-bearing strata ?
2. Describe the necessary plant for sinking shafts under various conditions, likewise the methods and precautions for general safety to the workmen.
3. A pair of shafts having been sunk from a level surface, 1,300 ft. and 1,390 ft. respectively, to a seam of coal dipping 1 in 3, show by sketches how you would open out the workings, also shaft-bottom arrangements ; give dimensions of shaft-pillars, plan of ventilation, and size of air-courses and roadways. Provide for a large output.
4. If, after the shafts were sunk, you were charged with the development of a colliery, to exploit a seam at a depth of 1,100 ft., for an output of 2,000 tons per day, what mechanical equipment would be necessary to accomplish this ? Describe and show by sketches how you would arrange such equipment, up to the final loading of the coal into wagons.

SUBJECT 2.—*Working Coal and Timbering Underground.*

1. Describe the different systems of working coal, and under what conditions, as to thickness and nature of coal, roof, and floor, you would adopt one system in preference to the others, keeping in view the getting of the coal in the most marketable condition and the safety of the workmen.
2. Explain and show by sketches the principles which should govern the timbering of working-places and roadways so as to most effectually prevent accidents.
3. Describe how you would proceed to clear a way through a long and heavy fall in a tunnel rising 1 in 3. Give sketches showing how you would timber it.
4. During pillar-extraction, how would you guard against dangers arising from accumulations of gas in the goaf being forced into the working-places ?

SUBJECT 3.—Mine-gases, Spontaneous Combustion, and Ventilation.

1. What gases are met with underground, and in what manner and to what extent are they dangerous in the air of mines? State how you would examine the air of a mine for the different gases.
2. Define "spontaneous combustion" and "gob-fires," in a mine? State how they are produced? Give a sketch of a gob-fire in the workings, and state how you would deal with it.
3. What is carbonic oxide? How is it produced in mines, and what effect has it on animal life?
4. A mine is ventilated by three splits of air, A, B, C: A passes 30,000 cub. ft. per minute, B 20,000 cub. ft. per minute, and C 15,000 cub. ft. per minute, out of a total of 65,000 cub. ft. If the total ventilation is increased to 120,000 cub. ft. per minute, what would each split take?
5. The barometer at the top of a shaft reads 30.4 in., the thermometer 63° Fahr., the depth of shaft is 1,300 ft., and at the shaft-bottom the thermometer reads 73° Fahr.: what will be the reading of the barometer at the shaft-bottom, and the difference in the pressure of the air at the top and bottom of the shaft?
6. Ventilate the plan on the following page, showing stoppings, air-currents, air-crossings, canvas doors, bratticing, doors, and regulators.
7. If the horse-power of a fan-engine is 60, and the water-gauge 3.25 in., what quantity of air should you obtain, with 60 per cent. useful effect of the fan?

SUBJECT 4.—Dealing with Old Workings and other Sources of Danger.

1. In a mine with large areas of goaf, and limited ventilation, just sufficient for the active workings, what precautionary measures would you adopt with respect to the exhausted areas?
2. What experience have you had of underground fires, spontaneous or otherwise? Show by sketches how you would lay out a mine liable to spontaneous combustion. Give your reasons.
3. Mines may become dangerous from various causes: enumerate some of these, and state what measures you would adopt to render the mine safe.
4. State what you would do before firing shots in a dry and dusty place, what explosive you would use, and how you would fire it.
5. What is the principal cause of accidents in mines, and what are your suggestions relative to lessening such cause?

SUBJECT 5.—Steam Boilers and Engines used about Mines.

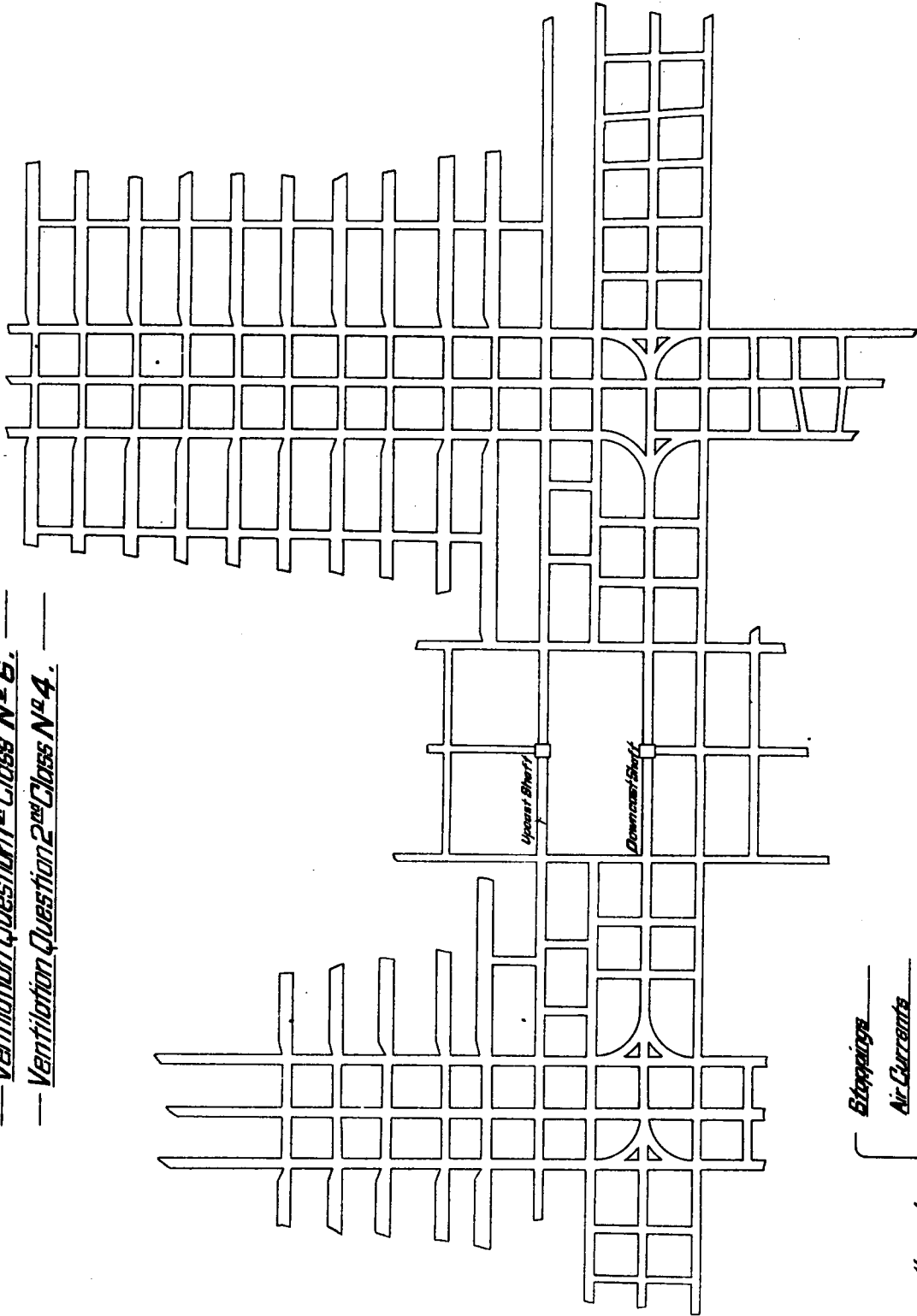
1. Enumerate the causes likely to lead to boiler-explosions, and what you would do to prevent same. Show by calculation how you would ascertain the safe working-pressure of a steam-boiler.
2. By endless rope it is proposed to haul 150 tons of coal per hour; the road is practically level; the loaded tubs to weigh 16 cwt., including a tare of 5 cwt.; the road is 2,640 yards long; speed of rope to be three miles per hour: what will be the pull on rope, horse-power and size of a pair of engines to do the work? Piston-speed, 240 ft. per minute; and boiler-pressure 120 lb. per square inch.
3. What is the horse-power developed by a pair of air-compressing engines, 36 in. cylinders, 6 ft. stroke, running 30 revolutions per minute, and compressing the air to 80 lb. per square inch above atmospheric pressure?

SUBJECT 6.—Mine Drainage and Haulage, and Appliances for same.

1. If there were three feeders of water flowing into the dip workings of your mine—A, 150 gals. per minute; B, 1,280 gals. per hour; and C, 288,000 gals. in 24 hours—give details and calculations showing size of pumps you would install to deal effectively with these feeders, the delivery column to be 40 chains long, rising 1 in 10.
2. Describe the mechanical and other appliances used in colliery winding. Give your recommendations respecting same, with a view to maximum safety.
3. In connection with an endless-rope system, branch ropes are worked: describe, and illustrate by sketches, how such a system is operated.
4. In connection with the haulage of coal by mechanical appliances and otherwise, various kinds of accidents occur: what precautionary measures can you suggest to lessen the number of such accidents?
5. What system of bringing the output to the surface would you adopt on an inclined plane 2,000 yards long, dipping 1 in 6, having in view the extension of the dip?
6. If required to make a new installation for which 1,000-horse-power steam plant is required, state class, size, working-pressure, and general specification of the boilers you would adopt, and give reasons for preference.

COOL

- MINE MANAGER'S EXAMINATION —
- Ventilation Question 1st Class N^o 6. —
- Ventilation Question 2nd Class N^o 4. —



- Show these by
- Stoppings
 - Air Currents
 - Over Canals
 - Air Splitts
 - Converse Sheets
 - Doors
- Conventional Signs

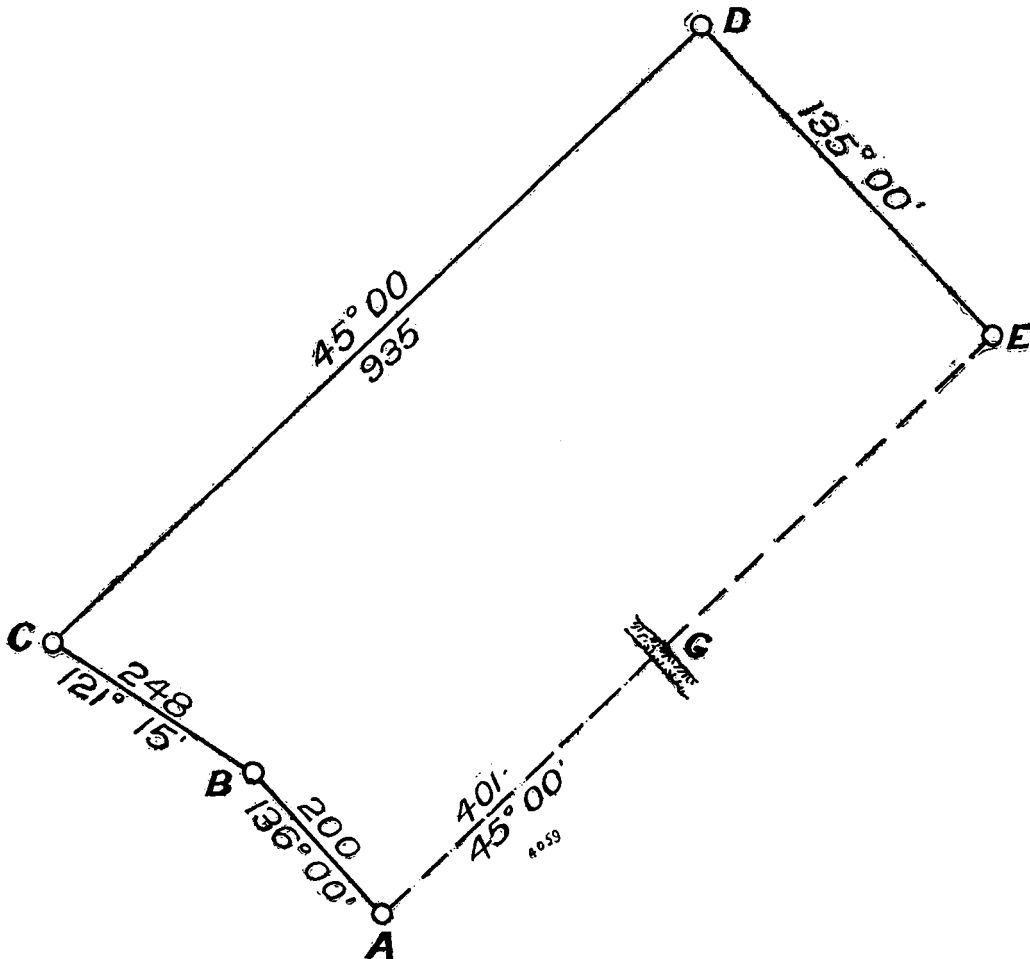
SUBJECT 7.—*Geology, Surveying, and Making Plans.*

1. What is the general character and approximate age of the series of rocks which includes most of the important coal-seams of New Zealand? Mention the chief localities in New Zealand where seams of coal occur.

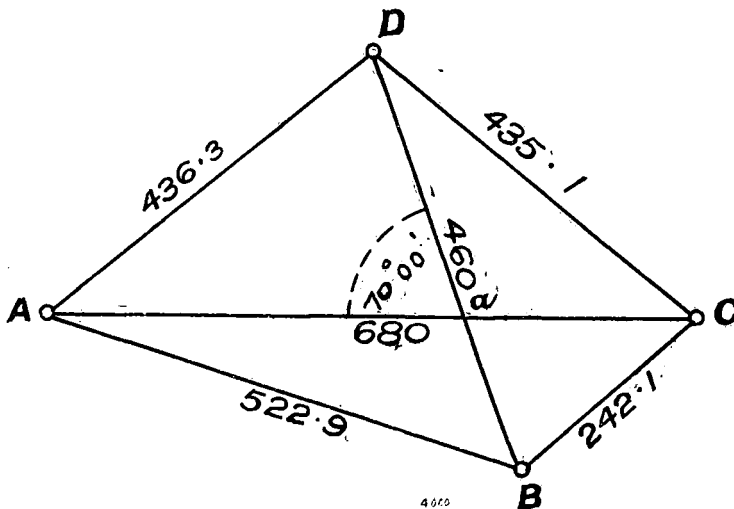
2. What gases are usually met with in coal-mines, and how are they formed? Define "fire-clay," "downthrow," "overlap," "dip," "stratification," and "crush."

3. The sketch represents portion of a mining claim (on which the underground workings are shown by dotted lines): find the distance, in feet and decimals, from the working-face at G to the boundary of claim at E, and also DE.

Note.—All distances on sketch are in links.



4. From data given, compute the area of the figure ABCD (by any method except scaling or planimeter).



5. Find the solid content, in cubic feet, of a cube of coal each of whose sides equals 120 in.

SUBJECT 8.—*Practical Elementary Electricity.*

1. Describe the "low tension" and "high tension" systems respectively of electric shot-firing.
2. How many 50 c.p. lamps, taking 3·5 watts per candle, can be run off a dynamo giving 12 electrical horse-power?
3. Describe the armature, also the commutator, of a dynamo.
4. What are the things which affect the "resistance" of an electrical conductor?
5. What is a dynamo, and what is a motor?
6. Describe an electrical coal-cutting installation, and how you would operate same with a view to general safety in a gaseous mine.
7. What is "pressure-drop"? Also calculate what would be the P.D. for each 5 chains of a cable one mile in length, wherein a current of 80 amperes is flowing, and the resistance is 0·5 ohm per mile.

SUBJECT 9.—*Arithmetic, and a Knowledge of the Coal-mines Act, 1908, and Amendments; also, First Aid to the Injured.*

1. A property of 800 acres 3 roods 10 perches contained a seam of coal 7 ft. 6 in. thick: assume the area as having been exhausted, and 90 per cent. of the coal won, what would the royalty have amounted to at 6d. per ton? (30 cub. ft. = 1 ton.)
2. Six hundred and thirty tons of coal are taken from a heading 12 ft. wide and 9 ft. high: what is the distance driven if 1 cubic yard weighs 18 cwt.?
3. If the wages, stores, traction, and royalty on 300,000 tons of coal, selling at 11s. per ton, amount to £150,000, what is the profit after 7½ per cent. advance on the foregoing charges, and a rise of 1s. 3d. per ton in the selling-price?
4. From 5 acres of seam, having a S.P. of 1·25 and a thickness of 9 ft., the coal was won; the coal sold for 10s. per ton, and an average profit of 12½ per cent. was obtained: what was the amount of profit in money value?
5. A 10 in. delivery column of pipes, in a shaft 800 ft. deep, is full of water: how many gallons will there be; and what will be the total pressure on a 6 in. pump-plunger at that depth?
6. Briefly state the requirements of the Coal-mines Act, 1908, and its amendments, as to,—
 - (a.) Persons in charge of machinery;
 - (b.) Signalling;
 - (c.) Mines liable to flooding;
 - (d.) Appointing of stations;
 - (e.) Fencing of places;
 - (f.) Safety-lamps and lights.
7. Explain how you would render first aid with respect to the various forms of hæmorrhage resulting from accidents.
8. Enumerate the different kinds of fractures, and how you would treat them.
9. How would you treat cases of suffocation by gas?

QUESTIONS ASKED AT THE 1910 EXAMINATION FOR SECOND-CLASS
CERTIFICATES OF COMPETENCY.

SUBJECT 1.—*Prospecting, Boring, Shaft-sinking, and Opening out a Colliery.*

1. Describe the different methods of prospecting a coal-bearing area.
2. Describe the appliances used for shaft-sinking, and state how you would sink a shaft 15 ft. in diameter, knowing a bed of quicksand would be met 30 ft. from the surface.
3. Show by sketches how you would open out your main roads and workings from shafts 500 ft. deep, with the sinking only completed to the seam of coal.

SUBJECT 2.—*Working Coal, and Timbering Underground.*

1. Explain the conditions under which one system of working coal is preferable to another, having in view economy in working, also general safety.
2. Describe how you would determine the safety of a miner's working-place, relative to danger from roof and sides.
3. Show by sketches how you would timber a longwall face; an ordinary bord; also a main road, with fairly hard roof, at a depth of 600 ft.
4. Explain the methods and precautions you would adopt in driving a place through a heavy fall of roof.

SUBJECT 3.—*Mine-gases, Spontaneous Combustion, and Ventilation.*

1. State what you know of the gases usually found in coal-mines, how they are likely to be found, and the precautions necessary to deal with them.

2. Explain the principle of a modern safety-lamp, and how you would determine the safe working-conditions of the mine when examining bord-and-pillar workings, with a safety-lamp, for gas.

3. What gases are given off by gob-fires? In a mine liable to spontaneous combustion, what special precautions would you adopt?

4. Ventilate the plan shown in question No. 6 of the first-class questions on ventilation, using the reference signs thereon to indicate your method.

5. In a bord, where a heavy fall has occurred, breaking down the brattice, gas has accumulated in the cavity: explain, and show by sketches, how you would clear away the gas and restore the place to working-order.

6. Give your reasons fully why it is necessary to maintain efficient ventilation in mines.

7. How is the volume of air circulating in mines usually ascertained? Show by a calculation how you would arrive at the total quantity passing in a mine.

SUBJECT 4.—*Dealing with Old Workings and other Sources of Danger.*

1. What precautions are necessary, and why, where you have extensive areas of old workings in a mine?

2. What dangers are possible to occur in mines where naked lights are used?

3. Enumerate the causes of creep, and show by sketches the effect of such in working-roads.

4. State the provisions you would make before and after shot-firing in a dry and dusty mine.

5. Accidents occur underground from various causes: what precautions would you adopt to lessen same?

6. If a district of your mine, in which safety-lamps are used, became suddenly fouled with explosive gas, what steps would you take?

SUBJECT 5.—*Mine Drainage and Haulage, and Appliances for same.*

1. Explain the different methods of mine-drainage, and give a description of what you consider the most efficient type of pump.

2. What is the use and advantage of a siphon; and what are the conditions necessary to enable it to work efficiently?

3. Describe the different systems of haulage, and state the conditions under which each system may be better applied than the others.

4. How would you lay out and equip a jig 5 chains in length and rising 1 in 8? Give your reasons, and illustrate by sketches.

5. Describe the various appliances in use for attaching tucks to haulage-ropes.

SUBJECT 6.—*Practical Elementary Electricity.*

1. Describe the application of electricity to underground signalling.

2. Describe as fully as you can a battery as used for shot-firing by electricity.

3. Name the principal parts of a dynamo, and their purpose.

4. What sources of danger can arise from the application of electricity underground?

5. What causes may operate to throw an electric signalling system out of working-order?

SUBJECT 7.—*Arithmetic, and a Knowledge of the Coal-mines Act, 1908, and its Amendments; also, First Aid to the Injured.*

1. Add together £523 11s. 10½d., £260 4s. 11½d., £23 4s. 3½d., 15s. 9½d., subtract £47 16s. 11½d., and divide the remainder by 19.

2. A miner earns 15s. 11½d. per shift for three pays of 14 days each: what are the total earnings, and how much would he receive for a similar period with an increase of 5 per cent.?

3. How many chains of single road will 10 tons of 9 ft. rails, 16 lb. per yard, lay?

4. A shaft-sump, 14 ft. diameter and 20 ft. deep, is full of water: how many gallons are there?

5. How many bricks would be required for a dam 8 ft. wide, 6 ft. high, and 4 ft. thick?

6. Briefly state the requirements of the Coal-mines Act, and amendments thereto, as to,—

- (a.) Special rules;
- (b.) Vertical shafts to underground furnaces;
- (c.) Water and boreholes;
- (d.) Ropes and chains.

First Aid.

1. How would you render first aid to a workman whose foot and leg were badly crushed by a fall of coal?

2. Name the different kinds of fracture, and how you would treat them.

3. What treatment would you give a person overcome by black damp?

4. Heavy bleeding oftentimes results from accidents: state some of the forms of such, and how you would treat them.

LIST OF PERSONS WHO HAVE OBTAINED CERTIFICATES AS MINE-MANAGERS UNDER THE COAL-MINES ACTS.

FIRST-CLASS MINE-MANAGERS' CERTIFICATES.

Issued under the Coal-mines Acts, 1886 and 1891.

Aitken, T., Wendon.	Gray, J., Abbotsford.	*Redshaw, W., Whangarei.
Alexander, T., Brunnerton.	*Harrison, J., Brunnerton.	Reed, F., Westport.
Austin, J., Sheffield.	Irving, J., Kaitangata.	*Richardson, D., Abbotsford.
Binns, G. J., Dunedin.	Jemison, W., Waimangaroa.	Shore, J., Kaitangata.
Bishop, J., Brunnerton.	*Kenyon, J., Shag Point.	Shore, T., Orepuki.
*Brown, T., Westport.	Kerr, G., Kamo.	*Shore, W. M., Kaitangata.
Brown, T., Glentunnel.	Lindsay, W., Otago.	*Smart, W., Christchurch.
Cameron, J., Denniston.	Lloyd, J., Invercargill.	Smith, A. E., Nelson.
Campbell, J. C., Fairfield.	*Louden, J., Green Island.	Smith, T. F., Nelson.
Cochrane, N. D., Dunedin.	Love, A., Whangarei.	Sneddon, J., Mosgiel.
Collins, W., Taupiri.	Mason, J., Nightcaps.	Swinbanks, J., Kawakawa.
Dando, M., Brunnerton.	May, J., Greymouth.	Taylor, E. B., Huntly.
*Elliott, R., Wallsend.	Moody, T. P., Kawakawa.	Thompson, A., White Cliffs.
*Ferguson, A., White Cliffs.	Moore, W. J., Springfield.	Walker, J., Collingwood.
*Freeman, J., Green Island.	Nelson, J., Green Island.	Williams, W. H., Shag Point.
*Geary, J., Kamo.	Ord, J., Huntly.	

First-class Certificates issued under the Coal-mines Acts, 1886, 1891, 1905, and 1908, after Examination.

Armitage, F. W., Auckland.	Fletcher, James, Granity.	McCormack, W., Denniston.
Armstrong, J., Brunnerton.	Fox, R. A., Denniston.	McEwan, Robert, Coromandel.
Barclay, T., Kaitangata.	Fry, Sydney, Waimangaroa.	McGeachie, J., Mokau.
Barclay, W., Kaitangata.	Gibson, John, Westport.	Milligan, N., Westport.
Bennie, Boyd, Waihi.	Gillanders, A., Shag Point.	Morgan, Wm., Waihi.
Brown, J. C., Denniston.	Gowans, W., Millerton.	Murray, T., Westport.
Campbell, Peter, Fairfield.	Green, E. R., Abbotsford.	*Newsome, F., Denniston.
Carruthers, J., Shag Point.	Green, J., Brunnerton.	Newton, James, Brunnerton.
Carson, W., Kaitangata.	Hamilton, J. S., Burnett's Face.	Shore, Joseph, Kaitangata.
Coombe, J., Waihi.	Herd, J., Brunnerton.	Smith, George, Fairfield.
Coulthard, J., Taylorville.	Hill, Robert, Abbotsford.	Sowerby, H., Denniston.
Dixon, C. W., Granity.	Hosking, G. F., Auckland.	Tattley, E. W., Huntly.
Dixon, W., jun., Kaitangata.	*Hughes, D., Preservation Inlet.	Tattley, F. J., Mercer.
Duggan, George, Burnett's Face.	Jebson, D., Canterbury.	Taylor, A. H., Waikato.
Dunn, Andrew, Denniston.	Johnson, W. P., Thames.	Thomson, Thomas, Denniston.
Dunn, W., Brunnerton.	Leitch, J., Blackball.	Turner, G. F., Shag Point.
Dunn, W. R., Thames.	Leitch, W., Blackball.	Westfield, C. H., Fairfield.
Elliott, R., jun., Denniston.	Marshall, A. G., Denniston.	Young, James H., Waimangaroa.
Fleming, J., Kaitangata.	McCaffrey, Patrick, Ferntown.	

Mine-managers' Certificates, issued under the Coal-mines Act, 1886, on Production of English Certificate.

Binns, G. J., Dunedin.	*Garrett, J. H., Auckland.	Macalister, J., Invercargill.
Black, T. H., Waipori.	Hayes, J., Kaitangata.	*Nimmo, J., Oamaru.
Broome, G. H., Ngakawau.	Hodgson, J. W., Ross.	*Straw, M., Westport.
Cater, T., Auckland.	*Lindop, A. B., Springfield.	Tattley, W., Auckland.
Cochrane, N. D., Dunedin.		

First-class Mine-managers' Certificates, issued to Inspectors of Mines by virtue of Office, under the Coal-mines Acts of 1886 and 1891.

*Coutts, J., Thames.	*Gow, J., Dunedin.	*Wilson, G., Thames.
Gordon, H. A., Wellington.	McLaren, J. M., Thames.	

*Mine-managers' Certificates, issued under the Coal-mines Acts of 1891, 1905, and 1908, on Production of Certificate from a recognised Authority outside the Dominion.**First Class.*

Alison, R., Greymouth.	*Jordan, R. S., Kaitangata.	*Proud, Joseph, Wanganui.
Clark, W., Blackball.	Kirkwood, D., Coromandel.	*Scott, Joseph, Ngahere.
Dixon, J., Westport.	Lewis, W., Blackball.	Tennent, R., Brunnerton.
Fletcher, George, Westport.	Mark, W. S., Kaitangata.	Twining, C. E., Dunedin.
Frame, Joseph, Kaitangata.	McAvoy, H., Christchurch.	Watson, James, Greymouth.
Goold, A. L., Auckland.	Paterson, D. S. A., Kawhia.	Wight, E. S., Auckland.
Irvine, James, Dunedin.	Pollock, James, Green Island, Otago.	Wood, William, Mokihinui.
James, Isaac Angelo, Westport.		

Second Class.

Brownlie, T., Huntly.	Grenall, S., Granity.	McCall, John, Wellington.
Burt, A., Huntly.	Inglis, A., Huntly.	McGeachie, J., jun., Mokau.
Dickinson, W., Gore.	Lennox, W., Springfield.	McGuire, William, Seddonville.
Dowgray, R., Granity.	Little, W., Wellington.	Penman, A., Huntly.
Eyeington, G., Huntly.	Littlewood, G. G., Denniston.	Robertson, J., Granity.
Greenwell, R., Huntly.	Longstaff, H. C., Kaitangata.	Talbot, H., Huntly.

SECOND-CLASS MINE-MANAGERS' SERVICE CERTIFICATES.

Issued under the Coal-mines Act, 1891.

Carson, M., Kaitangata.	Love, Alexander, Orepuki.	*Ross, John, Kawakawa.
Collier, Levi, Kamo.	McIntosh, Allan, Shag Point.	Sara, James, Reefton.
Clarke, Edward, Shag Point.	McLaren, J. M., Thames.	Smith, Charles, Whangarei.
Elliot, Joseph, Coal Creek.	*Marshall, J., Ngakawau.	Thomas, James, Springfield.
Harris, John, Denniston.	Murray, Thomas, Denniston.	Wallace, William, Huntly.
Herd, Joseph, Brunnerton.	*Nimmo, George Stewart, Ngapara.	Willetts, John, Papakaia.
Howie, James, Kaitangata.	Radcliffe, William, Reefton.	*Willetts, John Morris, Papakaia.
Leeming, William, White Cliffs.	*Roberts, John, Brunnerton.	Young, William, Waimangaroa.
Lobb, Joseph, Mokau.		

* Deceased since issue of certificates.

Second-class Certificates issued under the Coal-mines Acts, 1886, 1891, 1905, and 1908, after Examination.

Austin, W. B., Sheffield.	Duncan, James, Kaitangata.	McLelland, A. C., Kaitangata.
Barber, John, Shag Point.	Duncan, J. E., Kaitangata.	McNeill, D., Fairfield.
Barclay, T., Kaitangata.	Duncan, John, Lovell's Flat.	Mills, Walter, Huntly.
Barclay, T., jun., Kaitangata.	Ferguson, G., Roa.	Neilson, Moffat, Abbotsford.
Barclay, Wm., Kaitangata.	Fox, R. A., Blackball.	Ogilvie, W. W., Saddle Hill.
Barnes, A. E., Shag Point.	Harris, A., Saddle Hill.	Orr, Hugh, Fairfield.
Brown, Robert, Kaitangata.	Heyes, T., Kaitangata.	Parcell, W., jun., Bannockburn.
Cadman, J., Hikurangi.	Heycock, C. R., Nightcaps.	Penman, C. P., Kaitangata.
Campbell, Peter, Fairfield.	Hill, R., Abbotsford.	Price, F. J., Burnett's Face.
Carruthers, J., jun., Nightcaps.	Hodson, John, Kaitangata.	Scoble, E. J., Blackball.
Carson, Joseph, Kaitangata.	Holden, J., Nightcaps.	Snow, T., Mercer.
Charles, E., Glentunnel.	Hunter, A., Southland.	Tattley, F. J., Mercer.
Cherrie, R. C., Mokau.	Kelle, F. H., Denniston.	Taylor, Joseph, Collingwood.
Christie, James, Saddle Hill.	Kirkland, H. S. S., Nightcaps.	Thompson, Joseph, Blackball.
Clemo, G., Whangarei.	Lewis, David, Puponga.	Todd, T., Nightcaps.
Craig, John, Coal Creek Flat.	Lewis, J., Nightcaps.	Waldie, A. B., Mokau.
Dale, E. G., Kaitangata.	Lindsay, J. B., Orepuki.	Watson, A., Soldier's Creek.
Dixon, W., jun., Kaitangata.	McAllister, Neil, Kaitangata.	Westfield, C., Fairfield, Otago.
Doel, G., Lovell's Flat.	McLelland, J., Kaitangata.	Whittleston, A. W., Shag Point

LIST OF PERSONS WHO HAVE OBTAINED CERTIFICATES OF SERVICE AS UNDERVIEWERS UNDER THE COAL-MINES AMENDMENT ACT, 1909.

Allan, James, Puponga.	Hawthorn, James, Puponga.	Newlands, George, Brunnerton.
Attrill, Charles Waterford, Mercer.	Hunter, Peter, Ngakawau.	Nimmo, Thomas, Papakaio.
Bond, John, Waikaia.	Johnston, William Crowan, Gore.	Nimmo, William, Ngapara.
Boustridge, Thos. Hubert, Brunnerton.	Johnstone, Thomas, Denniston.	Penman, John, Denniston.
Broome, James, Gore.	Levick, Harry, White Cliffs.	Proctor, William, Kaitangata.
Clough, Henry, Millerton.	Mann, William, Granity.	Reed, William H., Hikurangi.
Davidson, William, Mine Creek.	Marsh, Charles George, Glentunnel.	Robertson, William, Mosgiel.
Davis, William, Runanga.	Muncaster, William, Runanga.	Todd, Thomas, Nightcaps.
Donaldson, James, Kaitangata.	McAlister, Robert, Kaitangata.	Walker, John, Blackball.
Falconer, Andrew, Abbotsford.	McGrane, Reginald, Seddonville.	Williams, William, Kaitangata.
Flynn, John, Bannockburn.	McKenzie, David, Nightcaps.	Wilson, Daniel, Kaitangata.
Green, Richard, Abbotsford.	McNeill, William, Fairfield.	Winter, John, Denniston.

LIST OF PERSONS WHO HAVE OBTAINED CERTIFICATES OF SERVICE AS FIREMEN AND DEPUTIES UNDER THE COAL-MINES AMENDMENT ACT, 1909.

Aitken, George, Glentunnel.	Glover, Richard, Runanga.	McGhee, William, Kaitangata.
Allan, Alex. George, Abbotsford.	Gray, Thomas, Abbotsford.	McGill, Douglas Thomas, Waikaka.
Allan, Charles, Brunnerton.	Gribben, John, Kaitangata.	McGill, John, Huntly.
Beardsmore, Edward, Denniston.	Headeroft, James, Runanga.	McKenzie, James, Nightcaps.
Berry, Albert Henry, Huntly.	Hamilton, John, Hikurangi.	Newburn, Robert, jun., Kaitangata.
Blaney, James, sen., Kaitangata.	Hargreaves, Charles, Millerton.	Newburn, Samuel, Kaitangata.
Boyd, Robert, Waronui.	Harris, John, Reefton.	Nicholas, William, Kaitangata.
Bradley, Robert, Denniston.	Harris, Joseph T., Saddle Hill.	Oliver, William, Kaitangata.
Buchols, Joseph, Waikaka.	Hartley, John, Denniston.	Parcell, Henry Clyde, Bannockburn.
Burgess, William Charles, E. Gore.	Hay, James, Denniston.	Park, Francis, Stirling.
Callaghan, Frederick, Kiripaka.	Heron, Ralph, Kimihia.	Peckham, Henry William, Huntly.
Campbell, Samuel, Millerton.	Higgins, Thomas James, Denniston.	Penman, Robert, Kaitangata.
Chamley, William, Millerton.	Hislop, William, Denniston.	Richards, James, Brunnerton.
Clausen, Emil P., c/o J. Worthington, 33 Hiropi Street, Newtown, Wellington.	Holden, Samuel, Granity.	Rogers, Edwin, Kaitangata.
Connolly, Michael, Denniston.	Housley, Benjamin, Huntly.	Sanderson, John, Kurow.
Connaw, John, Puponga.	Howe, George Charles, Shag Point.	Scott, Charles, Nevis.
Coppersmith, John, Denniston.	Jackson, Samuel, Millerton.	Scott, John, Runanga.
Coulthard, Thomas, Brunnerton.	Jarvie, William Marshall, Kaitangata.	Skellern, John, Huntly.
Cowan, Robert Black, Gibbston.	Jaspers, George Fred., Denniston.	Smith, Edwin, Springfield.
Cuthbertson, Robert, Fairfield.	Jenkins, James, Ngakawau.	Smith, William, Huntly.
Darby, James, Huntly.	Johnston, C. Mounter, Seddonville.	Smith, William, Seddonville.
Davis, Evan, Denniston.	Jones, David, Nightcaps.	Sneddon, James, Blackball.
Deeming, William, Hikurangi.	Kaye, Charles, Runanga.	Southward, John, Runanga.
Dellaway, Archibald, Denniston.	Kitto, Richard, Kaitangata.	Statham, Robert, Kaitangata.
Dickson, Richard, Hikurangi.	Leeming, J. T., South Malvern.	Taylor, David, Roa.
Dillon, Lawrence M., Nightcaps.	Lutton, William, Millerton.	Taylor, James, Springfield.
Duncan, Frank, Huntly.	Mann, Duncan, Millerton.	Thin, William, White Cliffs.
Duncan, Hugh, Kaitangata.	Mason, William, Denniston.	Travis, James, Alexandra South.
Evans, John, Granity.	Mears, Andrew David, Runanga.	Tripp, Albert, Kaitangata.
Evans, William, Abbotsford.	Moncrieff, Thomas, Nightcaps.	Wallace, John, Mataura.
Findlay, Charles, Denniston.	Moore, Thomas, Mangatini.	Wardrope, Francis, Hikurangi.
Foot, Frederick Ernest, Denniston.	Morganti, Charles, Ngakawau.	Watson, Andrew, Roa.
Fullick, George, Runanga.	Murdoch, Colin McColl, Stirling.	West, George Thomas, Waronui.
Gibson, Matthew, Abbotsford.	McCaffrey, James, Seddonville.	White, James, Roa.
Gibson, Robert, Millerton.	McCoughern, John, Kaitangata.	Whorsky, John, Huntly.
Gilmour, William, Millerton.	McDonald, John T., Millerton.	Wilson, Walter William, Springfield.
	McGarry, Isaac, Millerton.	Young, Thomas Gardner, Waikaia.

ANNEXURE C.

STATISTICS OF WORKINGS IN COAL-MINES, 1909.

Name of Mine and Locality.	Name of Manager.	Number of Years worked.	Quality of Coal.	No. of Seams worked.	Thickness of Seams.	Thickness worked.	Dip of Seam.	System of Working.	Number of Shafts.	Dimensions of Shafts.		Output delivered by	Output for 1909.			Approximate Total Output to 31st December, 1908.	Approximate Total Output to 31st December, 1909.	Number of Men ordinarily employed.		Power used for drawing Mineral.	Pumps.			Means of Ventilation.	Date of Inspector's Last Visit.	
										Size of Shaft or Adit.	Depth of Shaft or Length of Adit.		Coal.	Slack.	Total.			Above.	Below.		Total.	Stroke.	Size of Barrel.			Height of Column.
NORTHERN INSPECTION DISTRICT.																										
KAWAKAWA DISTRICT.																										
Kawakawa Mine ..	Neill, S.	11	semi-bitum.	1	6'	6'	1 in 3	pillar	1 5' 6" x 3' 6"	200'	adit	Tons. 580 ..	Tons. 580 ..			Tons. 73,412	Tons. 73,992	1	2	3 horse	..	..	..	natural	9/12/09	
KAMO DISTRICT.																										
Whangarei Mine ..	Taylor, A. H.	1	ditto	1	3' 10"	3' 10"	1 in 4	bord and pillar	1 12' x 6'	106'	shaft	175 ..	175 ..			..	175	7	9	steam	6"	4"	100'	exhaust steam	13/12/09	
Ruatangata Mine ..	Wallace, Wm.	1	semi-bitum.	1	7'	..	..	bord and pillar	6' x 5'	250'	adit	..	..			..	..	1	4	..	..	..	..	natural	11/12/09	
HIKURANGI DISTRICT.																										
Hikurangi Mine ..	Dunn, W. R.	17	ditto	1	5' to 14'	5' to 12'	1 in 6	ditto	2 6' x 8'	750'	..	58,359 ..	58,359 ..			581,593	639,952	12	72	horse and steam	16"	10"	35'	..	6/11/09	
Northern Collieries	Morgan, Wm.	12	..	1	3' to 12'	3' to 12'	varied	..	8 9' x 6'	1,850'	..	39,301 ..	39,301 ..			284,246	323,547	8	65	ditto	free drainage	..	..	..	7/11/09	
NGUNGURU DISTRICT.																										
Kiripaka Mine ..	Tattley, E. W.	11	..	1	13' to 20'	11' to 18'	1 in 6	..	2 9' x 6' 8' x 6'	990'	..	36,542 ..	36,542 ..			163,449	199,991	25	60	steam & com. pressed air	8"	6"	159'	fan	8/12/09	
WAIKATO DISTRICT.																										
Taupiri Coal-mines (Ltd.)—																										
Taupiri Extended	Wood, W.	22	brown	1	10' to 30'	20'	1 in 10	..	2 10' diam. 7' diam.	166'	shaft	76,985 24,245 101,180	907,763	1,008,943	34	189	223	..	..	..	12"	two 204'	fan	..	20/12/09	
Taupiri Reserve ..	..	23	..	1	10' to 24'	18'	1 in 8	..	1 8' x 6' 8' 6" diam.	209'	adit	5,002 1,500	6,502	329,487	335,989	3	9	12	..	..	12"	two 220"	steam pipes	..	21/12/09	
Ralph's Taupiri ..	Wight, E. S.	20	..	1	10' to 60'	20'	1 in 10	..	2 9' x 5' 6"	190'	..	63,394 21,751	85,145	663,112	748,257	41	169	210	..	..	12"	two 190"	fan	..	18/12/09	
Taupiri West ..	..	3	..	1	23'	..	1 in 10	..	1 9' x 5' 6"	230'	..	..	..			91	91	6	9	..	12"	5"	260'	..	..	
Taupiri South ..	Leather, W.	8	..	1	16'	9'	1 in 7	..	1 7' x 9'	396'	adit	..	..			20,873	20,873	1	4	5 manual	12"	5"	230'	air com. pressed furnace	21/12/09	

Name of Mine and Locality.	Name of Manager.	Number of Years worked.	Quality of Coal.	No. of Seams worked.	Thickness of Seams.	Thickness worked.	Dip of Seam.	System of Underground Working.	Number of Shafts.	Dimensions of Shafts.		Output delivered by	Output for 1909.			Approximate Total Output to State of December, 1908.	Approximate Total Output to State of December, 1909.	Number of Men ordinarily employed.			Power used for drawing Mineral.	Pumps.			Means of Ventilation.	Date of Inspector's Last Visit.
										Size of Shaft or Adit.	Depth of Shaft or Length of Adit.		Coal.	Slack.	Total.			Above.	Below.	Total.		Stroke.	Size of Barrel.	Height of Column.		
WEST COAST INSPECTION DISTRICT—continued.																										
BOATMAN'S.																										
Archer's Freehold ..	Archer, F. W. (per- mit)	15	bitum.	10' each	9'	1 in 6	1 in 6	bord and pillar	7' x 5'	750'	adit	Tons. 650	Tons. ..	Tons. 650	Tons. 12,701	Tons. 13,351	1	2	3	steam	Free drain age	natural	23/11/09			
Coghlan's Freehold ..	Coghlan, J. (per- mit)	13	"	12'	8'	1 in 3	1 in 3	ditto	6' x 4'	400'	"	43	769	812	2,308	3,120	1	1	2	gravity	Free drain age	"	23/11/09			
REEFTON.																										
Burke's Creek ..	Harris, John (per- mit)	8	semi- bitum.	112' to 14'	8'	1 in 6	1 in 6	"	10' x 8'	100'	"	388	..	388	6,389	6,777	2	2	4	manual	Free drain age	"	23/11/09			
Lockington's Mine, Burke's Creek	Lockington, E. (per- mit)	8	ditto	10'	6'	1 in 4	1 in 4	"	6' x 5'	400'	"	510	..	510	1,181	1,691	1	2	3	"	Free drain age	"	23/11/09			
Golden Treasure, Murray Creek	Billett, J. (permit)	30	bitum.	12'	all	variable	variable	open	..	..	..	87	887	974	24,702	25,676	1	..	1	..	..	..	24/11/09			
Phoenix and Venus, Murray Creek	Knight, John (per- mit)	28	"	10'	8'	1 in 2	1 in 2	bord and pillar	5' 6" x 4' 6"	250'	adit	621	703	1,324	24,823	26,147	2	2	4	manual	Free drain age	natural	24/11/09			
Watson and Moyle's Mine, Murray Creek	Watson, W. (per- mit)	4	"	8'	6'	1 in 10	1 in 10	ditto	6' x 4'	130'	"	187	271	458	..	458	..	2	2	"	Free drain age	"	24/11/09			
Reefton ..	Howell, J. H. (per- mit)	7	semi- bitum.	10'	8'	1 in 3	1 in 3	"	6' x 4'	600'	"	366	..	366	3,419	3,785	..	2	2	"	Free drain age	"	24/11/09			
Golden Point ..	Kearns, R. L. (per- mit)	1	bitum.	5'	all	1 in 2	1 in 2	open	..	..	..	73	..	73	..	73	1	..	1	..	..	..	25/11/09			
Waikahu ..	O'Donnell, James (permit)	7	"	12' and 18'	8' and 6'	1 in 4	1 in 4	bord and pillar	12' x 7' 10' x 6'	640' 700'	adit	675	..	675	2,143	2,818	2	2	4	manual	Free drain age	natural	23/11/09			
Lankey's Creek (Progress Com- pany)	Turnbull, D. (per- mit)	7	"	12' to 18'	all	1 in 25	1 in 25	ditto	6' 6" x 5' 6"	500'	"	317	300	617	11,480	12,097	1	5	6	gravity	Free drain age	"	24/11/09			
Loughnan's Mine ..	Billett, J. (permit)	4	"	6'	"	variable	variable	"	6' x 5'	130'	"	194	2,105	2,299	314	2,613	1	2	3	manual	Free drain age	"	25/11/09			
Merrifugs Mine ..	Osborne, W. (per- mit)	1	"	2' 6"	"	"	"	"	6' x 5'	220'	"	171	..	171	..	171	..	2	2	"	Free drain age	"	25/11/09			
GREYMOUTH.																										
Faparoa ..	Watson, J. T. ..	4	"	12'	9'	1 in 3	1 in 3	"	10' x 7' 6"	3,000'	endless rope	7,199	..	7,199	..	7,199	14	40	54	gravity	Free drain age	fan	4/12/09			
Blackball ..	Clark, Wm. ..	19	"	17'	15'	1 in 6	1 in 6	"	9' x 6'	1,232'	ditto	108,109	16,956	120,065	1,026,555	1,146,620	50	140	190	steam	Free drain age	"	3/12/09			
Brunner (St. Kilda section) ..	Armstrong, Jas. ..	45	"	12'	all	1 in 4	1 in 4	"	6' x 4'	30'	adit	21,733	15,749	37,482	2,188,338	2,225,715	18	52	70	"	Free drain age	"	18/11/09			
Output of mines included in previous statements at which operations are suspended																										
North Brunner ..	Smith, George ..	..	"	16' to 12'	..	1 in 4	1 in 4	"	9' 6" x 6' 6"	100'	..	(Under development)	..	..	..	..	100	20	120	..	..	..	19/11/09			
No. 1 Point Elizabeth State Colliery	Coulthard, John, and Herd, Joseph	5 1/2	"	8'	all	1 in 5	1 in 5	"	10' x 7'	726'	endless rope	108,947	107,273	216,225	795,458	1,011,683	91	920	411	steam	13"	6" 390'	6/12/09			
No. 2 Point Elizabeth State Colliery	Bishop, James ..	..	"	..	(Under develop- ment)	(Under develop- ment)	(Under develop- ment)	"	11' x 7'	510'	..	(Rope road tunnel construction)	..	..	..	..	47	28	75	..	..	..	5/12/09			
		..	"	..	..	..	..	..	11' x 7'	223'	..	..	..	..	..	..	..	..	..	..	..	..	6/12/09			

Output of mines included in previous statements at which operations are suspended

SOUTHERN INSPECTION DISTRICT.

CANTERBURY.	all	1 in 6	bord and pillar	1 6' x 4'	80'	shaft	312	..	312	90,439	90,751	1	4	5	steam	direct acting steam	exhaust steam from pump	28/9/09
Springfield, Springfield	all 4'	1 in 6	bord and pillar	1 6' x 4'	80'	shaft	312	..	312	90,439	90,751	1	4	5	steam	direct acting steam	exhaust steam from pump	28/9/09
Springfield Fireclay - works, Springfield	all	1 in 6	ditto	14' 6" x 3' 6" x 5'	50'	adit	..	..	..	472	472	1	3	4	horse	steam pump	ditto	28/9/09
Sheffield Fireclay-works, Sheffield	"	1 in 10	open	6' x 5'	..	open	..	..	..	..	..	..	2	2	..	..	..	..
Homebush, Glentunnel	"	1 in 3	bord and pillar	14' 6" x 3' 6" x 6"	50'	tunnel	12,231	1,602	13,833	225,838	239,671	5	35	40	steam & horse	..	furnace	16/12/09
St. Helen's, Whitecliffs	"	1 in 3	bord and pillar, slope, and wall	7' x 6' 4' x 3' 6" x 5'	40 ch. 80' 5 ch.	adit	913	..	913	17,933	18,846	1	3	4	steam	..	exhaust steam from pump	2/6/09
Mount Somers, Mount Somers (amalgamated with Woolshed Creek Mine)	10'	south 1 in 4½	bord and pillar	1 5' x 4' 7' x 6'	25' 10 ch. jig 25 ch. 68'	..	5,119	610	5,729	27,156	32,885	3	6	9	self-acting	..	natural	1/10/09
Albury	7'	1 in 1	ditto	14' x 3' 6" x 6"	..	..	883	..	883	9,654	10,537	1	2	3	horse	..	..	26/5/09
Waihaio Forks, Waihaio Forks (late Waihaio), Waihaio Forks	5' all	..	..	5' x 4' 5' x 4'	100' 260'	adit	..	..	..	3,002	3,002	..	..	2	band	..	..	22/9/09
Elephant Hill, Waihaio Downs	8'	1 in 6	..	6' x 5'	20 ch.	..	..	..	..	668	668	..	..	..	..	..	..	22/9/09
Private Pits.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Snowdon, Hakaia Gorge	8'	1 in 3	narrow	1 4' x 4'	90'	shaft	..	..	..	1,808	1,808	..	..	..	..	..	..	..
Craigieburn, West Coast Road	..	..	open	..	..	open	..	..	..	423	423	..	..	..	..	..	..	..
NORTH OTAGO.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Dalgely, Hakataramea	..	semi-vertical	bord and pillar	..	..	adit	30	..	30	2,820	2,850	..	1	1	horse	..	natural	..
Wharekuri, Wharekuri	13'	vertical	levels	8' x 6' 4' x 4'	20'	..	..	..	..	2,579	2,579	..	..	..	hand	..	..	..
Kurov, Kurov	30'	"	stopping	1 8' x 6' 4' x 4'	150'	dip drive	380	..	380	3,565	3,965	..	1	1	horse	..	..	..
Otiako, Otiako	12'	"	..	6' x 5'	200'	adit	40	..	40	278	318	..	1	1	..	..	..	25/5/09
St. Andrew's, Papakaio	6'	1 in 4	bord and pillar	1 4' x 3' 6' x 6'	60' 5 ch.	..	1,890	..	1,890	41,389	43,229	1	4	5	..	..	furnace	25/5/09
Prince Alfred, Papakaio	all	1 in 9	ditto	1 4' x 3' 5½' x 6'	51' 5 ch.	..	812	..	812	53,402	54,214	1	2	3	..	..	natural	25/5/09
Ngapara, Ngapara	8'	1 in 17	..	1 4' x 4' 6' x 6'	50' 10 ch.	..	991	..	991	25,240	26,281	1	2	3	..	..	..	22/5/09
Shag Point, Shag Point	all	..	..	5' x 4'	5 ch.	..	221	..	221	405,287	405,508	1	2	3	hand	..	..	21/9/09
Broadleaf, Shag Point	"	..	..	..	150'	..	242	..	242	..	..	..	3	3	..	..	..	21/9/09
Shag Point Company's, Shag Point	"	..	longwall	..	150'	..	94	..	94	..	..	..	6	6	horse	..	..	21/9/09
Allandale, Shag Point	"	1 in 4	bord and pillar & longwall	2 10' x 6' 8' x 4'	1,000' 280'	incline tunnel	3,450	1,466	4,916	305,665	310,581	3	14	17	steam	..	..	21/9/09

SOUTHERN INSPECTION DISTRICT—continued.

Name of Mine and Locality..	Name of Manager.	Number of Years worked.	Quality of Coal.	No. of Beams worked.	Thickness of Beams.	Thickness worked.	Dip of Beams.	System of Underground Working.	Dimensions of Shafts.			Output delivered by		Output for 1909.			Approximate Total Output to 31st December, 1908.	Approximate Total Output to 31st December, 1909.	Number of Men ordinarily employed.		Power used for drawing Minerals.	Pumps.			Means of Ventilation.	Date of Inspector's Last Visit.	
									Number of Shafts.	Size of Shaft or Length of Adit.	Depth of Shaft or Length of Adit.	Coal.	Slack.	Total.	Above.	Below.			Stroke.	Size of Barrel.		Height of Column.					
SOUTHERN INSPECTION DISTRICT—continued.																											
South Otago.																											
Bernhill, Abbotstford	Gray, James	32	brown	1	10'	all	1 in 10	bord and pillar	1	4 1/2' x 4 1/2' 6' x 6'	50' 10 ch.	level	Tons. 236	Tons. 1,082	Tons. 1,318	146,909	148,227	6	4	10	horse	..	..	..	natural	31/8/09	
Freeman's, Abbotstford	Gillanders, A. S.	29	"	2	7' to 14'	"	1 in 7	ditto	3	6' x 4' 6' x 5' 7' x 7'	150' 1,400' 264'	dip incline drive	19,390	1,990	21,380	384,730	406,110	8	36	44	steam & horse	..	..	..	furnace	28/10/09	
Green Island, Green Island	Barclay, jun., T.	22	"	1	14'	10'	1 in 10	"	..	4' x 3' 6' x 5' 7' x 7'	150' 20 ch.	adit	1,981	..	1,981	110,493	112,474	2	3	5	steam & horse	Tangye	..	..	..	natural	26/10/09
Jubilee, Saddle Hill	Barclay, T.	12	"	1	17'	all	1 in 10	"	2	4' x 5' 6' x 5' 7' x 7'	20 ch.	"	12,677	4,595	20,272	148,992	169,264	5	22	27	steam & horse	..	..	..	furnace	27/10/09	
Burnwell, Saddle Hill	Harris, A.	28	"	1	20'	10' to 15'	1 in 9	"	1	6' x 4' 6' x 5' 7' x 7'	6 ch.	tunnel	2,291	..	2,291	65,525	67,816	2	9	5	ditto	..	..	..	natural	26/10/09	
Saddle Hill (No. 1), Saddle Hill	Ogilvie, W. W.	37	"	1	20'	all	1 in 10	"	4	5' 10' x 4' 6"	100' 10 ch.	inclined drive	3,086	4,631	7,667	176,981	184,648	3	10	13	"	..	..	..	furnace	30/12/09	
Saddle Hill (No. 2), Saddle Hill	Hill, Robert	8	"	1	22'	10'	1 in 14	"	1	..	..	adit	4,732	12,240	16,972	104,015	120,987	10	22	32	"	..	..	..	fan	2/11/09	
Lauriston, Brighton	Walker, James R. (permit)	23	"	1	6'	5' 6"	variable	"	1	..	48'	tunnel	195	..	195	7,350	7,545	1	1	2	horse	..	..	..	natural	29/10/09	
Brighton, Brighton	McColl, D. L. (permit)	21	"	1	7'	all	1 in 20	"	1	4' x 3' 30' x 8'	48'	"	154	..	154	2,674	2,828	1	1	2	hand	..	..	..	"	29/10/09	
Ferndale, Taieri Beach	Fairbairn, S. H.	26	"	1	10'	8'	"	"	..	10' x 8' 1' x 6' x 6'	100' 40 ch. 12 ch.	level	88	..	88	857	945	..	1	1	38	steam & horse	..	..	..	furnace	7/12/09
Waronui, Milton	Carruthers, J.	5	"	1	14'	7'	1 in 7	"	1	6' x 6'	..	"	13,125	3,034	16,159	40,050	56,209	18	20	38	"	..	..	..	"	8/12/09	
Walleend, Lovell's Flat	Hewitson, R. (permit)	39	lignite	1	20'	all	..	open	..	..	..	open	..	..	..	11,539	11,539	..	..	..	hand	..	..	..	..	8/12/09	
Benhar, Stirling	Murdoch, C. (permit)	46	"	1	20'	12'	..	bord and pillar	..	4' x 4' 6' x 6'	50' 5 ch.	inclined	3,158	665	3,823	121,887	125,710	1	4	5	steam	..	..	..	natural	8/12/09	
Mount Wallace, Stirling	Park, F. (permit)	15	"	1	20'	12'	..	ditto	..	12' x 12' 6' x 4'	4 ch.	adit	633	..	633	8,055	8,688	..	1	1	horse	..	..	..	"	8/12/09	
Tareau, Taratu	Shore, T.	8	brown	1	20'	8' to 12'	1 in 10	"	2	6' x 4' 19' 6' x 200'	185' 200'	shaft	10,435	5,173	15,608	108,759	124,367	14	31	45	steam	Tangye	..	..	..	fan	23/12/09
Kaitangata	Carson, W. (N.Z. Coal and Oil Co., Ltd., O.G. Lockhart, sec.)	33	"	3	50' in aggregate	all	1 in 1 1/4 to 1 in 4	"	2	10' x 7' 8' x 4' 6' 11' x 6' 6' 9' diam.	51 ch. 580' 45 ch. 526' 66'	in inclined	81,223	46,509	127,732	2,312,680	2,440,412	62	265	327	steam & compressed air	2' 6" three-throw pumps	..	..	..	"	9/12/09
Castle Hill, Kaitangata	Penman, R. (permit)	16	"	4	50' in aggregate	"	1 in 1 1/4 to 1 in 4	"	1	11' x 6' 6' 9' diam.	45 ch. 526' 66'	"	221	..	221	181	402	..	1	1	hand	ditto	..	..	..	furnace	16/10/09
Port Arthur, Kaitangata	Penman, R. (permit)	5	"	1	10'	"	..	"	..	..	..	level	221	..	221	181	402	..	1	1	hand	ditto	..	..	..	natural	24/6/09
Hawthorn Den, Kaitangata	Espie, T. (permit)	1	"	1	9'	"	..	open	..	..	100'	open	116	..	116	..	116	..	1	1	"	..	..	..	..	"	23/6/09
Longridge, Kaitangata	Macfie, N. (permit)	1	"	1	..	..	..	bord and pillar	..	..	..	adit	91	..	91	..	91	..	3	3	"	..	..	..	natural	6/12/09	

SOUTH OTAGO—continued.

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Name of Mine and Locality.	Name of Manager.	Number of Years worked.	Quality of Coal.	No. of Beams worked.	Thickness of Beams.	Thickness worked.	Dip of Beam.	System of Working.	Number of Shafts.	Dimensions of Shafts.		Output delivered by			Output for 1909.		Approximate Total Output to 31st December, 1908.	Approximate Total Output to 31st December, 1909.	Number of Men ordinarily employed.			Power used for drawing Minerals.	Pumps.			Means of Ventilation.	Date of Inspector's Last Visit.
										Size of Shaft or Adit.	Depth of Shaft or Length of Adit.	Open.	Tons.	Coal.	Slack.	Total.			Tons.	Tons.	Above.		Below.	Total.	Stroke.		
SOUTHERN INSPECTION DISTRICT—continued.																											
CENTRAL OTAGO—continued.																											
Nevis Crossing, Nevis	Ritchie, Robert (permit)	6	brown	1	..	all	semi-vertical	open	..	..	1,003	..	open	1,003	1,003	6,396	7,339	2	..	2	hand	..	..	..	..	6/11/09	
Upper Nevis, Nevis	Ritchie, James	4	..	1	..	..	ditto	..	..	..	..	..	..	..	..	140	140	..	..	..	..	..	..	..	..	..	
Private Pits.																											
Donaldson's, Mount Highlay	Donaldson, W. and G.	3	..	1	10'	all	..	bord and pillar	5' x 6'	60'	475	..	dip	475	475	458	933	2	..	2	horse	water-box	..	natural	3/11/09		
Kyeburn, Kyeburn	McCready, W. J.	26	..	1	..	..	vertical	..	..	..	..	..	adit	..	..	15,452	15,452	..	..	..	hand	..	..	..	..	..	
McKnight's, Blackstone Hill	McKnight, D.	12	lignite	1	12'	all	..	open	..	..	8	..	open	8	8	185	193	..	..	..	..	..	..	..	..	13/4/09	
SOUTHLAND.																											
Pukerau, Pukerau	Hamilton, J. (permit)	29	..	1	16'	8' to 10'	1 in 10	bord and pillar	8' x 8'	11 ch.	793	..	adit	793	793	34,578	35,371	1	2	3	horse	windmill	..	natural	28/7/09		
Nelson's, Pukerau	Nelson, J. H. (permit)	20	..	1	16'	10'	..	ditto	..	..	134	..	..	134	134	3,999	4,133	..	1	1	hand	Douglass	..	..	28/7/09		
Heffernan's, Gore	Burgess, W. C. (permit)	31	..	1	15'	10'	..	..	1 6' x 5'	..	2,427	..	incline tunnel	2,427	2,427	45,244	47,671	1	2	3	horse	hand-pump	..	..	12/6/09		
Green's, Gore	Mason, James	21	..	1	17'	12'	1 in 20	..	10' x 8'	5 ch.	9,491	308	ditto	9,799	9,799	83,867	93,666	2	6	8	..	Tangye	..	..	22/11/09		
Smyth's, Gore	Broome, jun., J. (permit)	13	..	1	16'	12'	1 in 20	..	..	..	3,164	..	..	3,164	3,164	15,798	18,962	1	2	3	..	..	..	..	5/11/09		
Bushy Park, Croydon	Dixon, W. (permit)	4	..	1	20'	12'	..	..	..	..	1,977	..	..	1,977	1,977	9,850	11,827	..	2	2	..	Californian pump	..	..	5/11/09		
Boornwell, Chatton	Cameron, D. (permit)	10	..	1	12'	12'	1 in 10	..	20' x 12'	100'	1,983	..	adit	1,983	1,983	17,217	19,200	1	3	4	..	hand-pump	..	..	23/11/09		
Pacey's freehold, Chatton	Bucholz, J. (permit)	6	..	1	20'	14'	..	..	..	..	3,344	..	..	3,344	3,344	30,925	34,269	..	3	3	steam	hand-pump	..	..	23/11/09		
Chatton (late East Chatton), Chatton	Ramsay, P. (permit)	7	..	1	20'	12'	1 in 5	..	..	..	1,471	..	..	1,471	1,471	8,115	9,586	1	2	3	horse	drain	..	..	23/11/09		
Thorndale, Waikaka Valley	Higsted, Thomas	10	..	1	10'	all	..	open	..	..	14	..	open	14	14	8,132	8,146	1	..	1	..	..	..	..	..	21/10/09	
Springfield, Waikaka Valley	Charles, Edward	16	..	1	15'	8'	..	bord and pillar	..	..	1,849	..	adit	1,849	1,849	18,307	20,156	..	2	2	..	..	..	..	..	22/11/09	
Willow Bank, Waikaka Valley	Jones, W. (permit)	13	..	1	15'	10'	..	..	..	..	3,910	..	..	3,910	3,910	40,846	44,756	2	6	8	steam	two Douglas pumps	..	..	21/10/09		
Glenlee, Waikaka Valley	McGill, D. T. (permit)	16	..	1	14'	10'	..	open	..	..	578	..	open	578	578	10,634	11,212	1	..	1	horse	..	..	..	..	22/11/09	
McDonald's, Waikaka Valley	Molvor, W. (permit)	10	..	1	16'	12'	..	bord and pillar	12' x 12'	..	2,075	..	adit	2,075	2,075	20,698	22,773	1	3	4	steam	syphon	..	natural	22/11/09		
Landslip, Landslip, Waikaka	Kyle, W. (permit)	18	..	1	17'	all	..	ditto	..	60'	1,948	..	incline tunnel	1,948	1,948	31,236	33,184	1	5	6	..	steam-driven	..	..	..	24/11/09	

Riverbank, Landslip, Waikaia	Kyle, Wm.	6	1	10'	all	1 in 8	6 x 4'	adit	1,148	6,609	7,757	5	5	hand	oil engine and pump	24/11/09
Rossvale, Landslip, Waikaia	Bond, J. (permit)	6	1	10'	8'	..	2 6' x 5'	..	3,870	14,459	18,329	5	5	horse	..	24/11/09
Waikaia, Landslip, Waikaia	Cain, A. (permit)	2	1	10'	all	1 in 4	..	dip	3,811	5,254	8,565	1	3	4	..	24/11/09
Muddy Terrace, Waikaia	McLelland, J. ..	7	1	14'	7'	..	..	incline open	3,829	11,906	15,795	1	5	6	..	24/11/09
Argyle, Upper Waikaia	Hutton, C. H. (permit)	18	1	20'	all	..	..	open	107	3,399	3,506	1	1	1	..	..
Anderson's, Waikaia	Yomans, S. ..	2	1	18'	10'	vertical	..	lifts	..	5,435	5,435	..	..	..	..	14/6/09
Waimaea, Kingston Crossing	Johnstone, J. E. (permit)	1	1	3'	all	..	..	..	443	..	443	1	1	2	..	16/6/09
Beer's, Mossburn	Beer, Mrs. T. ..	7	1	6'	7'	irregular	..	open	113	510	623	1	1	1	..	11/12/09
Mataura Collieries (Limited), Mataura	Johnson, W. C. (permit)	13	1	17'	12'	..	..	adit	7,400	110,249	117,649	2	5	7	..	11/12/09
Mataura Lignite, Mataura	Coster, W. (permit)	33	1	16'	all	..	..	open	9,796	74,219	84,015	7	7	7	..	11/12/09
Boghead, Mataura	Sleeman, jun., C. P. (permit)	11	1	16'	..	..	..	..	2,855	6,834	9,689	2	2	2	..	11/12/09
Waimumu, Mataura	Wallace, J. (permit)	10	1	9'	7'	..	..	adit	1,615	27,333	28,948	1	2	3	..	5/11/09
Ota Creek, Ota Creek	Genge, E. (permit)	29	1	6'	5'	..	..	open	570	14,024	14,594	1	1	1	..	10/9/09
Clarke's, Wyndham	Clarke, S. ..	3	1	12'	all	..	..	..	1,590	4,812	5,902	1	1	1	..	4/11/09
Robin Hood, Pine Bush	Couser, Wm. (permit)	28	1	14'	..	..	..	..	165	2,838	3,003	1	1	1	..	10/9/09
Graham's, Fairfax	Graham, P. S. ..	31	1	6'	..	1 in 20	..	adit	145	16,261	16,406	1	1	1	..	..
Ardlowie, Fairfax	Poole, E. ..	7	1	36' in aggregate	24' in aggregate	variable to 1 in 7	..	open	53	694	747	1	1	1	..	10/12/09
Nightcaps, Nightcaps	Barclay, W. ..	28	3	36' in aggregate	all	..	3 4' x 4' 6" 5' x 5'	adit levels	50,052	616,263	666,315	28	62	90	..	..
Wairaki (late Hit or Miss), Nightcaps	Lloyd, J. ..	9	1	6'	..	..	..	adit	2,179	5,612	7,791	1	4	5	..	20/10/09
H.B., Nightcaps	Spence, G. R. (permit)	11	1	7'	..	..	..	..	1,621	7,739	9,860	1	3	4	..	20/10/09
New Brighton, Nightcaps	McKenzie, D. (permit)	24	1	20'	..	..	..	open and adit	2,427	1,972	4,399	2	3	5	..	25/8/09
The Willow, Nightcaps	Clarke, J. ..	10	1	14'	9'	..	..	open	48	2,317	2,365	1	1	1	..	25/8/09
Wairio, Nightcaps	Wairio Coal Company (J. McMeekin, Manager)	5	1	17'	9'	..	8' x 8'	adit	755	2,825	3,580	1	2	3	..	25/8/09
Beaumont, Nightcaps	Moss, W. (permit)	1	1	20'	14'	1 in 4	..	open	306	..	306	2	2	2	..	25/8/09
Wildbush, Riverton	Smith, William ..	2	1	11'	all	..	..	..	304	132	436	2	2	2	..	..
Bush Siding, Seaward Bush	Bowden, F. R. (permit)	7	1	32'	..	..	..	..	840	4,888	5,738	3	3	3	..	11/8/09
<i>Private Pits.</i>																
Waverley Park, Pukerua	Milne, James ..	8	1	7'	7'	..	..	..	..	30	30	..	..	..	..	..
Wellwood Park, Pukerua	Mason, A. M. W. ..	8	1	7'	..	..	..	..	24	154	178	..	..	..	..	..
Mason's, Pukerua	Mason, jun., A. ..	2	1	7'	..	..	..	..	12	13	25	..	..	..	..	..
Oukerama Station (late Glover's), Pukerua	Voight, jun., W. J. ..	12	1	7'	..	..	..	..	33	234	267	..	..	..	..	..

Name of Mine and Locality.	Name of Manager.	Number of Years worked.	Quality of Coal.	No. of Seams worked.	Thickness of Seams.	Thickness worked.	Dip of Seam.	System of Underground Working.	Number of Shafts.	Dimensions of Shafts.		Output delivered by	Output for 1909.			Approximate Total Output to 31st December, 1908.	Approximate Total Output to 31st December, 1909.	Number of Men ordinarily employed.			Power used for drawing Mineral.	Pumps.			Means of Ventilation.	Date of Inspector's Last Visit.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
										Size of Shaft or Adit.	Depth of Shaft or Length of Adit.		Coal.	Slack.	Total.			Above.	Below.	Total.		Stroke.	Size of Barrel.	Height of Column.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
SOUTHERN INSPECTION DISTRICT—continued.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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Private Pits—continued.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
Smith's, East Gore..	Smith, H.	6	lignite	1	7'	all	..	open	..	..	..	open	Tons. 20	Tons. 20	Tons. 47	Tons. 47	..	..	..	..	..	..	..	..	..																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
Riverview, Gore ..	Nicol, J. and J. ...	18	"	1	..	..	..	"	..	..	..	"	..	..	1,659	1,679	..	..	..	..	..	..	..	..	..																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
Cross's, Otama ..	Cross Bros.	11	"	1	4'	all	..	"	..	..	..	"	..	..	169	169	..	..	..	..	..	..	..	..	..																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
Ford's, Chetton ..	Ford, P.	29	"	1	7'	"	..	"	..	..	..	"	..	..	30	1,254	1,284	..	..	..	..	..	..	..	..																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
Perkins's, Wendon Valley	Perkins, G. A.	8	"	1	..	"	..	"	..	..	..	"	..	..	10	67	77	..	..	..	..	..	..	..	..																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
Tusach's, Waimumu ..	Tusach, J.	3	"	1	..	"	..	"	..	..	..	"	..	..	38	12	50	1	..	..	..	..	..	..	..																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
Wyndham, Wyndham ..	Irvine, D.	14	"	1	..	"	..	"	..	..	..	"	..	..	9	328	328	..	..	..	..	..	..	..	..																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
McBride's, Nightcaps ..	McBride, A.	1	brown	1	10'	all	..	"	..	..	..	"	..	..	..	..	651	651	..	..	..	..	..	..	..																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
Mount Linton, Nightcaps ..	McGregor, W. J. A.	15	"	1	10'	8'	1 in 4	"	..	..	..	"	..	..	..	58	58	..	..	..	..	..	..	..	..																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
Blackmount, Blackmount ..	Stutholme, P.	9	"	1	5'	all	..	"	..	..	..	"	..	..	188	1,132	1,320	1	..	..	..	..	..	..	..																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
Linwood, Te Anau...	Dore ..	9	lignite	1	7'	"	..	"	..	..	..	"	..	..	..	1,277,057	1,377,057	..	..	..	..	..	..	..	..																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
Output of mines included in 1908 statement, at which operations are suspended	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
Totals, Southern District, Middle Island	..	..	..	..	..	..	..	..	..	..	..	..	354,893	85,342	440,235	8397390	8837625	277	735	1012	..	..	..	..	..																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
Totals, West Coast District, Middle Island	..	..	..	..	..	..	..	..	..	..	..	..	805,276	317,366	1,126,642	1,960,772	1,473,041	727	1670	2397	..	..	..	..	..																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
Totals, North Island	..	..	..	..	..	..	..	..	..	..	..	..	300,853	47,517	348,370	4805998	5154368	155	627	782	..	..	..	..	..																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
Grand Totals	..	..	..	..	..	..	..	..	..	..	..	..	1,461,022	450,225	1,911,247	2,681,116	2,872,240	1,159	3,032	4,191	..	..	..	..	..																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
Output of mines included in statement for 1890, but whose operations were suspended prior to 1890 (less three, which are again included in body of statement—namely, Hill's Creek, 779 tons; Lovell's Flat, 323 tons; Wyndham, 1,988 tons: total, 3,090 tons)																	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

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