1901.

NEW ZEALAND.

INSPECTION OF COAL-MINES REPORT.

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

No. 1.

Mr. J. HAYES, F.S.Sc., Inspecting Engineer, to the UNDER-SECRETARY, Mines Department.

SIR,— Mines Department, Wellington, 7th May, 1901.

I have the honour to submit my report (covering those of the Inspectors of Mines for the several districts) for the year ending 31st December, 1900.

The output for the respective inspection districts was as under:—

—	Northern District.	West Coast District.	Southern District.	Total.
	Tons.	Tons.	Tons.	Tons.
Bituminous and semi-bituminous coal ...	79,679	594,183	...	673,862
Pitch-coal	...	...	37,804	37,804
Brown coal...	80,624	...	259,162	339,786
Lignite	...	...	42,538	42,538
Totals	160,303	594,183	339,504	1,093,990

In comparison with that of the preceding year, the output shows a net increase of 118,756 tons, made up as follows:—

—	Northern District.		West Coast District.		Southern District.		Total Increase.	Total Decrease.
	Increase.	Decrease.	Increase.	Decrease.	Increase.	Decrease.		
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Bituminous and semi-bituminous coal	13,405	...	72,421	...	...	...	85,826	...
Pitch-coal ...	...	...	...	...	...	31	...	31
Brown coal ...	5,770	...	...	...	19,474	...	25,244	...
Lignite	...	...	...	185	7,902	...	7,902	185
Totals ...	19,175	...	72,421	185	27,376	31	118,972	216

The number of mines in operation (including several lignite-pits from which fuel for private consumption is raised) is returned at 167, employing 2,460 persons.

The average output per person employed was 444·71 tons. During the year there were four fatal accidents, or at the rate of one fatality for every 273,497·5 tons of coal, &c., produced, and one for every 614 persons employed.

Very few, if any, non-fatal accidents which occurred during the year are likely to be attended with disablement of a permanent character. Accidents to eyes are not altogether uncommon in some mines, where pieces of coal have a tendency to fly from the face when the miner is using his pick. Mr. Green (Southern District) refers to this matter in his report. In his report on the coal-mines of the Northern District, Mr. Coutts mentions that no serious accidents have occurred during the year. Mr. Tennent (West Coast District), in referring to the marked decrease of accidents in the mines of the Westport Coal Company (Limited), attributes this result to the safe and more effective system of coal-getting by mechanical appliances which has been adopted by the company, together with efficient supervision.

Failure to make Returns.

The owners of six small coal-mines in the Southern District who failed to make the returns of output for the half-year ending 31st December, 1900 (as required by section 68 of "The Coal-mines Act, 1891"), have been proceeded against by the Inspector of Mines for the district. Fines were imposed in each case.

Fire at Westport-Cardiff Colliery.

The Westport-Cardiff Coal Company (Limited) ceased mining operations in September, 1899, the principal reason being that the only coal then available for working was of a very soft nature, so much so that even the lumps would not stand the ordinary handling from the workings to the ship's hold at Westport without being smashed up into fine slack, and no payable market could then be found for it. At the end of January, 1900, it was discovered that a portion of the mine known as the "Hector block" was on fire. In this section there is comparatively little coal left, and little or no active mining-work had been done in it for some time previous to the company ceasing operations. Its principal value was that of a means of access to another part of the property known as the "Bridge section." It was in this latter section (which is connected with the Hector block by means of a bridge across Chasm Creek) that the output of coal was obtained for some time previous to the stoppage, the coal being conveyed (*viâ* the Hector block) by a system of endless-rope haulage to the colliery sidings.

On the discovery of the fire, Mr. J. Dixon, mining engineer to the Westport Coal Company at Millerton (Granity Creek), took charge of operations. He was assisted to some extent by Mr. Tennent, the Inspector of Mines for the district. The conditions which existed were most unfavourable for blocking off the fire locally, and after considerable difficulty in trying to effect this it became necessary to block off the two entrances, and subsequently to erect dams so as to admit of the mine being flooded. This has been accomplished, and active fire is practically confined to a small fringe of coal which exists between the worked-out ground and the outcrop of the coal at the cliffs above Chasm Creek, and beyond the reach of available water. To attempt anything beyond what has been done would not serve any good purpose.

The Westport-Cardiff Coal Company (Limited) has gone into liquidation, and the property wa taken over by the Government, for moneys due, in May, 1900.

New Mines.

A new coal-mining area is being opened up at Puponga, near Collingwood. Coal of excellent quality, especially for household purposes, has been discovered. The principal seam shows a section of 7½ ft. of clean coal. Smaller seams also exist. I am not yet sure that the coal from the main seam will be suitable for the manufacture of coke for smelting purposes, but there is the possibility that it may be of considerable value in connection with the future working of the iron-deposits at Parapara, in the event of the process of smelting with "producer-gas" being adopted. The coal referred to has also the appearance of being good steam-coal. Analyses by the late Mr. Skey of several samples from the field show the coal to have a similar average evaporative power to that from the Grey Valley Coalfield.

Recent discoveries of coal are reported at Otakaia (Otago), and also near Nelson, but no particulars are yet to hand.

Shale-oil Manufacture.

As mentioned in the report of last year, extensive and costly operations have been in progress at Orepuki (Southland) for the development of the deposits of oil-shale (which are associated there with brown coals), and in the erection of works for the manufacture of burning and lubricating-oils and similar products. The mine-workings have been opened out on a good scale, so as to produce considerable quantities of shale, and the oil-making plant was put to work early in the present year. It is probable that the water (ammoniacal liquor) obtained in retorting the shale may be utilised for the manufacture of sulphate of ammonia. By the courtesy of Mr. Dunlop, the works superintendent, I am enabled to reproduce photographs giving good general views of the works under construction.

The company are now known as "The New Zealand Coal and Oil Company (Limited)," and are also the owners of the collieries at Kaitangata.

Mine-ventilation.

I find a growing tendency to adopt mechanical ventilation at the principal collieries, installations of this character already being established at Brunner, Denniston, Millerton, and Taupiri. There is a probability of the erection of fans at some other collieries. In order to place the possibility of fan-ventilation within the reach of even small collieries, I have recently given some further attention to this subject, and have designed a fan based on the lines which a somewhat lengthy experience has taught to be practical as regards efficiency and economy in working, yet so simple that the bulk of its construction may be effected by the mine carpenter and blacksmith at very moderate cost. As such a fan is likely to be of considerable use in connection with metalliferous mining operations, a description and illustration are embodied in my report on goldfields, &c.

Utilisation of Slack, &c.

In connection with my report of last year I mentioned the possibilities of, and gave some information in respect to, the utilisation of waste slack at the brown-coal collieries, and the soft, unsaleable coal at the bituminous collieries, by the manufacture of briquettes. Since then I have been favoured with some further particulars of American practice by the Henry S. Mould Company, of Pittsburg, U.S.A. They state that a number of improvements—suggested by further experience

—have been made in the plant. Among these are forms of dryers and heaters for use either with direct or steam heat; also alterations in the presses, which enable the compressed fuel to be turned out in the shape of an egg. "Eggettes" (as they are termed) and briquettes may be made in various sizes to suit requirements. Experience has proved in many instances that heat and compression are sufficient to produce briquettes without the use of pitch or other binding agent. Interested parties can try this without much expense or trouble by simply heating up a small amount of fine coal in a retort to as high a temperature as is possible short of ignition, and immediately subjecting the heated coal to very heavy pressure by a small hand or hydraulic press. Where coals will yield sufficient tarry matter themselves, the introduction of material to act as a binder or agglomerant is unnecessary, and the cost of production is somewhat reduced.

A totally different method of briquette-manufacture has recently been introduced by a German inventor. In this instance the fine coal is mixed with lime and water to the consistency of stiff mortar. It is then moulded into blocks under very slight pressure, the object being to produce a briquette of an open or spongy character, instead of the compact, dense article usually made. The fine coal and lime may be mixed dry if desired, and the water subsequently added, thus slaking the lime in the presence of the fuel material. For every ton of crushed coal about 2 cwt. of lime and 4 cwt. to 8 cwt. of water (the latter must be proportioned according as the coal is wet or dry) are used. After being moulded, the blocks or briquettes are dried in similar manner to slop-moulded bricks. If necessary for the purpose of promoting cohesion, a proportion of vegetable refuse, such as sawdust, fine shavings, moss, or straw-chaff, may be introduced. Where it is necessary to store this class of briquette out-of-doors hydraulic lime should be used, but ordinary lime is said to be good enough where storage is indoors, or where the briquettes will not be exposed to the weather otherwise than for a short time.

It is claimed that, owing to the admission of air being more easily effected, briquettes of this open or porous class are better suited to burning in places not under blast than those of a compact form; also that much less soot and smoke will be produced than where briquettes in which tar or pitch is incorporated as a binding agent is used. Experiments are said to have proved that the presence of lime has a tendency to promote combustion, and in all probability a chemical reaction of the lime will be found to be productive of beneficial results. The method appears very simple, and could be tried on a commercial scale at any brickyard where there is an ordinary machine for making common wire-cut bricks—in fact, such a machine seems peculiarly adapted to the purpose.

Another way in which fine coal and slack may be utilised is by grinding it to powder and blowing it (by means of a fan) into the furnaces of steam-boilers, &c. Experiments appear to have demonstrated that combustion is effected without waste or residium, and it is claimed that the heat liberated is approximately one-third more, in the use of given quantities of coal, than that obtained by feeding the fires in the usual way. The "Meldrum" furnace, now largely adopted by steam-users in Great Britain, utilises as a fuel what, until the last few years, was regarded as waste material. In this case the fuel is fed on to the fire-bars either by hand or by a mechanical stoker, and forced draught is effected by means of steam-jets.

By the adoption of appliances of either of the foregoing forms, I am strongly of opinion that much of the refuse slack which (especially at brown-coal collieries) now goes entirely to waste could be profitably utilised.

Explosives used in Coal-mines.

For many years the only explosive used for blasting purposes in coal-mines was common blasting-powder. It was generally employed in a loose state for dry holes, or enclosed in a tarred cartridge-bag where the shot had to be fired in a damp or wet place. Regulations under the mining laws of Great Britain subsequently made it illegal to take powder underground except in the form of cartridges carried in a proper case or canister. This led to the introduction and very general use of cartridges formed of powder mixed with some suitable binding agent, and compressed into moulds of convenient size and shape. Powder has always been favourably regarded as a blasting agent by the coal-miner on account of its convenience, and his familiarity with its use and properties. Its slow rending action renders it more conducive to the production of lump coal than is the case with the quick and shattering action of most nitro-glycerine compounds. Of late years blasting-powder has largely fallen into disuse owing to the restrictions placed upon it by the increasing severity of mining regulations in the interests of safety.

There is no gainsaying the fact that many disastrous explosions in collieries have been due to the use of blasting-powder in fiery mines, and also in mines of a non-fiery character, but which are dry and dusty. The total abolition of blasting in mines which are fiery, or dry and dusty, or which may have these conditions combined, would in many instances mean cessation of operations owing to the great extra cost which would necessarily be entailed in getting the coal and making height for roadways without the aid of some blasting agent. The necessity of having some safe explosive for colliery-work is fully recognised, and only such explosives are now permitted to be used in collieries in the United Kingdom as fulfil the conditions imposed by the Secretary of State. These conditions are such as allow of the use of those explosives only which pass a standard test, and are not likely by their use in mines to cause an explosion of firedamp or coal-dust. The object sought by the manufacturers of these explosives is the prevention of flame under the ordinary conditions of blasting. Many of the compounds consist of nitrate of ammonium and di-nitro-benzol or naphthalene in suitable proportions; others are of nitro-glycerine combined with sulphate of magnesium, nitrate of barium, nitrate of potassium, &c., and infusorial earth.

In October last an order was issued by the Secretary of State (London) repealing previous orders in relation to the use of permitted explosives in Home collieries, and which re-enacted those orders with certain modifications and additions. The chief purpose of the order was to embody the

results of a special test for explosives which have been made by the British Government in the direction of ascertaining the safest explosive compounds for use under dangerous conditions. The special test differed from the ordinary test in the following particulars: "(1) In the amount of the charges, which is increased by half for the first ten shots, and doubled, with a slight increase of stemming, for the remainder; (2) in the more sensitive character of the gaseous mixture in which the shots are fired; (3) in the fact that, while an explosive might pass the ordinary test with two failures in forty shots, under the special test a single failure disqualifies."

Six explosives passed the special test—viz., ammonite, amvis, carbonite, electronite (2nd definition), Nobel ardeer powder, roburite No. 3.

The following explosives have passed the ordinary test, and are included in the "permitted list":—

Ammonite.	Electronite (1st definition.	Nobel carbonite.
Amvis.	Elephant brand gunpowder.	Nobel gelignite.
Bellite No. 1.	Elephant brand gunpowder No. 2.	Oxalate blasting-powder.
" No. 3.	Faversham powder.	Pembrite.
Benedite.	Kynite.	Pitite.
British gelignite.	Kynoch gelignite.	Rhenish gelignite.
Bull-dog brand gunpowder.	Nahnsen's gelignite.	Roburite No. 3.
Carbo-gelatine.	National gelignite.	Stowmarket gelignite.
Carbonite.	Nobel Ardeer powder.	Sun gelignite.
Danmenite A.		Westfalite No. 1.
Earthquake powder.		" No. 2.

The method of firing these explosives has in many instances been by what is commonly known as "safety" fuse, ignited either by a fine wire heated in the flame of a safety-lamp or by means of a "safety-igniter." The latter consists of a light tube of tinned sheet-iron, about ¼ in. diameter and 2½ in. long, into one end of which the fuse is inserted. The other end is closed, and near its extremity is a tiny glass bulb containing a drop or two of sulphuric acid, and also a pellet of composition, which bursts into flame inside the tube when it comes into contact with the sulphuric acid. This is accomplished by nipping the tube with a suitable tool at a place marked for the purpose, and so liberating the acid by breaking the bulb.

In consequence of an explosion of firedamp which occurred at the Cwm Pit, Merthyr Tydvil (South Wales), in May last, a Commission was appointed to fully inquire into the cause. It appears that bull-dog powder—one of the permitted explosives—was used, a safety-fuse and safety-igniter being adopted as the method of firing the charge. After very careful inquiry the Commissioners reported as follows:—

"(1.) That it is impossible to say with certainty whether or no the explosion was due to the use of bull-dog powder. We think that the probability is that it was due to an imperfect fuse, improperly used.

"(2.) That most of the fuses at present employed in mining are distinctly dangerous, and that steps ought to be taken to test all fuses and other apparatus for firing explosives in mines."

Of late years the system of firing shots by electricity has been adopted to a considerable extent, and it is more than probable that the report of the Commission above referred to may tend to promote its more extended use, especially as it presents a minimum of risk as compared with other systems, and the prime cost of a 4 ft. length of electric fuse is now only a trifle over ¾d. This will compare favourably with the cost of ordinary fuse of good quality, apart from the cost of the safety-igniters previously mentioned. The battery and cable are very portable, and their cost moderate.

For the following general description of electric blasting I am indebted to my friend Mr. F. W. Brain, managing director of the Trafalgar Collieries Company (Limited), Drybrook, and of the Electrc Blasting Apparatus Company, Cinderford, Gloucestershire, England:—

"The system of electric blasting as distinguished from the alternate plan afforded by the safety-fuse consists in supplying the initial source of heat, required to bring about the explosion of the main charge, by means of an electric current, instead of by means of a match, a heated wire, or any other special device by which the ends of the time-fuse is lighted. While in the case of the time-fuse the igniting-device is applied to a short protruding end of fuse, and the workers retire to a safe distance to await the explosion, in the case of the electrical fuse there are wires communicating from the working-face to a position of safety, from which, when all is clear, the current is turned on. The danger of accidents to the workmen by premature explosion—by 'hang fire' or by ignition of the explosive gas—are not possible with electric shot-firing, and it is for these reasons that the adoption of electric blasting generally throughout coal-mines is strongly recommended.

"The two main divisions of electric blasting are known respectively as high tension and low tension, each of which has many adherents. The high-tension system of blasting is the more generally used in Great Britain; but in some other parts of the world the low tension is used to the almost complete exclusion of the alternative method. The broad division between these two plans lies in the fact that in one case the electrical circuit is entirely broken at the place where ignition is effected, and in the other case it is, as it were, partially broken; or, in other words, the size of the electric wires is diminished at this point to such an extent that, while the current can pass over the other portions of the circuit without any apparent heating effect, at this point the conductor is so reduced in sectional area that it is raised to a white heat almost instantaneously the current commences to flow. In the case of the high-tension system the flame essential to the ignition of the charge is produced by a spark which is

impelled, by the considerable electrical pressure exerted, across the small space where the circuit is broken. Going now into somewhat greater detail, we will proceed to examine the high-tension system, starting from the explosive charge.

"*The High-tension System.*—In the case of blasting agents where detonators are used to secure the full explosion of the charge, the electrical fuse is attached to, and forms part of, the detonator, which, as is well known, consists of a small copper tube closed at one end and filled to about half-way up with the detonating compound; the latter consists mainly of fulminate of mercury. The detonating compound is sealed in place with a thin coating of varnish, so as to protect it, at the same time keeping it in position; the electrical connections are introduced into the open end of the detonator, and there fixed. They consist of two pieces of insulated electric wires of sufficient length to reach from the explosive charge along the borehole into the working-face, with the igniting terminals suitably mounted. This is effected by passing their ends through a piece of vulcanite, guttapercha, or other solid piece of insulating material, about equal in diameter to the internal dimensions of the detonator. This cylinder of insulating material has two holes in it, through which the wires are brought as above; the ends are cut off short and are bent towards one another, so that they are the required distance apart. The junction of the insulating ends of the wire and the back of the insulating block through which they are introduced are then carefully covered with any convenient form of insulating material, which may be put on in a heated condition and left to solidify as it cools. In order to insure that the igniting spark, which is produced between the two exposed ends of the electrical wire, is immediately communicated to the detonating charge, from which it is distant some $\frac{1}{4}$ in., their ends are covered by a suitable chemical composition, which bursts into intense flame immediately the spark is produced. This flame in due course ignites the detonator, which in turn explodes the main charge.

"It is frequently stated, and also proved by means of volt-metres, that the electro-motive force of the current for high-tension blasting need only amount to about 125 volts, or little more than is usually to be found on electric-lighting installations. Those who have practical acquaintance with the subject will realise that the distance which a current of this comparatively small voltage can arc or spark over is far too small to be alone of any practical service for the purposes here mentioned; but the chemical composition, besides possessing the property of bursting into flame when ignited, assists the electric spark in the work required. It is unnecessary here to do more than mention the fact that once a current has been started a pressure much less than that mentioned above is amply capable of maintaining a spark of sufficient intensity to provide the heat for igniting the explosive. We have dwelt somewhat on this point as, from the electrician's point of view, it is a misnomer to apply the term 'high tension' to a system of electricity where no more than 125 volts are in use; though we admit that, by comparison with the amount required for the low-tension system, the use of this term in a specialised sense is in some respects justified. In fact, the terms 'high resistance' and 'low resistance' appear more correctly to define the two classes of fuses from an electrical standpoint. A further reason we have in calling attention to this point is to indicate that in high-tension blasting it is not a case of a spark leaping across a space of infinite electrical resistance, because such a state of affairs would involve the use of really high-tension apparatus, which, as such, would require for its proper working the impossible condition of perfect electrical insulation. High-tension blasting, so called, may therefore be looked upon as a system where a chemical composition which is a fair conductor of electricity is raised to a high temperature by the passage through it of an electric current of medium strength.

"*The Low-tension System.*—The low-tension system of blasting requires an electro-motive force of but a few volts; for there is no serious interruption in the circuit through which it flows, as the two wires, which are fixed within a short distance of one another, in about the same way as is described above, are connected by a piece of very fine platinum wire, which, in technical parlance, is known as a 'bridge.' The resistance of the circuit is therefore very much less than where the ends of the wire are connected solely by the chemical composition mentioned above, and consequently the amount of force necessary to establish the current is proportionately smaller. Three or four volts can force a current across the platinum bridge of sufficient volume, if we may use the term, to heat it to whiteness. The ends of the wire are, as in the case of the high-tension system, imbedded in the same chemical composition, though in the present case its only property which comes into use is its capacity to burst into flame as soon as the platinum bridge gets hot.

"The main feature of difference between the high-tension and the low-tension system of blasting is that it is possible to test the latter form of fuse before putting it into use, in order to ascertain if the electrical continuity of the circuit is uninterrupted. This is done by passing such a feeble current through it as will be sufficient to produce an indication on a sensitive form of measuring-instrument, known as a galvanometer. This test, however, is not of great importance, except in very particular work; for, given sufficient care in manufacture, the percentage of faulty fuses is so small as to render this precaution needless for practical purposes. Furthermore, the test does not show everything, for it can only indicate those faults which are due to an interruption of the circuit, ignoring those cases where the wires may be in contact otherwise than through the platinum wire—a condition of affairs which would lead to an inadequate amount of current passing through the platinum bridge to render it incandescent. The number of faults of this last-mentioned kind, small as their number may be, would about equal the total number occurring in high-tension fuses. Practically, therefore, this advantage is not of material character. Further, it is important to remember that in firing a number of low-tension fuses the resistance of the wires used for connecting purposes is a very serious factor to be taken into consideration; every additional 100 yards of wire so used will be found to reduce materially the number of fuses that can be fired. When using high-tension fuses this is not nearly so great a difficulty.

"*Electrical Connections.*—Having dealt separately with the two forms of fuse, we will now consider the question of connecting them up with the source of the electricity. There is, however, not

much to say, because the directions which might be given in regard to the care to be taken with the wires are purely of an electrical nature, and would apply with equal force to almost every class of electrical circuit. Needless, therefore, to say, the ends of the wires proceeding from the electrical fuse to the exterior of the borehole must be carefully cleaned and scraped before being twisted with the wires leading away to the firing-point. Also care must be taken that the exposed portion of the wire on the two circuits are kept away from one another, either by binding them round with insulating tape, or by keeping them hanging in the air out of contact with damp earth or any other possible source of leakage.

"The arrangement of the circuits when a number of charges are being fired together is a very important matter, though simple rules are laid down in regard to it, which makes the operation easy enough. We are referring to the question as to whether the wires from the different boreholes are to be connected in series or in parallel. The electrical term 'in series' refers to that arrangement of the wires which would cause the main current to pass through one fuse, then through the next, and then through the third, in the manner of a chain, so that the same current passes through them all. The term 'parallel' refers to the arrangement by which the current is split up into a number of branches. In practice the series system of connecting is generally used.

"*Exploders.*—The next question requiring consideration is the source of the electric current which is conducted along the wires to the fuse. The number of ways of obtaining the current are perplexingly numerous. Perhaps the simplest in those cases where the mine itself is lighted electrically is to take off connections from the main electric-light current; and with proper precautions this system works as well as any. It is, however, exposed to certain dangers which have to be fully guarded against. They lie mainly in the fact that any exposed wires in the blasting circuit which may by any chance be touching the earth are, under these conditions, liable to produce much more serious results, since a corresponding leakage on a main in the electric-light circuit may produce complications. The nearest allied method to taking the electric current from the electric-lighting circuit is to derive it from accumulators which are charged from the lighting circuits from time to time. There are several forms of strong and powerful batteries which are at the same time sufficiently portable to be used for this purpose, and the reliability of their action when kept in good working-order is a strong recommendation in their favour.

"In the bulk of the cases, however, the facilities for the electric-light installation do not exist, and it is necessary to fall back upon a system where the electricity required for blasting purposes is generated on the spot. The most obvious of the methods within this category is perhaps that of primary batteries, which consist of a certain number of cells of such size and arrangement as to produce the required current. A disadvantage of this system is that there is no form of primary battery which is capable of doing heavy work, such as is required for blasting purposes, with certainty and economy. Furthermore, a battery of this character requires a considerable amount of attention, and has to be kept in the very best condition if its efficiency is to be maintained. Again, its bulk and weight are in the way of carrying it about, and make it all the more liable to go wrong in the rough treatment which it of necessity must receive in a mine.

"The most practical plan, therefore, is to be found in the apparatus known as the 'magneto exploder.' These machines consist of a dynamo, such as is used for electric-light purposes, on a small scale, and arranged to be turned by hand; in fact, the only difference between it and a dynamo in the principle of its construction lies in the fact that what are known as the 'field magnets' are made of a piece of magnetized steel, representing a horse-shoe magnet on a large scale; whereas in the electric-lighting dynamos the magnetic field is produced by coils of wire passed around a soft-iron magnet, and supplied with electricity from the machine itself. It is astonishing what powerful currents can be obtained from these little machines by a few rapid turns of the handle—so much so, in fact, that the labour involved in working them is immaterial by the side of the many conveniences which accrue from their portability and their general solidity of construction, which prevents them from getting out of order."

I have, &c.,
JOHN HAYES,
Inspecting Engineer.

No. 2.

Mr. J. COUTTS, Inspector of Mines, to the UNDER-SECRETARY, Mines Department, Wellington.

SIR,— Inspector of Mines' Office, Thames, 31st January, 1901.

I have the honour to transmit to the Hon. the Minister of Mines the following report on the coal-mines in the Auckland District for the year ended 31st December, 1900, in compliance with section 67 of "The Coal-mines Act, 1891" :—

KAWAKAWA.

Kawakawa Mine.—The operations in this mine are now being carried on by Mr. John Culley, who has a permit to manage the mine in accordance with section 21 of "The Coal-mines Act, 1891." The work is still confined to taking out pillars on Moody's Outcrop, and, as the seam does not exceed 4 ft. thick where it is at present being worked, the quantity of coal broken out by the five men employed in the mine is therefore only limited. The output of coal for the year ended the 31st December was 3,649 tons. Last time the mine was inspected the workings were safe, the ventilation good, and the Act complied with.

HIKURANGI.

Hikurangi Coal-mine.—This company is steadily extending the workings in a south-easterly direction in Perrett's section, the main level being now in a distance of 2,483 ft. from the entrance of the incline on the surface, and from the main level the bords are worked up towards the outcrop for about 460 ft. A considerable portion of the coal has been worked out on the upper side of the level (except pillars), but as the level advances new bords are opened up, and a sufficient supply of coal is obtained to meet the demand. The amount of coal taken out to the dip of the main level during the year has been limited, but at one place an encroachment was made and a quantity of coal taken out from under the Railway Reserve. So far no damage has been done to the surface. A quantity of coal has been worked out on the east side of the incline, but it is considered there is only a limited amount of coal to work in this direction, and in consequence there are only a few men working here. A shaft has been sunk through the coal in the swamp on the north side of the railway, but, as there was a good deal of water to contend with, operations were suspended for a time, or until pumping machinery was erected to cope with it. The average number of men employed about the mine has been fifty, and the output of coal for the year ended 31st December was 38,572 tons, an increase of 4,535 tons as compared with the previous year. When the mine was last inspected the ventilation was good and the workings safe.

Hikurangi Colliery.—This company's mine being situated on the top of a spur, and the country very broken, the coal-seam on that account has also been very much disturbed, and of a soft nature; consequently this has been a great drawback to the sale of the coal. As the working-places were extended as far as they could be conveniently worked from the present adit-levels (owing to the coal dipping away from them), it was deemed advisable to take out the pillars in sight, and the operations for the greater part of the year have been directed in carrying out this work. These pillars being nearly exhausted, the company contemplates opening up the coal-seam afresh some distance eastward of the present workings, with a view to keeping their customers supplied. An average of eighteen men have been employed, and the output of coal for the year was 11,119 tons.

The *West Bryan's* and *Phœnix Mines* have not been worked during the year, but the Phœnix proprietors are arranging to take over the West Bryan's Mine with a view to commencing work at once. It is contended that the coal can be taken out to greater advantage under one management (as the mines join each other) than formerly.

WHANGAREI.

Kamo, New.—In the first six months of the year three men were employed in this mine on the outcrop, but, the coal here being exhausted, and there being little prospects of opening up any more that would pay with a small outlay, the lessee suspended operations for the time being on the 10th July. The output of coal was 471 tons.

NGUNGURU.

Ngunguru Coal-mine.—The operations in this mine have been chiefly confined to taking out pillars at the top of the incline rise, where the coal is from 5 ft. to 7 ft. in thickness. Four bords are being extended westward, but the coal is thin, varying from 2 ft. to 3 ft. 6 in. thick. The manager is hopeful that as these bords advance the coal will increase in thickness, and thus develop a portion of the property which is as yet practically unprospected. An adit-level was started from the side of the hill about 400 ft. from the entrance of the principal workings, and only a few feet had been driven when the coal was discovered 6 ft. thick. After driving on it a short distance a down-throw fault was met with which cut the coal entirely off, thus blighting their hopes of having found what they considered a new and important discovery. The coal-seam in this mine is very thin in places, and, as faults are frequently met with, it is naturally an expensive mine to work, even although the greater part of the workings are above water-level. An average of thirty-eight men have been employed, and the output of coal for the year has been 14,592 tons.

Kiripaka Mine.—This mine is situated on a spur on the north side of the Ngunguru River, and about 200 ft. above it. The coal is conveyed down a self-acting incline tramway in trucks from the entrance of the main adit-level for a distance of 18 chains to the loading-ground, where it is discharged into barges, and then taken down the river, where it is delivered into scows, &c., and sent to Auckland. The quantity of coal which has yet been proved payable is only limited, but so far it has turned out much better than was anticipated when operations were commenced to open it up. The seam has varied from 10 ft. to 20 ft. in thickness, and, being softer than the Ngunguru coal, it has enabled the proprietors to place it on the market at a small cost, thereby leaving a large margin of profit. The mine was safe and the ventilation good last time it was inspected. An average of ten men have been employed, who have sent away from the mine no less than 11,276 tons of coal during the year.

WAIKATO.

Taupiri Coal-mines Company (Limited).—Mining operations on this company's property have been vigorously proceeded with in three of the sections during the year, and more especially in Ralph's Mine, nearly half of the coal produced being obtained from this section, and the greater part taken out from the dip workings under the river. The company's attention is now directed towards extending the No. 2 level from the dip on the western side of the river, where several bords are being driven, and from which excellent coal is being taken out. On the eastern side of the dip, faults are striking diagonally across the face of the dip, and thereby hampering the workings from being extended in this direction. Mr. Wight, the new manager, is making improvements in the pit-bank to give better facilities for loading the railway-wagons, and the air-shaft has been increased in size to 8 ft. in diameter, and lined with bricks from bottom to top. At this shaft a fan 15 ft. in diameter is being erected to ventilate the mine. An average of eighty-six men have

been employed in this section, and the output of coal from here during the year has been 36,828 tons.

In the Taupiri Extended the work for the greater part of the year was confined to getting coal from the various bords which were in progress at the end of last year, but latterly the operations have been directed in driving a heading and dip on the western side of No. 2 shaft for the purpose of proving the extent and value of coal in this direction. So far as developments have gone, the coal has proved fully as good as was anticipated. There are only a few men employed here now, but the average number of men employed has been forty-seven, and the output of coal was 21,742 tons.

Work in the Taupiri Reserve section has been steadily carried on during the year, the operations being directed towards taking out the coal on the western side of the dip at No. 4 level and under Lake Kimihia. The seam is divided near the centre by what is termed a "clod" (or band of stone), varying from 4 in. to 9 in. thick, and, as the top portion is of inferior quality, the bottom portion is generally taken out and the top left in, which makes an excellent roof. The portion worked varies from 10 ft. to 16 ft., and is of excellent quality. When the mine was inspected in the month of June last the manager's attention was called to a soft portion of the roof where a fault had been driven through at No. 2 level, and which was only being temporarily repaired with timber; but, as this was under the lake, it was pointed out to him that it would have to be made more secure, and this portion of the level is now being filled and rammed tightly in with clay, &c., from the surface. At a subsequent inspection the workings were safe, but the ventilation was not as good as could be desired. An average of fifty-five men have been employed, and the output of coal was 18,621 tons.

Mokau.

Mokau Mine.—An average of eleven men were employed in this mine up to the month of August last, but, owing to the s.s. "Douglas" being wrecked at the Mokau Heads, and as no suitable boat could be got to take its place to convey the coal from the mine, all the men were discharged with the exception of two, who were kept on to do some repairs and look after the mine pending arrangements being made to form a company with a view to working on a more extensive scale than hitherto, and to get boats suitable for the trade. The mine is in good order, and a large supply of coal could now be put into the shoots at the loading-ground on the side of the river at a small expense. The output of coal for the year was 2,218 tons.

Fernside Mine.—This mine is being worked on a small scale, and the appliances, such as shoots, &c., for loading boats are very primitive. The mine is opened up by an adit-level from the bank of the river, and, as the seam is 6 ft. thick, and the distance over which coal has to be trucked to the loading-ground is only some 500 ft., it can be put into the boats at a cheap rate. An average of four men have been employed in this mine, and the output of coal was 1,205 tons.

Miranda.

Miranda Coal-mine.—This property has been taken over by Mr. Tattley, who has had four men employed on development-work, but finding there was going to be some trouble with water he has decided to erect pumping machinery to cope with it, and after that is done he is of opinion the coal can be placed on the market at a reasonable cost.

Harrison's Taupiri Coal Company, Huntly.—This is a new company, holding a lease of the University Reserve, adjacent to Ralph's old workings on the outcrop of the coal-seam. Operations have been commenced recently. The mine is situated on the eastern side of the railway, and about half a mile from the Huntly Railway-station. The work in progress consists in the erection of an engine for the purpose of pumping the water and hoisting the coal out of an incline dip which has been driven from the side of the hill to give facilities for opening up the mine. A light tramway is being laid down to convey the coal from the mine to the railway.

Of late more attention has been paid to prospecting and proving the extent of coal-seams in various places in the district than was formerly the case. Boring operations are proceeding in several places in the localities of Waikato, Whangarei, and Kawakawa, and in some instances I am informed they are meeting with encouraging results.

The total output of coal won from the mines in this district for the year ended 31st December, 1900, amounted to 160,303 tons, an increase of 19,175 tons as compared with that obtained in 1899. The comparison of output for 1899 and 1900, north and south of Auckland, is as follows:—

	Output for 1899. Tons.	Output for 1900. Tons.	Increase. Tons.
North of Auckland	67,323½	79,679	12,356½
South "	73,805	80,624	6,819
	141,128½	160,303	19,175½

Accidents.

I am pleased to say that no serious accidents have occurred in this district during the year, but several accidents of a slight nature have been reported, the men having in most instances declared on the Miners' Accident Relief Fund. The money paid out of the Government fund for this purpose is as follows: The Waikato Miners' Medical Association have drawn out of the Miners' Sick and Accident Relief Fund £30 3s. 11½d.; vouchers recommended for payment by the Inspector of Mines, £20 18s. 9d.: total, £51 2s. 8½d.

I have, &c.,

James Coutts,

Inspector of Mines.

The Under-Secretary, Mines Department, Wellington.

No. 3.

Mr. ROBERT TENNENT, Inspector of Mines, Westport, to the UNDER-SECRETARY, Mines Department.

SIR,— Inspector of Mines' Office, Westport, 1st April, 1901.

I have the honour, in compliance with section 67 of "The Coal-mines Act, 1891," to report as follows on the West Coast Coal-mines for the year ended 31st December, 1900:—

Puponga Coal-mine, Collingwood.—Mr. Taylor has continued prospecting operations, and has driven headings in the thickest seam yet discovered. This has a gross thickness of about 9 ft., or about 7½ ft. of clean coal, after the partings and bands are deducted.

Puponga Prospecting Company.—This local company has acquired a leasehold section of 400 acres, adjoining and to the dip of Puponga Coal-mine. Several prospecting-shafts have been sunk on the flat country, varying in depth from 12 ft. to 66 ft., but the greatest depths attained have unearthed no new discoveries. Operations are suspended awaiting further consideration.

Pakawau Coal-mine (Caldwell Bros., owners).—A misunderstanding having arisen between the mine-owners and tramway contractors in relation to the completion of bridges and other works, suspension of mining operations was caused in the early part of the year until the end of April. Since that time developments consisted in driving the dip heading, the bottom and rise levels, north and south. Good hard coal was tapped in dip heading, but as the levels extended northward the coal became soft and faulty. Loading facilities at the wharf are much improved by the construction of two storage-bins, with respective capacities of 29 tons and 40 tons, but scarcity of sailing craft tended to restrict the output to 1,439 tons, which tonnage, according to the manager's statement, could have been easily doubled. Pier and bridge-fencing have received attention, and may now be considered fairly satisfactory. Mine-ventilation was good, and timber freely used. Ten miners and two truckers employed.

Motupipi Coal-mine, Takaka.—(17/8/1900): Mining on this property is at a standstill.

Enner Glynn Coal-mine, Nelson.—(2/2/1900): George Wise and William Bennet were stoping coal in upper level. The ground was well secured and ventilation good. (13/8/1900): Mine abandoned and all exposed places fenced off. Ropes and all movable plant removed.

Mokihinui Coal-mine (John Gibson, mine-manager).—This property was taken over from the State and reopened in June last by a party of twelve working-miners, who work the colliery under the title of the "Westport Co-operative Coal Company." Prior to this company taking possession the property was opened and worked by the late Mokihinui Coal Company from three separate mines—viz., the Hutt Seam, Big Face, and Upper Mines. The first two named mines command the best quality of coal, and in consequence were partially exhausted on the "first working," and standing on pillars. Resuming operations, mining was chiefly confined to the Big Face Mine, from which 10,092 tons were produced, the greatest percentage being won from the bottom section of the coal-seam, which was left underfoot by the old company. Hutt seam dip heading was reopened, and the pump placed at a lower level. Considerable prospecting has been done north and south from the main heading, but results so far are not encouraging. A new steam-boiler was provided for the Hutt seam haulage-engine, and the pump-driving water-wheel has been strengthened and much improved. Timber receives strict attention, and safety in every detail is strictly observed. Reports kept to date, and the provisions of the Act enforced.

Cardiff Colliery.—As noted in my report of last year, the Westport-Cardiff Coal Company suspended operations at the end of September, 1899, and on the 28th January, 1900, "gob-fire" was discovered in the old mine. On the 29th January Mr. Dixon, late mining-manager at Granity Creek, and the writer met at the mine and made strenuous efforts to reach the seat of fire, but, the ventilation being natural and unreliable, we considered exploration impracticable, and declined to incur undue risk to life. Deciding then to abandon all further explorations, we arranged to remove the ventilating-fan from the Bridge Mine and rebuild it at the main tunnel exit to Chasm Creek. (2/2/1900): Reliable air-current being obtained, Mr. Dixon led an exploring party into No. 1 incline heading, where fire was discovered in the return or back heading. Finding all practical efforts ineffective to cope with the fire under the conditions where discovered, the party returned to the mine-mouth and temporarily sealed down the mine. (5/2/1900): On my return to the mine the temporary stoppings were found intact, but before opening the stoppings I crossed over the terrace to the Chasm Creek outcrops, where active fire was burning through the outcrop fissures over the broken pillared ground on the extreme point of the terrace. Returning to the mine-entrance and opening the stopping, with a full air-current maintained, I led a party along the main haulage-road to the foot of old furnace-drive, where the tunnel was discovered in full blaze at the foot of No. 1 incline. At this point all effort to cope with the fire in the mine was practically impossible. I then ultimately decided to hermetically seal down the mine by means of substantial clay-puddled plank stoppings. These works were efficiently carried out; but, combustion being supported with oxygen from the open drives that pierced the outcrops, and the open surface fissures through the broken pillared ground overlying the existing fire, the ordinary system of dealing with underground fires by means of airtight dams were made practically ineffective. Flooding was then decided on, and permanent and effective dams are now built in both ends of the main tunnel. Mine-water is now raised to the highest possible point on the outcrops, and the smoking outcrops must burn back to the water-level. Predictions were made in respect to the probabilities of fire spreading into other sections of the coalfield, but this theory is confined to the authors; and I have no hesitation in saying that the fire is now confined within the limits of the present mine, without possible danger to adjoining coal areas. The lease was determined on behalf of the State on the 23rd day of May, 1900. All movable plant is removed, stacked, or securely housed, and under the charge of a reliable caretaker.

Millerton Colliery (owners, Westport Coal Company, Limited).—Since the company opened this valuable section of their mining lease as a coal-producer, the growing and satisfactory increase of output maintained proves the efficient, permanent, and practical developments which have been perseveringly pushed forward to meet the rapidly increasing trade requirements and develop the colliery to the standard of efficiency originally designed. Notwithstanding that production depends chiefly from percussive pick-machines in the limited east dip area, last year's output shows a creditable increase of 32,712 tons over the preceding year, and a total of 158,129 tons, thus making the gross tonnage since mining was commenced in 1895, 450,598 tons. As showing the high standard of safety realised, and the immunity against accident experienced, only one slight mining accident was reported for the year. A considerable item in output was produced from twenty colliers in the rise district west of main haulage-road, directly connected with and in addition to the present dip mine. Developments towards Mine Creek area are permanently and efficiently completed, with the exception of winning or opening out the coalfield. This work is being steadily pushed forward, and a successful future from this property is anticipated. The endless-rope-haulage system, extending 40 chains in length, was successfully started in August last. Attached to the surging-drum (in addition to the powerful brake-strap) are four hydraulic cylinders worked from quadrant centres. This arrangement has reduced wear-and-tear of plant to a minimum, and the motion of the rope is controlled more effectively. Surface arrangements to meet immediate requirements comprise two Babcock and Wilcox 86-horse-power boilers, with feed-water heater attached. The motive-power supplied for the percussive pick-machines is generated from three Leyner compound air-compressors of the ordinary type. The plant is spaciously housed near the mine entrance, with ample accommodation to meet mining requirements to double present capacity. Ventilation is maintained by a 10 ft. diameter Scheile exhaust-fan, and the results over the whole mine are adequate and effective. In company with the men appointed on behalf of the miners, I made a careful inspection of the old workings on the 21st November. During the examination no indications of heating or gas were found. Timber is freely used throughout the mine by the company's officers, and all reports are kept up to date. The provisions of the Act are strictly observed. Weekly examinations are made of the old workings, and duly reported. Previous to the fan installation gas was reported several times, but the use of safety-lamps was strictly enforced, and since the full air-current was maintained gas is unknown and open lights are in use.

Denniston Collieries (owners, Westport Coal Company, Limited).—These collieries have been fully employed during the year. The aggregate output (211,357 tons) is very creditable, and compared with past statistics is the largest tonnage recorded. An increase of 8,843 tons is shown over the preceding year. Of the above total, three-fourths is won from percussive pick-machines, the remaining one-fourth by hand-labour, paid at tonnage rates.

Coalbrookdale Mine.—(29/12/1900): Developments in the Cascade section are kept well in advance. South of the haulage-road the main fault-line which intersects the "Look-out" working area was successfully crossed, with satisfactory results, the coal-seam found being of excellent quality, with an average thickness of 20 ft. North of the rope-road the workings extend 40 chains, and a very large proved area awaits development in that direction. In view of extending the main haulage-road further east to strike the Cascade dip boundary, a direct haulage-engine actuated by compressed air is placed in position to sink and open out this extensive section of coalfield. Compressed air for driving pick-machines, likewise all underground machinery, &c., is generated near the Cascade dip-incline entrance. The plant consists of two Leyner straight-line driven compound (or two-stage) air-compressors, with 14½ in. steam, 16 in. low-pressure, and 10 in. diameter high-pressure air-cylinders. Steam is supplied by two Babcock and Wilcox boilers of 120-horse power each. The whole plant is spaciously housed and finished in a creditable manner. Munsie's pillar section continues to be successfully worked west of dip heading. On the east side lower level prospecting-drives are being driven in advance of the old workings. Careful inspection was made of the various sections of old workings, but during examination no indication of heating or gas was found. No serious accidents reported. Reports kept to date. Air-measurement, 28,000 cubic feet per minute.

Ironbridge Mine.—(28/12/1900): The parallel dip headings in the Cedar Creek section are actively pushed forward towards Mount William. The coal is of splendid quality, and covers a large area. Extension of area adjoining Mount William was applied for by the company, and granted by the Hon. the Minister of Mines. Eight miners are employed removing pillars in the Fan district. This pillar section of hard bright coal—22 ft. in thickness—was opened out from the south outcrop about a year ago. Drainage is effected by open channel cut across the workings and discharged into Cedar Creek. Great care is exercised in removal of these pillars, and loss is reduced to a minimum. On the North Waimangaroa district removal of pillars was opened out from the west outcrop, eight miners being employed. This coal-seam—7 ft. in thickness, with average sandstone roof—offers facilities for practically exhausting the ground without loss. The drainage scheme contemplated to unwater the Cedar Creek dip areas is now under way. Levels and course of rock-tunnel are determined, and the work preparatory to clearing away the loose *débris* to form the tunnel-entrance is commenced. The calculated distance to be driven is about 30 chains, and arrangements are made to carry out the whole work with Leyner's rock-drills, actuated by compressed air. The completion of this scheme will effectively drain the whole mine, and give free access to exhaust the standing-pillar areas, without risk of flooding from inbreaks of surface-water. As a motive-power compressed air has superseded electricity for underground mechanical appliances. An efficient plant of the ordinary type, with ample capacity to drive all underground haulage machinery, pick-machines, pumps, &c., is built at Kiwi, a central position on the south bank of the North Waimangaroa River. Steam is supplied by Root's tubular boilers, the whole plant being spaciously housed. A machine-lad named John Hart

was injured on the head and face by a fall of coal coming over the sprag. Timbering and spragging are strictly attended to. Reports kept to date. Air-measurement, 17,500 cubic feet per minute. Air-current, direct. Electric light has been installed at the brake-head for screening and tipping purposes.

Langford Coal-mine.—This mine still continues to be shut down.

Whitecliff Coal-mine.—No further effort has been made to open this mine.

Cocksparrow Coal-mine.—(11/9/1900): This vertical seam varies in thickness from 1 ft. 6 in. to 2 ft., from which the Consolidated Gold-dredging Company was supplied with fuel.

Coal Creek Coal-mine.—This mine was idle the whole year. George Walker, of Rocklands, has taken up the lease with the object of supplying the Rocklands Gold-dredging Company with coal.

Golden Treasure Coal-mine.—(21/11/1900): On this leasehold coal for domestic purposes is practically exhausted. A considerable quantity of first-class steam-coal of easy access remains to be worked. The difficulty in Reefton is to find a suitable market.

Murray Creek Coal-mine (Lewis Betts, owner).—(21/11/1900): The open-face section of old pillar ground continues to supply a fair share of local trade as a first-class household fuel. Working-conditions afford no fresh subject-matter to report, as the crushed sandstone roof formation is sluiced away, and the coal picked and loaded.

Phœnix Coal-mine (John Fox, owner).—(21/11/1900): This leasehold contains two coal-seams; the top seam is 25 ft. and the bottom seam 22 ft. in thickness, separated by a dirt-band 6 ft. in thickness. For steaming and household purposes their qualities are identical, both seams being hard bright coals. Operations were formerly confined to the top seam, but during the past year the bottom seam was opened on the south outcrop by two parallel levels, which will command a better system of working. Screening and loading facilities are much improved on the new site. Eight men are employed.

Lankey's Creek Coal-mine.—(22/11/1900): William Lamberton works single-handed in a level drive located between a section of old rise workings and a dip fault-line. The coal in the present mine is nearly exhausted.

Bourke's Creek Coal-mine.—(21/11/1900): For general use this coal takes a leading place in the local market, prices being slightly easier owing to cartage facilities. The coal-supply is chiefly mined from a rise section, bounded westward by a fault-line, and southward by the outcrop. This section of working is practically exhausted, and unless the fault standing on the west adit-level face is cut future prospects are not encouraging. On a later visit the owner was plainly told his actual position, but the reply was "short of funds." Six men are employed. Reports kept to date.

New Inkerman Coal-mine.—(22/11/1900): The Inkerman Gold-mining Company continue to mine coal for steaming purposes at Rainy Creek low-level tunnel.

Devil's Creek Coal-mine.—This mine has been idle the whole year. The mine being on the Midland Railway Reserve, John MacQuilliam, the late owner, had not obtained proper title to the mineral, and in consequence the claim was "jumped."

Breen's Coal-mine.—(23/11/1900): This coal-seam intersects a small range on a vertical underlie, which is driven on by a single drive near the cap of the hill. The coal is of average quality for household purposes. Thickness, about 4 ft.; output for year, 60 tons.

Progress New Mine (the Progress Gold-mining Company).—(23/11/1900): The coal is exclusively used for steaming purposes at the Progress Quartz-mines. It is an average quality steam-coal, the seam being from 5 ft. to 6 ft. in thickness. Occasional displacements occur by the roof bending down to the floor, but difficulty is not experienced in winning the coal afresh. Three men are employed.

Waitakere Coal-seam.—The citizens of Charleston continue to enjoy their fireside comforts from this lignite-seam.

Blackball Colliery (owners, Blackball Coal Company).—(25/10/1900): The output from the mine being controlled by the limited carrying-capacity of the aerial tram-line, the increased demand on the colliery to meet trade exigencies necessitated double shift at the commencement of the year. Mining operations were successfully carried on until the 30th November, when a "gob-fire" (the result of spontaneous ignition) was discovered in the old workings. The furnaceman on duty, seeing the foul condition of the return air-current, made his exit through the mine to report the occurrence to the mine-manager, whom he met at the mine-entrance waiting to see the men at change of shift. The manager, knowing that G. H. Green (the relieving furnaceman) had passed to his work, gave immediate instructions to clear all hands out of the mine, and rescue parties were speedily formed to search for the missing man, but unfortunately without success. The position being serious, a powerful steam-jet was placed in the bottom of an unused upcast shaft near the mine-entrance, thus maintaining a strong reversed air-current, which enabled a rescue party on the 1st December to enter the mine by way of the furnace-drive and rescue the body of Green, where it had fallen a victim to the resultant gases. Further efforts to cope with the fire being impracticable, flooding was determined on, and a strong convex brick and cement dam was built in the rock adit. The water-supply being within easy access, it was conveyed over a flume-line 14 chains in length, 24 in. in width by 12 in. deep, and discharged direct into the mine at No. 13 incline, which tapped the outcrop. After a lapse of several weeks, drainage was effected by means of two built-in 8 in. pipes fitted with stop-valves, the mine being reopened for mining operations early in February. In view of opening out the coalfield to the dip-boundary, the main engine-road and all other permanent works are being made in the top seam underlying the strong sandstone formation, the top seam being tapped by a level rock crosscut driven west from a point on the main adit, about 50 yards from its junction with the bottom seam. During the year the aerial tram-line cables have been thoroughly renewed. Two miners named Harry Slade and Rodger Stephenson

were fatally injured in their working-faces. Blame was not attachable to any person in either of the accidents; also a miner named James Hodgson dropped down dead in his working-face, due to syncope, arising from disease of the heart. Reports kept to date. Air-measurement, 16,500 cubic feet per minute.

Brunner Mines (owners, Greymouth-Point Elizabeth Coal Company).—The output from these mines was well maintained, amounting to 120,403 tons, being a creditable and substantial increase of 23,892 tons over the preceding year.

Brunner Dip Mine.—(11/12/1900): During the year pillar-extraction was practically confined to exhaust the dip working, without risk of loss from heavy inflows of surface-water through the broken strata. Prior to a former visit the pump bed-plate had broken, which necessitated withdrawal. Fortunately weather conditions were favourable, hence surface-water was comparatively light, and, the ground behind the engine-road pillars having been exhausted, haulage facilities enabled the miners to remove and fill the coal away without loss in advance of the rising water. Connected with the present working, but to the rise of main level, a few large pillars are yet to be removed between Nos. 1 and 3 inclines; also, outside the "Big fault," and in conjunction with the Ladysmith rise district of old pillar-working, a section of valuable coal exists, which the management proposes to exhaust conjointly with the inside section, and thus maintain the present output. To win the coal outside the fault a rise heading will be driven from the adit engine-plane about 15 chains in from daylight. Gas in small quantities is occasionally reported in the morning examination. Lead-locked safety-lamps are exclusively used. Reports are kept to date, and the provisions of the Act are strictly enforced. No serious accidents are reported. Air-measurement, 16,000 cubic feet per minute.

Ladysmith Mine.—(11/12/1900): This mine forms the central portion of the Brunner lease, and opens out the most extensive area of unexhausted workings in the coalfield. Unfortunately, little is known of its geography. However, developments having for their object the total extraction of the pillars, and the conveyance of the coal over a series of securely timbered self-acting inclines, are carried out in a substantial and practical manner. The coal is of hard, bright quality, with strong grit sandstone roof. Ventilation is very good, and so far gases have not been met with. Reports kept to date; no accidents reported; naked lights in use.

Brunner Rise Mine.—(12/12/1900): This mine forms the extreme rise section of the Brunner lease. The natural conditions of coal and roof are variable, with steep gradients on soft fireclay floor, and cannot be considered favourable for removal of pillars. All things considered, total exhaustion has been most successful. The output is maintained from an adjoining dip section, tapped by a dip rock-tunnel, through which the coal is hauled by a standing-engine at dip-top. The natural air-current is now more constant and reliable since direct communication was permanently opened with the Ladysmith district. Reports are kept to date. No serious accidents are reported.

Accidents and Fatalities.

Millerton Mine (5/1/1900).—A machine-driver named John Robinson was slightly injured on the head by a fall of coal coming over the sprag.

Coalbrookdale Mine (13/2/1900).—A deputy named Richard Holmes was injured on the lower part of the bowels by a runaway truck. Injuries not serious.

Blackball Mine (29/3/1900).—A miner named Harry Slade was fatally injured by a fall of coal in the face. No blame attached to any person.

Ironbridge Mine (8/8/1900).—A machine-lad named John Hart was injured on head and face by a fall of coal coming over the sprag while holing. Injuries not serious.

Blackball Mine (14/8/1900).—A miner named Roger Stephenson was fatally injured by a jig-prop getting loose at the foot and striking him on the head. No blame attached to any person.

Blackball Mine (15/9/1900).—A miner named James Hodgson dropped dead in his working-face from syncope, arising from disease of the heart.

Blackball Mine (30/11/1900).—A furnaceman named George H. Green was suffocated by resultant gases generated by spontaneous ignition.

General Remarks.

According to statistical returns, the gross tonnage raised throughout the district was 589,183 tons, which, compared with the preceding year, is an increase of 67,236 tons, notwithstanding that the Westport-Cardiff Mine, which ceased operations in September, 1899, contributed 34,927 tons to the output for that year. The deficiency due to the stoppage of the Cardiff Mine has been more than made up by the increased output from the Westport Coal Company's collieries, which have not only maintained the output, but produced a surplus of 6,628 tons, which, added to the output of 10,092 tons from the Mokihinui Mine, gives a total increase of 16,720 tons from the locality of Westport alone.

From the Greymouth district the Brunner Mine raised 120,408 tons and the Blackball 82,516 tons, being an increase of 23,895 tons and 24,380 tons respectively.

Reviewing the producing-capacities of the various mines for the ensuing year, I fully anticipate a further increase.

Accidents in the Westport Coal Company's collieries are marked by a creditable decrease, while the Denniston Coal-miners' Accident Relief Fund shows a satisfactory increase, which facts can only be attributed to the safe and more effective system of coal-getting by mechanical appliances, together with the efficient supervision in connection therewith by the company's officers in timbering and spragging the working-faces.

I regret to record the occurrence of three fatal accidents and one death from syncope in the Blackball Company's mine. Two of these accidents and the death happened in the working-face,

while in the remaining case the man was suffocated by resultant gases generated from spontaneous ignition.

No serious accidents are reported from the Brunner Mine.

FOREIGN TRADE.

The quantity of coal shipped by the Westport Coal Company from the 1st April, 1900, to the 31st March, 1901, to ports outside the colony was 17,470 tons. This statement, compared with the preceding year's shipments, shows an increase of 10,515 tons.

I have, &c.,
R. TENNENT,
Inspector of Mines.

The Under-Secretary, Mines Department, Wellington.

No. 4.

Mr. E. R. GREEN, Inspector of Mines, to the UNDER-SECRETARY, Mines Department, Wellington.

Office of Inspector of Mines (Southern District), Dunedin,
11th March, 1901.

SIR,—

In compliance with section 67 of "The Coal-mines Act, 1891," I have the honour to submit the following report on the coal-mines in this district for the year ending 31st December, 1900:—

CANTERBURY.

Springfield Colliery, Springfield (H. Barker, permit).—(5/6/1900): Mr. Horseley, of Christchurch, recently acquired this property. Work underground mostly robbing pillars and getting fireclay where available. Return airway to second outlet almost blocked up by an ugly fall. Mr. Barker promised to drive a new road in the pillar past this fall.

Sheffield, Sheffield (John Austin).—(5/6/1900): Mr. Austin took the pit over from Austin Brothers on the 12th May. The second outlet has fallen in. A fire to improve the air made in the return about Christmas-time set the coal-pillars alight, and had such a hold when noticed that it could not be put out. As the coal burned out the roof fell. The fire is now smothered by falls, and what air is circulating in the mine leaks through this fall. There are only a few pillars on the roadside available, and this mine will soon be finished. Damp was squeezing out of the "gob," and I found it on the floor where the men were working. I pointed this out to Mr. Austin, and instructed the three men at work as to its danger. The level and main horse-road is very dirty. A few places, which I pointed out, require timber, which Mr. Austin promised to see to. (6/10/1900): The men in the mine having made a complaint to me under section 44 of "The Coal Mines Act, 1891," I visited as above. There was no one about. Subsequently Mr. Austin wrote me that he had discharged all hands and abandoned the mine.

Homebush, Glentunnel (T. Brown).—(8/6/1900): Substantial pillars were left when the mine was opened up; they are now being extracted successfully, a very small percentage of coal being lost. Timber used freely. Air good, but the drift to second outlet is very muddy.

St. Helen's Colliery, Whitecliffs (H. Levick).—(7/6/1900): Driving across the measures at water-level, and blocking out coal to the crop-out. Timber well set up to working-faces all over mine. Air good, rents to surface being somewhat numerous. Coal under water-level not being worked, the measures being steep (dip 30°). A considerable outlay would be required for pumping and hauling plant.

Hartley, Whitecliffs (A. Thompson).—(7/6/1900): Old mine abandoned. New drive well timbered, dipping 1 in 4; down 4 chains in "stone." Is under and now believed to be beyond old workings. A 4 in. Tangye pump keeps the water down easily.

Mount Somers Coal Company, Mount Somers (A. Harris, permit).—(27/6/1900): Stripping and opencast now discontinued. Seam 40 ft. thick. Bands of stone alternating with workable layers of good coal. The lower 10 ft. and upper 10 ft. are not being worked. A number of promiscuous drives having been put into the face, a low level is now being driven to cut off old workings. The coal is very hard, and the roof stands well. A new mine about a mile and a half to the north of the present workings has been driven 50 ft. into a face of coal, which is said to be 60 ft. thick, and of superior quality. It is proposed to lay a tramway to the new seam from the present tip-head, which is the terminus of the Selwyn County Council tramway.

Springburn Lime Company, Staveley (W. Healy, lately J. Duke).—(28/6/1900): A low-level tunnel has been driven across the measures, which are vertical. At 150 yards a 5 ft. seam of coal was struck, and it has been driven on both sides of the level. The air is dull at the face, and I arranged with Mr. Healy to have the south drive pushed on to daylight, there being about a chain to drive. Limestone resembling the Mount Somers stone occurs near the mine. A circular kiln has been built, and coal got is used for lime-burning only.

Rutherford's, Albury (J. H. Willetts).—(25/6/1900): Old workings in vertical seam are abandoned, mine-entrance fenced across, and air-shaft covered. A new drive on the opposite side of the creek is in about 33 yards on the strike of the seam, which is here apparently gradually flattening. A rise crosscut in the coal is driven off the level at such a low angle that only a thin tongue of pillar is left. The seam is about 20 ft. thick, of which 7 ft. on the bottom is not worked, being inferior.

Waihao Forks, Waihao Forks (D. MacPherson).—(10/8/1900): Opencast discontinued. Tunnel in 16 yards Coal-seam 4 ft. thick, dipping 1 in 3.

Studholme, Stony Creek, Waimate (A. Adamson, manager).—(10/8/1900): Old mine abandoned and entrance fenced across. New mine alongside in 72 yards; has fallen to within 10 yards from entrance. Two bords near the entrance are driven in coal a short distance.

Elephant Hill, Waihao Downs (J. Blackley).—(10/8/1900): The level only being worked three months in the year. A few props on the level require to be renewed, which Mr. Scott (miner) promised to attend to.

NORTH OTAGO.

McGimpsey's (late Scott and Porter), Kurow, (R. J. Porter, manager).—(11/8/1900): Level driven about 60 yards north-east in a solid block of the 6 ft. seam previously worked. This level being in the vicinity of old workings, the roof is somewhat shattered. I gave Porter notice to sink a shaft for air and second outlet.

Wharekuri, Wharekuri (known as Sutherland's), (A. Shanks, manager).—(11/8/1900): Vertical seam 30 ft. wide, strike north and south. The drive to the coal is 86 yards long. A level to the south in coal is 150 yards to the face, where a fault was met which altered the coal to soft and inferior. A drive for return and second outlet is in to the coal, and only a few yards of cutting now required to make a connection.

St. Andrew's, Papakaio (T. Nimmo).—(14/8/1900): Pressure on the low levels necessitates narrow drives. Air good. Return airway and upcast shaft in good order.

Prince Alfred, Papakaio (J. Willetts).—(14/8/1900): Roadways and working-places in good order. The heading has been extended to daylight and makes a good second outlet. Air good.

Ngapara, Ngapara (W. Nimmo, manager).—(13/8/1900): Workings being extended towards the west. All places standing well. Seam 25 ft., of which 8 ft. to 9 ft. is being taken out. Air good. Rules posted. Plan to date.

Shag Point, Shag Point (T. Shore, manager).—(12/5/1900): Coal being won from No. 1 seam (Hunt's stone drive), under sea, and from No. 5 seam, north workings. No. 1 seam: The workings are well laid out; the coal-seam, however, is variable in quality, bands of stone occuring frequently. Air dull in low-level face (Klason's), and also in some of the bord-faces above, owing to stentons not being put through. These working-faces are too far from the return airway. No. 5 seam, longwall: Seam thin and roof low; a band of stone in middle of coal provides sufficient material for packing goaf. Roadways and working-places in good order. Wood-chock pillars used at road-ends (off-headings), and timber kept well up to the faces. Air rather slack owing to the restricted areas at lower end of several of the faces, where, for their own convenience, the miners had thrown the stowing too close to the face, while there was plenty of room in the goaf behind. This I drew Mr. Shore's attention to, and Mr. Shore wrote me on 21st May that the stentons in No. 1 seam had been put through; that the stowing in the waste was now kept back from the faces in long-wall section, No. 5 seam, and that good air was travelling round the working-faces. The Act is generally well observed and complied with. (20/11/1900): Air at the faces good, and timber used freely. A new return cross-measure drive in stone from No. 1 seam, just pierced, will do away with the long brattice in Hunt's drive, and the amount of air circulating will be much increased thereby. The travelling-way to return airway and second outlet (Harbour shaft) in fair order. A few falls require to be trimmed up a bit. The ladders in the shaft are in good order. Air at intake, 7,000 cubic feet per minute.

Allendale Colliery, Shag Point (A. Gillanders, manager).—(11/5/1900): The trucking-roads and airways in the section worked from the bottom of the main incline are under considerable pressure, a partial creep having set in. This district is intersected by numerous small faults carrying water, and the roof and sides have to be supported, entailing large expenditure for maintenance and renewal of timber. The working-places, however, at present being opened are in an area of splendid coal. The roof is good and very little timber is required. The air is not what it should be in some of the far-in places. I drew the manager's attention to the state of the air at several of the working-faces, more especially at No. 2 north level face. The intake airway (old mine) is very circuitous and small in area, and the air becomes more or less stale before it reaches the working-faces, being charged with the deleterious gases thrown off by the old workings which it passes through. This the owners propose to rectify immediately by putting through from the new workings at a point which will communicate with a straight drive 4 chains from the bottom of the old mine. Reports well kept and rules posted, but plan in arrears. (21/11/1900): Owing to wet weather the mine-mouth showed signs of closing, and some 500 tons of cover have been removed. Mine-entrance and cross-measures drive from No. 1 north level very wet and dirty. Pillars adjoining the old mine-workings are being well taken out. Air good throughout the mine; 7,950 cubic feet of air per minute at the intake. On the 8th May James McRorie was taking down a stone from the roof when it came away unexpectedly; left leg fractured.

SOUTH OTAGO.

Freeman's, Abbotsford (R. Hill).—(23/11/1901): Pillar area being robbed. Second outlet and return airway in good order. The roads at the back are well timbered and safe, but low, owing to the bottom heaving. Sufficiency of timber used where robbing. Air, 3,700 cubic feet per minute at intake. Two brick stoppings on engine-plane leaking (CO_2) where pressure has cracked the brickwork.

Walton Park, Walton Park (J. Kenyon, manager.)—(24/2/1900): Pumping now discontinued, and water in the workings still rising gradually, but very slowly, being almost up to the permanent level—a bed of sand-drift which was struck in the main shaft at 82 ft. from the surface. Water-level, where pillars and head-coal now being taken out, is about 2 chains to the rise of the safety-barrier required by the District Railway Engineer for the safety of the Government railway-line. Damp is squeezing out from the old workings, and wooden brattices are drawn across openings to keep back the damp (CO_2), large quantities probably being generated by the rising water in contact

with fires known to exist in the old works. The leakage of damp is conducted to the upcast by substantial wood brattice. Where coal is taken out the roof falls, and, the cover being thin, several large plumps and land-cracks are visible on the surface. Ladder-way in upcast shaft and second-outlet shaft in good order. Air good where men are working, being near the intake.

Jubilee, Saddle Hill (J. Loudon).—(28/11/1900): The mine is in very good order. A fault has been struck in the low level which deteriorates the coal somewhat. Air-current baffling. An up cast air-shaft is required near the working-faces. The present air-shaft being near the mine-mouth, and ventilation being natural, leakage and drag are very considerable.

Saddle Hill No. 1, Saddle Hill (J. Christie).—(28/11/1900): Tops being dropped; air good. Mine standing in good order.

Saddle Hill No. 2, Saddle Hill (J. Christie).—(2/11/1900): The level is now in 14 chains The coal at the face is somewhat faulted, and bands of stony coal are making their appearance. The levels are in good working-order.

Burnweil, Saddle Hill (A. Harris).—(27/11/1900): Owing to a fire breaking out in the workings, the mine-mouth and shaft had to be closed. A new tunnel has been driven to the dip of the fire, and an air-shaft sunk near by. The new mine-workings cut across some of the bords in the old mine. The ends are bratticed off with ordinary brattice-cloth only, and there is very little smell from the fire.

Glenochiel, Saddle Hill (D. Bryce).—(27/11/1900): The fire which broke out in Harris and Sons' mine (adjoining) caused the workings to be filled with damp and smoke. After trying in vain for some time to get into the mine, Mr. Bryce sank a small shaft near the roadside, which draws off all bad air leaking through from the fire. He is now taking out pillars between his own and Harris's workings, and bringing down the roof, in the hope that the gases from the fire may be thereby kept back.

Mosgiel, Saddle Hill (J. Sneddon).—(27/11/1900): Robbing on south side and bords being opened off the new mine on the north side. The mine generally in good order. Air good.

Bruce, Milton (A. Young).—(19/12/1900): Pillars and roof in old workings have been partially robbed; all standing in good order. Air good.

Strip-and-at-it, Milton (N. Hardwick).—(19/12/1900): No one about. Apparently nothing doing.

Fortification, Milton (John Shore).—(19/12/1900): The new mine-tunnel has been opened, which at 60 ft. struck the main seam. The dip is down 230 ft. in good hard coal. This dip has about 10 chains to go to cut No. 2 dip, old mine, which has about 6 chains to go. Air good, and workings in good order. A railway is being brought in from the main line at Milton, six miles to the mine. The formation is almost completed, and the rails are laid at the Milton end.

McGilp's, Milton (N. McGilp).—(19/12/1900): Opencast and drive in good order. Stripping well ahead. A siding will be made into this pit from the Fortification Company's railway-line.

Early Bank, Milton (H. Groves).—(19/12/1900): No one about; evidently very little doing. Coal at level face changing to soft and inferior. Timber set at regular intervals.

Wallsend, Lovell's Flat (Robert Hewitson).—(9/2/1900): No one about, owing, probably, to the inclemency of the weather. Working-face not stripped, and a mass of clay and coal overhanging where coal being taken out. Should this fall while men working they could not possibly escape. Owing to the manner in which the accumulated dirt is stacked opposite the face, there is only a narrow gutter left for working in. A small portion of coal is being stripped at another place. I wrote Mr. Hewitson under date the 12th February, requiring him to take out coal at the place where stripping is done, and to work present face until stripped. (16/5/1900): Working block of coal well stripped, and owner intends to strip before taking coal out in future.

Lovell's Flat, Lovell's Flat (J. Carruthers, manager).—(16/5/1900): South communication heading to second outlet is double-shifted, and satisfactory progress being made. North level being extended with the object of getting round and cutting off the old workings to the rise. Two headings are being driven off the main east-rise crosscut for development purposes. Air sluggish and current baffling, mainly owing to the cages being onlya little less in area than the compartments; the cages, therefore, act somewhat like pistons while winding, only the air that can squeeze past the cages and shaft-walls circulating. The pit-bottom has been lowered and substantially retimbered. There is now good head room. A new special Tangye steam-pump has been placed at the pit-bottom: stroke, 14 in.; steam-cylinder, 16 in.; throw, 465 ft.; capacity, 10,000 gallons per hour. About four hours' pumping per day keeps down the growth. Rules posted. Report-book and plan well kept.

Mount Wallace, Stirling (George Shaw).—(9/2/1900.): Workings being well opened up in thick strong coal. Low level to be started shortly, which will give more grip of the field and provide second outlet and return for air.

Kaitangata Colliery, Kaitangata (G. H. Broome, manager).—(8/2/1900): Mr. W. M. Shore, who for many years was the manager of this colliery, has been succeeded within the last week by Mr. G. H. Broome, late of Westport-Cardiff Colliery. Accompanied by Mr. Broome and Mr. J. Shore, I examined the airways, travelling-ways, and working-places (north side); the dip workings, the rise workings on the south side and the return airway to the furnace and up-cast airshaft. At the bottom of the main incline (intake) the air measured 15,000 cubic feet per minute. The winch-dips are being extended and preparations made to obtain more coal from them than has recently been done. In No. 2 winch-dip ten men are working; air dull. There is no second outlet or return, and consequently no active circulation of air, compressed air being used for ventilating purposes. A level being driven has 80 ft. to 90 ft. yet to be cut to hole through. This will enable a split from the main air-current to be circulated through these workings, and Mr. Broome promised me that he would push the level on with the utmost speed. The south-side headings are being gradually stopped off as coal is

worked back. Air very warm; fair current travelling, but so heated that I drew manager's attention to it. I also requested that two men be withdrawn from one of the bords, the place they were working in having fallen very high. Lamp-stations appointed and safety-lamps used in the bords off two rise headings where the air was very dull. The main return air-course and travelling-way was in very bad order; the stone-drift was almost blocked by a large quantity of fallen conglomerate which appeared to be "running," caused, no doubt, by the warm air "melting" the conglomerate. Timber at this place had been renewed many times, but, the drift being steep, the timber was being continually knocked out. Under date of 12th February I wrote the manager, drawing his attention to the state of the air in the south workings, and to the dilapidated condition of the return airway. (15/5/1900): Air-intake, 26,400 cubic feet per minute. The wooden brattice at the entrance to main seam between Nos. 2 and 3 faults has, since my last visit, been replaced by brick stopping 120 ft. long, 18 ft. high at the highest part by 14 in. thick at the top. The stopping is backed with 1 yard of sand and ashes; the bricks on the face are cool, and I could not find a trace of fire-stink, I found a trace of gas in a "pot-hole" in the top level of the drum section (east side) also a trace at the face in Hayes'-bord near No. 5 fault. Safety-lamps were used in each of these places, and in Hayes'-bord a strong blower of compressed air was directed on the face. The north level from the bottom of the drum-heading is being extended and prepared for the coal-cutting machines, two of which are just ready for starting. There is no second outlet from the face here, compressed air being the ventilating agent, and only safety-lamps are used. The main return airway has been put in good order. The place on the steep so heavily fallen on my last visit has been secured by a cylindrical steel tube 36 ft. long by 4 ft. diameter in the clear. The sections are 3 ft. long, secured by angle-iron flanges bolted together, and the plates are stiffened by an extra angle-iron ring in the centre of each section. The tubing at the lower end butts against the hard strata, is packed at top and sides with dead ashes from the furnace, and the highly fallen place is gradually choking itself. The airway above the tubing is secured with stout timber close-lathed, and the return is now in good order. (16/5/1900): The workings in Nos. 2 and 3 winch-dips are in good order. Good air travelling freely throughout the mine. A plentiful supply of safety-lamps is kept in the cabin, and served out to the men going on shift to the places where gas has been found or is anticipated. (6/9/1900): McDougall's district, also drum-level section have been freely robbed, and bords stopped off when finished. North level district is being developed. Safety-lamps only are in use here, and the new coal is bleeding gas somewhat freely, Intake air measured 23,300 cubic feet per minute. (21/12/1900): Intake air, 27,280 cubic feet per minute. Workings in good order. Natural air circulating throughout the mine. Deputies' and underviewers' report-books well kept. Barometer and thermometer records and state of working places, roads, and airways duly entered. Rules posted and plan to date. Endless-rope haulage in the main stone-drive is working very satisfactorily. No serious accidents have been reported. George Pilling was injured on the 24th September 1900, by a fall of coal from the roof, which bruised his head, arms, back, and legs.

Castle Hill Colliery, Castle Hill, Kaitangata (G. H. Broome, manager).—(5/9/1900): Old workings discontinued. The main dip incline has been extended 90 ft. to a 12 ft. seam of coal, in which a level to the south is in 4 chains, and to the north 3 chains. This north level is giving off gas freely, and only safety-lamps are used. The south level is connected with the main return airway to the furnace by a stone-drive just completed. Plant and appliances in good order. Air at mine-entrance registered 26,400 ft. per minute. (20/12/1900): All work now in the 12 ft. seam and in the new 6 ft. seam, which was struck at 4½ chains from the bottom of the main incline. The dip in stone is still being extended. The workings in the 12 ft. seam are in good order and well ventilated. I found a quantity of gas at the face of the south level 6 ft. seam. No one was working there. Lamp-stations fixed and notices posted. William Cairns met with an accident on the 1st November; he fractured his forearm, owing to the rope surging and striking his arm. Cairns was travelling on the main incline at the time.

Central Otago.

Coal Creek, Roxburgh (R. Coskery).—(14/9/1900): This opencast pit is in a bad state, a land-slide of about ½ acre having filled up the pit and covered the working-face.

McPherson's, Roxburgh (M. McPherson).—(14/9/1900): Opencast pit well kept and in good working-order. Working-face well stripped in advance.

Perseverance, Roxburgh (J. Craig).—(14/9/1900): The old mine across the creek which took fire is now abandoned. Two new drives on the east bank of the creek are in 90 yards. A shaft is being sunk for return airway and second outlet.

Black Diamond, Shingle Creek (P. Galvin).—(14/9/1900): Nothing doing; mine-mouth closed by a slip. Owner trying to sell.

Drummey's, Alexandra (J. Drummey).—(17/9/1900): No one about. No work has been done here for some time other than that the water is regularly bailed out of the shaft.

Alexandra Coal-mine, Alexandra (A. Hunter, manager).—(13/1/1900): A new mine-tunnel is being driven which is to be extended to the dip-boundary, and a hauling-engine is to be erected on the loading-bank. Workings are well laid out, pillars square and of a good size. Bords on the south-west boundary of lease are stopped at a fault running north and south, approaching which the coal thins and is inferior in quality. Air good throughout the mine. Report-book kept, but no rules posted. (17/9/1900): The new mine tunnel in course of extension to the dip-boundary is down 8½ chains. The back heading for air is a chain from the main dip, and the pillars are 20 yards square. The old mine to the south is abandoned, the airway having closed.

McQueenville Coal-mine, Alexandra South (J. Howie, manager).—(12/1/1900): A new shaft 130 ft. in depth has been sunk to the dip of the workings, with which it is now connected. A good grip of the field has been obtained, and the mine is capable of a larger output than there is demand for at present. A band of clay 6 in. thick and 2 ft. from the bottom of the seam is trouble-

some. Workings all standing in good order. Air good, and report-book to date. (17/9/1900): Workings to the dip are well laid out, and are standing well in good strong coal. Air good throughout the mine. A new dip-tunnel is being driven from near the roadside, and a hauling-engine is to be erected on the loading-bank. The coal will be brought up this drive, and the shafts at present in use for winding will form excellent upcasts and second outlets.

Theyers's, Alexandra South (W. Theyers).—(17/9/1900): Nothing doing. No demand for the coal.

Undaunted Coal-mine, Gemmel's Gully, Alexandra (R. Ballantyne, manager).—(13/1/1900): This pit, which is 75 ft. deep, has been recently sunk, but notice of such was not forwarded to me. Coal is being taken out on a small scale. The whip-frame is of faulty structure, and the timbers are too light for the purpose. The hempen rope in use is worn in places halfway through, and the top of the shaft is unfenced. I wrote Mr. Ballantyne under date the 29th January, 1900, drawing his attention to the improper state of his appliances. I also drew his attention to a dangerous fallen-in shaft 2 chains up the gully from his working-shaft, and required him to fill it up, there being plenty of loose material available. (17/9/1900): The level face is 1 chain from shaft-bottom, and being narrow it is standing well.

Perseverance, Alexandra South (R. H. Findlay).—(17/9/1900): A new mine-tunnel has been driven, and the shaft is now used as an upcast. A winch hauling-engine is erected on the loading-bank near the roadside. The mine-workings are well opened up and in good order. Air good.

Alexandra Coal-mining Company, Alexandra (William Carson, manager).—(12/1/1900): This recently formed company has acquired Gard's lease. A new shaft was started in July, 1899. An iron cylinder 30 ft. long by 8 ft. diameter, was put down through 50 ft. of alluvial drift, and sunk 2 ft. into the coal-seam, which is here 28 ft. thick. A ring of concrete 2 ft. deep was put in all round the bottom of the cylinder to keep water back. The shaft is divided into two compartments, one being used for winding and the other as a ladder-way and return airway. The ladders are imperfect, and I drew the manager's attention to them on the spot, and by letter dated the 26th January, 1900. The rope used for winding is too light, and Mr. Carson promised to procure a heavier one. The shaft-bottom is only 2½ chains from Gard's nearest workings, which are presumably standing full of water.

A plan prepared by me, and approved by Mr. Hayes, Inspecting Engineer, has been forwarded to Mr. Carson, showing the workings of Gard's old pit and their relation to the new shaft. A safety barrier of solid coal 1 chain in width at the narrowest point is provided. This should prove to be sufficient, as Gard's workings were not extensive. (15/3/1900): Ladders not up to the mark yet. This shaft is too small, and the directors propose to sink a larger one to the dip in the near future. Rules not posted, and no report-book kept. (18/9/1900): Plant, machinery, and working-places in good order. Water streaming from roof in several places where the coal is open-jointed. I strongly advised the manager to keep the places narrow. Rules posted, and plan to date. Thomas Wheeler, banksman, met with an accident on the 4th August. The engine-man was winding water to the upper landing. While the cage was up Wheeler stretched himself on the ground, and was speaking down the shaft when the cage descended and jammed his head against the side of the shaft. Injuries: Nose broken and face cut.

Gard's and Beck, near Gemmel's Gully, Alexandra.—(13/1/1900): Nothing doing. Shaft covered over.

Cambrians, Cambrians (C. Dungey).—(13/10/1900): Stripping 10 ft. to 12 ft. of auriferous gravel. Coal-seam, 6 ft. to 12 ft. thick. The face at one point overhanging very badly.

Welshman's Gully, Cambrians (J. and R. McGuckin, lately Hughes).—(13/10/1900): Opencast; 12 ft. to 20 ft. of stripping (clay). Coal, 30 ft.; very little coal stripped in advance, and the men working under a high face, nearly vertical, where the top was loose in two places. I cautioned Mr. McGuckin, and advised him to keep more batter on the face.

Padgett's, Blackstone Hill (B. Padgett).—(15/10/1900): Coal has run out. Nothing doing now. The owner is going to prospect.

St. Bathan's Coal-mine, St. Bathan's (J. Enwright).—(16/1/1900): 6 ft. to 8 ft. of clay and gravel overlying the coal-seam. No stripping done in advance, and face overhanging in places. I again advised Mr. Enwright to carry a bench of stripping along in advance of the coal being got, so as to minimise risk of accident.

Rough Ridge, Idaburn (C. Beck).—(15/10/1900): Coal, 55 ft. thick at the deepest part, with 6 ft. to 10 ft. of gravel stripping, which is generally kept well back from the face. A quantity of loose weathered coal was overhanging above where the men were working on the bottom. The manager promised to have it taken down.

McLean's, Idaburn (L. McLean).—(15/10/1900): Not much doing. Owner busy carting stripping out of the pit. Mr. McLean was levering a piece of coal down with a crowbar on the 31st January when the point slipped, and the butt-end struck his ribs, fracturing one of them.

Idaburn, Idaburn (J. White).—(15/10/1900): Coal not stripped. Mr. White is behind this season, owing to the unusually large quantity of water made by the pit during spring.

Border Coal-pit, Idaburn (G. Turnbull).—(15/10/1900): Opencast. The water-growth is somewhat heavier than the wheel-pump is able to cope with this wet season. Not much doing.

Gimmerburn, Gimmerburn (C. Dougherty).—(15/10/1900): Not much doing here now. Stripping heavy, and coal dipping below water-level. Only about 5 ft. of coal water-free.

Commercial, Kyeburn (C. Archer).—(16/10/1900): The north level at 160 ft. from the shaft struck a fault which cut the coal out. The south level at 360 ft. from the shaft struck another fault, which also cut out the coal. A bed of running sand was tapped, but owing to there being very little water in the sand it was easily stopped. The coal (which is vertical) is worked in 17 ft. lifts, similar to the stopes in a quartz-mine. The air at the face is very dull.

Dairy Creek Coal-pit, Clyde (R. Robertson, manager, permit).—(11/1/1900): Two shafts have been sunk 20 yards apart: one is used for raising coal, and the other for water and as a travelling-way (ladders). The ladder-shaft is 130 ft. deep. Two single levels, one north and the other south, are driven from the shafts; there is therefore no circulation of air in the levels, and the air is very foul at the faces. No rules posted. No report-book kept. I wrote Mr. Robertson (who had just been appointed) on the 27th January, drawing his attention to the non-observance of "The Coal-mines Act, 1891," in this mine, and he will no doubt remedy the defects, and work the mine in accordance with the Act. (19/9/1900): The shafts have been connected, and air is now travelling freely throughout the workings.

Vincent Coal-mine, Clyde (George Turner, manager).—(11/1/1900): Three parallel levels are being driven (on the north side of the dip incline), which the proprietors intend to continue to the boundary of the lease, and work home. This method will enable a large proportion of the seam to the rise being won. The workings are standing in good order, but a fault recently cut may give trouble and necessitate timbering, owing to the soft character of the coal on both sides of the throw. Air fairly good. Upcast air-shaft unfenced on the surface. I drew Mr. Turner's attention to this, and he promised to fence forthwith. (19/9/1900): The fault at level face has proved somewhat troublesome; the line of strike which was north and south has swung round to the east, and the levels are semicircular in shape. The drives, being narrow, are all standing well. Air dull at the faces.

Cooper's, Cromwell (J. Cooper).—(8/3/1900): No one about. Gate on entrance. Evidently nothing done here for some time.

Gibbston Saddle, Gibbston (M. Macale).—(22/9/1900): Stripping discontinued. A dip drive is down 160 ft. The coal improves, and at the face is hard and bright, but, as on the surface, occasional soft seams are crossed.

Kawarau, Bannockburn (J. C. Campbell).—(21/9/1900): Several faults were struck in the dip drive. The lower fault was a downthrow of 11 ft., the coal being broken and disturbed, and unsaleable. The dip was eventually abandoned and the water allowed to rise, which caused the pillars to crush, and a "creep" set in. The fire in the south workings is causing trouble, owing to the "creep" cracking the stoppings. The mine is in a bad state, and cannot last more than a few months at present rate of retreat.

Parcell and Gibson's (Excelsior), Bannockburn (W. R. Parcell).—(21/9/1900): Pillars being taken out at north level faces. Insufficient timber being used at one pillar. The main level has fallen in places, and, the roof being bad, a new low level is being driven. The air is not conducted to the working-faces. The ends are not bratticed or stopped as they should be. The roadways on the south side are in bad order. The hauling-engine recently erected is now idle, and in need of repairs. Horse-power has been resumed, which is a retrograde step.

Bannockburn, Bannockburn (T. Wilson).—(20/10/1900): The level face is up to the boundary. The air is good, the ends being bratticed off. Timber has been renewed along the level, which is now in good order.

Cairnmuir, Bannockburn (Crow and Anderson).—(21/9/1900): The old coal-workings are abandoned, but a small prospecting-shaft is being sunk on the seam.

Nevis, Nevis (E. Luscombe).—(12/3/1900): Opencast, vertical seam, 60 ft. thick. Strike north and south, and probably is a continuation of the Gibbston seam, which it resembles in quality. The pit is very ragged in appearance, and slips are imminent at several points where all the coal has been taken out. Seam badly crushed generally, being soft and friable, with occasional patches of good hard coal. A drive is being put in on the south side, parallel with the seam, in which the coal is only moderately hard. On the north side the coal appears to harden and improve, and work is being presently carried on there.

Ryder's, Nevis (C. Scott).—(12/3/1900): Opencast discontinued, and now driving underground along west wall of vertical seam 40 ft. wide. The mine-entrance, however, has been taken too far into the hillside before starting to tunnel, and there is every indication of the banks on each side collapsing. I pointed this out to Mr. Scott, and he then asked me to assist him in selecting a new site for an entrance, which was done. This seam resembles the other vertical seams in the district, hard coal being patchy, soft crushed coal alternating with bands of good hard coal.

Mr. Scott maintains that his drive is on the bottom of the seam. If that be, so these vertical seams are not so unlimited in depth as they are generally supposed to be. The floor of the drive is certainly a blue clay, but I was unable, with the means at my disposal, to ascertain its depth. I looked for but could not see any indications of faulting.

Southland.

Whiterigg, Gore (H. Gray).—(4/12/1900): The coal being strong, the rooms are large and the pillars small. The coal-floor undulates, and the roof, in sympathy with it, is irregular on the top. When one of these troughs in the roof gets pricked, even when only a very small hole is made, the overlying sandy gravel "runs" until the place becomes filled. I drew Mr. Gray's attention to a dangerous mass of coal overhanging at the mine-mouth, which he promised to timber up to.

Heffernan's, Gore (Boyd and McNee).—(4/12/1900): Opencast. 3 ft. of stripping; 12 ft. of coal to water-level. The stripping overhanging 2 ft. on the face at one place.

Gutschlag's, Gore (W. Gutschlag).—(4/12/1900): Opencast. Stripping 3 ft.; coal 6 ft. to water-level. Very little doing.

Leitze's, Gore (M. Leitze).—(4/12/1900): 5 ft. to 8 ft. of stripping and 3 ft. to 5 ft. of coal to water-level. The coal is undermined 3 ft. in one place, the gravel overhanging.

Waikaka, Gore (Thomas Hoffman).—(4/12/1900): Opencast. 3 ft. of stripping and 5 ft. of coal to water-level. The water-wheel pump in use barely keeps the water down.

Green's, Gore (J. Smyth).—(4/12/1900): Coal strong and woody, and the bords, though wide and high, are standing well. I informed the lessee that it would be necessary to sink an air-shaft at an early date.

Knapdale, Knapdale (R. Irvine).—(4/12/1900): No one about. Not much doing from appearances.

Harvey's Coal-mine, Chatton (James Harvey).—(24/1/1900): Vertical seam, of which only the upper edge or water-free portion is being worked. Owner says that it will not pay him to work below water-level. The coal is worked out almost up to the road-line, and a pump will be required if output is to be continued. A clay wedge which started at nothing some distance back is now 5 yards thick, splitting the seam and increasing cost of getting.

Perkins's, East Chatton (A. Perkins).—(21/6/1900): The coal crops out in a gully and runs into the hillside. Clay-stripping 12 ft. to 14 ft., with 4 ft. of black band lying on top of the coal, which is here 10 ft. thick. Water heavy, and the bottom of the pit is very wet. About an eighth of an acre has been worked.

Pacey's, East Chatton (W. R. Pacey).—(21/6/1900): This pit, like Perkins's, has been opened in the gully, consequently the drainage of the country side gravitates into it. A low-level drain was brought in some time ago, but there is still some 10 ft. of coal below water-level. An engine is now on the ground which is intended for pumping purposes when dry weather comes, so that the low-lying coal can be recovered. The working-face of the pit is about 100 yards long, and is from 20 ft. to 35 ft. high. There is up to 14 ft. of clay and gravel on top of the coal. No attempt at stripping has been made, and the face is highly dangerous. I cautioned Pacey and the two men working in the pit as to the risks they ran working under such a face. 6 ft. of bottoms being lifted for present sales.

Mrs. McIvor's (lately Hill's), Landslip, Waikaia (A. C. McIvor).—(3/7/1900): Coal is at present being got at a point near the crop where the stripping is fairly light. The pit proper is in a very rough state, being almost blocked by heavy falls of clay and gravel, of which there is from 70 ft. to 80 ft. on top of the coal.

Goldie's Landslip, Waikaia (T. F. Goldie).—(3/7/1900): No work done for twelve months owing to owner's ill-health.

Monaghan's Landslip, Waikaia (R. Monaghan).—(3/7/1900): Two small openings made on the hillside expose a seam of coal similar in quality to McIvor's. Only a few tons have been taken out.

Argyle Coal-mine, Waikaia (John Baxter).—(23/1/1900): Opencast pit. Stripping with water (ground-sluicing), which is stored in a dam some distance above the face. A fair area of coal is stripped ready for winter-trade requirements. I advised Mr. Baxter to deepen his tail-race and keep on the bottom of the seam, several feet of coal being left underfoot.

Waimea, Longridge Village, Waimea (A. Smith).—(4/7/1900): Old workings on hillside abandoned owing to the stripping becoming too heavy. Coal is now being taken out of the flat in the creek-bed, and is only about 3 ft. thick. Stripping, 3 ft.

Pyramid, Mandeville (E. McAlister).—(4/7/1900): Coal-seam at level face dipping rapidly, and is evidently approaching a fault of some size. Only two parallel levels being driven.

Radford's (lately Carmichael's), Wendon (E. and P. Radford).—(4/7/1900): Opening up the old drive which had fallen in at the mouth, where a few sets of timber will be required. The seam is vertical, and 22 ft. wide. So far as could be seen, looking in over the fallen entrance, the old drive in the coal is standing in good order.

Waimumu, Mataura (C. P. Sleeman).—(30/5/1900): Stripping, which is 10 ft. deep, is kept well in advance of the working coal-face. The owner finds that it pays him to keep three men constantly stripping ahead of the three men getting coal. This is well proved by the average daily output, 25 tons. Good prospects can be obtained here on top of the coal-seam, the overlying gravel being auriferous.

Bogside, Mataura (H. Brown).—(30/5/1900): Face practically vertical. No stripping in advance. Mr. Brown, who works alone, was flooded out of the pit in November last, and is only now getting to work again.

Beattie and Coster's, Mataura (W. Coster).—(30/5/1900): Only a small area stripped where coal being got. Two men at work, one stripping and the other getting coal.

River View, Mataura (L. D. Nicol).—(30/5/1900): Opencast. Not much doing.

Nightcaps Colliery, Nightcaps (J. Lloyd, manager).—(19/1/1900): New hauling-engine and boiler being erected at the tramway terminus on the railway loading-bank. Coal is principally obtained from underground workings, but a few miners are employed in opencast pit near the outcrop. Here a gang of men are stripping about an eighth of an acre of coal in anticipation of a largely increased winter demand, the present output being the best on record at this time of the year. A new ventilating-shaft is to be sunk and furnace built near working-faces. Furnace and upcast shaft now in use are to be utilised by boiler and engine, required to work the seams to the dip; present workings, being above water-level, maintained by Californian pump. Working-places roomy and in good order. Roof here and there looks ragged, owing to partings and diagonal backs which are prevalent in the mine. Timber is freely used, and a large stock is kept on hand. Air cool throughout the mine, but travelling very slowly, and somewhat tainted with powder-smoke. (27/10/1900): An 8-horse portable engine and boiler have been set in the mine at the top of the dip for hauling and pumping purposes. Smoke and steam are conducted to the old furnace-shaft. A 2 ft. fan is being erected for ventilating the dip, which is down 4 chains. A new air-shaft has been sunk near the working-face, and the air is good, but charged with smoke in some of the places. The hauling-engines—10 in. cylinders by 2 ft. stroke, and a 20-horse-power boiler, all made and fitted up by Johnston and Sons, Invercargill—are giving every satisfaction. A serious defect, however, is that the engine-driver cannot see any part of the tramway owing to the engines being set low.

Wallace, Nightcaps (C. Darcy).—This pit is now worked out and finished. Owner promised to fence the bank on roadside.

Reliable, Nightcaps (Jesse Alley).—(29/10/1900): Opencast. Turning the creek, and working in the old creek-bed and banks alongside. Mr. Alley sustained an accident (strangulated hernia) on the 1st February, 1900, while lifting a large lump of coal into the box.

Quested's, Nightcaps (J. Quested).—(29/10/1900): Pit stopped and full of water. Owing to stripping being heavy, owner is going to open in another place.

H.B., Nightcaps (Lamont).—(29/10/1900): Main drive in 3 chains. Timber in use too light for this class of coal, clay backs being frequent. Shaft for air and second outlet is required.

Black Diamond, Nightcaps (W. Tinker).—(29/10/1900): Not working owing to a fault down-throw 14 ft. cutting across the face.

Morley Village, Nightcaps (W. Reid, jun.).—(29/10/1900): This is a new pit just started. A little opencast work has been done to begin with, and Mr. Reid intends putting a drive into the coal-face.

Wairio, Nightcaps (A. McBride).—(27/10/1900): Opencast. Stripping, 21 ft. Coal-seam, 10 ft. Stripping removed with plough and scoop.

Orepuki, Orepuki (M. Straw, manager).—(21/4/1900): Development-work for the production of coal and shale being vigorously prosecuted. A main incline, 9 ft. by 6 ft. 6 in., dipping 1 in 4, has been driven 1,000 ft. in sandstone to the main coal-seam, which ranges from 8 ft. to 20 ft. in thickness, and is immediately overlaid by 4 ft. of shale. Levels are driven off each side at the bottom of the main incline, and a heading being put up off the west level is to be extended to the boundary (about one mile). The roof being heavy, strong timber is used, and in places sets are close-lathed. Coal and shale are to be worked towards home in districts; 20-yard stalls are to be opened off the headings, and coal and shale worked on the long-wall principle.

ACCIDENTS.

4th January, 1900.—George Dickson, Nightcaps Colliery: Left thigh lacerated by drum spur-gearing. While guiding new steel rope on drum a lever held by Dickson became jammed, and he was thrown on to the cog-wheels.

31st January, 1900.—Lachlan McLean, Idaburn: Fractured rib. While taking down a piece of coal with a crowbar the point slipped, and the butt-end of the bar struck McLean on the breast.

1st February, 1900.—Jesse Alley, Reliable Colliery, Nightcaps: Strangulated hernia, sustained while lifting a large lump of coal into the box.

5th April, 1900.—R. Henry, Nightcaps Colliery: Ulceration of cornea, with loss of sight (one eye), caused by a piece of coal from the pick-point striking the eye.

8th May, 1900.—James McRorie, Allandale: Fractured left leg. A piece of stone on the roof came away unexpectedly while being taken down.

28th June, 1900.—Eli Bearsdmore, Kaitangata Colliery: Ulceration of cornea, caused by a piece of coal from the pick-point striking the eye.

30th June, 1900.—P. Peterson, Kaitangata Colliery: Ulceration of cornea, caused by a piece of coal from pick-point striking the eye.

4th August, 1900.—T. Wheeler, banksman, Alexandra Coal Company's Mine: Nose broken and face cut. Head jammed against side of shaft by descending cage from upper landing while Wheeler was stretched on the ground talking down the shaft.

24th September, 1900.—George Pilling, Kaitangata Colliery: Bruised head, back, and legs, by fall of coal from roof.

1st November, 1900.—William Cairns, Castle Hill Colliery: Fractured forearm, caused by hauling-rope surging and striking arm.

25th October, 1900.—Francis Winter, Nightcaps Colliery: Instantaneously killed by a fall of coal at the face. This accident was fully reported to you on the 31st October.

Thirty-one other accidents have been reported during the year, but are not of sufficient importance to mention individually. Of these, six were eye accidents at the Kaitangata Mine, caused while working "proud coal." Pieces of coal flying from the pick-point cause injury to the eye; septic poisoning is set up, followed by ulceration of the cornea, with, in severe cases, partial loss of sight.

I have, &c.,

E. R. GREEN,

The Under-Secretary, Mines Department, Wellington. Inspector of Mines.

Errata.—Coal-mines Report, page 12, under heading of "General Remarks": *For* "589,183 tons," *read* "594,183 tons"; *for* "67,236 tons," *read* "72,421 tons."

LIST of PERSONS who have obtained CERTIFICATES as MINE-MANAGERS under the Coal-mines Acts of 1886 and 1891.

THE COAL-MINES ACT.

FIRST-CLASS MINE-MANAGERS' CERTIFICATES.

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

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

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

Armitage, F. W., Auckland.
Armstrong, J., Brunnerton.
Barclay, T., Kaitangata.
Carruthers, J., Shag Point.
Carson, W., Kaitangata.
Coulthard, J., Taylorville.
Dixon, C. W., Granity.
Dixon, W., jun., Kaitangata.
Dunn, W., Brunnerton.
Dunn, W. R., Thames.
Elliott, R., jun., Denniston.
Fleming, J., Kaitangata.
Fry, Sydney, Waimangaroa.
Gibson, John, Westport.
Gillanders, A., Shag Point.
Green, E. R., Abbotsford.
Green, J., Brunnerton.
Herd, J., Brunnerton.
Hill, Robert, Abbotsford.
Hosking, G. F., Auckland.
Hughes, D., Preservation Inlet.
Jebson, D., Canterbury.
Johnson, W. P., Thames.
Leitch, J., Blackball.
Leitch, W., Blackball.
McCormack, W., Denniston.
McEwan, Robert, Coromandel.
Milligan, N., Thames.
Murray, T., Westport.
Newsome, F., Denniston.
Newton, James, Brunnerton.
Shore, Joseph, Kaitangata.
Sowerby, H., Denniston.
Tattley, E. W., Huntly.
Taylor, A. H., Waikato.
Turner, G. F., Shag Point.
Young, James H., Waimangaroa.

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

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

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

Mine-managers' Certificates, issued on Production of Certificate from a recognised Authority outside the Colony, under "The Coal-mines Act, 1891."

Alison, R., Greymouth.
Dixon, J., Westport.
Fletcher, George, Westport.
Frame, Joseph, Kaitangata.
Irvine, James, Dunedin.
Jordan, R. J., Kaitangata.
Lewis, W., Blackball.
Pollock, James, Green Island, Otago.
Proud, Joseph, Wanganui.
Scott, Joseph, Ngahere.
Tennent, R., Brunnerton.
Wight, E. S., Auckland.

SECOND-CLASS MINE-MANAGERS' SERVICE CERTIFICATES.

Issued under "The Coal-mines Act, 1891."

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

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

Austin, W. B., Sheffield.
Barclay, T., Kaitangata.
Barclay, Wm., Kaitangata.
Campbell, Peter, Fairfield.
Clemo, G., Whangarei.
Dixon, W., jun., Kaitangata.
Harris, A., Saddle Hill.
Hill, R., Abbotsford.
Hunter, A., Southland.
Lindsay, J. B., Orepuki.
Neilson, Moffat, Abbotsford.
Parcell, W., jun., Bannockburn.
Snow, T., Mercer.
Taylor, Joseph, Collingwood.
Waldie, A. B., Mokau.
Westfield, C., Fairfield, Otago.

APPENDIX I.

Statistics of Workings in Coal-mines, 1900.

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 1900.			Approximate Total Output to 31st December, 1899.	Approximate Total Output to 31st December, 1900.	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.		
NORTH ISLAND.																										
Kawakawa District.													Tons.	Tons.	Tons.	Tons.	Tons.									
Kawakawa (stopped) ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	794,865	794,865	..	..	..	..	..	..	..	..	..
Kawakawa (late New Bay of Islands Company)	Culley, John ..	6½	semi-bitum.	1	4′	4′	1 in 8	bord and pillar	4	6′ x 4′ 4′ x 3′	165′	adit	3,649	..	3,649	52,742	56,391	2	5	7	horse	..	..	..	natural	15/9/00
Hikurangi District.																										
Hikurangi Coal Company ..	Moody, T. P. ..	7	ditto	1	7′ to 12′	7′ to 10′	1 in 8	ditto	7	6′ x 5′	198′	incline-plane adit	38,572	..	38,572	158,711	197,283	6	44	50	steam-engine	2 hand-pumps	..	..	„	13/9/00
Hikurangi Colliery ..	Kerr, George ..	4	„	1	10′	10′	irregular	„	1	6′ x 8′	..	adits	11,119	..	11,119	30,077	41,196	4	14	18	hand	..	..	..	„	13/9/00
West Bryans (stopped) ..	..	..	„	..	..	..	..	..	..	..	..	..	..	..	..	34,348	34,348	..	..	..	..	..	..	..	..	..
Phœnix (stopped)	..	..	„	..	..	..	..	..	..	..	..	..	..	..	..	11,823	11,823	..	..	..	..	..	..	..	..	..
Walton and Graham (stopped)	..	..	„	..	..	..	..	..	..	..	..	..	..	..	..	1,210	1,210	..	..	..	..	..	..	..	..	..
Whangarei District.																										
Kamo (stopped)	..	..	„	..	..	..	..	..	..	..	..	..	..	..	..	225,037	225,037	..	..	..	..	..	..	..	..	..
Kamo New	McDonald, Donald	6 1/12	„	1	8′	7′	irregular	bord and pillar	1	6′ x 4′	170′	adit	371	100	471	8,902	9,373	..	3	3	hand	..	..	..	„	20/12/00
Whauwhau (stopped) ..	..	..	„	..	..	..	..	..	..	..	..	..	..	..	..	70,853	70,853	..	..	..	..	..	..	..	..	..
Ngunguru District.																										
Ngunguru Mine	Taylor, A. H. ..	8	„	1	3′ to 7′	3′ to 7′	irregular	bord and pillar	2	4′ x 2′ 7′ x 5′	600′ 1,600′	adits	14,592	..	14,592	100,546	115,138	11	27	38	steam-engine & horse	6½″	2½″	35′	„	19/9/00
Kiripaka Mine	Clemo, George ..	2	„	1	20′	7′ to 14′	1 in 9	ditto	1	7′ x 5′	363′	„	11,276	..	11,276	1,609	12,885	3	7	10	hand	..	..	..	„	19/9/00
Waikato District.																										
Taupiri Coal Mines Company—Waikato Section (stopped)	..	..	brown	..	..	..	..	..	..	..	..	..	..	..	..	209,089	209,089	..	..	..	..	..	..	..	..	..
Taupiri Extended Section..	Wight, E. S. ..	14	„	1	20′ to 40′	7′ to 20′	1 in 10	bord and pillar	2	10′diam.	166′ 209′	shaft	21,373	369	21,742	611,912	633,654	13	34	47	steam-engine	16½″ 14″ 20″	7″ 5″ 5″	170′ .. 204′	fan	12/9/00
Taupiri Reserve Section ..	„	14	„	1	20′ to 24′	7′ to 18′	1 in 7	ditto	2	7′ 10′ 6″	50′ 1,782′	incline-plane adit	17,831	790	18,621	182,821	201,442	11	44	55	ditto	14″ 12″	7″ 6″	260′ 44′	natural assisted by exhaust steam	12/9/00
Ralph's Taupiri Section ..	„	3	„	1	30′ to 60′	7′ to 24′	1 in 10	„	2	9′ 6″ x 5′ 8′ 6″ dia.	190′ 145′	shaft	36,466	362	36,828	42,393	79,221	19	67	86	„	12″ 24″	6″ 8″	132′ 150′	ditto	12/9/00
Ralph's (stopped)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	23,019	23,019	..	..	..	..	..	..	..	..	..
Mokau District.																										
Mokau Mine	Cherrie, Robert ..	16	„	1	7′ 6″	7′ 6″	1 in 36	bord and pillar	1	6′ x 6′	990′	adit	2,218	..	2,218	19,591	21,809	3	8	11	hand	..	..	..	natural	29/10/00
Fernside Mine	Lobb, Joseph ..	3	„	1	6′	6′	1 in 12	ditto	2	7′ x 5′ 6′ x 4′	495′	„	1,215	..	1,215	2,050½	3,265½	..	4	4	„	..	..	..	„	29/10/00
Co-operative (stopped) ..	..	..	„		..	..	..	..	..	..	..	..	..	..	..	940	940	..	..	..	..	..	..	..	..	..
Miranda District.																										
Miranda (stopped)	..	..	„		..	..	..	..	..	..	..	..	..	..	..	20,668	20,668	..	..	..	..	..	..	..	..	..
Bombay District.																										
Bombay (stopped)	..	..	„		..	..	..	..	..	..	..	..	..	..	..	81½	81½	..	..	..	..	..	..	..	..	..
Totals, North Island	..	..	..	..	..	..	..	..	..	..	..	..	158,682	1,621	160,303	2,603,288	2,763,591	72	257	329						

NELSON.																											
Enner Glynn .. .	Wise, George ..	4	semi-bitum.	1	5′	all	vertical	..	2	8′ x 4′	..	..	..	..	..	1,337	1,337	..	..	..	..	..	..	..	..	..
COLLINGWOOD DISTRICT.																											
Pakawau	Walker, James ..	6	bitum.	1	3′ 10″	all	1 in 4	bord and pillar	..	5′ x 5′	150′	adit	743	696	1,439	1,726	3,165	2	10	12	horse	..	..	..	natural	17/8/00
Puponga	Taylor, Joseph ..	5	„	4	..	all	1 in 4	ditto	..	..	..	„	200	100	300	200	500	8	10	18	„	..	..	..	„	18/8/00
Mine not now at work.																											
Wallsend	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	47,413	47,413	..	..	..	..	..	..	..	..	..	
TAKAKA.																											
Mines not at work.																											
Motupipi	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	130	130	..	..	..	..	..	..	..	..	..	
Takaka, Takaka	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	70	70	..	..	..	..	..	..	..	..	..	
WESTPORT.																											
Mokihinui	Gibson, John	bitum.	1	9′ to 35′	9′ to 26′	1 in 6	bord and pillar	2	6′ x 9′	528′	adit	8,592	1,500	10,092	43,074	53,166	11	53	64	steam & horse	12″	8″	77′	„	19/12/00
Millerton	Green, John ..	9	„	1	4′ to 40′	12′	variable	ditto	3	10′ x 6′	33 chns. 38 chns.	incline-plane	131,607	26,522	158,129	292,469	450,598	69	174	243	gravity	12″	4″	140′	fans	22/12/00
Coalbrookdale	Dunn, W. ..	20	„	2	4′ to 20′	all	„	„	2	8′ x 8′	8,146′	adit										12″	6″	100′		31/12/00
										9′ x 5′	263 ch.		171,995	39,362	211,357	2,666,862	2,878,219	99	277	376	steam and compressed air	12″	5″	100′	„	29/12/00
Ironbridge	Sowerby, H. ..	9	„	2	4′ to 20′	„	„	„	2	8′ x 6′	9,048′	„										7″	6″	30′	..	
Mines not at work.																											
Westport-Cardiff	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	227,441	227,441	..	..	..	..	..	..	..	..	19/12/00
Waitakere	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	868	868	..	..	..	..	..	..	..	..	..	
White Cliffs, Buller Road ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	799	799	..	..	..	..	..	..	..	..	..	
Flaxbush	Morgarita, C. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	390	390	..	..	..	..	..	..	..	..	..	
THREE CHANNEL FLAT.																											
Cocksparrow	Cadigan, D. ..	6	glance	1	1′ 6″	all	vertical	tunnel	..	5′6″x4′6″	450′	adit	568	..	568	..	568	..	2	2	hand	..	..	..	..	11/9/00
Mines not at work.																											
Longford	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,830	1,830	..	..	..	..	..	..	..	..	..	
Alexander	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	282	282	..	..	..	..	..	..	..	..	..	
BOATMAN'S.																											
Mines not at work.																											
Archer's Mine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,280	1,280	..	..	..	..	..	..	..	..	..	
Coghlan's Mine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	370	370	..	..	..	..	..	..	..	..	..	
Barr's Mine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	35	35	..	..	..	..	..	..	..	..	..	
REEFTON.																											
Bourke's Creek	Davis, W. ..	3	semi-bitum.	1	14′	12′	varies	bord and pillar	2	9′ x 9′	360′	adit	1,197	..	1,197	1,269	2,466	2	4	6	horse	..	..	..	natural	21/11/00
Murray Creek	Betts, Lewis ..	21	ditto	1	14′	all	„	open face	..	..	..	..	443	..	443	9,622	10,065	1	..	1	hand	..	..	..	..	21/11/00
Phœnix	Fox, John ..	9	„	2	20′ & 30′	9′	1 in 6	bord and pillar	2	8′ x 6′	150′	adit	902	..	902	13,996	14,898	5	3	8	„	..	..	..	natural	21/11/00
New Inkerman	Jamieson, J. ..	3	„	1	5′	all	1 in 3	stoping	1	6′6″x4′6″	70′	„	405	..	405	749	1,154	..	1	1	..	..	..	..	„	20/11/00
Lankey's Creek	Lamberton, W. ..	18	„	1	5′	4′ 6″	level	tunnel	1	4′ x 6′	250′	„	176	..	176	7,956	8,132	..	1	1	hand	..	..	..	..	20/11/00
Progress New Mine ..	Cochrane, T. ..	2½	„	1	6′	all	30°	bord and pillar	2	11′ x 6′	300′	„	1,196	..	1,196	8,633	9,829	2	2	4	..	..	..	..	..	22/11/00
Breen's	Loughnan, H. ..	8	„	2	6′	„	vertical	tunnel	1	9′ x 6′	100′	„	60	..	60	1,553	1,613	..	1	1	..	..	..	..	..	22/11/00
Mines not now at work.																											
Devil's Creek	Macquham, J. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	40	40	..	..	..	..	..	..	..	..	..	
Golden Treasure	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6,625	6,625	..	..	..	..	..	..	..	..	21/11/00	
Cochrane's	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	370	370	..	..	..	..	..	..	..	..	..	
Reefton	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	40	40	..	..	..	..	..	..	..	..	..	

Statistics of Workings in Coal-mines, 1899—*continued.*

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. Size of Shaft or Adit.	Dimensions of Shafts. Depth of Shaft or Length of Adit.	Output delivered by	Output for 1899. Coal.	Output for 1899. Slack.	Output for 1899. Total.	Approximate Total Output to 31st December, 1898.	Approximate Total Output to 31st December, 1899.	Number of Men ordinarily employed. Above.	Below.	Total.	Power used for drawing Mineral.	Pumps. Stroke.	Pumps. Size of Barrel.	Pumps. Height of Column.	Means of Ventilation.	Date of Inspector's Last Visit.
													Tons.	Tons.	Tons.	Tons.	Tons.									
MIDDLE ISLAND—*continued.*																										
REEFTON—*continued.*																										
Sir Francis Drake	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2,173	2,173	..	..	..	..	..	..	..	..	..
Cumberland	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,070	1,070	..	..	..	..	..	..	..	..	..
Coal Creek	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	67	67	..	..	..	..	..	..	..	..	..
GREYMOUTH.																										
Blackball	Leitch, James ..	10	bitum.	2	17′	15′	1 in 5	bord and pillar	..	9′ x 6′	1,232′	„	79,716	2,800	82,516	274,047	356,563	34	141	175	steam	..	..	..	furnace	25/10/00
Brunner Dip Mine	Coulthard, J. ..	36	„	1	7′	all	1 in 4	ditto	2	10′ x 7′	2,400′	adit	88,115	37,288	125,403	1,594,027	1,719,430	14	126	140	steam	16″	8″	150′	fan	11/12/00
Brunner Rise „	Dando, M. ..	7	„	1	8′	„	1 in 4	„	2	10′ x 7′	600′	dip hd.						17	86	103	„				nat'l	12/12/00
Mines not at work.																										
Coal-pit Heath	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	577,190	577,190	..	..	..	..	..	..	..	..	..
Tyneside	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	18,398	18,398	..	..	..	..	..	..	..	..	..
Wallsend	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	205,539	205,539	..	..	..	..	..	..	..	..	..
CANTERBURY.																										
Springfield, Springfield ..	Campbell, P. ..	24	brown	1	3′ 3″	all	1 in 6	bord and pillar	2	6′ 6″ x 4′	70′	shaft	1,135	81	1,216	83,356	84,572	2	4	6	steam	direct st	acti ng		exhaust from pump	5/6/00
Sheffield, Sheffield	Austin, J. ..	37½	„	1	4′	„	1 in 3	ditto	..	7′ x 5′	..	dip incl.	234	..	234	52,050	52,284	..	..	..	horse	..	..	..	natural	6/10/00
Homebush, Glentunnel ..	Brown, T. ..	28	„	1	7′	„	1 in 3	„	..	7′ x 6′	40 ch.	adit	6,705	..	6,705	119,583	126,288	3	10	13	„	..	..	..	„	8/6/00
St. Helen's, Whitecliffs ..	Levick, H. ..	11	„	2	3′	„	1 in 2	„	..	6′ x 4′ 6″	..	„	1,755	..	1,755	5,147	6,902	1	5	6	hand	..	..	..	„	7/6/00
Hartley, Whitecliffs ..	Thompson, A. ..	5	„	1	..	..	1 in 6	„	..	6′ x 6′	3 ch.	dip tunl.	197	..	197	1,794	1,991	2	6	8	steam	..	..	..	„	7/6/00
Mount Somers, Mount Somers	Harris, W. ..	36	„	1	35′	all	1 in 9	open	..	..	..	open	1,987	1,042	3,029	31,397	34,426	..	6	6	hand	..	..	..	„	27/6/00
Rutherford's, Albury ..	Willetts, J. M. ..	9	„	1	22′	10′	1 in 1	bord and pillar	1	4′ x 3′ 6″	68′	shaft	663	..	663	1,921	2,584	1	2	3	horse	..	..	..	„	25/6/00
Elephant Hill, Waimate ..	Blackley, J. ..	32	lignite	1	..	..	..	..	..	..	..	..	28	..	28	90	118	..	1	1	..	..	..	..	„	10/8/00
Studholme's (Stony Creek) ..	Adamson, A. ..	11	„	1	..	..	..	bord and pillar	..	..	..	adit	115	..	115	94	209	1	2	3	..	..	..	..	..	10/8/00
Pits worked for Private Use.																										
Dalethorpe, Springfield ..	A. J. Nuthall ..	6	brown	1	..	..	..	..	..	..	..	..	15	..	15	169	184	1	1	2	..	..	..	..	..	..
Snowdon, Rakaia Gorge ..	G. Gerard ..	15	„	1	14′	8′	..	narrow	1	4′ x 4′	90′	shaft	100	..	100	1,368	1,468	2	2	4	..	..	..	..	..	..
Craigeburn, West Coast Road	D. Manson ..	4	„	1	..	..	..	„	..	..	..	adit	28	..	28	90	118	2	..	2	..	..	..	..	..	..
Springburn, Stavely ..	W. Healy ..	..	„	..	12′	..	..	..	..	..	7 ch.	tunnel	50	..	50	200	250	..	1	1	..	..	..	..	..	28/6/00
Waihao Forks, Waihao Forks	D. McPherson ..	8	lignite	1	..	..	..	open	..	..	..	open	27	..	27	171	198	..	1	1	..	..	..	..	..	10/8/00
Pits not now at work.																										
Wairiri, South Malvern ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,213	1,213	..	..	..	..	..	..	..	..	..
Acheron, Lake Coleridge ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	503	503	..	..	..	..	..	..	..	..	..
Kowai Pass, Springfield ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	559	559	..	..	..	..	..	..	..	..	..
Glenroy, South Malvern ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	115	115	..	..	..	..	..	..	..	..	..
Whitecliffs, South Malvern ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	33,051	33,051	..	..	..	..	..	..	..	..	..
Duke's (Park Gate) Kakahu	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	916	916	..	..	..	..	..	..	..	..	..
Spring Vale, Fairlie Creek ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	200	200	..	..	..	..	..	..	..	..	..
Mount Hutt, Rakaia Gorge ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	155	155	..	..	..	..	..	..	..	..	..

NORTH OTAGO.																										
Hakataramea, Hakataramea	McFarlane, D.	½	..	..	..	..	..	..	..	..	..	..	25	..	25	..	25	..	1	1	..	..	..	..	..	..
Awakino, Kurow	Porter, H. J.	21	brown	1	15′	7′	vertical	stoping	1	6′ x 2′ 6″	53′	adit	126	..	126	5,459	5,585	1	1	2	horse	..	..	..	natural	11/8/00
Sutherland's, Wharekuri	Shanks, A.	..	″	..	..	..	..	..	..	..	..	..	275	..	275	689	964	1	2	3	..	..	..	..	″	11/8/00
St. Andrew's, Papakaio	Nimmo, T.	22	″	1	8′	7′	1 in 3	bord and pillar	1	4′ x 2′ 6″	60′	″	1,691	..	1,691	26,177	27,868	1	4	5	horse	..	..	..	″	14/8/00
Prince Alfred, Papakaio	Willetts, J.	31	″	1	7′	6′	1 in 5	ditto	1	4′ x 4′	50′	″	1,185	..	1,185	42,700	43,885	2	5	7	″	..	..	..	furnace	14/8/00
Ngapara, Ngapara	Nimmo, W.	22	″	1	8′ to 25′	8′	1 in 4	ditto	1	6½′ x 4½′	15 ch.	″	1,021	..	1,021	15,923	16,944	1	2	3	″	..	..	..	natural	13/8/00
Shag Point, Shag Point	Shore, T.	37	pitch	2	5′ and 2′ 9″	all	1 in 4	ditto and longwall	3	16½′ x 6′	450′	shaft	15,859	5,350	21,209	365,650	386,859	13	54	67	steam	2′	6″	450′	steam from pump	20/11/00
Allendale, Shag Point	Gillanders, A.	13½	″	1	variable 3′ 6″ to 9′	″	1 in 4	bord and pillar	..	10′ x 6′	20 ch.	dip tunl.	12,068	4,527	16,595	130,375	146,970	8	46	54	..	...	..	..	Ditto	21/11/00
Pits not now at work.																										
Phillips, Kurow	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,985	1,985	..	..	..	..	..	..	..	..	..
Wharekuri (Collins) Kurow	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,424	1,424	..	..	..	..	..	..	..	..	..
Rosebery, Otepopo	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,424	1,424	..	..	..	..	..	..	..	..	..
Earlybank	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	281	281	..	..	..	..	..	..	..	..	..
Cairns, Kurow	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11,395	11,395	..	..	..	..	..	..	..	..	..
SOUTH OTAGO.																										
Fernhill, Abbotsford	Gray, J.	23	brown	1	19′	10′	1 in 10	bord and pillar	1	4¾′ x 4½′	..	adit	62	3,433	3,495	126,791	130,286	11	7	18	horse	..	..	..	natural	13/11/99
Freeman's, Abbotsford	Hill, R.	19½	″	1	6′ to 8′	all	1 in 9	ditto	3	5′ x 3½′ 10′ x 4′	125′	incline	4,885	4,118	9,003	235,489	244,492	3	16	19	steam	..	..	..	steam from pump	23/11/00
Walton Park, Walton Park	Kenyon, J.	30	″	1	15′ to 17′	12′	1 in 9	″	3	6′ x 4′ 12′ x 4′	25′ to 175′	″	10,525	943	11,468	531,721	543,189	3	15	18	″	..	..	..	furnace	24/2/00
Jubilee, Walton Park	Loudon, J.	3	″	1	18′	9′	..	″	..	..	..	adit	7,115	1,386	8,501	11,579	20,080	2	10	12	horse	..	..	..	natural	28/11/00
Saddle Hill, Saddle Hill	Christie, J.	26	″	1	19′	10′	1 in 10	″	3	5′ x 2′	50′	incline	1,334	7,447	8,781	99,243	108,024	4	9	13	″	..	..	..	″	28/11/00
Burnweil, Saddle Hill	Harris, A.	9	″	1	16′	10′	variable	″	1	5′ x 3′	30′	″	509	1,837	2,346	13,297	15,643	3	5	8	″	..	..	..	″	27/11/00
Glenochiel, Saddle Hill	Bryce, D.	19½	″	1	16′	7′	″	″	1	8′ x 4′	43′	″	..	1,764	1,764	21,420	23,184	1	2	3	″	..	..	..	″	27/11/00
Mosgiel, Saddle Hill	Sneddon, J.	17	″	1	15′	9′	1 in 10	″	2	4′ x 4′ 6′ x 4′	27′ to 32′	″	1,735	6,217	7,952	73,941	81,893	4	10	14	steam	..	..	..	″	27/11/00
Lauriston, Brighton	Walker, J.	14	″	1	6′	5′ 6″	variable	″	1	..	48′	″	273	73	346	4,787	5,133	1	2	3	horse	..	..	..	″	30/12/99
McColl's, Brighton	McColl, D. L.	12	″	1	6′	5′ 6″	″	″	..	..	..	″	..	..	..	1,122	1,122	..	..	..	″	..	..	..	″	30/12/99
Bruce, Milton	Young, A.	32½	″	1	15′	9′	1 in 8	″	..	..	..	adit	650	..	650	22,168	22,818	..	2	2	hand	..	..	..	″	19/12/00
Strip-and-at-it, Milton	Hardwick, N.	6	″	1	8′	6′	..	″	..	..	..	″	..	..	..	528	528	..	..	..	″	..	..	..	″	19/12/00
Reid's, Akatore, Milton	Reid, Jas.	6	″	1	14′	all	..	″	..	..	..	″	..	..	..	244	244	..	..	..	″	..	..	..	″	7/11/99
Fortification, Milton	Shore, J.	32½	″	1	20′	7′	..	″	1	4′ x 4′	..	dip	1,728	..	1,728	3,426	5,154	4	6	10	steam	..	..	..	steam from pump	19/12/00
Glenledi, Milton	McGilp, N.	..	″	1	20′	all	1 in 8	open	..	..	..	open	760	..	760	901	1,661	1	..	1	hand	..	..	..	..	19/12/00
Early Bank, Milton	Groves, W. A.	1½	″	1	..	..	..	narrow	..	..	..	″	66	..	66	254	320	..	1	1	″	..	..	..	natural	19/12/00
Adam's Flat, Adam's Flat	Reid, John	18	lignite	1	14′	10′	..	open	..	..	..	″	34	..	34	2,099	2,133	1	..	1	″	..	..	..	..	7/11/99
Paskell's, Adam's Flat	Paskell, J.	36	″	1	8′	all	1 in 6	″	..	..	..	″	8	1	9	447	456	1	1	2	″	..	..	..	..	7/11/99
Wallsend, Lovell's Flat	Hewitson, R.	30	″	1	20′	″	..	″	..	..	..	..	290	..	290	10,220	10,510	2	..	2	″	..	..	..	..	16/5/00
Lovell's Flat, Lovell's Flat	Carruthers, J.	6	brown	1	16′	8′	1 in 6	bord and pillar	2	11′ x 4′	465′	shaft	4,257	3,879	8,136	19,524	27,660	12	22	34	steam	..	..	..	steam from pump	16/5/00
Tuakitoto, Lovell's Flat	McDougall, M.	11	″	1	20′	8′	..	ditto	1	..	..	incline	12	..	12	3,060	3,072	..	1	1	horse	..	..	..	natural	2/11/99
Benhar, Stirling	McSkimming, P.	37	lignite	1	30′	12′	..	″	2	4′ x 4′	..	″	2,219	371	2,590	93,519	96,109	1	4	5	″	..	..	..	″	3/11/99
Mount Wallace, Stirling	Shaw, D.	6	″	1	14′	8′ to 10′	..	″	..	..	..	adit	642	..	642	2,340	2,982	..	1	1	hand	..	..	..	″	9/2/00
Kaitangata (including Castle Hill, Kaitangata)	Broome, G. H. (W. P. Watson, general manager)	24	brown	2	10′ to 40′	10′ to 35′	variable	″	2	13′ x 5′ 6″ &6′ diam.	704′	incline & shaft	70,895	41,560	112,455	1,257,108	1,369,562	40	268	308	steam	..	..	..	furnace	21/12/00
		7	″	1	5′ to 15′	..	..	..	1	10′ diam. 11′ x 6′ 6″	500′ & 2200′	incline tunnel	..	..	..	39,262	39,262	..	..	..	″	..	..	..	″	..
Wangaloa, Kaitangata	Smith, J.	20	″	1	10′ 6″	8′	1 in 6	″	..	..	..	adit	42	12	54	1,234	1,288	..	1	1	hand	..	..	..	natural	20/12/00
Lischner's, Waipahi	Lischner, F.	14½	lignite	1	15′	all	..	open	..	..	..	open	3,124	..	3,124	22,734	25,858	3	..	3	″	..	..	..	..	..

Statistics of Workings in Coal-mines, 1900—*continued.*

MIDDLE ISLAND—*continued.*

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. Size of Shaft or Adit.	Dimensions of Shafts. Depth of Shaft or Length of Adit.	Output delivered by	Output for 1900. Coal.	Output for 1900. Slack.	Output for 1900. Total.	Approximate Total Output to 31st December, 1899.	Approximate Total Output to 31st December, 1900.	Number of Men ordinarily employed. Above.	Number of Men ordinarily employed. Below.	Number of Men ordinarily employed. Total.	Power used for drawing Mineral.	Pumps. Stroke.	Pumps. Size of Barrel.	Pumps. Height of Column.	Means of Ventilation.	Date of Inspector's Last Visit.
South Otago—*continued.*													Tons.	Tons.	Tons.	Tons.	Tons.									
Pits worked for private use.																										
Taratu, Kaitangata ..	Fraser, H. H. ..	28	"	1	..	..	..	..	..	..	..	open	39	5	44	133	177	..	1	1	"	..	..	..	"	..
Pits not now at work.																										
Record, Kaitangata ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	414	414	..	..	..	..	..	..	..	..	..
Early Rise, Milton.. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	15	15	..	..	..	..	..	..	..	..	..
Chain Hills, Abbotsford ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	842	842	..	..	..	..	..	..	..	..	..
Salisbury, Mosgiel	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4,433	4,433	..	..	..	..	..	..	..	..	..
Bruce No. 2, Milton ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	23,322	23,322	..	..	..	..	..	..	..	..	..
Rigfoot, Stirling	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5,163	5,163	..	..	..	..	..	..	..	..	..
Morrison's, Stirling ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	646	646	..	..	..	..	..	..	..	..	..
Pomahaka, Pomahaka ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	20	20	..	..	..	..	..	..	..	..	..
Castle Hill No. 1, Kaitangata	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9,314	9,314	..	..	..	..	..	..	..	..	..
Crofthead, Kaitangata ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6,713	6,713	..	..	..	..	..	..	..	..	..
Langridge, Kaitangata ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	693	693	..	..	..	..	..	..	..	..	..
Lakeside, Kaitangata ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	700	700	..	..	..	..	..	..	..	..	..
Lesmahagow, Kaitangata ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,511	1,511	..	..	..	..	..	..	..	..	..
Cowpan's, Owaka	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	95	95	..	..	..	..	..	..	..	..	..
Shennan's, Waipahi ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	45	45	..	..	..	..	..	..	..	..	..
Central Otago.																										
Coal Creek, Roxburgh ..	Coskery, R. ..	30	lignite	1	unknown	50′	variable	open	..	..	..	open	1,150	..	1,150	18,416	19,566	4	..	4	horse	..	..	..	..	14/9/00
McPherson's, Roxburgh ..	McPherson, M. ..	30	"	1	"	30′ to 40′	"	"	..	..	..	"	1,777	..	1,777	18,910	20,687	3	..	3	"	..	..	..	..	14/9/00
Perseverance, Roxburgh ..	Craig, James ..	13	"	1	99′	70′	vertical	narrow	..	6′ x 7′	..	adit	1,093	..	1,093	12,940	14,033	1	4	5	hand	..	..	..	natural	14/9/00
Black Diamond, Roxburgh ..	Galvin, P. ..	..	"	..	..	..	..	"	..	..	..	"	..	..	..	232	232	..	..	..	..	..	..	..	"	14/9/00
Drummey's, Alexandra ..	Drummey, J. ..	..	brown	..	..	..	..	..	..	..	..	shaft	14	..	14	165	179	..	..	..	hand	..	..	..	"	17/9/00
Alexandra, Alexandra ..	Thomson, W. A...	20	"	1	14′	7′	..	bord and pillar	2	5′ x 2′ 6″ & 6′ x 4′	60′	adit	2,944	..	2,944	33,335	36,279	1	3	4	horse	..	..	..	"	17/9/00
Perserverance, Alexandra ..	Findlay, R. M. ..	..	"	..	..	..	..	ditto	..	..	..	"	2,226	..	2,226	724	2,950	2	4	6	"	..	..	..	"	17/9/00
McQueenville, Alexandra ..	Howie, J. ..	13	"	1	14′	7′	..	"	2	4′ 9″ x 3′	62′	shaft	4,230	..	4,230	28,484	32,714	2	4	6	"	..	..	..	"	17/9/00
Alexandra Coal Company, Alexandra	Carson, W. ..	..	"	..	..	..	..	..	..	..	..	"	6,207	..	6,207	3,128	9,335	3	16	19	..	..	..	..	..	18/9/00
Simpson Theyer's, Alexandra	Theyers, W. ..	3¼	"	1	..	..	..	..	..	..	..	"	..	..	..	1,636	1,636	..	..	..	..	..	..	..	..	17/9/00
Undaunted, Alexandra ..	Ballantyne, R. ..	1½	"	..	..	..	..	..	..	..	..	"	119	..	119	3	122	..	..	..	..	..	..	..	..	17/9/00
Cambrian's, Cambrian's ..	Dungey, C. ..	16	lignite	1	9′	all	..	open	..	..	..	open	327	..	327	13,219	13,546	2	..	2	horse	..	..	..	..	13/10/00
Welshman's Gully, Cambrian's	McGuckin, J. & R.	39	"	1	30′	"	..	"	..	..	..	"	1,601	..	1,601	26,638	28,239	4	..	4	"	..	..	..	..	13/10/00
Blackstone Hill, Blackstone Hill	Dunsmuir, A. ..	34	"	1	unknown	16′	..	"	..	..	..	"	96	..	96	2,321	2,417	1	..	1	"	..	..	..	..	..
Price's, Blackstone Hill ..	Price, G. ..	3	"	1	..	..	..	"	..	..	..	"	12	..	12	40	52	..	..	..	hand	..	..	..	..	..
St. Bathan's, St. Bathan's ..	Enwright, J. ..	3	"	1	..	..	..	"	..	..	..	"	537	..	537	900	1,437	2	..	2	horse	..	..	..	..	16/1/00
Rough Ridge, Idaburn ..	Beck, C. ..	14	"	1	35′	all	..	"	..	..	..	"	522	..	522	13,266	13,788	3	..	3	"	..	..	..	..	15/10/00
McLean's, Idaburn ..	McLean, L. ..	..	"	1	..	"	..	"	..	..	..	"	157	..	157	877	1,034	2	..	2	"	..	..	..	..	15/10/00
Idaburn, Idaburn ..	White, J. ..	30	"	1	20′	"	..	"	..	..	..	"	759	..	759	30,836	31,595	2	..	2	"	..	..	..	..	15/10/00
Border, Idaburn	Turnbull, G. ..	30	"	1	12′	"	..	"	..	..	..	"	1,203	..	1,203	5,179	6,382	1	..	1	"	..	..	..	..	15/10/00
Gimmerburn, Gimmerburn ..	Doughert, C. ..	35	"	1	12′	"	..	"	..	..	..	"	46	..	46	2,517	2,563	2	..	2	hand	..	..	..	..	15/10/00
Commercial, Kyeburn ..	Archer, C. ..	21	brown	1	10′	8′	vertical	stoping	..	..	..	shaft	641	..	641	12,593	13,234	1	2	3	water	..	..	..	natural	16/10/00
Dairy Creek, Clyde ..	Robertson, R. ..	28	"	1	40′	..	..	levels	..	..	..	incline	684½	..	684½	5,531	6,215½	..	..	..	hand	..	..	..	"	19/9/00
Vincent, Clyde	Turner, G. ..	..	..	..	40′	..	..	"	..	..	..	..	3,589½	..	3,589½	3,685	7,274½	2	6	8	"	..	..	..	"	19/9/00

Cromwell, Cromwell ..	Pollock, J. ..	5	"	1	..	..	..	..	1	..	..	shaft	..	..	..	3,019	3,019	..	..	..	horse	..	..	..	"	..
Cooper's, Cromwell ..	Cooper, J. ..	..	"	1	..	..	..	..	..	..	..	adit	65	..	65	320	385	..	4	4	hand	..	..	..	"	8/3/00
Cardrona, Cardrona ..	McDougall, R. ..	16	"	1	30′	all	..	open	..	..	..	open	1,323	..	1,323	7,706	9,029	2	4	6	"	..	..	..	..	24/11/99
Gibbston Saddle, Gibbston ..	Macale, M. ..	14	"	1	30′	"	..	"	..	..	..	"	647	..	647	4,427	5,074	1	3	4	"	..	..	..	..	22/9/00
Kawarau, Bannockburn ..	Campbell, J. C. ..	23	"	1	8′	"	1 in 4	bord and pillar	1	6′ x 6′	34′	incline	2,238	180	2,418	23,555	25,973	2	7	9	horse	..	..	..	steam from pump	21/9/00
Excelsior, Bannockburn ..	Parcell, W., Jun.	8	"	1	5′ 6″	"	1 in 4	ditto	1	..	..	"	2,616	9	2,625	6,544	9,169	2	8	10	steam	..	..	..	natural	21/9/00
Bannockburn, Bannockburn	Wilson, T. ..	11	"	1	5′	"	1 in 4	"	1	6′ x 4′	20′	adit	1,247	..	1,247	1,140	2,387	2	5	7	hand	..	..	..	"	20/10/00
Nevis, Nevis	Luscombe, E. ..	7	"	1	20′	"	vertical	open	..	..	..	open	820	..	820	1,619	2,439	1	..	1	..	..	..	..	..	12/3/00
Upper Nevis, Nevis ..	O'Connell, W. ..	..	"	..	..	..	..	"	..	..	..	"	..	..	..	65	65	..	..	..	..	..	..	..	..	..
Williamson's, Nevis ..	Williamson, A. ..	..	"	..	..	..	..	"	..	..	..	"	..	..	..	95	95	..	..	..	..	..	..	..	..	..
Ryder's, Nevis	Scott, C. ..	..	"	..	..	..	..	"	..	..	..	"	653	..	653	396	1,049	..	2	2	..	..	..	..	..	12/3/00
Clough and Allen's, Nevis ..	Holmes, R. ..	..	"	..	..	..	..	"	..	..	..	"	103	..	103	135	238	1	..	1	..	..	..	..	..	..
Pits not now at work.																										
Padgett's, Blackstone Hill ..	.. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	46	46	..	..	..	..	..	..	..	..	15/10/00
Waikerikeri, Clyde ..	Dunstan Coal Co. (J. Smart, sec.) ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	20,322	20,322	..	..	..	..	..	..	..	..	..
McCready and Coombes ..	Coombes, W. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	15,317	15,317	..	..	..	..	..	..	..	..	..
Gully Pit, Roxburgh ..	(Cockburn) ..	3	lignite	1	..	..	..	..	..	..	..	..	..	..	..	482	482	..	..	..	..	..	..	..	..	..
Enterprise, Alexandra ..	(Rivers) ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	703	703	..	..	..	..	..	..	..	..	..
Fennessy's, Idaburn ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	70	70	..	..	..	..	..	..	..	..	..
Cairnmuir, Bannockburn ..	(Crow & Anderson)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,451	1,451	..	..	..	..	..	..	..	..	..
Cooper & Gibson's, Bannock'rn	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5,395	5,395	..	..	..	..	..	..	..	..	..
Gibbston, Gibbston ..	(Cowan's) ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	19,464	19,464	..	..	..	..	..	..	..	..	..
Harrex and Owens, Cambrians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	60	60	..	..	..	..	..	..	..	..	..
Blackman's Gully, Clyde ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	144	144	..	..	..	..	..	..	..	..	..
Nulli Secundus, Bannockburn	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	632	632	..	..	..	..	..	..	..	..	..
Blackman's, Alexandra ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	89	89	..	..	..	..	..	..	..	..	..
Gibson's, Bannockburn ..	Gibson, J. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	220	220	..	..	..	..	..	..	..	..	..
Ritchie's, Nevis	Ritchie, James ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	75	75	..	..	..	..	..	..	..	..	..
Watherston's, Nevis ..	Watherston, A. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	5	..	..	..	..	..	..	..	..	..
SOUTHLAND.																										
Pukerau, Pukerau	O'Hagan, C. ..	20	lignite	1	16′	10′	1 in 10	bord and pillar	..	6′ x 7′	530′	adit	996	..	996	26,651	27,647	1	3	4	horse	..	..	..	natural	..
Waikoikoi, Pukerau ..	Scott & Ferguson	½	"	..	..	..	..	..	..	..	..	..	10	..	10	..	10	2	..	2	..	..	..	..	"	..
Dudley's, Pukerau	Nelson, J. H. ..	11	"	1	16′	all	..	open	..	..	..	open	251	..	251	2,204	2,455	1	..	1	hand	..	..	..	..	..
Whiterigg, Gore	Gray, H. ..	18	"	1	12′	"	..	bord and pillar	..	..	..	adit	1,032	..	1,032	6,615	7,647	1	3	4	"	..	..	..	natural	4/12/00
Heffernan's, Gore	Boyd and McNee	22	"	1	30′	15′	..	open	..	..	..	..	730	..	730	4,053	4,783	2	..	2	..	..	..	..	..	4/12/00
Gutschlag's, Gore	Gutschlag, W. ..	17	"	1	10′	all	..	"	..	..	..	..	90	..	90	3,162	3,252	..	..	..	..	..	..	..	..	4/12/00
Leitze's, Gore	Leitze, M. ..	21	"	1	4′ to 7′	"	..	"	..	..	..	..	17	..	17	1,398	1,415	..	..	..	..	..	..	..	..	4/12/00
Sarginson's, Gore	Sarginson, J. H.	14	"	1	..	..	..	"	..	..	..	..	15	..	15	1,421	1,436	..	..	..	..	..	..	..	..	..
Waikaka, Gore	Hoffman, F. ..	6	"	1	9′	all	..	"	..	..	..	..	70	..	70	534	604	1	..	1	..	..	..	..	..	4/12/00
Green's, Gore	Smyth, J. ..	12	"	1	19′	16′	..	bord and pillar	..	..	..	adit	4,016	..	4,016	18,025	22,041	5	..	5	horse	..	..	..	natural	4/12/00
Croydon, Gore	Hope, J. ..	..	"	..	..	..	..	..	..	..	..	..	25	..	25	..	25	..	..	..	..	..	..	..	..	..
Knapdale, Knapdale ..	Irvine, W. ..	15	"	1	26′	15′	almost vertical	wide headings	..	..	..	adit	622	..	622	5,403	6,025	..	1	1	..	..	..	..	natural	4/12/00
Hunter's, Otama	Hunter, T. ..	..	"	..	..	..	..	..	..	..	..	..	376	..	376	1,568	1,944	1	..	1	..	..	..	..	..	..
Harvey's, Chatton	Harvey, J. ..	23	"	1	16′ to 26′	16′ to 18′	..	open	..	..	..	open	376	..	376	12,928	13,304	1	..	1	..	..	..	..	..	24/1/00
Perkin's, Chatton	Perkins, A. ..	1	"	..	..	..	..	"	..	..	..	"	200	..	200	200	400	2	..	2	..	..	..	..	..	21/6/00
Pacey's, Chatton	Pacey, R. ..	24	"	1	unknown	14′	1 in 6	"	..	..	..	"	700	60	760	9,521	10,281	4	..	4	..	..	..	..	..	21/6/00
Johnston's, Waikaka Valley ..	Johnston, W. ..	7	"	1	11′	all	..	"	..	..	..	"	1,005	..	1,005	1,206	2,211	2	..	2	..	..	..	..	..	..
Thorndale, Waikaka Valley ..	Orchard, E. C. ..	½	"	..	..	..	..	"	..	..	..	"	20	..	20	..	20	2	..	2	..	..	..	..	..	..
North Chatton, Waikaka ..	McNee, J. ..	1	"	..	..	..	..	"	..	..	..	"	672	..	672	..	672	2	..	2	..	..	..	..	..	..
Reed's, Waikaka	Reed, R. ..	4	"	1	..	all	..	"	..	..	..	"	354	..	354	24	378	1	..	1	..	..	..	..	..	..
McGill's, Wendon Valley ..	McGill, J. ..	7	"	1	14″	"	..	"	..	..	..	"	323	..	323	1,425	1,748	2	..	2	..	..	..	..	..	..
Edge's (No. 14), WendonValy.	Nicoll, D. ..	..	"	..	..	..	..	"	..	..	..	"	230	90	320	966	1,286	..	2	2	..	..	..	..	..	..
Wendon, Wendon Valley ..	Evans, G. H. ..	22	"	1	16′	all	..	"	..	..	..	"	329	18	347	3,785	4,132	2	..	2	..	..	..	..	..	..
Radford's, (late Carmichael's, Waimea), Wendon	Radford, E. and P.	1	"	..	22′	..	..	levels	..	..	..	"	204	..	204	3,711	3,915	2	..	2	..	..	..	..	natural	4/7/00

Statistics of Workings in Coal-mines, 1900—*continued.*

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 1900.			Approximate Total Output to 31st December, 1899.	Approximate Total Output to 31st December, 1900.	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.		
MIDDLE ISLAND—*continued.*																										
													Tons.	Tons.	Tons.	Tons.	Tons.									
SOUTHLAND—*continued.*																										
Monaghan's, Landslip, Waikaia	Monaghan, R. ..	1	"	..	..	..	..	open	..	..	..	open	14	..	14	..	14	1	..	1	..	..	..	..	..	3/7/00
McIvor's (late Hill's), Landslip, Waikaia	McIvor, W. ..	9	"	1	15′	all	..	"	..	..	..	"	254	..	254	1,594	1,848	2	..	2	..	..	..	..	..	3/7/00
Goldie's, Landslip Waikaia	Goldie, T. F. ..	..	"	..	..	..	..	"	..	..	..	"	..	..	..	175	175	..	..	..	hand	..	..	..	..	3/7/00
Number One, Landslip, Waikaia	McKinnon, A. ..	½	"	..	..	..	..	"	..	..	..	"	113	..	113	..	113	..	1	1	..	..	..	..	..	..
Argyle, Landslip, Waikaia	Baxter, J. and T.	9	"	1	10′	all	..	"	..	..	..	"	512	..	512	1,165	1,677	1	..	1	..	..	..	..	..	23/1/00
Waimea, Longridge Village, Waimea	Smith, A. ..	10	"	1	3′	..	..	"	..	..	..	"	700	..	700	5,909	6,609	2	..	2	..	..	..	..	..	4/7/00
Pyramid, Mandeville	McAllister, E. ..	8	brown	1	18′	9½′	1 in 2	bord and pillar	..	..	..	adit	333	..	333	1,283	1,616	..	2	2	hand	..	..	..	natural	4/7/00
Waimumu, Mataura	Sleeman, C. P. ..	24	lignite	1	16′	all	..	open	..	..	..	open	6,475	..	6,475	31,393	37,868	7	..	7	..	..	..	..	..	30/5/00
Bogside, Mataura	Brown, H. ..	3½	"	1	16′	13′	..	"	..	..	..	adit	819	..	819	1,269	2,088	1	..	1	hand	..	..	..	..	30/5/00
Beattie and Coster's, Mataura	Coster, W. ..	24	"	1	16′	all	..	"	..	..	..	open	1,561	..	1,561	23,745	25,306	2	..	2	"	..	..	..	..	30/5/00
River View, Mataura	Nicol, L. D. ..	9	"	..	..	..	..	"	..	..	..	..	15	..	15	834	849	..	..	..	..	..	..	..	..	31/5/00
Duthie's, Waimumu	Duthie, J. ..	½	"	..	..	..	..	"	..	..	..	..	128	..	128	..	128	1	..	1	..	..	..	..	..	..
Munro's, Wyndham	Munro, E. ..	13	"	1	5′	all	..	"	..	..	..	open	412	..	412	10,739	11,151	2	..	2	hand	..	..	..	..	..
Ota Creek, Wyndham	Shields, W. ..	20	"	1	6′	"	..	"	..	..	..	"	540	..	540	8,906	9,446	2	..	2	..	..	..	..	..	..
Wyndham, Wyndham	Walker, William	5	"	1	..	"	..	"	..	..	..	"	179	..	179	74	253	1	..	1	..	..	..	..	..	..
Robin Hood, Pine Bush	Trotter, A. ..	19	"	1	15′	"	..	"	..	..	..	"	144	..	144	1,235	1,379	1	..	1	..	..	..	..	..	..
Graham's, Fairfax	Graham, P. S. ..	22	"	1	5′ 6″	"	..	bord and pillar	..	..	..	adit	563	..	563	12,320	12,883	..	2	2	..	..	..	..	natural	..
Spey Bank, Fairfax	Salton, R. ..	7	lignite	1	5′	all	..	Ditto	..	..	..	"	39	..	39	496	535	..	1	1	..	..	..	..	natural	..
Isla Bank, Fairfax	Slattery, M. ..	20	"	1	6′	"	..	open	..	..	..	open	436	..	436	4,637	5,073	1	..	1	..	..	..	..	"	..
Nightcaps, Nightcaps	Lloyd, J. ..	19	brown	3	38′ in the aggregate	..	..	bord and pillar	..	..	..	adit	27,840	..	27,840	238,878	266,718	16	37	53	horse	..	..	..	furnace	27/10/00
Wallace, Nightcaps	Darcy, C. ..	15	"	1	10′	all	..	open	..	..	..	open	1,738	..	1,738	18,409	20,147	4	..	4	hand	..	..	..	..	29/10/00
Alley's Reliable, Nightcaps	Alley, Jesse ..	8	"	1	7′	"	..	"	..	..	..	"	80	..	80	624	704	2	..	2	..	..	..	..	..	29/10/00
Quested's, Nightcaps	Quested, J. ..	..	"	..	..	..	..	"	..	..	..	"	125	..	125	392	517	1	..	1	..	..	..	..	..	29/10/00
H.B., Nightcaps	Lamont, — ..	2	"	1	6½′	..	..	bord and pillar	..	..	..	adit	463	..	463	343	806	1	2	3	hand	..	..	..	natural	29/10/00
Black Diamond, Nightcaps	Tinker, W. ..	..	"	..	..	..	..	..	..	..	..	..	..	..	..	220	220	..	..	..	..	..	..	..	..	29/10/00
Blythe, Nightcaps	Green and Spence	1	"	..	..	..	..	..	..	..	..	..	96	..	96	..	96	3	..	3	..	..	..	..	..	..
Morley Village, Nightcaps	Reed, W., jun. ..	½	"	..	..	..	..	..	..	..	..	..	301	..	301	..	301	..	4	4	..	..	..	..	..	29/10/00
Wairio, Nightcaps	McBride, A. ..	½	"	..	..	..	..	open	..	..	..	open	304	..	304	3,452	3,756	1	..	1	..	..	..	..	..	27/10/00
Brighton's, Nightcaps	Brighton, G. ..	1	"	..	..	..	..	..	..	..	..	..	22	..	22	..	22	..	..	..	..	..	..	..	..	..
Orepuki, Orepuki	Straw, M. ..	..	oil-shale	..	..	..	..	developing	..	..	..	adit	..	1,412	1,412	5,483	6,895	7	25	32	..	..	..	..	steam from pump	21/4/00
Pits worked for private use only.																										
Waikoikoi, Pukerau	Kirk, W. ..	13	lignite	1	6′	all	..	open	..	..	..	open	16	..	16	254	270	..	..	..	..	..	..	..	..	..
Glover's, Pukerau	Glover, A. ..	6	"	1	..	"	..	"	..	..	..	"	25	..	25	59	84	..	..	..	..	..	..	..	..	..
Ford's, Chatton	Ford, P. ..	20	"	..	..	..	..	..	..	..	..	..	400	..	400	*	400	..	..	..	..	..	..	..	..	..
Otama, Otama	Graham, T. ..	7	"	1	..	all	..	open	..	..	..	open	40	..	40	195	235	..	..	..	..	..	..	..	..	..
Cross's, Otama	Cross, Mrs. (owner)	..	"	..	..	"	..	"	..	..	..	"	12	..	12	52	64	..	..	..	..	..	..	..	..	..
Mutch's Mataura	Mutch, J. ..	10	"	1	4′	"	..	"	..	..	..	"	27	..	27	261	288	..	..	..	..	..	..	..	..	..
Nichol's, Gore	Nichol, W. ..	..	"	..	..	"	..	"	..	..	..	"	10	..	10	..	10	..	..	..	..	..	..	..	..	..
Marshall's, Edendale	Marshall, H. ..	9	"	1	3′	"	..	"	..	..	..	"	50	..	50	440	490	..	..	..	..	..	..	..	..	..
Jones, Edendale	Jones, E. and A.	6	"	1	..	"	..	"	..	..	..	"	40	..	40	240	280	..	..	..	..	..	..	..	..	..
Mount Linton, Nightcaps	Chalmers, N. G.	10	brown	1	10′	8′	..	"	..	..	..	"	60	..	60	554	614	..	..	..	..	..	..	..	..	..

Pits not now at work (stopped recently).																												
Smyth's, Gore																	7,107	7,107										
Boyd & McNee (late Black's), Greenvale																	478	478										
Glendhu, Mataura																	347	347										
Southbrook, Waikaka																	117	117										
Smith's, Mataura																	55	55										
Edendale, Wyndham	McDonald, A.																1,997	1,997										
Neill's, Edendale																	79	79										
Valley Road, Pukerau																	3,062	3,062										
Pits not now at work.																												
McDonald's, Waikaka																	696	696										
Moffet & Longshaw's, Waikaia																	72	72										
Townshend's, Mataura																	489	489										
Town's, Mataura																	8,002	8,002										
Carr's, Mataura																	518	518										
Porter's, Pukerau																	22	22										
Dickson and Walker, Croydon																	37	37										
Hokonui, Hokonui																	52,084	52,084										
Slaughter-yards, Mataura	(Freezing-works use)																83	83										
Perseverance, Pukerau									open				open				2,052	2,052										
Frank's, Pukerau									"				"				45	45										
Rejefsky's, Gore									"				"				57	57										
Clukoski's, Gore									"				"				28	28										
Kirk and Sheddon, Gore									"				"				140	140										
Fryer's Excelsior, Gore									"				"				807	807										
Dryden's, Gore									"				"				438	438										
Kingdon's, Gore									"				"				27	27										
Westbrook, Greenvale									"				"				175	175										
Middlemiss, Greenvale									"				"				15	15										
Marshall's, Otama																	48	48										
Maslin's, Wendon																	854	854										
Vial's Perseverance, Waikaia																	631	631										
Cambrian (McIvor), Waikaia																	191	191										
Northcote's, Waikaia																	685	685										
McGowan's, Mataura																	125	125										
Genge's, Wyndham																	2,819	2,819										
Monaghan's, Pine Bush																	11	11										
Morley Village (Brazer's)																	2,096	2,096										
Cluny, Orepuki																	156	156										
Totals, Middle Island																	739,604	194,083	933,687	10516227	11449914	545	1586	2131				
Totals, North Island																	158,682	1,621	160,303	2603288	2763591	72	257	329				
Grand Totals																	898,286	195,704	1093990	13119515	14213505	617	1843	2460				

Add output of following twelve mines, included in previous statement but now abandoned: Motupipi, 360 tons; Westport-Wallsend, 3,441 tons; Waimangaroa, 17,307 tons; Wellington, 2,299 tons; Inkerman, 2,665 tons; Inglewood, 314 tons; Devil's Creek, 343 tons; Inangahua, 71 tons; Murray's Creek No. 2, 450 tons; Burke's Creek, 300 tons; Reefton, 36 tons: total	27,586
Add output of Waikaka, Adams's Flat, and Waimea Mines, inserted twice in statement for 1891	6,518
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; and Wyndham, 1,988 tons: total, 3,090 tons	132,732
Output of mines included in former statements, but whose operations were suspended prior to 1889	172,529
	14552870

* Been working twenty years, raising 20 tons per annum.

NOTE.—Reed's Pit, Waikaka, and Walker's Pit, Wyndham, have been transferred from pits worked for private use to pits worked for sale.

With the exception of Hunter's, Otama; Carmichael's, Waimea (now worked by E. and P. Radford); Wairio, Wairio, Nightcaps (worked by A. McBride); and Orepuki, Orepuki (M. Straw, Manager for New Zealand Coal and Oil Syndicate, Limited), which were returned last year as not at work, have been transferred to pits at work; and, with the addition of the pits above, under head of "Pits not now at work," the pits not now at work are the same as last year.

Approximate Cost of Paper.—Preparation, not given; printing (2,200 copies), £26 1s.

JOHN HAYES, Inspecting Engineer.

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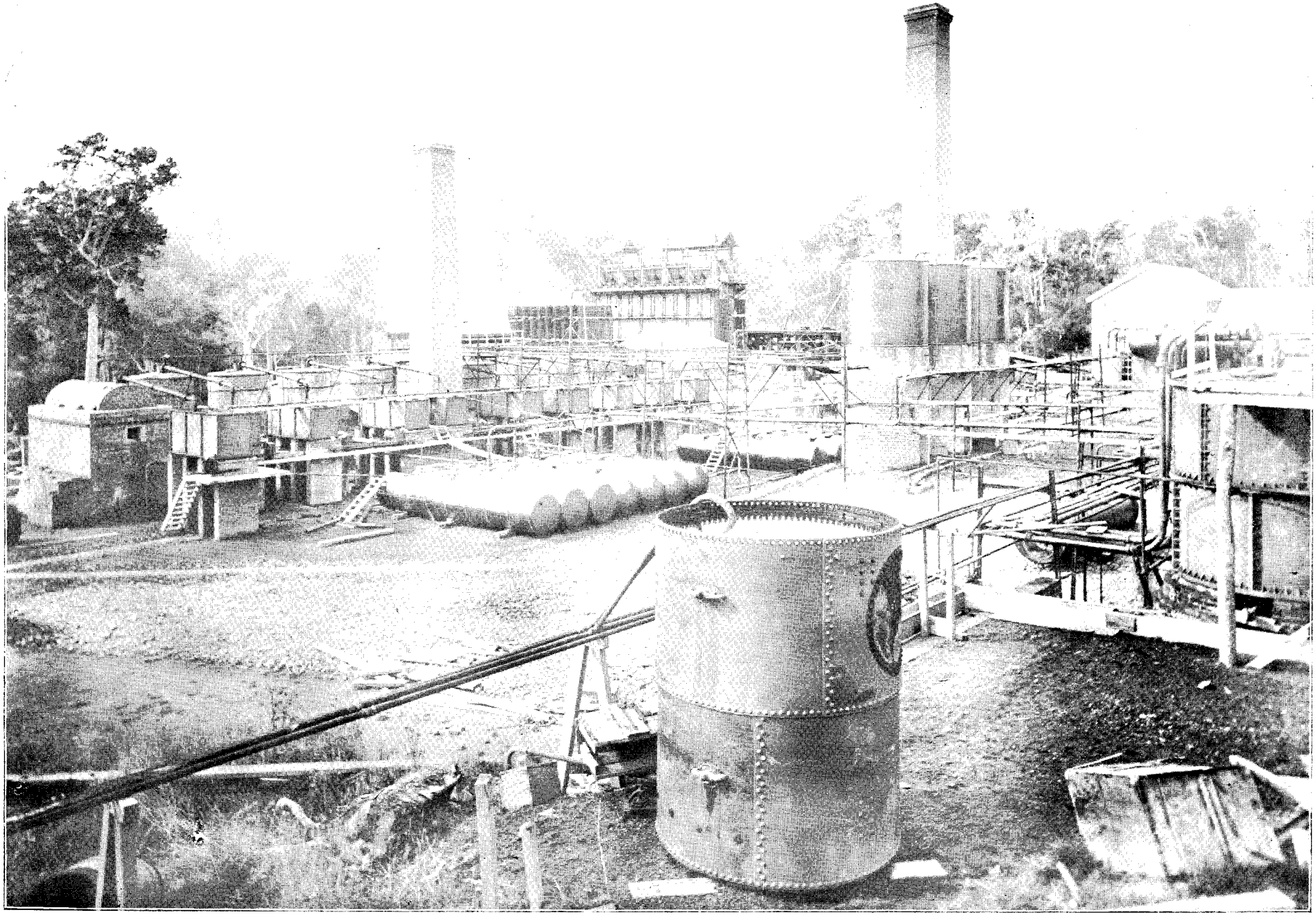

Orepuki Oil- and Shale-works.

Orepuki Oil- and Shale-works.

C. 3A.