1902.

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, 23rd April, 1902.

I have the honour to submit my annual report (covering those of the Inspectors of Mines for the several districts) for the year ending 31st December, 1901.

The output for the respective districts is summarised as follows :—

Class of Coal, &c.	Northern District.	West Coast District.	Southern District.	Total.
	Tons.	Tons.	Tons.	Tons.
Bituminous and semi-bituminous coal ...	87,055	667,898	...	754,953
Pitch-coal	...	...	14,584	14,584
Brown coal	88,029	1,637	315,486	405,152
Lignite	...	...	52,949	52,949
Oil-shale	...	...	12,048	12,048
Totals	175,084	669,535	395,067	1,239,686

Compared with the output of the previous year, this shows an increase of coal and lignite amounting to 133,648 tons, which, together with 12,048 tons of oil-shale from the mine at Orepuki (Southland), brings up the total net increase in the production of the mines to 145,696 tons.

The following table will show the ratio of increase and decrease in the output of the various classes of coal produced in the districts under the supervision of the several Inspectors of Mines :—

Class of Coal, &c.	Northern District.		West Coast District		Southern District.		Total Increase.	Total Decrease.	Total Net Increase.
	Increase.	Decrease.	Increase.	Decrease.	Increase.	Decrease.			
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Bituminous and semi-bituminous coal	7,376	...	73,715	...	...	...	81,091	...	...
Pitch-coal ...	...	...	...	...	...	23,220	...	23,220	...
Brown coal ...	7,405	...	1,637	...	56,324	...	65,366	...	...
Lignite	...	...	...	...	10,411	...	10,411	...	...
Oil-shale	...	...	...	...	12,048	...	12,048	...	...
Totals ...	14,781	...	75,352	...	78,783	23,220	168,916	23,220	145,696

The approximate total quantity of coal, &c., raised at the several mines of the colony up to the 31st December last is 15,792,556 tons.

The number of mines at work is returned at 149, the number of persons employed being 2,754. This shows that fewer mines were worked than was the case in the previous year, but it is to be remembered that in many instances small lignite-mines (many of these being mere quarries) are worked in a very spasmodic fashion for private consumption and limited local requirements. The decrease in the number of the mines worked is thus largely explained. The number of persons employed shows an increase of 294 as compared with the previous year.

Taking the average output per person employed, a slight increase is to be noted—viz., 450·1 tons, as against 444·71 tons in 1900. This is doubtless due in a great measure to the use of coal-cutting machinery at the collieries of the Westport Coal Company (Limited), and the amount of pillar-working at other collieries in various parts of the colony, as well as to the amount of lignite obtained in open-face workings.

During the year there were three persons killed whilst engaged in coal-mines. This gives one fatality for every 918 persons employed and 413,228·6 tons raised. Such results as these are proof of the care exercised in the management of the mines, the larger places especially. A number of minor accidents, such as are incidental to the work of coal-mining, have occurred in the various districts, and at many small collieries the demands on the Coal-miners' Relief Fund have been out of all proportion to the local contributions. It is to be feared that this fund is sometimes abused, and medical officers should co-operate with managers and Inspectors to check any attempts at imposition.

Since the services of an assistant were granted to Mr. Green, Inspector of Mines for the Southern District, it has been possible to inspect the mines more frequently than hitherto, and quite as often as is necessary or desirable.

Prosecution.

Only one prosecution was instituted by the Department during the year. In this instance proceedings were taken against a mine-manager for defective ventilation, and a fine was imposed by the presiding Magistrate.

Westport-Cardiff Colliery, Seddonville.

As intimated in my last annual report, the fire in the old workings is confined to a small strip of coal where the seam is exposed in the cliffs above Chasm Creek and to the rise of the water with which the mine is flooded to as high a level as conditions allow.

This colliery being in the hands of the Government, prospecting operations were commenced in the latter part of the year to determine the extent of coal in a hitherto unworked portion of the property known as "The Cave Area," with a view to the opening-up of the same for the requirements of the Government service. It gives me pleasure to state that these prospecting operations have been very satisfactory. As the existing railway-sidings, loading-bins, and plant can be utilised in conjunction with the working of this area, the Government will be able to commence coal-mining operations here at a very much less capital cost than would be the case with an entirely new colliery undertaking. It is intended that in future the property shall be known as the "Seddonville Colliery."

Shale-oil and Briquette Manufacture.

The New Zealand Coal and Oil Company (Limited) have got their shale-mine and oil distilling and refining plant at Orepuki into the productive stage, and experiments have been made in the direction of utilising the slack from the company's collieries at Kaitangata for the manufacture of briquettes. It has been found that one of the products from the shale-oil makes an excellent agglomerant, the resultant briquette being very compact and hard. I understand that it is the intention of the company to go into the matter on a commercial scale.

Mechanical Ventilation.

A new fan has been installed at Ralph's Mine, Huntly (Taupiri Coal-mines Company, Limited), and since the commencement of the present year a fan built on the lines of that designed by myself to meet the requirements of colonial mines, and described in the report of last year (goldfields division), has been set to work at the Orepuki Shale-mine. This is 9 ft. in diameter, and at a speed of 180 revolutions circulated a volume of air amounting to 33,120 cubic feet of air per minute, with a water-gauge reading of $1\frac{1}{10}$ in. It is to be noted that prior to the fan being put to work the air was travelling in the opposite direction, a long line of uncovered steam-pipes in the main incline causing that to be the upcast. The fan had therefore to overcome and reverse this, and results would naturally have been somewhat better under more favourable conditions. A photograph of this fan (which is fitted with sides of steel plate) is reproduced. It is to be regretted that wood instead of concrete was adopted for the base, also that the connection with the engine has been made by spur-gearing instead of belting. This latter feature was adopted so as to adapt an existing engine to the work. Similar fans, varied in proportions to suit the actual requirements of work, are being constructed for other collieries.

Examination of Coalfields.

In accordance with instructions received, an examination of several properties on the West Coast coalfields, with the object of obtaining information and data for the guidance of the Government in the consideration of the proposal to establish one or more collieries for the requirements of the public service, was made by Messrs. H. A. Gordon (formerly Inspecting Engineer to this Department), A. Jamieson (late of the Westport Coal Company, Limited), A. McKay (Government Geologist), and myself. These properties were duly reported upon.

Fires in Coal-mines.

The liability to the spontaneous ignition of worked-out (or partially worked) ground in our coal-mines has led me to give some consideration to the subject, and in connection with this matter I trust that the combination of an extensive Home as well as colonial experience may be considered sufficient to justify my present remarks.

It is well known that coals of a hydrous character are more susceptible to spontaneous ignition than those of a more anhydrous nature, and on this account the occurrence of fire in mines working brown coal is more frequent and usual than in the case of mines where bituminous or anthracite coals are worked. In consequence of fires a very considerable tonnage of coal has been irrecoverably lost. This is not to be wondered at in the case of many mines in the colony which have been laid out on a system (or, in many instances, a want of system) whereby efforts to localise the extent and effects of a fire can seldom be crowned with success. It must not be inferred that the management is to be entirely blamed for this, although a want of special knowledge and experience in the laying-out of underground workings in such a manner as to minimise the risk of damage by fire is frequently apparent. Owners of mines are frequently to blame for not seeking the advice of mining engineers who have had practical experience in this matter, and also for requiring a fairly large output long before it is possible to open out the mine sufficiently to warrant such an output being legitimately obtained. It is quite a common but altogether erroneous idea with persons whose knowledge of these things is limited, that a good output can be obtained, and profits made, almost as soon as the coal has been struck, and this very notion on the part of mine shareholders, combined with shortage of capital, has been responsible for the loss of very large areas of coal not only in this colony, but all over the world. If a colliery is to be worked successfully there must be some well-defined plan laid out for the general development of the field, and this applies equally to both large and small holdings. Our coalfields are a national asset, and every care ought to be exercised to prevent undue loss or waste. There is no doubt that the granting of leases in excess of reasonable and legitimate requirements to men who have neither the capital nor knowledge to work the areas to the best advantage has been productive of much loss of coal by fires and other causes. Such men seldom have any idea as to the sizes of pillars which should be left in the inward working to allow of safe and economical extraction from the boundary backwards, nor the means nor knowledge to keep such pillars in proper shape, the result being that pillars are often found to be only feet in width where they ought to be yards, or even fathoms. With such haphazard mining a "crush" or "creep" may be brought on, and a fire ensue. Under a want of system such as this—no provision having been made to effectively deal with such a contingency as fire—the closing of the mine and consequent loss of coal is almost inevitable.

The point I now wish to impress is, that where there is a natural tendency towards spontaneous ignition the plan to be adopted for working a mine should receive very careful and serious consideration, and some method ought to be devised by which fires can be localised and kept under control. The accompanying sketch-plan will help to illustrate my meaning; and although I do not claim that the method shown will answer all requirements—different conditions requiring different treatment—yet the general system (which may be modified to meet local conditions) is one which I think is worth adoption, and has been proved of undoubted value in some of the English coalfields which are peculiarly liable to fires, and where thick seams, lying at a high angle of inclination, are worked.

Reference to the plan will show that I have selected for example a seam of coal won by means of an incline from the outcrop of the coal itself. The practical mind will at once grasp the scheme and adapt it to other forms of entry. The relatively small number of collieries in the colony which are worked from vertical winding-shafts is really the reason why I have adopted the dip-incline system as an illustration; and in this connection I may remark that in some of the English colliery districts where fires are frequent and the seams fairly steep it is usual to sink the shafts as near the outcrop as is practicable, and drive inclines to the dip boundary, allowing the mine-water to follow up the incline as section after section of the coal is exhausted, and so fill up the worked-out ground.

The plan shows a main incline (preferably about the centre of the field) driven to the dip boundary. This forms the main haulage-road and intake airway, and would be advantageously worked by an endless rope. On each side of this is an airway for conveying the return air from the workings of the separate sides of the main incline. These are joined near the fan, an air-crossing spanning the main incline for this purpose. Levels are to be driven from the bottom of the incline to the boundary on each side, and no bords or other workings (except the necessary stentons) are to be cut until the levels have been extended to a distance equal to the length of three panels from the boundary. The rise headings (one of which is to form the jig from the intermediate levels) are then commenced, and the main levels continued to the boundary. The rise headings referred to are pushed forward with all speed, intermediate levels driven, and headings again driven a convenient distance to the rise, as shown on the sketch-plan. Thus the coal is cut into "panels," and bords are then driven from the inbye heading of No. 1 panel towards the boundary. When the upper bords have reached the boundary (or boundary barrier, if such be required) the work of taking out the pillars from the inbye end is commenced. This operation is followed on in order from the other bords in rotation, the resultant work being practically as shown in No. 1 panel on plan. The bords in No. 2 panel will be cut about the same time as the pillars from the corresponding parts of No. 1 panel are being extracted, but they are not to be driven through to the headings of No. 1 panel (see plan). A substantial barrier must be left solid for the time being between the inbye ends of the bords from No. 2 panel and the headings of No. 1 panel. This isolation of broken ground between one panel and another forms the crux of the whole system, the size of the barrier being determined by the thickness and dip of the coal and other local conditions. It will be seen from the plan that pillar-extraction has been commenced in No. 2 panel, and the barrier of coal left in.

I will now assume that fire occurs in the goaf of No. 1 panel after the pillars have been for the greater part extracted. This can at once be controlled by breaking down the stopping C and erecting stoppings at A and B. A quicker method would be to have doors fixed at A and B, which

could be promptly closed on the outbreak of fire, stoppings being immediately afterwards built behind them. This same system will, of course, apply throughout, and its value is apparent. By keeping each panel isolated (so far as goaf is concerned) an outbreak of fire may be confined to itself and more readily extinguished owing to its limited area. On the other hand, if the pillars in the panel are all exhausted and no outbreak of fire has taken place, a rise heading can be quickly driven in the middle of the barrier pillar and the coal extracted. In this way no coal is lost, and the only coal lost in the event of fire is the barrier and the balance of unworked pillars in any panel; but even in this latter instance it might be possible to work the coal so left (after it has been satisfactorily proved that the fire has been extinguished) from the headings connected with a lower level. It will be noticed that the headings of No. 4 panel are not connected with the intermediate levels. In this case a barrier pillar is left until No. 1 panel is exhausted. If fire exists in No. 1 panel, the safety of No. 4 panel from fire in the neighbouring panel is assured; but should No. 1 be exhausted without any sign of fire, then No. 4 panel workings can command the coal right up to the low side of No. 1 panel.

At collieries where there is a liability to fires the adoption of some such system as that outlined would do much to keep fires under control and save the loss of valuable coal. It may be urged that the initial expense of developing the mine would be more than some owners or lessees could afford, but in many instances this could be met by setting apart a convenient block of coal for complete exhaustion (such block being sealed off after being worked out), which would provide funds for the general adoption of the system, and that this would pay best in the end admits of no question.

Examination for Managers' Certificates.

The papers used at the examination held early in the present year are appended.

The list of persons holding certificates as managers of mines, and the schedule of statistics of output, persons employed, &c., are also appended. I have, &c.,

JOHN HAYES,
Inspecting Engineer.

The Under-Secretary for Mines, Wellington.

No. 2.

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

SIR,— Inspector of Mines' Office, Thames, February, 1902.

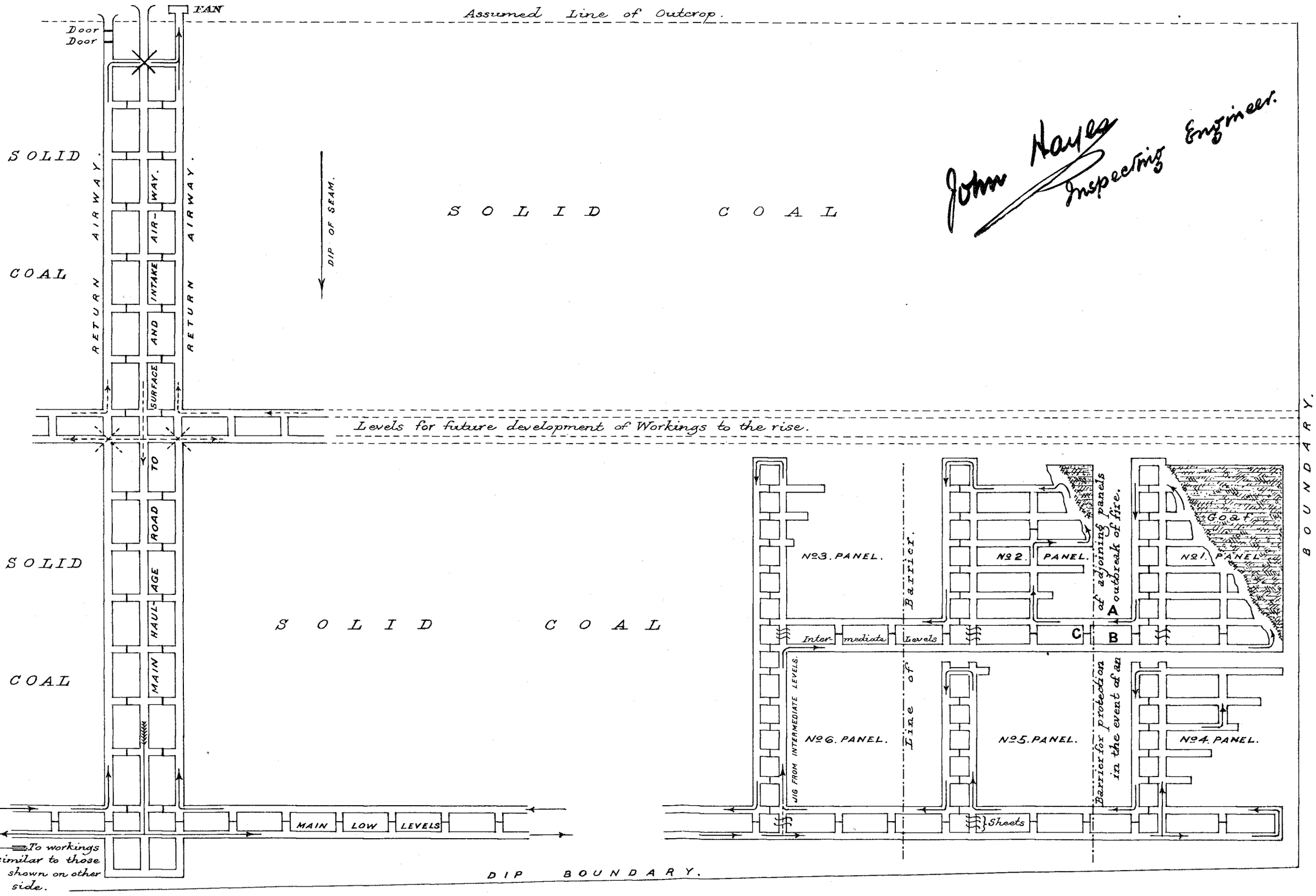
I have the honour to transmit the following report on the coal-mines in the Auckland District for the year ended the 31st December, 1901, in compliance with section 67 of "The Coal-mines Act, 1891":—

Kawakawa.—This mine is still being steadily worked by Mr. John Culley, who has six men employed. The operations in the early part of the year were directed to taking out a small patch of coal on what is termed "Moody's Outcrop," and some pillars of coal adjacent that were left in by the old company. The seam varied from 2 ft. to 4 ft. in thickness. As the coal here was getting exhausted, the manager directed prospecting-work to be done on Caraway's Hill for the purpose of finding pillars of coal said to have been left in at this particular place, and for this work he applied to the Hon. the Minister of Mines for assistance. A grant of £1 for £1 to the extent of £75 was made, and, as it proved to be a larger undertaking than was at first anticipated, the pillars were not reached by an adit incline until £183 had been expended. To all appearance the work will prove a success, and will pay for the outlay, as coal is now being obtained from here in payable quantities, and the prospects of getting coal to keep the present number of men employed for some time to come is assured. This mine was inspected twice during the year. The ventilation was good, and the mine was safe. Abundance of props, &c., were kept on hand to be put in as required.

Hikurangi Coal Company.—The following is an abstract from Mr. Moody's (manager's) report on this company's mine which may be of interest: "During the year several openings have been made by tunnels in which patches of coal have been found, but on the north side of the main workings faults are frequently met with, and in consequence the areas of coal between those faults are limited. One of the principal works has been the construction of a ground-tramway 28 chains in length to connect No. 6 tunnel with the place where the trucks from the mine are tipped into the railway-wagons. This tunnel is northerly from the main workings, and is near the self-acting incline of the Hikurangi Collieries Company. In this section a fine belt of coal has been opened up, averaging nearly 11 ft. in thickness, and as it is above water-level the coal can be put in the wagons at a very small cost. In the headings above the south level of the main workings the system of haulage has been altered where the grades are steep, self-acting inclines having been adopted, with dummies running up to counterbalance the loaded trucks as they are lowered down to the main level, and the bords, instead of being driven as formerly straight up on the rise of the coal, are now driven nearly parallel with the main level. The company has been successful in being able to supply the demand for the coal, and with highly payable results, and to all appearance will be able to do this for some time to come. 39,593 tons was raised during the year, this being the largest output since the company commenced operations. They now contemplate opening up the western area of the property, adjoining the West Bryan's Mine, and intend to drive a level from near the railway-siding for the purpose of unwatering this portion of their property."

The following report and analysis on five samples of coal from this mine were made by Sir James Hector in 1896: "Nos. 1 and 2, top and bottom of new dip seam (thickness, 9 ft. to 14 ft.); No. 3, from near dip fault; No. 4, from splint seam; No. 5, from the fault (iridescent coal).

Sketch Plan to illustrate notes on Fires in Coal Mines.



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All these coals are almost precisely the same character, and belong to the class of semi-bituminous coals, as they do not form a compact lustrous coke like a bituminous coal. In purity and usefulness as fuel they are equal to the average West Coast coal, and superior to the coal first mined at Hikurangi, and also to the Kawakawa coal. The following results of analysis have been supplied by Mr. Skey:—

	1	2	3	4	5
Fixed carbon	53·29	53·28	54·03	54·26	57·16
Gas and oil	41·82	41·89	39·94	38·91	35·70
Water	3·62	3·60	3·82	3·01	4·01
Ash	1·27	1·23	2·21	3·82	3·13
	100·00	100·00	100·00	100·00	100·00

"The evaporative powers are as follows:—

1	2	3	4	5
6·90 or 11·68	6·90 or 11·68	7·00 or 11·91	7·05 or 11·93	7·43 or 12·62

"The first entry of evaporative power gives the pounds of boiling water which the coal will evaporate as computed on the old formula, and the second is the result computed by the formula now used in New South Wales. Nos. 1, 2, 3, and 5 are compact laminated coals, with bright lustre and black shining streak. The colour of the ash is light reddish brown. The brilliant iridescence, or 'peacock coal bloom,' on No. 5 is caused by thin films of silica on the joints of the coal. No. 4: Splint coal; is very compact and hard, so that it would stand handling well. It has a bright pitchy lustre, is without lamination, but is cut by joints coated with lime and films of pyrites. Its ash is light grey, and the streak is dull brown."

The mine was inspected on the 2nd June and 27th November, and on both occasions the ventilation was good and the workings safe. A good supply of timber was on the ground.

West Bryan's and Phœnix Coal-mines.—These two mines, which adjoin each other, were closed down for some time, but operations have been resumed, Mr. S. C. Brown and others, of Auckland, having secured the rights from the owners of the land to work the coal conjointly by the stipulated royalty per ton. In the West Bryan's section the work has been principally confined to taking out pillars, from which 5,989 tons of coal has been won since the mine was unwatered, and an average of ten men have been employed. In the Phœnix section a good deal of trouble was at first experienced in trying to pump the water out, the boiler supplied not being of sufficient power to work the pump. On the coal being worked out from the dip in the West Bryan's section the engine and boiler were no longer required at that place, and were removed to the Phœnix, when the difficulty of unwatering this section was got over. The work is principally directed to taking pillars out of this section, which will in a short time be exhausted. Since operations were again commenced the output of coal has amounted to 992 tons. An average of nine men are employed. The two mines are under the management of Mr. A. L. Goold. The mines were inspected twice during the year, and operations were being carried on in a satisfactory manner.

Hikurangi Collieries Company (Limited).—Operations in this mine were carried on in the early part of the year (up till the month of April), when it was closed down pending arrangements being made with the owners of the adjoining property. As no agreement could be arrived at, the company again commenced prospecting operations on the north-east portion of their property. It was found to be necessary to do this as the coal in the former workings was nearly worked out. 3,786 tons of coal was obtained from this mine during the year.

Ngunguru Coal-mine.—This mine has been working for a period of nine years, and is situated on the south side of, and at an altitude of 150 ft. above, the Ngunguru River. The mine is opened up from the surface of the hill by three adit inclines or headings, but these are some distance apart and at different levels. In the A district (or main portion of the mine) the main heading was extended in a southerly direction for a distance of nearly 2,000 ft. from the mouth of the tunnel, and the bords carried east and west of the heading for a few chains until either the seam became too small to work or was cut off by a fault, and for some time past the operations have been chiefly in the direction of extracting the pillars, which are of small size, and by this means the coal is being rapidly exhausted.

B district, west: A dip incline was put down on the coal for nearly 500 ft. The haulage from here is being done by a vertical portable engine of 6-horse power. In this district bords are being extended on thin coal, but the pillars are also being operated upon, and it will only be a short time before most of the coal is worked out. There is an excellent band of fireclay on the top of the coal, some of which is occasionally sent to Auckland to be made into bricks, &c., and it is to be regretted that a considerable quantity of this valuable clay will be completely lost as the pillars of coal are withdrawn.

C district: This is opened up by a dip incline, but so far the coal-seam has been very much disturbed by faults. At present a crosscut drive is being driven through a fault to a point where a borehole was put down to a depth of 120 ft., and 4 ft. of coal was met with. As this is a new discovery, it is fully expected a large area of coal will be eventually opened up here.

The output of coal during the year was 17,789 tons, and the average number of men employed was forty-seven. The mine was inspected on the 28th June and 28th November; the ventilation was good, and great care is taken by the manager to prevent accidents to the men, a plentiful supply of props and timber always being at hand. Three accidents were reported during the year, one of which turned out more serious than was at first anticipated. The injured workman was on the Coal-miners' Accident Relief Fund for seven months and a half, and, as the medical officer attending him gave a certificate to the effect that he was permanently disabled, it was recommended that a sum of £50 be paid to him in full satisfaction of all further claims on the fund.

Kiripaka (Panipo) Mine.—As mentioned in my last annual report, the amount of coal in sight in this mine is very limited; the seam in places is 20 ft. thick, from 6 ft. to 12 ft. being worked. The coal is semi-bituminous, is of fair quality, and is largely used by the coastal steamers; but unfortunately the outcrop has been touched at all points. The pillars are at present being withdrawn, and can only last for a few months. Prospecting and boring has been done on the hills in the immediate neighbourhood, but so far nothing of importance has been discovered. 15,968 tons of coal has been won from the mine during the year, and an average of sixteen men have been employed. The mine was inspected twice during the year, and everything was being carried out satisfactorily.

Taupiri Coal-mines (Limited).—This company's operations during the year have been principally directed to the working of coal in the Taupiri Reserve and Ralph's sections to supply the market.

In the Taupiri Extended section only four men have been employed, in driving a pair of headings to develop this part of the property. These have been driven to the westward 8 chains, to a point under the river, and from the headings seventeen bords have been opened out; but, as sufficient coal was obtained to supply the demand, there was no necessity to increase the output, and in consequence the bords were not advanced. These headings are now stopped temporarily, and two are being driven from the lowest point in a northerly direction to further prove the value of this freehold.

Taupiri Reserve: This section has been continuously worked during the year, operations being confined to extending the Nos. 3 and 4 levels and working the bords, &c., to the rise. In the early part of the year the coal passed through was very soft, but eventually an excellent class of coal was met with, which has now been driven on for some considerable distance. The No. 4 level has been driven in a south-westerly direction a total distance of 33 chains from the bottom of the engine incline, and the incline is down a distance of 28 chains from the surface. As mentioned in my last annual report, the ventilation in this section was not as good as could be desired; but this has since been greatly improved by all the wooden stoppings being taken out and replaced by brick-and-mortar walls from the mouth of the incline to within a reasonable distance of the face of the level. The upcast shaft has been retimbered, new ladders put in, and the old workings made safe where required.

Ralph's Taupiri: In this section work has been vigorously pushed ahead. More than half of the coal won from the company's mines was obtained from here. The underground engine incline has been extended, and is now down a total distance of 20 chains and 320 ft. vertical from the surface. As the seam is rising ahead, a large area of coal will be won from this point. In the early part of the year the brace (or pit-bank) was raised 5 ft. at the shaft, and the tramway leading from the shaft to the tipplers was laid down on a slight grade, so that by this means the full skips gravitate to the tipplers, where they are emptied into the railway-wagons, the empties being brought back to the shaft by a creeper chain. This is worked by a small engine, which is capable of being regulated to any speed required, a considerable amount of manual labour being thus saved. A new 80-horse-power boiler has been erected as an additional power to work the machinery, &c.; also a new workshop has been built and fitted up with lathes, drills, screwing-machines, &c. Siding-accommodation has also been made sufficient to allow thirty-five wagons to stand behind the tipplers. The mines were inspected three times during the year, and, as considerable improvements have been made generally, there is now little to complain of.

The total output of coal from these mines for the year ended 31st December, 1901, was 75,742 tons. An average of 160 men were employed.

Harrison's Taupiri.—The operations in this mine are carried on from a dip incline which was sunk on the coal for a distance of 330 ft. The seam is 24 ft. thick, and from 16 ft. to 20 ft. is worked. As this mine is situated on the outcrop of Ralph's old mine, the amount of coal to be obtained from here is limited; but the company has been successful in raising 8,344 tons of coal during the year at a small cost. The company has also directed their attention to prospecting for coal on the rising ground at Pukemirio, some six miles to the westward of the Waikato River at Huntly, and the manager informs me that they have been successful in discovering a seam of coal 20 ft. to 24 ft. in thickness over a large area of ground. An average of thirty men have been employed by this company. The mine was inspected three times during the year, and the ventilation was found to be good and the workings safe.

Maramarua Coal-mine (late Miranda).—This mine is worked by a syndicate (of which Mr. William Tattley, sen., is at the head), whose operations so far have been limited. An adit incline has been put down from the surface about 14 chains south of the Miranda Coal Company's old shaft. The incline is down a distance of 360 ft., and the coal in the face at the time of my visit was of good quality, but the work then was chiefly confined to driving a return airway. A good deal of trouble was at first experienced with the water—which had accumulated in the old workings—percolating through the coal more rapidly than the small Tangye pump could contend with, but an additional pump and boiler were obtained, and when put in position the water difficulty was overcome. A large quantity of coal could be raised from this mine, as the seam is 55 ft. thick in places and extends over a large area; but, as the mine is a considerable distance from the Government railway, the cost of putting it on the market is thereby increased, which makes it a difficult matter to compete against those mines having facilities for putting the coal direct from the mine into the railway-wagons. As the syndicate has only lately got into the producing stage, the output up to the end of December was only 430 tons of coal. An average of ten men have been employed. The mine was inspected on the 7th December. The workings were safe, and an air-course was being made for the purpose of ventilating the mine.

Taranaki Collieries (Limited), Mokau.—The properties formerly known as the "Marysville" and "Fernside" have been amalgamated, and are now known as the "Mangapapa," the property

being owned by the above-named company. For some time past it has been worked by Mr. Stubbs, under an arrangement with Messrs. Robertson and Vickery, of Sydney, who represent the Taranaki Collieries (Limited). The company have been building new steamers suitable for extending the trade, and when operations are commenced on the company's account it is fully expected the work in the mine will be more systematically carried on than formerly. The amount of work done during the year has been very limited, the output being only 3,513 tons, mostly obtained from the Marysville section, an average of ten men being employed. The mine was inspected on the 21st October last, when it was found that the ventilation was not as good as could be desired. The bords in progress were being carried forward too wide, and were not driven to lines; thus the pillars had in places been encroached on, making them useless as supports. The manager's attention was again called to the system on which the mine was being worked, and it was pointed out to him that the ventilation would have to be improved, and alterations be made as to the mode of working the mine.

Drury.—Mr. Wallace has sent in a notification that he has commenced to open up the old Drury Coal-mine, and has four men employed.

Ohinemuri.—Two coal leases of 100 acres each have been granted in this district, and prospecting operations are now being carried on at one of them near the Rahau Road, between Karangahake and Owharoa, but so far nothing of importance has been discovered.

ACCIDENTS.

The following are the names of persons injured in the mines north of Auckland who sent in claims to be placed on the Coal-miners' Relief Fund (the number of days they were absent from work and the amount received by each are also given): John Manderson, Ngunguru Mine, 44 days, £4 11s. 8d.; William A. Fife, Ngunguru Mine, 50 days, £5 4s. 2d.; Edward Roberts, Ngunguru Mine, 198 days, £20 10s. 5d., and a sum of £50 was paid to Edward Roberts in satisfaction of all further claims of the fund: making a total of £80 6s. 3d.

In the mines in the south of Auckland (Huntly) twenty-seven miners were injured, and were absent from work on 378 days, and received the usual sick-pay from the Relief Fund, amounting to £39 7s. 6d. This money is paid through the Waikato Medical and Accident Association, who also pay an equal amount to the miners injured, in terms of clause 6 of the amended regulations for the management and administration of funds and moneys under section 69 of "The Coal-mines Act, 1891."

There were no serious accidents in this district during the year, except that Edward Roberts had his hip injured by a loaded skip, which the medical officer considers will disable him for life.

I have, &c.,

JAMES COUTTS,

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

No. 3.

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

SIR,— Inspector of Mines' Office, Westport, 24th March, 1902.

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, 1901:—

Enner Glynn Coal-mine.—With regard to mining, nothing further has been done on this property during the year.

Payne's Ford Coal-mine (F. Payne, owner).—The coal from this small mine is chiefly used for private domestic purposes and burning small parcels of lime for the land.

Motupipi Coal-mine.—Mining continues to be at a standstill. Messrs. Bishop and Griffiths have taken away several samples of coal from this property, leaving impressions amongst the people that operations would commence at an early date.

Pakawau Coal-mine (Caldwell Bros., owners).—(20/11/1901): The irregular shipments of coal necessitated suspension of operations from the 19th January till the 25th February. From this date work continued steady until the end of September; but, as improvements in transport did not have the favourable results anticipated, the full employment at the mine is now confined to one man and two lads. The coal-seam worked on No. 2 dip of south level is 3 ft. in thickness, parted in centre by a 2 in. stone band, which tends to break amongst the coal. Timbering is strictly attended to, and ventilation very good.

Puponga Coal-mine (owners, Puponga Coal Company).—(20/11/1901): The dilatory system of development adopted by the management of this property is not consistent with the modern practice of mining engineering. The condition of these neglected premises, viewed from a practical standpoint, proves that laxity of effort is not an effective element in establishing a legitimate industry. Dealing with the coal lease held by Mrs. Annie Taylor, which commands a valuable coal-seam, the low level skirting the dip outcrop boundary has been driven on a splendid face of coal, and securely timbered for a distance of 2½ chains. Construction of the 2 ft. gauge steel-laid tram-line, 113 chains in length, drags slowly along, and the plant which is already forwarded to equip the colliery does not improve from exposure to the elements.

Cape Coal Prospecting Syndicate (Osborne and Smith, borers).—No. 1 boring pierced three thin coal-seams of non-commercial value in a total depth of 402 ft. No. 2 boring: Comparing the strata at a depth of 35 ft., the indications are more favourable than those met with in No. 1 bore-hole.

Mokihinui Coal-mine (James Armstrong, mine-manager).—(13/11/1901): This co-operative company continued mining operations in the Big Face Mine until all marketable coal was practically exhausted. Prior to stoppage of this section of working, the acute overhead pressure, acting directly on the weak pillars, absolutely crushed out the old stopping formerly built to suppress the original fire. After fighting against these unfavourable conditions and rebuilding several of the fresh outbreaks with stone-and-mortar stoppings, it was evident that all practical efforts to suppress the rapid progress of the fire were ineffective, and tended only to increase further unnecessary expenditure. Consequently the removal of plant was made imperative, the hill being then left a smouldering mass. Operations were then commenced to open out from a fresh outcrop on the Hutt seam, about 1 chain above the "by-throw." Driving was continued on good coal for a distance of 4 chains, when the dip-heading face being cut off by an acute depression of the roof-formations necessitated fresh development. After completion of the necessary work, another 2 chains driven on soft coal disclosed extensive faulting which intersected the measures north-easterly, liberated excessive water, and made further driving impracticable. At present mining is confined to removal of pillars next the outcrop in the Hutt seam old tunnel-workings.

Cardiff Mine, Seddonville.—The prospecting of the Cave area on behalf of the Government has been systematically carried out under the direction of Mr. John Hayes, Inspecting Engineer to the Mines Department. The flooding of the "old mine" by means of dams built in the main tunnel has proved most effective in extinguishing the fire formerly located in this terrace, overlooking the Chasm Creek Bridge, and extending southwards towards Cave area. Above the water-line the fire is gradually extending northward in a few small pillars left next the side of the cliff and a thin seam outcrop of no commercial value. This should cease at a fault not far away.

Millerton Colliery (owners, Westport Coal Company; George Fletcher, mining manager).—(5/12/1901): The most efficient modern developments in ventilation, haulage, and coal-cutting by machinery, embodying the practical factors of safety and economy, have been utilised in the progressive and persevering efforts made by the proprietors of the colliery to render it, in point of equipment, worthy of a first place on the New Zealand coalfields, success of productiveness being based on the minimum of risk to life and property. The reputation gained by the excellent heating properties of the coal for naval and commercial purposes necessitated double shifts being recently established in order to meet the rapidly increasing trade requirements. The increase of output over the preceding year (49,988 tons) was the largest recorded. Prior to pillar-extraction in the east dip workings natural drainage was effected by driving a low-level rock crosscut, undercutting the dip headings at a depth of 20 ft. This tunnel is capable of providing effective precautions against the possible spread of fire, which may arise in the event of spontaneous ignition, by means of flow-pipes fitted with stop-valves built into concrete dams. Thus drainage and flooding are effected at will. In the Mine Creek area the effective mining and mechanical developments attained are practically capable of maintaining the standard output, assuming the east dip workings were cut off by unforeseen circumstances. Ventilation has been materially improved since the brickwork of the fan-enclosure was completed. Hence the measured constant air-volume—50,000 cubic feet per minute—effectively sweeps the workings with an average fan-speed of ninety revolutions, which speed is equal to one-half the effective ventilating-power. The air-compression installation has been further supplemented with increased steam and machine power, while the fan has been furnished with the latest devices in speed and "tell-tale" recorders. Important additional engine-power recently added to the hydraulic-brake installation on Nos. 1 and 2 haulage inclines has materially simplified the motion of the ropes, and reduced the risk of the chain-clips slipping on them. The company's workshops, situated at Granity, on the Government railway-siding, have undergone extensive enlargement and improved general equipment. The whole surface arrangements, including workshops, screening and tipping appliances, and haulage inclines, are efficiently lighted by a newly erected electric installation. Storage-bins with a capacity of 3,000 tons are nearly completed. The reports recorded at the colliery by the company's officers and the men appointed on behalf of the miners were highly satisfactory during the year. A brick-built fully equipped lamp-station and other suitable offices were recently erected at the mine-mouth. No serious accidents were reported.

Denniston Collieries (owners, Westport Coal Company, Limited; Alfred B. Lindop, mining manager).—It is gratifying to state that these collieries continue to show a marked increase of output. The total tonnage sold for commercial purposes—226,193 tons—is the largest on record. Of this total, the percentage won by percussive pick-machines actuated by compressed air was three-fourths, while one-fourth was won by hand-labour at tonnage rates.

Coalbrookdale Mine (15/11/1901): Mining operations in the Cascade west section have practically been free from fault-lines during the year. Skirting the Look-out outcrops, the presence of several stone bands threatened a thinning of the coal-seam, but their limited course caused little inconvenience on the working-face. Consequently, an extensive unbroken field is anticipated over a wide area. In order to facilitate the haulage and ventilation of this district, a rock crosscut started direct from the working-face to connect with the main haulage-road is nearly completed. This direct connection will also give free access to exhaust the pillars south of the 12 ft. fault-line. The dip heading driving south towards Cascade Creek is progressing satisfactorily on a splendid face of coal. As the result of extensive prospecting in the Cascade district, 40 chains east from the rope-road and dip of Munsie's jig, a recently proved valuable coal-seam of superior quality and thickness awaits development. Munsie's pillar section west of the dip heading is successfully exhausted direct to the outcrop, the miners being fully employed on a valuable section of solid working recently opened on the east side of same heading. Ventilation is maintained by furnace built on the surface directly connected with upcast shaft. There have been no additions to the air-compression installation. Reports kept to date, and other provisions of the Act strictly observed. No serious accidents reported. Air-measurement, 28,500 cubic feet per minute.

Ironbridge Mine (14/11/1901): An abrupt intrusion of the underlying formations having displaced the Cedar seam directly in line of main dip heading, fresh developments made deviation from the original heading necessary to win the coal southwards towards Mount William, the variable dip of the measures being purely characteristic of the West Coast coalfield. Extraction of pillars continues to be carried out in the Fan and Kiwi districts with success. The solid section of the Kiwi district is exclusively worked by percussive pick-machines under very favourable natural conditions. The drainage-tunnel (which starts from a low level on the North Waimangaroa River) to effectively unwater the whole areas in the Ironbridge Mine is being vigorously worked on three shifts with Leyner's wet drills, actuated by compressed air. Completion of this much-needed and important work will dispense with all underground pumping machinery, and give free access to exhaust large areas of long-standing pillars that could not otherwise have been worked owing to probable influx of surface-water through the broken overhead strata. Ventilation of this tunnel is maintained by a fan driven by water-power. Needless to say, the working-conditions are perfect. A section of the main haulage-road, driven through broken hillside formation, shows signs of movement between the "big curve" and Ironbridge main dip heading. As this road commands the full volume of haulage, stoppage means total suspension of operations. Meantime a temporary deviation is being made to insure against risk provided a slide should occur. Afterwards a permanent roadway, driven on defined lines through solid country, will be constructed to cut off all irregular gradients and curves such as exist in the present roadway. The air-compression installation, situated at Kiwi, on the south bank of the North Waimangaroa River, has been further supplemented with steam and machine power. The plant is very nicely kept. Reports are kept to date. Air-measurement, 18,000 cubic feet per minute.

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

Cocksparrow Coal-mine (owner, Antonio de Philippi).—(7/12/1901): This thin vertical coal-seam (chiefly worked to supply the Mokoia dredge with steaming-coal) is well timbered and ventilated.

Whitecliffs Coal-mine.—(6/12/1901): Job Lines, the original lessee, recently reopened this mine with the object of supplying steaming-coal for dredging purposes on the Buller River. The coal is thick and is of superior quality.

Coal Creek Coal-mine (George Walker, Rocklands, lessee).—(6/12/1901): The most important rise section of this coal-seam is opened from a securely timbered low level, undercutting the main road. Rocklands and other dredges on the Buller River are supplied with this coal.

Golden Treasure and Murray Creek Coal-mines.—(26/10/1901): As these adjoining, partially exhausted, and open-face leases contained a quantity of superior steaming-coal of easy access which the original owners could not dispose of, James Billet, carrier and contractor, Reefton, recently bought over all mining rights in order to insure the Murray Creek battery with regular supplies at reasonable rates. Since change of ownership loading facilities are much improved by direct dray-road to the place.

Lankey Creek Coal-mine.—(26/10/1901): William Lamberton, who formerly owned this mine, had to suspend operations owing to the lease being "jumped."

Bourke's Creek Coal-mine (owners, Cairns and McLiver).—(23/11/1901): The effort to cut the anticlinal fault-line on the west adit-face and No. 2 incline has been disappointing, as the thinned coal underlying a very bad roof made further driving dangerous and expensive. Natural conditions, however, indicate that, to win the coal-seam economically, developments to open the field from the north side of the terrace are necessary. Meantime trade requirements are being supplied from the removal of rise pillars, while drainage is being effected at the lowest surface-level. Reports kept to date.

Phœnix Coal-mine (owner, John Fox).—(26/10/1901): The development of this mine is carried out in a safe and orderly manner, and the mined coal takes a first place for household purposes. Two parallel headings are being pushed to crosscut an intersecting fault-line and connect the bottom and rise sections of working. This connection when completed will open the main portion of the field and insure ventilation. At time of writing the property has changed ownership. Reports are kept to date.

Archer's Freehold.—(25/10/1901): The coal mined is from an adit level connected by rises to the surface at regular intervals for ventilation. Instructions were given to replace the timbers in tunnel-entrance, which shows side-pressure. Output has largely increased for dredges and mining purposes.

New Inkerman Coal-mine.—(28/10/1901): This coal is exclusively used for steaming purposes at Rainy Creek. Ventilation is good from a direct rise to daylight.

Devil's Creek Coal-mine.—(30/10/1901): This coal lease, recently granted to James Connolly, Reefton, is shut down, and all movable plant removed.

Loughnan's Coal-mine.—(28/10/1901): In consequence of the coal-seam being exhausted to water-level in the old mine, the dray-road has been extended to open a new face.

Progress New Mine.—(30/10/1901): The mined coal is taken from removal of pillars in the rise level, working homewards from the dividing fault-line. Care is taken to thoroughly secure the ground, and win the coal without loss. An outcrop shown on east side of creek was opened, but results proved a slide.

Waitakere Coal-seam.—(31/12/1901): Local demands are supplied from five separately sub-divided sections of the coal-seam. Some of the well-kept faces supply good lumpy coal.

Blackball Mine (owners, Blackball Coal Company, Limited; Joseph Scott, mining manager).—(12/12/1901): As referred to in my report of last year, the discovery of "gob-fire" on the 30th November, 1900, necessitated flooding, and, after natural drainage was effected, mining operations were resumed on the 11th February. From this date mining continued without further

interruption until a fresh outbreak occurred in No. 3 incline on the 24th April, 1901. Unfortunately, an efficient natural water-supply was not available; but the services of the Greymouth Fire Brigade, supported with engine-pump, were effective in locating and suppressing the fire in four days. Experience having thus taught the management the urgency and economy of providing an efficient water-supply for future emergencies, prompt action was taken to lay down a direct 3 in. pipe-line from Coal Creek, 3,500 ft. in length, fitted with suitable T branches, and nozzles on each heading, capable of discharging 6,000 gallons per hour with a head-pressure equal to 150 ft. Thus the heated areas over the most important sections of the mine are capable of being suppressed without loss of time. It is, however, to be regretted that, notwithstanding the strict daily supervision, and constant precautions taken to insure absolute safety to life and property, spontaneous ignition continues to be a growing source of trouble and anxiety, especially where heating occurs in soft pyritical coal underlying large bodies of loose sand discharged from the rapidly disintegrated soft-sandstone roof, a condition which practically defies percolation, and necessitates shafts to be sunk through the heated *débris* to freely admit full volumes of water into the seat of fire. Speaking generally on the working-conditions of the mine, expenditure extending over two years was incurred in crosscutting and grading No. 1 west main haulage-road through a series of extensive displacements in the bottom seam, when, after driving a distance of 400 ft. through thin and inferior coal, the coal-seam ultimately nipped out. Having considered the uncertain position of the old workings with regard to fire, and also that the coal-seam could be more practically and systematically developed from the deeper levels, the management, at this juncture, decided to abandon further prospecting, and pillar-extraction was commenced homeward from the fault-boundary. So far the method of extraction adopted to win the highest percentage of coal with safety is by splitting and working the stumps backward, a system which may be considered doubtful, as overhead pressure, resulting from the exhausted ground, will act as a second factor of danger in creating spontaneous fire, besides involving a large cost in unrecovered timber. Favourable progress is made in the development of the dip section under steam-pumps, preparatory to driving permanent water-lodgment for electrical installation, which has just arrived. This installation, supplied by Chandler and Taylor, has automatic cut-off 8 in. diameter horizontal cylinders with 10 in. stroke, and range of speed from 270 to 350 revolutions per minute, and is connected direct to a 4-pole generator with a kilo-watt capacity from 18 to 22, capable of driving one of Evans's 9 in. by 9 in. treble-barrel horizontal ram-pumps. The plant is fitted with compound clutch-gear suitable for wire rope or direct motor movement. The steam-power has been recently increased by a 40-horse-power boiler of the Lancashire type, while Anderson, of Christchurch, is building a new Cornish boiler, which is expected early at the colliery. Reports are kept to date. Air-measurement, 27,000 cubic feet per minute.

Brunner Mines (owners, Greymouth-Point Elizabeth Coal Company; Robert Alison, mining manager).—Considering that the gross tonnage mined was won from partially exhausted pillar areas, it is eminently satisfactory to note that the output for the year 1901 shows a substantial increase of 6,613 tons as compared with the preceding year.

Brunner Dip Mine (John Coulthard, mine-manager).—(12/12/1901): The rise and dip areas inside the "big fault" line having become totally exhausted and flooded to the adit level in the commencement of the year, trade requirements necessitated that the pillar area outside the fault-line should be opened from the adit level in conjunction with the two already working new districts. Subsequently, however, to withdrawal of the workmen from the old to the new workings a complication occurred between the management and the union with regard to lighting, as safety-lamps had been exclusively used in the inside workings, while naked lights were used in the rise districts outside the fault. However, an amicable solution of the difficulty was arrived at, and naked lights declared universal. The principle of pillar-robbing formerly practised in this district, before it was abandoned, incurred unnecessary risk to pick out the remaining stumps next the fault, the roof and floor being met together. The sizes of unworked pillars are now, however, found to be more uniform. Ventilation under direct fan control receives strict attention, and a measured air-volume of 20,000 cubic feet per minute is constant. Reports and other provisions of the Act are strictly kept.

Ladysmith Mine (Joseph Herd, mine-manager).—(12/12/1901): Practically this recently opened central district of old pillar-working has not only proved a profitable factor in maintaining the increased output from the Brunner Mine, but a source of employment was opened for a large number of residents. The extraction of coal from this district has so far been very successful and free from serious accident. Mechanical ventilation has taken the place of natural since direct communication with the adit-level district was completed, the whole system being under direct control of the fan. Reports are kept to date. Official examinations strictly made. No serious accidents reported.

Brunner Rise Mine (Maurice Dando, mine-manager).—(12/12/1901): As proof of the rapid exhaustion of the Brunner Mine, I have to record that the rise and dip sections of the Coolgardie areas are successfully worked out, and a new face of pillars opened near the outlet of the main self-acting haulage incline intersecting what is locally named the "fireclay" district. This area of workings (recently opened by two parallel rise headings) is calculated to exhaust the pillars located between the Ladysmith and Coolgardie districts, from which the supply of fireclay for brick-making is chiefly obtained. The general characteristics of the roof are good, and the coal is of splendid quality. Reports are kept to date.

It is noteworthy that the monthly inspections reported at the colliery office, under section 33, subsection (46), of the Coal-mines Act, by the persons appointed on behalf of the miners are highly commendable.

ACCIDENTS AND FATALITIES.

Ironbridge Mine, Denniston Colliery (30/5/1901).—A miner named William Hendy, while working in the "big pillars," was killed by a fall of coal. Verdict: "Accidental death."

Mokihinui Mine (9/1/1901).—A pony-driver named John Bain was kicked on the head by his horse. Injuries were not serious.

GENERAL REMARKS.

Comparing the productive capacities of the large collieries with the increased trade requirements for 1901, the ratio of increased production, as compared with 1900, has fully confirmed anticipations, which in itself is a source of considerable satisfaction. It is, however, to be regretted—if the present condition of trade be any guide on which to base approximate statistical calculations for the forthcoming year—that at the time of writing the Brunner Mines, which produced 127,016 tons last year, has reduced employment to single shift, while the Mokihinui Mine has been practically at a standstill for some time past. These facts point to a descent of prosperity which cannot be overlooked from a commercial point of view.

The export of coal from the Westport Coal Company's collieries to places outside the colony for the twelve months ended 31st December, 1901, amounted to 32,236 tons, as compared with 17,470 tons in 1900, and 6,955 tons in 1899. Although we cannot speak encouragingly with regard to the exportation of our fine coals from the limited natural resources of our coalfields, still, considering the efficient development of our mines, it must be admitted that the avenue of trade opened in the foreign coal-market constitutes a considerable factor of employment which the otherwise variable consumption of the colony itself could not maintain.

Accidents in the various large collieries throughout the inspection district show a marked decrease, while the respective accident relief funds (under the Coal-mines Act) show a satisfactory increase.

The future development and working of the Seddonville Colliery under State control will be watched with interest not only in New Zealand, but in more important mining centres.

FOREIGN TRADE.

The quantity of coal shipped by the Westport Coal Company from the 31st December, 1900, to the 31st December, 1901, to ports outside the colony was 32,236 tons. This statement, compared with the preceding year's shipments, shows an increase of 14,766 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,
31st March, 1902.

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, 1901:—

CANTERBURY.

Springfield Colliery, Springfield (P. Campbell, permit).—(18/11/1901): Very little coal is now sold from this pit, in which work mainly consists of providing coal and fireclay for the local pottery. It was fortunate that I visited the pit on this date. I found Campbell at work in a cross-measures rise drive some 3 chains from the level. There was every indication that the face was in the immediate vicinity of a standage of water in old workings, a plan of which, if made, cannot now be found. I instructed Campbell to withdraw from the place for a few days, after which drill-holes were to be carefully bored in the roof and sides to locate the body of water. Campbell was quite unconscious that he was in a place of danger until it was pointed out to him. The air to three far-in working-faces is badly conducted, and damp leaking from the waste is consequently not carried away. I instructed Campbell, and also Mr. Horsley, proprietor, as to these matters. Drawing-roads wet and muddy. Report-book up to date. (4/12/1901): Revisited the pit to see if work required had been carried out. I found that the cross-measures heading was standing as when last seen, water from joints in roof and sides flowing much more freely than it was a fortnight ago. Air fair to-day, but stentons not yet put through at the faces.

Victoria Mine, Springfield (W. J. Cloudesley, permit).—(18/11/1901): Adit level in 100 yards to shaft 50 ft. deep. A cross-measures drive to the main seam is being put in. There are old workings in the vicinity of the shaft, but the water is said to be drained away.

Dalethorpe Pit, Springfield (A. J. Nuthall).—(18/11/1901): New drive is in about 1 chain to face. The timber at the face requires renewing. The pit has been idle for some time.

Sheffield Colliery, Sheffield (J. Austin).—(14/11/1901): Nothing doing here now. Plant lifted and removed.

Homebush Colliery, Glentunnel (J. C. Campbell, manager).—(14/11/1901): Considerable life is being infused into this property, which contains the largest coalfield at present being worked in Canterbury. Preparations are being made for boring from the surface for the purpose of learning what is contained in the measures underlying the seam of coal being worked. A new dip drive has been started away from the main haulage-road, and a shaft 50 ft. deep has been sunk, down which the

wire rope for dip haulage is passed. A vertical 8-horse-power engine and boiler (combined) is in position at the top of the shaft, with drum and signal-wires complete. An upper seam 6 ft. in thickness to the rear of the boiler conveniently supplies fuel for steam-raising. In the old mine pillars continue to be carefully withdrawn, timber being freely used. Air good. An old mine-mouth has been reopened, which makes a new upcast and second outlet. Eleven men employed underground.

St. Helen's Colliery, Whitecliffs (H. Levick, permit).—(13/11/1901): Five water-free tunnels have been driven at various points; balance of coal to the rise now almost extracted. Air dull at three of the working-faces, ends not up to level above, and damp squeezing out from waste. A new level is in 40 yards, and the coal should be struck at 60 yards; but Mr. Levick maintains that the seams worked (three) do not continue to the dip, being cut off by faulted and disturbed ground.

Hartley Colliery, Whitecliffs.—(13/11/1901): Still nothing doing here.

Brockley Pit, Glenroy (Henry Lee, permit).—(13/11/1901): A cross-measures drive is in 80 yards to a vertical seam of coal 3 ft. 6 in. in thickness. Levels are driven north and south, about 1 chain on each side. Timber well put in, but too light to withstand the pressure that may ultimately be expected as the levels advance and coal is extracted. A wooden tramway 8 chains in length is laid from the mine to the district road, from which point the coal is carted nine miles to Glentunnel Railway-station. It is expected that the principal market for the coal will be found in Christchurch City. Five men employed.

Snowdon Coal-pit, Rakaia Gorge (G. Gerard).—(16/11/1901): An old mine, on north bank of Rakaia River. A level drive in 5 chains, which, with the back level, is all the work done in this seam. The upcast shaft is also used for landing the bags of coal on the terrace. A new mine is being opened up on three parallel seams of superior brown coal, lying at an angle of 1 in $1\frac{1}{2}$, which outcrop on a conglomerate underlying the terrace-formation of the river-bank. A cross-measures drive is being put in to prove the seams, when the work can be laid off to the best advantage.

Craigieburn Pit, West Coast Road (D. Manson).—(19/11/1901): Several thin surface seams, from 1 ft. to 2 ft. in thickness, have been worked out on the breast of a steep face. It is proposed to open a mine on the opposite side of the stream, where outcrops of coal are known to exist, in more solid country.

Mount Somers Coal-mines, Mount Somers (William Harris, permit).—(8/8/1901): The bank above mine-mouth requires more batter. Development-work conducted in a haphazard manner, and too much robbing being done towards the outcrop to avoid pumping. The dip drive is not on the bottom of the seam, but is carried in at water-level. The new mine is now producing coal. 80 chains of level tramway, with a "jig-brow" 37 chains in length, at 1 in 5, connects the mine with the Selwyn County tramway. Two parallel drives are in 2 chains to face. The coal from this mine is said to be superior to the old-mine coal, and commands a higher price on the market.

Rutherford's Mine, Albury (J. M. Willetts).—(21/11/1901): The workings are well opened up, and the mine is in good working-order.

Elephant Hill Pit, Waihao Downs (Louis Matthias).—(6/12/1901): Mouth of drive rather too perpendicular for safety. The main level is kept in good order. Timber used where required. Air good. Not being worked at present.

Waihao Pit, Waihao Forks (late Studholme's, Stony Creek), (A. Adamson, permit).—(6/12/1901): The level face is 4 chains in from the mouth. The opening into the old mine for air-return and second outlet requires to be enlarged. An outcrop on the face of the terrace at another part of the lease has been driven on 40 ft., and found to be a seam of coal 4 ft. thick underlying $2\frac{1}{2}$ ft. of shale similar to that in McPherson's pit, from which it is distant about a quarter of a mile.

Waihao Forks Mine, Waihao Forks.—(6/12/1901): Messrs. Ward and Morgan have obtained the right to mine coal and shale from Mr. McPherson. The old mine-mouth has fallen in, and is now abandoned. A new mine opened on the south branch of the Waihao River is in about 30 ft. to the face. 3 ft. of light shale is seen to overlie 3 ft. of coal at this point, but no sinking or other prospecting or development work has been done to prove the continuance of the shale and coal, which appear to underlie the terrace lying between the north and south branches of the Waihao River. The shale in appearance very much resembles that found in White's pit, Ida Valley, Central Otago.

Dalgety or Hakataramea Mine, Hakataramea (D. MacFarlane).—(7/12/1901): The mine is now fallen in and abandoned. Mr. MacFarlane, manager of the Morven Hills Station, informed me that about 100 tons per annum for the last twenty years had been produced for station requirements only.

Rocky Point Pit, Hakataramea (D. MacFarlane).—(7/12/1901): This mine was opened up about eighteen years ago by Henderson and Morton, who were flooded out at that time by the river rising. The water has been recently taken out, and Mr. MacFarlane proposes to open up the mine for his own use in place of the Dalgety Mine.

North Otago.

Awakino Pit, Kurow (H. J. Porter).—(31/10/1901): Apparently nothing doing here for some time.

Sutherland and Shanks's Pit, Wharekuri (A. Shanks).—(28/6/1901): Only one man getting coal. An old drive is being repaired. The seam is nearly vertical, with fireclay walls. All the sets of timber in the drive were crushed and broken. I found the return airway blocked by a fall of sand. Mr. Shanks's attention was drawn to the state of the pit, and I subsequently wrote him,

under date the 4th July, 1901, calling upon him to have the pit put in a state of safety. Although the owners are old miners of many years' experience, I fully expect, from the careless manner in which their pit is worked, that one or other of them will eventually meet with a serious accident. The old workings (of which no plans are in existence) are a source of danger, which is not sufficiently realised by Sutherland and Shanks, although I have impressed it upon them.

Otiake Coal-pit, Otiake (Simpson and Cunningham).—(9/12/1901): A prospecting-shaft, 3 ft. 6 in. by 2 ft. 3 in., 70 ft. deep, has been sunk alongside an old shaft abandoned many years ago. The coal-seam is said to be 18 ft. in thickness, dipping west at an inclination of 1 in 3. I instructed the owners that several sets of timber were required at the top of the shaft, where the sides were crumbling. Owing to there being 30 ft. of black damp in the shaft I was unable to get down, the windsail in use being inadequate to ventilate the shaft. The shaft is too small for a centre wall. Mr. D. Scott was in charge. I recommended the owners to abandon this shaft, to sink a new shaft away from the old workings, and to drive a tunnel to it from the gully.

St. Andrew's Colliery, Papakaio (T. Nimmo, permit).—(30/10/1901): Owing to slackness of trade the mine is idle to-day, and the manager in town. No person was in the mine, but I got one of the men to go in with me. The furnace was not alight, and a north-west gale was blowing. Air very dull at faces (pillar-workings). Another instance of deficient ventilation under adverse natural conditions. (10/12/1901): Air good to-day. Furnace and return airway in good order. Two pillars at the back are being taken out abreast. Ample supply of props in use. Damp is leaking from the waste, but current of air ample to carry it away.

Prince Alfred Colliery, Papakaio (J. Willetts).—(30/10/1901): Work now confined to drawing pillars next old workings. Mr. Willetts's method of setting the timber not quite safe, and I instructed the men as to the proper method, and also told them to err on the safe side by setting plenty of props at the lip and in the bords before starting to the pillars. An air-shaft is required to the rise, and Mr. Willetts promised to have it sunk at once.

Ngapara Colliery, Ngapara (W. Nimmo, permit).—(26/6/1901): Brown-coal seam 8 ft. thick. Three men employed. The coal is brought down with powder, and the smoke hangs in the workings. Recommended that the quantity of air should be increased in the working-faces. Plan kept. Rules posted. Report-book up to date.

Shag Point Colliery, Shag Point (Thomas Shore, manager).—(21/3/1901): No. 6 seam, south workings, stopped, coal having turned into stone. A prospecting-bore in No. 6 seam is down 85 ft., with no sign of a lower seam of coal as yet. Air dull at Klason's level face, No. 5 seam, stenton not being through. In the main the requirements of the Act are duly observed at this colliery. Ventilation good. Report-books and plan to date. (22/6/1901): I went through the mine with the acting-deputy, and visited Nos. 1, 5, and 6 levels districts. Fifty-two men employed in the mine. Ventilation: Air good throughout the mine. Prospecting-work is being carried on under the sea to prove a small seam which had been passed through in the main shaft. The working-places are in good order. The lower seam (No. 6) is being worked long-wall. Seam thin, and work difficult, but well conducted. The miners are paid at the rate of 6s. per ton for winning the coal in this seam. (10/9/1901): The under-sea cross-measures drive (Hunt's) has been extended, and at 130 ft. east from No. 1 seam a 4 ft. seam of clear bright coal was struck. North and south levels have been commenced. The roof is quartz conglomerate, containing "cutters," or small fissures, from which feeders of water are flowing, making at the rate of 15,000 gallons of water per hour. Owing to the breakage of the eccentric strap of the pumping-engine and its consequent stoppage for repairs, the water rose over the pump, and two tanks holding 360 gallons each were put on for baling the water, but very little progress is being made. A dam is being built in the stone drive to retain the bulk of the water to enable repairs to pump being effected. The water from the fissures is brackish, and the mine-water—which is all that is available for boiler-feed—is proving more troublesome than formerly, each of the three boilers requiring to be blown down at intervals of not more than seven days. The No. 5 landing in shaft being cut off by water being up over the door-heads, the intake air is conducted from No. 3 landing, which is also used as a travelling-way. The cover overhead from the face of Hunt's drive is 300 ft. thick vertically, and numerous soundings of the sea taken some years ago give a depth of 30 ft. to 35 ft. of water in this locality. (29/10/1901): Still patiently baling water, which is 28 ft. up the shaft, and the manager expects that it will take about eight weeks' baling to uncover the pump and get the water down again. (12/12/1901): Water in shaft still at 28 ft. mark. A "Johnston" pump, having a capacity of 10,000 gallons per hour, has just been started, which, together with tanks, reduced water in shaft 13 in. in twenty-four hours. Boiler-feed water from the pit is proving very injurious, and is the cause of frequent stoppages and delay, during which the water in the pit gains rapidly on the plant in use. The Government Analyst finds that the water from the mine is composed of 60 per cent. of sea-water and 40 per cent. fresh water, while the water taken direct from the fissures in the new seam under sea consists of 90·9 per cent. sea-water diluted with 9·1 per cent. fresh water.

Allandale Colliery, Allandale (Alexander Gillanders, manager).—(21/3/1901): Air at intake, 6,750 cubic feet per minute. A "creep" on the old mine section has caused the pillars to sink, and the intake airway is low in places. Some of the broken timbers have been renewed, and the manager is taking up bottom to increase height of airway. The seam being thin, the roof and floor meet in the places. In consequence of this feature the airway will settle and cause no further trouble. Owing to brattice not being up across ends, air is not being conducted to several working-places which are warm and badly ventilated. I wrote Mr. Gillanders, under date the 29th March, requiring him to have these several matters remedied forthwith, and subsequently visited the mine on the 16th April, 1901, when I found that the airway was being attended to, and the ventilation of the mine satisfactory throughout. (16/4/1901): Five men lifting and stowing bottom in air-course where affected by "creep." Air in pillar-workings good. Plans are being prepared for a cross-measures drive at the main horse-road level face to connect with a shaft from the surface.

If this work be completed and fan ventilation adopted, the main engine plane would become the intake airway, and the long air-courses in the old workings could then be cut off. Plan and report-books to date. (21/6/1901): Work is being carried on in three seams. In the No. 1 seam work is now confined to taking out pillar-coal, and this was being done with due regard to safety. The air is good. Floor heaving considerably, pressure due to "creep" and soft bottom not having quite subsided yet. In the No. 2 seam the air is good throughout all the working-places. The bottom is heaving somewhat, but attention to the roadways prevented this from becoming a source of danger—that is, the roof is brushed, timber renewed, and the floor lifted wherever necessary. In the No. 3 seam the air is not good in advancing places; the rotten nature of the roof in this seam rendered the working difficult. A little clearance is required at some points in the intake airway, but throughout its length it was in good order. (30/8/1901): Air at intake, 8,200 cubic feet per minute. The intake airway is in good order, and from 5 ft. to 6 ft. in height. Owing to bad roof and soft bottom the No. 3 seam workings are unprofitable. Close timbering is required, and the places are driven narrow, maintenance being difficult. In the No. 2 seam, main workings, the coal-seam is thin, but is of good quality. The air is good throughout the mine. Some improvements have recently been made to the ventilation. Double doors have been erected at the mine-mouth (upcast), and a chimney 20 ft. high, 6 ft. by 5 ft., built on a shaft 25 ft. deep, with a fire at the bottom. A steam-jet is also laid ready for use when required to increase ventilation. (29/10/1901): Air at intake, 7,560 cubic feet per minute. No. 2 seam at the north level has pinched out to 2 ft. in thickness. A cross-measures drive to No. 1 seam has proved 7 ft. seam of good clean coal. This is important, as 12 chains of rise-coal is proved to be available. The No. 3 seam workings are from 4 ft. 6 in. to 6 ft. high, and roof still bad and hard to maintain. Air dull in McMillan's bord, which is nearly through to the heading. Only two men now on the pillars. (12/12/1901): Air at upcast, 6,000 cubic feet per minute. The intake airway requires attention in several places. No improvement in the No. 3 seam workings; roof still tender and floor soft as ever. The No. 1 seam places are turning out well, as expected, and, the seam being 6 ft. thick, good returns may be looked for from this part of the mine. Air good throughout the mine. Preparatory to sinking a shaft for new upcast a trial bore is to be put down at a point near the schoolhouse. The work will be commenced at an early date.

SOUTH OTAGO.

Fernhill Colliery, Abbotsford (James Gray, manager).—(4/1/1901): Air well conducted by wooden brattice to working-faces. Owing to pressure caused by a "creep," two stoppings on roads leading to old workings are leaking "damp" slightly. The prospecting-drives in the fault area to south-west are standing full of water, and are not now being persevered with. Report-book to date, and rules posted. (17/9/1901): The "creep" mentioned on the occasion of my last visit has developed into a "sit." Numerous plumps have taken place in the mine-workings, and fires broke out, but are now subdued. The whole of the north and east workings are bratticed off, and only the south side is now being worked. A new air-shaft, 4 ft. 6 in. by 2 ft. 6 in., 40 ft. deep, has been sunk to the rise. Small quantities of damp and fire-stink are escaping from two stoppings and fouling the air in the working-places. Mr. Gray is attending to this, and is daily decreasing the leakage. Report-book to date.

Freeman's Coal Company, Abbotsford (Robert Hill, manager).—(4/1/1901): Notified manager that McCabe's old shaft was unprotected and required to be filled up or covered over and fenced. Mr. Hill subsequently wrote me that the shaft had been filled up. (22/3/1901): All work consists of drawing pillars, and the faces are gradually retreating to the engine plane. Air good generally throughout the mine, but rather dull in one place some distance from the return. (17/9/1901): The pillar-workings are being rapidly brought back. The mouth of the drift to the air-course requires to be cleaned up; also a door at mine-mouth and a chimney on the upcast shaft to provide surplus air required to carry off the damp exuding from the waste. Mr. Hill promised to attend to these matters The workings are conducted with due regard to safety. Timber freely used where required. A new mine to the west of the recent workings is being opened; the drive will skirt the old mine-workings to the rise. A shaft sunk some years ago near the Fernhill Railway is in good order, and will be utilised for an upcast. Air good. Report-book and plan to date.

Walton Park Coal Company, Walton Park (J. Kenyon, manager).—(4/1/1901): Air, 9,000 cubic feet per minute at intake. Work still consists of dropping roof-coal and extracting pillars left in by the old company near the outcrop. The overburden on coal-seam here being not more than 20 ft. to 30 ft., the surface is very much broken where pillars are out. A brisk fire is maintained at the furnace, and is required to carry off the considerable quantity of "damp" squeezing out of the old workings. The damp is not allowed to permeate the working-places, but is carried to the furnace upcast behind substantial wooden brattice erected for the purpose. The ladder-shaft forms the second outlet for the men, and is also the upcast for the working-faces. Rules posted. (22/3/1901): Smell of fire-stink on main intake, and intake air somewhat mixed with damp from leaking stopping on roadside. A good current of air is carried into the mine, and circulates round the working-faces. The furnace is well attended to. (26/9/1901): Old mine-entrance is now stopped off owing to an outbreak of fire from old workings through a stopping near the main wall. Coal is being worked opencast in the gully, where the stripping is only 3 ft., but thickens rapidly into the hill on each side. (23/12/1901): Work still consists of extracting pillars and head-coal. The old furnace upcast is now cut off. Two new upcast shafts sunk near the working-faces carry off the damp from old workings. Wooden brattice is erected to conduct the vitiated air to the upcasts, and prevent it from pervading the working-places.

Jubilee Colliery, Saddle Hill (P. Campbell, manager).—(22/3/1901): Air good. Mine in good order. (26/9/1901): A new mine-entrance and upcast air-shaft at a point near the faces supplies excellent air. The old workings are standing in good order. Pillars intact. The mine and plant

is in good order. (23/12/1901): Bords and working-places in good order. Air excellent. Report-book and plan to date.

Saddle Hill No. 1, Saddle Hill (C. H. Westfield, manager).—(18/9/1901): The dip is being extended to provide a few more bords. This mine continues to be well conducted; pillars square, every place being driven to lines. Air good. Report-book to date. Twenty sets of timber are being renewed in the main haulage plane; being the upcast, the timber has perished rapidly.

Saddle Hill No. 2 (C. H. Westfield).—(26/9/1901): The main south levels are still being extended. There is evidently many years' coal-supply in this property at present rate of output. A new upcast air-shaft has been sunk near the working-faces. Air good. An upthrow fault has been crossed, and the coal improves in quality.

Burnweil Colliery, Saddle Hill (Adam Harris, owner and manager).—(18/9/1901): The old mine where the fire originated is closely bratticed off, and I could not detect any leakage of damp or fire-stink. The new mine to the south is being well opened up and good pillars left in. Air good.

Glenochiel Colliery, Saddle Hill (D. Bryce, permit).—(20/6/1901): The old mine is abandoned, and coal is now being got from a new mine-entrance to the south of the old workings. I instructed Mr. Bryce to have the old mine-entrance fenced, and also to keep the top of the upcast shaft protected. The deep plumps on the surface near the seat of the fire have been filled up. (23/12/1901): The old workings are completely blocked off. Good air in the new mine.

Mosgiel Colliery, Saddle Hill (James Sneddon, manager).—(22/3/1901): New dip heading is now 12 chains down. Coal changing to soft; indications not good. The character of the alteration being gradual may be expected to be somewhat extensive. There is an area of good coal unworked to the north side of the dip. (20/6/1901): Dip-face 14 chains from mine-mouth. The seam has altered in character from strong hard coal to tender coal jointed and intersected with slippy clay backs lying at all angles. All bords have been drawn in to 8 ft. in width, and timber is freely used. Report-book and plan to date. Thomas G. Spain was injured on the 15th instant. A piece of coal about half a ton in weight came away unexpectedly from an unseen "lipe" or clay joint in the roof at the face, causing injury to spine. (23/12/1901): The dip workings are now cut off. Owing to soft bottom the pillars sank, and the area is abandoned meanwhile. A new crosscut dip being driven will enable the pillars to be won when roof and floor meet, which, from appearances, will not be long. Coal is now being won from north-side pillars. In this area, unlike the Dip section, the roof and floor are hard, and places stand well. A fire in the dip is giving trouble. I recommended Mr. Sneddon to draw ash stoppings across the bord-ends and isolate the fire, a large supply of suitable ashes being obtainable from the waste-heap at the pit-bank.

Riccarton Coal Company, East Taieri (Alexander Love, permit).—(20/6/1901): This new mine is the most southerly one of the Saddle Hill group. A well-timbered level drive into the hill struck the coal-seam at 15 yards, and is continued in coal for 100 yards to the face, where the seam is now dipping in an easterly direction. An 8-horse-power portable engine on the brow is used for hauling empty trucks up the hill and lowering full ones. The tram-line (single) from the mine to the main south road is 60 chains in length. Substantial shoots have been erected at the roadside. The owners propose to bring a branch railway-line from Mosgiel Station to the shoots, a distance of about two miles.

Lauriston Colliery, Brighton (J. R. Walker, owner).—(13/5/1901): Mine in good order. Due care taken in supporting roof, which is liable to fall away from the parting.

McColl's Pit, Brighton (D. L. McColl, owner).—(13/5/1901): Apparently not much doing. Connection not yet made to shaft for upcast airway and second outlet.

Bruce Mine, Milton (A. Young, owner).—(20/12/1901): Two men at work. Places driven high and wide, but coal strong. No falls anywhere. Ventilation good.

Strip-and-at-it Mine, Milton (N. Hardwick, owner).—(20/12/1901): After cessation from work for some time this mine is being put in working-order again. The mine-mouth has been retimbered and bank well battered. One man is getting coal in a 3 ft. seam. The fault-line has been driven through, and the coal-seam found again. A small shaft provides upcast for return air, while a drive is to be pushed on 1½ chains for second mine-outlet.

Fortification Railway and Coal Company, Milton (J. Shore, manager).—(12/7/1901): This seam is being worked by means of two dip drives. Old mine-workings: The main dip is driven 10 chains. All the old workings have been closed off, and work up to the present has been confined to narrow working and breaking off. I traversed the air-courses and found a good current passing round. The air-shaft was in good order and provided with ladders. The main drive is being increased in height and retimbered. New mine-workings: The new dip is driven about 7 chains, and the opening-out work consists of two levels, two bords, and two headings. The air-course is in good order, and the shaft provided with ladders. Twenty men employed. Rules posted, and report-book to date. (20/12/1901): A. Harris in temporary charge. Ventilation fair. Traversed all working-places and airways; found all clear and in good order. Mine-entrance to No. 1 dip should be heightened and better timbered. This work was begun, but is incomplete. Bottom heaving in some of the travelling-ways. A good supply of timber is kept on hand. A prospecting-shaft has just been put down on the Coomb Hay Estate portion of this property. Depth 61 ft. 6 in., bottoming on running sand. In all, seven seams were passed through, ranging from 6 in. to 23 in. in thickness. Report-books to date.

Glenledi Pit, Milton (N. McGilp, owner).—(20/12/1901): No one about the mine on this visit. Mine clean. Air good. Roof not very strong, and timber used in places where necessary.

Reid's Akatore Pit, Milton (James Reid, owner).—(20/12/1901): Mr. A. Young had this area leased from Reid, but has since thrown it up. No one at work now.

Adam's Flat Mine, Adam's Flat (J. Reid, owner).—(21/12/1901): Coal is principally taken from here in the threshing season. 6 ft. of coal in sight in the face. Pit worked opencast. Stripping about 8 ft. Face at present fallen in and in a neglected state.

Paskell's Pit, Adam's Flat (J. Paskell, owner).—(21/12/1901): Opencast. Nothing doing at date. Seam, 7 ft. Stripping, 18 ft. to 20 ft. Stripping too heavy. Face perpendicular.

Wallsend Pit, Lovell's Flat (R. Hewitson, owner).—(20/12/1901): Stripping kept fairly well in advance of the working-face. The pit is kept in much better order than it used to be.

Lovell's Flat Colliery, Lovell's Flat (James Carruthers, manager).—(7/1/1901): Air at intake, 5,580 cubic feet per minute. The downcast and second-outlet shaft is 260 ft. deep, in good order, fitted with inclined ladders and landings 14 ft. apart. Travelling-way to shaft well kept. A new dip drive has been started to the east of the shaft in good coal, with promising indications. Coal thinning somewhat going north, and the roof of working-places in this district requires much timber owing to liability to "cut." The coal is "proud," and the roof very tender. I drew the manager's attention to one place where the roof-coal was shattered and the props badly set. Air rather warm in rise headings, where return not quite up to face. (12/7/1901): The dip drive from the shaft-bottom is down 2 chains in good coal. An engine for haulage has been erected, and the dip is unwatered by a pulsometer pump discharging into the main lodgment. A heading (on the point of pricking through) in the south side, when completed, will provide a direct circuit of air in the new workings, and the airway through the old workings will be cut off. Air warm and rather dull in rise places. Rules posted, report-books and plan to date. (19/9/1901): The dip-face is now down 200 ft. in good coal. Bords are broken away both sides and substantial pillars left. The old workings, which were heating, are now blocked off. Air plentiful, and travelling freely round the rise workings. The north-level coal is thinning gradually, and is now only 5 ft. in thickness. Owing to the tender nature of the roof in the north-side workings all the places are timbered, and every care is taken to provide for safe working. (20/12/1901): The dip workings east side are turning out well. Coal superior, and thickness of seam is maintained. The north-level coal has thinned to 5 ft., but quality good. Being narrow, the level can be maintained, but the bords are hard to keep even when close-timbered. The coal in the south-west section continues to be soft and somewhat inferior in quality. Air good, but current sluggish; friction due to increased travel is rapidly overcoming the motive power in use—viz., exhaust steam from pump in upcast shaft. A fire which broke out in the heading was drenched out with water, and the area is now sealed off. Fan ventilation very desirable.

Tuakitoto, Lovell's Flat (M. McDougall, owner).—(20/12/1901): This mine has been idle during the whole of the year.

Benhar Coal-mine, Benhar (James McLeod, permit).—(7/1/1901): The heading in upper seam is now discontinued, except that water is pumped out daily. A new road is being opened in the middle seam in good strong coal. The dip being in 230 ft. to face, a return for air is required, and is to be started at once. A small steam-boiler has been erected at the mine-mouth for pumping purposes. The rules were torn, and Mr. McLeod has ordered new copies. (12/7/1901): The coal to the west and north is cut out by faults, which have not yet been proved. Air good. (20/12/1901): The workings are in good order. Air fairly good. A new drive is being cut to win the lower seam.

Mount Wallace Pit, Stirling (D. Shaw, lessee).—(12/7/1901): No one about at the new pit. Notice posted that the pit is closed. (20/12/1901): The mine recently opened up is now abandoned, and Shaw has returned to Tweedie's old mine, the coal being of better quality and more accessible to settlers. The old mine-workings are all standing, although driven wide and high, the coal being of a strong nature. A new dip is being driven alongside the old workings.

Kaitangata Colliery, Kaitangata (G. H. Broome, manager).—(28/2/1901): Air at intake, 18,040 cubic feet per minute. McDougall's heading section, No. 5 fault, having cut off the workings, preparations are being made for robbing pillars and head-coal back towards the heading. Drum-heading section standing; no work being done at present. North-side section at present provides the bulk of coal-output from the mine. The headings (Nos. 1, 2, and 3) are up to No. 6 fault. Substantial ribs of solid coal are left on each side of the headings, so that stoppings may be put in should fire break out. Most of the pillars between the headings are taken clean out, the work having been laid out with a view to this being done immediately the bords were finished. The return airway from the north section is rather rough and requires to be cleaned up. Safety-lamps in good order. Report-books duly kept. (1/3/1901): No. 3 dip section: Air good. Duncan's bord requires three or four sets of timber. I also asked the manager to set props closer in several other bords. No. 2 dip is well ventilated. The return therefrom now connects with the main return at a point below the tubing, about half a mile of airway having been cut off. There is now no return from the shaft-workings, which are stopped off, and in all probability filling with water and black damp, being to the dip of all the open mine-workings. (14–16/3/1901): A small fall at the mouth of Duncan's level had knocked down the fence and danger-notice board. There was a little gas mixed with damp near the face of level, which is 660 ft. in. A little black damp was found in the bottom north level off No. 3 dip. Water being up had cut off the air-return in the level. No persons were working in or near these disused places, which had been discontinued for some considerable time. The brick stopping on the main stone drive was slightly warm at one place near the top, indicating heat in the vicinity; otherwise the mine was in good working-order. (19/4/1901): A slight ignition of gas in No. 2 dip on the 15th instant having been reported, I visited the mine on this date, and saw Alfred Weston, who was slightly burnt on the hands, but not sufficiently so to cause him to leave work. Weston was working with two safety-lamps at the face, but used a naked light on his head while trucking up the cuddy, and he alleged that on going up with an empty box the gas ignited at the flat-sheet. An examination of the face showed that it was at a "roll," and no doubt a light blower of gas was tapped which, rising to the roof, came back to the flat-sheet at 40 ft. from the face. I reported the ignition to you, and it was subsequently arranged by the mine-manager and myself that mixed lights would be discarded

and only safety-lamps used throughout a district in the mine in which gas had been found or was known to exist. The underviewer (Mr. McCormack) in charge of the district had visited Weston's place within an hour before the ignition, and he did not observe more than a trace of gas in the place at that time, but both he and Weston were aware of its presence. The air is dull to-day in the south level, with a trace of gas in the high corner at the face. All other places clear of gas; only safety-lamps are used. Lamp-stations posted, and air conducted by brattice up to faces of all bords and headings. Steps have been laid in the steep part of the main return for fair travelling. No. 3 winch-dip section is now cut off and work suspended. Mr. Broome has appointed Mr. Neil McAllister underviewer, with charge of the day-shift. The brick stopping on the stone drive is slightly warm at the top; heavy sand packing has been put in above on iron plates resting on iron rails. (9/7/1901): Air at intake, 21,060 cubic feet per minute. No. 4 dip workings: Lamp-stations fixed, and only safety-lamps used in this section. The advancing workings make a little gas, which is kept clear by ventilation. I found traces of gas in pot-holes in the roof in Cairns's and Barris's bords. North level: Nos. 2 and 3 headings are up to No. 6 fault, bords finished, and now splitting and robbing pillars. Only safety-lamps used. A heavy fall of roof having driven a slight quantity of gas mixed with damp on to a naked light, which caused a slight harmless ignition, Mr. Broome decided to discontinue the use of naked lights in the pillar-workings here. Great caution is required to avoid accident while working with safety-lamps in the pillars owing to the dim nature of the light given out. Drum section: Nothing doing. McDougall's section: Pillars and roof-coal being gradually worked out homewards. Air warm. I drew Mr. Broome's attention to this, and on my return to Dunedin wrote him, under date the 16th July, pointing out that the air was much heated in the pillar-workings, and would no doubt become more so, and asked him to make special efforts to circulate as much air as possible through this section. Ponies are now used for trucking on the long roads in the north-side and McDougall's sections. Suitable stables are provided underground, and are ventilated by a small split of air leading direct into the main return. Report-books by manager, engineer, underviewers, and deputies well kept. Plans to date. (10/7/1901): No. 2 dip section: Found a small quantity of gas in Dixon's and Penman's headings; all other places clear and in good working-order. No. 3 dip section: Only six men now working; work in the 6 ft. seam is discontinued. Air good. Main return airway in fair order, a few sets of timber being required, and several small falls are being attended to. Furnace and drift in good order. Surface appliances (windlass and rope) at top of upcast are ready for immediate use, and, having been used recently in connection with repairs to furnace, are known to be in good working-order. (27/8/1901): Air good throughout the mine. McDougall's section: Robbing rapidly reducing the area of working-places. I requested Mr. Broome to see that props were more freely used in the pillar-workings under the lip or fringe of the high places. Still no work in drum section, or No. 3 dip. No. 4 dip section: Only safety-lamps used. Found traces of gas in two pot-holes in roof. No. 2 dip section: Only four places being now worked. The coal has proved disappointing, being soft and inferior generally throughout the district. North section: Small quantities of gas being occasionally reported, only safety-lamps are used. I found no gas here on this occasion. Report-books to date. (4/9/1901): Air at main intake, 17,280 cubic feet per minute. No. 2 dip workings in good order; gas occasionally reported in Penman's heading. Air dull in Nos. 1 and 2 heading districts, north section, and men sent home this morning in consequence. I traversed the whole of the district, and found that the air was impregnated with damp, and at the top of No. 2 heading an admixture of gas and damp had gathered, but was very dull. On my making inquiry into the cause of the deficient ventilation here, the manager informed me that while repairing the roadway the previous night one of the roadsmen had omitted to replace a brattice, and the air took the short circuit, leaving the top of the heading unventilated. I also observed by report-books that the barometer had fallen $\frac{3}{4}$ in. during the last twenty-four hours. When I visited the heading the brattice had been restored, and a full complement of air—4,080 cubic feet per minute—was travelling the district. No. 3 dip section clear. Main return airway requires and is receiving attention in the coal section. (20/9/1901): Air at intake, 22,200 cubic feet per minute. I found an inadequate supply of air in McDougall's section, 1,080 cubic feet per minute only at the intake, while fifteen miners, six truckers, and one pony were at work. The air was hot in two of the working-places, and at the inbye end of the level black damp was lying, the current of air being insufficient to carry it away. The faces generally were warm and ventilation inadequate throughout the section. On my recommendation Mr. Broome was subsequently prosecuted for a breach of section 33, subsection (1), of "The Coal-mines Act, 1891." Mr. Broome pleaded guilty, but in mitigation of the penalty said that an air-door between the main intake and the return had been wilfully drifted open and left so. The Magistrate imposed a fine of £2, and £2 9s. costs. Mr. Broome afterwards informed me that he offered a reward of £20 for information that would lead to the conviction of the offender, but without result. North side: Places all in good working-order; also No. 4 dip section. The coal-cutting machines are now withdrawn from the mine. Record of safety-lamps, all deflector type, in daily use at Kaitangata Colliery: Day-shift, 56 lamps; afternoon-shift, 54 lamps; night-shift, 2 lamps: total, 112 lamps. (28/9/1901): Air at intake, 20,952 cubic feet per minute. The miners are not working to-day. I traversed the working-places throughout the mine, and found them in good working-order. The return airways require some clearing-up in places, as pointed out to the manager, especially at No. 3 dip in the coal. The brick stopping on the main wall is showing signs of crush owing to weight, and is being replaced gradually by an ash stopping backed and faced with boarding. (24/10/1901): Weight on timbers at mine-mouth is causing the renewal of several sets. The pillars in McDougall's section are being successfully drawn. A fall in the drum-level return airway is giving some trouble. The No. 4 dip and No. 2 dip sections are in good working-order, and air good. The furnace has recently been repaired, and both it and the return airway are in good order. A weight on the main stone drive is causing the bottom to heave

slightly; the timbers are repaired as required. The brick stopping is still crushing, and the ash stopping is continued when necessary. An iron manhole-door in the roof at brick stopping enables ready access to the heated portion. A thermometer record is duly kept. (18/12/1901): Air at intake, 19,980 cubic feet per minute. McDougall's section being gradually robbed back to the drum. Mr. Broome estimates that fully two-thirds of the seam, which averages 30 ft. in thickness, is being won. Return airways, with the exception of the No. 1 heading section, all in good order. Traces of gas in pot-holes, No. 4 dip section, and at the top of No. 2 heading, north section. Air good throughout the mine, which is in good working-order. The new deflector safety-lamps (maker, Richard Johnston) are giving excellent results. They are strongly made, give an excellent light with best oil, and are very sensitive in the presence of CH_4.

Castle Hill Mine, Castle Hill (G. H. Broome, manager).—(18/3/1901): Air excellent and the mine in good order. I found a little gas at the face of the north back level. No. 4 rise, 6 ft. seam. Every precaution is being taken; air conducted to the face, and only safety-lamps used. Whatever the cause may be, it is noticed that gas "bleeds" more freely from workings in this mine advancing north than from the south workings. (11/7/1901): Air at intake, 30,000 cubic feet per minute. The main dip-incline face is 14 chains from No. 1 landing. The new seam (25 ft.) is being developed. Gas having been reported, only safety-lamps are used. A jacky pit, 42 ft. deep, for communication between the main incline and the new seam is almost completed. When finished, the main body of the air-current will sweep direct from the intake up the pit and through the new-seam workings. Meanwhile compressed air is used for ventilating this section of work. I found traces of gas at the south-level face. Report-books to date. (28/8/1901): Air at intake, 26,255 cubic feet per minute, with only half a fire on at one side of the furnace. The jacky pit is 42 ft. deep, 11 ft. by 4 ft. 6 in. in the clear; divided into three compartments—two for lowering coal and one for ladder-way. Coal from new seam is to be lowered down the jacky pit, the bottom of which is 1 chain from the main haulage incline. The ventilation is largely in excess of requirements, but owing to the advancing levels and headings making a little gas the men use safety-lamps. No work is now being done in the 6 ft. seam, and the levels are stopped off. North and south levels in the 11 ft. seam are driven 20 chains on each side of the main incline in readiness for winter-trade demands. Report-books and plan to date. (25/10/1901): Air excellent throughout the mine. An excess of air sweeping through the working-places, and, although the new seam is being opened up, I was unable to find a trace of gas in any of the faces. This is very satisfactory, and a practical illustration of the efficiency of adequate ventilation in the removal of gas from the workings. I examined the return airways and standing-places already opened up, and found all clear of gas and in good order. (19/12/1901): Air at intake, 24,000 cubic feet per minute. The main-incline extension is now completed, the water-lodgment finished, and preparations are being made for the extension of the endless-rope-haulage system to the bottom at 10½ chains from No. 1 landing. Air well conducted to all the working-faces by stentons and brattice where required. Report-books well kept, and plan to date. The mine is in a very satisfactory state; plant, roadways, and airways in good condition; development-work well advanced and in readiness for a greatly increased output.

McCormack's Old Mine (Castle Hill No. 1).—(17/12/1901): The mine-mouth has been filled in, no smoke is escaping, and the fire is now damped down.

Mainholm Mine, Waipahi (Frederick Lischner, owner).—(8/1/1901): Opencast working. Seam 20 ft. in thickness. This pit is worked in a systematic way. An area 3 chains by 1 chain, stripped in advance of coal-face. A new 8-horse-power portable Marshall engine and boiler is being placed in position to drive a 6 in. centrifugal pump for unwatering the pit in wet weather or in time of flood.

Taratu Mine, Kaitangata (H. H. Fraser, owner).—(17/12/1901): Prop seam. Coal for private use only being won. Places all standing in good order. A company has been formed to work the field. Coal is known to outcrop in many places on the property. A railway is being brought in six miles from Lovell's Flat Railway-station. The formation is almost completed, and the coal is expected to be on the market early in the coming year.

Lakeside Pit, Kaitangata (James Landells, owner).—(17/12/1901): The old mine is now abandoned. A new drive is in 10 yards in an outcrop of coal on the side of a gully. Like Fraser's property, several seams of coal are known to crop out at various places, and coal can be obtained almost anywhere near to the surface.

Wangaroa Mine, Kaitangata (James Smith, owner).—(17/12/1901): Mr. Smith has leased the mine to Alexander Forrest, who is working by himself. The drives are narrow and all standing in good order. From indications at level-face a fault is not far away. The seam is 9 ft. thick, with a dip of 1 in 12 to the north-east. The Bruce County Council has erected a toll-bar on the main road near the outlet from the mine. The toll-keeper is instructed to charge 5s. for every load of coal passing the toll-gate, which effectually bars Forrest from sending coal to Kaitangata Township, and, as the demand from farmers on the coast is limited, the trade of the mine is likely to be restricted.

Early Bank Pit, Milton.—(20/12/1901): Nothing doing here now, and the mine-mouth has fallen in.

Central Otago.

Coal Creek Collieries Company, Coal Creek (Isaac Watson, permit).—(31/5/1901): Opencast workings. Face, 70 ft. 20 ft. of good coal. Overburden well trimmed back. An old low level opened up thirteen years ago is being cleaned out, and a water-channel is being brought up for drainage. The manager has made a good substantial job of the entrance to this level, the idea being to use the level as a permanent roadway after completion. Five men employed. (21/8/1901): The development of this pit is going on slowly; some coal is being taken out of the opencast, but the stripping is becoming too heavy for the work to be remunerative. The old drainage level has

been cleared out, a box drain put in, and a roadway laid down. Six men are engaged in and about the pit at present. (25/9/1901): J. McKeich in charge. All opencast working now stopped. (11/10/1901): Two men underground. This mine is suffering through mismanagement. (12/12/1901): (R. Newell, permit.) Three men underground. As trade is increasing at this pit additional men are to be put on. The mine is now being conducted on better lines.

McPherson's Pit, Coal Creek, Roxburgh (M. McPherson, lessee).—(31/5/1901): Opencast. Four men employed. A good face is being worked, but there is a strong tendency to undermine. Stripping not carried back from the face. A low level is being driven in for drainage. (21/8/1901): The old working-face has been discontinued in favour of taking up the bottom coal in the pit. The drainage level is being driven through a soft clay, and the undertaking is slow and troublesome. (25/9/1901): Reached coal with drainage level; now laying pipe-line. (12/12/1901): The drainage level, when finished, will allow of over 20 ft. of bottom coal to be lifted water-free.

Craig's Perseverance Mine, Roxburgh (James Craig, permit).—(31/5/1901): A new dip is being driven; grade, 1 in 4. The mine-mouth is well timbered, and one man was engaged putting a good batter over the entrance. Four men are employed. The pit is in good order. (21/8/1901): The new dip is stopped pending the erection of a hydraulic motor and winch to replace horse haulage. In the meantime coal is obtained from the level. The coal is firm and hard, so that the places are carried high. Air good. The mine is well managed. (25/9/1901): The dip is now below present working-level, and Mr. Craig expects to break away with a lower level soon. (12/12/1901): This mine is now in the hands of Craig Brothers. Work is being carried on in the second level from the dip. 17 ft. of coal has been left between the upper and lower levels. Air good. The thickness of the seam has not yet been determined, but it is believed to be fully 100 ft.

Gully Pit, Roxburgh (Gourlay and Rennie).—(12/6/1901): The owners not having done anything to the pit, some of the settlers in the district are helping themselves and taking out a few tons for winter supply. The old pit, being in a gully, is full of water. Only about 3 ft. of coal lies above water-level, with from 10 ft. to 12 ft. of stripping on top.

Black Diamond, Roxburgh (P. Galvin).—(11/6/1901): Pit not now at work. Abandoned.

Hesson's, Shingle Creek (George Hesson).—(11/6/1901): Prospecting for coal in the Coal Creek coal-measures, above Bulrush Swamp. Three shafts have been sunk, but the coal-seam has not yet been struck.

Holt's Mine, Shepherd's Flat (William J. Holt).—(6/6/1901): A prospecting-shaft has proved the coal to be 6 ft. thick, with 16 ft. of cover in the gully. The coal will only be required in the event of a dredge being placed on the Upper Fraser River.

Alexandra Coal-mine, Alexandra (W. A. Thomson, lessee).—(8/6/1901): Main dip incline wet and dirty, drainage-water not conducted properly. Only two places now being worked; high side of roof-coal tender where coal is coming away from a parting. Props used in the bords. Air only fair. Rules posted, and report-book to date. (11/12/1901): Mine in good order. Ventilation fair. Three men. Haulage done by horse. Pumping-gear will be required at an early date if the dip workings are to be prosecuted vigorously. The water-growth is beyond present appliances, and the bottom bords are now under water. The mine has been worked in a half-hearted manner during the past year. Mr. Thomson informs me that he is negotiating for the purchase of a pumping plant.

Perseverance Colliery, Alexandra (R. Finlay, lessee).—(8/6/1901): Dip drive being pushed on. Bords broken away on left-hand side of dip only. Pillars to back heading 30 ft. square; bords 9 ft. wide. The high sides of the bords are inclined to "cut," more especially in the vicinity of "thread-faults," where the roof-coal is somewhat tender. I notified Evans to drive narrow through the faulted coal, and to put in timber when necessary. A supply of timber is kept at surface. Report-book to date, but rules not posted. (10/12/1901): Mine in good order. Ventilation fair. The boiler lately on the Electric No. 1 dredge has been placed in position. Six men employed. On account of the tender nature of the coal left on to form the roof, timber is required in the dip workings. The bords are driven only 9 ft. in width, while the pillars are 30 ft. in thickness.

McQueenville Coal-mine, Alexandra (James Howie, manager).—(8/6/1901): The dip-drive face is now 8 yards beyond the main shaft. The dip of the seam is altering to what is now a gentle rise. The working-places are standing in good order. Air good, with the exception of Duncan's place, the stentons not being bratticed, consequently air dull at face. What looks like an accumulation of dross occurs in several of the old bords, but Mr. Howie assured me that the waste consisted mainly of the 18 in. band of stony coal which is thrown back, and is not liable to spontaneous ignition. Report-book to date. Mine carefully managed. (10/12/1901): Mine in good order. Ventilation good. Mine haulage by horse at present, but it is the intention of the owners to erect a steam-engine with winding-gear on the bank at mine-mouth in the near future.

Drummey's Pit, Alexandra (J. Drummey, lessee).—(8/6/1901): No one about. I learnt that the only work done here for some time is baling out water.

Simpson and Theyers, Alexandra.—(8/6/1901): Still no work being done at this pit. Pit-head plant removed.

Alexandra Coal Company, Alexandra (William Carson, manager).—(7/6/1901): All places are driven 9 ft. wide by from 7 ft. to 8 ft. high, leaving from 13 ft. to 15 ft. of coal for roof. Roadways all in good order, and the mine is clean, dross being all filled away. Dip drive at face now rising gently. In several places water is streaming from open joints in the roof, and in one heading, where the Molyneux Hydraulic Company's dredge crossed, work was stopped on that account. The streams here are small, but as a precaution (after consultation with Mr. Hayes, Inspecting Engineer) I wrote the manager, under date the 1st October, to have the heading filled and stowed with the most suitable material available as a protection to the roof (timber, owing to its liability to rot, being considered unsuitable). Also, boreholes to be put up 7 ft. into the roof of all advancing places at intervals of not more than 20 ft. The roof throughout the mine is

exceptionally strong; there is not a break or fall anywhere, and the workings are nowhere more than 9 ft. in width, while pillars are not less than 8 yards square. A new three-throw pump by Cossens and Black, of Dunedin, has been placed in the pit. Suction 6 in. diameter, delivery 5 in., capacity 8,000 gallons per hour, driven by endless wire rope working six hours daily. Air at dip-face dull owing to stentons for air-return not being close up to face. (10/12/1901): The heading driven towards the river and over which the dredge worked, and which was to be securely packed with suitable material, is still standing open, save for a pillar of bagged *débris* about 16 ft. by 5 ft. at base which has been built at widest part. In the highest heading a borehole is advanced in the face all the way. In the roof, however, for a distance of about 70 ft. only two boreholes have been driven. Each of these is 4 ft. 6 in. deep and 35 ft. apart. The manager promised to put these boreholes to full depth, fill and stow the heading, and follow the requirements contained in my letter of the 1st October closely in the future. Ventilation fair throughout the pit. All work in the extension has been stopped, except that a small connection is being made through to the slant dip for air. Six miners, one trucker, and one horse were in the pit on above date.

Undaunted (late Ballantyne's) Coal-pit, Alexandra (D. Mathias, permit).—(19/8/1901): Shaft 60 ft. This shaft has been sunk and timbered in an erratic manner, but is standing well. The last owner worked the highest and poorest quality of the coal. Present owners starting away a dip, and also pushing on levels to connect for air. The seam now being worked is about 6 ft. thick, with good floor and roof. Output to date limited. (11/12/1901): Mine in good order. Ventilation fair.

Jones's Coal Area, Lauder (one time Harrox and Owen's).—(9/6/1901): Very little coal has ever been found here. Water has been brought on to the ground for sluicing the stripping away, and the present proprietor (who holds a lignite license over the area) is engaged bringing up a tail-race. This is purely a prospecting-work, as no defined seam of coal has yet been met with. Sixty tons of coal were taken out by Harrox and Owen in 1897.

Cambrian's Coal-pit, Cambrian's (C. Dungey, lessee).—(10/6/1901): These workings are shallow; about 10 ft. of coal, having an overburden of 15 ft. of gravel. The coal follows the run of the bottom. Where the bottom rises the coal pinches out, and where the bottom dips the coal makes. Two men are engaged. No stripping was being done in advance.

Welshman's Gully Pit, Cambrian's (J. McGuckin, lessee).—(10/6/1901): Four men employed. Open-face working, consisting of about 10 ft. of coal in sight, with 25 ft. of overlying clay. A very good block of coal left underfoot by previous owners is being taken up. Where the face is being operated on at present the stripping is light, but further ahead the overburden is heavy. Water is brought in from Stewart's Creek, and the workings are pumped dry by hydraulic elevator. It will be some considerable time before this mine will be in good order.

Blackstone Hill Pit, Blackstone Hill (A. Dunsmuir).—(12/6/1901): Work has been discontinued for some time.

G. Price's Coal-pit, Blackstone Hill (G. Price, lessee).—(12/6/1901): The lessee, who has a lease of 10 acres, getting out coal for his own use only. 12 ft. of coal in the face, with 4 ft. of stripping.

St. Bathan's Pit, St. Bathan's (J. Enwright).—(5/2/1901): Opencast. Face undermined and dangerous. Stripping not kept up to the mark. I have had to caution Enwright on this and former occasions as to the dangerous manner in which he works this pit. The pit is making a considerable quantity of water, and some mechanical appliance is now required for pumping, the water-growth being entirely beyond the capacity of the bucket and windlass in use. (10/6/1901): Stripping not yet quite up to the mark. Two men at work.

Rough Ridge Coal-mine, Idaburn (M. Beck, manager).—(12/6/1901): Seam 35 ft. thick. The overburden, which is about 6 ft., is not well stripped back, concerning which I gave the man in charge notice. Three men employed. Drainage-water is lifted out of the well by horse-power and bucket.

McLean's Coal-pit, Idaburn (L. McLean, lessee).—(12/6/1901): Not much work done in this pit yet. The face of coal is about 15 ft. deep, with a light overburden of gravel. A heavy slide of gravel and crushed coal had taken place previous to my visit, and Mr. McLean was still busy clearing it away. The pit is quite dry. Two men engaged.

Idaburn, Idaburn (J. White, lessee).—(12/6/1901): Owing to the demand for coal, Mr. White has been taking out the coal without keeping the overburden well stripped back. I gave Mr. White verbal notice, and subsequently wrote him, drawing his attention to the matter. There is about 20 ft. of coal in the face. Two men are employed. A pulsometer steam-pump is used to drain the water from the pit.

Border, Rough Ridge (G. Turnbull, lessee).—(12/6/1901): Opencast. About 12 ft. thickness of coal. Water in pit heavy owing to soakage from the creek close by. Two men employed.

Gimmerburn, Gimmerburn (C. Dougherty).—(12/6/1901): Only a few tons for private use being taken out.

Commercial Coal-pit, Upper Kyeburn (C. Archer, permit).—(14/6/1901): The low level is now at a depth of 80 ft. Motive power is derived from a water-wheel and endless rope. The top pulley-shaft is connected with the winding-drum by bevel gearing, and can easily be thrown out of gear. The empty truck is let down by means of a hand-brake. An eccentric on the other end of the main shaft actuates the pump-rods. The pit does not require much pumping except in wet seasons. The levels are driven to the fault, leaving 5 ft. or 6 ft. of coal overhead. Then the roof is broken through at the end of the level, and the overlying gravel is run into the level for filling. As the coal is taken from overhead the level is filled in advance with gravel. Four men employed. (3/10/1901): Archer is pushing on the main dip, and has it advanced over 100 ft. The sump being kept deeper than the dip workings, there is no water in the dip. A man is working in a block of coal left in the top level. The pit can easily cope with the present requirements of the district.

Dairy Creek Coal-pit, Clyde (R. Robertson, permit).—(5/6/1901): Workings generally in good order. Air good. Preparations now being made to put a dip drive down in coal from surface and erect an engine for haulage purposes to replace shaft and horse haulage at present in use. (9/12/1901): W. Dixon, manager. The new mine dip has been driven down to the middle level, and has about 20 ft. to go to reach the bottom level of the shaft-workings. Mine idle on this date. Ventilation fair throughout the workings.

Clyde Collieries (Vincent Coal-pit), Clyde (G. F. Turner, manager).—(5/6/1901): The south levels are stopped at an upthrow fault, the throw of which is not yet determined. Headings off the level are all up to the outcrop; pillars intact. A crosscut dip drive is down 30 yards in excellent coal. Roadways in good order; iron rails throughout. Workings very safe. Air good. New mine started to the rise. When finished will become a second outlet in addition to shaft already provided. A new coupled engine, 6 in. cylinders, 12 in. stroke, has been erected for haulage purposes. Rules posted. Report-book and plan to date. (9/12/1901): Mine idle on this date. Ventilation fair, and mine in good order. Top dip stopped through shortage of timber, but connection has been made through to the main workings.

Cromwell Pit, Cromwell.—(25/7/1901): Not working.

Wadie and Simmons's Mine, Lindis.—(29/4/1901): A few tons only have been taken out of the creek-bed. The coal was waterlogged, and when tried on the Lindis dredge was said to be inferior and incapable of keeping up steam.

Cardrona Mine, Cardrona (D. Scurr).—(27/4/1901): Opencast. The open race formerly used for bringing in water for ground-sluicing the stripping has been cut off, and 600 ft. of 9 in. pipes are now laid, a pressure of 200 ft. vertical head being obtained. The stripping is easily removed. The pit is now being worked in a safe and systematic manner.

Kawarau Coal-pit, Bannockburn (Cromwell and Bannockburn Collieries Company; T. Barclay, manager).—(25/7/1901): The new dip is down about 5 chains, but the last 100 ft. of coal proved too stony and had to be abandoned. Eight men are employed taking out what coal is left above this to the rise. The pit is in good order. Air good. Report-book a fortnight in arrears. (1/10/1091): Owing to mishap to pump, the water was up for three days. Since the water was taken out the roof has fallen at the foot of the main dip near the pump. The men have withdrawn their tools and were taking up some of the roads. The manager anticipates that the settlement will cease in a few days. This pit is fast being worked out, and the intention is to drive a new dip on the proposed extension lease. Six men in mine; three men on top. Report-book to date. (31/11/1901): The pillar-work is fast closing in. The old workings, which were on fire, have been broken into, consequently the atmosphere is close and warm. Three men below. A new dip being put down on the Kawarau Extension will strike the coal at 100 ft., with a dip of 1 in 4.

Excelsior Pit (Parcell and Gibson's), Bannockburn (Cromwell and Bannockburn Collieries Company; Thomas Barclay, manager).—(25/7/1901): Work in this pit now confined to taking out pillar-coal. The coal being hard and the roof good, the work is comparatively easy and safe. Nine men underground. Air good. No levels have been driven yet lower than the bottom of the haulage dip. Report-book up to date. (2/10/1901): Pillar-work still going on. Air good. Eight men in mine; two men on top. Report-book up to date. (31/11/1901): Work slack. Ventilation good, and mine in fair working-order.

Bannockburn Coal-mine (Wilson's), (Cromwell and Bannockburn Collieries Company; T. Barclay, manager).—(25/7/1901): Three men are taking out pillar-coal in the old mine. On account of the work closing in, ventilation is somewhat impeded, and the air is warm. A short time, however, should see this section of work finished. A low level driven from the river-bank strikes the seam 120 ft. to the dip of the old workings. Several places have been broken off and carried on to connect with the air-shaft. Until that is completed the air will be dull. The surface arrangements in connection with the lower workings are still primitive. Haulage over the river is done by means of a hand-winch, and the coal is carried on a travelling-chair suspended from a wire rope. (2/10/1901): Two men in old mine at pillar-work. Air warm. A connection is being made from the new workings. Nine men in lower workings; three men on top. Coal is being worked to the rise. (31/11/1901): Trade being slack, there was no one about. Air good.

George Jeffrey's Area, Bannockburn.—(2/10/1901): Two prospecting-shafts have been sunk. The last shaft was sunk well in the lease, and found coal at 50 ft. depth. Two men engaged.

Cairnmuir Pit (Crow and Anderson's), Bannockburn (Crow and Anderson, owners).—(25/7/1901): A small prospecting-shaft has been sunk, but no serious efforts are being made to develop the area.

Nevis Coal-pit, Nevis (Alexander Cameron).—(30/4/1901): Mr. Luscombe recently sold the pit to Mr. Cameron. There was no one about; no work being done owing to the Nevis Company's dredge having cut away the coal-road entrance to the pit. The north side of the pit is standing well, but the south-side workings (where the coal is soft and inferior) are fallen in. (27/11/1901): Opencast. Seam 40 ft. thick. Top stuff stripped with water. Three men. Mr. Charles Scott now in charge.

Ryder's Pit, Nevis (John Williamson, permit).—(1/5/1901): A new opening on the seam—which is vertical—has been made. The coal was previously worked opencast until stripping became too heavy. Two parallel drives have been put in the face going south. The coal is harder and of better quality than is usual in the locality. I drew the manager's attention to the dangerous nature of the face over the entrance to the drives; owing to the loose and friable nature of the clays on the coal-seam here, more batter is required. Instructions to this effect were given to the manager. (27/11/1901): Seam 45 ft. thick. One man only at work.

Clough and Allen's, Nevis (Mrs. A. Holmes).—(1/5/1901): Opencast. This pit adjoins and is the northern continuation of Ryder's Pit seam. Apparently very little is being done here; the coal could be more easily won from the Ryder's Pit side than any other way.

Gunion's, Nevis (R. Gunion).—(30/4/1901): This area lies on the left bank of the Nevis River, and coal is showing in the tail-races on the terrace of the old alluvial workings. Nevis is said to have been supplied with coal from this area in the early days.

Ritchie's, Nevis (J. Ritchie).—(1/5/1901): Opencast. Only a small quantity of coal for private use being got out.

Renshaw's Pit, Nevis (G. Renshaw).—(1/5/1901): Opencast. Only a small quantity being taken out for private use.

Gibbston Coal Company's (late Gibbston Saddle) Pit, Gibbston (J. Hodson, permit).—(1/8/1901): Three men working in open face above return air-drive. Stripping light, 3 ft. to 4 ft. The main dip is being pushed on by one man and a boy. The coal is proving soft and friable, and requires good timbering. The floor is a soft fireclay, and promises to be troublesome. Throughout the old workings there are accumulations of dross. These show no signs of heating, and will shortly be cleared out. Owing to the inaccessibility of the mine to wagon traffic, a tramway a mile and a half long is being constructed from the foot of the mountain-range to the mine. (25/12/1901): A new level drive has been driven 40 ft. to cut off the dip. Air at date was dull in the mine, but when top level is driven 20 ft. to main air-course, and bottom level connected with dip workings, circulation will be good. All work in the mine, with exception of the new level, was stopped at this date. Two men at work. Operations in connection with construction of tramway temporarily suspended. A new 6 ft. seam has been found in the outcrop.

Scott's, Gibbston (A. Scott).—(1/8/1901): No work has been done by the owner as yet. The area includes Cowan's old mine-workings.

Doolan's Creek, Gibbston (M. B. Edwards, permit).—(1/8/1901): This area has been taken up by a syndicate, who intend to proceed with the formation of a road when the frost disappears. (25/11/1901): The road from Doolan's Creek to the top of the saddle is being pushed on. Eight men are employed.

Cooper's Pit, Cromwell.—(25/7/1901): Not working.

SOUTHLAND.

Pukerau Coal-mine, Pukerau (C. O'Hagan, permit).—(8/1/1901): Bords are driven 15 ft. wide by 10 ft. to 11 ft. high. The seam is 16 ft. in thickness, and, roof being strong, all places are standing well. A rise shaft is being put up for ventilating and pumping purposes. Plan behind. (29/8/1901): Three men employed. The coal is strong in the pillars, but a good thickness of roof requires to be left, as the overlying material is very free. The air-shaft is completed. Air good.

Waikoikoi Coal-pit, Pukerau (Scott and Ferguson).—(8/1/1901): Opencast pit being opened up.

Nelson's (late Dudley's) Pit, Pukerau (J. H. Nelson).—(8/1/1901): Opencast. Stripping 12 ft. of clay and gravel. A good area stripped in advance of working-face. The coal is the same seam as worked by O'Hagan.

Whiterigg Mine, East Gore (J. Hope, permit).—(3/9/1901): Two men at work in the mine. Air good. Mine in very fair order.

Hefferman's Pit, East Gore (J. Boyd). — (3/9/1901): Formerly opencast. Starting a dip to mine the coal.

Sarginson's, Gore (A. Reinke).—(3/9/1901): Opencast. One man taking up about 6 ft. of coal.

Green's Pit, Gore (J. J. Smythe).—(3/9/1901): P. Healey is prospecting a small seam at East Gore. (4/9/1901): The general order of this pit is good. Four men getting coal. Air good.

Knapdale Mine, Knapdale (R. Irvine).—(31/8/1901): Not working at present.

Harvey's Pit, Chatton (J. Harvey).—(15/2/1901): The pit is now leased to James McDougall. A large flake of coal and casing on one side of the pit is loose and ready to fall. I instructed McDougall and Harvey to take the flake down, as, in the event of its falling while horses or men in the pit, serious injury might be caused. The pit is nearly finished, being up to the road-line going south, and the owner considers that it will not pay to put down pumping plant to enable coal to be worked under water-level. (31/8/1901): Not working.

Perkins's, Chatton (A. Perkins).—(31/8/1901): Not working; stripping too heavy on this area.

Pacey's, Chatton (R. Pacey).—(31/8/1901): Opencast. Face 12 ft. coal, with 4 ft. stripping. The seam has been proved to be 30 ft. thick in one part of the face. Two men at work at present. The coal underfoot will be taken up in the dry season.

Otama Pit, Otama (T. Graham).—(12/11/1901): Opencast. Private pit. Quality, lignite (good). Thickness, 3 ft.; 12 ft. stripping.

Cross's Pit, Otama.—(12/11/1901): Private pit. 4 ft. seam of lignite; 15 ft. stripping.

Hunter's, Otama (T. Hunter).—(12/11/1901): Opencast. 10 ft. seam of lignite, with 25 ft. stripping, which is heavy. Two men.

Johnston's Pit, Waikaka Valley (W. Johnston).—(22/1/1901): Opencast. 6 ft. stripping removed with plough and scoop. Coal 11 ft. thick. Pit being safely worked. (3/9/1901): Pit not worked during winter months.

Thorndale Mine, Waikaka Valley (E. C. Orchard and Sons).—(22/1/1901): New opencast pit. Fairly large area stripped in advance.

Reed's Pit, Waikaka Valley (Robert Reed).—(22/1/1901): Opencast. Stripping, which is heavy, is not kept so well in advance as it should be. (3/9/1901): Three men employed. Several dredges draw their coal-supply from this pit.

McGill's Pit, Wendon Valley (J. McGill).—(23/1/1901): Opencast. Stripping kept well in advance of coal-face. (30/8/1901): Pit closed during winter months, but is being reopened in view of summer trade.

McDonald's, Wendon Valley (Donald Nicoll).—(23/1/1901): Opencast and driving. Stripping ahead not being attended to in opencast, and the drive is very large, 12 ft. by 12 ft. Drays are backed right into the mine, but the owner intends to lay a tramway and truck the coal out. Three sets of timber required at mine-mouth, as pointed out to Mr. Nicoll. (30/8/1901): This pit is now worked on good lines. The entrance has been well timbered. Four men getting coal.

Styles's Pit, Wendon Valley (Arthur Styles).—(23/1/1901): Opening up a small pit near Edge's.

Wendon Pit, Wendon Valley (G. H. Evans).—(23/1/1901): Stripping becoming too heavy; a heading is being driven in the coal. The face being too vertical over the mine-mouth, I instructed the owner to give it a safe batter. (30/8/1901): Two men getting coal. There is a strong tendency in this mine to drive wide without due regard to pillars. The coal is strong, but when opened up becomes friable under atmospheric action, causing the pillars to crush.

Radford's (Carmichael's) Pit, Wendon (E. and P. Radford).—(11/11/1901): Opencast. Seam almost vertical. Coal 20 ft. thick. Stripping 25 ft., which is sluiced off when water is plentiful, but scarcity of water leaves the pit in an awkward state. Two men.

Monaghan's Pit, Landslip, Waikaia (P. Monaghan).—(13/11/1901): Opencast. Coal has been stripped in two places on the hillside, but very little coal has been taken out.

McIvor's, Landslip, Waikaia (Mrs. McIvor).—(13/11/1901): Thickness of seam, 15 ft. Amount worked, 7 ft. This was worked by an adit, but the seam is so disjointed and full of gravel-partings that it was difficult and dangerous to work. The adit has now been abandoned for opencast method of working. Two men.

Goldie's Pit, Waikaia (T. F. Goldie).—(13/11/1901): Opencast. This is a newly acquired area. Quality, shale. Thickness of seam, 12 ft., all of which is worked. Stripping 12 ft. Power, hand. Two men.

No. 1 Pit, Landslip, Waikaia (A. McKinnon).—(13/11/1901): This seam is worked by an adit. Thickness of seam, 12 ft., 7 ft. of which is worked. Two men. Natural ventilation, fair. Roof strong. The bottom has been opened out in the soft sandstone for drainage, depriving side coal of its support.

Argyle Pit, Waikaia (J. and T. Baxter).—(13/11/1901): Opencast. Worked ten years. Pit now in fair order. Seam 10 ft. thick, with 15 ft. stripping. Two men.

Waimea Pit, Longridge Village (A. Smith).—(11/11/1901): Opencast. Present coal-seam almost worked out. 5 ft. of stripping required to get 2 ft. 6 in. of coal. Three men.

Pyramid Pit, Mandeville (E. MacAllister).—(11/11/1901): Mine worked by adit. A little coal is being taken out of the lowest level. No one at work to-day. Natural ventilation, fair.

Waimumu Coal-pit, Mataura (C. P. Sleeman).—(10/9/1901): Coal 17 ft. 6 in., with 17 ft. stripping. Four men stripping, and three men getting coal. Low-level drainage-tunnel keeps the pit dry. Stripping heavy, but kept well advanced.

Bogside Coal-pit, Mataura (H. Brown). — (10/9/1901): Opencast. 16 ft. coal, with 10 ft. stripping. Stripping kept well back. Water pumped out by steam-pump, which barely keeps the mine dry. Two men at work.

Beattie and Coster's Pit, Mataura (W. Coster).—(10/9/1901): Opencast. 16 ft. coal, with 10 ft. stripping. Stripping well advanced from the coal-face. Water pumped from the pit by means of a water-wheel and steam-pump. Two men at work.

Townshend's, Mataura (R. T. Coomer).—(14/2/1901): Opencast. The pit had been closed for several years, but owing to the demand for coal for local dredges the pit has recently been reopened. Tenders are called for stripping. (11/9/1901): Not working.

Duthie's Pit, Waimumu (J. Duthie).—(11/9/1901): Working a 10 ft. 6 in. seam of coal. Stripping 12 ft. In the stripping a higher seam is making, and increases to 6 ft. where tried, 20 to 30 yards back. Below the worked seam there is a parting of clay 2 ft. 4 in., and an underlying seam has been proved by borehole to be 5 ft. to 6 ft. or more in thickness. Present working-face 150 ft. long. Tramway to be laid down from the pit to the Waimumu Valley to furnish coal-supplies to the dredges. Three men at work.

Ota Creek Coal-mine, Wyndham (W. Shields).—(9/1/1901): Opencast. Stripping 10 ft. of gravel. Only 5 ft. of the seam being worked, balance of seam lying below water-level being left underfoot.

Wyndham Coal-mine, Wyndham (William Walker).—(9/1/1901): Opencast. Not much doing, the bulk of coal-seam lying below permanent water-level of the valley.

Edendale Pit, Wyndham (A. McDonald).—(9/1/1901): Small opencast pit. Still closed.

Marshall and Jones's Pit, Edendale (H. Marshall and E. and A. Jones).—(9/1/1901): Small opencast pit. Worked for private use only.

Neill's Coal-pit, Edendale (T. Neill).—(9/1/1901): Small opencast. Still closed.

Munro's Coal-pit, Wyndham (E. Munro).—(9/1/1901): Opencast pit. Now closed, coal above water-level being all worked out.

Robin Hood Coal-pit, Pine Bush (A. Trotter). — (23/10/1901): Opencast lignite-pit. Coal 10 ft. to 12 ft. thick. Stripping, 4 ft. to 6 ft., is principally auriferous gravel, with yellow clay on top. There is not much demand for coal at present.

Graham's, Fairfax (P. S. Graham).—(24/7/1901): Successive levels are driven; no system of bords or headings. The seam is lying practically horizontal. Stentons are put through regularly for air, and the new drive is bratticed to the face for air-return.

Spey Bank Pit, Fairfax (R. Salton).—(24/7/1901): Seam 5 ft. in thickness. A drive 10 ft. wide is in 2 chains to the face. Very little now doing, Mr. Salton being past hard work.

Isla Bank Pit, Fairfax (M. Slattery).—(24/7/1901): Opencast. No stripping in advance of working-face. Coal about 14 ft. Stripping 6 ft.

Nightcaps Colliery, Nightcaps (John Lloyd, manager).—(22/2/1901): The new dip is down 2½

chains, and is ventilated by 7 in. galvanised-iron pipes led from a small fan ; belt driven from the hauling-engine underground. The main intake is in good order, wooden brattice across all openings off the level, and air conducted to the workings in a proper manner. Air cool, but current sluggish, and the far-in faces are dull, smoke after shot-firing being slow to clear. The coal in this colliery is of a strong nature, and has to be blasted. On my recommendation compressed powder has been substituted for ordinary blasting-powder, with beneficial results to the air. A new upcast is on the point of pricking through. This, when completed, should give more than ample air for the men (nineteen) in this section. (19/7/1901) : Dip drive 5 chains to face. Stentons off the dip provide free circulation of air to the breast of working-faces. Brattice for conducting air is well built of boards nailed on studs, and filled in between with fine material. Air excellent at all the working-faces. The new "snatch" or furnace upcast shaft is working well. (6/9/1901) : The mine is in good order. The regularity of the seam being broken by cross clay-seams renders the maintenance of the mine difficult, but great care is being exercised. Timber is freely used in the travelling-ways. Air good throughout the mine. I found the furnace and upcast shaft in good order. (3/10/1901) : A considerable portion of the output is still being won from opencast working along the line of outcrop. In the underground places clay backs are giving the usual amount of trouble, but timber is liberally used, and due care is apparently taken to provide for safety. Air good throughout the mine. James R. Quested was killed in the mine on the 1st October, 1901, by a fall of timber and coal from the roof while trimming a bar preparatory to setting a centre prop. Particulars under heading of "Accidents."

H.B. Coal-mine, Nightcaps.—(22/2/1901) : The mine is idle (no tenant at present), and the owner is unable to work it himself. (5/9/1901) : J. Beadle, permit. I visited the mine on this date in consequence of a fatal accident whereby W. H. Guttery lost his life at the mine-mouth. Particulars of the accident will be found under the heading "Accidents." The mine was recently leased from the owner, Mr. A. Lamont, by Beadle and Guttery, Guttery being in charge. There has not been much coal taken out, the mine having been worked intermittently by several parties of miners. An air-shaft has been sunk, and the ventilation is satisfactory. The drives are narrow, and props set where required. Care is required in working the coal, owing to the large number of clay backs in the seam ; but the miners in the Nightcaps district understand the nature of the work, and accidents from falls of roof at the face are comparatively rare.

Hit or Miss Mine, Nightcaps (W. Tinker, permit).—(22/2/1901) : A new mine being opened on a part of the Nightcaps Coal Company's property adjacent to the H.B. Mine, Morley Village.

Blythe Pit, Nightcaps (Grier and Spence).—(6/9/1901) : Opencast. Working to the dip, and stripping kept well back in front of the working-face. One man at work.

Wairio (late A. McBride), Nightcaps (Kelly Brothers; J. W. Kelly, permit).—(6/9/1901) : Kelly Brothers have leased McBride's coal-pit, Nightcaps, and have started away a level to mine the coal. Formerly this pit was worked opencast, but the stripping proved too heavy.

Orepuki Shale-mine, Orepuki (New Zealand Coal and Oil Company; Michael Straw, manager).—(20/2/1901) : Development-work is well advanced ; levels and headings driven, all close-timbered. The shale-reduction plant will be ready in a month, and an area of coal and shale is now opened up in readiness, a continual and constant supply of both being necessary. As the mine was opened up it was unexpectedly found that the district was considerably troubled and faulted, and the original plans of laying off the workings had to be departed from. It was found that the strata underground formed a succession of synclines and anticlines in regular order and succession, and skill and ingenuity have been displayed in laying off the hauling-ways to enable the mineral to be landed at the foot of the main engine-incline haulage free. The coal-seam is from 12 ft. to 20 ft. in thickness, and the shale overlying the coal is 4 ft. thick. The district opened is laid out for work in stalls 20 yards apart ; all the shale to be won with as much coal as may be required, the balance of the coal-seam being left in underfoot. The present intake airway and shaft (which constitute the second outlet) are in good order. Substantial inclined iron ladders with proper landings have been placed in the shaft. Air good and well conducted round the working-faces. Report-books and plan to date. (18/7/1901) : For ventilation purposes the exhaust steam from the pump at the bottom is turned into the main engine plane, causing heat and discomfort in travelling the brow. Air warm in No. 4 jig rise workings, indicating heating in waste. Owing to the rotten nature of the roof overlying the shale, it has been found that 20-yards stalls are not workable, and 10-yards stalls are now being opened up. Double the number of men will then be employed on a face of work, and by taking the shale out more rapidly the cost per ton will be reduced. An abundance of heavy timber is in use, and a full supply at hand underground and on top. Air inadequate at some of the working-faces, it being heavily charged with deleterious gases from the waste, and fan or other mechanical ventilation will soon be necessary, present power being insufficient for requirements. (9/9/1901) : Air-current, 5,800 cubic feet per minute. No more coal is taken out of the mine than is required in connection with surface plant, but the shale overlying the coal-seam is exhaustively worked. So far all work has been carried on to the rise and out to the boundary. Operations are now confined to bringing home the pillars. All stoppings are cool. Air slack generally throughout the mine, but is dullest in the shoots (south level) and in No. 3 stall, No. 1 district. A steam-jet is used to increase the circulation, but the erection of a fan should be proceeded with at once. Returned through the second outlet and found all in good order. Report-book kept up to date. (4/10/1901) : Air at intake, 9,000 cubic feet per minute. Coal-cutting machines from Kaitangata are being installed, with good results. All holing is done in the coal, only sufficient coal being taken out to insure recovery of shale-seam ; and from the rotten nature of the roof great difficulty is experienced in maintaining roadways and working-places 6 ft. high ; therefore the balance of the coal-seam, 6 ft. to 15 ft., is left underfoot. Air dull at far-in faces, large quantities of damp coming from the waste. The motive power of the air-current is not sufficiently strong to adequately ventilate the faces and carry off the poisonous

gases generated in the waste, and mechanical ventilation is urgently required. I subsequently wrote the mine-manager and the general manager of the company to that effect, and pointed out the immediate necessity of attending to the matter. (6/11/1901): There was an improvement throughout the mine as regards ventilation. Air at intake, 6,958 cubic feet per minute for thirty-five men. Alexander's and Crawford's places in No. 8 jig were stopped off when the shale was worked out, but the barrier has crushed. The damp is leaking, and goes direct to the south level. This part of the mine is the furthest in of the rise workings, and the air is always reported dull here. Owing to the roof in the waste falling irregularly, the fire between Nos. 3 and 4 has not yet been cut off, smoke still drawing out. The crosscut to Nos. 1 and 5 jigs has been repaired and put in thorough good order. Timber is plentifully used throughout the mine, and full supplies kept handy to the working-places. Every care is taken for prevention of accidents and safety of workmen.

Clifton Coal-mine, Invercargill (Thomas Gillies).—(23/7/1901): A seam of lignite in Seaward Bush lying near the surface, but beneath the water-level of the surrounding country. To be worked opencast.

REMARKS.

The output of coal and lignite (Southern District) during the year is returned at 383,730 tons, and of shale 12,048 tons, a total increase of 56,274 tons over the previous year. Returns of output from the several portions of the district are as follows:—

	Tons	cwt.
Canterbury	16,100	4
North Otago	37,650	19
South Otago	200,464	0
Central Otago	51,207	0
Southland	78,307	18
	383,730	1
Output for previous year	339,504	0
Increase	44,226	1
Shale added	12,048	0
Total increase	56,274	1

New mines have been opened at Brockley, at Riccarton, and at several other small places. A good deal of prospecting is being conducted throughout the district, with varied results. At Taratu a branch line of railway is being constructed from the Lovell's Flat Railway-station to the coalfields, about seven miles. The coal areas granted on Crown lands in Central Otago during the past two years, with few exceptions, are not being worked.

The contributions to the Coal-miners' Relief Fund amounted to £370 5s, while payments have been recommended amounting to £400 18s. 9d.

ACCIDENTS.

4th September, 1901.—Walter H. Guttery, miner, one of the lessees of the H.B. Coal-mine, Nightcaps, was suffocated (while trucking) by a fall of dirt at the mine-mouth. The corner of Guttery's box struck the right-hand prop at the mine-mouth, knocking it out, and three sets of timber fell. An accumulation of fine dirt, which had weathered from the bank above, slid down and covered deceased, who, when uncovered fifteen minutes afterwards, was lying face down with about 2 ft. of dirt covering his head. The tram-road was canted, and it was usual for the boxes to be twisted past the prop on which the corner of the box struck. An iron bar was brought to the spot for the purpose of drawing the road off the prop, but it had not been done. The Coroner's jury brought in a verdict of "Death by suffocation, caused by an accidental fall of dirt." I reported fully on this accident under date the 9th September, 1901.

1st October, 1901.—James R. Quested, miner, Nightcaps: Killed by a fall of timber and coal from the roof. Was trimming a bar preparatory to setting a centre prop when it collapsed. James Mason, underviewer and examiner, told deceased that the bar was "weighting," and instructed him to set a centre prop to it. Deceased unfortunately started to trim the bar with a tomahawk, when the bar broke at the part being trimmed. Care had apparently been taken to provide good timber. The bar was selected by the mine-manager, and accepted by deceased and his mates. I subsequently wrote to Mr. Lloyd, pointing out that minimum timber sizes in wide places should be increased. The Coroner's jury brought in a verdict of "Accidental death; no blame attachable to any one." I reported this accident fully to you under date the 8th October, 1901.

16th January, 1901.—George Ferguson, Shag Point: Fractured thigh, crushed between two boxes.

20th January, 1901.—Robert McNatty, Beck's, Rough Ridge: Fractured thigh; cause, dray running over him in the pit.

3rd April, 1901.—Hugh Jones, Cromwell and Bannockburn Collieries: Hip bruised by a fall of coal from roof while drawing a prop.

15th June, 1901.—Thomas G. Spain, Mosgiel, Saddle Hill: Injury to spine by fall of coal from face.

7th August, 1901.—Edward Mackie, Kaitangata: Fractured thigh. Fall of coal from roof while dropping tops.

20th December, 1901.—William McNeil, in charge of a sinking shaft, Walton Park: Was in the bottom, when a piece of clay fell from the side and fractured two ribs.

A number of minor accidents occurred not of sufficient importance to require individual mention.

Eye accidents continue at several collieries, due to pieces of proud coal flying from the pick-point causing ulceration of the cornea. The importance of at once obtaining medical assistance is generally understood, and consequently the effects of injuries from this cause are decreasing rapidly. Gauze shields are also worn over the eyes for protection.

The question of fan ventilation is receiving attention, and several coal-owners are having fans built on the same principle as that designed by the Inspecting Engineer, and described in last year's report on goldfields.

I have, &c.,

E. R. GREEN,
Inspector of Mines.

The Under-Secretary, Mines Department, Wellington.

APPENDIX I.

MINING MANAGERS' EXAMINATION PAPERS.

QUESTIONS USED IN EXAMINATION OF MINING MANAGERS FOR FIRST-CLASS CERTIFICATES.

SUBJECT No. 1.—*On Prospecting, Sinking, Tunnelling, and opening out a Colliery.*

1. In prospecting a new field for coal, describe how you would proceed, and what indications would guide you as to the probability or otherwise of finding coal.
2. Describe the mode of putting down bore-holes:
   (*a*) With diamond-drill;
   (*b*) Hand-rods;
and state under what conditions you would use the above, and why.
3. Describe the method of sinking a pit 14 ft. diameter through quicksand, supposing it to be 60 yards before a suitable place occurs for a wedge-ring to be put in, the tubbing to be of iron. Also give thickness and size of tubbing.
4. Explain how you would keep the shaft circular and plumb while sinking.
5. (*a*) What precautions would you use whilst sinking as to (*a*) scaffolding; (*b*) firing shots; (*c*) signalling; and how would you ventilate the shaft during operations?
6. In opening up a new coalfield describe fully how you would determine the position of shafts or adits for winning coal; assume conditions.
7. Draw a ground-plan showing surface arrangements for a mine to deal with an output of 800 tons per day of eight hours.

SUBJECT No. 2.—*On working Coal and Timbering underground.*

1. Sketch the various systems of setting timber with which you are acquainted, and explain the advantages in each case.
2. Describe the different systems of coal working, and under what conditions each system works best. Give a rough sketch of the system adopted at any mine you are acquainted with, stating thickness of seam, quality of roof, floor, &c.
3. Give your experience in taking out pillars, and describe how you protect yourself from falls of roof.
4. In working a seam of coal on bord-and-pillar system, state what conditions would guide you as to size of pillars.
5. What are the requirements of the Coal-mines Act as to timbering and spragging?
6. In a seam of coal lying at an angle of 18°, what angle would you set the props to support roof?
7. Under what conditions would you use wooden chocks for timbering? Describe the operation of drawing timber, and precautions necessary for safety.

SUBJECT No. 3.—*On the Gases of Mines, Spontaneous Combustion, and Ventilation.*

1. Describe the different gases met with in coal-mines in the order of their specific gravities, their occurrences, properties, and effects.
2. State which, in your opinion, are the best mining-lamps in use at present, and define exactly the points in which each lamp you approve of excels the other.
3. What are the chief points to be kept in view when constructing an airway with the object of passing a large volume of air with the minimum expenditure of power.
4. Describe the barometer, anemometer, and water-gauge, and their uses.
5. If 40,000 ft. of air per minute is passing through an airway 9 ft. square at a velocity of 493·827 lineal feet per minute, what would be the horse-power of same supposing length of airway to be 2,000 ft.?
6. Which do you consider should be the largest: the area of the openings that admit the fresh air or the openings for the efflux of the vitiated air; and give reasons?
7. How would you detect the first symptoms of spontaneous combustion in mines: State your opinion of causes; and explain the different modes of extinguishing underground fires?

SUBJECT No. 4.—*On dealing with Old Workings and other Sources of Danger.*

1. What precautions would you adopt in approaching old workings likely to contain gas or water?
2. Describe the operation of shot-firing in a coal-mine, and the conditions to be observed. What is a blown-shot, and its effects under different conditions?

3. What indications does a safety-lamp give of the presence of firedamp under the following conditions?—

(*a*) When a small amount only is present;
(*b*) When gas is present as an explosive mixture.

4. Should a fall occur in your intake airway and a large amount of firedamp be given off, what steps would you take?

5. Give a sketch and description of a water-dam, and what would guide you as to the position you would place it.

6. What are the requirements of the Coal-mines Act as to shot-firing? What has to be done in the case of missed shots? and what extra precautions would you take to guard against accidents from missed shots?

7. What are the requirements of the Coal-mines Act as to safety-lamps and lamp-stations underground?

SUBJECT No. 5.—*On Steam Boilers and Engines used about Mines.*

1. Describe and give sketch of what you consider a suitable steam boiler for colliery use. Show positions of fittings, and the use for which they are applied.

2. What is the nominal h.-p. of a Lancashire boiler whose length is 30 ft. and 6 ft. diameter?

3. What is the available power of a pair of winding-engines with 24 in. cylinders, 5 ft. stroke, making 40 revolutions per minute, steam-pressure on boilers indicating 75 lb.?

4. Describe the size of engines, drums, and boilers you would use for raising 800 tons daily from a shaft 300 yds. deep, giving size of shaft, ropes, tubs, &c.

5. Describe the different methods employed of transmitting power from surface to machinery underground.

6. What is the breaking-strain of a $3\frac{1}{2}$ in. best plough-steel wire rope? and what is the safe working-load?

7. Describe the arrangements for banking and caging at top and bottom of a shaft to facilitate winding.

SUBJECT No. 6.—*On Mine Drainage and Haulage and Appliances for same.*

1. Draw a sketch of a siphon pump, and describe its action.

2. Describe by a sketch a plunger, or forcing set of pumps, worked by an engine on the surface. What are the advantages of such a set, as compared with a bucket or lifting pump, and what are the disadvantages?

3. What diameter of plunger would you require to pump 1,000 gallons per minute with a 6 ft. stroke and eight strokes per minute?

4. Give a description of the various means of lowering coal from working-faces into main levels or haulage.

5. It is required to raise 400 tons per day of eight hours up a haulage-road with a rise of 1 in 8 a distance of 40 chains by endless-rope haulage. Show what H.P. and size of engines you would require, the weight and number of tubs empty and filled, and how far apart, and the manner of attachment and size of rope.

6. Compare the relative advantages and disadvantages of electricity and compressed air when used as a motive power in a mine.

7. What do you consider the best method of pumping from dip workings? Give reasons.

SUBJECT No. 7.—*On Geology, Surveying, and making Plans.*

1. Describe the geological features of the coalfields you are acquainted with.

2. Explain the formation of country where you would be most likely to find coal. Explain the meaning of the terms: "Upthrow," "downthrow," and "reverse" faults, "anticlinal," "synclinal," "conformable," and "unconformable," as applied to mining.

3. Give shortly your ideas as to the origin of coal.

4. Candidate must produce plan showing survey of a portion of a mine surveyed by himself, and showing the connection between surface and underground work, the boundaries of surface to be not less than 20 acres; traverse to be calculated, and field-book shown.

5. A to B is on a bearing of S. 30° W., length 50 links;
A to C is on a bearing of S. 60° E., length 86·6 links;
What is the bearing and length from B to C?

6. Two pits, A and B, are exactly east and west of each other, and are 800 yds. apart from centre to centre. A third pit, C, is situated due north of B. All three pits are visible to each other. The exact distance of C from A and B cannot be measured direct, owing to an intervening river: Explain how you would calculate the distance.

7. Describe the method of levelling, and show how to keep a level-book, and reduce the levels.

SUBJECT No. 8.—*Arithmetic, and a Knowledge of the Coal-mines Act.*

1. A pillar of coal is 16 yards square and 12 ft. thick, how many tons will it contain?

2. How many bricks would it require to line a shaft 200 yards deep, 14 ft. in diameter, with 9 in. brickwork?

3. What weight of material would you wind in sinking a shaft 12 ft. in diameter 90 ft. deep (assume weight per cubic foot)?

4. If the horse-power of a fan engine be 30, and 35,000 cubic feet of air per minute are put in circulation: what would be the horse-power required, the quantity of air being increased to 100,000 cubic feet per minute?

5. If 9,147 tons cost £2,947 2s. 6d., what is the cost per ton in price and decimals?
6. Describe the provisions of the Coal-mines Act with regard to—
   1. Ventilation.
   2. Shaft signals.
   3. Refuge holes.
   4. Machinery.
   5. Abandoned workings.
   6. Shafts.
7. What is the duty of a manager as regards ventilation, and what is the minimum quantity of air circulated per man and horse allowed in non-fiery mines?

QUESTIONS USED IN EXAMINATION OF MINING MANAGERS FOR SECOND-CLASS CERTIFICATES.

SUBJECT No. 1.—*Prospecting, Shaft-sinking, Tunnelling, and opening out a Colliery.*

1. In prospecting a new field for coal, give a short account how you would proceed.
2. Describe the necessary fittings for starting a new shaft, and explain the operation of sinking to the stone head.
3. How would you proceed to open up a coalfield, seam 6 ft. thick, by a dip incline 1 in 6, length 600 yds., and deal with 100 gallons of water per minute?
4. State how you would set timber in a drawing-road—
   (*a.*) With soft roof and strong sides and floor;
   (*b.*) With good roof and weak sides and floor;
   (*c.*) With weak roof and floor and good sides.

SUBJECT No. 2.—*On working Coal and Timbering underground.*

1. Describe in detail the system of working coal with which you are best acquainted, giving section of the coal, nature of roof and bottom, and dip of strata.
2. Describe under what circumstances you would use cogs or chocks in underground workings.
3. Supposing the bars of main road, with very rotten roof, had to be withdrawn: what orders would you give men as to safety in carrying out this work?
4. Show by sketch, and describe, the manner in which you would lay out a district in a mine to employ 30 hewers.

SUBJECT No. 3.—*On Gases in Mines, Spontaneous Combustion, and Ventilation.*

1. Enumerate the gases met with in coal-mines. How can you detect them? State the characteristics of each.
2. What do the rules require a fireman to do if he finds firedamp in a working-face: (*a*) If he removes it; (*b*) if he does not remove it; (*c*) if it accumulates during the working?
3. State your opinion as to spontaneous combustion in mines, and how you would deal with underground fires.
4. Give your opinion as to the relative merits of fan and furnace ventilation, and indicate conditions under which each is preferable.

SUBJECT No. 4.—*On dealing with Old Workings and other Sources of Danger.*

1. In approaching workings known to resist water, what precautions would you adopt?
2. Sketch form of dam suitable to contain a head of 150 ft. of water; materials you would use, and what are the conditions you would try to secure in the site where dam was fixed?
3. What are the causes of blown-out shots, and the danger from them? and what precaution would you take to prevent them?
4. What would you do in case of an accumulation of gas in mine when the men are at work?

SUBJECT No. 5.—*Mine Drainage, Haulage, and Appliances for same.*

1. Describe a force-pump and a siphon. Where can a siphon be used to advantage?
2. Describe a lifting set of pumps; and state how much water can be raised by such a pump 9 in. diameter, 6 ft. stroke, making 10 strokes per minute.
3. On an incline having a grade of 1 in 4 and 20 chains long it is required to lower 12 tubs in a race or set, each tub containing 10 cwt. of coal, empty tubs weighing 5 cwt.: give particulars of class of drum, size of rope, and general arrangements of incline.
4. Give a description of any mechanical underground haulage you are acquainted with.

SUBJECT No. 6.—*Arithmetic, and a Knowledge of "The Coal-mines Act, 1891."*

1. Subtract—

Tons	cwt.	qr.	lb.	Acres	roods	poles
3,927	17	3	15	5,430	2	21
2,198	14	1	16	4,910	3	31

2. Multiply £61,760 2s. 3½d. by 17.
3. If 6 cwt. of small coal are screened out of every ton of coal raised at a colliery, what is the percentage of large and small coal?
4. What are the provisions of the Coal-mines Act as to the following?—
   (*a.*) Report-books, when and where kept;
   (*b.*) Under-Manager's duties;
   (*c.*) Fireman's duties;
   (*d.*) Employment of boys underground;
   (*e.*) Withdrawal of workmen;
   (*f.*) Signalling;
   (*g.*) Man-holes in haulage and horse-roads.

APPENDIX II.

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.
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.
Bennie, Boyd, Waihi.
Carruthers, J., Shag Point.
Carson, W., Kaitangata.
Coulthard, J., Taylorville.
Dixon, C. W., Granity.
Dixon, W., jun., Kaitangata.
Dunn, Andrew, Denniston.
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., Westport.
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.
Westfield, C. H., Fairfield.
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.
Lindop, A. B., Springfield.
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.
Goold, A. L., Auckland.
Irvine, James, Dunedin.
Jordan, R. S., Kaitangata.
Lewis, W., Blackball.
Pollock, James, Green Island, Otago.
Proud, Joseph, Wanganui.
Scott, Joseph, Ngahere.
Tennent, R., Brunnerton.
Twining, C. E., Dunedin.
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.
Longstaff, H. C., Kaitangata.
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.
Barber, John, Shag Point.
Barclay, T., Kaitangata.
Barclay, Wm., Kaitangata.
Brown, Robert, Kaitangata.
Campbell, Peter, Fairfield.
Cherrie, R. C., Mokau.
Christie, James, Saddle Hill.
Clemo, G., Whangarei.
Dixon, W., jun., Kaitangata.
Duncan, James, Kaitangata.
Duncan, John, Lovell's Flat.
Harris, A., Saddle Hill.
Hill, R., Abbotsford.
Hodson, John, Kaitangata.
Hunter, A., Southland.
Lindsay, J. B., Orepuki.
McAllister, Neil, Kaitangata.
Neilson, Moffat, Abbotsford.
Orr, Hugh, Fairfield.
Parcell, W., jun., Bannockburn.
Snow, T., Mercer.
Taylor, Joseph, Collingwood.
Waldie, A. B., Mokau.
Westfield, C., Fairfield, Otago.

APPENDIX III.

STATISTICS of WORKINGS in COAL-MINES, 1901.

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 1901. Coal.	Output for 1901. Slack.	Output for 1901. Total.	Approximate Total Output to 31st December, 1900.	Approximate Total Output to 31st December, 1901.	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.
NORTH ISLAND.													Tons.	Tons.	Tons.	Tons.	Tons.									
KAWAKAWA DISTRICT.																										
Kawakawa (stopped) ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	794,865	794,865	..	..	..	..	..	..	..	..	..
Kawakawa Mine (formerly New Bay of Islands Company)	Culley, John ..	7	semi-bitum.	1	4′	3′ 6″	1 in 6	bord and pillar	2	6′ x 4′	100′	adit	2,938	..	2,938	56,391	59,329	1½	4½	6	horse	..	..	..	natural	26/11/01
HIKURANGI DISTRICT.																										
Hikurangi Coal Company ..	Moody, T. P. ..	8	ditto	1	7′ to 12′ 6″	7′ to 11′	1 in 6	ditto	2	6′ x 9′	264′	adit in-cline	39,593	..	39,593	197,283	236,876	5	51	56	steam	..	..	..	„	27/11/01
Hikurangi Colliery Company	Kerr, George ..	4	„	1	10′ to 12′	9′	irregular	„	2	6′ x 9′	..	adit	3,786	..	3,786	41,196	44,982	3	9	12	manual	..	..	..	„	27/11/01
West Bryan's (amalgamated)	Goold, A. L. ..	..	„	1	6′ to 10′	6′	1 in 8	„	1	7′ x 7′	..	adit in-cline	5,989	..	5,989	34,348	40,337	2	8	10	horse	..	..	..	„	27/11/01
Phœnix (amalgamated)	„ ..	..	„	1	6′ to 10′	6′	1 in 8	„	1	7′ x 6′	..	ditto	992	..	992	11,823	12,815	1	6	7	steam	5″	6″	..	„	27/11/01
Walton and Graham (stopped)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,210	1,210	..	..	..	..	..	..	..	..	..
WHANGAREI DISTRICT.																										
Kamo (stopped)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	225,037	225,037	..	..	..	..	..	..	..	..	..
Kamo, New (stopped) ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9,373	9,373	..	..	..	..	..	..	..	..	..
Whauwhau (stopped) ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	70,853	70,853	..	..	..	..	..	..	..	..	..
NGUNGURU DISTRICT.																										
Ngunguru	Taylor, A. H. ..	9	semi-bitum.	1	2′ to 5′	2′ to 5′	1 in 8	bord and pillar	3	4′ x 4′ 4′ x 6′ 7′ x 6′	17′ 528′ 248′	adit in-clines	17,789	..	17,789	115,138	132,927	13	34	47	steam & horse	12″	4″	20′	natural	28/11/01
Kiripaka (Pomipo)	Clemo, George ..	2½	ditto	1	20′	6′ to 12′	irregular	ditto	1	7′ x 5′	..	adit	15,968	..	15,968	12,885	28,853	2	14	16	manual	..	..	..	„	28/11/01
WAIKATO DISTRICT.																										
Waikato (stopped)	Wight, E. S. ..	..	brown	1	..	..	..	..	..	..	..	..	..	..	..	209,089	209,089	..	..	..	..	..	..	..	..	..
Taupiri Extended	„ ..	13½	„	1	30′	20′	1 in 10	bord and pillar	2	10′diam. each	166′ 209′	shaft	2,168	67	2,235	633,654	635,889	2	6	8	steam	24″ 12″	10″ 2-5″	166′ 209′	fan	15/6/01
Taupiri Reserve	„ ..	14½	„	1	20′ to 24′	7′ to 18′	1 in 8	ditto	2	7′ dia. 10′ x 6′	60′	adit in-cline	25,606	3,083	28,689	201,442	230,131	11	44	55	„	12″	2–7″	220′	exhaust steam	24/9/01
Ralph's Taupiri	„ ..	10½	„	1	30′ to 50′	20′	1 in 10	„	2	9′ 6″ x 5′ 8′ 6″ dia.	190′ 145′	shaft	44,455	363	44,818	79,221	124,039	13	76	89	„	12″	2–6″	190′ 90′	fan	24/9/01
Ralph's (stopped)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	23,019	23,019	..	..	..	..	..	..	..	..	..
Harrison's	Harrison, John ..	2	brown	1	20′ to 24′	16′ to 20′	1 in 15	bord and pillar	3	6′ x 8′	330′	adit in-cline	8,254	90	8,344	..	8,344	5	25	30	steam	..	..	..	natural	24/9/01
MOKAU DISTRICT.																										
Taranaki Collieries (Limited) (formerly Mokau) & Fernside	Lobb, J. ..	17	„	1	7′ 6″	7′ 6″	1 in 36	ditto	1	6′ x 6′	990′	adit	3,513	..	3,513	21,809	25,322	3	7	10	horse	..	..	..	„	20/10/01
Fernside (stopped)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3,265½	3,265½	..	..	..	..	..	..	..	..	..
Co-operative (stopped) ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	940	940	..	..	..	..	..	..	..	..	..

MIRANDA DISTRICT.																											
Miranda (stopped)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	20,668	20,668	..	..	..	..	..	..	..	..	..
Maramarua	Tattley, William	1	brown	1	55′	8′ 6″	irregular	bord and pillar	1	6′ x 6′	360′	adit incline	430	..	430	..	430	4	6	10	steam	12″	7″	80′	natural	7/12/01
BOMBAY DISTRICT.																											
Bombay (stopped)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	81½	81½	..	..	..	..	..	..	..	..	..
Totals, North Island	..	..	..	..	..	..	..	..	..	..	..	..	171,481	3,603	175,084	2763591	2938675	65	291	356							

MIDDLE ISLAND.

NELSON.																											
Enner Glynn (*not now at work*)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,337	1,337	..	..	..	..	..	..	..	..	..
COLLINGWOOD DISTRICT.																											
Pakawau	Walker, James ..	6	bitum.	1	2′ 6″ to 4′	all	1 in 4	bord and pillar	..	4′ x 5′	150′	adit	857	851	1,708	3,165	4,873	3	13	16	horse	..	..	..	natural	20/11/01
Puponga	Taylor, Joseph ..	6	„	1	8′	all	1 in 4	pillar and stall	2	10′ x 6′	170′	„	500	..	500	500	1,000	10	10	20	„	..	..	..	„	20/11/01
Mine not now at work.																											
Wallsend	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	47,413	47,413	..	..	..	..	..	..	..	..	..	..
TAKAKA.																											
Mines not now at work.																											
Motupipi	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	130	130	..	..	..	..	..	..	..	..	..	..
Takaka	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	70	70	..	..	..	..	..	..	..	..	..	..
WESTPORT.																											
Mokihinui	Armstrong, James	1½	bitum.	1	7′ to 12′	all	1 in 6	bord and pillar	2	9′ x 10′	660′	adit	14,077	6,180	20,257	53,166	73,423	10	30	40	steam	18″	8″	50′	natural	13/11/01
Millerton	Green, John ..	10	„	1	4′ to 40′	12′	variable	ditto	3	10′ x 6′	33 ch.	incline	180,385	26,994	207,379	450,598	657,977	92	254	346	gravity	12″	4″	140′	fans	5/12/01
Coalbrookdale	Dunn, William ..	21	„	2	4′ to 20′	all	„	„	2	8′ x 8′	45 ch. 8,146′	plane adit															
										9′ x 5′	263 ch.	„									steam	12″	5″	100′		
Ironbridge	Sowerby, H. ..	10	„	2	4′ to 20′	„	„	„	2	8′ x 6′	9,048′	„	185,802	40,391	226,193	2,878,219	3,104,412	103	347	450	& compressed air	18″	6″	25′	„	15/11/01
																						9″	2″	25′		
Mines not now at work.																											
Westport Cardiff	..	..	..	..	..	..	..	pro-specting	..	..	..	..	..	..	..	227,441	227,441	9	6	15	..	..	..	..	..	13/11/01
Flaxbush	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	390	390	..	..	..	..	..	..	..	..	..
BULLER ROAD.																											
White Cliffs	Fleming, M. ..	7	..	1	..	9′	1 in 3	pillar	2	9′ x 7′	75′	adit	181	..	181	799	980	..	1	1	windlass	..	..	.	natural	6/12/01
Rocklands	Fleming, Andrew	1	brown	1	16′	8′	1 in 10	bord and pillar	2	10′ x 8′	250′	„	656	..	656	..	656	..	3	3	man	..	..	..	„	6/12/01
Mine not now at work.																											
Waitakere	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	868	868	..	..	..	..	..	..	..	..	..	..
THREE-CHANNEL FLAT.																											
Cocksparrow	Clay	3	glance	2	1′ 4″	1′ 4″	vertical	tunnel	..	5′6″x4′6″	500′	adit	391	..	391	568	959	..	2	2	hand	..	..	..	natural	7/12/01
Mines not now at work.																											
Longford	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,830	1,830	..	..	..	..	..	..	..	..	..	..
Alexander	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	282	282	..	..	..	..	..	..	..	..	..	..

Statistics of Workings in Coal-mines, 1901—*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 1901.			Approximate Total Output to 31st December, 1900.	Approximate Total Output to 31st December, 1901.	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.									
BOATMAN'S.																										
Archer's Mine	Archer, F. W. ..	8	..	1	14′	10′	1 in 3	tunnel	..	8′ x 7′	600′	adit	800	..	800	1,280	2,080	2	3	5	hand	..	..	..	natural	25/10/01
Mines not now at work.																										
Coghlan's Mine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	370	370	..	..	..	..	..	..	..	..	..
Barr's Mine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	35	35	..	..	..	..	..	..	..	..	..
REEFTON.																										
Bourke's Creek	Davis, W. ..	4	semi-bitum.	1	14′	10′	1 in 3	tunnels & bords	..	10′ x 10′	500′	adit	1,453	..	1,453	2,466	3,919	2	6	8	horse	..	..	..	natural	23/11/01
Murray Creek	Betts, Lewis ..	22	ditto	2	14′	14′	1 in 3	openface	..	..	..	..	450	..	450	10,065	10,515	2	..	2	hand	..	..	..	..	30/10/01
Phœnix	Fox, John ..	10	„	1	50′	10′	1 in 12	bord and pillar	2	8′ x 6′	4 ch.	adit	823	..	823	14,898	15,721	1	2	3	„	..	..	..	natural	30/10/01
New Inkerman	Sutherland, B. ..	4	„	1	5′	all	1 in 3	ditto	2	6′ x 3′ 6″	200′	„	520	..	520	1,154	1,674	..	1	1	„	..	..	..	„	28/10/01
Progress New Mine ..	Cochrane, T. ..	4	„	1	5′	„	1 in 2	„	2	8′ x 5′	400′	„	1,860	..	1,860	9,829	11,689	2	2	4	horse	..	..	..	„	28/10/01
Loughnan's	Loughnan, S. ..	9	„	1	4′ 6″	„	1 in 3	„	2	8′ x 4′ 6″	200′	„	100	..	100	1,613	1,713	..	1	1	hand	..	..	..	„	28/10/01
Mines not now at work.																										
Devil's Creek	Conolly, James ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	40	40	..	..	..	..	..	..	..	..	30/10/01
Lankey's Creek	Lamberton, W. ..	..	..	..	..	..	..	..	..	..	..	..	96	..	96	8,132	8,228	..	1	1	hand	..	..	..	natural	26/10/01
Golden Treasure	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6,625	6,625	..	..	..	..	..	..	..	..	..
Cochrane's	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	370	370	..	..	..	..	..	..	..	..	..
Reefton	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	40	40	..	..	..	..	..	..	..	..	..
Sir Francis Drake	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2,173	2,173	..	..	..	..	..	..	..	..	..
Cumberland	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,070	1,070	..	..	..	..	..	..	..	..	..
Coal Creek	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	67	67	..	..	..	..	..	..	..	..	..
GREYMOUTH.																										
Blackball	Leitch, James ..	11	bitum.	2	17′	15′	1 in 5	bord and pillar	..	9′ x 6′	1,232′	adit	62,683	16,469	79,152	356,563	425,715	39	145	184	steam	5¾″	6″	30′	furnace	12/12/01
Brunner Mines: Three sections	Coulthard, J. / Dando, M. / Herd J.	37	„	1	10′	all	1 in 4	ditto	5	10′ x 7′	2,970′	„	101,964	25,052	127,016	1,719,430	1,846,446	50	170	220	horse & steam	..	..	..	fan	12/12/01
Mines not now at work.																										
Coal-pit Heath	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	577,190	577,190	..	..	..	..	..	..	..	..	..
Tyneside	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	18,398	18,398	..	..	..	..	..	..	..	..	..
Wallsend	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	205,539	205,539	..	..	..	..	..	..	..	..	..
CANTERBURY.																										
Springfield, Springfield ..	Campbell, P. ..	25	brown	1	3′ 3″	all	1 in 6	bord and pillar	2	6′ 6″ x 4′	70′	shaft	1,357	102	1,459	84,572	86,031	2	4	6	steam	direct acting steam			exhaust from pump	4/12/01
Victoria, Springfield ..	Cloudesley, W. J.	1	„	1	3′	„	1 in 6	..	1	4′ 6″ x 3′	50′	adit	43	..	43	..	43	..	3	3	horse	..	..	..	natural	18/11/01

Homebush, Glentunnel ..	Campbell, J. C. ..	29	brown	2	3′ & 7′	all	1 in 3	bord and pillar	..	6′ x 6′	40 ch.	adit	6,126	145	6,271	126,288	132,559	3	14	17	horse	..	..	..	natural	14/11/01
St. Helen's, Whitecliffs ..	Levick, H. ..	20	„	3	4′ 6″	„	1 in 3	stope and wall	1	4′ 6″ x 3′ 7″	5 ch.	„	1,912	..	1,912	6,902	8,814	1	5	6	hand	..	..	..	„	13/11/01
Brockley, Glenroy	Lee, H. ..	1	„	1	3′ 6″	„	vertical	..	..	..	..	..	60	..	60	..	60	2	3	5	..	..	..	..	„	13/11/01
Mount Somers, Mount Somers	Harris, W. ..	37	„	1	35′	„	1 in 9	bord and pillar	..	..	..	adit	3,832	980	4,812	34,426	39,238	1	6	7	hand	..	..	..	„	8/8/01
Rutherford's, Albury ..	Willetts, J. M. ..	10	„	1	22′	10′	1 in 1	ditto	1	4′ x 3′ 6″	68′	shaft	880	120	1,000	2,584	3,584	2	3	5	horse	..	..	..	„	21/11/01
Elephant Hill, Waihao Downs	Mathias, L. ..	33	lignite	1	..	..	..	..	..	..	..	..	12	..	12	118	130	..	1	1	..	..	..	..	„	6/12/01
Waihao, Waihao Forks (late Studholme's, Stony Creek)	Adamson, A. ..	12	„	1	4′	all	..	bord and pillar	..	..	..	adit	388	..	388	209	597	1	1	2	..	..	..	..	„	6/12/01
Pits worked for Private Use.																										
Dalethorpe, Springfield ..	Nuthall, A. J. ..	7	brown	1	..	..	..	..	..	..	..	..	33	..	33	184	217	..	..	..	..	..	..	..	..	18/11/01
Snowdon, Rakaia Gorge ..	Gerard, G. ..	16	„	1	14′	8′	..	narrow	1	4′ x 4′	90′	shaft	50	..	50	1,468	1,518	..	..	..	..	..	..	..	..	18/11/01
Craigieburn, West Coast Road	Manson, D. ..	5	„	1	..	..	..	..	..	..	..	adit	30	..	30	118	148	..	..	..	..	..	..	..	..	19/11/01
Springburn, Stavely ..	.. ..	..	„	..	12′	..	..	..	..	..	..	„	..	..	..	250	250	..	..	..	..	..	..	..	..	28/6/00
Waihao Forks, Waihao Forks	McPherson, D. ..	9	lignite	1	..	..	..	open	..	..	..	open	28	..	28	198	226	..	..	..	..	..	..	..	..	6/12/01
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	..	..	..	..	..	..	..	..	..
Sheffield, Sheffield	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	52,284	52,284	..	..	..	..	..	..	..	..	14/11/01
Hartley, Whitecliffs ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,991	1,991	..	..	..	..	..	..	..	..	13/11/01
NORTH OTAGO.																										
Dalgety or Hakataramea, Hakataramea	McFarlane, D. ..	22	..	..	..	..	..	..	..	..	..	..	100	..	100	25	125	1	..	1	..	..	..	..	natural	7/12/01
Awakino, Kurow	..	22	brown	1	15′	7′	vertical	stoping	1	6′ x 2′ 6″	53′	adit	..	..	..	5,585	5,585	..	..	..	..	..	..	..	„	31/10/01
Sutherland and Shanks's, Wharekuri	Shanks, A. ..	..	„	..	..	..	..	..	..	..	..	..	252	..	252	964	1,216	1	1	2	..	..	..	..	„	28/6/01
Otiake, Otiake	Simpson and Cunningham	½	„	..	..	..	..	..	..	..	..	..	32	..	32	..	32	1	1	2	..	..	..	..	„	9/12/01
St. Andrew's, Papakaio ..	Nimmo, T. ..	23	„	1	6′ 6″	6′	1 in 4	bord and pillar	1	4′ x 2′ 6″	60′	adit	1,597	..	1,597	27,868	29,465	1	4	5	horse	..	..	..	„	10/12/01
Prince Alfred, Papakaio ..	Willetts, J. ..	32	„	1	1′ to 9′	all	1 in 9	ditto	1	5½′ x 6′	51′	„	1,457	..	1,457	43,885	45,342	2	5	7	„	..	..	..	„	30/10/01
Ngapara, Ngapara	Nimmo, H. ..	23	„	1	18′ to 25′	8′	1 in 17	„	1	4′ x 4′	50′	„	1,159	..	1,159	16,944	18,103	1	2	3	„	..	..	..	furnace	26/6/01
Shag Point, Shag Point ..	Shore, T. ..	31	pitch	6	2′ to 6′	all	1 in 4	ditto and longwall	2	16½′ x 6′ 7½′ x 5′	415′ 280′	shaft	10,972	3,612	14,584	386,859	401,443	12	49	61	steam	2′	8″	400′	exhaust steam	12/12/01
Allendale, Allendale ..	Gillanders, A. ..	14	brown	3	4′ to 6′	„	1 in 4	bord and pillar	..	10′ x 6′	1,000′	dip tunl.	12,796	5,673	18,469	146,970	165,439	10	55	65	„	1′	two 6″	200′	ditto and natural	12/12/01
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	..	..	..	..	..	..	..	..	..

Statistics of Workings in Coal-mines, 1901—*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 1901. Coal.	Output for 1901. Slack.	Output for 1901. Total.	Approximate Total Output to 31st December, 1900.	Approximate Total Output to 31st December, 1901.	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.
													Tons.	Tons.	Tons.	Tons.	Tons.									
MIDDLE ISLAND—*continued.*																										
South Otago.																										
Fernhill, Abbotsford ..	Gray, J. ..	24	brown	1	19′	10′	1 in 10	bord and pillar	1	4¾′ x 4½′	..	adit	222	2,810	3,032	130,286	133,318	4	6	10	horse	..	..	..	natural	17/9/01
Freeman's, Abbotsford ..	Hill, R. ..	21	"	2	7′ to 14′	6′ to 7′	1 in 7	ditto	3	6′ x 5′ 7′ x 7′	1,400′ 264′	tunnel	6,228	4,615	10,843	244,492	255,335	6	20	26	steam	75″	5″	130′	steam from pump	17/9/01
Walton Park, Walton Park ..	Kenyon, J. ..	31	"	1	10′ to 19′	12′	1 in 10	"	3	6′ x 4′ 12′ x 4′	30′ to 170′	"	10,251	791	11,042	543,189	554,231	3	15	18	horse	..	..	..	furnace	20/12/01
Jubilee, Walton Park ..	Campbell, P. ..	4	"	1	12′ to 18′	8′	1 in 10	"	2	6′ x 5′	4 ch.	"	9,149	1,428	10,577	20,080	30,657	2	14	16	"	..	..	..	natural	23/12/01
Saddle Hill, Saddle Hill ..	Westfield, C. ..	29	"	1	20′	8′ to 16′	1 in 10	"	4	5′ 10″ x 4′ 6″	264′	"	2,462	6,748	9,210	108,024	117,234	3	11	14	"	..	..	..	"	26/9/01
Burnweil, Saddle Hill ..	Harris, A. ..	10	"	1	16′	10′	variable	"	1	5′ x 3′	30′	"	626	2,431	3,057	15,643	18,700	4	4	8	"	..	..	..	"	18/9/01
Glenochiel, Saddle Hill ..	Bryce, D. ..	20	"	1	16′	7′ to 9′	1 in 9	"	3	6′ x 4′	4 ch.	"	..	1,572	1,572	23,184	24,756	1	2	3	"	..	..	..	"	23/12/01
Mosgiel, Saddle Hill ..	Sneddon, J. ..	17	"	1	8′	7′	1 in 10	"	2	4′ x 4′	14 ch.	"	1,251	6,634	7,885	81,893	89,778	4	9	13	steam	4′	4″	70′	"	23/12/01
Riccarton, East Taieri ..	Love, A. ..	1	"	1	..	..	..	"	..	..	300′	"	414	..	414	..	414	2	3	5	"	..	..	..	"	20/6/01
Lauriston, Brighton ..	Walker, J. R. ..	15	"	1	6′	5′ 6″	variable	"	1	..	48′	"	233	71	304	5,133	5,437	1	2	3	horse	..	..	..	"	13/5/01
McColl's, Brighton ..	McColl, D. L. ..	13	"	1	6′	5′ 6″	"	"	..	..	..	"	43	16	59	1,122	1,181	..	1	1	"	..	..	..	"	13/5/01
Bruce, Milton ..	Young, A. ..	34	"	1	15′	9′	1 in 8	"	..	..	..	adit	663	..	663	22,818	23,481	..	2	2	hand	..	..	..	"	20/12/01
Strip-and-at-it, Milton ..	Hardwick, N. ..	7	"	1	8′	6′	..	"	..	..	..	"	164	..	164	528	692	..	1	1	"	..	..	..	"	20/12/01
Reid's, Akatore, Milton ..	Reid, James ..	7	"	1	14′	all	..	"	..	..	..	"	..	..	..	244	244	..	..	..	"	..	..	..	"	20/12/01
Fortification, Milton ..	Shore, J. ..	34	"	1	14′	7′ 6″	1 in 12	"	2	7′ x 6′ 6′ x 6′	4½ ch. 11½ ch.	"	5,713	..	5,713	5,154	10,867	6	14	20	steam	6″	4″	30′	"	20/12/01
Glenledi, Milton	McGilp, N. ..	..	"	1	20′	all	1 in 8	open	..	..	..	open	80	..	80	1,661	1,741	1	..	1	hand	..	..	..	"	20/12/01
Adam's Flat, Adam's Flat ..	Reid, John ..	19	lignite	1	14′	10′	..	"	..	..	..	"	38	..	38	2,133	2,171	1	..	1	"	..	..	..	"	21/12/01
Paskell's, Adam's Flat ..	Paskell, J. ..	37	"	1	8′	all	1 in 6	"	..	..	..	"	6	2	8	456	464	1	1	2	"	..	..	..	"	21/12/01
Wallsend, Lovell's Flat ..	Hewitson, R. ..	31	"	1	20′	"	..	"	..	..	..	"	250	..	250	10,510	10,760	2	..	2	"	..	..	..	"	20/12/01
Lovell's Flat, Lovell's Flat ..	Carruthers, J. ..	7	brown	1	10′	7′	1 in 4	bord and pillar	2	11′ x 5′	470′	shaft	8,451	6,033	14,484	27,660	42,144	8	29	37	steam	16″	6″	480′	"	20/12/01
Tuakitoto, Lovell's Flat ..	McDougall, M. ..	11	"	1	20′	8′	..	ditto	1	..	..	incline	..	..	..	3,072	3,072	..	..	..	horse	..	..	..	"	20/12/01
Benhar, Stirling ..	McLeod, J. ..	38	lignite	1	30′	12′	..	"	2	4′ x 4′	..	"	2,244	427	2,671	96,109	98,780	1	4	5	"	..	..	..	"	20/12/01
Mount Wallace, Stirling ..	Shaw, D. ..	7	"	1	14′	8′ to 10′	..	"	..	..	..	adit	613	..	613	2,982	3,595	..	1	1	hand	..	..	..	"	20/12/01
Kaitangata (including Castle Hill, Kaitangata)	Broome, G. H. ..	25	brown	2	6′ to 20′	all	variable	"	2	9′ x 7′ 6′ diam.	1,100′	incline	89,501	24,882	114,383	1,369,562	1,523,207	42	268	310	steam	..	..	..	furnace	18/12/01
		8	"	2	6′ to 20′	"	"	"	1	11′ x 6′ 6″ 10′ diam.	2,200′	"	..	..	..	39,262	..	..	..	..	"	..	..	..	"	19/12/01
Wangaloa, Kaitangata ..	Smith, J. ..	21	"	1	10′ 6″	8′	1 in 6	"	..	..	..	adit	80	28	108	1,288	1,396	..	1	1	hand	..	..	..	natural	17/12/01
Mainholm, Waipahi ..	Lischner, F. ..	16	lignite	1	15′	all	..	open	..	..	..	open	3,258	..	3,258	25,858	29,116	3	..	3	"	..	..	..	"	8/1/01
Pits worked for Private Use.																										
Laratu, Kaitangata ..	Fraser, H. H. ..	29	..	1	..	..	..	..	..	..	..	..	27	..	27	177	204	..	..	..	"	..	..	..		17/12/01
Takeside, Kaitangata ..	Landells, James ..	1	..	..	..	..	..	..	..	..	..	..	20	..	20	700	720	..	..	..	..	..	..	..	..	17/12/01

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	..	..	..	..	..	..	..	..
Lesmahagow, Kaitangata ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,511	1,511	..	..	..	..	..	..	..	..
Cowpan's, Owaka	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	95	95	..	..	..	..	..	..	..	..
Shennan's, Waipahi ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	45	45	..	..	..	..	..	..	..	..
Early Bank, Milton ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	320	320	..	..	..	..	..	..	..	..
CENTRAL OTAGO.																									
Coal Creek, Roxburgh ..	Newall, R. ..	31	lignite	1	unknown	20′	variable	bord and pillar	..	..	..	adit	1,672	..	1,672	19,566	21,238	3	2	5	horse	..	..	..	natural	12/12/01
McPherson's, Roxburgh ..	McPherson, M. ..	31	″	1	″	30′ to 40′	″	open	..	..	..	open	4,087	..	4,087	20,687	24,774	5	..	5	″	..	..	..	″	12/12/01
Perseverance, Roxburgh ..	Craig, J. ..	14	″	1	99′	70′	1 in 4	narrow	..	6′ x 7′	..	adit	2,050	..	2,050	14,033	16,083	1	4	5	hand	..	..	..	″	12/12/01
Drummey's, Alexandra ..	Drummey, J. ..	..	brown	..	..	..	..	..	..	..	..	..	..	..	..	179	179	..	..	..	″	..	..	..	″	8/6/01
Alexandra, Alexandra ..	O'Connell, M. ..	21	″	1	14′	7′	..	bord and pillar	2	5′ x 2′ 6″ 6′ x 4′	60′	adit	1,474	..	1,474	36,279	37,753	1	3	4	horse	..	..	..	″	11/12/01
Perseverance, Alexandra ..	Evans, E. ..	..	″	..	..	..	..	ditto	..	..	..	″	3,435	..	3,435	2,950	6,385	1	4	5	″	..	..	..	″	10/12/01
McQueenville, Alexandra ..	Howie, J. ..	14	″	1	14′	7′	..	″	2	4′ 9″ x 3′	62′	shaft	2,858	..	2,858	32,714	35,572	1	5	6	″	..	..	..	″	10/12/01
Alexandra Coal Company, Alexandra	Carson, W. ..	..	″	..	..	..	..	″	..	..	..	″	8,750	..	8,750	9,335	18,085	4	18	22	..	..	..	..	″	10/12/01
Undaunted, Alexandra ..	Mathias, D. H. ..	3	″	1	7′	6′	1 in 4	″	1	5′ x 2′ 6″	70′	adit	437	..	437	122	559	1	3	4	..	..	..	..	″	11/12/01
Cambrian's, Cambrian's ..	Dungey, C. ..	17	lignite	1	9′	all	..	open	..	..	..	open	439	..	439	13,546	13,985	2	..	2	horse	..	..	..	″	10/6/01
Welshman's Gully, Cambrian's	McGuckin, J. & R.	40	″	1	30′	″	..	″	..	..	..	″	1,277	..	1,277	28,239	29,516	4	..	4	″	..	..	..	″	10/6/01
Blackstone Hill, Blackstone Hill	Dunsmuir, A. ..	35	″	1	unknown	16′	..	″	..	..	..	″	50	..	50	2,417	2,467	2	..	2	″	..	..	..	″	12/6/01
Price's, Blackstone Hill ..	Price, G. ..	4	″	1	12′	all	..	″	..	..	..	″	12	..	12	52	64	1	..	1	hand	..	..	..	″	12/6/01
St. Bathan's, St. Bathan's ..	Enwright, J. ..	4	″	1	..	..	..	″	..	..	..	″	512	..	512	1,437	1,949	2	..	2	horse	..	..	..	″	10/6/01
Rough Ridge, Idaburn ..	Beck, M. ..	15	″	1	35′	all	..	″	..	..	..	″	937	..	937	13,788	14,725	3	..	3	″	..	..	..	″	12/6/01
McLean's, Idaburn ..	McLean, L. ..	..	″	1	15′	″	..	″	..	..	..	″	93	..	93	1,034	1,127	1	..	1	″	..	..	..	″	12/6/01
Idaburn, Idaburn ..	White, J. ..	31	″	1	20′	″	..	″	..	..	..	″	960	..	960	31,595	32,555	2	..	2	″	..	..	..	″	12/6/01
Border, Rough Ridge ..	Turnbull, G. ..	31	″	1	12′	″	..	″	..	..	..	″	396	..	396	6,382	6,778	2	..	2	″	..	..	..	″	12/6/01
Gimmerburn, Gimmerburn ..	Docherty, C. ..	36	″	1	12′	″	..	″	..	..	..	″	42	..	42	2,563	2,605	1	..	1	hand	..	..	..	″	12/6/01
Commercial, Kyeburn ..	Archer, C. ..	22	brown	1	10′	8′	vertical	stoping	..	..	..	shaft	787	..	787	13,234	14,021	1	2	3	water	..	..	..	″	3/10/01
McCready and Coombs', Upper Kyeburn	McCready and Coombs ..	..	″	..	..	..	..	..	..	..	..	..	6	12	18	15,317	15,335	..	..	..	..	..	..	..	″	..
Dairy Creek, Clyde ..	Robertson, R. ..	29	″	1	40′	..	..	levels	..	..	..	incline	1,854	..	1,854	6,216	8,070	3	4	7	hand	..	..	..	″	9/12/01
Clyde Coal Company (Vincent), Clyde	Turner, G. ..	..	″	..	40′	..	..	″	..	..	..	″	3,674	..	3,674	7,274	10,948	2	5	7	″	..	..	..	″	9/12/01
Cardrona, Cardrona ..	McDougall, R. ..	17	″	1	30′	all	..	open	..	..	..	open	1,915	..	1,915	9,029	10,944	6	..	6	″	..	..	..	″	27/4/01
Gibbston Coal Company (late Gibbston Saddle), Gibbston	Hodson, J. ..	15	″	1	30′	″	..	bord and pillar	..	..	..	adit	1,317	..	1,317	5,074	6,391	3	5	8	..	..	..	..	″	25/12/01
Kawarau, Bannockburn	Cromwell and Bannockburn Collieries Company. T. Barclay, Manager	24	″	1	10′	6′	1 in 4	ditto	1	6′ x 6′	34′	incline	3,160	149	3,309	25,973	29,282	2	9	11	steam	..	..	..	″	31/11/01
Excelsior, Bannockburn		9	″	1	6′	5′	1 in 4	″	1	6′ x 5½′	..	″	3,186	..	3,186	9,169	12,355	3	8	11	″	..	..	..	″	31/11/01
Bannockburn, Bannockburn		12	″	1	6′	5′	1 in 4	″	1	6′ x 4′	20′	adit	4,247	..	4,247	2,387	6,634	3	8	11	..	..	..	..	″	31/11/01
Nevis, Nevis	Scott, C. ..	8	″	1	20′	all	vertical	open	..	..	..	open	700	..	700	2,439	3,139	2	..	2	hand	..	..	..	″	27/11/01
Ryder's, Nevis	Williamson, J. ..	..	″	..	..	..	..	″	..	..	..	″	645	..	645	1,049	1,694	3	..	3	″	..	..	..	″	27/11/01
Clough and Allen's, Nevis ..	Holmes, Mrs. A...	..	″	..	..	..	..	″	..	..	..	″	50	..	50	238	288	1	..	1	″	..	..	..	″	1/5/01
Pits worked for Private Use.																									
Angel's, Bannockburn ..	Angel, C. F. ..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	1	1	..	1	..	..	..	..	″	..
Ritchie's, Nevis	Ritchie, J. ..	..	..	..	..	..	..	..	..	..	..	..	13	..	13	75	88	1	..	1	..	..	..	..	″	1/5/01

Statistics of Workings in Coal-mines, 1901—*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 1901.			Approximate Total Output to 31st December, 1900.	Approximate Total Output to 31st December, 1901.	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.									
Central Otago—*continued.*																										
Pits not now at work.																										
Black Diamond, Roxburgh	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	232	232	..	..	..	..	..	..	..	..	11/6/01
Simpson Theyers, Alexandra	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,636	1,636	..	..	..	..	..	..	..	..	8/6/01
Cromwell, Cromwell	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3,019	3,019	..	..	..	..	..	..	..	..	25/7/01
Cooper's, Cromwell	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	385	385	..	..	..	..	..	..	..	..	25/7/01
Upper Nevis, Nevis	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	65	65	..	..	..	..	..	..	..	..	..
Williamson's, Nevis	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	95	95	..	..	..	..	..	..	..	..	..
Padgett's, Blackstone Hill	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	46	46	..	..	..	..	..	..	..	..	15/10/00
Waikerikeri, Clyde	..	Dunstan Coal Co. (J. Smart, sec.)	..	..	..	..	..	..	..	..	..	..	..	..	..	20,322	20,322	..	..	..	..	..	..	..	..	..
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 Owen's, Cambrian's	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	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	..	..	..	..	..	..	..	..	..
Watherston's, Nevis	..	Watherston, A. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	5	..	..	..	..	..	..	..	..	..
Southland.																										
Pukerau, Pukerau	..	O'Hagan, C. ..	21	lignite	1	16′	8′ to 10′	1 in 10	bord and pillar	1	8′ x 8′	11 ch.	adit	1,037	..	1,037	27,647	28,684	1	3	4	horse	..	..	..	natural	29/8/01
Waikoikoi, Pukerau	..	Scott & Ferguson	2	″	..	..	..	..	..	..	..	..	..	100	..	100	10	110	2	..	2	..	..	..	..	″	8/1/01
Nelson's (late Dudley's), Pukerau		Nelson, J. H. ..	12	″	1	16′	all	..	open	..	..	..	open	111	..	111	2,455	2,566	1	..	1	hand	..	..	..	″	8/1/01
Whiterigg, East Gore	..	Hope, J. ..	19	″	1	20′	15′	1 in 20	bord and pillar	1	3′ 6″ x 2′ 6″	2 ch.	adit	1,166	..	1,166	7,647	8,813	1	3	4	horse	..	..	..	″	3/9/01
Heffernan's, Gore	..	Boyd, J. ..	23	″	1	30′	15′	..	open	..	..	..	open	1,161	..	1,161	4,783	5,944	1	2	3	..	..	..	..	″	3/9/01
Gutschlag's, Gore	..	Gutschlag, W. ..	18	″	1	10′	all	..	″	..	..	..	″	22	..	22	3,252	3,274	1	..	1	..	..	..	..	″	4/12/00
Sarginson's, Gore	..	Reinke, A. ..	15	″	1	..	..	..	″	..	..	..	″	383	..	383	1,436	1,819	1	..	1	..	..	..	..	″	3/9/01
Green's, Gore	..	Smyth, J. J. ..	13	″	1	22′	17′	1 in 20	bord and pillar	..	..	5 ch.	adit	4,325	..	4,325	22,041	26,366	..	6	6	horse	..	..	..	″	4/9/01
Knapdale, Knapdale	..	Irvine, W. ..	16	″	1	26′	15′	almost vertical	wide headings	..	..	..	″	276	..	276	6,025	6,301	..	1	1	..	..	..	..	″	31/8/01
Harvey's, Chatton	..	Harvey, J. ..	24	″	1	16′ to 26′	16′ to 18′	..	open	..	..	..	open	282	..	282	13,304	13,586	1	..	1	..	..	..	..	″	31/8/01
Perkin's, Chatton	..	Perkins, A. ..	2	″	..	..	..	..	″	..	..	..	″	150	..	150	400	550	1	..	1	..	..	..	..	″	31/8/01
Pacey's, Chatton	..	Pacey, R. ..	25	″	1	unknown	14′	1 in 6	″	..	..	..	″	1,364	25	1,389	10,281	11,670	3	..	3	..	..	..	..	″	3/9/01
Johnstone's, Waikaka Valley		Johnstone, W. ..	8	″	1	11′	all	..	″	..	..	..	″	508	..	508	2,211	2,719	3	..	3	..	..	..	..	″	22/1/01
Thorndale, Waikaka Valley		Orchard, E. C. ..	1½	″	..	..	..	..	″	..	..	..	″	802	..	802	20	822	4	..	4	..	..	..	..	″	3/9/01
Reed's, Waikaka Valley	..	Reed, R. ..	5	″	1	..	all	..	″	..	..	..	″	2,078	..	2,078	378	2,456	4	..	4	..	..	..	..	″	3/9/01
McGill's, Wendon Valley	..	McGill, J. ..	8	″	1	14′	″	..	″	..	..	..	″	104	..	104	1,748	1,852	2	..	2	..	..	..	..	″	30/8/01
McDonald's, Wendon Valley		Nicoll, D. ..	..	″	..	..	..	..	″	..	..	..	″	485	115	600	696	1,296	3	..	3	..	..	..	..	″	30/8/01
Wendon, Wendon Valley	..	Evans, G. H. ..	23	″	1	16′	all	..	″	..	..	..	″	1,260	40	1,300	4,132	5,432	1	1	2	..	..	..	..	″	30/8/01
Radford's, Wendon	..	Radford, E. and P.	2	″	..	22′	..	..	levels	..	..	..	″	306	..	306	3,915	4,221	2	..	2	..	..	..	..	″	11/11/01

Monaghan's, Landslip, Waikaia	Monaghan, R.	2	lignite	..	..	..	..	open	..	..	..	open	60	..	60	14	74	1	..	1	..	..	..	..	natural	13/11/01
McIvor's (late Hill's), Waikaia	McIvor, W.	10	"	1	15′	all	..	"	..	..	..	"	177	..	177	1,848	2,025	2	..	2	..	..	..	..	"	13/11/01
Goldie's, Waikaia	McIvor, R.	..	"	..	..	..	..	"	..	..	..	"	93	..	93	175	268	1	..	1	hand	..	..	..	"	13/11/01
Number One, Waikaia ..	McKinnon, A.	1½	"	..	..	..	..	"	..	..	..	"	135	..	135	113	248	1	..	1	"	..	..	..	"	13/11/01
Argyle, Waikaia	Baxter, J. and T.	10	"	1	10′	all	..	"	..	..	..	"	203	..	203	1,677	1,880	1	..	1	"	..	..	..	"	13/11/01
Waimea, Longridge Village, Waimea	Smith, A.	11	"	1	3′	..	..	"	..	..	..	"	555	..	555	6,609	7,164	3	..	3	"	..	..	..	"	11/11/01
Pyramid, Mandeville ..	McAllister, E.	9	brown	1	18′	9′ 6″	1 in 2	bord and pillar	..	..	..	adit	6	..	6	1,616	1,622	..	1	1	"	..	..	..	"	11/11/01
Waimumu, Mataura ..	Sleeman, C. P.	25	lignite	1	16′	all	..	open	..	..	..	open	9,477	..	9,477	37,868	47,345	8	..	8	"	..	..	..	"	10/9/01
Bogside, Mataura	Brown, H.	4½	"	1	16′	13′	..	"	..	..	..	"	578	..	578	2,088	2,666	1	..	1	"	..	..	..	"	10/9/01
Beattie and Coster's, Mataura	Coster, W.	25	"	1	16′	all	..	"	..	..	..	"	2,696	..	2,696	25,306	28,002	3	..	3	"	..	..	..	"	10/9/01
Townshend's, Mataura ..	Coomer, R. T.	..	"	..	..	..	..	"	..	..	..	"	250	..	250	489	739	..	..	..	"	..	..	..	"	11/9/01
Duthie's, Waimumu ..	Duthie, J.	1½	"	1	..	..	..	"	..	..	..	"	799	..	799	128	927	1	..	1	"	..	..	..	"	11/9/01
Ota Creek, Wyndham ..	Shields, W.	21	"	1	6′	all	..	"	..	..	..	"	650	..	650	9,446	10,096	1	..	1	"	..	..	..	"	9/1/01
Wyndham, Wyndham ..	Walker, W.	6	"	1	..	"	..	"	..	..	..	"	14	..	14	253	267	1	..	1	"	..	..	..	"	9/1/01
Robin Hood, Pine Bush ..	Trotter, A.	20	"	1	15′	"	..	"	..	..	..	"	130	..	130	1,379	1,509	1	..	1	"	..	..	..	"	23/10/01
Graham's, Fairfax	Graham, P. S.	23	"	1	5′ 6″	"	1 in 20	bord and pillar	..	..	6 ch.	adit	538	..	538	12,883	13,421	..	2	2	"	..	..	..	"	24/7/01
Spey Bank, Fairfax ..	Salton, R.	8	"	1	5′	"	..	ditto	..	..	..	"	5	..	5	535	540	..	1	1	"	..	..	..	"	24/7/01
Isla Bank, Fairfax	Slattery, M.	21	"	1	6′	"	..	open	..	..	..	open	404	..	404	5,073	5,477	2	..	2	"	..	..	..	"	24/7/01
Nightcaps, Nightcaps ..	Lloyd, J.	20	brown	3	36′ in the aggregate	24′ in aggregate	variable	bord and pillar	3	4′ x 4′ 4′ x 4′ 6″ 5′ x 5′	32 ch.	adit	31,845	..	31,845	266,718	298,563	18	32	50	steam and horse	..	..	..	furnace	3/10/01 27/10/01
Quested's, Nightcaps ..	..	..	"	..	..	..	..	open	..	..	..	open	60	..	60	517	577	1	..	1	hand	..	..	..	natural	..
H.B., Nightcaps	Beadle, J.	3	"	1	6′ 6″	..	..	bord and pillar	..	..	..	adit	587	..	587	806	1,393	3	..	3	"	..	..	..	"	5/9/01
Hit or Miss, Nightcaps ..	Tinker, W.	1	"	1	..	..	..	..	..	..	..	..	354	..	354	..	354	..	2	2	"	..	..	..	"	22/2/01
Blythe, Nightcaps	Greer and Spence	2	"	..	..	..	..	open	..	..	..	open	688	..	688	96	784	2	..	2	"	..	..	..	"	6/9/01
Wairio, Nightcaps	Kelly, G. W.	1½	"	..	..	..	..	"	..	..	..	"	108	..	108	3,756	3,864	1	2	3	"	..	..	..	"	6/9/01
Brighton's, Nightcaps ..	Brighton, G.	2	"	..	..	..	..	"	..	..	..	"	148	..	148	22	170	2	..	2	"	..	..	..	"	..
McBride's, No. 11, Nightcaps	Kelly, T.	1	"	..	..	..	..	..	..	..	..	..	72	..	72	..	72	1	2	3	"	..	..	..	"	..
Orepuki, Orepuki	Straw, M.	..	brown & oil-shale	..	..	..	..	..	..	..	..	adit	926 12,048 (shale)	9,696	10,622 12,048 (shale)	6,895	17,517 12,048 (shale)	7	75	82	steam	..	..	..	fan	6/11/01
Pits worked for Private Use.																										
Waikoikoi, Pukerau ..	Kirk, W.	14	lignite	1	6′	all	..	open	..	..	..	open	20	..	20	270	290	..	..	..	..	..	..	..	..	..
Glover's, Pukerau	Glover, A.	7	"	1	..	"	..	"	..	..	..	"	..	..	..	84	84	..	..	..	..	..	..	..	..	..
Leitze's, East Gore ..	Leitze, M.	22	"	1	4′ to 7′	"	..	"	..	..	..	"	25	..	25	1,415	1,440	..	..	..	..	..	..	..	..	..
Ford's, Chatton	Ford, P.	21	"	..	..	..	..	"	..	..	..	"	30	..	30	400	430	..	..	..	..	..	..	..	..	..
Otama, Otama	Graham, T.	8	"	1	..	all	..	"	..	..	..	"	40	..	40	235	275	..	..	..	..	..	..	..	..	12/11/01
Cross's, Otama	Cross Brothers	..	"	..	..	"	..	"	..	..	..	"	20	..	20	64	84	..	..	..	..	..	..	..	..	12/11/01
Bushbridge's, Mataura ..	Bushbridge, P.	1	"	..	..	..	..	"	..	..	..	"	15	..	15	..	15	..	..	..	..	..	..	..	..	..
Mutch's, Mataura	Mutch, J.	11	"	1	4′	all	..	"	..	..	..	"	25	..	25	288	313	..	..	..	..	..	..	..	..	..
River View, Gore	Nicoll, L. D.	10	"	..	..	..	..	"	..	..	..	"	15	..	15	849	864	..	..	..	..	..	..	..	..	..
Nichol's, Gore	Nichol, W.	..	"	..	..	..	..	"	..	..	..	"	..	..	..	10	10	..	..	..	..	..	..	..	..	..
Marshall's, Edendale ..	Marshall, H.	10	"	1	3′	all	..	"	..	..	..	"	55	..	55	490	545	..	..	..	..	..	..	..	..	9/1/01
Mount Linton, Nightcaps ..	Taylor, R.	11	"	1	10′	8′	..	"	..	..	..	"	..	..	..	614	614	..	..	..	..	..	..	..	..	..
Pits not now at work.																										
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	..	..	..	..	..	..	..	..	..
Moffet & Longshaw's, Waikaia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	72	72	..	..	..	..	..	..	..	..	..

STATISTICS of WORKINGS in COAL-MINES, 1901—*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.		Output delivered by	Output for 1901.			Approximate Total Output to 31st December, 1900.	Approximate Total Output to 31st December, 1901.	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.		
SOUTHLAND—*continued.*																										
Pits not now at work—contd.													Tons.	Tons.	Tons.	Tons.	Tons.									
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								"				"				428	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									
Waikaka, Gore																604	604									
Croydon, Gore																25	25									
Hunter's, Otama																1,944	1,944									12/11/01
North Chatton, Waikaka																672	672									
Edge's No. 14, Wendon Valley																1,286	1,286									
Munro's, Wyndham																11,151	11,151									9/1/01
Wallace, Nightcaps																20,147	20,147									
Alley's Reliable, Nightcaps																704	704									

Black Diamond, Nightcaps ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	220	220	..	..	..	..	..	..	..	..	..	..
Morley Village, Nightcaps ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	301	301	..	..	..	..	..	..	..	..	..	..
Jones, Edendale	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	280	280	..	..	..	..	..	..	..	..	..	..
Totals, Middle Island	..	..	..	..	..	..	..	..	..	..	..	..	..	869,508	195,094	1064602	11449914	12514515	623	1775	2398							
Totals, North Island	..	..	..	..	..	..	..	..	..	..	..	..	..	171,481	3,603	175084	2763591	2938675	65	291	356							
Grand Totals ..	..	..	..	..	..	..	..	..	..	..	..	..	..	1040989	198,697	1239686	14213505	15453191	688	2066	2754							

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, Adam'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
	15,792,556

JOHN HAYES, Inspecting Engineer.

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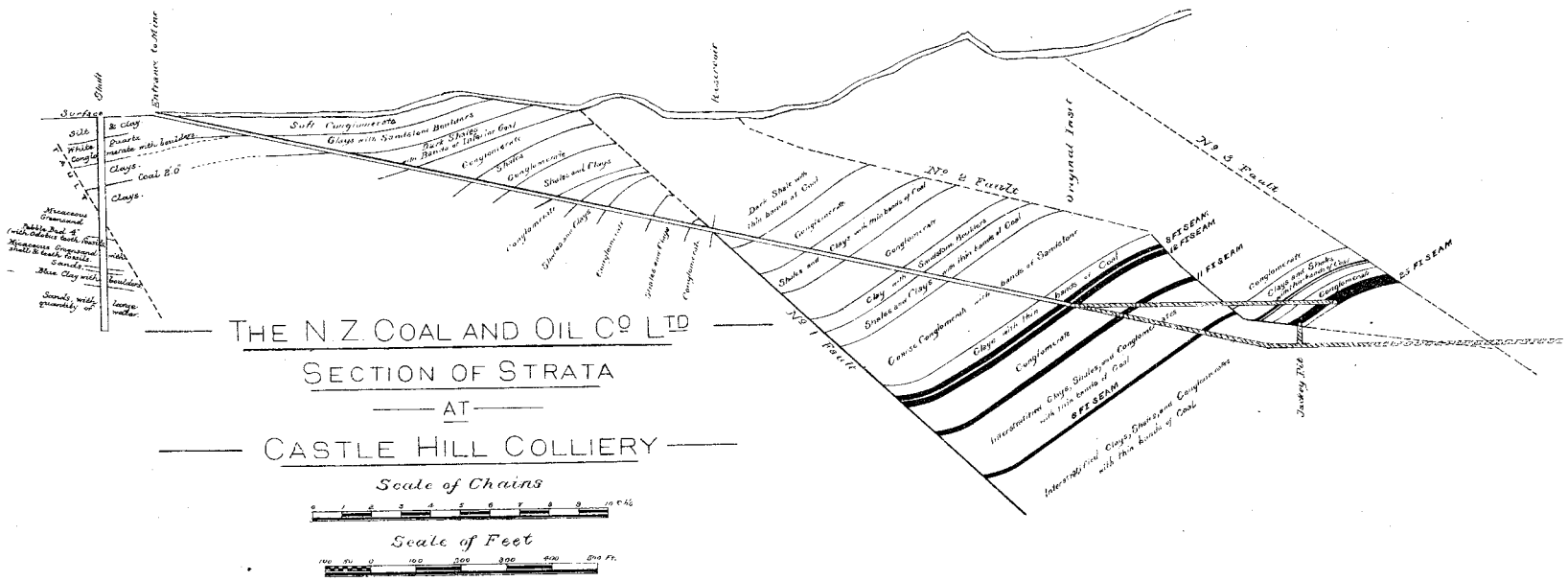

THE N.Z. COAL AND OIL Co LTD

SECTION OF STRATA

AT

CASTLE HILL COLLIERY

Scale of Chains

0 1 2 3 4 5 6 7 8 9 10 Chs

Scale of Feet

100 50 0 100 200 300 400 500 Feet

Signed A. Brooms (A.M.I.C.E.; M.I.M.E.)
Mine Manager

Reference

Main Drive Extensions ... Shown thus ...

Proposed Extension ... " ... "

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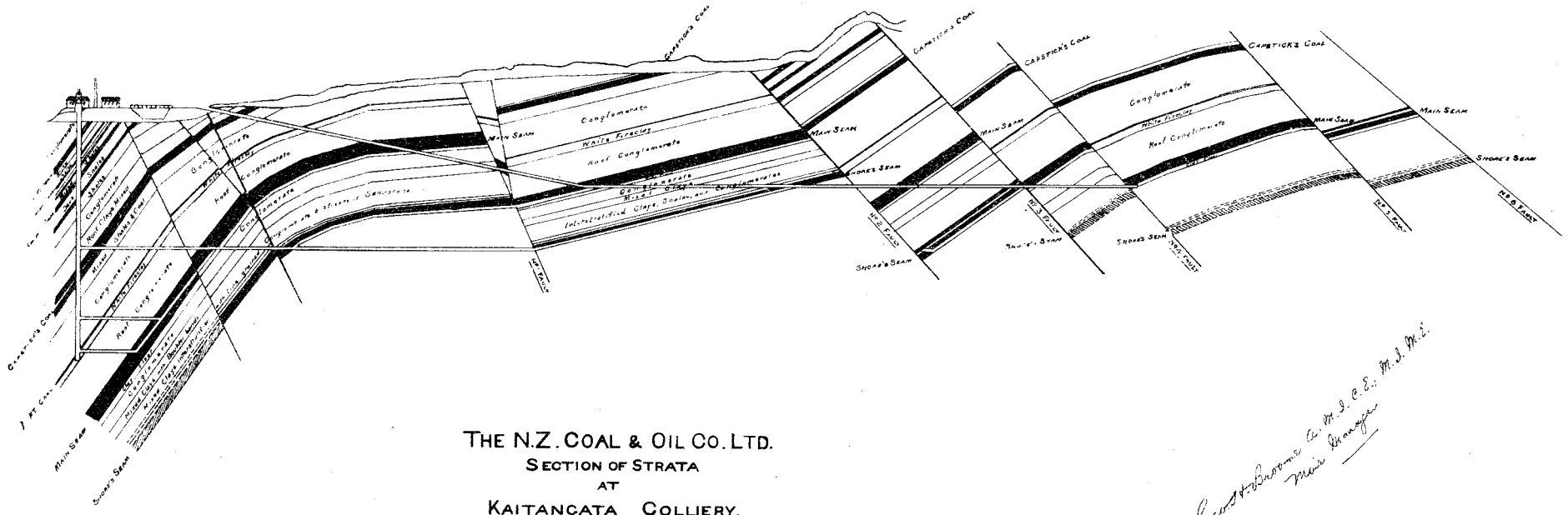

THE N.Z. COAL & OIL CO. LTD.

SECTION OF STRATA

AT

KAITANCATA COLLIERY.

Scale of Chains.

Scale of Feet.

Geo. A. Brame A.M.I.C.E. M.I.M.E.
Mine Manager

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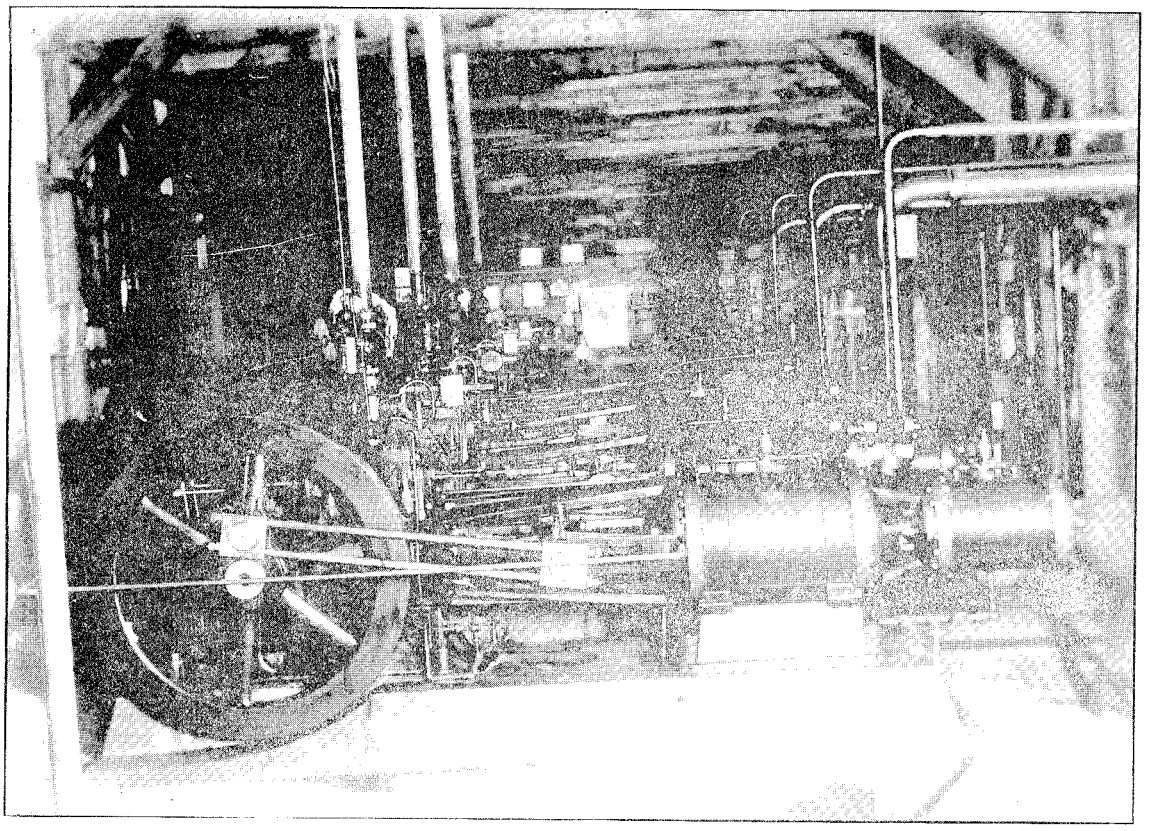
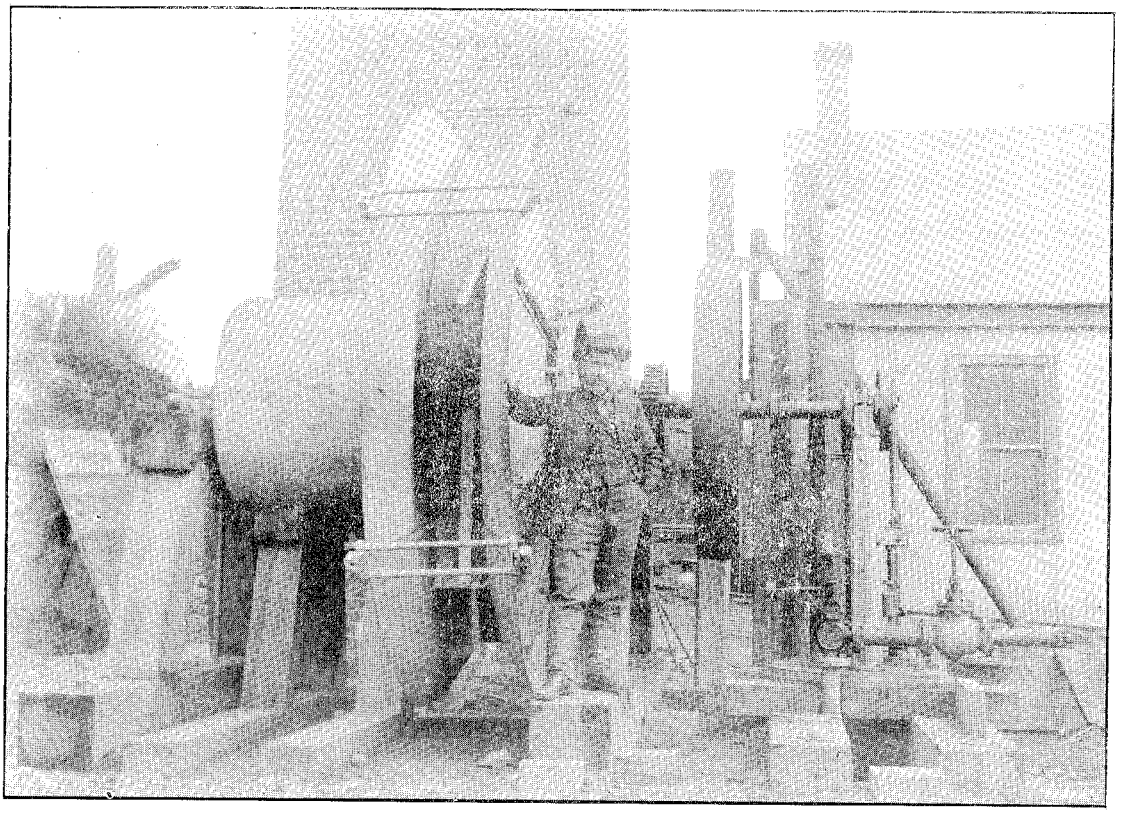
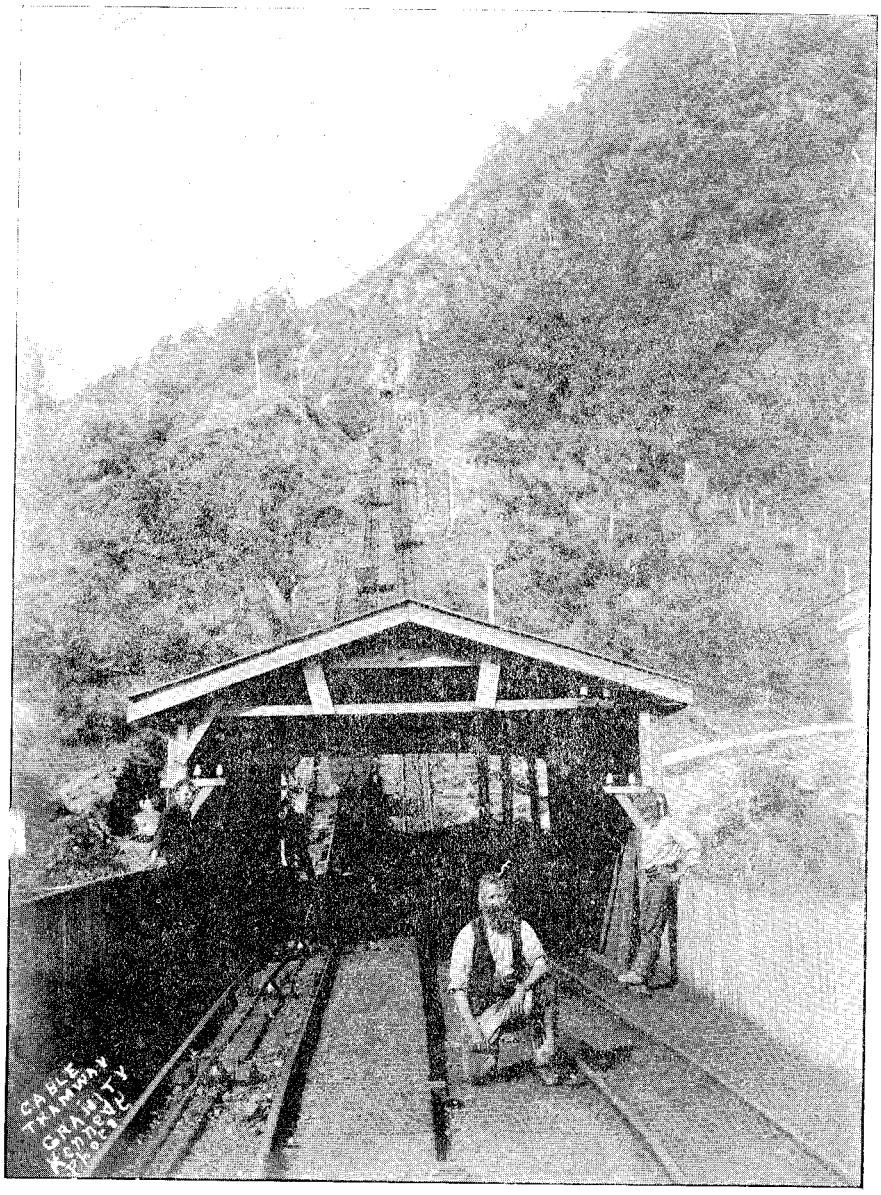


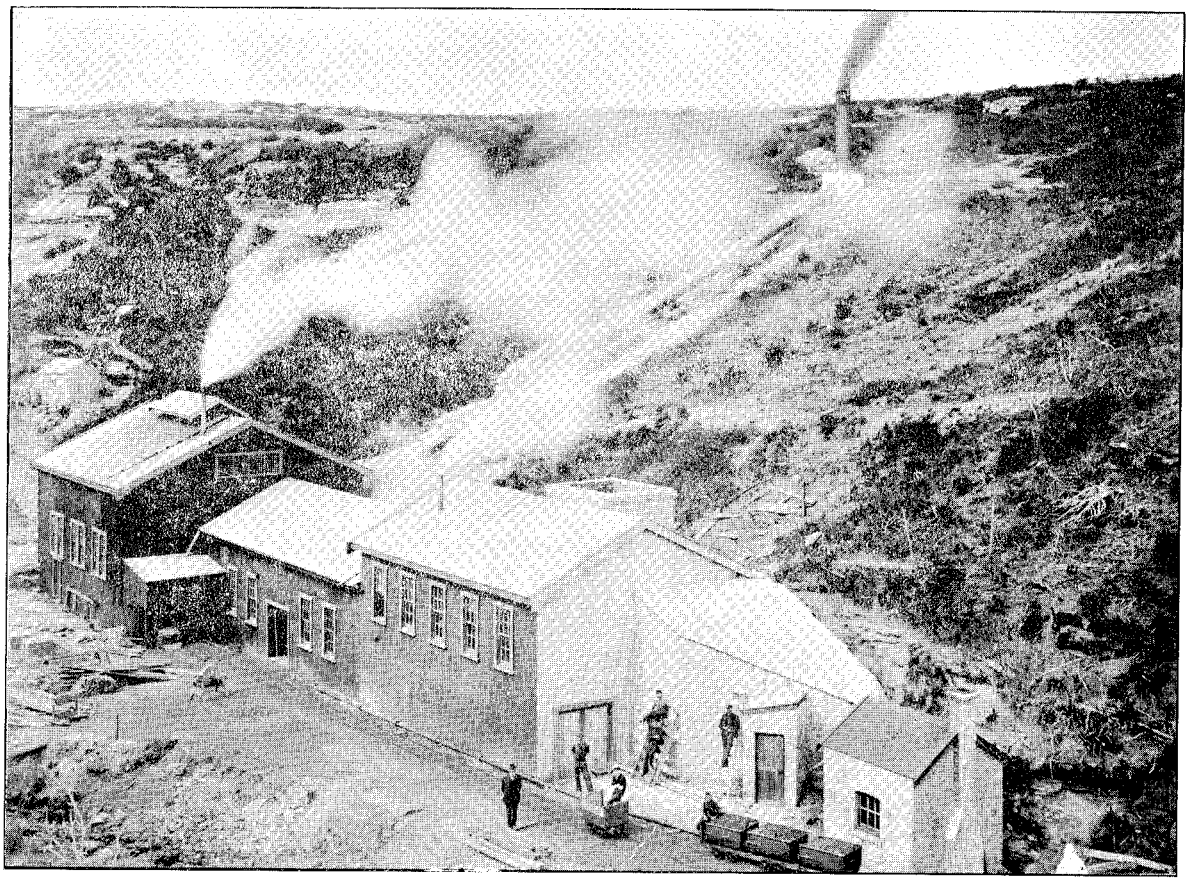
Air-compressors at Mine Creek Power Station, Millerton Colliery. (Westport Coal Company, Limited.)



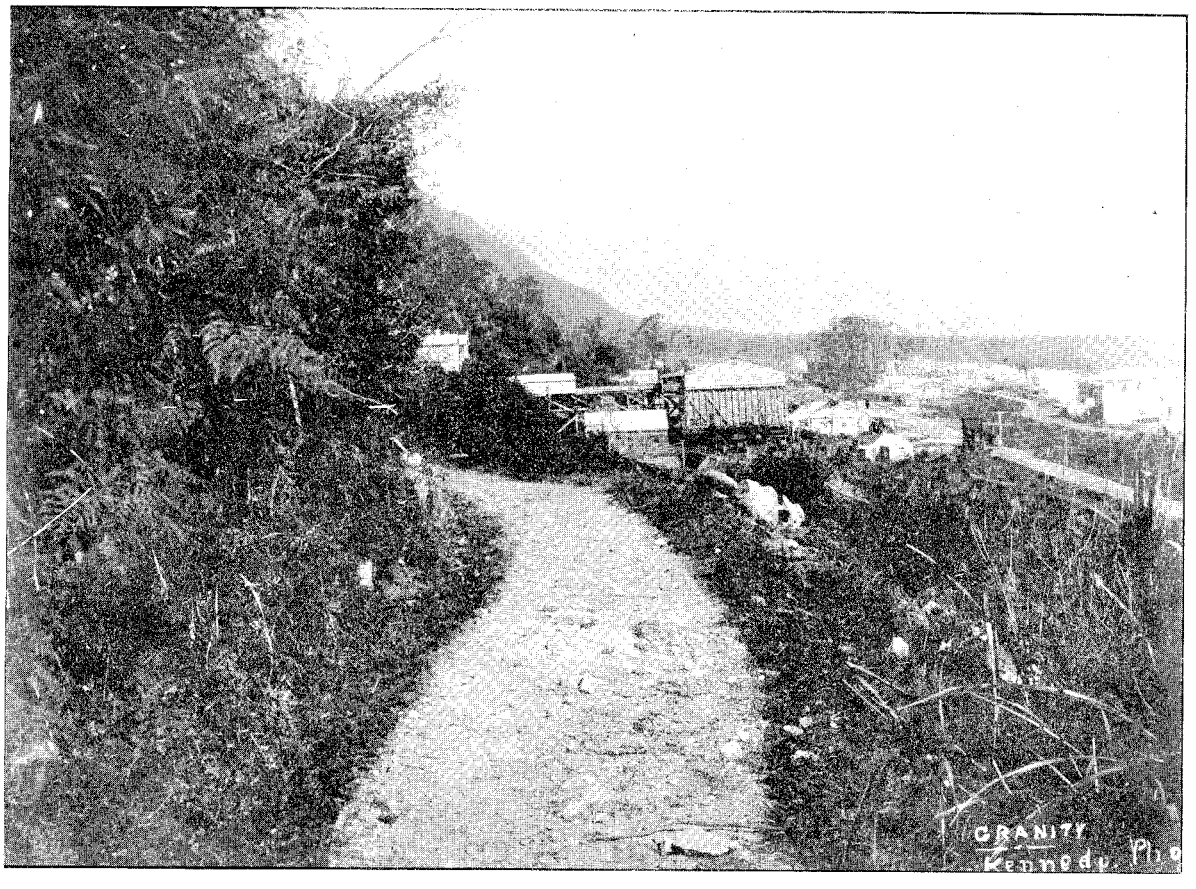
C. 3A. Ventilating Fan at Orepuki Shale-mine, Southland.



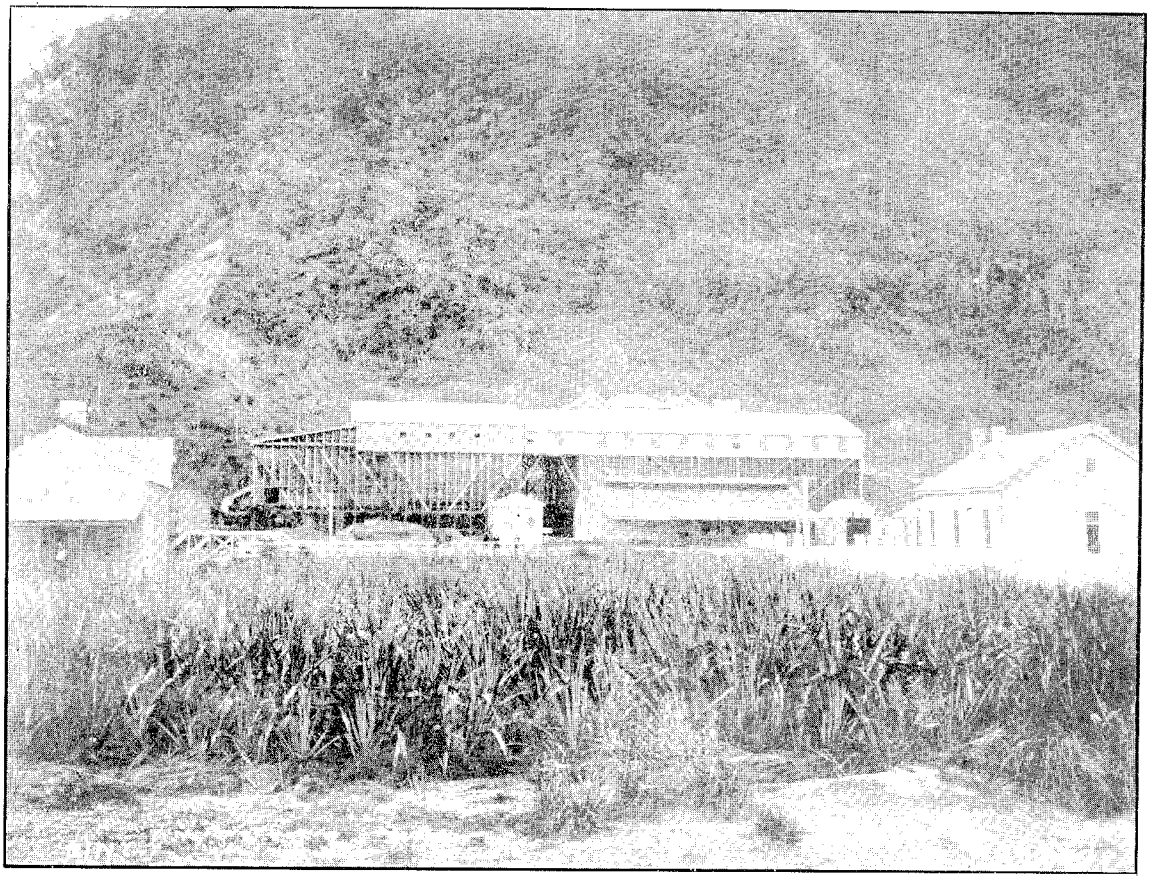
Bottom of Cable Tramway, Millerton Colliery. (Westport Coal Company, Limited.)



C. 3A. Power Station at Mine Creek, Millerton Colliery. (Westport Coal Company, Limited.)



View of Granity from Millerton Track.



C. 34. Bins, Workshops, and Offices at Granity, Millerton. (Westport Coal Company, Limited.)