

1888.
NEW ZEALAND.

COAL-MINES OF NEW ZEALAND.

(EXTRACTS FROM THE REPORTS OF INSPECTORS.)

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

NORTH ISLAND.

No. 1.

Mr. Inspector McLAREN to the UNDER-SECRETARY of MINES, Wellington.

SIR,—

Inspector of Mines' Office, Thames, 23rd March, 1888.

As required by section 59 of "The Coal-mines Act, 1886," I have the honour to report on the coal-mines of the northern districts of Kawakawa and Waikato for the year ending the 31st December, 1887.

The total output of coal from both the above districts in 1887 was 98,710 tons. This is somewhat less than the output in 1886, which was 104,794 tons.

During 1887 there have been two new collieries opened, viz., the Miranda and the Taupiri Reserve, both of which are in the Waikato District. I have also been informed that two new seams have been found within the Kawakawa District; one at Ngunguru, not far from the sea-coast, between Whangarei and the Bay of Islands, and the other somewhere in the same district, which, the finders believe, is also not far from the coast, but they are, as yet, unable to give any probable distance, as they found their way to it from inland. The first (Ngunguru) is on Maori property, and the other is also believed to be on land belonging to the Natives.

KAWAKAWA DISTRICT.

1. *Kawakawa Colliery*.—The quantity of coal raised in 1887 was 35,078 tons, being 4,303 tons more than during 1886. About 75 per cent. of the coal obtained has been from the No. 2 District, which lies in a south-easterly direction from the former workings; the other 25 per cent. was obtained from No. 3 District, which is on the dip side of No. 2. In this locality (No. 3 District) a fault was met with in the latter part of October, the coal there being found to be depressed vertically about 14ft. A heading is now being driven alongside this fault. The coal here is of excellent quality—hard, pure, and bright—and exhibits the following section: Roof consists of hard green sandstone, in places containing impressions of shells; underneath this roof there is a seam of coal 1ft. thick, then a thin band, then another seam of coal 3ft. 3in. thick; the floor consists of fireclay, under which comes the primitive rock, geologically called dioritic slate. The seam of coal in this mine is extremely variable as regards thickness. The roof in nearly all places in the workings is very bad, and so treacherous that enormous quantities of timber have to be used, and the most constant care and strict supervision exercised by the manager, Mr. T. P. Moody, and his assistant-manager, Mr. John Swinbanks. The good results of this care are shown by the fact that no accidents have occurred—a result contrary to what might be expected from the nature of the roof. It is worthy of note that during the existence of this mine, now nearly twenty years, only one fatal accident has occurred. Considering the large output of coal and the number of men employed, this is a record of which the management may well be proud. Mr. Moody deserves credit for adopting every precaution for the protection both of life and property, the safety of the men's lives being in all cases his first consideration. At the date of my last visit, 19th January, 1888, a fall from the roof to the rise of No. 2 level had caused a partial stoppage of the ventilation, but this was being attended to, and the ventilation would be quite restored by the following day. The operations of this mine for the half-year ending the 31st December, 1887, have been more favourable than during former corresponding periods—a result hardly to be expected considering the depressed state of the market.

2. *Whauwhau Mine*.—The output from this mine during 1887 was 8,473 tons, being wholly obtained from pillars. Towards the north a heavy fault was met with, which appears to completely cut off the coal. The manager, Mr. Love, informs me that in a trial boring downwards, near the end of the main heading, the bed-rock was reached at between 30ft. and 40ft. below the level, which points to the fact that the coal here must have an upthrow. The company are pro-

posing to make trial-borings from the surface in the direction of Kamo. At my visit of inspection on the 21st January last I found that the air of a portion of the travelling-road was very much heated from the decomposition of the lime in the roof and sides of travelling-roads and bords; the working-faces were, however, much cooler. The manager is about to construct another and shorter road, which will avoid the necessity of going through this overheated place.

3. *Kamo Colliery*.—From my last year's report it will be seen that on the 19th February, 1887, I took action and obtained judgment against the manager for not providing sufficient ventilation, safety-cages, &c., as required by the Act, and which were absolutely necessary for the safety of the men. The company were, however, unable to raise the necessary funds, and in consequence the mine was closed, by the directors' instructions, on the 18th April, 1887; the pumps, however, have since been kept going to keep the mine drained. Since that date the only work done has been on a small block of coal that was left at the surface-level, where from two to four men have since been partially employed. On my visit of inspection in January last, I found that the manager, Mr. Geary, had, in working from this block, broken into the old workings. As these had fired, or had been smouldering, opening into them only increased the flame through the supply of fresh air, which not only endangered the men, but also the whole property, I therefore instructed that these openings, as well as the air-shaft, be at once closed up, so as to be thoroughly air-tight; and before leaving the district I saw that this was all done. It is to be regretted that from the present state of the money-market this company has not been able to raise the necessary fresh capital to sink a new shaft, and recommence operations in an easterly direction, or further towards the dip, there being every encouragement to do so, as both seams are thickening in that direction. In the dip at the present shaft the seam, which at the surface-level is only 4ft. thick, has enlarged to nearly 9ft., and the 10ft. seam at the surface-level is about 14ft. at the shaft; and there is also every indication that the thickening of these seams still continues further towards the dip, giving every encouragement that further operations will be successful, provided that borings are first made, and full particulars of the strata obtained, in order to ascertain the best position on which to sink the permanent shaft. The omission of those preliminary measures was a great mistake in the first instance. These borings should not be very expensive to make.

WAIKATO DISTRICT.

4. *Taupiri Colliery*.—The output from this mine for the year ending the 31st December, 1887, was 29,601 tons. About one-half of this output was obtained during the first part of the year from the far dip-workings, or No. 5 District, and also from the pillars in Nos. 1 and 3 Districts. Since then the output has been principally from the bords and headings under the swamp in No. 5 District. In this district a new shaft, 92ft. deep, was completed about the end of February, and is now used for pumping and ventilating purposes, this being the sixth ventilating-shaft in the mine. In the early part of May a portion of the old workings in No. 3 District, where the roof had partly caved in, was observed to be heating. This kept increasing, and began throwing off strong smoke and gases. It therefore became necessary that this portion of the mine should be entirely separated, and the fire extinguished by cutting off all the air-supply. This was effected by the manager, Mr. Collins, having ten substantial sand-stoppings built, and the air thoroughly excluded. This portion of the mine has not been opened since, but it now has every appearance of being quite cool, and the fire extinguished. A trial heading, 7ft. wide by 6ft. high, was driven in a north-westerly direction to prove the thickness and quality of coal in that locality. On the 13th December the roof near the face of this heading suddenly caved in, apparently from a great pressure of water overhead, and a large volume of water poured in, washing the slack and tramway-ballast into the sump. The pumping-engines had to be kept going at full speed, night and day, for four days before the water was got under; since which one pump has been able to keep this water down. From the steadiness with which the water continues to flow, it would appear as if it came from an underground channel, it having no appearance of either coming from the swamp overhead or the Waikato River. A curious instance of the coal taking fire from the effects of a shot occurred in this mine on the 9th January of the present year, in a bord close to No. 6, or the new shaft. It is usual for the men to fire as they are knocking-off work at 4 p.m. About 10 p.m. the engine-driver, R. Batten, reported to the manager that the mine must be on fire, as heavy smoke was coming up No. 6 shaft. The manager as quickly as possible got three men, viz., R. Ralph (son of the lady from whom the company lease the property), E. Connor, and R. Robson, to go with him to the place. These, the manager states, deserve the highest credit for the way they faced the danger with him; indeed it was with the greatest difficulty, and only by crawling on their hands and knees, with their mouths close to the ground, that they reached the place. The blaze was by that time up to the roof, or 12ft. high, but they worked with a will, and ultimately got the fire under. The men that charged the hole admit to stuffing brown paper over the powder, and, though they will not acknowledge it, I have no doubt in my own mind they must also have tamped it with coal-dust or slack, a thing not allowed under any consideration. It is to acts such as this of disobedience or gross carelessness on the part of the men themselves, that all the accidents are traceable which have taken place in my districts since I became Inspector of Coal-mines in 1879.

5. *Waikato Mine*.—The output during the year 1887 has all been taken from the pillars, and every care and attention appear to have been given by the manager, Mr. E. B. Taylor, to prevent accidents. I mentioned in my last year's report that, as the coal was found to dip under the tunnel-level, it would be necessary either to erect steam pumping and hauling machinery in the mine or open out, away on the flat, slightly above the Waikato River level, what will be practically a new mine. The latter plan has wisely been adopted, and the works for obtaining coal from this level are now approaching completion. A wharf 64ft. long by 12ft. wide has been erected on the western bank of the Waikato River, from which a tramway to the tunnel-entrance is now nearly completed. The length of this tramway is half a mile; the rails being steel, 16lb. to the

yard, and the gauge 2ft. The grade of this tramway is very slight, being only 1 in 144 and 1 in 179. The new tunnel is now being driven to intersect the coal, which it is expected to do at about 450ft. from daylight. This tunnel will avoid all necessity of pumping, and the coal will be won level free. The grade of this tunnel will be the same as portion of the tramway, viz., 1 in 179. So far as it has been driven (195ft.) the strata passed through consists of an exceedingly hard but poor quality of limestone. The output for the year ending the 31st December, 1887, has been 11,240 tons; the total number of men employed being thirty-three.

6. *Taupiri Reserve Colliery*.—This is one of the newly-opened mines in which operations for mining coal were begun in June last. This company's lease consists of 7,000 acres of the University College Reserve land, near Huntly, having Lakes Kimihia and Hakanoa as its western boundary. I am informed that permission has also been obtained from the Crown Lands Board to work the coal under Lake Kimihia. Boring operations were first commenced in June, 1885, and coal was found in several bores, the most important being a seam about 20ft. thick, situated near the northern boundary of the lease. To get the coal to market it was necessary to connect with the Waikato Railway, and a branch-line was constructed from it to the mine; this branch, which skirts the border of the Kimihia Lake, is two miles and a half long, and quite level; the cost of construction being £3,600. This work was well advanced before it was considered necessary to begin mining operations, which commenced in February, 1887, by sinking a trial shaft on a spur leading up from Lake Kimihia. The coal was reached at a depth of 31ft. from the surface, the dip being ascertained from a bore that was made about 8 chains away from this shaft. It was decided to drive a dip, or incline-tunnel, at a grade of 1 in 5. This tunnel reached the coal at 165ft., and at 63ft. further to the dip, or 228ft. in all. The first working-level was opened out at right angles to the inclination or dip of the coal. The extension of this incline-tunnel has been continued beyond the workings; the total length at the date of my last visit, on the 1st February, 1888, being 530ft. This extension, so far, shows that the seam continues very regular in its incline downwards, and that it dips right under Lake Kimihia. The dimensions of this tunnel are 6ft. 3in. high by 9ft. wide, which allows for two lines of rails, with water-channel on each side. The timbers consist of kauri cap-pieces, 10ft. long by 10in. by 10in.; legs, 8in. by 5in., 6in. by 6in. long, backed by 3in. side-slabs. The shaft is a small one, being only 5ft. by 4ft. It is 43ft. deep, and is used for pumping and ventilation, it being made into the upcast, or return-air course, a heading having been connected with it from the workings for this purpose. Up to the present the means employed for haulage has been a horse-whim, but a pair of 28 horse-power engines with necessary boiler-power are about to be substituted. The drainage is effected by a 6in. pulsometer, steam for which is supplied from the boiler of the locomotive-engine used on the railway, but the total quantity to lift at present is small, being only about 1,500 gallons in twenty-four hours. This mine is under the management of Mr. John Ord, and the work of opening it out has been done very creditably by him. The output for the six months it has been opened (to the 31st December, 1887) is 2,226 tons; an average of eighteen men being employed.

7. *Miranda Colliery*.—This is another of the mines opened during 1887. Operations for raising coal were began in May last. It is owned by a company called the Miranda Coal and Iron Company, whose property consists of about one thousand acres, situated at Bridgewater, fourteen miles east from Mercer. The approach to the mine is by one of the tributaries of the Waikato River, called the Maramarua Stream, which is navigable to within half a mile of the colliery. Between the head of the navigable part of the stream and the mine-shaft a canal has been cut, the cost of which was £1,800. At the foot of the Maramarua Stream a wharf has been erected, to which a siding from the Auckland-Waikato Railway has been constructed. From the mine to this wharf the coal is conveyed in barges, which are towed by a specially-constructed stern-wheel steamer, the barges having a carrying capacity of 40 tons. The shaft has been sunk about 50ft. from the edge of the vast swamp that stretches from this place to the Waikato River, a distance of about twelve miles. The coal is in one seam, which is 53ft. in thickness. By boring, coal has been proved to extend nearly over the whole estate; but whether it maintains the same thickness all through I have not yet learned. The shaft has been constructed 14ft. long by 5ft. wide, and securely timbered with totara, the principals being 9in. by 9in. The top of the coal was reached at a depth of 145ft. from the surface; this, with 53ft. of coal, and including well-hole, makes the total depth of shaft 210ft. It is divided into two main compartments, one being for double winding, and the other for pumps and ladder-way. The poppet-heads are 30ft. high, the legs consisting of 12in. by 12in. kauri timber, the sills being of totara, 15in. by 15in. by 40ft. The ropes and cages have been fitted with detaching-hooks, and safety-catches, as required by the Act; but operations have been begun with only the small engine that was employed for sinking the shaft; the winding-drums in connection with which, being only about 4ft. 6in. in diameter, are far too small for the continuous working of a wire rope, the poppet-head pulleys have also the same fault; the result being that the best steel ropes, which, with drums and pulleys of not less than 10ft. in diameter, would last for years, do not last for a couple of months. The water in the mine is at present raised by tanks. The inflow of water is very heavy, necessitating about sixteen hours' constant winding out of the twenty-four; but regular pumping-machinery is about to be erected, the pipes for which (9in. in diameter) are already on the ground. The system of working the mine will be "bord and pillar," the bords to be 12ft. wide, with 16-yard pillars. So far the mine has been ventilated by making the pumping-division of the shaft the up-cast, but this is about to be altered to furnace-power; for this purpose a 9ft. circular shaft is about to be sunk at some distance from the present shaft; this will be lined with brick set in mortar. As there is plenty of clay in the locality the bricks will be made on the spot. Preparations for making these are now begun. As I mentioned in my last year's report, the mode of conveying the coal from the mine to the railway is the same as that first introduced into this district by Mr. E. B. Taylor, manager of the Waikato Colliery, viz., that the body of the truck unships from the frame, and is lifted into the barges, and from thence emptied into the railway-wagons, so that no handling of coal takes place between the mine and the railway-wagons—which, from the tender nature of the coal, is very desirable.

GENERAL REMARKS.

There have been no fatal accidents during the year 1887 ; indeed, there has been only one of any kind. This happened to a miner named Clarkson, in June last, at the newly-opened Miranda Mine, whereby he had his leg broken and also received a nasty scalp-wound. As regards the circumstances of this accident it may be explained that there is a heavy inflow of water into the mine, necessitating the water-tank being kept going constantly, even when no coal is being raised. The engine-driver, therefore, unless signalled for coal, keeps raising and lowering the tank as quickly as he can get it filled and emptied. In the temporary absence of the onsetter, and during the slight stoppage to empty the tank at top, Clarkson made to cross to the other side of the shaft, through the cage, which was at the bottom, and, miscalculating his time, got caught in the shaft-timbers, whereby he got his leg broken and sustained other injuries. He had himself entirely to blame, as he had no right to attempt to cross there, a special cut being made round the shaft at the bottom for this purpose, but to save himself going the few yards round about he nearly lost his life.

I am sorry, however, to have to record that a fatal accident occurred to a miner named James Russell, at the Taupiri Colliery, on the 3rd February last. This accident occurred entirely through the man's own carelessness. As this accident occurred in the present year it will appear in this year's statistics, when published in 1889, but, as it has been usual for Inspectors to bring the subject of their reports up to the latest date of their visiting the mines, I may mention that the above gives only one fatal accident in the North Island for every 833,621 tons of coal raised, a result so favourable and low that I have never seen it equalled in the mining statistics of any country.

Though there have been very few accidents in the coal-mines of the North Island, yet it is one of those subjects that should most deeply attract the attention of all persons acquainted with or interested in mining, for it must be patent, even to a casual observer, that on the adoption of a proper system of working great interests depend. These affect the mine-owner, the persons engaged in the prosecution of the work, and also the preservation of life and health of the working-miner. It should, therefore, come home to the consideration of every person in the pursuit of any mining industry to ascertain by which of all the known methods a mine ought most properly to be worked. All these considerations and many others are demanded in the proper arrangement of any mine—whether it be extensive or not—and it cannot be denied that scientific knowledge, ability, and extensive practice are required for the well-being and successful issue of such a work.

Towards attaining this end, however, there is another most important factor, viz., that of starting on a sound financial basis. I do not know what is the practice in the South Island, but in the North the unsound principle of erecting works and starting business principally on borrowed money is almost universal. Not to have their capital "called up" may, in the first instance, be a great relief to the shareholders' pockets, but its final effect is most disastrous. Whatever difficulties any enterprise may have to encounter, the heavy interest demanded on borrowed money must be paid. This interest in itself would pay more than good dividends to shareholders, and would put each company in such a flourishing condition that its shares, instead of being valueless, would find a ready market. Can it be expected that, after paying such heavy interest, there will be sufficient profits left to give a dividend to shareholders? There may be hopes of such a thing in a gold-mine, where the stone won to-day may be worth 10s. and to-morrow 20s. per ton; but in coal, where the quality in one part of the mine is the same as another, or has so little difference that it makes no change in the market-value, such a thing is not to be expected. When the very limited market and the intense competition of trade in these modern days are taken into consideration, it must be apparent that the enormous profits cannot be realised that will enable double dividends being paid, one to the money-lenders and another to the shareholders.

The effect of this system is that companies are continually in financial difficulties, and, instead of being able to increase business, are most seriously crippled; indeed, the natural outcome of this state of things is a continual cry from secretaries to managers to "keep down expenses," "keep down expenses," and, even should it impair efficient working, the unfortunate managers must do so, or go; and, in the latter case, be replaced generally by cheap, half-skilled, and wholly unscientific management as well as labour. A book might be written on this subject; but, in a report such as this, I can merely point to what I consider the main cause of the failure for many years of nearly all the companies that have been floated in Auckland, namely, the heavy millstone of debt that has been placed round their neck, under which they stagger for a time, and ultimately sink: the end is always the same.

I have, &c.,

JAMES M. McLAREN,
Inspector of Mines.

The Under-Secretary of Mines, Wellington.

No. 2.

MIDDLE ISLAND.

Mr. Inspector BINNS, F.G.S., to the UNDER-SECRETARY OF MINES.

SIR,—

Dunedin, 29th March, 1888.

I have the honour, in compliance with section 59 of "The Coal-mines Act, 1886," to make the following report for the information of the Hon. the Minister of Mines: The period dealt with is, as regards the East Coast mines, from the 15th April to the 31st December, 1887; but, as will be seen on reference to last year's departmental publications, a supplementary report on the West Coast collieries was sent in on the 30th September, so that in their case there is a period of only three months to be dealt with. During the whole of the year my time has as usual been devoted to the official duties of my position. Attached are the ordinary tables of statistics and accidents.

With regard to the former, I may point out to you that, under section 60 of "The Coal-mines Act, 1886," the duty of an owner or manager of a coal-mine is to apply to the Mines Department for a form on which to make the return of output, &c., and then to forward the information to the Inspector on or before the 1st March. As I had no hope of this being done—as a matter of fact, only two managers applied—I forwarded to each mine on the 7th February a form of return, together with a circular copy of section 60, and an addressed envelope for a reply. In spite of all this trouble, there were on the 9th instant twenty mines from which no reply had been received. With regard to the table of accidents, it is hardly necessary to point out that it is of very disproportionate length as compared with past years. Following the usual custom, I give below remarks on the various mines:—

8. *Wallsend Colliery, Collingwood*.—Visited on the 8th November, 1887, when the daily and weekly reports were duly kept, but the Act far from perfectly observed. For instance, there was no safety-lamp at all, nor was a copy of the Act kept at the mine. The seam continues thin and variable, but the mine appeared in better order than usual. On the 29th November the usual admonitory letter was sent to the manager.

9. *Mokihinui Coal-mine, Mokihinui*.—Not visited; not at work yet.

10. *Coalbrookdale Colliery, Westport (formerly known as the Banbury Mine)*.—Since my last report this colliery has been visited in November, when the ventilation was still imperfect, but the Act in other respects generally observed. The coal is 20ft. thick in places, but the dip changes very capriciously. On the east side of the south branch of the Waimangaroa the thickness is 12ft., and the dip E. (magnetic) at 17°. In the old workings the pillars have been partially worked; but there is so much surface-water in the field that unless a district is capable of free drainage it is inadvisable to bring down the roof. The output has at last reached a point more consonant with the magnitude of the invested capital and the works carried out. In 1886 the total from the Koranui and this mine was 119,779 tons, and during 1887 the latter alone put out 115,942 tons. As the Koranui Mine was purchased by the Westport Coal Company and closed during 1887 the transaction is not, so far, beneficial to the coal-production of the district or colony; but, if we consider that for less than 4,000 tons more coal a large separate establishment of inclines, drives, officials, &c., had to be kept up, it is obvious that the coal in the field must have been of late much more cheaply produced. Though primarily beneficial to the shareholders, this result is of undoubtedly advantage to the whole colony.

11. *Murray Creek Coal-mine, Reefton*.—In July last a letter was addressed to Mr. Trennery, the owner of this mine, requesting his attention to General Rules 1 (ventilation) and 48 (copy of Act and report-book to be kept at mine), and section 30 (Act exhibited at mine); but when the colliery was visited on the 21st October these particulars were entirely disregarded. It appeared that Mr. Trennery had obtained a lamp, though not of an approved pattern. In my supplementary report of the 30th September last I pointed out that the occurrence of gas had been mentioned in Burke's Mine, at Boatman's, and that my former opinion as to the probability of finding firedamp in this field had received some support, if not actual confirmation. My opinion on this point is strengthened by Mr. Macilquhaum, some time manager of this mine, who states that on the 28th June last a miner named Dawson fired a shot, and that a feeder of gas ignited, flickering over the face of the coal for about a square yard. Mr. Trennery, the owner of the mine, disputes this view, on what ground I am not aware, as he was not present at the time, and is unacquainted with coal-mining, whereas Dawson's account is entirely corroborative. There is only one argument against the probability of finding gas, and that is, the surface-cover is so slight and open that the gas must have escaped. No doubt this may be advanced with a show of reason; but I am unaware of any rule governing these cases, and in August, 1881, in the Wellington Coal Company's mine a severe explosion occurred under a very light cover. The analysis of this Murray Creek coal approximates so closely to that of various fiery mines that I am confident it requires only a combination of unfavourable circumstances to produce fatal results. When these do eventuate the coal-workers of this neighbourhood will perhaps acknowledge that gas does exist. Mr. Macilquhaum, I may mention, is fully cognisant of the danger, and appears capable of dealing with it. I have written to Mr. Trennery, requiring his compliance with the law, and have received a notice that Mr. James Straker is now manager of the mine.

12. *Lankey's Gully Coal-mine, Reefton*.—Mr. Elliston, the late owner, had, at my last visit, sold the mine to Messrs. Aston and Lamberton, and passed on to them my letter of the 7th July. On the 22nd October, 1887, the condition of the mine was but little improved, consequently I again wrote to the owners.

13. *Archer's Coal-mine, Boatman's*, is merely a private mine, and was visited in June, 1887.

14. *Boatman's Coal-mine, Boatman's*.—Worked in the usual style of the district—no pillars, and the roof hanging on timber. I have written to Mr. Coghlan.

15. *Burke's Coal-mine, Boatman's*.—In October last the condition of this mine seemed a little improved. There was, however, no return, and the Act was entirely disregarded. The excuse was that Mr. Coghlan had been for some months very ill, and that therefore the mine and the last mentioned, both of which belonged to him, had not received attention.

16. *Phoenix Coal-mine, Reefton*.—Visited twice during 1887, the first visit having been already reported on. This mine is very carelessly worked, the main level being far too wide. My letter of the 7th July, mentioned in the last report, was apparently wasted, for on the 24th October there was no improvement, except in so far that the old level had been abandoned, and one of more reasonable dimensions was used in its stead. Consequently, on the 24th November I addressed a final warning to Mr. Williams, the owner, who replied on the 12th December that my suggestions should receive attention.

17. *Progress Coal-mine, Reefton (known some years ago as the Oriental)*.—Exceedingly badly worked, so much so that the solitary miner employed there expressed to me his apprehension of danger. There was no second outlet, consequently no return, no attempt at keeping the Act, and

a general air of carelessness or ignorance about the place. Messrs. Levi and Perotti, directors of the Progress Quartz-mining Company, promised that another outlet should be made, and the place be put in order. On the 12th December, 1887, I wrote requiring attention.

18. *Coal Creek Coal-mine, Buller Road*.—About two miles below Mr. George Walker's station on the Buller Road a seam of pitch-coal crops out in the bed of the river, and at this point working has occasionally been carried on, the last person who took anything out being Mr. Berlin, who informs me that the mine "never had any manager nor any name other than Coal Creek."

19. *Golden Fleece Coal-mine, Reefton*.—I have visited this mine once since last report. It appears to be carefully worked and well timbered, but the Act has not been observed in some particulars.

20. *Brunner Coal-mine, Greymouth*.—The West Coast coal-mines having been reported on so recently as the 30th September, there remains but little to say on this occasion. During my inspections of October, 1877, Mr. J. Gow, resident Inspector at Greymouth, accompanied me, as did also Mr. Bishop, manager of the mine. We found a little gas in the prospecting-level through the fault. The main return registered only 13,159 cubic feet per minute, but doubtless by now the new fan will be producing a much larger quantity. On the 5th October the miners made their inspection with a satisfactory result. Report duly kept, but plan nearly seven months old. On the 20th October we made an inspection of the old workings without discovering any gas. At that time Mr. Bishop was expecting an extensive compressed-air hauling-plant for opening out the dip. The machinery was to consist of a pair of 26in. air-compressors, two steel Lancashire boilers, 30ft. by 7ft., two pumps capable of raising 300 gallons per minute, and a hauling-engine with a pair of 18in. cylinders. Mr. Bishop shares my strong predilection for a hydraulic plant, but the first cost was found to be excessive.

21. *Coal-pit Heath Colliery, Greymouth*.—At the time of my visit in October, 1887, only four men—including the underviewer—were working in this mine. Gas was found in two places in the two lowest level workings. The ventilation near the extreme in-bye point measured 2,683 cubic feet per minute, but the air was oppressively warm. As usual, the plan was not at the mine, but if only four men were employed of course no plan would be required, the exemption not having been, so far as I know, withdrawn. Copies of the Act and special rules were exhibited, but no names were attached.

22. *Tyneside Colliery, Greymouth*.—In October last Mr. James Hodgson was again in charge of the mine, and ten men were said to be ordinarily employed. The ventilation was natural, and no gas could be found. No weekly report was kept, and the daily report (which was at that time kept usually fully written up in advance, lacking only the signature) was a week late. No copy of the Act could be found about the premises, though Mr. Kilgour a few days subsequently found it stowed away about the office. The "conspicuous place" chosen for the special rules was behind a door, and there were no names of manager, inspector, &c., attached. Plan up to the 5th June, 1887. No approved lamp was provided, although in December, 1886, Mr. Kilgour was most anxious that the Government should import some. On the 2nd December I wrote to the manager requiring him to observe the law, and pointing out that continued neglect could result only in prosecution. On the 12th December Mr. Hodgson wrote that he had constructed a furnace and kept a weekly report, that the daily report should be written every day, that the special rules and Act with names attached were duly exhibited, and an improved lamp had been ordered.

23. *Greymouth-Wallsend Colliery, Greymouth*.—On the 13th October, 1887, I found with regret that, in spite of frequent requests and notices, safety appliances (under General Rule 23) had not been fitted to the cage at this mine. On the 14th we found about 1ft. of gas in No. 4 incline on the east side; the air was noted as "Good, but by no means too much." On the 1st October two of the miners had examined the mine, and reported gas as occurring in three places, but that no shots were fired in there during working-hours. The report continued: "With these exceptions we found all the other workings, road-ways, and air-courses in good condition. We also examined the shaft, accompanied by the engineer, and found it in good repair." These examinations by workmen are, in my opinion, if properly carried out by experienced and judicious men, the most valuable safeguard that can be devised. Nobody is more likely to know of and detect danger than the men who daily work in the mine, and whose personal acquaintance with their own portion of the workings is supplemented doubtless by intercourse with the whole working-staff of the colliery. On the 18th October we found a good deal of gas in the No. 1 back-heading, which Mr. Elliott had stopped on that account. The ventilation was as follows: Main return from west side, per minute, 18,746 cubic feet; from east side, 17,360 cubic feet: total, 36,106 cubic feet. As regards the general working of the mine a good deal more care seems to have been taken since the inquiry, the lamps better cleaned, and the brattice better kept up. As will be seen on reference to the accident table, out of thirty-one separate accidents, eleven have occurred at this mine; and, of thirty-four persons injured, this colliery is responsible for thirteen. I shall have some remarks to make on this head in a subsequent portion of this report.

On the East Coast the mines have not been reported on since the 15th April, 1887.

24. *Springfield Coal-mine, Springfield*.—This mine is gradually becoming of less and less assistance to the coal output. Since 1879, when the output was 4,589 tons, it has been reduced more than 50 per cent. In 1881 the tonnage was 11,928; since which time it has, with one exception, steadily fallen off. In 1881 the coal output of the Malvern Hills was 25,328 tons; in 1883, 13,972 tons; and in 1887, only 10,301 tons. On the 9th August a trial was made of the safety-cage, which fell only 2½in. when the rope was cut; the detaching-hook, too, acted very well. The pit was in very good order, and the Act seems perfectly observed, except that the pit-bank was not covered, and no approved lamp was used. Since my visit Mr. Lindop has written to say that he has two Evan-Thomas lamps. Special rules have been established.

25. *Canterbury Colliery, Sheffield*.—On the 13th August, 1887, the air was better, but the mine was not examined every morning with an approved safety-lamp, neither was a copy of the Act kept at the mine.

26. *Homebush Coal-mine, Glentunnel*.—Visited the 12th August, 1887, at which date there were only eight men below and one above. The ventilation of the rise-workings was very deficient, being due to natural causes, and entirely unguided. Mr. Brown, the mine manager, had no approved lamp, but had kept a daily report. The plan had not been made up for sixteen months. There was no copy of the Act at the mine.

27. *Dalethorpe Coal-mine, Springfield*, is now closed. On the 10th August the mine was in tolerably good order, but the Act unknown. As the pit was on the point of closing I did not think it worth while to introduce any formalities. In case, however, of a possible continuation I sent a copy of the Act, and notices of various points. On the 10th September working ceased, and due notice was subsequently sent to me.

28. *Brockfield Coal-mine (formerly Hartley)*.—In July, 1887, Mr. Ferguson wrote complaining that I had published his output for the previous year as 2,682 tons instead of 5,219 tons 19 cwt., as shown in his press copy. On my next visit, therefore, in August, I took the original return, signed by himself, and stating 2,682 tons. Mr. Ferguson has spent a good deal of time and money prospecting and driving in somewhat crushed ground. One dip-drive was, Mr. Ferguson informs me, 6½ chains down, and had cut a 16ft. seam of brown coal, when it unfortunately collapsed.

29. *St. Helens No. 2 Coal-mine, Whitecliffs*.—Messrs. Smart and Gundry gave up possession of this at the end of 1886, and during 1887 a party of miners, of whom Mr. John Bayles was manager, took charge. In August, 1887, the lower drive was in tolerable order, but the upper crushed and working. I explained the Act to Mr. Bayles, and on the 1st September wrote to him. The place was not revisited before the end of the year, when Mr. Bayles gave it up.

30. *Snowdon Coal-mine, Rakaiia Gorge*, and

31. *Acheron Coal-mine, Acheron*, have not been revisited.

32. *Stobwood Colliery, Rockwood*.—Visited on the 11th August, 1887. Mr. Nimmo had, he informed me, no copy of the Act. A weekly report was kept. A very interesting washout has been passed through, which cuts out the coal. An air-shaft had been sunk. On the 2nd September I sent a copy of the Act, and a letter calling attention to the requisite portions. The mine was in excellent order.

33. *Whitecliffs Coal-mine, Whitecliffs*.—On the 11th August, Mr. Leeming had not attended so well to the regulations as he ought to have done. The working-place was not well aired, no safety lamp used, though a daily report (unsigned, however) was kept. There was no copy of the Act exhibited. The plan was made up to June. Since then, Mr. Leeming, who appears anxious to do what is correct, has written to me stating that the various points referred to have received attention.

34. *Mount Somers Coal-mine, Mount Somers*.—As intimated last year, the open-work mining has now been abandoned, and the coal is worked by a drive. On the 16th August two men were employed, Mr. D. Jebson being in charge. The powder magazine consisted of a hole in the coal, just outside the mine, with a piece of sacking hung in front of the aperture. A tramway to the mine was then being constructed by the County Council; when finished it was to be eight miles and a half in length, and was to cost £4,000. Mr. Wright, the owner of this mine, has leased the tramway for a term of years. On the 2nd September, 1887, I sent a copy of the Act to Mr. Jebson requiring his compliance therewith.

35. *Wharekuri Coal-mine, Wharekuri*.—During 1887 very little was done on account of a fire in the mine. On the 27th December a couple of men were sinking a shaft about 75ft. from the entrance to the mine. The old works were all closed. A weekly report was kept, but somewhat late; no Act up; no safety-lamp.

37. *Prince Alfred No. 1 Coal-mine, Papakaio*.—On the 18th August the workings were in good order, and a report kept. No Act up and no safety-lamp, so I wrote to Mr. Willetts on these points.

38. *Prince Alfred No. 2 Coal-mine, Papakaio*.—In August two men were working back a pillar, and the air was good, but the same points were neglected as in the case of the preceding mine, which belongs to the same owner as this.

39. *St. Andrew's Coal-mine, Papakaio*.—Visited 18th August, 1887. Although the mine was in excellent order, the Act was not perfectly observed; Mr. Nimmo stating, in explanation, that he had not received a copy. The old special and general rules were exhibited with the names duly attached. Plan kept, and mine ventilated by a furnace.

40. *Ngapara Coal-mine, Ngapara*.—Inspected 6th December, 1887. No approved lamp on the ground, and report written only once a week, instead of daily. A Clanny lamp was on the premises, but was not used. I informed Mr. Nimmo that it would be necessary to procure one of an approved type, and make a daily use of it.

41. *Shag Point Colliery, Palmerston*.—On the 4th July, 1887, work was being carried on in both divisions of the main seam. The air was warm, but not excessively so. Cage-cover opening from within, but not made of ½ in. iron; the cage was not fitted with safety-catches, but the apparatus was being constructed in Dunedin; detaching-hooks had, of course, been fixed long ago. The ropes had been, on the 18th April, tested up to 5 tons, the ordinary load being 2 tons. The pit-bank was not covered, and the shaft for a second outlet was progressing very slowly. In the old (main) shaft Mr. Williams was driving through a very hard quartzose conglomerate for the purpose of catching the lower seams. On the 13th July a letter was addressed to Mr. Williams, requesting his attention to (1) pit-bank cover, and (2) cage cover; and on the 3rd August a reply was received that these were attended to.

42. *Allandale Coal-mine, Palmerston*.—This is a new coal-mine, near Shag Point, commenced towards the end of 1887 by Mr. A. McIntosh, who was connected in the early days with the Shag Point Mine.

44. *McLean's Lignite Mine, Idaburn*.—An open-work lignite-mine, visited on the 24th November, 1887.

45. *Lockhart and Beck's Lignite-mine, Idaburn.*—A new open-work mine, adjoining the Idaburn Lignite-mine, visited on the 24th November, 1887.

46. *Idaburn Lignite-mine, Idaburn.*—On the 14th November this mine was the scene of an unfortunate fatal accident, whereby the owner, Mr. J. Macdonald, lost his life. The accident was not reported, and I was at Ferntown, near Collingwood, when the news reached me by private telegram. An account of the accident will be given in its proper place.

47. *Ida Valley Lignite-mine, Ida Valley.*—An open-work lignite-mine, visited in November.

51. *Kyeburn Coal-mine, Upper Kyeburn Diggings.*—When I visited this mine, on the 25th November, there was nobody about, so I could not go in. At Mr. McCreedy's house I saw a weekly report, but there was no safety-lamp to be found, so I wrote requesting the owner to purchase one.

52. *Perseverance Coal-mine, Kyeburn.*—Visited on the 25th November, 1887. Mr. Archer had not attended to my notice *re* safety-lamp, exhibition of Act, &c.; I therefore wrote to him again.

53. *Commercial Coal-mine, Kyeburn (late Archer's).*—Report two weeks back, and no attempt to keep the Act in any other way. I have written to the owner.

66. *Allandale Coal-mine, Green Island.*—This mine used to be on the list, but has been closed for some years. I received no notice of its recommencement, and on visiting the ground on the 30th September, 1887, found the drive fallen in and the place abandoned.

67. *Fernhill Colliery, Green Island.*—When this mine was visited, on the 30th September, 1887, the manager was away, so I went through the mine with one of the workmen, who said that the places were examined with a safety-lamp every morning.

68. *Green Island Colliery, Green Island.*—I am able on this occasion to give a better report on this mine. On the 3rd August powder was stored, only in 25lb. kegs, in an old vertical boiler. A Mueseler lamp used in the morning, also a copy of the Act hung up at the mine, and a daily report kept. On the 26th September the whole of the workings on the west side of the railway-line had fallen in, and a new drive had just been commenced on the other side. On the 19th December the Act and special rules were not properly exhibited.

69. *Saddle Hill Coal-mine (Christie's) No. 1.*—On the 12th December, 1887, I was at this pit, but the manager, Mr. D. L. Christie, was ill, and I did not see him. There was no safety-lamp, but a copy of the Act was exhibited, with the requisite names attached, and the pit was in good order. I wrote subsequently to Mr. Christie, calling his attention to certain points.

70. *Saddle Hill Coal-mine (Christie's) No. 2.*—On the 29th March, 1887, as mentioned in my last report, I received notice from Mr. D. L. Christie that a new mine had been commenced. This is a drive to the west of the old pit, and during the year very little has been done except what was necessary to prove the existence of the coal.

71. *Saddle Hill Coal-mine (McDougall's).*—On the 12th December, 1887, I found the law totally disregarded at this mine, so wrote to Mr. McDougall, giving him a week to put things to right, and on the 20th received a letter (dated 17th December, post-marked 20th) saying that a Mueseler lamp had been purchased.

72. *Glenochiel Colliery, Saddle Hill.*—This colliery was visited on the 14th December, 1887, when I found that the new drive had been connected with the shaft, thus doing away with the necessity for safety-cages, detaching-hooks, &c., the expense of which the owners are by no means in a position to bear. The workings were in good order, but still no attempt had been made to observe the law. I therefore gave the owners final notice that in default of improvement I should recommend a prosecution. As will be seen by the next report, this had to a certain extent the desired effect.

73. *Walton Park Colliery, Green Island.*—There has been little or no change in the condition of this colliery. On the 26th July, 1887, the ventilation was very good, the pit-bank covered, and the ropes had been repeatedly tested, but the Act was not exhibited, and the Mueseler lamp in the company's possession had not been used. On the 8th September Mr. Loudon called to tell me that the workings were every morning examined with a safety-lamp before the entrance of the men.

74. *Abbotsroyd Colliery, Green Island.*—Inspected on the 19th December, 1887, when the ventilation was slack, owing to the furnace being low. The smoke from this furnace, on account of the peculiarities described in my last report, can escape into the workings, and I have therefore written to Mr. Freeman on the subject. A bonneted Mueseler lamp was used, and a daily report kept. Rules and Act exhibited, but the requisites names not all attached. The Act seemed pretty well kept, and the pit in good order.

75. *Mosgiel Colliery, Mosgiel.*—In September the mean return was 4,450 cubic feet of air per minute, but by not being guided round the east side, where most of the men were, a good deal of the efficacy of the current was lost. The ventilating-furnace required attention, as it was placed in the centre of the shaft, the coal being exposed in places, and the timber being in dangerous proximity to the fire. In fact, it was distinctly unsafe, besides being incompatible with General Rule 33. A bonneted Mueseler lamp was used, fitted with the shut-off arrangement, invented by my old friend Mr. A. H. Stokes, F.G.S., now Her Majesty's Chief Inspector for the Midland District of Great Britain. "The roof is somewhat insufficiently timbered, being heavy in places," was written in my notes, and ten days after a boy was injured by a fall of coal. Daily and weekly reports were kept, but there was no signal down the engine-plane; this, however, was at work on the 14th December, and the furnace has been allowed to remain unlighted, on account of the danger referred to above.

76. *Brighton Coal-mine, Brighton.*—In May, 1887, Mr. Walker sent notice that he had opened a mine in this locality, which I visited in July. The workings consisted of a short dip-drive in one 8ft. seam of coal. One man was employed below ground, and one carting. I explained the Act to Mr. Walker, and wrote on the 29th July.

77. *Bruce Coal-mine, Milton*.—On the 19th April, 1887, I visited this mine, and found that a weekly but no daily report was kept, and that the mine was not examined with a safety-lamp. On the 10th May notice was sent to Mr. Hardwick to comply with these portions of the Act.

78. *Real Mackay Coal-mine, Milton*, was, on the 19th April, 1887, in much better order than usual; the pillars larger, and the bords and headings less wide. Also a very good daily report was kept, but no safety-lamp at the mine. Air good, and the mine generally in good order. On the 27th August Mr. Young called at my office about the abstract of the Act.

79. *Fortification Coal-mine, Milton*.—The bad system of working described in my last report on this mine has materially damaged the property, but on the 19th April it was in somewhat better order. Still, in several details the law was not kept, and I therefore, on the 10th May, wrote to Mr. Reid.

83. *Benhar Colliery, Stirling*.—In August, 1887, Mr. Nelson wrote, stating that he had never received a copy of the Act relating to coal-mines. Having written to Wellington for a copy of the "new Mining Act," he had received one, in which nothing about coal could be found. I may call the attention of colliery managers and others to the fact that it is necessary when sending for an Act of Parliament to quote the exact title, otherwise the wrong one may not improbably be sent. On the 21st September I called, and found the owner and manager away, so went round the workings without him. As the office was closed I saw no report or plan.

84. *Penman's Coal-mine, Benhar, Stirling*.—On the 21st September, 1887, I visited a small coal-mine at Benhar, then recently commenced by Mr. J. Penman, with whom I went over the provisions of the Act, and to whom I sent a copy on the 28th September. He, however, very shortly afterwards sold the mine to Messrs. J. and A. Morison.

85. *Rigfoot Coal-mine, Benhar*.—In September last this was an open-work coal-mine near Benhar, owned and managed by Mr. James Aitken.

86. *Kaitangata Railway and Coal Company's Mine No. 1, Kaitangata*.—This is the old shaft, and has not been in operation during the year.

87. *Kaitangata Railway and Coal Company's Mine No. 2, Kaitangata*.—Under this are comprised the engine-plane workings, which have been vigorously, successfully, and, with one exception, safely worked. On the 4th October, 1887, eighty-five men were employed below ground. An examination of the workings failed to discover any gas. In the top bord, No. 1, South Incline, head coal was being worked. The place was an enormous height—28ft. or 29ft. at least; and, as I have never considered it safe to work under these high places, I informed Mr. Shore of my opinion. He quite agreed with me, and explained a new system, which was then in fact being tentatively employed. This consists in working first about 10ft. vertically of sufficient proportion laterally to bring on a weight which crushes the pillars into the floor; the whole area is then allowed to settle, which it does in a very interesting and satisfactory manner. The upper portion of the already-worked bords is then taken out, and by this process the men are not subjected to the danger of filling below a roof which they cannot possibly examine. The ventilation generally was good. The water-pipe which descends the upcast shaft, and which was referred to last April, has been continued into the workings. As this introduces a system hitherto somewhat rare, a few words descriptive of the arrangement may not be out of place. The pipe, which is 2in. in diameter, commences at a dam near the furnace-shaft, is then continued down that shaft 3 chains, to the incline $2\frac{1}{2}$ chains, 12 chains along the south level and 3 chains on the north, then 8 chains down the main incline, where it joins the pump air-pipes, which continue 17 chains up the main engine-plane to the surface, and 4 chains on the surface to the compressor. At all the openings are T joints, where the water can be tapped for laying dust; and the whole length of pipes can be used either for compressed air or water. It is evident that in many colliery explosions—notably the one which occurred here in 1879—the power of turning fresh air into the mine would have been the means of saving many lives; and although these pipes were not put down for that purpose, and will, I trust, never be required for it, it is gratifying to know that they are there, and would probably be uninjured by any accident which could occur. As present, as stated, the upper portion is used for water, with which the furnace-ashes are cooled and the roads moistened; and the lower portion is used for air, which drives the pump and a coal-cutter. This also merits description. It is known as Harrison's coal-cutter, and is a remarkable machine, entirely unlike most of the class with which one has been acquainted in past years. Instead of working on fixed rails, with a sawing or scraping motion for the cutter, it is quite free on a pair of wheels, on a wooden platform with a ratchet-motion, which keeps it up to the face, and has a direct-acting cutter working like a slotting-machine. The direction is given by a man, who holds two handles at the back; and the whole machine is about the size and shape of an ordinary basket perambulator without the front wheel. I am sorry to have no drawings, which might have explained it better. The only machine of at all similar design with which I am acquainted is one patented by Routledge and Ommaney in 1866, which struck a succession of rapid blows, and was held to its work by a man. In spite of the small size, it undercuts to about 4ft., and, when fitted with larger wheels, vertically equally well, making coal superior to that produced by hand-cutting. It is premature, perhaps, to express any opinion at present, but my impression is that the problem of a thoroughly efficient coal-cutter has not yet been solved. On the 8th October, 1887, I wrote to Mr. Shaw, suggesting that where it is necessary to work the very high places a light temporary scaffold might be erected for the men to examine the roof. The reply was that such an appliance should be used if required. At the time of writing, however, no head-coal was being worked. During the year one man was injured for 52,889 tons raised and this notwithstanding the fact that for a considerable period the mine was worked almost entirely by unskilled labour.

88. *Castle Hill Coal-mine, Kaitangata*, commenced near the end of 1887, and not visited during that year.

89. *Whangaloa Coal-mine, Whangaloa*.—Visited on the 5th October, 1887, when there was nobody about, so I did not go through the mine. Very little has been done.

90. *Lesmahagow Coal-mine, Whangaloa*.—Inspected the 5th October, 1887, In good order, but the Act disregarded, except for a weekly report.

91. *Bonnie View Coal-mine, Whangaloa*, was commenced near the sea-coast, in a nice seam of coal, and visited in October, 1887. Is now stopped.

92. *Crofthead Coal-mine, Kaitangata*, is situated near the crown of the ridge on the new road from Kaitangata to the coast. The mine was on the 5th October, 1887, carefully worked, and before the end of the year Mr. Mackie obtained an approved lamp, and sent me the name of the manager.

93. *Hui Head Coal-mine, Kaitangata*, is situated a little to the north-east of the last. The owner did not succeed in proving a good seam, so the works were stopped.

95. *Parratt's Lignite-mine, Wyndham*.—In April, 1887, when I was here, no work was going on except a tail-race, which was in process of construction for drainage purposes.

96. *Menzie's Ferry Lignite-mine, Wyndham*.—On the 25th April, 1887, I had occasion to draw Mr. Morris's attention to section 20 of "The Coal-mines Act, 1886."

97. *Smyth's Lignite-mine, Gore* :

98. *Lieza's Lignite-mine, Gore* ;

99. *McKinnon's Lignite-mine, Gore* ; and

100. *Chittock's Lignite-mine, Gore*.—All open-work, and have been visited since my last report.

101. *Gore Lignite-mine, Gore*.—On the 3rd April, 1887, the owners of the mine Messrs. Tweedie and Hunter, sent me notice of commencement, and on the 20th of that month I paid them a visit. The mine offered no particular subject for remark, being carried on in a seam of lignite, 7ft. 6in. thick, with a 9in. band of dirt in the middle. I requested the owners to procure a safety-lamp (approved), and subsequently sent them a copy of the Act.

102. *Hefferman's Lignite-mine, Gore* ;

103. *Chatton Lignite-mine (Lacey), Chatton* ; and

104. *Chatton Lignite-mine (Pemble), Chatton*.—Open-work lignite-mines, only the first of which was visited in 1887.

105. *Mapp and McKenzie's Lignite-mine, Pukerau*.—An open-work lignite-mine, visited on the 22nd September, 1887.

106. *Pukerau Lignite-mine, Pukerau*.—On the 22nd September, 1887, I found the Act very imperfectly attended to at this mine. No safety-lamp used; iron prickers employed; no copy of the Act up. A daily report was kept, however, and the mine in good order. On the 28th September I wrote giving Mr. McKenzie notice to observe the law.

108. *Mataura Lignite-mine (Beattie's), Mataura*, and

109. *Mataura Lignite-mine (Town's), Mataura*, are both worked open-cast, and were visited on the 17th April, 1887.

110. *Sleeman's Lignite-mine, Mataura*, and

111. *Townshend's Lignite-mine, Mataura*, have not yet been visited. They are both open-cast. The same remarks apply to

112. *Edge's Lignite-mine, Waikaka* ;

113. *No. 14 Lignite-mine, Waikaka* ; and

114. *Sarginson's Lignite-mine, Gore*.

115. *Nightcaps No. 1 Coal-mine, Nightcaps*.—These thin seam-workings were in good order in April, 1887; only one man was at work. The workings were examined every morning with a safety-lamp; not, however, one of an approved pattern.

116. *Nightcaps No. 2 Coal-mine, Nightcaps*.—This is the thick seam. On the 27th April, 1887, I measured the ventilation, which was 5,320 cubic feet per minute. Eleven men were at work, and the air and timber good. Reports kept, and a safety-lamp—not an approved one—used for the morning examination. I explained to Mr. Lloyd that it was necessary to use a certain type.

117. *Nightcaps No. 3 Coal-mine, Nightcaps*.—Open-work.

118. *Wairio Coal-mine, Nightcaps*.—At the date of my visit in April, 1887, the coal was got entirely from the open-cast workings. The owner, Mr. Knight, had shortly before been injured by a dray, and was then in hospital. It appeared that on the 7th April a miner named John Dempster was working in the drive, when a piece of coal fell on him. I visited the injured man in the River-ton Hospital.

119. *Morley Village Coal-mine (Alley's), Nightcaps*.—An open-work mine; well laid out and worked. There is only 3ft. of coal, with 7ft. to 8ft. feet of cover.

120. *Reed's Coal-mine, Nightcaps*, and

121. *Morley Village Coal-mine (Lamont's), Nightcaps*, are open-work, and were visited in April, 1887.

122. *Hokonui Coal-mine, Winton*, was commenced towards the end of 1887, and was not visited in that year.

123. *Fairfax Lignite-mine, Fairfax*, is still open-cast, and was visited on the 26th April, 1887.

124. *McDowall's Lignite-mine, Fairfax*.—Worked by adit and one excessively wide drive. Heavily timbered. Found a keg nearly full of powder in the mine. The Act was not observed.

125. *Isla Bank Lignite-mine, Fairfax*.—Open-work. Inspected 26th April, 1887.

126. *Orepuki Coal- and Shale-mine, Orepuki*.—On the 23rd April, 1887, I made an examination of this mine, which has, since that date, been abandoned. At that time the manager was about to fit up detaching-hooks, manufactured and patented in the colony. The design was, in the main, good; but, instead of the copper pin usually employed to prevent accidental separation of the plates, there was a brass $\frac{1}{2}$ in. bolt, bevelled at the point, and fitting into a hole counter-sunk barely $\frac{1}{4}$ in. into the inner plate. The head of this bolt projected $1\frac{1}{4}$ in. from the face, and was totally unchecked or fastened. I did not consider it safe, and had no hesitation in declining to approve it; but subsequently Mr. Ford, the patentee, arranged to insert a copper pin with a good head at each end, immediately below the collar, to act as a check in case the brass bolt should come out. Im-

mediately after this, viz., on the 14th May, I received a letter from Mr. Shore, the manager, asking for exemption from the safety-cages and hooks, on condition that a communication by drive was made. Acting under authority from the head office, I granted this request, on condition that two men were put on to drive at once, but very shortly after the pit was abandoned.

ACCIDENTS.

During 1887 the number of accidents has been as unprecedentedly large as it was gratifyingly small in 1886. Instead of fifteen accidents, injuring fifteen people, none fatally, we had in this Island thirty-one accidents, injuring thirty-four people, four of whom died.

The average number of deaths in this Island for the seven years ending 1886 was 1·857 per annum, while for 1887 the number was, as already stated, more than double. Mr. Inspector Gow has investigated most of the accidents on the West Coast, and has been good enough to send me a list, in order to make up a table for this Island, and enable me to give the death-rate, &c. From all sources I obtain the following table:—

Classification of Accidents during 1887.

Below—				Separate Accidents	Persons injured.
Trucks	...	...	...	6	6
Fall of roof and sides	...	...	...	17	17
Gas explosion*	...	...	...	2	4
Miscellaneous	...	...	...	2	2
				— 27	— 29
Shafts—					
Working	...	...	...	1	1
				— 1	— 1
Above—					
Fall of coal	...	...	...	1	1
Crushed by horse	...	...	...	1	1
Powder	...	...	...	1	2
				— 3	— 4
Total	...	...	...	31	34

In looking at this table it will be noticed that, as compared with 1886, the sixteen additional accidents are due to the following causes. Increases in 1887—trucks below ground, 5; falls of roof and sides, 9; gas-explosion, 1; miscellaneous below, 2; fall of coal above ground, 1; crushed by horse, 1; and powder above ground, 1; total increase, 20. Decrease in 1887—powder below, 1; sinking shafts, 1; trucks above, 2; total decrease, 4. Net increase 16, of which more than half are due to falls.

Another thing that strikes one in looking at the table is the way in which the fatal accidents occurred in the early part of November. After working for twenty-nine months with only one death, we had three men killed in thirteen days. Another noticeable point is the frequency of accidents at the Greymouth Wallsend Mine, thirteen men having been hurt for an output of 53,313 tons, or one for 4,101 tons; at the same rate that would be 119 men injured for the Middle Island. Taking the number of men employed above and below (though all the accidents happened below), we obtain one man injured out of every eleven employed. In the Kaitangata Mine they have in five years raised 242,064 tons of coal, and employed 588 men, for an accident-list of one killed and five wounded. Taking this as six accidents, we obtain 40,344 tons of coal, and ninety-eight men employed, per accident. During the past year only one man was injured.

It is not to be expected that where quantities are so small, as in the coal-production of this colony, a regular average of deaths and accidents should be maintained: thus, in 1886 we had no deaths, and in 1887, four. Taken however over the whole period since mining has been subject to Government control, we have, I do not doubt, a death-rate which will compare favourably with that of any coal-mining country in the world.

REMARKS ON ACCIDENTS.

No. 6. Accident to John Dempster, at the Wairio Coal-mine. This was never reported, as Mr. Knight, the owner of the mine, was in hospital at the time: not, however, that this fact made much difference, for he seemed unaware of any obligation in that direction. Dempster was in charge, and, when some coal fell and injured him somewhat severely.

No. 7. Explosion in the Wallsend Mine, Greymouth. (Separate report of Royal Commission, already published.)

No. 16. Accident to Thomas Smart, whom I saw in the Westport Hospital on the 30th October. He seemed very badly injured, and informed me that a piece of clay fell on him, and that there was no scarcity of timber.

No. 17. J. Stephenson had his hip dislocated by a piece of proud coal. When I saw him he seemed perfectly recovered.

No. 18. This occurred to a boy named David Sneddon, who was working alone at the Mosgiel Colliery in a heading towards the outcrop, where the coal is very soft and traversed by vertical joints. A piece of coal fell from one of these. In my opinion, a boy should not be allowed to work alone below ground. Indeed, General Rule 39 of "The Coal-mines Regulation Act, 1887," of Great Britain enacts that "No person not now employed as a coal- or ironstone-getter shall be allowed to work alone as a coal- or ironstone-getter in the face of the workings until he has had

* The explosion in the Wallsend Mine, which is considered to have been due to coal-dust and gas, is included.

two years' experience of such work under the supervision of skilled workmen, or unless he shall have been previously employed for two years in or about the face of the workings of a mine.

No. 20. This occurred on a surface-tramway at Ferntown, about two miles from the mine. A horse fell upon Squires and injured him so much that he was not at work at the end of the year, and was not expected to resume until March. This accident was never reported, the following reason being given: The side-note to this section reads, "In case of accident in mine, manager to report to Inspector, who is to further report to Minister." Now, the manager argued, and rightly so, that the accident was not "in" the mine, so did not report at all. Perhaps to the existence of this side-note, which is entirely inaccurate, is due the fact that so few accidents are reported by the managers to the Minister.

No. 21. One of the deputies at the Greymouth-Wallsend Mine stepped on to the wrong side of a jig when the tub was running, and got somewhat bruised. Mr. Inspector Gow and I were at Greymouth at the time, and made a joint investigation, as we did also of

No. 22, which occurred three days after. In this case a piece of coal fell and cut Mason's foot.

No. 25. This was the somewhat unusual occurrence of a fatality in an open-work mine. Not that I wish by any means to record an expression of opinion that open-work mining is at all a safe method of getting coal. There is, unfortunately, a popular impression to that effect; but my belief is that if we got a large quantity of coal by open-work mining we should have many accidents. The notes of my inspection of this pit, eight months before the fatality, were—"Still open-work; nothing new to report. Cautioned Macdonald." This particular mine has always been badly worked, and the present manager appears unwilling to take warning. He will probably share his predecessor's fate.

No. 5 accident happened at the same mine. By some means a quantity of blasting-powder took fire, and Macdonald and his mate were laid up for three weeks. It was not reported.

No. 29. A. Cunningham. This took place at Kaitangata, on No. 2 incline, south side, No. 2 Colliery. I examined this place, and saw Cunningham. In my opinion the occurrence was due to his omission to secure a piece of coal. The place was severely crushed, and required extra care. The injured man assured me that he was not short of timber.

Of seventeen accidents reported to me twelve were notified in proper time, one within four days, and four not at all. Of these last, in one case the owner was in hospital; in another the owner got killed; in another the owner (who was subsequently killed) was injured; and in the last the side-note, as already explained, furnished an excuse, if not a reason, for maintaining silence.

NUMBER OF COAL-MINES.

For 1887 we had 119 mines on the list, ninety-six of which have been visited up to the 31st December. Of the remaining twenty-three, sixteen are open-work (of which eight are either new or were heard of recently for the first time), three were commenced too recently to be visited, one is closed, and the three remaining put out together 195 tons.

Fifteen mines have been struck off since last year, the Koranui being the only one of importance. Twenty-nine have been added, five of which merely resume their former places, and four now appearing for the first time have been working for a considerable period. It does not seem as if any of the new mines would be worked on a large scale, though the Hokonui may have a moderate output.

METHODS OF WORKING.

Compared with last year, the following table indicates that one shaft less is at work; that there is a reduction of one in the number of adits worked by steam-power, of two worked with horse-power, and two self-acting inclines; also that there are twelve more open-work mines.

Worked by shafts—						
Steam-power used	...	...	...	...	...	8
Horse-power	...	...	...	...	...	4
						— 12
Worked by adit—						
Engine-plane	...	...	...	...	...	9
Horse	...	...	...	...	...	9
Self-acting inclines	...	...	...	...	...	1
Hand-power	...	...	...	...	...	45
No information	...	...	...	...	...	1
						— 65
Open-work	...	...	...	...	...	42
Total	...	...	...	...	...	119

SAFETY-CAGES AND HOOKS.

Taking safety-cages first. There are now twelve mines worked by shafts, viz., Coal-pit Heath, and Greymouth-Wallsend, which had no safety-cages when I saw them; Tyneside, Saddle Hill, and Walton Park, which have other means of exit, and have been exempted; Springfield and Shag Point properly supplied; Orepuki exempted *pro tem.*, and now closed; Alexandra, Waikerikeri, and Macqueenville, where there are no cages; and Kaitangata (shaft) not used during the year. So that everything is satisfactory except the Coal-pit Heath and the Greymouth-Wallsend. The same remarks apply to most of the mines in discussing safety-hooks, except that the Greymouth-Wallsend and Coal-pit Heath have got them, and there is thus no fault to find.

STATISTICAL TABLE.

Owing to the number of mines now included in this table, and the quantity of information attempted to be given, absolute accuracy can hardly be obtained. Add to this the probability that, since the particulars were obtained from mine-owners, many changes may have taken place, and it will readily be understood that the figures are given subject to correction, and that any mine-owner or manager who will take the trouble to point out any errors will be conferring a favour.

With regard to the inclusion in the list of many very small mines, I may mention that the Act makes no distinction by which they might be left out, and that they are nearly always more trouble to get at, and frequently more troublesome to deal with, than the largest mines. In Great Britain mines employing one man are included in the lists, and not only so but some which have been suspended, and which have presumably not been inspected during the year, are also retained. My custom is to strike off any mine which has neither employed labour nor been inspected. The last column, "Date of Inspector's last visit," does not, in my case, refer to the year 1888.

SAFETY-LAMPS.

Most of the mines are now provided with approved lamps, though there has been some difficulty in persuading the owners of some lignite-mines, producing a few tons a month, and working close to the surface, and barely out of daylight, that a safety-lamp was absolutely necessary. Since the New Zealand Act was passed, the Home Parliament has enacted that "Wherever safety-lamps are used they shall be so constructed that they may be safely carried against the air-current ordinarily prevailing in that part of the mine in which the lamps are for the time being in use, even though such current should be inflammable." This appears to be very indefinite, and in consequence a battle is now raging at Home between those who wish to introduce new and safe lamps and those who cling to the Davy, on account, probably, of old associations.

ABSTRACT OF ACT.

Section 30, requiring that an abstract of the Act shall be exhibited at or near the mine, appears likely to cause a certain amount of trouble. Some of the managers applied for an official abstract, and, acting under instructions from the head office, I informed them that if a copy of the Act is hung up the law will be observed. I am afraid that the replacement of torn copies will be rather expensive for the small mines.

SPECIAL RULES.

The formation of special rules has been carried out without difficulty. At present ten are finally approved, three have been sent up for approval, and one set is in process of negotiation.

I have, &c.,

GEORGE J. BINNS,
Inspector of Mines.

The Under-Secretary of Mines, Wellington.

No. 3.

Mr. Inspector BINNS, F.G.S., to the UNDER-SECRETARY of MINES.

Supplementary Report.

SIR,—

Dunedin, 12th April, 1888.

I have the honour to make the following report on the coal-mines in this Island during the period commencing on the 1st January, 1888, and ending at the present date. The numbers refer to the table sent in on the 7th instant.

8. *Wallsend Colliery, Collingwood*.—The special rules for this colliery have been finally settled, and the time for making up the plan has, on the application of the manager and by the authority of the head office, been extended to six months.

12. *Lankey's Gully Coal-mine, Reefton*.—On the 16th January Messrs Aston and Lamberton wrote that they had driven an air-course, and had written for an approved lamp, which had not arrived. They failed, however, to send the name of the manager.

26. *Homebush Coal-mine, Glentunnel*.—Special rules for this mine were sent to the head office for approval on the 1st March.

28. *Brockfield Coal-mine, South Malvern*.—In February Mr. Ferguson wrote that all work was discontinued, pending arrangements for a low-level drive to cut off the water.

36. *Kurou Coal-mine, Kurou*.—On the 8th February the mine was in a better condition than usual. No attention was, however, paid to the law, and I wrote to Mr. Muir on the 13th.

41. *Shag Point Colliery, Palmerston*.—When I visited this mine on the 10th February forty men were employed, thirty of whom were below ground. Of these two were in the upper seam prospecting, and the rest in the lower seam through the stone-drive. The mine was not at work, and the air pretty good. The rules and Act were duly exhibited, and the pit-bank covered; plan up to the 4th January; daily report kept, but not signed by the underviewer who makes the examination. We made a trial of Howarth's patent safety-cage. On the first occasion the guides were somewhat out of plumb, and the cage fell 10½ in.; on the second trial it fell 2½ in., and one of the wedges got broken as it was being taken out.

42. *Allandale Coal-mine, Palmerston*.—Mr. McIntosh notified me on the 30th January that this mine commenced work on the 23rd of that month—a statement somewhat inconsistent with an output return of 56 tons for 1887. I visited the mine on the 10th February, finding three men at work above ground and four below. The seam varies from 4ft. 4in. to 5ft. 6in., and dips N.W. at 1 in 1½, forming part of the syncline which exists between Mounts Vulcan and Pukewitahi. Mr.

McIntosh proposes to start in the valley to the north-west of the mine with an adit, and work the coal entirely to the rise. He has already constructed a road three-quarters of a mile long from the main road. On the 13th February I wrote pointing out sundry portions for Mr. McIntosh's attention, but he has not yet sent me the name of the manager.

51. *Kyeburn Coal-mine, Kyeburn*.—On the 5th March, in reply to an inquiry, Mr. McCready wrote that he had procured an approved lamp and hung up a copy of the Act.

52. *Perseverance Coal-mine, Kyeburn*.—In response to a letter from me, Mr. Archer wrote in the beginning of March that he had a "suitable lamp for the Perseverance Coal-mine."

54. *Alexandra Coal-mine, Alexandra South*.—An examination of this mine recorded the fact that Mr. Thomson had not only absolutely neglected all my warnings and requests, but that, when laying out new work which could quite as easily have been constructed in compliance with the law, he had treated the Act as so much waste-paper. I, therefore, gave him three weeks, informing him that, if he continued to put the law at defiance, I should reluctantly be compelled to take extreme steps. On the 9th instant I received a letter from Mr. Thomson stating that he had carried out the works suggested by me and had ordered an approved lamp.

55. *Macqueenville Coal-mine, Alexandra South*.—Mr. McLay, the manager of this mine, had also absolutely neglected to take any steps necessary for the observance of "The Coal-mines Act, 1886." In sinking a new shaft a space of only 4ft. by 3ft. was left, so that, to get sloping ladders in and leave a space for the coal-bag was almost an impossibility; naturally, this was got over by putting in vertical ladders with 3in. footholds. Since my visit in 1887 two new shafts have been put down, the last but one proving too wet to be profitably worked. The present workings are unpleasantly damp. On the 20th March I wrote a letter to Mr. McLay in the same terms as my notice to Mr. Thomson, and, while at Clyde on the 22nd March, Mr. McLay called and appeared anxious, having at once mastered the fact that something must be done, to get things in order; he promised to write and let me know when arrangements were completed.*

56. *Earnsclough Coal-mine, Clyde*.—Visited the 15th and 22nd March, on the former of which occasions I found that the old mine had been for some time closed, and that a pair of shafts, 52ft. and 35ft. deep respectively, had been sunk. Mr. Buckley, the owner, had obtained an Evan-Thomas safety-lamp, which he had been in the habit of using while the mine was at work, during which time also a daily report had been kept. There was apparently no fault—or hardly any—to be found, and great credit is due to Mr. Buckley for making every effort to comply with the law. If he can do it, there is no reason why other Central Otago coal-mine proprietors, who have done nothing, should be allowed to benefit by their parsimony and carelessness. After all Mr. Buckley's care it is the more to be regretted that a fatal accident, which will be hereafter described, should have occurred here on the 18th March.

57. *Waikerikeri Coal-mine, Clyde*.—Visited 15th March. Mr. Holt had certainly done something towards keeping the law, having obtained an Evan-Thomas lamp, which was kept at the mine. There was, however, no copy of the Act and no report. The workings were not very secure, as I pointed out. On the 23rd March I found that the old shaft by the river was very insecurely fenced, so in writing to Mr. Holt on the 4th instant I included a notice on this point.

58. *Dairy Creek Coal-mine, Clyde*.—I regret to state that on the 15th March last I found that Mr. Collins had paid no attention to the Act, except in so far as to post up at the entrance to the mine a notice of the names of the owner or agent and of the Inspector. Accompanying the statistical return, which, by-the-by, was not posted until a week after the legal time had expired, Mr. Collins sent a letter requesting me to interview the Minister of Mines with regard to a road, which, he stated, has been constructed in front of the entrance to the mine in such a manner as to hinder the free egress of drainage-water. I replied that my duties do not include interference with disputes of this nature.

59. *Excelsior Coal-mine, Cromwell*, has again changed hands, after standing idle for some months. The present owners, Messrs Clarke and Burrows, have been at some pains to get the place into a little better order. The seam is dangerous to work, as it dips at an angle of 60°, and neither of the men is a practised collier; so I cautioned Mr. Clarke, who alone was at the mine on the 14th March. They appear to have an intelligent idea of how they intend to work the seam, and have taken air in with the aid of a waterfall. It is unnecessary, perhaps, to say that the Act was totally unobserved; and so I wrote on the 4th April.

60. *Bannockburn Coal-mine*.—This mine also has changed hands, having passed from Mr. Parcell's possession into that of Messrs. Johnson and Andrews, the former of whom had the Excelsior Mine last year. The workings were on the 14th March in good order, but no attempt had been made to keep the law, unless having the old 1874 Act general and special rules hanging up can be construed into an effort in that direction.

61. *Kawarau Coal-mine, Bannockburn*.—This mine on the 14th March was in excellent order, and Mr. Pryde had obtained a safety-lamp, from which, however, he had not derived much benefit, as it was an ordinary Davy, and had never been used. The old 1874 Act special and general rules were exhibited. I wrote to Mr. Pryde shortly after.

62. *Gibbston Coal-mine, Gibbston*.—Messrs. Macale and Cowan are now the proprietors of this mine, and they had not, on the 13th March, observed the law in any respect, but the place is tolerably well timbered. The usual letter has been sent.

63. *Steele's Coal-mine, Gibbston* (13th March, 1888).—Worked open-cast, a drive which was put in having been covered by a surface-slip. This mine is upwards of 3,200ft. above sea-level, and the seam, which is 25ft. thick, is covered by 18in. of white stone, above which is another thin seam of coal.

65. *Jones's Lignite-mine, Roxburgh* (23rd March, 1888), was, as usual, very well worked.

67. *Fernhill Coal-mine*, and

* Since writing the above, I have heard from Mr. McLay that he has been unable, on account of floods, to get the alterations at the pit finished, but that he has obtained a safety-lamp and report-book.

68. *Green Island Coal-mine*, have not been visited this year. Special rules have been approved for both.

69. *Saddle Hill Colliery (Christie's) No. 1*.—Mr. Christie commenced the daily examination and report on the day of my visit, 2nd February, 1888. The brace was not covered in, but, as the owners expect to abandon the pit at an early date, compliance with point appeared capable of being postponed. The Act was duly exhibited, and a bonneted Mueseler lamp used. Abandoned places fenced.

70. *Saddle Hill Colliery (Christie's) No. 2*.—Nothing more done; visited 2nd February.

71. *Saddle Hill Colliery (McDougall's)*, (2nd February, 1888).—Mr. McDougall had an approved lamp, but the daily report was not at the mine, nor was the Act exhibited. On the 6th March Mr. McDougall wrote saying that he had a daily report-book and a copy of special rules at the mine. Possibly by the latter he meant a copy of the Act.

72. *Glenochiel Colliery, Saddle Hill* (2nd February, 1888).—Messrs. Bryce Brothers have at last made an effort, and bought an Evan-Thomas lamp, which is used in the morning. No report at the mine, however, and no copy of the Act, nor have I succeeded so far in inducing the owners to send me the name of the manager.

73. *Walton Park Colliery, Green Island*.—Mr. Loudon would not accept the special rules of the other mines in this locality, so a new set has been drawn up.

74. *Abbotsford Colliery, Green Island*.—Special rules have been approved.

77. *Bruce Coal-mine, Milton*.—On the 10th January Mr. Hardwick had no approved lamp and no daily report; the weekly report was said to be at the house. On the 1st February the manager wrote that he had sent for an approved lamp.

78. *Real Mackay Coal-mine, Milton* (10th January, 1888).—Mr. Young had no Act exhibited, no daily report, and no safety-lamp. I gave him a fortnight's notice to get straightened up, and on the 25th January received a letter stating that he had a lamp, a "copy of rules," and a report-book at the mine.

79. *Fortification Coal-mine, Milton*.—Mr. Reid had an old Davy lamp, in excellent order, and a copy of "The Coal-mines Act, 1886;" no copy of the Act, and no report on the premises. A weekly report was said to be at the house. Most of the mine had fallen in (see previous reports). I wrote to the owner, and after waiting a considerable time for an answer wrote again, whereupon Mr. Reid replied on the 3rd March that, as he proposed giving up possession of the mine in six weeks, he presumed that the existing lamp would do. I replied that, under existing circumstances, it was perhaps hardly necessary to obtain a new one.

80. *Cannon's Lignite-mine, Lovell's Flat*, and

82. *Adams Lignite-mine, Adams Flat*, are both open-work mines, and when visited on the 10th January, 1888, were in good order.

81. *Paskell's Lignite-mine, Glenore*, was, on the 10th January, 1888, in a very dangerous state. An 8ft. seam is worked open-cast, under a very heavy overhanging gravel, which was dangerous. I wrote on the 28th January.

83. *Benhar Colliery, Stirling* (11th January, 1888).—Mr. Nelson has, I regret to say, not apprehended the necessity for compliance with the law, and I must call your attention specially to this fact, with an expression of opinion that a mistaken leniency on the part of an Inspector is not only prejudicial to the safety of the miners but unjust to the manager, who may find himself suddenly and unexpectedly pounced on and heavily fined. The timber did not appear too plentiful. I wrote to Mr. Nelson on the 28th January, intimating that in the event of continued neglect on his part I should be compelled to resort to legal action.

84. *Morrison's Coal-mine, Stirling* (11th January, 1888).—Only one man employed. Notice sent on the 30th January to the owners.

85. *Rigfoot Coal-mine, Stirling* (11th January, 1888), is now worked by an adit, and was at that time apparently safe. I have written to the manager, explaining the provisions of the Act.

86. *Kaitangata Railway and Coal Company's Mine*.—On the 12th January, 1888, I examined the workings in the engine-plane, finding the north side rather warm. A good many bords were being worked in the head-coal, which had settled down and closed up the bords. In all respects the Act seemed carefully observed. Special rules have been approved.

88. *Castle Hill Colliery, Kaitangata* (13th January, 1888).—At that time the mine consisted of a straight drive with two short branches, one of which terminated in a shaft. A Marsant lamp was at the mine, and appeared to be duly used, but no report was kept, nor was the Act at the mine. Mr. Carson has subsequently written that these deficiencies were rectified.

89. *Wangaloa Coal-mine, Kaitangata*.—There was nobody about on the 13th January, so I examined only the main level, without going into the rise-workings.

90. *Lesmahagow Coal-mine, Kaitangata*.—I was at this mine in January, but the place was deserted, and I did not go in.

91. *Bonnie View Coal-mine, Wangaloa*, appeared on the 13th January to be abandoned, and at the end of January Mr. Allan wrote that it was so.

92. *Croft Head Coal-mine* (13th January, 1888).—At this date two men and a boy were at work. A Marsant lamp was used, but no report was kept, and no Act at the mine. On the 1st February Mr. Mackie wrote that he would observe these portions.

94. *Wyndham Lignite-mine (Genge), Wyndham*;

95. *Parratt's Lignite-mine, Wyndham*;

96. *Menzies Ferry Lignite-mine, Wyndham*;

97. *Smyth's Lignite-mine, Gore*;

98. *Leize's Lignite-mine, Gore*;

99. *McKinnon's Lignite-mine, Gore*;

100. *Hoffman's Lignite-mine, Gore*;

102. *Hefferman's Lignite-mine, Gore*; and

103. *Chatton Lignite-mine (Pacey), East Chatton*, are all open-work, and were visited in January, 1888.

101. *Gore Coal-mine, Gore*.—I examined this mine on the 21st January, when there was nobody about. On seeing Mr. Hunter subsequently, I found that the Act was not kept in any way. Mr. Tweedie, the registered manager, had been away for some time, but no notice had been sent. In February Mr. Tweedie left altogether, leaving Mr. Hunter to carry on the mine alone, and from him I received a notice that he was manager.

104. *Chatton Lignite-mine, Chatton*.—This mine, though new on the list, has been at work for about twelve years. I for the first time heard of it—saw it, in fact—when driving towards Mr. Pacey's mine, which is in the same locality. It is a Government lease, and well worked; the seams, of which there are two, being very thick, The strike is N. and S. (magnetic).

105. *Mapp and McKenzie's Lignite-mine, Pukerau* (24th January, 1888).—This undertaking has been very short-lived, having commenced in September, 1887, and been closed in March, 1888, as the water became too much to get rid of.

106. *Pukerau Lignite-mine, Pukerau*.—On the 24th January the manager was not at the pit, and I could not see that the Act was observed. On the 31st I wrote inquiring whether the safety-lamp was daily used and the copy of the Act kept at the mine, and on the 6th February Mr. McKenzie replied in the affirmative.

108. *Mataura Lignite-mine, Mataura (Beattie)*, and

109. *Mataura Lignite-mine, Mataura (Town)*, are both open-work, and well laid out. They were visited in January.

111. *Edge's Lignite-mine, Waikaka*.—Worked for six years. I first heard of it in January last. An open-work mine, employing two men.

112. *No. 14 Lignite-mine, Waikaka*, was commenced about the end of November, 1887, and was inspected on the 23rd January, 1888. The seam is lying at a high angle, and the workings are open to the day.

116. *Nightcaps Coal-mine No. 2, Nightcaps*.—This is the adit in the thick seam. On the 19th January the general rules were exhibited, nicely framed; but there was no copy of the Act, nor had Mr. Lloyd an approved lamp. The mine was in very good order.

115. *Nightcaps Coal-mine No. 1, Nightcaps*.—This is the thin seam worked by engine-plane. Only one man was working on the 19th January, and the place seemed in good order; the ventilation rather slack, however.

117. *Nightcaps Coal-mine No. 3, Nightcaps*.—The open-work not now used.

118. *Wairio Coal-mine, Nightcaps*.—Open-work. Visited 19th January, 1888.

119. *Morley Village Coal-mine (Alley's), Nightcaps*.—Open-work in a thin seam. Well laid out. Visited in January.

121. *Morley Village Coal-mine (Lamont's), Nightcaps*.—Open-work. Not at work when I was there in January.

122. *Hokonui Coal-mine, Winton* (20th January, 1888).—This is an open-work mine situated at the termination of the Winton Tramway, which is about eleven miles in length. The coal is similar to Nightcaps; and the company have secured a considerable contract for the supply of the railways. Mr. T. Shore, late of Orepuki, is the Manager.

126. *Orepuki Coal- and Shale-mine, Orepuki*, has not been visited this year. Messrs. Cassels and Co., the present owners, wrote on the 14th February that the old pit was entirely closed, and that they were proposing to put down an adit.

NEW MINES.

Craig's Lignite-mine, Coal Creek, Roxburgh, is situated near Jones's Lignite-mine, and appeared on the 23rd March to be carelessly worked, though it was nearly dark at the time of my visit, and I was unable to distinguish the angle of dip with any degree of accuracy.

Pukerau Lignite-mine (formerly known as Swan's).—This mine, which was worked during the summer of 1887 to a small extent, was visited in September, when it was standing. In October I forwarded a letter to Mr. Swan, who, it appears, died immediately after my visit, consequently the letter was not answered. The lease has now been taken up by Messrs. Mapp and McKenzie, and the mine reappears on the list.

Waimea Lignite-mine, Riversdale, has not yet been visited. It is an open-cast working, and Mr. Carmichael, the owner, has applied for a copy of the Act.

Lieze's (Junior) Lignite-mine, Gore.—Open-work; formerly known as White's Lignite-mine.

Bayles and Buckingham's Coal-mine, South Malvern.—This is a reopening of an old tunnel driven about fourteen years ago, and would hardly have merited mention had it not been the scene on the 23rd March of a very unfortunate fatal accident.

ACCIDENTS.

There have already been two fatal accidents in this Island during 1888, both occurring at prospecting-works,

The occurrence of a fatality at the Earnsclough Coal-mine has already been mentioned. The cause was very simple. Mr. J. Buckley, the owner of the mine, had been constantly on the premises for about two months, and on Saturday, the 17th March, he was down the shaft, which measures 4ft. 10in. by 3ft., and is 35ft. deep; the air was quite clear, but the shaft is close to old workings, to drain which it had been sunk. The ground has always been noted for foul air (see report of the 12th June, 1880, page 15). Mr. Buckley stated at the inquest, and the evidence was corroborated, that before leaving on the Saturday he had cautioned his stepsons, aged respectively thirty and twenty-seven years, not to go down without first lowering a candle—a rash proceeding, of which it seemed the deceased had been guilty on the preceding day. Mr. Buckley added, "You

will do it once too often." On Sunday the deceased went down about 9 a.m., having been lowered by his brother, John Statham, in a sling on the rope. Whether he first lowered a candle or not is uncertain, but if so it must have fallen off the rope. To quote the evidence of John Statham: "On arrival at the bottom he stayed there about a minute and called out to me to pull up again. I pulled away as hard as I could until I got him about half-way up the shaft when he fell off the rope. I felt a sort of kick in the rope, and on looking down the shaft saw deceased falling. He seemed to be going head first down. He then lay at the bottom of the shaft about a minute before I could get him up by singing out to him. He then got up and staggered on to his feet and leaned against the side of the shaft for about half a second. After I had attracted his attention by shaking the rope against him he seemed to take hold of the rope in his hand and called out 'Up,' but very slowly. I then pulled him up about 2ft., when he let go the rope again. After repeated calling on my part he paid no attention." After the survivor had run for assistance the body was pulled up by the rope. Scrub was pulled up and down the shaft for the purpose of removing the bad air, but to no purpose. Nobody seems to have thought of pouring water down, though there is a large race flowing within a yard of the pit-top. Possibly it would have been useless, as the foul air came to within 4ft. of the pit-mouth. There is no doubt, in my mind, but that foul air came from an incipient underground fire in the old workings. These were full of water until about six weeks before the accident; then gradually the water was drawn off until three days before the accident, when it rose suddenly in the shaft about 6ft. This was drawn off, and there would be free passage for the products of the slow combustion, which doubtless found their way into the shaft. John Statham described the foul air as smelling like a gob-fire, and John Bailey said it resembled the smell of burning gum-boots. The verdict was accidental death, no blame whatever being attributed to Buckley or the surviving Statham.

While the above inquest was proceeding a man named Thomas Jacob Buckingham was smothered by a fall of dirt in a tunnel near Glentunnel, in Canterbury. The accident was at once reported by telegraph, but I was travelling at the time and did not hear of it until the following day, about 2 o'clock, when I immediately telegraphed to the Coroner respecting the adjournment of the inquest. My message appears to have arrived too late, as the Coroner (Mr. Caleb Whiteford, R.M.) replied that the inquest was over. This without any previous notice or adjournment, and in direct contravention of "The Coal-mines Act, 1886." I arrived at Glentunnel on the morning of the 27th, and made such inquiries as were practicable under the circumstances. The workings consisted solely of an old tunnel, through a small hill on the south side of the Selwyn River, near South Malvern. The drive commenced at a bearing of W. (magnetic) for about 59-yards, having been driven apparently with the intention of cross-cutting the measures. As the dip of these is S. 70° E., the tunnel was at this point bearing 20° too much to the south. Apparently to rectify this the direction was changed to N. 55° W., which brought it nearly as much out in the other direction. Fifteen yards inbye from the bend a fall had occurred, which was the cause of the accident. At the fall the measures appeared to be faulted, and to dip N. 60° E. at 47°, the ordinary dip being only about 20°. This brought the line of the tunnel within 23° of the strike of the measures, and caused the fall.

At about 11.45 a.m. on the 23rd March John Bayles and Buckingham were working at about 74 yards from the entrance, and the latter was pushing in a lath when a fall came and imprisoned him. Bayles attempted to get him out, when another fall occurred, imprisoning both, and had not help been at hand two lives would have been lost, but Bayles was dragged out, and Buckingham covered so thoroughly that it was about 8 p.m. before his body was recovered. The timber was not longitudinally stayed, and when once set free it knocked the rest down like a house of cards. Some props which have been below ground since 1875 were perfectly hard and sound. I am not aware what timber it is, but it is round 6in. or 7in. stuff. I had no idea any one was working on the ground, no notice having been sent.

PROSPECTING.

I am not aware of any important prospecting-works. Last year Mr. Tweedie was working among the jurassic rocks near Fortrose without any commercially-valuable result.

SAFETY-LAMPS.

Most of the mines are now provided with approved lamps of various patterns.

In my supplementary report, dated the 15th April, 1887, an unfortunate error occurs. The conclusion of the report, in referring to safety-lamps, states, "These, therefore, are at present the only lamps which I shall approve. Should any owner or agent desire to use any other type of lamp, with the exception of the tin-can Davy, he can do so by proving to my satisfaction that it is safe." This would intimate that under no circumstances could the tin-can Davy be approved. The words "with the exception of the tin-can Davy" were, as you will observe on reference to the manuscript, sent up as an addendum, with a request that they might be added after "lamps" in line 24; unfortunately they were inserted after "lamp" in line 26, exactly reversing my meaning. If the interpolation be placed after "lamps" the sense is at once apparent, as follows: "These, therefore, are the only lamps, with the exception of the tin-can Davy, which I shall approve." As a matter of fact, the Davy, when properly protected, is one of the safest lamps known.

OUTPUT OF COAL.

The output of coal for the Middle Island during 1887 was 459,910 tons, as compared with 430,160 tons for 1886, being an increase of 29,750 tons, or 1,130 tons less than the increase for the previous year. The principal alterations in the outputs of collieries are as follows:—

Increases.—Wallsend-Greymouth, 51,808 tons; Coalbrookdale, 40,333 tons; Mosgiel, 3,304 tons; Fernhill, 3,119 tons; and St. Helens No. 2, 1,830 tons.

Decreases.—Koranui (closed), 44,170 tons; Coal-pit Heath, 10,259 tons; Brunner, 8,558 tons; Shag Point, 4,250 tons; St. Helens No. 1 (closed), 3,531 tons; Brockfield, 2,551 tons; Saddle Hill, 1,748 tons; Springfield, 1,537 tons; and Walton Park, 1,480 tons.

Increases.—Greymouth Coalfield, 31,684 tons; and Green Island Coalfield, 3,784 tons.

Decreases.—Westport Coalfield, 3,837 tons; and Malvern Coalfields, 3,601 tons.

NUMBER OF MEN.

Curiously enough, notwithstanding the increase of coal, there is a large decrease in the number of men employed, the returns giving 1,171, as compared with 1,311 in 1886. I do not know how to account for this, but on analysing the figures we see that in the Westport field the staff was decreased by 121, at Greymouth and in the Malvern district by eleven each, and in the Kaitangata field by twenty-two. Of course, if a greater quantity of coal can be raised by fewer men it is so much better for the miners and, in a certain degree, for the proprietors. The output per man for 1887 is 393 tons (nearly), as against 328 tons in 1886 and 326 in 1885.

DEATH-RATE.

The death-rate in the Middle Island for last year is abnormally large. The output being 459,910 tons, the number of men employed 1,171, and the deaths 4, the number of tons raised and the men employed per life lost are naturally 114,977 and 293 respectively, or 3.41 per thousand persons employed. In 1886, as there were no fatalities there could be no death-rate, but in 1885 the figures were (for this Island) 133,093 tons per life, and 2.45 lives lost per 1,000 persons; and in 1884, 125,609 tons, and 2.95 lives lost. Since the commencement of inspection in the colony to the end of 1886 the figures were (for the two Islands) 228,191 tons raised per life lost, and 1.413 life per 1,000 persons.

I have, &c.,

GEORGE J. BINNS,

Inspector of Mines.

The Under-Secretary of Mines, Wellington.

No. 4.

Mr. Inspector Gow to the UNDER-SECRETARY of MINES.

Accidents on the Westland and Nelson Coalfields.

SIR,—

Nelson Creek, 24th March, 1888.

I have the honour to make the following report on the several accidents which have occurred and have been inquired into by me during the year ending the 31st December, 1887:—

1. *Brunner Mine*.—On the 10th January Thomas Hope, coalhewer, got his collar-bone broken by a fall of coal through carelessness in not using a sprag.

2. *Wallsend Mine*.—On the 19th February Henry Eckhold was so seriously injured by a fall of coal from his working-face that he died on the 24th March. I visited the mine late at night of the same day, and inspected the spot where the accident occurred. Joseph Carter (Eckhold's mate) pointed out to me where he was standing on a ladder, preparing for a shot near the roof, when the coal fell on Eckhold, who was at the time standing on a plank, cutting in the opposite side of the working-face. Had there been sprags used the accident could not have occurred. There were sprags of various lengths ready for use lying near that working-face. On the day of the accident Eckhold told me that "it was an accident pure and simple." I attended the inquest at the Greymouth Hospital on the 26th March. The jury gave their verdict, "Died from injuries received in Wallsend Mine on the 19th February, and no blame to mine manager or viewers."

3. *Coal-pit Heath*.—On the 7th March Jame Duke was injured by a fall of coal-headings while he was in the act of taking it down. The coal came down quicker than he expected, and injured his chest.

4. *Wallsend Mine*.—On the 25th April James Dunn, William Walker, and Joseph Elliott were more or less burnt by an explosion caused by a blown-out shot. It is only necessary for me to state here that the Governor appointed a Commissioner to inquire into this case, which was done, and fully reported, bearing date the 13th June, 1887.

7. *Coal-pit Heath*.—On the 26th August James Hays got his arm broken while taking down some headings; much more coal came down than he expected, and he did not get out of its way in time.

8. *Brunner Mine*.—George Newton, on the 29th August, when hastily stepping back from his working-face, fell and injured his ankle.

9. *Brunner Mine*.—James Arbuckle, on the 26th October, while taking out pillar-coal, ventured on the wrong side of the standing-props, and was injured by a fall of stone.

10. *Brunner Mine*.—On the 27th October Frank Goodrich, when travelling hastily along the engine-plane from his work, lost his light, and, in order to prevent being run over by the passing trucks while he relit his lamp, placed himself in front of one of the full trucks, resting his back lightly against it, and allowing it to push him along. He had travelled only a short distance in this dangerous position when his feet were caught by something (supposed to have been one of the rollers), causing him to fall, when the trucks immediately passed over him, breaking his leg and crushing him internally. Although the telegraph-wires were within his reach, by which he could have stopped the trucks till he relit his lamp, he did not use them. He is still in the hospital mending slowly.

11. *Coal-pit Heath*.—On the 1st September T. Kirkwood, when descending the pit, carelessly put his elbow through the side of the cage, when it came in contact with some of the framing and was broken.

12. *Coal-pit Heath*.—John Bremner, on the 3rd October, while filling some loose coal, got his arm broken between two tubs.

12. *Wallsend Mine*.—On the 14th October George Rankine, a deputy, got injured by being crushed between a full tub and the wall-side on the second jig. The accident was occasioned by Rankine stepping to the full instead of to the empty side of the way as the tub approached.

13. *Wallsend Mine*.—On the 17th October William Mason, while working in his place, got his foot badly crushed by a fall of coal from the side of a pillar. He had previously tried the place, and thought it quite safe.

14. *Coalbrookdale, Westport*.—On the 15th November Edward Jones was killed very simply while cutting coal to take out bottoms. While working in the cutting a wedge-shaped piece of coal of considerable weight slipped in from the side, crushing his body above the waist, and killed him

APPENDIX.

No. 1.

STATISTICS of WORKINGS in COAL-MINES, 1887.
NORTH ISLAND.

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 Workings.	Dimensions of Shafts.		Output delivered by	Output for 1887.			Approximate Total Output to 31st December, 1886.	Approximate Total Output to 31st December, 1887.	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.		
KAWAKAWA DISTRICT.																									
1. Kawakawa ..	Moody, T. P. ..	23	semi-bitum.	1 2' 6" to 15'	2' 6" to 15'	1 in 6	1 in 6	bord and pillar	4	7' x 10'	..	Tons. 35,078	..	Tons. 35,078	Tons. 615,402	Tons. 650,480	26	91	117	engine	6'	two 13"	247'	furnace	19/1/88
2. Kamo ..	Geary, Joseph ..	11	brown	2 4' to 14'	4' to 10'	varies	varies	"	8	15' x 6' and 12' x 2 1/2'	240'	6,792	..	6,792	125,967	132,759	17	50	*67	"	3' to 7"	10'	268'	natural	21/1/88
3. Whauwhau ..	Love, Alexander	23	"	1 5' to 10'	5' to 10'	"	"	"	1	6' x 5'	1,300'	8,473	..	8,473	54,362	62,835	3	12	15	horse	..	..	..	"	18/1/88
WAIKATO DISTRICT.																									
4. Waikato Mine, near Huntly	Taylor, E. B. ..	11	"	1 6' to 18'	6' to 18'	"	"	"	..	adit 8' x 9' and 6' x 6'	90' and 60'	11,240	..	11,240	83,917	95,157	9	24	33	horse and self-acting incline	..	..	..	"	31/1/88
5. Taupiri, Huntly	Collins, William	12	"	1 5' to 45'	5' to 35'	"	"	"	6	adit 10' x 6'	672'	29,601	..	29,601	235,404	265,005	9	51	60	engine and horse	2' 6" 2' 0" 1' 6" 1' 6"	110' 110' 112' 112'	natural and steam exhaust	4/2/88	
6. Miranda, Bridgewater ..	Cater, T. ..	1 1/2	"	1 53'	40'	1 in 5-67	1 in 5-67	"	1	shaft 5' x 14' adit 9' x 6' 3"	210'	5,300	..	5,300	..	5,300	7	11	18	engine	..	..	..	upcast natural	31/1/88
7. Taupiri Reserve, near Huntly	Ord, J. ...	1 1/2	"	1 14' to 20'	10' to 16'	1 in 7	1 in 7	"	1	shaft 5' x 4' 43'	adit 583' shaft 43'	2,221	5	2,226	..	2,226	6	12	18	horse whim	No. 6 pulso-meter	..	43'	natural	1/2/88

MIDDLE ISLAND.

WEST WANGANUI.	Walker James ..	19	bitum.	2	2' to 3'	all	W. 12°	long wall ..	..	adit	3,197	586	3,768	21,156	24,939	5	13	18	hand	..	..	8/11/87
8. Wallsend, Collingwood ..	Clarke, J. F., Secretary	7½	..	..	..	..	..	mostly prospecting during year	..	..	300	..	300	425	725	..	2	2	..	..	..	28/3/86
9. Mokihini, Westport ..	Brown, T.	9	..	1 12' to 20'	16'	16'	varies	3' 6' diam. 6' x 6' 90'	30' 10' 49' 90'	adit	65,163	50,779	115,942	312,491	428,433	60	154	214	engine	..	..	1/11/87
10. Coalbrookdale, Westport	Straker, James ..	4	glance	1 17' 6"	10'	10'	W. 10°	8' diam. 90'	45' 6"	..	572	..	572	1,982	2,554	..	1	1	hand	..	..	24/10/87
11. Murray Creek, Reefton ..	Aston and Lamberton (owners)	10	..	1 8'	all	all	varies	14' x 2' 6"	..	..	251	27	278	3,450	3,728	1	2	3	..	..	..	22/10/87
12. Lankey's Gully, Reefton	Archer, W. B. (owner)	2	..	1 3'	..	..	N. 30° W. 40°	..	..	..	60	60	120	50	170	..	1	1	..	..	..	14/6/87
13. Archer's, Boatman's	Coghlan, J.	7	..	2 2' 7" and 1' 7"	..	..	S. 30° W. 12½°	..	..	..	110	17	127	1,417	1,544	1	1	2	..	..	..	26/10/87
14. Boatman's, Boatman's	Libeau, Louis ..	6	..	1 18' 6"	6'	6'	N. 80° W. 29°	..	..	..	29	262	291	1,351	1,642	1	1	2	..	..	..	26/10/87
15. Burke's, Boatman's	Adams, W. ..	3	..	1 20'	10'	10'	E. 30° to 40°	..	..	..	352	40	392	860	1,252	..	1	1	..	..	..	24/10/87
16. Phoenix, Reefton ..	..	8	..	1 12'	8'	8'	S.E. 7½°	..	..	..	..	..	6	614	614	..	1	1	..	..	..	25/10/87
17. Progress, Reefton (formerly Oriental)	..	..	pitch	1 12'	all	all	S. 45° E. 12°	open work	..	..	6	..	6	..	6	..	..	..	..	..	..	28/10/87
18. Coal Creek, Buller Road	..	17	glance	1 16'	8'	8'	varies	..	..	adit	..	..	..	7,309	7,309	..	..	..	..	..	..	24/10/87
19. Golden Fleece, Reefton ..	Bishop, J.	23	bitum.	1 8' to 10'	all	all	S.W. 1 in 4	..	..	..	61,104	17,508	78,607	564,070	642,677	31	150	181	engine	..	..	20/10/87
20. Brunner, Greymouth ..	Elliott, R.	11	..	1 16'	..	..	..	2 10' x 6' 8' diam.	280' 75'	shaft	25,304	2,133	27,437	184,590	212,027	21	74	95	90 h.p.	..	..	19/10/87
21. Coal - pit Heath, Greymouth	Hodgson, James	11	..	1 16'	..	..	..	2 10' 6' x 6' 25' 25'	116' 25'	..	2,062	750	2,812	7,021	9,833	4	10	14	eng.	..	..	19/10/87
22. Tyneside, Greymouth ..	Elliott, R.	11	..	1 16'	..	..	..	2 11' diam. 14' diam.	670' 660'	..	45,085	8,229	53,314	13,639	66,943	27	120	147	engine	..	..	18/10/87
23. Wallsend, Greymouth ..	Lindop, A. B., General Manager	11	brown	1 7' 6"	..	..	S.E. 1 in 6 to 1 in 12	1 12' x 5' 2"	246'	..	1,675	527	2,202	59,112	61,314	2	6	8	..	..	..	9/8/87
24. Springfield, Springfield ..	Moore, W., Mine Manager	25	..	2 2' and 1'	..	..	S.E. 1 in 3	1 5' diam.	25'	adit	1,250	40	1,290	30,159	31,449	2	2	4	horse	..	..	13/3/87
25. Canterbury, Sheffield ..	McIlraith, J. A., General Manager	15	..	2 3' 6"	..	..	E. 10° S. 1 in 3	23' 6" x 3' 3' 6" x 3' 20'	60' 20'	..	2,717	108	2,825	72,400	75,225	2	6	8	..	..	..	12/8/87
26. Homebush, Glentunnel ..	Brown, T., Mine Manager	2	glance	2 2'	..	..	S. 65° E. 35°	..	..	..	273	..	273	167	440	..	1	1	hand	..	..	10/8/87
27. Dalethorpe, Springfield ..	Ruck, T.	..	altered ..	1' 3"	..	..	S. 60° E. 1 in 3½	..	..	engine-plane	131	..	131	21,398	21,529	6	13	19	14 h.p. eng.	..	..	10/8/87
28. Brockfield (formerly Hartley), Whitecliffs	Ferguson, A. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10/8/87

* This number of men were only working up till the 18th April, 1887, since which from two to four men have been partial employed.

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 1887.			Approximate Total Output to 31st December, 1886.	Approximate Total Output to 31st December, 1887.	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.		
MAVERN—continued.																										
29. St. Helen's No. 2, White-cliffs	Bayles, John	3	brown	1	3' 6"	all	S. 52° E. 30° W.	narrow work	..	..	..	adit	Tons. 1,850	Tons. 50	Tons. 1,900	Tons. 170	Tons. 2,070	1	5	6	hand	..	..	..	natural	11/8/87
30. Suowdon, Rakaia Gorge	Gerard, W. (owner)	..	..	1	9' 3"	"	N. 80° W. 32°	"	..	..	..	"	50	..	50	90	140	..	1	1	"	..	..	..	"	26/7/86
31. Acheron, Lake Coleridge	Murchison, J. (owner)	20	anthracite	1	5' 3"	"	S. 45° W. 18°	"	..	..	..	"	25	..	25	130	155	..	1	1	"	..	..	..	"	26/7/86
32. Stobwood, Rockwood	Nimmo, J. S.	2	brown	1	6'	"	S. 35° E. 78°	"	1	3' x 1' [10"]	16'	"	243	..	243	100	343	..	2	2	"	..	..	..	"	11/8/87
33. Whitecliffs, Whitecliffs	Leeming, W.	7	"	1	7' 6"	"	S. 52° E. 30°	"	..	..	..	"	1,313	49	1,362	6,256	7,618	..	5	5	"	..	..	..	"	11/8/87
34. Mount Somers, Mount Somers	Jebson, D.	23	"	1	24'	8'	S. 60° E. 10°	"	..	..	..	"	1,380	..	1,380	4,161	5,541	..	4	4	"	..	..	..	"	16/8/87
35. Wharekuri, Wharekuri	Cairns, W. B.	21	"	1	25'	14'	S. 60° W. 60°	"	1	4' x 3'	80'	"	52	..	52	8,020	8,072	1	1	2	"	..	..	..	"	7/12/87
36. Kurow, Kurow	Muir, Robert	8	"	1	10'	10'	N. E. 63°	"	..	..	..	"	120	..	120	1,005	1,125	1	1	2	"	..	..	..	"	13/7/86
37. Prince Alfred No. 1, Papakaio	Willetts, John	18	"	1	8'	all	N. 50° E. 12°	bord and pillar	1	4' diam.	42'	"	1,410	..	1,410	24,329	25,739	2	5	7	"	..	..	..	"	18/8/87
38. Prince Alfred No. 2, Papakaio	Nimmo, John	11	"	1	9'	"	E. 10° S. 1 in 5	"	2	..	70'	"	1,071	..	1,071	8,226	9,297	2	2	4	horse	..	..	..	"	18/8/87
39. St. Andrews, Papakaio	Nimmo, James	9	"	1	6' 6"	"	E. 13°	"	2	4' diam. 4' x 3'	26'	"	837	..	837	6,984	7,821	1	2	3	"	..	..	..	furnace	18/8/87
40. Ngapara, Ngapara	Williams, W. H.	24	pitch	1	25'	7' to 8'	N. 5°	"	14	6' x 2'	36'	"	7,292	422	7,714	189,139	189,853	10	30	40	engine	24"	6"	170'	steam	4/7/87
41. Shag Point, Palmerston	McIntosh, A.	3	"	1	2' 5" and 2' 8"	all	E. 1 in 4	"	2	13' x 5' 6' x 4'	247'	shaft	56	..	56	..	56	2	2	4	horse	..	..	..	natural	..
42. Allandale, Palmerston	McKnight, James	23	lignite	1	6'	"	N.W. 1 in 12	open work	..	..	..	adit	163	..	163	370	533	1	1	2	"	..	..	..	"	16/3/87
43. Hill's Creek, Hill's Creek	McLean, L.	2	"	1	14'	"	S. 20° E.	"	..	..	..	"	565	..	565	642	1,207	1	1	2	"	..	..	..	"	24/11/87
44. McLean's, Rough Ridge	Grant, W.	1	"	1	..	..	S.W. 25°	"	..	..	..	"	94	..	94	..	94	2	2	4	"	..	..	..	"	24/11/87
45. Lockhart and Beck's, Rough Ridge	McLean, L.	17	"	1	23'	all	..	"	..	..	..	"	2,009	..	2,009	14,907	16,916	2	2	4	"	6"	9"	20'	"	24/11/87

47. Ida Valley, Ida Valley Creek	Tumbull, George Dunsmuir, A. . .	17	"	1	20'	12'	N.W. 10° N.E. 1 in 8	"	"	"	"	"	"	"	"	"	230	"	230	899	1,129	1	1	1	1	6"	2½"	15'	..	24/11/87	
48. Blackstone Hill, Hill's	Jones, J. R. Dungey, Caleb McCready, D. . .	21	"	1	13'	all	W. 10° S. 45° W. 40°	"	"	"	"	"	"	"	"	"	80	"	80	30	110	1	1	1	1	..	..	..	..	27/8/86	
49. Cambrian's, St. Bathian's	Jones, J. R. Dungey, Caleb McCready, D. . .	26	"	1	25'	12'	W. 10° S. 45° W. 40°	"	"	"	"	"	"	"	"	"	1,212	"	1,212	8,876	10,088	3	..	3	..	..	..	..	..	27/8/86	
50. Cambrian's, St. Bathian's	Jones, J. R. Dungey, Caleb McCready, D. . .	3	brown	1	16'	12'	S. 45° W. 40°	narrow	"	"	"	"	"	"	"	"	700	"	700	940	1,640	2	2	2	hand	..	..	..	..	27/8/86	
51. Kyeburn, Kyeburn	McCreedy, D. . .	14	brown	1	25'	12'	S. 45° W. 40°	"	1' 2' x 3'	"	10'	"	adit	"	"	"	350	200	550	12,783	13,333	..	2	2	..	..	..	..	natural	25/11/87	
52. Perseverance, Kyeburn	Archer, C. . .	9	lignite	1	18'	12'	S. 45° W. 40°	"	26' x 2' 3"	5' x 2' 6"	50'	"	"	"	"	"	400	50	450	4,116	4,566	..	2	2	2	..	..	..	..	25/11/87	
53. Commercial (late Archer's), Kyeburn	Thomson, W. . .	5	"	1	8'	5' 6"	S. 45° W. 70°	"	1' 3' x 2'	50'	"	"	"	"	"	"	15	5	20	680	700	..	1	1	1	..	..	..	..	25/11/87	
54. Alexandra, Alexandra South	Thomson, W. . .	8	brown	1	12'	6'	N. 20° E. 1 in 7½	board and pillar	25' 6" x 2' 9"	60'	60'	shaft	"	"	"	"	780	..	780	9,684	10,464	..	1	1	1	horse	..	..	..	natural	11/3/87
55. Macqueenville, Alexandra South	McLay, G. . .	..	"	1	6'	all	..	"	1' 4' x 3'	50'	"	"	"	"	"	"	846	..	846	3,623	4,463	..	3	3	3	..	*	*	..	"	11/3/87
56. Earnscleugh, Clyde	Buckley, John . .	11	"	1	14'	8'	S.W. 1 in 8	"	24' 10" x 3' 4" 10" x 3' 35"	52'	"	adit	"	"	"	"	266	133	399	3,271	3,670	1	2	3	hand	..	..	..	..	12/3/87	
57. Walkerikeri, Clyde (formerly Clyde)	Holt, William . .	6	"	1	2'	..	S. 1 in 1	stopping	23' 6" x 3' 160'	"	"	shaft	"	"	"	"	218	..	218	17,217	17,435	1	1	2	horse	..	..	..	..	12/3/87	
58. Dairy Creek, Clyde	Collins, T. M. . .	16	"	1	20'	10'	S.E., E. 6° S., very high	"	4' x 3' 6"	36'	"	adit	"	"	"	"	100	..	100	3,537	3,637	1	1	2	"	..	..	..	..	12/3/87	
59. Excelsior, Cromwell	Clarke & Burrows (owners)	6	"	1	12'	7'	N. 70° W. 1 in 4	"	24' x 3' 6"	36'	"	"	"	"	"	"	80	..	80	1,702	1,782	..	2	2	2	hand	..	..	..	water-fall	14/3/87
60. Bannockburn, Cromwell	Johnson, Robert..	16	"	1	12'	6'	N. 70° W. 1 in 4	board and pillar	..	"	"	engine plane adit	"	"	"	"	800	..	800	7,768	8,568	..	2	2	2	engine	3'	6"	50'	natural	14/3/87
61. Kawan, Cromwell	Pryde, J. . .	10	"	1	15'	all	W. 1 in 7	"	1' 6' x 2'	30'	"	"	"	"	"	"	889	..	889	6,576	7,465	..	2	2	2	horse	..	..	..	..	14/3/87
62. Gibston, Arrow	Macale and Cowan (owners)	20	pitch	1	4' 6"	"	N. 70° W. 22½°	narrow	..	"	"	"	"	"	"	"	1,000	..	1,000	11,170	12,170	2	2	4	hand	..	..	..	..	14/3/87	
63. Steele's, Arrow	Steele, C. . .	1	"	1	25'	"	S. 20° W. 40°	open	..	"	"	"	"	"	"	"	624	..	624	..	624	3	..	3	..	..	..	..	..	..	14/3/87
64. Robertson's, Roxburgh	Jones, J. . .	24	lignite	1	28'	20'	W. 1 in 7	"	..	"	"	"	"	"	"	"	..	..	..	9,486	9,486	..	..	..	..	..	..	..	..	..	11/3/87
65. Jones's, Roxburgh	..	17	"	1	25'	20'	E. 10° N. 1 in 10	"	..	"	"	"	"	"	"	"	1,000	..	1,000	2,271	3,271	4	..	4	..	..	..	..	..	..	11/3/87
66. Allandale, Green Island	..	6	brown	1	13'	"	E. 10° N. 1 in 10	room & ranee	..	"	"	adit	"	"	"	"	..	..	..	211	211	..	..	..	..	..	..	..	..	..	30/9/87
67. Fernhill, Green Island	Gray, James . .	10	"	1	19' 6"	7'	N. 10° E. 1 in 10	room & ranee	14' 9" x 3' 6"	40' x 50'	"	"	"	"	"	"	4,362	3,951	8,313	50,795	59,108	3	13	16	self-acting in- inclines	..	..	..	..	furnace	30/9/87
68. Green Island, Green Island	Richardson, D. . .	15	"	1	14'	10'	E. 10° N. 1 in 10	"	1' 12' x 4' 6"	130	"	"	"	"	"	"	3,866	2,044	5,910	93,967	99,877	1	6	7	horse	..	..	..	..	natural	19/12/87
69. Saddle Hill, Saddle Hill	Christie, D. L. . .	13	brown	1	19' 6"	11'	E. 1 in 10	room & ranee	24' 8" x 4' 4' x 4'	35' x 10'	"	shaft	"	"	"	"	2,805	..	2,805	57,858	60,663	2	4	6	horse	..	..	..	..	furnace	12/12/87
70. Saddle Hill No. 2, Saddle Hill	..	1	"	..	..	..	E. 1 in 10	"	..	"	"	adit	"	"	"	"	..	..	..	..	..	..	..	..	..	..	..	..	..	12/12/87	
71. Saddle Hill, Saddle Hill	McDougall, M. . .	4	"	1	19' 6"	6'	E. 1 in 10	"	15' x 2' 4"	35'	"	"	"	"	"	"	181	1,380	1,561	2,081	3,642	1	2	3	horse	..	..	..	..	natural	12/12/87
72. Glenochiel, East Taieri	Bryce . .	6½	"	1	20'	8'	varies	"	1' 8' x 4'	48'	"	"	"	"	"	"	178	40	218	2,428	2,646	1	1	2	..	..	..	..	..	..	14/12/87
73. Walton Park, Green Island	London, J., General Manager Lindsay, W., Mine Manager Freeman, J. . .	17	"	1	18'	7'	E. 1 in 9	"	3' 11' x 4' 12' 6" x 4' 6"	173'	"	shaft and adit	"	"	"	"	18,720	5,150	18,870	313,764	332,634	7	32	39	horses and engine	4' 6"	11"	175'	furnace	26/7/87	
74. Abbotsroyd, Green Island	Freeman, J. . .	6½	"	1	16'	7'	E 10° N. 1 in 10	"	5' x 4' 4' x 4'	25'	"	engine-plane	"	"	"	"	9,159	2,554	11,713	99,433	111,146	4	20	24	engine	2' 6"	6"	47'	"	19/12/87	
75. Mosgiel, Mosgiel	Sneddon, James..	3	"	1	15'	7'	S. 1 in 10	"	4' x 4' 45'	80'	"	engine-plane	"	"	"	"	1,940	2,761	4,704	1,550	6,254	2	7	9	hand	+	+	+	+	14/12/87	
66. Brighton, Brighton	Walker, James . .	1	"	1	8'	6'	"	"	1' 6' x 6'	32'	"	adit	"	"	"	"	219	45	264	..	264	1	1	2	..	..	..	..	..	28/7/87	

† Syphon.

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 Working.	Number of Shafts.	Dimensions of Shafts.		Output delivered by	Output for 1887.			Approximate Total Output to 31st December, 1886.	Approximate Total Output to 31st December, 1887.	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.		
ORAGO—continued.																										
77. Bruce, Milton ..	Hardwick, N. ..	13½	pitch	1	12' 6"	6'	varies	bord and pillar	1	4' x 3'	29'	adit	Tons. 1,256	Tons. 105	Tons. 1,361	Tons. 13,228	Tons. 14,589	1	4	5	hand	..	..	..	natural	19/4/87
78. Real Mackay, Milton ..	Young, A. ..	19½	"	1	25'	8'	N.E. to E. 1 in 8	"	1	4' 6" x 3'	34'	"	627	..	627	13,654	13,281	..	2	2	horse	..	..	..	"	19/4/87
79. Fortification, Milton ..	Reid, T. ..	4	"	1	12'	6' to 7'	S. 60° E. 5°	"	..	..	..	"	420	..	420	1,184	1,604	..	2	2	hand	..	..	..	"	19/4/87
80. Cannon's, Lovell's Flat ..	Cannon, T. ..	17	lignite	1	25'	20'	..	open work	..	..	..	"	550	..	550	3,590	4,140	1	..	1	..	..	..	..	"	19/5/86
81. Paskell's, Adams Flat ..	Paskell, J. T. ..	23	"	1	8'	all	N.E. 1 in 6	"	..	..	..	"	18	1	19	270	289	1	..	1	..	..	..	..	"	19/5/86
82. Adams Flat, Adams Flat ..	Reid, J. ..	..	"	1	8'	..	S. 45° E.	"	..	..	..	"	226	..	226	306	532	2	..	2	..	..	..	..	"	19/5/86
83. Benhar, Benhar ..	Nelson, J. ..	23	brown	1	40'	10'	S. 17°	"	..	4' x 4'	48'	engine-plane adit	3,300	900	4,200	47,403	51,603	1	6	7	engine	*	*	..	urnace	21/9/87
84. Morrison's, Benhar ..	Morrison, James ..	1	brown	1	6'	6'	E. 12°	bord and pillar	..	..	..	"	49	2	51	..	51	..	1	1	hand	..	..	..	natural	21/9/87
85. Rigfoot, Benhar ..	Aitken, J. ..	1	"	1	8'	8'	S. 12°	"	..	11' 9" x 4' 6"	392'	"	312	..	312	..	312	1	1	2	" (engine tanks	..	..	..	"	21/9/87
86. Kaitangata No. 1, Kaitangata ..	Watson, W. P. ..	12	pitch	1	30'	25°	W. 45°	"	1	..	..	"	..	..	..	..	..	..	..	..	..	..	..	..	furnace	21/11/87
87. Kaitangata No. 2, Kaitangata ..	Shore, W. M., Gen. Manager ..	4	"	110' to 34'	25'	25'	W. 1 in 4	"	1	6' diam.	210' x 10'	engine-plane adit	36,535	16,355	52,890	340,678	393,568	13	83	96	"	2'	5'	250'	"	21/11/87
88. Castle Hill, Kaitangata ..	Carson, M. ..	½	"	1	12'	8'	..	"	1	3' 9" x 2' 6"	54' x 4'	adit	39	5	44	..	44	1	3	4	hand	..	..	..	natural	..
89. Wangaloa, Wangaloa ..	Smith, J. ..	7	"	1	10' 6"	6'	E. 1 in 6	"	..	..	..	"	30	10	40	750	790	..	1	1	"	..	..	..	"	5/10/87
90. Lesmahagow, Wangaloa ..	Sewell, R. M. ..	6	"	1	5'	all	N. slight	"	..	..	..	"	84	..	84	642	726	..	1	1	"	..	..	..	"	5/10/87
91. Bonnie View, Wangaloa ..	Allen, T. ..	½	"	1	3'	"	S. 60° E.	"	..	..	..	"	30	..	30	..	30	..	1	1	"	..	..	..	"	5/10/87
92. Crothead, Kaitangata ..	Mackie, E. ..	1	"	1	14'	8'	10°	bord and pillar	..	..	..	"	200	..	200	..	200	2	3	5	"	..	..	..	"	5/10/87
93. Huilhead, Kaitangata ..	Darby, James ..	½	"	1	3' 3"	all	10°	"	1	..	..	"	20	..	20	..	20	..	1	1	"	..	..	..	"	5/10/87
94. Wyndham, Wyndham ..	Genge, T. ..	10	lignite	1	4'	"	15°	open work	..	..	..	"	420	..	420	1,358	1,778	1	..	1	..	..	..	..	"	14/5/86
95. Parratt's, Wyndham ..	Parratt, Thomas ..	2	"	1	4'	"	..	"	..	..	..	"	100	..	100	70	170	1	..	1	..	..	..	..	"	25/4/87
96. Menzie's Ferry, Wyndham ..	Morris, J. ..	7	"	1	3' 7"	"	level	"	..	..	..	"	439	..	439	2,025	2,464	1	..	1	..	..	..	..	"	25/4/87
97. Smyth's, Gore ..	Smyth, William ..	..	"	1	10'	10'	W. 5°	"	..	..	..	"	50	..	50	..	50	1	..	1	..	..	..	..	"	20/4/87
98. Lize's, Gore ..	Lize, M. ..	..	"	1	8'	all	N. 10°	"	..	..	..	"	215	9	224	600	824	1	..	1	..	..	..	..	"	21/4/87
99. McKinnon's, Gore ..	McKinnon, A. ..	6	lignite	1	6'	6'	level	open work	..	..	..	"	195	..	195	762	957	1	..	1	..	..	..	..	"	21/4/87

[illegible]

Output from mines included in former statements, and whose operations were suspended prior to 1886
Output from mines included in statement for 1886, but whose operations have since been suspended.

Output from mines included in former statements, and whose operations were suspended prior to 1886
Output from mines included in statement for 1886, but whose operations have since been suspended.

Total output to 31st December, 1887

* Steam jet.
† Including 7,703 tons omitted from last year's statement.

[*Approximate Cost of Paper*.—Preparation, nil; printing (1,975 copies), £24 12s. 6d.]

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