

1900.

NEW ZEALAND.

INSPECTION OF COAL-MINES REPORT.

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

No. 1.

Mr. J. HAYES, F.S.Sc., Inspecting Engineer, to the UNDER-SECRETARY, Mines Department.
 SIR,— Mines Department, Wellington, 11th April, 1900.
 I have the honour to submit the following report on coal-mining operations for the year ending 31st December, 1899.
 The output for the several inspection districts was as under:—

—	Northern District.	West Coast District.	Southern District.	Total.
	Tons.	Tons.	Tons.	Tons.
Bituminous and semi-bituminous coal ...	66,274	521,762	...	588,036
Pitch-coal	...	...	37,835	37,835
Brown coal... ..	74,854	...	239,688	314,542
Lignite	...	185	34,636	34,821
Totals	141,128	521,947	312,159	975,234

The gross output shows an increase of 68,201 tons over that of the preceding year.
 Operations are carried on at 160 mines, the total number of persons employed being returned at 2,153. This gives an average output of 452.9 tons per person employed. The number of fatal accidents was three, or at the rate of one fatality for every 325,078 tons produced.
 The output of the northern district is 7,262 tons less than last year, whilst the west coast and southern districts show an increase of 75,463 tons.
 Under date of 28th March I made the attached report on those coal-mines in the southern district which were visited by me during the year prior to my appointment as Inspecting Engineer to the department. My successor as Inspector of Mines at Dunedin is Mr. Edwin R. Green, who for some ten years previously was manager to the Freeman's Coal Company, Abbotsford.

REPORT OF INSPECTION OF COAL-MINES, SOUTHERN DISTRICT. Canterbury.

Springfield Colliery.—(31/7/99): Only five men are now employed in the mine getting coal and fireclay. The coal is principally used for pottery-works, there being a very limited demand apart from the company's own requirements. The coal is thin and stony. Ventilation is good, and the workings generally well looked after. Report-books, &c., satisfactorily kept.
Canterbury Colliery, Sheffield (Austin Brothers).—(1/8/99): All coal is now being brought out by the new low-level adit. The coal to the rise being almost all exhausted, it will soon be necessary to open out in a systematical manner to the dip. The seam yields 3 ft. 10 in. of clear coal, which is in two divisions, with a thick band of clay between. The air is very good throughout, and care is exercised to insure safety. Report-book properly kept, and the survey brought up to date. Mr. W. B. Austin, who obtained a second-class certificate at last examination, has succeeded his father as the responsible manager.
Homebush Colliery, Glentunnel (T. Brown, manager).—(3/8/99): Work here consists in bringing back the pillars in a panel of coal near the far end of the level, nine hewers being engaged. Winter trade has been very brisk, and demand in excess of output. Ventilation is excellent, and the general condition of the mine good. Every care is taken to maintain safety. It will be necessary in the near future to consider the question of working to the dip if the demand for winter supply is to be met, and if this matter is gone about in the right way the facilities of output will be very materially increased, and allow of the trade being pushed.

Levick's Coal-mine, Whitecliffs.—(4/8/99): The workings are entered by three adit-tunnels, and the pillars are now being worked back. Mr. Levick is a careful man, and spares neither expense nor trouble to keep things safe. Requirements of the Act are well complied with.

At Brockley a little more prospecting has been done, but, with the exception of a few odd loads of coal, the output is yet practically nil.

The Wairiri Mine has been closed.

Leeming's Hartley Mine, near Whitecliffs, has been taken up by a Christchurch company (the Hartley Colliery Syndicate), and when I was in the locality a new dip-tunnel was being driven.

At Mount Somers Coal-mine Mr. Park continues to work his large seam of coal opencast.

Mr. W. Young has disposed of his lease of the Albury Coal-mine to Mr. Willetts, who is now working the pit.

North Otago.

St. Andrew's Coal-mine, Papakaio (T. Nimmo).—(27/9/99): This mine is kept in excellent order, and every care appears to be taken to insure safety, and to work the coal with a minimum amount of loss. Act generally well complied with.

Prince Alfred Coal-mine, Papakaio (J. Willetts).—(27/9/99): All coal is now being got at the new opening referred to in my last report. The coal is very patchy, and this causes the style of work to be very irregular, and often necessitates fairly close timbering. Air very good, and plan up to date.

Ngapara Lignite-mine, Ngapara (W. Nimmo).—(8/11/99): Found all workings, ventilation, &c., in very satisfactory condition.

Shag Point Colliery, Shag Point (T. Shore, manager).—(20/4/99): The cross-measures level tunnel which was driven from the shaft from below No. 5 seam has been continued to the dip (seaward), and struck the No. 1 seam, which was formerly worked from the shaft at a higher level. This seam, so far as proved at the low level, averages 5 ft. 6 in. thick, but a few feet above it there is another seam about 4 ft. thick, with a band of stone in it. I think it very possible that what appears here in two seams is really the No. 1 seam divided. This part of the mine is submarine. The amount of cover where the seam is cut will be upwards of 320 ft. As the old workings in the same seam contain water, I arranged with the management for a barrier pillar of 2½ chains to be left between the new workings from this tunnel and the old workings, for the protection of the former. The code of signals for use in the shaft not being posted up in their proper places, and the flanges of the winding-drum being, in my opinion, somewhat deficient, I wrote the manager thereon on the 22nd April, 1899. I understand the requirements were complied with. (28/9/99): No. 1 seam (at end of long tunnel) continues very variable in thickness and quality. From present appearances it looks as though the area available may be limited in extent. No. 5 seam is practically exhausted on the south-east side of shaft, but to the north-west the strata separating it from a small overlying seam has thinned out, so that the two appear as one good seam, with No. 4 seam for a roof in places, the strata below No. 4 seam having also thinned out. This latter seam, although of fair thickness, is too stony to be of commercial value. Plans are kept up to date, and the mine well looked after.

Allandale Colliery, Shag Point (A. Gillanders, manager).—(19/4/99): Continued work in the seam proves that the coal is still variable in thickness, the minimum, so far as yet seen, being 3 ft. 6 in., and the maximum thickness 8 ft. Taken as a whole, the roof is rather bad, and the coalfield disturbed by numerous small faults. In the new mine the solid workings are approaching the old mine-workings, where the coal is still standing in pillars. The ventilation is very fair. The attention of the manager was drawn to some minor matters in connection with the working of the mine verbally, and also by letter under date of the 22nd April, 1899. A fatal accident occurred at this mine on the 13th April, 1899, the particulars of which will appear under the head of "Accidents." (26/9/99): There is now a considerable area of ground opened out, and the work of extracting the pillars near the rise of the field has commenced. A cross-measures tunnel, driven from the bottom level, has cut an underlying seam 4 ft. 6 in. thick, so far as proved. This seam is from 30 ft. to 40 ft. (vertical) below that hitherto worked, and as yet very little has been done in it. Ventilation very fair on the whole, although near the old workings the air was slightly charged with black-damp. This was perhaps all the more noticeable on this date in consequence of the ordinary work of the pit being suspended for the day owing to falling-off of demand, and advantage being taken of this to effect needed overhauls to the pumping plant. The steam was necessarily cut off, and as the ventilating-power is largely augmented by the heat from steam-pipes the decreased ventilation for the time being is easily understood. Mr. Gillanders subsequently informed me that he had improved the ventilation generally throughout the mine.

South Otago.

Walton Park Colliery (J. Kenyon, manager).—(5/1/99 and 27/1/99): On these dates I visited the colliery for the purpose of making a survey of the workings in relation to the ground agreed to be left for the protection of the Walton Park Branch Railway. Ventilation and general requirements appear well attended to. (23/6/99): Inspected the whole of the workings, which are now at some distance from the railway reserve. Owing to underground fires on the south side (to which—under the conditions of work—this mine is peculiarly liable) the pillars are now being worked out on the north side. Many of the old places were originally driven in the upper part of the seam, from 4 ft. to 7 ft. being left underfoot. Falls of roof have in many places covered what is perhaps the best portion of the seam, and the removal of this *débris* is somewhat expensive. It is quite safe to state that had this colliery been opened out in a proper systematic manner in the first instance, and continued to be worked under similar conditions, it would have been the model colliery of Otago, and could have been worked at a steady profit. The hand-to-mouth system upon which the colliery was opened has been responsible for the irrecoverable loss of scores of thousands of tons of coal.

Jubilee Colliery, Fairfield (Louden and Howarth).—(23/6/99): The workings are now in fairly hard coal, and the partings referred to in my last report now appear run out. The seam has a gross thickness of 17 ft., about 8 ft. being worked at present. The area opened out is not yet large. Fourteen men are employed. Ventilation is very good. Report satisfactory, and plan kept.

Kaitangata Colliery (W. M. Shore, manager).—(9/1/99 and 10/1/99): In my last report I mentioned the advisability of providing more powerful ventilation for this colliery. As this and the Castle Hill collieries have recently been taken over by the New Zealand Collieries, Railway, and Oil Syndicate (Limited), it has been considered advisable to connect these two mines, and on these dates I visited the property to consult with Mr. Shore, and to render him what assistance I could in furthering the matter. I also visited the mine on the 25th January, and inspected the leading workings to the rise. Everything was very satisfactory. (11/8/99): The pillar-workings on the south side are now finished. To the extreme rise (east) No. 5 fault has been recently cut. This has a downthrow to the east. The largest amount of work now going on is in the main seam in the districts between Nos. 3 and 4 faults and Nos. 4 and 5 faults. In the 18 ft. seam a new dip has been started from the long tunnel, and now connects the workings from the shaft section in the same seam, thus establishing a very good ventilation for this district. A new dip is also about to be started in the same seam near the far end of the long tunnel, where the seam is met with east of No. 3 fault. I found all the leading headings well bratticed up and quite clear of gas. The workings in the shaft section are also well ventilated. A start has been made to connect the workings with those of Castle Hill Colliery.

Central Otago.

Jones's Coal-pit, Coal Creek, Roxburgh.—(18/1/99): This mine is now worked by Mr. R. Coskery, who has commenced stripping ground in advance of the working-face. This is what I have repeatedly urged, and there is more ground now stripped than I have ever seen before at this pit.

Mrs. McPherson's Pit, Coal Creek, Roxburgh.—(18/1/99): The workings here are opencast as usual, and the ground is kept stripped well back from the working-face. To drain the lower portion of the seam a 3 in. siphon has been adopted, and works well. This has displaced a very crude arrangement of pumping by steam-power, which was not satisfactory.

Craig's Perseverance Pit, Coal Creek, Roxburgh.—(18/1/99): The underground workings are on fire, and have been sealed off. The coal now being got is worked opencast, and an ample amount of ground stripped off in advance.

Black Diamond Coal-pit, Shingle Creek.—(18/1/99): At this visit the mine was not at work, and there was no one about. A sump appears to have been made since my previous visit, and the mine is kept drained by a pump worked by an overshot water-wheel. Tunnel is well timbered and in good order.

Lett's McQueenville Coal-mine, Alexandra South.—(8/5/99): All the working-places were inspected, and the mine found generally in good order and well ventilated. In the north-east level some old workings of McQueen and Co., of which I have no record, have been met with. Mr. Lett has recently sunk a third shaft in the property, about 100 yards to the dip of his new shaft and present working-level. Reports and plans up to date.

Pratt's Coal-mine, Clyde.—(16/1/99): Mr. Pratt has taken over the lease held by T. C. Marie, and is sinking a new shaft. No work is being at present done in the old dip. On my return to Dunedin I wrote Mr. Pratt as to posting rules, keeping daily report, and complying with the Act generally. I again visited the mine on the 1st March, and made a survey of what work had been done at the shaft. The ladder-way in this shaft has been fixed vertically. Notice was given to alter this so as to comply with the Act. The old dip-tunnel workings have totally collapsed. This is not to be wondered at considering the way in which the mine has been worked in the past.

Vincent Coal-pit, Clyde.—(16/1/99): This is a new mine under the charge of Mr. William Kitto, to whom a permit has been issued. It is situated between Holt's old pit and that held by C. T. Marie. The seam has a dip of 1 in 2 to the north, but its thickness is not yet fully proved. An upcast shaft, 5 ft. by 3 ft., timbered throughout, has been sunk, but at this date was not connected with the workings. (1/3/99): Surveyed the mine on this date. The workings are now connected with the air-shaft. Ventilation is very good, and Mr. Kitto seems to take all reasonable care for the safe-working of the mine.

Cromwell Coal-pit, Cromwell.—(3/3/99): After standing idle for a considerable length of time this pit has been recently leased by Mr. James Pollock, who has put down a duplex steam-pump. This has enabled him to get to work, but the pump (which is a very small one) is of insufficient capacity, and I fear he may yet be overcome by water unless a larger pump is provided. The seam crops out into the bed of the Kawarau River, the shaft being at no great distance from the river-bank. I made a survey of the mine, and to protect the workings from being inundated by the river water, decided it was necessary to leave a barrier of coal $1\frac{1}{2}$ chains in width to the dip side of the river-bank. The mine is on Crown lands. When Mr. Pollock had dewatered the mine he found some old roadways fallen in, and has been at considerable expense in fixing matters up. Ventilation very fair. On visiting the locality in November I found the pit idle: pump too small for its work: nothing done to replace it with a larger one.

Kawarau Coal-pit, Bannockburn (J. Pryde).—(6/3/99): This pit is standing at present, and is full of water. In my last report particulars were given as to how the water had been allowed to accumulate, and, although a steam-boiler and hauling-engine have been erected since my previous visit, no determined effort appears to have been made to unwater the mine. Not being able to make anything of Mr. Pryde, the solicitor for the mortgagees was subsequently interviewed, the result being that the mortgagees practically took the working of the mine into their own hands,

and placed Mr. J. C. Campbell as certificated manager in charge. Under Mr. Campbell's management the mine has been unwatered (a duplex steam-pump being used for the purpose) and work resumed.

Excelsior Coal-mine, Bannockburn (Parcell and Gibson).—(4/3/99): Like many other small coal-mines on Crown lands, this mine has been worked without a plan being kept. I therefore made a survey of the underground workings and surface boundaries. Very good ventilation is maintained, and the workings are generally in good order.

Southland.

McKinnon's Pit, Gore (Whiterigg Mine).—(6/9/99): This is now let to and worked by Mr. H. Gray. All the workings are underground, and as no plan had been kept I made a survey of the mine. The lignite is 12 ft. to 15 ft. thick, about 4 ft. being left for support to roof. Ventilation very good. As Mr. Gray is an experienced coal-miner, it is expected the pit will be more systematically worked in the future than it has been in the past.

Heffernan's Pit, Gore.—(6/9/99): Very little has been done here for some time. There is a thick seam of lignite, which has been worked opencast.

Sarginson's Pit, Waikaka Valley, Gore.—(5/9/99): Very little appears to have been done since my last visit. The pit is on private land, and is worked opencast.

Green's Pit, West Gore.—(2/9/99): This pit is now worked by Mr. J. Smyth, who has closed his own mine adjoining. The requirements of the Act are fairly well attended to, and ventilation good. Plan up to date. I am of opinion that a good area of lignite exists here, and, in view of the requirements of the dredging industry (which is sure to develop in the locality), consider that steps should be taken at once to open out the mine on a much larger scale.

Irvine's Pit, Knapdale, Chatton.—(6/9/99): The seam lies at an angle of, say, 50°, and dips north-east. Thickness, 22 ft. One level is being driven about 20 ft. high, with lignite above and below. As there are some three outlets to the surface, ventilation is very good.

Johnston's Pit, Waikaka Valley.—(5/9/99): This pit has been practically idle for some time. At this date I noticed preparations were being made for stripping the surface off the lignite. In view of the number of dredges proposed to be built in the immediate locality, the pit will be very convenient as a source of fuel-supply.

Harvey's (late Pemble's) Pit, Chatton.—(6/9/99): Seam vertical, 30 ft. to 40 ft. wide, and broken at face into two divisions by a wedge-shaped bar of clay. The face is approaching the county road, and at the present working-level it is estimated that the pit will be worked out in two or three years. The limited demand and low selling-price will not admit of working at a lower level with the expense of pumping, &c., added to ordinary costs. Present face is kept well stripped.

Perkins's Pit, Chatton.—(6/9/99): This pit is very near Pacey's, and has only been commenced a short time. At present the face shows only 3 ft. of good lignite, with about 4 ft. of very inferior stuff above it. This is overlaid by 3 ft. to 6 ft. of clay. Very little work is being done, and only one man is employed.

Pacey's Pit, Chatton.—(6/9/99): Opencast working. At my previous visit the pit was being worked by Mr. A. Perkins, who kept a fair amount of ground stripped off. Mr. Pacey has again resumed the working, and at this date there is no advance stripping done. The seam has a dip of about 1 in 5. Hitherto some 15 ft. of lignite has been worked. Mr. Pacey states that a borehole proved a thickness of 30 ft. without bottoming. He promised to strip an area during the slack season, and also proposes to work the coal now underfoot.

McGill's Pit, Wendon Valley, Waikaka.—(5/9/99): Opencast working. Seam about 14 ft. thick at face. Stripping variable, maximum thickness exposed, say, 10 ft. Very little stripped in advance of lignite-face. Owner proposes to strip a good area during the slack season.

McDonald's Pit, Wendon Valley, Waikaka.—(5/9/99): Little or nothing has been done for some time, and the place is in a very rough state. A man named Henderson last worked it (opencast). He has left the place, and letters addressed to him have been returned through the Dead Letter Office.

Evans's Pit, Wendon (O. H. Evans).—(5/9/99): Hitherto this pit has been worked opencast. The stripping is too thick and hard to break down to allow of opencast working with profit. A start has been made to work by underground mining, but the entrance was not secured at my visit. Mr. Evans promised to attend to this, and to comply with the requirements of the Act as to the required distance between inlet and outlet.

Pyramids Coal-pit, Mandeville.—(7/9/99): Pit not working at present. Mr. Macalister, the owner, thinks of opening at a lower level. As no plan of working existed, I made a survey of the mine.

Sleeman's Waimumu Mine, Mataura (C. P. Sleeman).—(4/9/99): Mr. Sleeman is working his new pit exclusively, and has laid himself out to meet all reasonable demands. The lignite is 16 ft. thick, overlaid by 12 ft. of gravels and 4 ft. of clay and soil. This is stripped off, the face of the stripping being some 5 to 6 yards in advance of the lignite-face. This is as it should be, and agrees with what I have constantly urged on the various owners of lignite-pits worked opencast—viz., that the face of stripping should always be kept "foot for foot" ahead of the lignite-face—i.e., if stripping is 10 ft. thick, the top of the lignite should be kept bared for the same distance, and so on in similar proportions. If owners of opencast pits would only adopt this plan the risk of accident would be materially reduced.

Bogside Coal-pit, Mataura (H. Brown).—(4/9/99): Opencast working; not much ground stripped. Mr. Brown works the pit himself, employing casual labour as required.

Beattie and Coster's Pit, Mataura.—(4/9/99): The face shows about 16 ft. of lignite, overlaid by 12 ft. of stripping, most of the latter being gravel, which is auriferous, and would, I think, pay

to sluice off. The portable engine and centrifugal pump now on the ground, and used for draining the pit, might be utilised in conjunction with this suggestion. Very good prospects can be got right on the top of the lignite, and the gold is of very good quality.

Nightcaps Colliery, Nightcaps.—(18/8/99): The dip-workings under Owen's land are now nearly exhausted. Probably the end of the year will see the completion of this section of work. In the level-tunnel workings the places have been continued in the solid coal. Near the outcrop some ground is kept stripped so that the demands of the busy season can be met. As each acre so stripped will yield an average of, say, 35,000 tons of marketable coal, and it is possible to work a few acres in this manner, the value of such a stand-by is apparent. There appears to be every reasonable care exercised to insure safety, and the Act is generally well complied with.

Morley Pit, Nightcaps.—(18/8/99): This pit is still worked opencast, the coal being at present taken by arrangement of the Wallace County Council from a county road adjoining the owner's property. Its face shows about 8 ft. of coal, overlaid by 3 ft. to 4 ft. of surface material. An ample area is kept stripped in advance.

H.B. Mine, Nightcaps.—(18/8/99): This mine was recently opened by Beadle and Lamont, and sold to S. Lee, late of Shag Point, who is now working it. The seam is about 6 ft. 6 in. thick, and very much disjointed by clayey veins. I cautioned the owner as to the care required in properly securing the roof and sides, and also required him to make a better job of the timbering at the entrance to the mine.

Orepuki Mine (M. Straw, manager).—(15/8/99): This property, which has been idle for some years, was taken over a short time ago by the New Zealand Collieries, Railway, and Oil Syndicate (Limited). A considerable amount of boring and prospecting has been done to ascertain the area and thickness of the oil-bearing shale. From information thus obtained it would almost appear that the coal- and shale-bearing area forms a basin. A new tunnel, 10 ft. wide at the bottom, 9 ft. wide at top, and 6 ft. 6 in. high, has been driven for a considerable distance, with a dip averaging 1 in 5. It has been very stoutly timbered and amply provided with manholes. Until the second outlet is made, ventilation is secured by the tunnel being divided by a stout wood bratticed partition, the heat from the steam- and exhaust-pipes of a small pump assisting to promote a good circulation of air. A level has recently been started from the tunnel, which has cut the seam of shale, 4 ft. in thickness. A seam of coal underlies the shale, but it is questionable if its quality will admit of its being of more than local importance. It is proposed to adopt a fan for the permanent ventilation of the mine. A large and expensive plant is now being erected for the purpose of extracting burning- and lubricating-oils and paraffin-wax from the shale, of which I hope to give further particulars when the work is completed.

Accidents.

An accident occurred at Allandale Colliery, near Shag Point, on the 13th April, 1899, by which a young man named John William Macintosh lost his life. Deceased was assisting in the repairs of the main jig-brow, and was in the act of taking a loaded tub down in the incline, when the coupling in connection with the haulage-rope gave way. Deceased was close to the foot of the incline, and holding on to the tub from behind when this occurred; and it was stated at the inquest that, owing to the rails being partly covered by *débris* consequent on the repairs in progress, deceased had to push the tub, and that a jerky push caused the hook to become detached. This allowed the tub to run, deceased meanwhile holding on to it, and on reaching the bottom it cap-sized, hurling deceased forward, and causing injuries to his head, from which he died some two or three hours afterwards. The Coroner's jury returned a verdict of "Accidental death."

Peter McAllister sustained fracture of collar-bone at Gibbston Saddle Coal-pit on the 1st May. This pit is worked opencast, and the accident was caused by a fall of stuff.

George Davis, a miner working at Freeman's Coal Company's colliery, Abbotsford, lost his right eye by accidentally getting his pick-point into it. Davis was working in the face at the time, and could give no explanation as to how the accident occurred.

Samuel Newburn, an employé at Kaitangata Colliery, had his ankle broken while at work on the 27th June.

Other accidents reported have not been of a really serious character, and, taken as a whole, coal-mining in the southern district has been carried on, at the principal mines especially, with due regard to the safety of the persons employed.

General.

In most of the coal-mines worked opencast, operations are conducted by men who are not coal-miners in the proper sense of the term. I find in many instances a strong disinclination to take off (or strip) a reasonable amount of overlying ground, and it is owing to the neglect of this simple means that the majority of accidents occur in opencast workings. The necessity of such work has been steadily urged, and if those pit-owners who are so negligent in this matter would only visit one or two places where stripping is systematically done they could hardly fail to realise the advantages. As no provision is made in the general or special rules for work of this kind, it will be necessary for Inspectors to take action in the manner set forth in section 49 of "The Coal-mines Act, 1891," in cases where owners continue to neglect to keep ground stripped in advance.

Owing to a considerable amount of my time having been taken up in connection with special work in other parts of the colony, I have not been able to visit several of the small mines during the portion of the year prior to my appointment as Inspecting Engineer to the Mines Department. It is at these small mines where the most trouble is experienced; men working on a small scale, and often employing little or no labour outside their own families, are, as a rule, very indifferent as to the legislative requirements in connection with the industry. Nothing short of a few prosecutions will apparently rouse them to a sense of their responsibility.

Owing to the rapid expansion of the gold-dredging industry, there have been numerous applications for coal licenses and leases throughout Central Otago. Considerable care will have to be exercised in dealing with these, as, if licenses and leases are granted indiscriminately to parties without the necessary knowledge and capital to open out and satisfactorily work the mines, and more mines are opened than the reasonable demand for fuel will justify, a repetition of past history will be experienced. Getting coal anyhow, and selling it at prices which preclude the possibility of doing more than paying bare wages, without a margin for development-work and contingencies, will not do in the future. This style of thing has been responsible for the loss of a large amount of coal and lignite in the past, and, if allowed to be perpetuated, the question of future supply in parts of Central Otago will become very serious indeed. In order to show how small slack-coal may be utilised to advantage, I have written a short paper on "Briquette-manufacture," which will be found as an appendix to this report.

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

No. 2.

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

Office of Inspector of Mines (Southern District), Dunedin,

SIR,—

26th February, 1900.

In accordance with the requirements of section 67 of "The Coal-mines Act, 1891," I have the honour to submit the following report on the mines visited by me as from the 1st November to the 31st December, 1899, inclusive :—

SOUTH OTAGO.

Fernhill Coal Company, Abbotsford (James Gray, manager).—(13/11/99) : Workings generally in good order. Coal principally obtained from pillars and roof, which are now fairly well robbed. Prospecting-drive 4 chains in faulted coaly strata to the north. Should this drive strike the coal-seam, which is lost in this direction, the life of this colliery will be renewed. Air travelling very slowly, and the quantity is too small for such an extent of open workings as there are in this mine. Upcast air-shaft in the gully requires some means of egress for second outlet. I drew Mr. Gray's attention to this, also to the necessity for controlling the water, which falls continuously down the shaft in a heavy spray, and guiding it down one of the corners of the shaft in such a manner as not to interfere with the air-current. No general rules posted in mine. Report-book kept, but not entered up to date. I wrote Mr. Gray on these points, but did not receive an answer. (19/12/99) : I again visited this mine, and found that Mr. Gray had not done anything towards providing means of egress, or to control the water in the upcast air-shaft ; but he promised to do so forthwith, and subsequently informed me that he had done so.

Abbotsford Colliery, Abbotsford (Freeman's Coal Company ; Robert Hill, manager).—(20/12/99) : Pillars being taken out in the district opened during the past three years. Weight and side-pressure on main level near where pillars are being drawn breaking timber, and roof low in consequence, but safe. Timber being renewed daily where necessary. Advised Mr. Hill to make a deviation by cutting a new drawing-road in the pillar above the level, and thus save a large expense in renewals. Drew manager's attention to the necessity for providing outlets for men extracting pillars. Air dull at working-faces ; this will be remedied by a put-through on to the upper level, which is almost completed. Travelled return airway, and found same in good order. Rules posted. Plan and report-books to date. Act generally well observed.

Walton Park Colliery, Walton Park (J. Kenyon, manager).—(19/12/99) : Discontinued pumping owing to the boiler being ruined by the use of pit-water. The corrosive action of the water (which is all that is available) on the inside of the boiler has eaten away the rivet-heads to such an extent that the boiler had to be thrown out of use pending repairs. The water in the mine is rising slowly, and is not interfering with the working of the mine. Pillars, head-coal, and bottoms are being carefully taken out. The shaft recently sunk for pumping and air is now cut off, water having risen over the door-heads. Two other air-shafts—one having a ladder-way, the other the large bricked shaft with furnace—are available, and have the air conducted to them by substantial brattice. Examined the ladder-shaft and the travelling-ways thereto, and found them in good order. Mr. Kenyon is keeping the air off the further shaft in the meantime, so that risk of fire in the old works may be minimised as much as possible. Air travelling freely, and not so stale as might have been expected in workings so surrounded by old works, some of which fire up on being opened to the air. The following is an analysis by Mr. Skey, Government Analyst, Wellington, of Walton Park boiler-scale :—

Sulphate of lime	...	...	...	...	...	...	80.55
Carbonate of lime	...	...	...	...	...	...	Traces
Carbonate of magnesia	...	...	...	...	...	...	0.96
Iron-oxides with alumina traces	...	...	...	...	...	...	10.29
Siliceous matter	...	...	...	...	...	...	3.01
Soluble salts, principally alkaline sulphates	...	...	...	...	...	...	4.78
Water	...	...	...	...	...	...	0.41

100.00

Jubilee Colliery, Saddle Hill (James Loudon, manager).—(19/12/99) : Mine generally in good order. Coal strong, and very little timber required. Pillars in a few places not more than 6 ft.

thick, while bords on either side are over 12 ft. wide. Drew Mr. Louden's attention to this. New heading being driven, the bords off which are to be set out to a bearing which will prevent mistakes being made. Air not so good at faces as it might be if better directed, the best of the air being allowed to escape to the upcast without passing round the working-places. A new air-shaft further up the gully and near the working-faces is required, the present shaft, which was sunk when the mine was first opened, being quite near the mine-mouth. Requested Mr. Louden to fill up a trial shaft in the gully, which was standing full of water and unfenced. Plant and appliances in excellent order. Rules posted. Report-books well kept.

Saddle Hill Coal-mine No. 1, Saddle Hill (Christie Brothers; James Christie, manager).—(18/12/99): Entered the mine by the engine-plane, travelled throughout the workings, and out by the travelling-way. All in good order, working-places standing splendidly, and there is scarcely a prop in the mine. Workings extended to south of dip. Headings and levels well opened up to bearings, and driven to lines, which keeps the pillars square. Air excellent, and plenty of it. Rules posted. Plan to date.

Saddle Hill Coal-mine No. 2, Saddle Hill (Christie Brothers).—(18/12/99): This is a new mine on the northern outcrop of Messrs. Christie's field. A pair of levels are in 4 chains, and they are to be extended to the southern boundary of the property, which will enable Messrs. Christie to command the whole of their coal to the rise. Drainage free, and haulage self-acting. The mine is very creditably opened out; timber at the mouth specially selected and well put in. Drives in coal are not too wide or high, and are standing like rock. Coal from this mine is carried over the Jubilee Mine tramway to the railway-trucks. Air good. Rules posted.

Burnwell Colliery, Saddle Hill (Adam Harris).—(18/12/99): Workings all in good order. New drive being put in to cut the seam to the dip. This will enable Mr. Harris to work all his coal to the rise, and, as the new dip is to be driven to the boundary, a complete grip of the field will be obtained. Air cool, but not much travelling. Report kept. Rules posted. Plan to date.

Glenochiel Colliery, Saddle Hill (Bryce Brothers).—(13/11/99): Workings in good order. Bords to dip being stopped on a fault running north-east and south-west, which cuts them out one after another. Nothing done so far to prove fault. Large area of pillar- and head-coal opened out. Air cool and good, but travelling slowly. Upcast air-shaft unfenced, and no means of egress provided. No report-book kept. No rules posted. I drew Mr. Bryce's attention to these matters, and also wrote him on the subject, to which I did not receive any reply. (16/12/99): Found that the upcast air-shaft was fenced, but still no means of egress provided. Mr. Bryce subsequently wrote me stating that he had complied with the requirements.

Mosguel Colliery, Saddle Hill (Nicol and Sneddon).—(16/12/99): The old engine has been replaced by a new ten-horse-power Ransome's portable. Dip driven 9 chains in coal. All the miners at work in bords off a heading driven from the south low level. Coal soft and inferior, making a lot of slack. Owners contemplating extending dip-incline another 10 chains to their boundary. Very little work has been done on north side of dip, where coal looks very well. There is plenty of air entering the mine, but, not being well directed, most of it escapes into the return without passing round the south side, where the men are at work. I requested Mr. Sneddon to remedy this by hanging a brattice across the dip below the put-through to the south. Airways and working-places in good order. Report-book and plan up to date.

Lauriston Colliery, Brighton (J. Walker and Sons).—(30/12/99): Main level being driven in a trough, apparently faulted, coal being of medium quality. There is a nasty parting in the roof about 9 in. above the coal; this flakes off in patches in places right up to the face. I advised Mr. Walker and his sons (two) to exercise great caution, and to be on their guard against accident from this cause. Air cool, very little travelling. No rules posted. No report-book kept or copy of Act at mine.

McColl's Coal-mine, Brighton (Donald McColl).—(30/12/99): Mr. McColl has abandoned his workings in the 3 ft. seam, and has returned to the lower or 6 ft. seam. A new drive (2 chains) is in the coal, and the level off the dip appears to be running in the direction of the old workings. There is no plan of the old mine. I instructed McColl to be very careful in approaching the old works, as most likely they will be standing full of water. On my return to Dunedin I wrote him to the same effect, and also requested him to make a communication with a shaft near his dip-face. The mine is drained by a siphon working 22 ft. lift. Side-pressure at mine-mouth is squeezing timber on to the roadway. Advised owner to renew before wet weather comes on.

Bruce Colliery, Akatore, Milton (Anthony Young).—(8/11/99): Was opencast, but now driving in the coal, which is 20 ft. thick; places standing in good order. Rules posted.

Strip-and-at-it Colliery, Akatore, Milton (Noah Hardwick).—(8/11/99): Mine stopped for lack of trade. Locked gate on entrance. Went round the mine with a son of the owner. Props in use very light. Mine in fairly good order, but the air dull. On reaching the bottom of the air-shaft, which is (or ought to be) the second outlet, I found that the shaft had not been sunk through the coal, but only a small hole cut through. A box-flue 12 ft. long, 9 in. by 9 in. inside, had then been set on top of the coal, and the sides of the shaft, being untimbered, allowed to fall in against the box. The air-shaft was also unfenced on the surface. I wrote the owner instructing him to remove the box-flue and make the shaft full size at the bottom, to put ladders in the shaft, and to fence around the top.

Fortification Railway and Coal Company, Akatore, Milton (J. Hughes, permit).—(8/11/99): It is proposed to open up a new mine further up the valley, which will command the whole field, and be more advantageous for the proposed railway, tenders for the construction of which are now being called. Return airway and workings standing well, and are in good order. Dip-drive down 7 chains. Drew Mr. Hughes's attention to the necessity for ladder in upcast shaft, also hinged door on wooden chimney to provide travelling-way for second outlet. Report kept and rules posted.

Milton Colliery, Akatore, Milton (Neil McGilp).—(8/11/99): Opencast and drive; 22 ft. of coal and 6 ft. to 8 ft. of stripping. Stripping well ahead of the coal in the open work, except in one place near the centre of face, where overhanging mass of loose clay and coal was ready to fall at any moment. Drew owner's attention to this, and instructed him to bring the loose stuff down. One man putting in a drive on the south side of the claim, where the stripping was becoming heavy. The first set of timber at the entrance was very insecure. I instructed the man doing the work how to fasten his sets together with longitudinal stays, otherwise, the top being slippery wet clay, the sets of timber might give way and the drive collapse.

Early Bank Coal-mine, Akatore, Milton (Alexander Love).—(8/11/99): Entrance to mine locked up; no one about. I subsequently saw Mr. Love, who informed me that the main drive was in about 2 chains, and a cross-drive off the main also 2 chains in. This was all the work done, and as trade was quiet Mr. Love thinks of leasing the mine.

John Reid, Adams' Flat, Milton.—(7/11/99): Opencast. No stripping done in advance, and face vertical. No batter whatever. No one working at the time of my visit. Found a keg of powder with the top off, and a sack thrown over it, in a hole cut in the coal on one side of the claim. After some trouble I found Reid, who promised to remove the powder to some safe place.

Paskell's Coal-mine, Adams' Flat, Milton (John Thomas Paskell).—(7/11/99): Opencast. Owner thinks of driving, as the stripping (some 20 ft. of cemented quartz-grit) was becoming too heavy. The coal is 8 ft. thick, and, as both it and the cover resembles Benhar, I recommended Mr. Paskell to visit that mine, and to obtain the services of a good miner to open out his own mine on similar lines. Stripping overhanging at one place near the centre of claim, which I drew owner's attention to, and on my return to Dunedin I wrote him about it. This is one of the likeliest places I know where an accident may occur. The coal is simply mined out and the top stuff allowed to follow, when it is carted away, no attempt being made to strip in advance, or even to put a little batter on the gravel-face.

Lovell's Flat Coal-mine (lately Burnwell), Lovell's Flat (J. Carruthers, manager).—(2/11/99): Mr. Robert Glendining, of the Shag Point Colliery, has recently acquired this colliery, and appointed Mr. James Carruthers manager under the supervision of Mr. Thomas Shore, of Shag Point. These gentlemen were very busy altering, enlarging, and, where necessary, renewing plant and workings. Engine and drum, two boilers, and two new screens are being erected on the surface. A special Tangye pump is landing from Home, and will replace the tanks on the cage for unwatering the pit. Underground timbers at pit-bottom are being renewed and heightened. A pair of new north levels are set away from near pit-bottom, which will enable the manager to cut off some of the old workings, which are heavily fallen. I advised him to stop off these fallen places as soon as possible, as they were showing signs of heating, and the temperature of the air in the rise-workings was thereby increased. The heading to No. 1 shaft is being extended, and has yet 5 chains to go. Air in pit slack to-day. New owner is sparing no expense to make this colliery equal to modern requirements.

McDougall's Tuakitoto Coal-mine, Lovell's Flat.—(2/11/99): Owner works alone, lifting bottoms; second outlet, which is the return airway, passable, but low in places. Air good.

Benhar Coal-mine, Benhar (Peter McSkimming).—(3/11/99): Bords all in good order, pillars being fair size, and roof strong. Air good, and could be improved by stopping the ends of a few bords on the dip. Rules posted. No plan. Gave owner notice to have survey made and plan forwarded.

Kaitangata Colliery (W. M. Shore, manager).—(1/11/99): The new owners (New Zealand Collieries, Railway, and Oil Syndicate) have recently appointed Mr. Thomas Barclay and Mr. John Shore under-managers to Mr. W. M. Shore, who is in ill-health, and have also engaged Mr. William McCormack, of Granity, specially to install the recently imported coal-cutting and holing machines. Mine standing to-day, but a number of roadsmen executing repairs, filling and drawing dross off the roadways in south workings, putting on the finishing touches to the endless-rope-haulage system in the Stone drive (which will save half a mile of hand-drawing), a shift working two iron men in the east workings, and the shift at work in No. 2 winch dip, Shore's seam, making ready to drive a pair of levels to meet another pair being driven from the Castle Hill Mine for new return airway and second outlet. These levels are being pushed on with all possible speed night and day at each end, and, having 24 chains to go, Mr. Shore expects that it will be some time in April before communication is established. The present main return airway, which is also the travelling-way and second outlet, shows signs of deterioration, and is not so passable as might reasonably be expected in a colliery employing 200 men underground (110 men on the day-shift and ninety on the afternoon- and night-shifts). The furnace is also showing signs of wear, so the completion of the new air-courses and the utilisation of the splendid furnace and air-shaft in the Castle Hill Mine will be of material advantage to this colliery. All work to the dip communicating with the winding-shaft is now stopped and the pump drawn, and Mr. Shore purposes using the winding-engines for the endless-rope-haulage system which the company intends establishing throughout the mine. All coal sent out is now being got from the south side (pillar- and head-coal) and from the north and east workings advancing and opening out up to No. 5 fault. The south workings are gradually being finished and stopped off. The weight on pillars to the rise has caused them to sink, and roof is low. I travelled through all the places, and found some of them partially obstructed by falls; examined carefully for gas, but did not find any. Lamp-station, placarded, on the heading at the entrance to the higher workings. Roadways are dry and dusty, and the levels are watered twice a week. Air very warm in this section, which I drew Mr. Shore's attention to. In the north and east sections the roadways and working-places are in excellent order. Air dull in machine-heading owing to faces being so far from return. Mr. Barclay (who went round with me owing to Mr. Shore being unwell) explained that a level was being pushed on which would shortly prick through at the heading-face. In this section a shot fired attracted my attention, and

on going into the place I found an inadequate quantity of coal lying owing to the place not having been properly prepared by the miner working there. On making inquiries I learned that the miners fire their own shots in this colliery. This being a contravention of special rule 25, I requested Mr. Shore to make the necessary alteration. In addition to naked lights, safety-lamps are used throughout the mine, as a little gas is occasionally reported. The mine officials appear to exercise the utmost vigilance. I found no trace of any firedamp in the workings on the day of my visit. Deputy's daily reports and readings of barometer and thermometer carefully recorded every shift. On my return to Dunedin I wrote Mr. Shore, under date the 6th November, pointing out that he was not complying with section 33, subsection (1), in regard to the air in south workings; also special rule 25, which provides that deputy shall fire all shots in every mine in which firedamp has been found, &c. Mr. Shore replied (8th November) that the air was split at the intake a few days after my visit, and a constant supply taken direct into the south side instead of, as previously, having traversed the whole of the north and east districts before reaching the south; also that special rule 25 had been complied with. (10/11/99): Inspected surface appliances for second outlet at shaft up the gully from mine-mouth, and found a good hand-winch in position ready for use, with a flexible-wire rope on the drum, and housed for protection from weather; beam across shaft and pulley attached, all in good working order.

Castle Hill Colliery (owners, New Zealand Collieries, Railway, and Oil Syndicate; manager, Mr. W. M. Shore).—(3/11/99): Three continuous shifts of men day and night driving a pair of levels to communicate with the Kaitangata Mine. This colliery is in excellent order, having been recently put in a state of thorough repair. Timber renewed and roadways enlarged where necessary. Air very good. Safety-lamps hanging on wall near face for use if required. I could find no trace of gas in working-places. Reports well kept. (10/11/99): Winding plant in good order standing ready for use on surface at the top of upcast air-shaft.

Smith's Mine, Wangarua, near Kaitangata (J. Smith, lessee).—(2/11/99): No one about. Locked gate on entrance, and got into mine by return airway. Mine in good order, and air very good. Not much work being done apparently.

Record Reign Coal-mine, Kaitangata (Robert Penman).—(2/11/99): No one about. Mine apparently abandoned.

CENTRAL OTAGO.

Gibbston Coal-mine, Gibbston (Martin Macale).—(16/11/99): Opencast. Stripping, which is very heavy, is being removed with water. Coal patchy, and quality irregular; pinching out in places, and replaced by soft patches of sooty and very inferior coal. No definite face of work. Owner working hard, but without much system.

Cardrona Coal-mine, Cardrona (Robert McDougall).—(24/11/99): Vertical seam lying in a V-shaped trough. Line of strike about N. 10 W. Stripping done by water, which has brought down a large land-slip on each side of the claim. As the coal is worked back to the saddle these slips will prove to be almost unmanageable, and from present indications will eventually slide in from three sides, and completely cover up the coal-exposure. This may take place next spring or the one following. Low-level tunnels will probably soon have to be driven, and the coal properly mined; and, as this mine is the only source of supply for a large district, I advised Mr. McDougall to set about this at once, so that he could insure a regular supply and output. Mr. McDougall promised to start a new low-level tunnel on Monday next, the 27th.

The management of this mine has not been such as to work the claim to the best advantage. The output from the four men working could easily be doubled if a few alterations of a practical nature were made.

Kawarau Coal-mine, Bannockburn (lately Pryde's Pit), (J. C. Campbell, manager).—(20/11/99): The whole of the old workings on the south side of the dip had to be sealed off on account of fire and crush which took place after the water that Mr. Pryde had allowed to accumulate was drained off. Bord-ends had to be built off with stoppings packed with 5 ft. of sand to keep back fire-stink. New dip-drive is being extended west, and is now 4 chains below Pryde's lowest places. Bords on each side of dip in good hard coal. Dross is accumulating in some of the places. The custom which prevails at this and other collieries in the district of using dross for stoppings, sometimes loose and sometimes filled into bags, is liable to cause spontaneous combustion, especially when falls from the roof take place on the heaps of dross, or should the dross get wet fire is likely to follow. Air steady. Report to date.

Excelsior Coal-mine, Bannockburn (Parcell and Gibson; J. Gibson, permit).—(18/11/99): Workings standing very well, and care taken in driving them somewhat regular. Air very slack; no current. Area of upcast air-shaft at bottom contracted to 5 square feet. Drew Mr. Gibson's attention to this, and requested him to enlarge shaft-bottom, which, Mr. Gibson has since written me, has been done. An eight-horse-power vertical engine has recently been substituted for horse-haulage and drawing water. Rules posted. Report-book well kept.

Bannockburn Coal-mine, Bannockburn (Thomas Wilson).—(18/11/99): Mine very recently reopened after being idle for nearly two years. Timbering at adit-entrance rotten and very ragged in appearance, and has not been renewed as occasion required. Props along the main level rotten, and useless for the purpose of taking any weight should it come on them. Heavy falls have taken place in the left-hand level, which district has completely collapsed. Air not good, and travelling very slowly. I found that the bottom of the upcast air-shaft was not sunk through the coal, and that a small hole only large enough to admit a man's arm had been pricked through to the bord below. I drew Mr. Wilson's attention to this, and requested him to enlarge the shaft-bottom to the full size of the shaft. I wrote Mr. Wilson on the 2nd December requesting him to renew the whole of the timber sets and props along the adit and the level, and to add extra timber where required.

ACCIDENTS.

16th October.—William McCormack was burnt on the arms by an ignition of gas at Kaitangata Colliery. While kneeling down to couple up a length of pipe which had just been added to the branch line of pipes conveying compressed air to the coal-cutting machines in Telford's heading, a "blow through" was given to clean any dust out that may have been in the pipe. Shortly after the "blow through" the ignition occurred, with the result that McCormack was burnt, while J. Brown, an assistant, some 20 ft. away, escaped uninjured. McCormack's light was on the floor, and there can be no doubt that the "blow through" of compressed air raised up a quantity of fine dust made by the holing-machines, dashed same against the coal-face, and on the rebound the dust (probably associated with a little gas that might have accumulated during the time the compressed air was off, thus forming a most explosive mixture, which on reaching the light on the floor) promptly ignited. Mr. McCormack was unable to attend to his work for a month. I reported specially on this matter under date the 6th November.

Four other slight accidents occurred not of sufficient importance to specify individually.

I have, &c.,

E. R. GREEN,

Inspector of Mines.

The Under-Secretary, Mines Department, Wellington.

No. 3.

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

SIR,—

Inspector of Mines' Office, Thames, 14th February, 1900.

I have the honour to transmit to the Hon. the Minister of Mines the following report on the coal-mines in the Auckland District, in compliance with section 67 of "The Coal-mines Act, 1891," for the year ending the 31st December, 1899:—

KAWAKAWA.

Kawakawa Mine.—This mine until the early part of this year was the property of the New Bay of Islands Company (Limited), who worked it for a term of five years and a half, and then sold the mining requisites, &c., to Robert Hislop and party, who have worked it continuously ever since. The present party's operations have been confined to that portion of the mine known as "Moody's Outcrop." The seam where it is at present worked is very thin, varying from 1 ft. 6 in. to 3 ft. in thickness, and a few pillars left by the old company were 4 ft. thick, the present party being successful in getting them out. The seam being thin, the cost of getting the coal is, of course, much greater than in thick seams; and, as it has to be taken along a tramway for a considerable distance to the railway, the present owners can barely make it pay. Still, as the mine was considered to be worked out years ago, it is pleasing to know that a few men are making a living from the coal produced from it. Seven men have been employed, and the output of coal for the year was 3,945 tons. Robert Hislop has a permit to manage this mine, and has exercised great care in carrying on the work. No accidents.

HIKURANGI.

Hikurangi Coal Company.—The operations in this company's mine have been steadily pushed ahead, and the mine opened up to such an extent that a considerable quantity of coal can be procured at a small cost, as there is little water to contend with in the present workings. The output from this mine is increasing every year, and, with a view to be in a position to keep up the supply to meet the increasing demands for some time to come, the company contemplates commencing operations on the eastern side of the Government railway to open up the seam of coal on this part of their property. Several bores have already been put down, and excellent coal is said to have been obtained, and, as the company has a large area of ground in this direction, the prospects may be considered encouraging. This mine was inspected twice during the year. The ventilation was good, the workings were safe, and were carried out in an efficient manner. Fifty-one men have been employed, and the output of coal for the year was 34,037 tons, an increase of 1,064 tons as compared with the previous year.

Phoenix Mine.—Work in this mine has ceased for the present.

West Bryan's.—There was only 23 tons of coal taken out of this mine in the early part of the year, which was principally for Mr. Smith's own use.

Hikurangi Colliery.—This company's works in the mine are being carried on from adit-levels driven from the side of the hill, the covering on the coal in the deepest place never exceeding 50 ft. The seam where recently worked is 14 ft. thick, but only about 9 ft. is taken out. The mine was twice visited during the year, and on each occasion the ventilation was good and the workings safe. There was also an abundance of timber, such as props, &c., on the mine, to be used as required. Twenty-two men have been employed, and the output of coal for the year was 13,656 tons, this being an increase of 1,719 tons on that obtained for the previous year.

WHANGAREI.

New Kamo Mine.—The lease of this mine was sold during the year to William Beehre, and is now being worked under the management of Donald McDonald, who was granted a permit in accordance with section 21 of "The Coal-mines Act, 1891." The work in the early part of the year was confined to taking out pillars left in the old mine, but the present owner directed the operations to be made in opening up the seam to the north of the old workings, and has been suc-

cessful in finding the coal. The seam is 8 ft. thick where intersected, but the manager intends to only take out 6 ft. 6 in. for a time. Four men are employed, and the output of coal for the year was 1,049½ tons, an increase of 81½ tons on that obtained the previous year.

Kamo Mine has ceased working.

Wharwhau has ceased working.

NGUNGURU.

Ngunguru Mine.—This company's operations were directed to taking out pillars to the rise and dip, there being only one bord carried forward in solid coal when the mine was inspected on the 16th November last. The Ngunguru Coal Company (Limited), through causes best known to themselves, found it necessary to put the company into liquidation in the early part of the year, and it is now being carried on by Mr. Tankard on behalf of a company. The mine was inspected three times during the year. The ventilation was good and the workings safe, although one fatal accident occurred to a miner named Alexander Scott whilst he was in the act of drawing out props, as already reported. There has always been abundance of timber kept on the mine, to be used as required. Thirty-nine men have been employed on this mine for the greater part of the year, and the output of coal was 13,004 tons, a decrease of 2,836 tons as compared with that of the previous year.

Kiripaka Mine (Callaghan's).—This is a new mine, and is worked by a small syndicate, who are pushing on with the work as fast as their circumstances will allow. The seam of coal where operated on is 20 ft. thick and of fair quality, but they have only been working on the coal for the last six months, and consequently there has not been a large amount of work done on it yet, more especially as only six men have been employed in the mine and one on the surface. The operations in the mine are being carried on under the management of Mr. George Climo, who was granted a permit in terms of section 21 of "The Coal-mines Act, 1891." The output of coal to the end of the year was 1,609 tons.

WAIKATO.

Taupiri Coal Company (Limited).—In the early part of the year the Waikato, Taupiri Extended, Taupiri Reserve, and Ralph's Taupiri Coal Companies were reconstructed and formed into a company called the Taupiri Coal Company (Limited). The shareholders no doubt benefit by the change, a considerable saving having been effected, three mine-managers, three legal managers' offices, and other expenses connected with the working of three of the companies having been dispensed with, whilst the supply of coal to meet the demand has not been interrupted. The new company at once stopped all work in the Waikato Mine, and operations in the Taupiri Reserve Mine were also stopped for a time, but this mine was again started for the purpose of producing a certain amount of coal to comply with the terms of the lease. The work has been concentrated in obtaining coal to meet the demand from the Taupiri section and Ralph's Taupiri Mine, from which a large amount of good coal is forthcoming. The most important work in Ralph's Taupiri section has been the sinking of the dip a distance of 14 chains, from which two levels have been driven off, and beyond advancing the levels and headings in the Taupiri Extended section no new work of any importance has been carried out. The seam of coal in the four sections of this company's mine varies from 16 ft. to 65 ft. in thickness, but, as the coal worked is either under the lakes or river, or in close proximity to them, large pillars have to be left in, more especially as the covering of the seam is mostly composed of running sand. As the bords are, as a rule, carried forward 16 ft. in width, and from 10 ft. to 24 ft. in height, a considerable quantity of coal is left in, and therefore a large area is traversed for a small quantity of coal in comparison to the thickness of the seam.

There have been 185 men employed in this company's mine, and the output of coal has been 68,929 tons, this being a decrease of 1,270 tons from the four mines last year.

Bombay Mine.—Stopped.

MOKAU.

Mokau Mine.—This mine has been steadily worked during the year by Messrs. Stubbs and Co., of Waitara, who purchased the s.s. "Douglas" to convey the coal from the mine to Waitara and New Plymouth. The mine being situated up the Mokau River about twenty miles, a considerable amount of time is lost by the boats getting up and down the river with the tides. The bar at the mouth of the river causes a good deal of uncertainty to boats getting in and out, and therefore there is some difficulty in keeping the market regularly supplied with the coal. The operations in the mine during the year have been principally confined to opening up a block of coal to the north-east of the old workings, which have now been practically cut off from the present workings. The coal in the bords now carried forward will average 7 ft. 6 in. in thickness, and appears to be improving as it is opened up, and the band of stone in the centre is getting thinner. William Tattley, jun., resigned the position of mine-manager in the month of December, and Robert Cherrie was appointed in his place. A good deal of necessary work in connection with the ventilation and mode of working the mine has been carried out by the late manager since my previous visit. Eleven men have been employed, and the output of coal for the year was 3,483 tons, being an increase of 88 tons as compared with that of the previous year.

Fernside Mine.—This mine, which was opened up in the early part of last year, continues to be worked by a syndicate represented by Messrs. Bayley and Ogle, of Waitara. The management of the mine is carried on by Mr. Joseph Lobb, who has three men employed. The coal varies from 3 ft. to 5 ft. in thickness, but appears to be thinning as it is driven on towards the rise. The return airway which was in progress on my last visit is completed, and the ventilation throughout the working is all that can be desired. The s.s. "Manakau" is engaged in conveying the coal from the mine to Waitara. The output of coal during the year was 1,393 tons, this being an increase of 735 tons as compared with that of the previous year.

The total output of coal won from the mines in this district for the year ended the 31st December, 1899, amounted to 141,128½ tons, being a decrease of 7,261½ as compared with that obtained during the year 1898. The figures are as follows:—

	Output for 1898.	Output for 1899.	Decrease.
	Tons.	Tons.	Tons.
North of Auckland	74,140	67,323½	6,816½
South of Auckland	74,250	73,805	455

There has been a falling-off in the coal produced from the coal-mines in this district during the year as compared with the previous year, partly, no doubt, owing to the quantity of coal from the West Coast of New Zealand being put on the market at a reasonable price, and in some cases (where coal has to be carted a long distance) consumers considered it cheaper to use the West Coast coal. This coal is of a superior quality, and, although a higher price is paid for it, a less amount is required in proportion to do the same work.

ACCIDENTS.

A fatal accident happened in the Ngunguru Coal Company's mine on the 2nd May, whereby Alexander Scott, a miner, met his death whilst in the act of drawing out props where pillars had been worked out, as reported on fully by Mr. Ryan (Assistant Inspector) on the 10th May, 1899.

An accident, which turned out to be of a serious character, happened on the 28th July to John Henry Duffy, a miner. Whilst at work in Ralph's section of the Taupiri Coal Company's mine a piece of coal flew from the pick and struck him in the eye. Some time previous to this accident he lost the sight of one eye through a similar misfortune, and this happening to the other eye caused him to be almost totally blind, and has rendered him unfit to follow his ordinary employment.

There were also thirty-one other accidents reported, but not of a serious nature. Twenty-one men received aid from the Miners' Accident Relief Fund in terms of the amended regulations for the management and administration of funds and moneys under section 69 of "The Coal-mines Act, 1891." The other ten men were either not long enough off work to entitle them to any money, or they did not comply with the regulations.

The total number of day's pay provided out of the Relief Fund was 702, which, at 2s. 1d., amounted to £73 2s. 6d.; the amount paid for total disablement was £50; for funeral expenses, £10; and £15 was granted to the widow of Alexander Scott: making a total of £148 2s. 6d.

I have, &c.,

JAMES COUTTS,

Inspector of Mines.

The Under-Secretary for Mines, Wellington.

No. 4.

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

SIR,—

Inspector of Mines' Office, Westport, 9th April, 1900.

I have the honour, in compliance with section 67 of "The Coal-mines Act, 1891," to report as follows on the West Coast coal-mines for the year ended 31st December, 1899:—

Puponga Coal-mine, Collingwood.—(11/9/99): The owner, Joseph Taylor, is still hopeful that a large industry will yet be established at his colliery in the Puponga Valley. The developments comprise three new tunnels, which vary in lengths from 3 ft. to 12 ft., and intersecting coal-seams, from 6 in. to 5 ft. in thickness, intermixed with fireclay bands. Timber is set in a most careless manner, and the owner has been informed that the adits must be retimbered previous to further work being done, which he has promised to carry out. Mr. Taylor anticipates that an extensive trade will be opened with Nelson at an early date.

Pakawau Coal-mine (Caldwell, owner).—(11/9/99): During the year there has been no coal raised. A new rock tunnel was driven 150 ft., striking the coal-seam to the full dip westward; but beyond providing an outlet for ventilation purposes nothing further is done. Screening-, washing-, and storage-bins are built near the mine-mouth, and a mile and a half iron-laid surface-tramway connects the mine with a new loading-wharf. On a later visit operations were still suspended and the property deserted.

Motupipi Coal-mine, Takaka (manager, J. E. Golding).—(13/9/99): It is difficult to give a correct statement of the work done at this mine, from the fact that at all times when visited the place is deserted. The dip-heading is standing full of water. The output for the year was 40 tons.

Enner Glynn Coal-mine, Nelson.—(24/8/99): George Wise and William Bennett work this mine. The deep workings where the fire existed are still under water. In March last operations were resumed on the outcrop, from the old surface adit, which strikes the coal-seam behind the incline-shaft. The seam has a vertical position, is well timbered, and ventilation is good. As a household fuel it finds a ready local market. Reports kept.

Mokihinui Coal-mine.—With the exception of pumping the water from the Hutt seam dip-heading, mining operations are still suspended.

Cardiff Colliery (owners, Westport-Cardiff Coal Company).—(19/9/99): The output shows a decrease on preceding year of 25,174 tons. The chief centre of operations was on the western or bridge section of the coalfield. Developments were chiefly driven in the outcrops, but as the workings advanced into the solid country the coal assumed a soft character, which tended to deteriorate its quality as an article of commerce. Direct haulage from the western district to the loading-station on the Government railway-siding being a question of economy, the endless-rope terminal was extended, and placed, in conjunction with the self-acting haulage terminus, at the

bridge-approach. Thus a direct line of conveyance was maintained through the old mine to the shoots. Plant and working-places are in good order, and the provisions of the Act are strictly enforced. At the end of September last the company suspended operations, and on the 28th January, 1900, a fire (the result of spontaneous ignition) was discovered in the old mine. Exploring parties having ascertained the extent and locality of the burning, it was ultimately decided to seal down the mine by means of clay-puddled dams.

Millerton Colliery (owners, Westport Coal Company, Limited).—(25/9/99): During the year operations at this colliery have been marked by a satisfactory degree of success. As a coal-producer this mine is comparatively in its infancy, yet so complete are the arrangements indispensable to a successful issue that the increase of output against the preceding year—38,148 tons—may be considered highly creditable. Practically the year's output was produced from the dip-workings east of the main haulage-road, of which four-fifths is won mechanically, the undercutting being done by percussive pick-machines actuated by compressed air. Power is generated by two steam-driven Leyner compound air-compressors, the installation being sufficiently productive to likewise drive the underground pumps and haulage machinery. The compressed-air system at this colliery gives satisfaction, and its applicability to mining operations generally is a proven fact. In the world's mining compressed air is a much-abused motive-power, it being little understood; and at the present day, if correctly installed, its beneficial uses and adaptability to general mining can scarcely be estimated. Developments have chiefly been directed towards more creek area, and the permanent heading, which has been vigorously pushed forward, has pierced the coal-seam at a distance of 40 chains westward from the present main haulage. Consequently, further developments in opening out said area will be of an extensive character during the ensuing year. As the permanent plant required to work this large area will be independent from the other sections of the colliery, a suitable site is selected near the mine-mouth, where all foundations are already cut in the solid rock formation. Steam will be supplied from Babcock and Wilcox boilers, and additional Leyner's compound compressors, which are on hand, will shortly be placed in position; also a large Schiele fan will soon be at work at this site, and when operative will ventilate effectively the whole mine. With respect to safety, every care is taken to minimise risks to all workmen, both at underground and surface work. Blasting operations have of late been a subject that has directed the attention of the management with regard to safety, and, in order to secure the most reliable explosives under the permitted list, contracts have been entered into for continuous supplies from the best makers. In the production of the output the quantity of compressed powder used against the coal won was in the ratio of 227·8 lb. of powder against every 1,000 tons of coal, or 1 lb. of powder to 4·5 tons of coal. Reports and other provisions of the Act are strictly kept. No accidents reported. Air-measurement, 16,500 ft. per minute. Four inspections made.

The following report by Mr. Jonathan Dixon, manager at Granity Creek, will be of interest: "The exploitation by the Westport Coal Company (Limited) of the Millerton portion of their extensive coal-mining lease has maintained its standard during the past year. The Millerton Mine is only in an incipient stage, yet the progressive development is of an advanced kind. To those conversant with the time required to equip in detail a modern coal-mine, to deal economically, effectively, and beneficially with the winning of the mineral, likewise in the case of the mine under review, credit will be given for the position at present held in the colony's coal trade by the Millerton Colliery. During the past twelve months of the brief period since the mine became coal-producing operations have been marked by an extended development of the dip areas, wherefrom has been won nearly the whole of said year's output. These dips have a varying grade, but it may be assumed to average 1 in 5 or 6. The coal is hauled by a system of direct haulage from various suitable landings by engines set at the dip-tops. The motive-power is compressed air. The requisite compression of air is generated by Leyner's compound air-compressors suitably placed near mine-entrance. These compressors likewise supply the motive-power for the percussive-pick machines, and similarly the pumps used for mine-drainage. In connection with this mine an extensive portion of the lease is being developed at Mine Creek. The main heading, approximating 50 chains in length, has been driven into said area, and, the coal being of the best quality, a satisfactory yield can be contemplated from this field. This heading branches off the main rope road in the mine, and for some 20 chains has a rising grade of 1 in 2·5; the succeeding 12 chains rises 1 in 5·75, thence dipping towards creek-bed at an average grade of 1 in 6. The traction from this field will be by the endless-rope system, the gravity of the 'full load' being the power used to 'travel' the rope. The speed of ropes, &c., will be controlled by a surging-drum horizontally placed, of requisite size and power to efficiently meet all demands. The installing of these mechanical appliances, together with the necessary detail, is being expedited with all despatch. The surface arrangements necessary to the effective working of this field are being erected. A spacious boiler-house, also air-compressing plant house are erected. The former will contain three Babcock and Wilcox boilers of 86-horse power each, with requisite feed-water heaters, &c., and the air-compressing plant, when installation finally completed, will consist of six compound air-compressors of the type now in use. One boiler is set, another on the ground ready for erection; some of the compressors are likewise in position. A 10 ft. Schich exhaust fan and engine will be set in proximity to fore-mentioned plant, and will be connected with return airway of an area not less than 100 square feet. With this fan in operation the ventilation of the whole mine should be adequately and effectively effected. A large concrete dam is being placed across Mine Creek in a suitable position, and will have a capacity of at least half a million gallons. The water thus stored is for supplying boilers, likewise the cooling-chambers in air-compressors. It will be readily noted that the coal will be won mechanically from this area, as it is principally in the rest of the mine, also that the motive-power will be compressed air. The position of this mine after due development is undoubtedly in the van of the New Zealand coal trade."

Coalbrookdale Colliery (owners, Wesport Coal Company).—(21/12/99): The total outputs of the Denniston collieries show a gross increase of 9,663 tons over the preceding year. At the commencement of the year the endless-rope haulage was extended 15 chains towards the dip of Cascade section. This extension placed the main levels in position to win and open out the coal-field in the direction of what is locally named the "Look-out" area. From present developments the prospects of this field are very encouraging, the seam having an average thickness of 20 ft. It is all mined by percussive pick-machines actuated by compressed air. The power generated is from a newly erected plant situated near the entrance of Cascade dip-incline. It consists of two Leyner straight-line driven compressors, with 14½ in. steam, 16 in. low-pressure and 10 in. high-pressure air-cylinders. Steam is supplied from one of Babcock and Wilcox 120-horse-power boilers, but, in view of utilising compressed air as a motive-power for pumping and haulage purposes in the mine, the company intend to provide additional boiler-power. On the upper side of the 13 ft. downthrow fault, which intersects this section of the coalfield, the east and west pillar districts have been successfully worked backwards to within safe distance of the main haulage-road. Roadways, airways, and working-faces receive careful attention, as every necessary precaution is enforced to minimise risk to life and property. All working-faces are inspected and securely timbered by the company's officers previous to fitters or machine-men being allowed to start work. The company's officers are wholly responsible for the inspection and safety of the workmen referred to. No serious accidents reported. Reports kept to date. Air-measurement, 28,000 cubic feet per minute. Four inspections made. Munsie's: In this district of pillars twelve pairs of miners are employed. John Mason was slightly injured by a thin flake of roof-stone in the face bruising his ankle and hips.

Ironbridge Colliery.—(20/12/99): The dip-workings in Cedar Creek area are extended by two parallel dip-headings. The coal-seam is over 20 ft. in thickness. Extending northward, this coal-field is intersected by the north branch of the Waimangaroa River, and in order to win the coal from the north section a rise-heading was driven in direct course to cut the south outcrop at the most suitable position to bridge the ravine. At this point a wooden bridge is constructed, with 30 ft. span, built to a gradient of 1 in 4, which runs in direct line with front heading of north workings, the outlet, or back heading, being 50 yards eastward. Gravity is the power used to lower the coal to the low level of old mine. From thence it is conveyed by horse, and attached to the iron-bridge endless-rope haulage. In both sections of solid working all the coal is mined by pick-machines, of which there are two types in use—viz., Morgan and Gardiner's, actuated by electrical power, and Yoch's pick-machines, by compressed air. The electrical power generated at Coalbrookdale is transmitted two miles and a half over the surface by bare copper cables, and is also used for pumping and hauling. As a result of careful and practical experiments extending over a considerable time in reference to the adaptability and applicability of electrical *versus* compressed power for mining operations, it was confirmed beyond doubt that compressed air as a motive-power is the most suitable and practical factor of safety and economy; and it has been decided that compressed air will be the future power at the Denniston collieries. Acting on these facts, an extensive air-compressor plant is newly erected in a central position at Ironbridge Mine, midway between Cedar Creek dip-workings and North Waimangaroa Coalfield. This plant has equal capacity with the one referred to in the Coalbrookdale Mine; steam is generated by Roots's tubular boilers. Attention has been directed to the natural drainage of Cedar Creek area, and it is contemplated to drive a water-channel 30 chains in length, so as to drain, and enable an extensive pillar area to be exhausted. In addition to these pillars, a large solid area will be freed of water; also the bottom seam, which is proved to be 9 ft. thick, and underlying the present seam at a depth of 90 ft., will be under command. The working-conditions of this mine are satisfactory, and the provisions of the Act strictly carried out. Air-measurement, 17,500 cubic feet per minute. Four inspections made. No serious accidents reported.

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

Whitecliffs Coal-mine.—The owner applied for a lignite license, but on the plea that the coal is bituminous I objected.

Flaxbush Coal-mine.—(2/3/1900): This mine has been reopened by a low-level rock tunnel 150 ft. in length. The coal is 2 ft. thick, and has a vertical position. Ventilation good. Timber freely used. Two men employed.

Coal Creek Coal-mine.—(14/11/99): During the year only 25 tons of coal was mined, but, in view of the Rocklands Gold-dredging Company starting operations in this locality, there is a better future.

Golden Treasure Coal-mine.—(18/11/99): On this lease two men are employed, who depend chiefly on the gold saved from sluicing off the surface cover. 196 tons of coal was mined.

Murray Creek Coal-mine (Lewis Betts, owner).—(18/11/99): This lease adjoins the Golden Treasure, and is worked open face. Whilst sluicing off the surface cover fair quantities of gold are saved. The coal is a good household fuel, and finds a ready local market. Three men employed.

Phoenix Coal-mine (John Fox, owner).—(18/11/99): This lease contains two valuable coal-seams, parted by a 6 ft. layer of shaly fireclay. These are hard bright coals, 50 ft. and 22 ft. in thickness, and as a household fuel compares favourably with Westport best. Fox being a practical miner, the mine is worked in an orderly manner. Three men employed. A complete plan, showing position of workings with surface boundaries, was duly received.

Lankey's Creek Coal-mine (William Lamberton, owner).—(10/9/99): The owner of this mine continues to push his drive westward. In the face the coal is split with a rock band, which thickens in a north-westerly course, and in view of getting clear of the stone a rise-heading is started.

Bourke Creek Coal-mine.—(7/11/99): Cairns and McLiver, who own this mine, are not colliers, but lately practical colliers are employed to mine the coal. The workings are safe, tidy, and there is good air. When last visited the bottom level touched a fault, but from what could be seen of

it I considered the coal would rise behind the roll. A new screening and storage plant was being erected. Two men employed.

Inkerman Coal-mine.—(14/11/99): The Inkerman Gold-mining Company still continue to mine coal for steaming purposes at Rainy Creek low-level tunnel. One man employed.

Devil's Creek Coal-mine (John MacQuham, owner).—(20/11/99): This coal lease is on Midland Railway reserve, and in consequence no proper title has been granted. Pending a settlement the owner has shut down the mine. Both levels are standing on hard bright coal 8 ft. in thickness. The mine is in good order.

Breen's Coal-mine.—(20/11/99): At this mine all the coal in sight was practically standing in very small pillars, and I objected to their removal owing to very bad roof and most impractical miners. On a former visit I pointed out a splendid outcrop of hard coal, to which the owner has made a good road. The coal turns out well.

Progress New Mine (the Progress Gold-mining Company).—(15/11/99): On this lease two mines are opened to supply coal for steaming purposes at the Progress Mines. The coal averages from 5 ft. to 6 ft. in thickness. Thomas Cochrane supplies the coal. Three men employed. Air good.

Beckford Coal-mine.—This mine is abandoned.

Waitakere Coal-mine.—This lignite-seam was not visited.

Blackball Colliery (owners, Blackball Coal Company).—(20/11/99): From this colliery the output shows a satisfactory increase of 5,301 tons over the preceding year, and on the Accident Fund a saving of £103 14s. 8d. for the same period. Referring to my remarks on No. 1 west level in previous report, these mining difficulties have been dealt with in a practical and successful manner, and accordingly the original level course has been maintained. It was necessary that this roadway should receive special attention, as it is the continuation of the main adit which forms the traffic outlet for the whole mine. The endless-rope haulage when first installed was confined to the rock-tunnel section of roadway, but as the workings advanced it became necessary that further extension of the rope-line to a more central position of the working should be carried out, which has been done in a creditable manner, making the general terminus for loading and unloading at the foot of No. 4 incline. Total length of haulage-line, 2,432 ft. To carry out a more efficient system of signals in view of reducing risk, the principal stations along the rope-line are connected by telephone, in addition to the ordinary inward and outward electric signals. This arrangement will be the means of saving much time being lost in the case of breakdowns along the line. In view of the west working under-crossing Coal Creek, the thickness of overlying strata was determined by borehole at 90 ft. 6 in., of which 60 ft. next the coal was hard sandstone. No. 11 incline was cut through on the terrace, and forms an outlet direct from the faces. Double shift is established at the colliery owing to trade pressure. Aerial tramway has received special attention of late. Haulage-rope six miles and a quarter in length and two miles cable sections were renewed. Warning- and signal-boards are placed at all principal stations, and the provisions of the Act are carried out to the letter. Air-measurement, 17,240 cubic feet per minute. Timber sufficient. Direct air-current good. Ratio of compressed powder used in pounds weight against every 1,000 tons of coal mined was 129 lb. to 1,000 tons. No accidents reported. Four inspections made.

Brunner Collieries (owners, Greymouth-Point Elizabeth Coal Company).—Considering the output from these mines is won wholly from the extraction of pillars, the returns show a substantial increase of 37,720 tons over the preceding year.

Brunner Dip Mine.—(21/11/99): Since the pumps were placed in position to discharge the water direct on to the adit-level, double shift gave facilities to extract the pillars from the lower levels more successfully and economically. Now that the pillars are exhausted from the lower levels, except a small section that will be worked in conjunction with the barrier pillar, the workings are chiefly confined to No. 1 rise incline, heading, and barrier. Between the dip-road and engine-plane a small solid section was blocked into pillars and exhausted. In this district Charles Woollett was killed by a fall of coal and fireclay. In the rise district the pillars are successfully worked. The roof is very strong. Double shift is confined to the barrier pillar, it being behind in the order of the workings. Three electric lights are installed in the main thoroughfare at the top of engine-dip and endless-rope terminal. This installation has tended to minimise risk to the lad who unhooked the engine-rope from the race, as it is discharged at a high speed. Gas was reported several days over a large fall on east side of dip-road, but this is now removed by ventilation. All other places are clear of gas. Marsaunt safety-lamps are strictly enforced; lead-rivet locks. Considerable repairs have been done on return airway, which is now in fair order. All reports are kept to date. Air measurement, 16,000 cubic feet per minute. Six inspections made.

Brunner Rise Mine.—(22/11/99): Notwithstanding the difficulties contended against from steep gradients and heavy overlying pressure on the pillars and roadways, the quantity of coal won from this section of the lease is considerably in excess of the original calculated tonnage. No. 1 block, located next to the cliff, was the chief source of the year's output. In the first working this section was considered worthless, consequently a large percentage of the coal won was from the solid. With regard to keeping up a standing coal-output against the decrease from exhaustion of this mine, an adjoining section of old rise-workings was recently tapped by a dip rock tunnel, which has opened out a valuable district of pillar and solid coal. Therefore resources from this mine are fairly guaranteed for some time to come. Further, another drive is set away a short distance to rise of fan drift at the old mine, where an extensive area of Brunner old pillars exist. A miner named James Allen had his leg broken by a fall of coal in the face. During the summer months black-damp was a source of trouble. Reports are kept to date. Double shift was again resumed. Six inspections made. Monthly inspections are carried out by the workmen.

Coal Creek.—This property appears to be at a standstill.

ACCIDENTS AND FATALITIES.

13th January, 1899.—A miner named James Allen had his leg broken by fall of coal in the face.

19th May, 1899.—A miner named Charles Woollett received injuries on the head by fall of coal in the face. He died the following day.

9th September, 1899.—John Mason was slightly injured by a fall of stone in the face.

GENERAL REMARKS.

It is noteworthy that, notwithstanding the decrease in output from Westport-Cardiff owing to suspension of operations, the deficiency was maintained by the Westport Coal Company, and at Westport an increase of 22,538 tons is shown over the preceding year. This increase may be attributed to the larger production of coal won from each working-face by the aid of coal-cutting machinery compared with hand-labour, for had it been otherwise decrease was inevitable, considering the limited areas from which the coal was mined.

Extending compressed-air installation as a motive-power for mining operations: Extensive plants were erected during the year at Coalbrookdale and Ironbridge Mines, compressed air being decided as the future power at Denniston. In short, the whole solid-work system is undercut by percussive pick-machines actuated by compressed air.

Westport Coal Company should fully maintain last year's output, and a corresponding tonnage with last returns may be expected from the Brunner mines. Blackball should also yield a substantial increase, as double shift is established at this mine.

The accident-rate shows a marked decrease—one fatality in Brunner Dip Mine. Comparing the causes of accidents in the British mines with those in the Westland mines, it will be seen that in the former the large percentage of serious and fatal accidents are due to falls on roadways, whilst in the Westland mines they are due to falls of coal and stone in the working-faces, falls on roadways being a danger unknown in our mines. One fact to be noted is that where the faces are secured wholly by and under the direct supervision of the company's officers risk is reduced to its lowest minimum, as is the case in the Westport Coal Company's mines.

FOREIGN TRADE.

The quantity of coal shipped by the Westport Coal Company from the 1st April, 1899, to the 31st March, 1900, to ports outside the colony was 6,955 tons. This statement, compared with the preceding year's shipments, shows a decrease of 3,753 tons.

I have, &c.,

R. TENNENT,

The Under-Secretary, Mines Department, Wellington.

Inspector of Mines.

BRIQUETTE-MANUFACTURE.

The utilisation of unsaleable brown-coal slack in various parts of the colony, and of the soft bituminous coals in parts of the West Coast district, is a question which must sooner or later be taken into serious consideration.

At the brown-coal collieries there is often a very large amount of small coal which is unavoidably lost or thrown away owing to (a) the limited demand for fuel of this quality, and (b) the absence of machinery for working it up into a marketable product. There are also several areas of soft bituminous coals in the West Coast mining district which cannot be worked, except at considerable loss, under existing conditions. This coal appears to be severely crushed by nature's forces, and owing to its very friable character it will not stand the ordinary handling and transit without being smashed up into dust. It is owing in a great measure to this characteristic that the Mokihinui and Westport-Cardiff Mines had to suspend operations. There is also a considerable area of soft coal in part of the Westport Coal Company's property at Granity Creek.

That this coal, which is now unsaleable by reason of the conditions referred to, can be worked up into a valuable fuel is evidenced by the fact that the slack produced at brown-coal mines in parts of continental Europe is manufactured into good briquettes, as is also the slack at many of the bituminous-coal mines of England, America, and elsewhere.

In order to present some information as to the methods of doing this, and of the machinery required, I have been in communication with manufacturers of briquette-making plants and others. Their replies have enabled me to give the following general particulars.

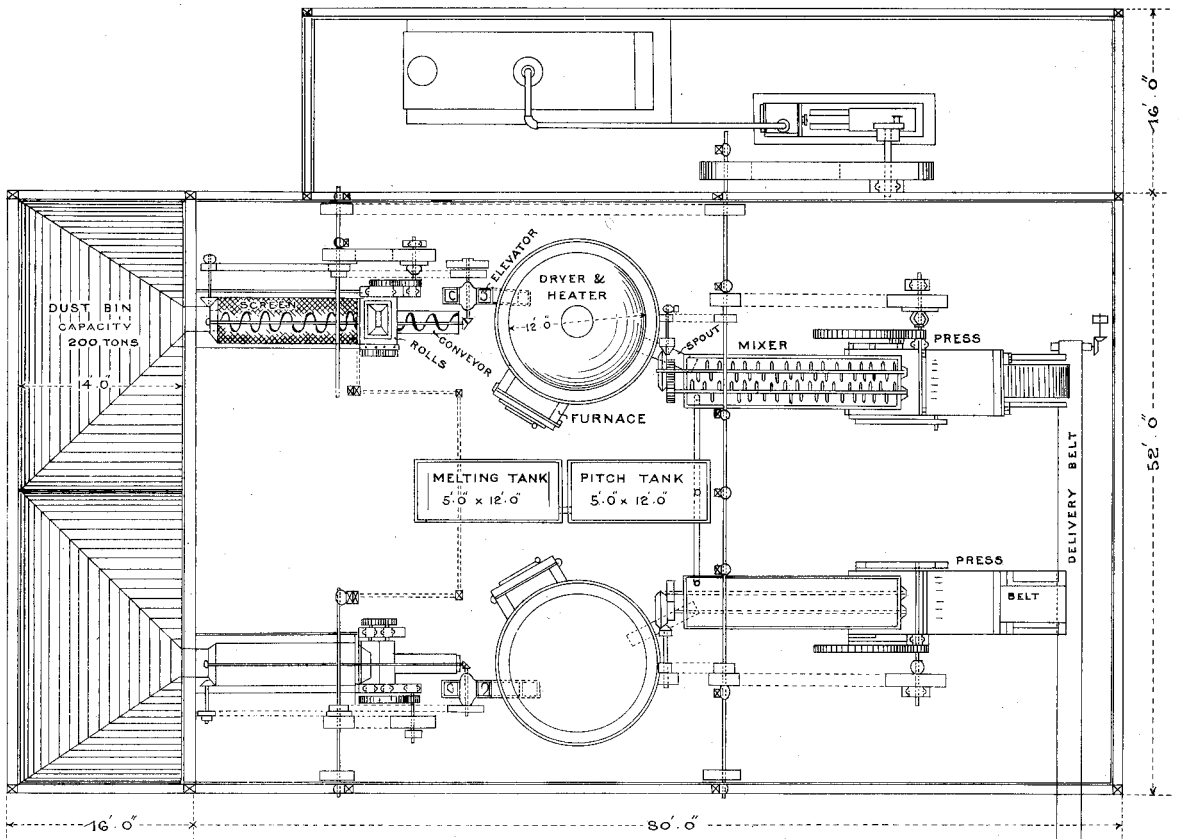
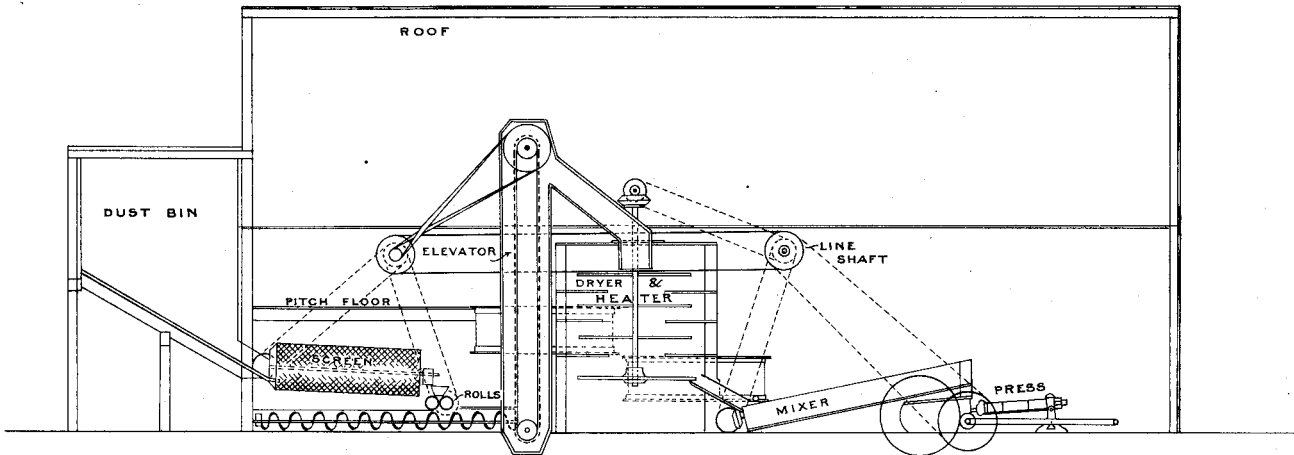
Small coal is, when necessary, still further reduced in size by suitable grinding machinery, then mixed at a fairly high temperature with coal-tar pitch or other suitable binding material. It is then run into moulds and subjected to heavy pressure, the result being a "briquette" of compressed fuel. It is claimed for briquettes that they are superior to lump coal, being really denser than the actual lump, and will burn from the outside thoroughly to the centre without decrepitating under the heat. Other claims are: Non-disintegration from atmospheric influences, cleanliness in handling, and compactness in storage; this latter feature commending itself more particularly in connection with use on steamships.

Some five years ago the manufacture of briquettes was commenced at Morwell, Victoria. Notwithstanding that the material operated on was a coarse lignite, containing (I am informed) 50 per cent. of moisture, very good briquettes were made from it, but owing to various causes—want of sufficient capital being given as the principal one—the work has recently been stopped, and the plant sold by the assignees. The machinery was built by the Austral Otis Engineering Company (Limited) of South Melbourne, and consisted of crushing-rolls, dryers, finishing-rolls for fine crushing, and briquette machine-press. Its capacity was 30 tons of briquettes in twenty-four

— BRIQUETTE PLANT. —

— by the —
 — Henry S. Mould & Co., Pittsburg, Pa. U.S.A. —

Scale of Feet
 0 5 10 20 30



C.H.P. del.

hours, each briquette being 1 lb. in weight. It was necessary to dry the lignite until neither more nor less than 10 per cent. of moisture was retained, and I understand the grinding and compression took place at such a temperature as rendered the addition of a binding material unnecessary. The relative value of these briquettes to the material from which they were made was as $2\frac{1}{2}$ to 1, or, in other words, $2\frac{1}{2}$ tons of lignite gave only the same results as 1 ton of briquettes.

Some of this lignite was sent to Germany for trial, but it appears that the machinery in use there would not deal with the Victorian article, as it was so much more difficult to treat than the German brown coals. It is also contended that bituminous small coal does not require anything like so elaborate a plant as is necessary for lignite.

As the composition of the brown coals of New Zealand appears to compare closely with those used for successful briquette-manufacture in Germany, there does not seem any great difficulty in the way of turning the small coal (now wasted) to good use, provided the cost of treatment is not too great.

The Henry S. Mould Company, Carnegie Building, Pittsburgh, Pa., U.S.A., are the sole licensees of B. C. White's patents in connection with briquette machinery, Messrs. R. R. Hunt and Co., of Shortland Street, Auckland, being colonial agents. The president of the company, under date the 18th January last, sent me a description of the plant, together with a drawing (which is reproduced) showing general arrangements. These, however, are not always adhered to, local conditions often necessitating alterations. The president states, "If there is available in your country any coal-tar pitch or low-grade asphalt at reasonable cost, there is no question but that the briquetting of the lignite and soft bituminous coals could be done very satisfactorily and profitably. . . . The general process is as follows: From a storage-bin the coal is automatically fed into a revolving screen of about 8 mesh, through which the coal that is in condition for briquetting falls to a trough with screw conveyor, at the end of which the coal-dust is elevated into heater; that which is too coarse for briquetting goes through crushing-rolls and then to the heater. The coal is brought up to a temperature of about 300° Fahr., and passes to double-bladed screw conveying mixer, at the bottom of which, from suitable tanks, the hot pitch is introduced in proper proportion, the mass thoroughly mixed, conveyed to the hopper of the press, where the briquettes are formed and ejected on to a carrier-belt, which takes them to storage-bins or cars. Owing to the very great pressure which we produce with our press, we are enabled to briquette the bituminous coals of this country (United States) with as low as 4 per cent. of pitch as a binder, and with some of our western lignites we can successfully briquette with 6 per cent. The process is entirely automatic, and the labour-cost consequently low. The briquettes made by our presses will stand transportation without much breakage, atmospheric influences without disintegration, and will not decrepitate when burning, but will burn from the outside to the centre, leaving a fine clean ash."

From the description of the press it appears that the pressure may be regulated from 0 to 5 tons per square inch to suit requirements; also that briquettes may be made in various thicknesses. The machines are built in three sizes—viz., 12-, 25-, and 50-tons capacity in ten hours, the briquettes turned out by the large size press being 3 in. in diameter by 3 in. long, and weighing a little over 1 lb. each, but size and shape can be altered, if desired, to suit requirements.

Sir James Hector, F.G.S., has given a considerable amount of attention to the question of utilising the small coal now thrown away at brown-coal collieries. He maintains that briquettes can be successfully made from brown-coal slack by heat and pressure, and without any agglomerant (or binding material) being added; and from evidence I have been able to obtain it would appear that this is the principle of the process adopted in Germany and Austria. My own view of the matter is that the heat to which the slack is subjected is sufficient to cause a partial exudation of its oily or tarry constituents, and that these act as an agglomerant in conjunction with the pressure to which the material is subjected.

It is stated in a Victorian parliamentary paper dealing with this question "that in the German process the coal is pressed when the bituminous or oily matter contained in it is at smelting-point." An English correspondent states, "We have no experience of brown coals in this country. The only place, so far as I know, where brown coals are made into compressed fuel is, I think, in Westphalia (Germany), where they have an extremely rich brown coal, which is passed through heaters and partially distilled. Notwithstanding this partial distillation, there is enough bituminous matter left to compress the coal into blocks."

The two quotations given would seem to support my views, but in discussing the question with Sir James Hector I found that he holds the opinion that chemical as well as mechanical influences are responsible for the results obtained, oxygen being set free by the drying process, the result being a direct combination of the hydrogen and carbon contained in the coal, which would materially assist in producing a compact block.

In dealing with bituminous coal for briquette-manufacture, it would appear that experience has demonstrated the necessity of using pitch or some other binding material, and, as a matter of fact, the several plants of English and American manufacturers of which I have particulars are all designed for the incorporation of an agglomerant with the crushed coal. The machines chiefly used in Great Britain are made by the Uskside Engineering Company (Limited), Newport, Monmouthshire, and Mr. Robert Middleton, Sheepscar Foundry, Leeds. Machines by one or other of these makers are also in use in America, India, China, Australia, and other parts of the world. The general method of manufacture does not vary a great deal from that of the White (American) process already described, except that the pitch is merely reduced in a mill (instead of being melted) before being mixed with the coal. Both pitch and coal are treated by the disintegrator together, the object being to thoroughly mix the two as well as to reduce them to proper size—fine grinding being said, by one maker at least, to be a mistake. After leaving the disintegrator, the material is elevated to a vertical pug-mill, which

is steam-heated either by steam-jacketing or by the introduction of jets of dry steam direct into the mill or heater. This causes the pitch which is distributed through the coal to become melted, and the mass is thus rendered partially plastic. It is then passed into the press, and emerges as finished briquettes.

As to the pressure to which coal briquettes should be subjected there appears to be a diversity of opinion. Mr. Middleton makes his machines to exert a double pressure (*i.e.*, in both directions), capable of regulation from 10 cwt. to upwards of 2 tons per square inch. Heavy pressure, as adopted by Mr. Middleton, agrees with American practice. The Uskside Company adopt pressure in one direction only. This is about 12 cwt. to the square inch, which they contend is found ample for all practical purposes, claiming that, as the result of experience in South Wales, the pressure used should be as light as is consistent with making a solid briquette, as any unnecessary pressure has the effect of crushing the coal in the process of compression and reducing it to a fine dust, which requires more pitch for its combination, and does not burn so freely as fuel composed of large particles.

Working-costs will vary according to the spot-value of slack. Where there is no outlet for brown-coal slack, and expense has to be incurred in removing it, the prime cost of material may be taken as *nil*; the cost of briquettes being that of the necessary steam-production, labour, wear-and-tear, interest on capital, and depreciation.

With bituminous coals the cost would work out somewhat as follows (colonial rates of wages being considered) for a 5-tons-per-hour plant :—

Labour (say)	...	s. d.	
Pitch (say, 5 per cent. proportion) ...	...	1 0	per ton of briquettes.
Steam-production, interest, and depreciation ...	...	2 6	"
		1 0	"
		4 6	"

to which must be added the value of slack.

The actual cost of production at a large colliery in North Staffordshire averaged throughout a year, allowing for interest and depreciation, is given at 3s. 2½d. per ton; slack is valued at 4s. 10d. : total cost of briquettes, 8s. 0½d. per ton. Two presses are used, and turn out 8½ tons per hour.

Owing to the amount of drying required in treating brown coals, the cost of labour and steam would be higher than for bituminous coals, but as against that there is the absence of cost for pitch or other agglomerant. It is also stated that briquettes made from brown-coal slack may be greatly improved in quality by the addition of, say, 5 per cent. of patent petolite compound.

The cost in England of complete plants of various sizes is quoted as follows (subject to alteration) :—

Mr. R. Middleton.

		£	s.	d.
Capacity, 1 ton per hour	...	430	0	0
" 2½ tons per hour	...	845	0	0
" 5 "	...	1,385	0	0
" 10 "	...	1,895	0	0

F.O.B., Hull or Liverpool. Engines and boilers extra.

The Uskside Engineering Company (Limited).

Capacity, 1 ton per hour	£425, or £650 with engine and boiler.
" 2½ tons per hour	£740, " £1,150
" 5 "	£1,060, " £1,750
" 10 "	£1,600, " £2,730

F.O.B., London or Liverpool.

It must be remembered that the machines just quoted are as made for dealing with bituminous-coal slack; some extra drying arrangements would be necessary for brown coals.

There appears to be no question as to the importance of briquette-manufacture in the future, and it is to be regretted that so much material as could be advantageously worked up into valuable fuel is now going to waste. If what has already been done with brown coal in Germany is fully recognised, the possibilities of success in this colony should be apparent, and the value of a fuel eminently suitable for use in locomotives and steamships, as well as general purposes, and which can be made from what is now waste material, is obvious.

By the courtesy of manufacturers of briquette-making plant, I am enabled to give illustrations of the machinery.

J. HAYES, Inspecting Engineer.

LIST OF ILLUSTRATIONS.

1. General arrangements of American briquette plant.
2. Section showing arrangement of Middleton's briquette plant (R. Middleton, engineer, Sheepscar Foundry, Leeds, England).
3. General ground-plan arrangements of briquette plant
4. Sectional view of same
5. Illustration of briquette-press
6. Section of same
7. Illustration of portable briquette plant suitable for coal-merchants' use

The Uskside
Engineering Company
(Limited),
Newport, Mon.,
England.

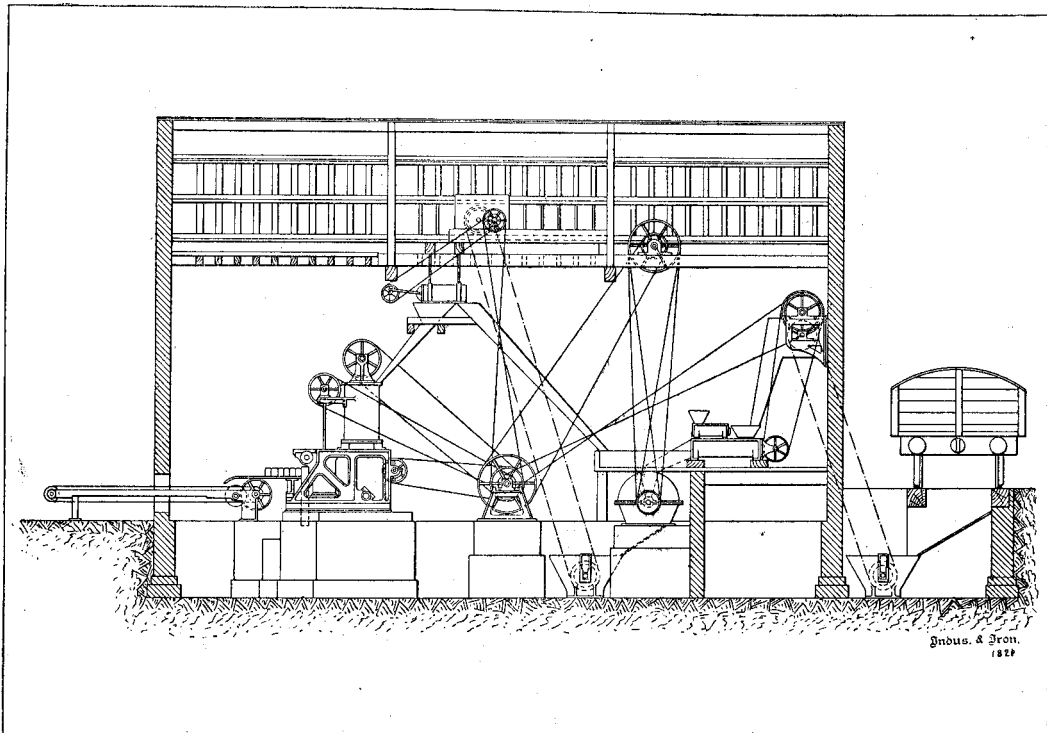


Fig. 2.—Section showing arrangement of Middleton's briquette plant.

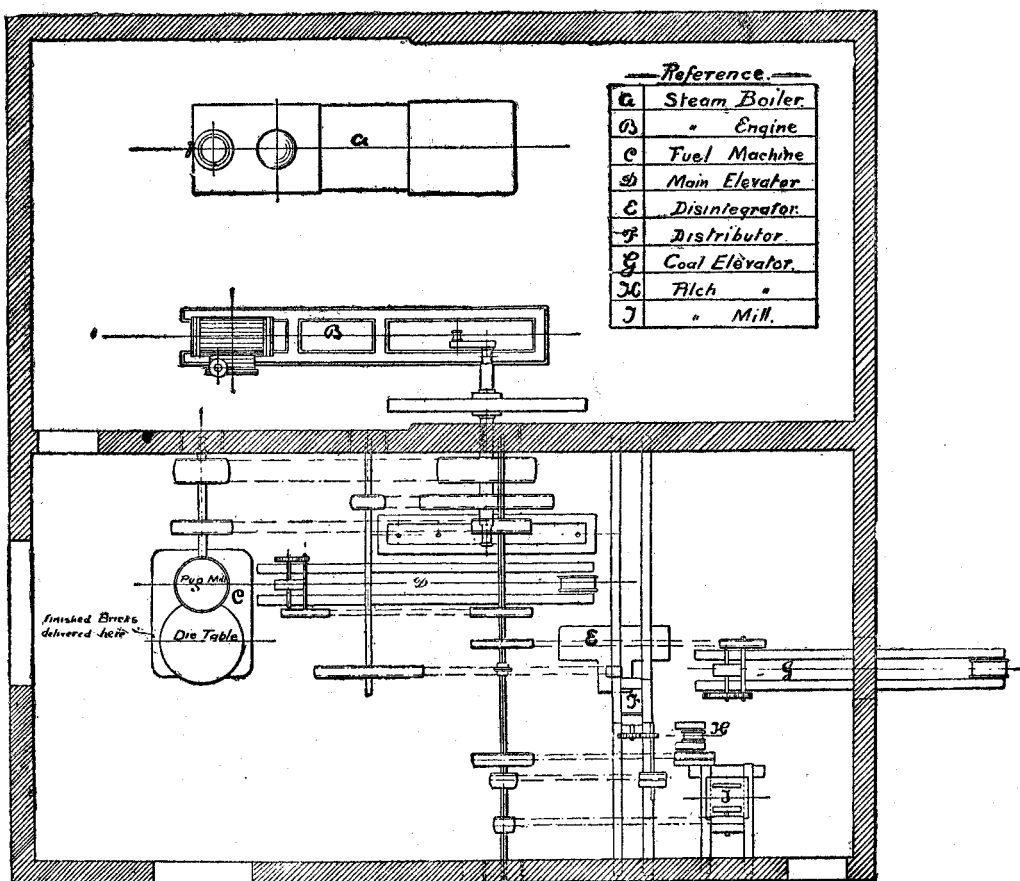


Fig. 3.—General ground-plan arrangements of briquette plant.

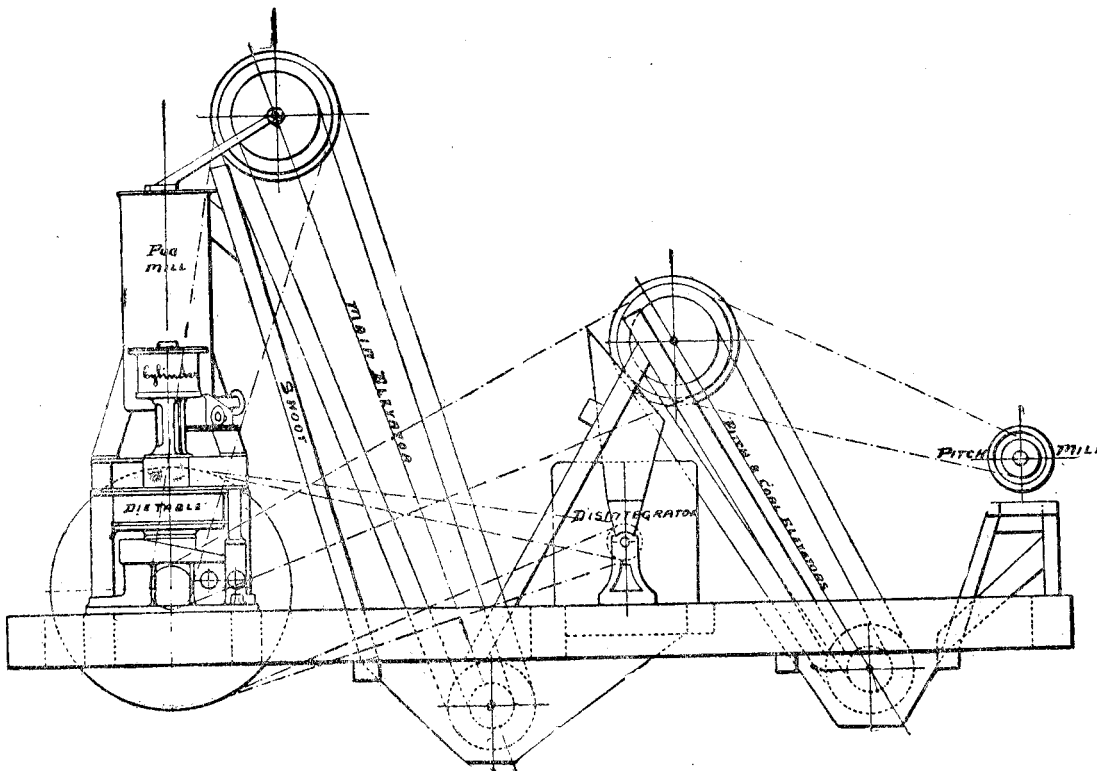


Fig. 4.—Sectional view of briquette plant.

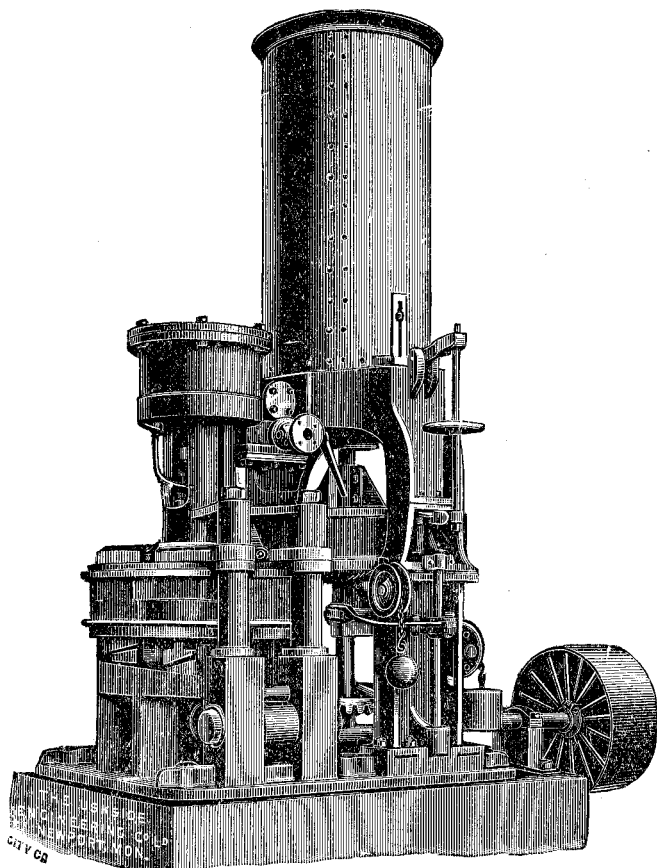


Fig. 5.—Illustration of briquette-press.

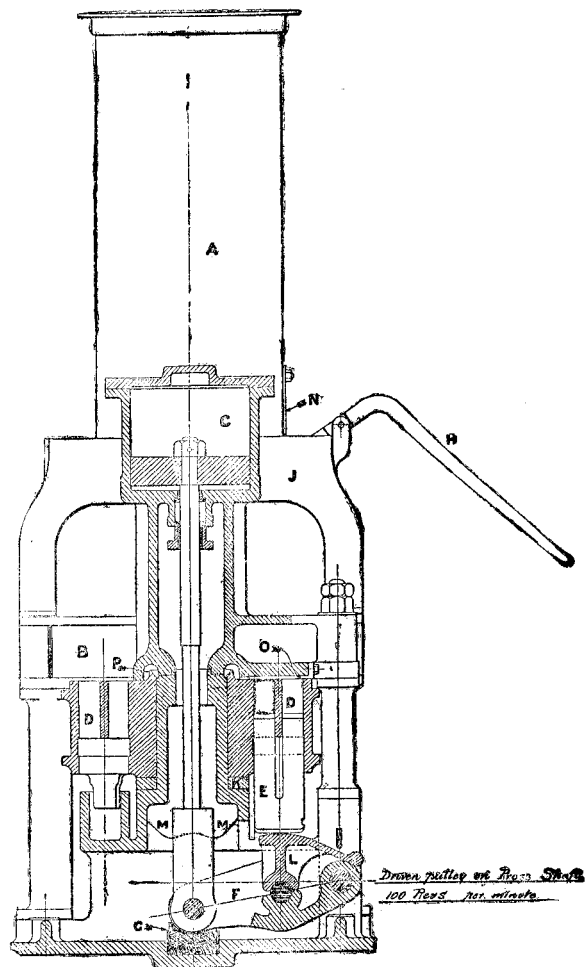


Fig. 6.—Section of briquette press.

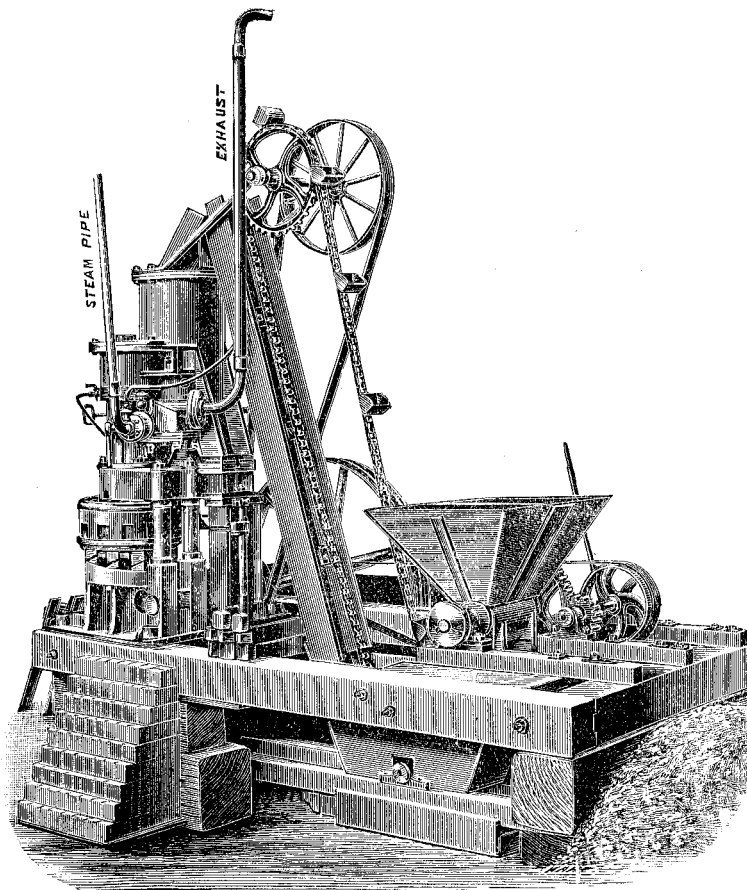


Fig. 7.—Illustration of portable briquette plant suitable for coal-merchants' use.

STATISTICS OF WORKINGS IN COAL-MINES, 1899.

C.—3A.

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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 1899.			Approximate Total Output to 31st December, 1898.	Approximate Total Output to 31st December, 1899.	Number of Men ordinarily employed.		Power used for drawing Mineral.	Pumps.			Means of Ventilation.	Date of Inspector's Last Visit.	
										Size of Shaft or Adit.	Depth of Shaft or Length of Adit.		Coal.	Slack.	Total.			Above.	Below.		Total.	Stroke.	Size of Barrel.			Height of Column.
NORTH ISLAND.																										
KAWAKAWA DISTRICT.																										
Kawakawa (stopped)	..	..	semi-bitum.	..	..	..	..	..	..	..	..	..	Tons.	Tons.	Tons.	794,865	794,865	..	..	..	..	..	..	natural	14/11/99	
Kawakawa Mine (late New Bay of Islands Company)	Hislop, Robert ..	5½	ditto	1	2' to 4'	the whole	1 in 5	bord and pillar	1	5' x 5'	..	adit	3,945	..	3,945	48,797	52,742	2	5	7	horse	..	..	..	..	
Hikurangi District.																										
Hikurangi Coal Company ..	Moody, T. P. ..	6	"	1	7' to 12'	average 9'	1 in 6	ditto	8	7' x 6'	330'	engine incline-plane adit	34,037	..	34,037	124,674	158,711	4	47	51	steam	2 hand-pumps	..	..	"	15/11/99
Hikurangi Colliery Company	Kerr, George ..	3	"	1	14'	9'	irregular	"	2	6' x 9'	..	adit	13,656	..	13,656	16,421	30,077	4	18	22	hand	..	..	..	..	
West Bryans (stopped)	..	..	"	..	..	..	..	..	..	..	..	..	23	..	23	34,325	34,348	..	..	..	..	..	..	..	..	
Phoenix (stopped)	..	..	"	..	..	..	..	..	..	..	..	..	..	..	..	11,823	11,823	..	..	..	..	..	..	..	..	
Walton & Graham's (stopped)	..	..	"	..	..	..	..	..	..	..	..	..	..	..	..	1,210	1,210	..	..	..	..	..	..	..	..	
WHANGAREI DISTRICT.																										
Kamo (stopped)	..	..	"	..	..	..	..	..	..	..	..	adit	949	100	1,049	225,037	225,037	..	..	4	hand	..	..	..	7/7/99	
Kamo, New ..	McDonald, Donald ..	5½	brown	28'	and 5'	average 6' 6"	1 in 8	bord and pillar	1	16½' x 4½'	175'	..	..	..	..	70,853	70,853	..	..	..	..	..	..	..	natural	..
Whauwhau (stopped)	..	..	"	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
Ngunguru District.																										
Ngunguru Mine ..	Taylor, A. H. ..	7	semi-bitum.	1	3' to 7'	the whole	1 in 8	bord and pillar	2	7' x 5' 4' x 2'	1,716' 600'	adit and engine-plane adit	13,004	..	13,004	87,542	100,546	12	27	39	steam-engine & horse	6"	2½"	35'	natural	16/11/99
Kiripaka Coal-mine	Climo, George ..	1	ditto	1	20'	14'	1 in 4	ditto	1	7' x 5'	462'	adit	1,609	..	1,609	..	..	1	6	7	hand	..	..	..	"	16/11/99
Waikato District.																										
*Waikato Mine (stopped)	..	..	"	..	..	..	..	..	..	..	..	shaft	1,963	..	1,963	207,126	209,089	..	..	74	steam-engine	16½"	7"	170'	fan	24/11/99
*Taupiri Extended	Cochrane, N. D. ..	13	"	1	120' to 50'	7' to 20'	varies, but about 1 in 7	bord and pillar	2	10' diam.	170' 204'	adit	30,302	511	30,813	581,099	611,912	12	62	74	..	..	..	..	..	..
*Taupiri Reserve	"	13	"	1	118' to 24'	10' to 16'	about 1 in 7	ditto	1	9' x 6' 7"	50'	engine-plane shaft	6,329	156	6,485	176,336	182,821	8	32	40	ditto	14"	5"	204'	exhaust	24/11/99
*Ralph's Taupiri	"	2	"	1	150' to 60'	7' to 20'	about 1 in 7	"	2	10' x 5'	190'	..	29,108	560	29,668	12,725	42,393	11	60	71	"	12"	6"	132'	steam	23/11/99
Ralph's (stopped)	..	..	"	..	..	..	..	..	..	..	..	adit	..	..	..	23,019	23,019	..	..	..	..	..	..	..	..	..
Mokau District.																										
Mokau Mine	Cherrie, Robert ..	15	brown	1	7' 6"	the whole 5'	1 in 36	bord and pillar	1	6' x 6'	990'	adit	3,483	..	3,483	16,108	19,591	3	8	11	hand	..	..	..	natural	29/1/00
Fernside Mine	Lo J. ..	2	"	1	5'	..	1 in 12	ditto	1	7' x 5' 6' x 4'	486'	"	1,393	..	1,393	657½	2,050½	1	3	4	"	..	..	..	"	29/1/00
Co-operative (stopped)	..	..	"	..	..	..	..	..	..	..	..	..	..	..	..	940	940	..	..	..	..	..	..	..	..	..
MIRANDA DISTRICT.																										
Miranda (stopped)	..	..	"	..	..	..	..	..	..	..	..	..	..	..	..	20,668	20,668	..	..	..	..	..	..	..	..	..
BOMBAY DISTRICT.																										
Bombay (stopped)	..	..	"	..	..	..	..	..	..	..	..	..	..	..	..	81½	81½	..	..	..	..	..	..	..	..	..
Totals, North Island	..	..	..	..	..	..	..	..	..	..	..	..	139,801	1,327	141,128	2,462,160	2,603,388	59	271	330	..	..	..	..	..	..

* These four mines are now included in the Taupiri Coal-mining Company (Limited).

NELSON.			MIDDLE ISLAND.										19/2/00		
Owner	Miner	Mineral	Quantity	Value	Area	Depth	Direction	Notes	Remarks	Remarks	Remarks	Remarks	Remarks	Remarks	Remarks
Enner Glynn	Wise, George	4 semi-bitum.	1 5'	all	vertical	2 8' x 4'	..	..	1,337	1,337	2	2	..	..	natural
COLLINGWOOD.															
Pakawau	Walker, James	5 bitum.	1 4' 6"	"	1 in 4	longwall	..	adit	1,726	1,726	4	4	horse	..	11/9/99
Puponga	Taylor, Joseph	5 "	4 2' to 5'	"	1 in 10	tunnels	..	"	200	200	2	4	"	..	11/9/99
Mines not now at work.															
Wallsend	..	..	..	..	..	..	..	..	47,413	47,413	..	..	..	..	..
TAKAKA.															
Mines not now at work.	Golding, J. E.	1 semi-bitum.	2 2' 9"	all	flat	bord and pillar	..	adit	90	130	4	4	..	..	17/9/99
Motupipi	..	..	..	..	..	..	..	..	70	70	..	..	..	..	..
Takaka	..	..	..	..	..	..	..	..	25,729	192,514	20	90	110	..	19/9/99
Westport-Cardiff	Broome, G. H.	7 bitum.	1 17'	all	varies	bord and pillar	..	adit and incline	105,586	19,831	125,417	160	197	..	25/9/99
Millerton	Green, John	8 "	1 4' to 40'	10'	"	ditto	..	ditto	169,724	32,790	202,514	241	332	..	21/12/99
Coalbrookdale	Dunn, W.	19 "	2 4' to 20'	all	"	"	..	adit	868	868	..	..	..	..	22/12/99
Ironbridge	Milligan, N.	8 "	2 4' to 20'	"	"	"	..	"	43,074	43,074	..	..	..	..	..
Mines not now at work.	Humphries, J.	30 lignite	1 14'	"	..	..	..	..	25	774	1	1	horse	..	2/11/99
Waitakere	..	..	..	..	..	..	..	..	160	230	2	2	..	..	2/2/00
Mokihinui	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Whitecliffs, Buller Road	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Flaxbush	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
LONGFORD.															
Mines not now at work.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Longford	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Alexander	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
BOATMAN'S.															
Mines not now at work.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Archer's Mine	Archer, F.	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Coghlan's	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Bar's	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Burke's Creek	Cairns, R.	2 semi-bitum.	1 14'	12'	varies	bord and pillar	..	adit	1,280	1,280	2	2	4	horse	7/11/99
Murray Creek	Bettes, Lewis	21 ditto	1 14'	all	"	open-face	..	..	9,622	9,622	3	3	..	..	18/11/99
Golden Treasure	Davidson, J.	18 "	1 14'	"	"	"	..	..	6,429	6,429	2	2	..	..	18/11/99
Phoenix	Fox, John	9 "	2 22' & 50'	10'	1 in 5	bord and pillar	..	adit	12,949	13,996	1	2	3	..	18/11/99
Inkerman Gold-mining Co.	Sutherland, B.	9 "	1 4' 6"	all	38°	ditto	..	"	595	749	1	1	1	windlass	14/11/99
Lankey's Creek	Lamberton, W.	17 "	1 6'	5'	1 in 4	2 5' x 6"	..	"	7,956	7,956	1	1	1	man	10/7/99
Devil's Creek	Macquham, J.	3 1/2 "	1 6'	all	3 in 14	stopping	..	"	40	40	..	..	..	..	15/11/99
Progress New Mine	Cochrane, T.	1 1/2 "	1 6'	"	30°	bord and pillar	..	"	7,357	8,633	2	2	4	"	15/11/99
Breen's	Loughnan, H.	7 "	2 6'	"	1 in 2	open-face	..	open	1,553	1,553	2	2	..	..	15/11/99
Mines not now at work.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Cochrane's	..	..	..	..	..	..	..	..	370	370	..	..	..	..	..
Reefion	..	..	..	..	..	..	..	..	40	40	..	..	..	..	..
Sir Francis Drake	..	..	..	..	..	..	..	..	2,173	2,173	..	..	..	..	..
Cumberland	..	..	..	..	..	..	..	..	1,070	1,070	..	..	..	..	..
Coal Creek	..	..	..	..	..	..	..	..	67	67	..	..	..	..	..

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 Shifts.	Dimensions of Shafts.		Output delivered by	Output for 1899.				Approximate Total Output to 31st December, 1898.	Approximate Total Output to 31st December, 1899.	Number of Men ordinarily employed.			Power used for drawing Mineral.	Pumps.			Means of Ventilation.	Date of Inspector's Last Visit.
										Size of Shaft or Adit.	Depth of Shaft or Length of Adit.		Coal.	Slack.	Total.	Above.			Below.	Total.	Stroke.		Size of Barrel.	Height of Column.			
MIDDLE ISLAND—continued.																											
GREYMOUTH.																											
Blackball ..	Leitch, James ..	9	bitum.	2	17'	15'	1 in 5	bord and pillar	2	9' x 6'	1,232'	adit	Tons. 47,489	Tons. 10,647	Tons. 58,136	Tons. 215,911	Tons. 274,047	20	70	90	steam	..	..	..	furnace	20/11/99	
Brunner Dip ..	Coulthard, J. ..	35	"	1	7'	all	1 in 4	ditto	2	10' x 7'	2,400'	"	96,511	..	96,511	1,497,516	1,594,027	37,115	152	152	"	16'	8"	165'	{ fan (nat'l	21/11/99	
Brunner Rise ..	Dando, M. ..	6	"	1	6'	"	1 in 4	"	2	10' x 7'	1,000'	"	..	..	..	..	..	21	60	81	horse	..	..	..	..	22/11/99	
<i>Mines not now at work.</i>																											
Coal-pit Heath ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	577,190	577,190	..	..	..	..	..	..	..	..	..	
Tyneside ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	18,398	18,398	..	..	..	..	..	..	..	..	..	
Wallsend ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	205,539	205,539	..	..	..	..	..	..	..	..	..	
CANTERBURY.																											
Springfield, Springfield ..	Barker, H. ..	23	brown	1	3' 3"	all	1 in 6	bord and pillar	2	6' x 4'	70'	shaft	1,536	88	1,624	81,732	83,956	2	4	6	steam	direct-acting steam	..	..	..	exhaust from pump natural	31/7/99
Sheffield, Sheffield ..	Austin Brothers ..	37	"	1	4'	"	1 in 3	ditto	..	7' x 5'	..	dip incl.	2,520	..	2,520	49,530	52,050	2	10	12	horse	..	..	..	..	1/8/99	
Homebush, Glentunnel ..	Brown, T. ..	27	"	1	7'	"	1 in 3	"	..	7' x 6'	40 ch.	adit	4,938	..	4,938	114,645	119,583	2	8	10	"	..	..	..	"	3/8/99	
St. Helen's, Whitecliffs ..	Levieck, H. ..	10	"	2	3'	"	1 in 2	"	..	6' x 4' 6"	..	"	2,324	..	2,324	2,823	5,147	1	5	6	hand	..	..	..	"	4/8/99	
Hartley, Whitecliffs ..	Leeming, W. ..	4	"	1	..	"	1 in 6	"	..	6' x 6'	3 ch.	dip tunl.	7	..	7	1,755	1,762	1	4	5	steam	..	..	..	"	3/8/98	
Mount Somers, Ashburton ..	Park, G. T. ..	35	"	1	35'	all	1 in 9	open	..	..	..	..	1,358	806	2,164	29,233	31,397	2	2	4	hand	..	..	..	"	9/8/98	
Rutherford's, Albury ..	Willetts, J. M. ..	8	"	1	22'	10'	1 in 1	narrow	1	4' x 3' 6"	68'	shaft	255	..	255	1,666	1,921	1	1	2	horse	..	..	..	"	14/9/97	
<i>Pits worked for Private Use only.</i>																											
Dalethorpe, Springfield ..	Nuthall, A. J. ..	5	brown	1	..	..	..	narrow	..	4' x 4'	..	shaft	45	..	45	124	169	..	..	..	..	..	..	..	..	..	
Snowdon, Rakai Creek ..	Gerard, W. (owner) ..	14	"	1	14'	8'	..	"	1	4' x 4'	90'	adit	121	..	121	1,247	1,368	..	..	..	..	..	..	..	..	..	
Cragieburn, West Coast Road ..	Manson, D. ..	3	"	1	12'	..	..	tunnel	..	..	7 ch.	..	32	..	32	58	90	..	..	..	..	..	..	..	..	..	
Springburn, Seavely ..	Duke, W. ..	..	"	..	..	..	..	open	..	..	..	..	100	..	100	200	1	1	2	..	..	..	..	..	..	..	
Wahao Forks, Waimate ..	MacPherson, D. ..	7	"	1	..	..	..	open	..	..	..	adit	10	..	10	161	171	..	..	..	..	..	..	..	..	..	
Studholme (Stony Creek) ..	Grant, W. ..	10	"	1	..	..	..	narrow	..	..	..	..	2	..	2	92	94	..	..	..	..	..	..	..	..	..	
Elephant Hill, Waimate ..	Blackley, J. ..	31	"	..	..	..	..	..	..	..	..	..	50	..	50	40	90	2	..	2	..	..	..	..	..	11/8/98	
<i>Pits not now at work.</i>																											
Wairiri, South Malvern ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,213	1,213	..	..	..	..	..	..	..	..	..	
Acheron, Lake Coleridge ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	503	503	..	..	..	..	..	..	..	..	..	
Kowai Pass, Springfield ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	559	559	..	..	..	..	..	..	..	..	..	
Glenroy, South Malvern ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	115	115	..	..	..	..	..	..	..	..	..	
Whitecliffs, South Malvern ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	33,051	33,051	..	..	..	..	..	..	..	..	..	
Duke's (Park Gate), Kakahu ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	916	916	..	..	..	..	..	..	..	..	..	
Spring Vale, Fairlie Creek ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	200	200	..	..	..	..	..	..	..	..	..	
Mount Hutt, Rakai Creek ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	155	155	..	..	..	..	..	..	..	..	..	
Hartley, South Malvern ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	32	32	..	..	..	..	..	..	..	..	..	

NORTH OTAGO.

Sutherland's, Wharekuri St. Andrew's, Papakaio	Sutherland, J. Nimmo, T.	21	..	..	7'	1 in 3	bord and pillar	1 14' x 2' 6"	60'	adit	539 1,620	539 1,620	150 24,557	689 26,177	1 2 4	3 5	horse	..	..	..	natural	2/11/99 27/9/99
Prince Alfred, Papakaio	Willets, J.	30	..	..	6'	1 in 5	ditto	1 4' x 4'	50'	"	1,196	1,196	41,504	42,700	2 4	6	"	..	..	..	furnace	27/9/99
Ngapara, Ngapara ..	Nimmo, W.	21	..	..	8'	1 in 4	"	6 1/2' x 4 1/2'	15 ch.	"	811	811	15,112	15,923	1 1	2	"	..	..	..	natural	8/11/99
Shag Point, Shag Point	Shore, T.	36	pitch	2	all	1 in 4	ditto and long wall	3 16 1/2' x 6'	450'	shaft	17,765	23,829	341,821	365,650	13 62	75	steam	2'	6"	450'	from putup ditto	28/9/99 26/9/99
Allandale, Shag Point	Gillanders, A.	12 1/2	"	1	"	1 in 4	bord and pillar	10' x 6'	20 ch.	dip tunl.	9,514	4,492	14,006	116,369	8 52	60	"	2'	5"	..	..	26/9/99
<i>Pits not now at work.</i>																						
Scott & Porter's (late Wade's), Kurow	Scott, D	20	brown	1	15'	vertical	stopping	1 6' x 2' 6"	53'	adit	..	..	5,459	5,459	..	..	horse	..	..	..	natural	2/11/98
Cairn's, Kurow ..	Cairns, W.B.	33	"	..	..	1 in 2 1/2	narrow	1 4' x 8'	80'	dip incl.	..	..	11,395	11,395	..	..	"	..	..	..	"	2/11/98
Phillips's, Kurow ..	..	..	..	..	..	..	..	..	..	..	..	..	1,985	1,985	..	..	"	..	..	..	..	..
Wharekuri (Collins's), Kurow	..	..	..	..	..	..	..	..	..	..	..	..	1,424	1,424	..	..	"	..	..	..	..	..
Rosebery, Otepopo	..	..	..	..	..	..	..	..	..	..	..	..	1,424	1,424	..	..	"	..	..	..	..	..
Early Bank, Otepopo	..	..	..	..	..	..	..	..	..	..	..	..	281	281	..	..	"	..	..	..	..	..
South Otago.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Fernhill, Abbotsford	Gray, J.	22	brown	1	19'	1 in 10	bord and pillar	1 14 1/2' x 4 1/2'	..	adit	153	4,047	4,200	122,591	4 11	15	horse	..	..	..	natural	13/11/99
Freeman's, Abbotsford	Hill, R.	18 1/2	"	1	6' to 8'	1 in 9	ditto	3 5' x 3 1/2'	125'	incline	4,032	3,682	7,714	227,775	3 17	20	steam	..	..	..	steam	20/12/99
Walton Park, Walton Park ..	Kenyon, J.	29	"	1	15' to 17'	1 in 9	"	3 6' x 4', 12' x 4'	25' to 175'	"	9,173	525	9,698	522,023	4 15	19	horse	..	..	..	natural	19/12/99
Jubilee, Saddle Hill	Louden, J.	2	"	1	18'	..	"	..	..	adit	6,975	1,538	8,513	3,066	3 10	13	"	..	..	..	"	19/12/99
Saddle Hill, Saddle Hill	Christie, J.	25	"	1	19'	1 in 10	"	3 5' x 2'	50'	incline	1,123	4,730	5,853	93,330	2 7	9	"	..	..	..	"	18/12/99
Burnwell, Saddle Hill	Harris, A.	8	"	1	16'	variable	"	1 5' x 3'	30'	"	1,804	2,801	4,605	8,692	7 5	12	"	..	..	..	"	18/12/99
Glenochiel, Saddle Hill	Bryce, D.	18 1/2	"	1	16'	1 in 10	"	1 8' x 4'	43'	"	2,295	2,295	19,125	21,420	1 3	4	"	..	..	..	"	13/11/99
Mosgiel, Saddle Hill	Sneddon, J.	16	"	1	15'	1 in 10	"	2 4' x 4'	27' to 32'	"	1,606	4,653	6,259	67,682	3 8	11	steam	..	..	..	"	16/12/99
Lauriston, Brighton	Walker, J.	13	"	1	6'	variable	"	1	48'	"	239	90	329	4,458	1 2	3	horse	..	..	..	"	30/12/99
McColl's, Brighton ..	McColl, D. L.	11	"	1	6'	"	"	..	..	adit	40	..	40	1,032	1 1	2	"	..	..	..	"	30/12/99
Bruce, Milton	Young, A.	31 1/2	"	1	15'	1 in 8	"	..	..	"	612	..	612	21,556	2 2	2	hand	..	..	..	"	8/11/99
Strip-and-at-it, Milton	Hardwick, N.	5	"	1	8'	..	"	..	..	"	37	..	37	491	..	1	"	..	..	..	"	8/11/99
Reid's, Akatore, Milton	Reid, James	5	"	1	14'	all	"	..	..	"	..	..	..	244	..	..	"	..	..	..	"	7/11/99
Fortification, Milton	Hughes, J.	2 1/2	"	1	20'	1 in 8	"	1 4' x 4'	..	dip	1,414	71	1,485	3,426	1 3	4	steam	..	..	..	"	8/11/99
McGilp's, Milton ..	McGilp, N.	..	"	1	20'	..	open	..	..	open	429	..	429	901	1 2	3	hand	..	..	..	"	8/11/99
Early Bank, Milton	Love, A.	0 1/2	"	1	..	..	open	..	..	open	254	..	254	1,472	1 1	2	"	..	..	..	"	8/11/99
Adam's Flat, Adam's Flat	Reid, John	17	lignite	1	14'	..	open	..	..	open	51	..	51	2,048	1 1	2	"	..	..	..	"	8/11/99
Paskell's, Adam's Flat	Paskell, J.	35	"	1	8'	1 in 6	"	..	..	"	25	4	29	418	1 1	2	"	..	..	..	"	7/11/99
Wallend, Lovell's Flat	Hewison, R.	29	"	1	20'	1 in 6	"	..	..	"	342	..	342	9,878	2 ..	2	"	..	..	..	"	27/10/98
Lovell's Flat, Lovell's Flat ..	Carruthers, J.	5	brown	1	16'	1 in 6	bord and pillar	2 11' x 4'	465'	shaft	336	251	587	18,937	13 6	19	steam	..	..	..	natural	2/11/99
Tuakitoto, Lovell's Flat	McDougal, M.	10	"	1	20'	..	ditto	1 ..	..	incline	160	..	160	2,900	..	..	horse	..	..	..	"	2/11/99
Benhar, Stirling ..	McSkimming, P.	36	"	1	30'	..	"	2 4' x 4'	..	"	2,440	428	2,868	90,651	2 3	5	"	..	..	..	"	3/11/99
Mount Wallace, Stirling	Shaw, George	5	"	1	14'	8' to 10'	"	..	..	adit	756	10	766	1,574	1 1	1	hand	..	..	..	"	15/7/98
Kaitangata (including Castle Hill, Kaitangata)	Shore, W. M. (W. P. Watson, gene- ral manager)	(23 6	"	2	10' to 40'	variable	"	2 13' x 5' 6" & 6' dia. 1 10' diam. 11' x 6' 6"	704'	incline & shaft tunnel	69,811	41,699	111,510	1,145,598	28 209	237	steam	..	..	..	furnace	1/11/99
Wangaloa, Kaitangata	Smith, J.	19	"	1	5' to 15'	..	bord and pillar	..	..	adit	..	..	39,262	39,262	..	..	"	..	..	..	"	3/11/99
Conical Hills, Waipahi Valley Road, Pukerau	Lischmuir, F. Orchard, E. R.	13 1/2 ..	lignite ..	1	15'	..	open	..	..	open	2,924	..	2,924	19,810	4 ..	4	horse	..	..	..	natural	2/11/99
<i>Pits worked for Private Use only.</i>																						
Taratu, Kaitangata	Fraser, H. H.	27	brown	1	..	..	adit	..	..	adit	60	..	60	73	1 1	1	hand	..	..	..	..	..

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 1899.			Approximate Total Output to 31st December, 1898.	Approximate Total Output to 31st December, 1899.	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.		
MIDDLE ISLAND—continued.																									
SOUTH OTAGO—continued.																									
Pits not now at work.																									
Record, Kaitangata	..	..	..	..	..	..	..	..	..	..	..	..	Tons.	Tons.	Tons.	414	414	..	..	..	..	..	..	2/11/99	
Early Rise, Milton..	..	..	..	..	..	..	..	..	..	..	..	..	15	15	15	15	15	..	..	..	..	..	..	..	
Chain Hills, Abbotstford	..	..	..	..	..	..	..	..	..	..	..	..	842	842	842	842	842	..	..	..	..	..	..	..	
Salisbury, Mosgiel ..	..	..	..	..	..	..	..	..	..	..	..	..	4,433	4,433	4,433	4,433	4,433	..	..	..	..	..	..	..	
Bruce No. 2, Milton	..	..	..	..	..	..	..	..	..	..	..	..	23,322	23,322	23,322	23,322	23,322	..	..	..	..	..	..	..	
Rigfoot, Stirling ..	..	..	..	..	..	..	..	..	..	..	..	..	5,163	5,163	5,163	5,163	5,163	..	..	..	..	..	..	..	
Morrison's, Stirling	..	..	..	..	..	..	..	..	..	..	..	..	646	646	646	646	646	..	..	..	..	..	..	..	
Pomahaka, Pomahaka	..	..	..	..	..	..	..	..	..	..	..	..	20	20	20	20	20	..	..	..	..	..	..	..	
Castle Hill No. 1, Kaitangata	..	..	..	..	..	..	..	..	..	..	..	..	9,314	9,314	9,314	9,314	9,314	..	..	..	..	..	..	..	
Grothead, Kaitangata	..	..	..	..	..	..	..	..	..	..	..	..	6,713	6,713	6,713	6,713	6,713	..	..	..	..	..	..	..	
Langridge, Kaitangata	..	..	..	..	..	..	..	..	..	..	..	..	693	693	693	693	693	..	..	..	..	..	..	..	
Lakeside, Kaitangata	..	..	..	..	..	..	..	..	..	..	..	..	700	700	700	700	700	..	..	..	..	..	..	..	
Lesmahagow, Kaitangata	..	..	..	..	..	..	..	..	..	..	..	..	1,511	1,511	1,511	1,511	1,511	..	..	..	..	..	..	..	
Cowpan's Owaka ..	..	..	..	..	..	..	..	..	..	..	..	..	95	95	95	95	95	..	..	..	..	..	..	..	
Shennan's, Waipahi	..	..	..	..	..	..	..	..	..	..	..	..	45	45	45	45	45	..	..	..	..	..	..	..	
CENTRAL OTAGO.																									
Coal Creek, Roxburgh	..	29	lignite	1	unknown	50'	variable	open	..	..	..	open	1,533	1,533	16,883	18,416	5	..	5	horse	..	..	..	18/1/99	
McPherson's, Roxburgh	..	29	"	1	"	30' to 40'	"	"	..	..	..	"	2,397	2,397	16,513	18,910	3	..	3	"	..	..	..	18/1/99	
Perseverance, Roxburgh	..	12	"	1	99'	70'	vertical	adit	..	..	..	adit	1,280	1,280	11,660	12,940	3	2	5	hand	..	..	natural	18/1/99	
Black Diamond, Roxburgh	..	..	"	..	..	..	..	..	..	..	..	..	15	15	178	193	..	..	..	..	..	..	..	18/1/99	
Drumney's, Alexandra	..	..	"	..	..	..	..	..	..	..	..	..	156	156	9	165	1	1	2	hand	..	..	..	18/1/99	
Thomson, W. A. ..	..	19	brown	1	14'	7'	..	adit	..	..	..	adit	5,027	5,027	26,308	33,835	2	6	8	horse	..	..	..	17/9/98	
McQueenville, Alexandra	..	12	"	1	14'	7'	..	shaft	..	..	..	shaft	6,995	6,995	21,439	28,484	3	9	12	"	..	..	..	8/5/99	
Simpson, Theyers, Alexandra	..	21	"	1	..	..	..	..	..	..	..	..	190	190	1,446	1,636	3	4	7	"	..	..	..	17/9/98	
Undaunted, Alexandra	..	05	"	..	..	..	..	..	..	..	..	..	3	3	8	8	..	..	..	..	..	..	..	..	
Cambrian's, Cambrian's	..	15	lignite	1	9'	all	..	open	..	..	..	open	405	405	12,814	13,219	3	..	3	horse	..	..	..	21/9/98	
Welshman's Gully, Cambrian's	..	38	"	1	30'	"	..	"	..	..	..	"	2,025	2,025	24,613	26,638	4	..	4	"	..	..	..	21/9/98	
Blackstone Hill, Blackstone Hill	..	33	"	1	unknown	16'	..	"	..	..	..	"	102	102	2,219	2,321	1	..	1	"	..	..	..	22/9/98	
Price's, Blackstone Hill	..	2	"	1	..	..	..	"	..	..	..	"	20	20	20	40	..	..	..	hand	..	..	..	..	
Padgett's, Blackstone Hill	..	2	"	1	..	..	..	"	..	..	..	"	..	46	46	..	..	..	..	..	..	..	..	..	
St. Bathian's, St. Bathian's	..	2	"	1	..	..	..	"	..	..	..	"	442	442	458	900	2	..	2	horse	..	..	..	22/9/98	
Rough Ridge, Idaburn	..	13	"	1	35'	all	..	"	..	..	..	"	546	546	12,720	13,266	3	..	3	"	..	..	..	22/9/98	
McLean's, Idaburn	..	..	"	1	..	..	..	"	..	..	..	"	145	145	732	877	1	1	2	"	..	..	..	22/9/98	
Idaburn, Idaburn	..	29	"	1	20'	"	..	"	..	..	..	"	837	837	29,999	30,836	1	1	2	"	..	..	..	22/9/98	
Border, Idaburn ..	..	29	"	1	12'	"	..	"	..	..	..	"	372	372	4,807	5,179	1	..	1	"	..	..	..	18/11/97	
Gimnerburn, Gimnerburn	..	34	"	1	12'	"	..	"	..	..	..	"	192	192	2,325	2,517	2	..	2	hand	..	..	..	..	
Commercial, Kyeburn	..	20	brown	1	10'	8'	vertical	shaft	..	..	..	shaft	326	326	12,267	12,593	1	2	3	water	..	..	natural	23/9/98	
Dairy Creek, Clyde	..	27	"	1	unknown	..	..	incline	..	..	..	incline	1,116	1,116	4,415	5,531	1	4	5	band	..	..	..	1/3/99	
Vincent, Clyde	..	..	"	..	..	..	..	..	..	..	..	..	3,545	3,545	1,140	3,685	2	4	6	band	..	..	..	1/3/99	
Cromwell, Cromwell	..	4	"	1	..	..	..	shaft	..	..	..	shaft	529	529	1,546	2,219	4	7	11	horse	..	..	..	3/3/99	

Cooper's, Cronwell	Cooper, J.	..	1	30'	10'	1 in 4	open	6' x 7'	530'	adit	open	320	320	4	hand	18/1/99
Cardrona, Cardrona	McDougall, R.	..	1	30'	10'	1 in 4	open	6' x 7'	530'	adit	open	7,025	7,066	2	4	24/11/99
Gibbston Saddle, Gibbston	Macale, M.	13	1	30'	10'	1 in 4	open	6' x 7'	530'	adit	open	3,856	3,856	2	2	16/11/99
Kawarau, Bannockburn	Campbell, J. C.	22	1	8'	10'	1 in 4	bord and pillar	6' x 7'	530'	adit	incline	21,900	23,555	2	8	20/11/99
Excelsior, Bannockburn	Gibson, J.	7	1	5' 6"	10'	1 in 4	pillar ditto	6' x 7'	530'	adit	"	2,886	2,886	2	5	18/11/99
Bannockburn, Bannockburn	Wilson, T.	10	1	5'	10'	1 in 4	"	6' x 4'	20'	adit	open	1,079	1,140	1	1	18/11/99
Nevis, Nevis	Luscombe, E.	6	1	20'	10'	1 in 4	"	6' x 4'	20'	adit	open	869	1,619	1	1	..
Clough and Allen's, Nevis	Clough and Allen	..	..	..	10'	1 in 4	"	6' x 4'	20'	adit	open	83	95	..	..	..
Upper Nevis, Nevis	Connel, W. O.	..	..	..	10'	1 in 4	"	6' x 4'	20'	adit	open	55	55	..	..	..
Williamson's, Nevis	Williamson, A.	..	..	..	10'	1 in 4	"	6' x 4'	20'	adit	open	55	55	..	..	..
Pits not now at work.																
Ryder's, Nevis	Scott, C.	..	..	..	10'	1 in 4	"	6' x 4'	20'	adit	open	396	396	..	..	14/1/98
Waikerikeri, Clyde	Dunstan Coal Co. (J. Smart, sec.)	..	..	..	10'	1 in 4	"	6' x 4'	20'	adit	open	20,322	20,322	..	..	23/9/98
McCready and Coombes	Coombes, W.	3	1	..	10'	1 in 4	"	6' x 4'	20'	adit	open	15,317	15,317	..	..	12/11/97
Gully Pit, Roxburgh	(Cockburn)	..	..	..	10'	1 in 4	"	6' x 4'	20'	adit	open	482	482	..	..	..
Enterprise, Alexandra	Perseverance, Alexandra	..	..	..	10'	1 in 4	"	6' x 4'	20'	adit	open	703	703	..	..	..
Perseverance, Alexandra	(Findlay)	..	..	..	10'	1 in 4	"	6' x 4'	20'	adit	open	724	724	..	..	..
Gards & Cameron, Alexandra	..	..	..	..	10'	1 in 4	"	6' x 4'	20'	adit	open	3,128	3,128	..	..	..
Fennessy's, Idaburn	..	..	..	..	10'	1 in 4	"	6' x 4'	20'	adit	open	70	70	..	..	..
Cairnmuir, Bannockburn	(Crow & Anderson)	..	..	..	10'	1 in 4	"	6' x 4'	20'	adit	open	1,451	1,451	..	..	..
Cooper & Gibson's, Bannockb'n	..	..	..	..	10'	1 in 4	"	6' x 4'	20'	adit	open	5,395	5,395	..	..	..
Gibbston, Gibbston	(Cowan's)	..	..	..	10'	1 in 4	"	6' x 4'	20'	adit	open	19,464	19,464	..	..	14/10/97
Harrex and Owens, Cambrians	..	..	..	..	10'	1 in 4	"	6' x 4'	20'	adit	open	60	60	..	..	..
Blackman's Gully, Clyde	..	..	..	..	10'	1 in 4	"	6' x 4'	20'	adit	open	144	144	..	..	..
Nulli Secundus, Bannockburn	..	..	..	..	10'	1 in 4	"	6' x 4'	20'	adit	open	632	632	..	..	..
SOUTHLAND.																
Pukerau, Pukerau	O'Hagan, C.	19	1	16'	10'	1 in 10	bord and pillar	6' x 7'	530'	adit	open	25,646	26,651	2	3	natural
Dudley's, Pukerau	Dudley, J. D.	10	1	16'	all	..	open	..	..	adit	open	1,972	2,204	1	1	..
Whiterigg, Gore	Gray, H.	17	1	12'	15'	..	"	..	..	adit	open	5,374	6,615	2	4	6/9/99
Heffernan's, Gore	Heffernan, P.	21	1	30'	15'	..	"	..	..	adit	open	3,787	4,053	2	2	6/9/99
Gutschlag's, Gore	Gutschlag, W.	16	1	10'	all	..	"	..	..	adit	open	3,089	3,162	2	2	8/12/97
Leitze's, Gore	Leitze, M.	20	1	4' to 7'	..	..	"	..	..	adit	open	21	1,377	1	1	8/12/97
Sarginson's, Gore	Sarginson, J. H.	13	1	9'	all	..	"	..	..	adit	open	1,268	1,421	2	2	5/9/99
Waikaka, Gore	Hofman, F.	5	1	19'	all	..	"	..	..	adit	open	128	534	1	1	8/12/97
Smyth's, Gore	Smyth, J.	10	1	19'	16'	..	bord and pillar	..	..	adit	open	7,107	7,107	5	5	2/9/99
Green's, Gore	Irvine, R.	11	1	19'	16'	almost vertical	ditto	..	..	adit	open	14,642	18,025	2	2	6/9/99
Knapdale, Knapdale	..	14	1	26'	15'	..	wide headings	..	..	adit	open	4,715	5,403	..	..	..
Johnston's, Waikaka Valley	Johnston, W.	6	1	11'	all	..	open	..	..	adit	open	1,133	1,206	2	2	5/9/99
Harvey's, Chatton	Harvey, J.	22	1	16' to 26'	16' to 18'	..	open	..	..	adit	open	12,528	12,928	1	1	6/9/99
Perkins's, Chatton	Perkins, A.	1	..	..	..	..	"	..	..	adit	open	200	200	1	1	6/9/99
Pacey's, Chatton	Pacey, R.	23	1	unknown	14'	1 in 6	"	..	..	adit	open	9,261	9,521	1	1	6/9/99
McGill's, Wendon	McGill, J.	6	1	14'	all	..	"	..	..	adit	open	1,005	1,425	2	2	5/9/99
Edge's (No. 14), Wendon	Nicoll, D.	..	1	..	..	..	"	..	..	adit	open	438	528	2	2	..
Wendon, Wendon	Evans, G. H.	21	1	16'	all	..	"	..	..	adit	open	322	3,463	1	1	5/9/99
Boyd & McNees (late Black's), Greenvale	McNee, J.	5	1	12'	"	..	"	..	..	adit	open	385	478	2	2	23/9/97
Hill's, Waikaka	Hill, J. P.	8	1	5'	"	..	"	..	..	adit	open	1,336	1,594	..	..	21/12/98
Argyle, Waikaka	Baxter, J.	8	1	10'	"	..	"	..	..	adit	open	216	949	1	1	22/12/98
Goldie's, Waikaka	Goldie, J.	..	1	..	..	..	"	..	..	adit	open	38	142	1	1	21/12/98
Wamee, Riversdale	Smith, J.	9	1	..	..	..	"	..	..	adit	open	925	4,984	3	3	30/10/96
Pyramid, Mandeville	McAllister, E.	7	1	18'	9 1/2'	1 in 2	bord and pillar	..	..	adit	open	348	935	2	2	7/9/99
Wainumu, Mataura	Sleeman, C. P.	23	1	16'	all	..	open	..	..	adit	open	4,555	26,838	7	7	4/9/99
Bogside, Mataura..	Brown, H.	24	1	16'	13'	..	adit	..	..	adit	open	554	1,269	..	..	4/9/99

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 1899.			Approximate Total Output to 31st December, 1898.	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.		
MIDDLE ISLAND—continued.																								
SOUTHLAND—continued.																								
Beattie and Coster's, Mataura	Coster, W.	23	lignite	1	16'	all	..	open	..	..	..	open	Tons. 1,210	Tons. 337	Tons. 23,535	23,745	2	..	hand	..	..	..	4/9/99	
Glendhu, Mataura..	Otway, E. A.	..	..	..	..	..	..	..	..	..	..	..	337	10	347	3	1	..	..	..	..	..	..	
River View, Mataura	Nicol, L. D.	8	..	..	..	..	..	..	..	..	..	..	220	614	9,727	10,739	2	..	..	..	..	..	..	
Munro's, Wyndham	Munro, E.	12	lignite	1	5'	all	..	open	..	..	..	open	1,012	..	1,012	9,727	2	..	hand	..	..	..	24/8/98	
Ota Creek, Wyndham	Shields, William	19	..	1	6'	"	..	"	..	..	..	"	588	588	8,818	8,906	1	..	"	..	..	..	24/8/98	
Robin Hood, Pine Bush	Trotter, J. D.	18	"	1	15'	"	..	"	..	..	..	"	147	147	1,088	1,235	1	..	"	..	..	..	24/8/98	
Graham's, Fairfax ..	Graham, P. S.	21	"	1	5' 6"	"	..	bord and pillar	..	..	..	adit	489	489	11,831	12,320	2	..	"	..	..	natural	24/6/98	
Spey Bank, Fairfax	Salton, R.	6	"	1	5'	"	..	ditto	..	..	..	"	51	51	445	496	..	1	..	..	..	"	..	
Isla Bank, Fairfax ..	Slattery, M.	19	"	1	6'	"	..	open	..	..	..	open	412	412	4,225	4,637	1	..	..	..	..	"	24/6/98	
Nightcaps, Nightcaps	Lloyd, J.	18	brown	3	38' in the aggregate	..	..	bord and pillar	..	..	..	adit	23,747	..	23,747	215,131	238,878	10	30	horse	..	"	18/8/99	
Wallace, Nightcaps	Darcy, C.	14	"	1	10'	all	..	open	..	..	..	open	2,400	..	2,400	16,009	18,409	4	..	hand	..	..	18/8/99	
Alley's, Nightcaps ..	Alley, Jesse	7	"	1	7'	"	..	"	..	..	..	"	96	96	528	624	2	..	..	..	..	..	..	
Quested's, Nightcaps	Quested, J.	..	"	..	..	..	..	"	..	..	..	adit	144	144	248	392	1	..	..	..	..	..	..	
H. B., Nightcaps ..	Lee, S...	1	"	1	6½'	..	..	bord and pillar	..	..	..	adit	285	285	58	843	1	1	hand	..	..	natural	18/8/99	
Black Diamond, Nightcaps	Tinker, J. D.	..	"	..	..	..	..	..	..	..	..	..	215	215	5	220	..	1	..	..	..	..	..	
Hunter's, Otama ..	Hunter, T.	..	"	..	..	..	..	..	..	..	..	..	201	201	200	401	1	..	..	..	..	..	..	
Pits worked for Private Use only.																								
Waikoiko, Pukerau	Kirk, W.	12	"	1	6'	all	..	open	..	..	..	open	13	..	241	254	..	..	..	..	..	..	..	
Glover's, Pukerau ..	Glover, A.	5	"	1	..	"	..	"	..	..	..	"	..	..	59	59	..	..	..	..	..	..	..	
Reid's, Waikaka ..	Reid, R.	3	"	1	..	"	..	"	..	..	..	"	6	..	18	24	..	..	..	..	..	..	..	
Southbrook, Waikaka	Ayson, W.	5	"	1	..	"	..	"	..	..	..	"	5	..	112	117	..	..	..	..	..	..	..	
Otama, Otama ..	Graham, T.	6	"	1	..	"	..	"	..	..	..	"	40	40	155	195	..	..	..	..	..	..	..	
Mutch's, Mataura ..	Mutch, J.	9	"	1	4'	"	..	"	..	..	..	"	24	24	237	261	..	..	..	..	..	..	..	
Smith's, Mataura ..	Smith, H.	6	"	1	4'	"	..	"	..	..	..	"	11	11	44	55	..	..	..	..	..	..	..	
Cross's, Otama ..	Cross, Mrs. (owner)	..	"	..	..	"	..	"	..	..	..	"	18	18	34	52	..	..	..	..	..	..	..	
Wyndham, Wyndham	Walker, William	4	"	1	..	"	..	"	..	..	..	"	14	14	60	74	..	..	..	..	..	..	..	
Edendale, Wyndham	McDonald, A.	9	lignite	1	5'	"	..	"	..	..	..	"	12	12	1,985	1,997	..	..	..	..	..	..	..	
Marshall's, Edendale	Marshall, H.	8	brown	1	3'	"	..	"	..	..	..	"	60	60	380	440	..	..	..	..	..	..	..	
Jones's, Edendale ..	Jones, E. and A.	5	"	1	..	"	..	"	..	..	..	"	50	50	197	247	..	..	..	..	..	..	..	
Neill's, Edendale ..	Neill, T.	4	"	1	..	"	..	"	..	..	..	"	12	12	67	79	..	..	..	..	..	..	..	
Mount Linton, Nightcaps	Chalmers, N. G.	9	"	1	10'	8'	..	"	..	..	..	"	12	12	542	554	..	..	..	..	..	..	..	
Pits not now at work.																								
McDonald's, Waikaka	..	..	..	..	..	..	..	..	..	..	..	..	..	..	696	696	..	..	..	..	..	..	..	
Moffet & Longshaw's, Waikaka	..	..	..	..	..	..	..	..	..	..	..	..	..	..	72	72	..	..	..	..	..	..	..	
Townshend's, Mataura	..	..	..	..	..	..	..	..	..	..	..	..	..	..	489	489	..	..	..	..	..	..	..	
Town's, Mataura ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8,002	8,002	..	..	..	..	..	..	..	
Carr's, Mataura ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	518	518	..	..	..	..	..	..	..	
Porter's, Pukerau ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	22	22	..	..	..	..	..	..	..	
Dickson and Walker, Oroydon	..	..	..	..	..	..	..	..	..	..	..	..	..	..	37	37	..	..	..	..	..	..	..	
Hokonui, Hokonui..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	52,084	52,084	..	..	..	..	..	..	..	

MIDDLE ISLAND—continued.

